

PD-ABJ-687
91299

A.I.D. EVALUATION SUMMARY - PART I

1. BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS.
2. USE LETTER QUALITY TYPE, NOT "DOT MATRIX" TYPE.

IDENTIFICATION DATA

A. Reporting A.I.D. Unit: Mission or AID/W Office <u>USAID/Guatemala-Central America Programs</u> (ES# _____)	B. Was Evaluation Scheduled in Current FY Annual Evaluation Plan? Yes <input checked="" type="checkbox"/> Slipped <input type="checkbox"/> Ad Hoc <input type="checkbox"/> Evaluation Plan Submission Date: FY _____ a _____	C. Evaluation Timing Interim <input checked="" type="checkbox"/>
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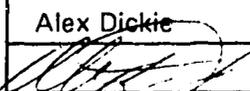
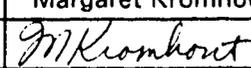
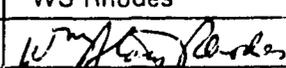
D. Activity or Activities Evaluated (List the following information for project(s) or program(s) evaluated: if not applicable, list title and date of the evaluation report.)

Project No.	Project/Program Title	First PROAG or Equivalent (FY)	Most Recent PACD (MO/Yr)	Planned LOP Cost (000)	Amount Obligated to Date (000)
596-0150	Regional Environmental and Natural Resources Management (RENARM)	9/15/89	9/30/95	40,000 USAID/G 6,322 Buy-ins	41,779

ACTIONS

E. Action Decisions Approved By Mission or AID/W Office Director	Name of Officer Responsible for Action	Date Action to be Completed
Action(s) Required 1. Adopt a unifying strategy whose objective is the conservation of biodiversity of near pristine critical ecosystems and direct sustainable land use efforts towards ameliorating major threats to those sites. 2. Structure activities for geographic concentration on critical ecosystems already identified and their buffer zones, and on resolving major threats to those ecosystems. 3. RENARM management should invite the managers of protected area bilateral projects to participate in a protected area management confederation to identify and solve problems of mutual interest. 4. The experience which PVOs and NGOs have gained should be documented and used to guide design of RENARM II. 5. Using these guidelines, project management should seek to achieve the proposed program concentration as quickly as possible, in order to enable implementors and staff to complete Phase I in an orderly manner while planning the second phase.	Alex Dickie " " " " "	Feb. 1995 Feb. 1995 Oct. 1994 Feb. 1995 On-going Process

G. Approvals of Evaluation Summary and Action Decisions:

	Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer	Mission or AID/W Office Director
Name (Typed)	Alex Dickie	N/A	Margaret Kromhout	WS Rhodes
Signature				
Date	9/27/94		9/14/94	9/27/94

ABSTRACT

H. Evaluation Abstract (Do not exceed the space provided)

RENARM (Regional Environmental and Natural Resources Management project) is a large, complex regional program, designed by ROCAP as the regional response to the strategy for AID assistance to environmental and natural resource management in Central America. It involves more than 20 implementors performing multiple activities in eight countries, at an authorized level of \$61.1 million, including buy-in authority of \$10.9 million. This evaluation, which takes place 4 1/2 years after authorization and roughly 3 years after the start of field implementation, is intended to provide a basis for planning activities to the PACD and preparatory to design of a second phase.

RENARM is experimental, seeking to find ways to deal effectively with E/NR policy, engage US PVOS in E/NR programs in Central America. RENARM set out to accomplish three things: (1) To get a handle on Central American E/NR policy; (2) to involve U.S. PVOs in Central America E/NR programs; and (3) to focus CA regional institutions (particularly CAIIE) on E/NR matters. It is well on its way to accomplishing all three objectives, although few activities are complete, nor will their full potential be realized by PACD. The anticipated four-year second phase will be needed to get the full benefit of the investment made in the establishment and initial learning phase.

Declining funding will require a much more restrictive structure for a second phase, but there is not in place a strategy and criteria for selecting those activities to be continued. The evaluation recommends a strategic objective of conserving biodiversity of critical ecosystems, with sustainable land use efforts in the surrounding areas concentrated on ameliorating major threats to those ecosystems, and policy efforts and biological research focused on finding solutions to those threats.

The report summarizes the activities and performance of individual activities, and provides recommendations for improving that performance. It also suggests activities for elimination in the second phase because their immediate targets will have been reached and/or they are less important than others for achieving the purpose of RENARM. These recommendations also support the retention of activities whose current record suggests the greatest potential for achieving that purpose.

COSTS

I. Evaluation Costs

1. Evaluation Team		Contract Number OR	Contract Cost OR	Source of Funds
Name	Affiliation	TDY Person Days	TDY Cost (U.S. \$)	
Albert L. (Scaff) Brown, Team Leader	Chemonics	Chemonics Team 258 days per person	Fixed Price \$216,315.00	Contract 596- 0150-C-00- 4089-00
James A. Chapman, Natural Resources Policy	Chemonics			
Robert B. Peck, Forestry/Agroforestry	Chemonics			
Stephen Stewart, Sociologist/Anthropologist	DECOR			
César A. Barrientos, Protected Areas	DECOR			
2. Mission/Office Professional Staff		3. Borrower/Grantee Professional		
Person-Days (Estimate) _____ 00 _____		Staff Person-Days (Estimate) _____ 20 _____		

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A.I.D. EVALUATION SUMMARY - PART II

S U M M A R Y

J. Summary of Evaluation Findings, Conclusions and Recommendations (Try not to exceed the three (3) pages provided)

Address the following Items:

- | | |
|--|---|
| <ul style="list-style-type: none"> • Purpose of evaluation and methodology used • Purpose of activity(ies) evaluated • Findings and conclusions (relate to questions) | <ul style="list-style-type: none"> • Principal recommendation • Lessons learned |
|--|---|

Mission or Office:

USAID/Guatemala-Central American Programs

Date This Summary Prepared:

August 3, 1994

Title and Date of Full Evaluation Report:

Regional Environmental and NR Management (RENARM) Midterm External Evaluation

A. Purpose and Methodology: To provide a basis for the following planning activities;

- Implementation refinement for the rest of RENARM's first funding period (i.e. to 9/95)
- Confirmation or rejection of the original intention to continue RENARM as a ten year effort through 9/99
- Design refinement for RENARM's second funding period (9/95-9/99)
- Alignment of RENARM with new AID management structures which may evolve

The evaluation methodology included initial orientation briefings and review of summary data prepared by USDH and PSC management and coordination staff and specialists. Iterative reviews of: (1) AID CA E/NR strategy and program documents; (2) the RENARM project paper, amendments and semi-annual reports; and (3) implementor agreements, work plans, reports, special studies and internal evaluations were interspersed with repeated interviews of direction and coordination staff as well as implementor management and technical staff. Each country involved in the RENARM program was visited for interviews with bilateral mission staff and program staff at implementor headquarters and/or program sites. Field trips to representative program sites provided an opportunity for exchange of views with other implementor staff, NGOs, and farmers.

Purpose of Activities Evaluated: RENARM is an innovative, risk taking activity that is exploratory and experimental. It seeks to bring together a wide variety of alternative approaches and implementors to create the conditions necessary for the sustained use of natural resources in the Central American region.

B. Performance (Findings and Conclusions, with recommendations for Activity Continuance)

RENARM is an innovative, risk taking activity. The project paper anticipates the need for implementors and management alike to learn from doing. It overtly recognizes the need to explore alternatives to traditional USAID project design paradigms, and a corresponding need for "paying as much attention to process as to product." Consequently, the project paper, although formally conventional, provides less specific guidance than usual and more opportunity for innovation by the implementors. It lacks a unifying strategy for its twenty implementors and their multiple activities. This makes the project difficult to describe, manage, and evaluate.

RENARM set out to accomplish three things: (1) to get a handle on Central American E/NR policy; (2) to involve U.S. PVOs in Central American E/NR programs; and (3) to focus CA regional institutions (particularly CATIE on E/NR matters. It is well on its way to accomplishing all three objectives, although few activities are complete, nor will their full potential be realized by PACD. The anticipated four-year second phase will be needed to get the full benefit of the investment made in the establishment and initial learning phase.

M

S U M M A R Y (Continued)

B1. Central American Environmental and Natural Resource Policy

This effort has created a participative policy analysis package (The Green Book Complex, and introduced the concept of policy as the resultant of competing interests. The participative policy analysis package is used to help NGOs as well as governments, and others to understand the effects of policy on their members and decide whether or not to advocate change. The PACA consortium is actively engaged in field testing this system with NGOs. The Mesoamerican Biodiversity Legal Project, a consortium of a U.S. university and two Central American NGOs, has established a network of national legal experts, completed an inventory of Central American environmental laws, and drafted a model law which, if adopted by isthmian nations, would facilitate the establishment and management of multinational parks. Its progress has attracted foundation support to guarantee its institutional integrity for three years, assuring the availability of its expertise to other RENARM activities.

RENARM support of the executive secretariat of Central American Council on Environment and Development (CCAD) has enabled that organization to support the CA Presidential Summits by drafting the environmental agendas and drafts for Presidential deliberation. Among its effects are:

- o Developing the Central American Agenda for Environment and Development, which was presented at ECO 2 in Rio de Janeiro and stands as the strategy for C.A. activities in environment and development.
- o Forming CICAD, the interparliamentary commission, and CCAP, an organization of all Central American park directors.
- o Development of the Tropical Forestry Action Plan for Central America, and work to finance its implementation.

CCAD is currently working on development of the Alliance for Sustainable Development which is intended to move Central America into a NAFTA-like agreement with the U.S. CCAD will also be involved in setting the C.A. agenda for the Summit of the Americas.

RENARM, through a buy-in with World Resources Institute (WRI), assists CCAD to strengthen the policy-making and outreach activities of the national councils on environment and development (CONAMAs) and develop their capacity to do rapid policy assessments, build consensus, mobilize public support, and resolve conflicts on critical environmental issues.

B2. Involvement of U.S. PVOs in Central American E/NR Programs

RENARM sought increased utilization of PVOs in Central American E/NR programs, primarily in the management of biodiverse protected areas and their related buffer zones. To achieve this, AID contracted with two consortia: PACA (CARE International, The Nature Conservancy, and Conservation International), and Paseo Pantera (Wildlife Conservation Society and Caribbean Conservation Corporation).

B2a. PACA (CARE International, The Nature Conservancy)

The general model which PACA uses is a U.S. PVO working with local NGOs to manage a protected area and a buffer zone, with functional foci on environmental policy and information, environmental monitoring, and public awareness. In each case, PACA provides technical assistance for problem diagnosis and planning, followed by training/workshops and small grants of equipment and materials. PACA has established four model program sites in Guatemala, Belize, Honduras, and Costa Rica. These, plus PASEO's biological corridor (see below) are the major ecosystems around which Phase II activities will be concentrated. TNC works with the NGOs protecting the nuclear zones, CARE with those involved in buffer zone communities.

- o Environmental Education. Although PACA is only one among many public and private influences, environmental awareness is higher now in Central America than ever before.
- o Protected Area Management. NGOs are either directly responsible for nuclear zone management or are influential collaborators with the responsible government agencies. PACA/TNC support of these NGOs includes their strengthening through fellowships in park management, technical assistance in work planning and providing data for research and management. TNC developed a methodology for rapid ecological assessments (REAs) and has funded REAs in Belize, Guatemala, Costa Rica, and Honduras.

SUMMARY (Continued)

- o Buffer Zone Management. PACA/CARE works with NGOs outside the nuclear zone, not only in environmental education, but also in a wide variety of community development efforts, including terracing and other agro-conservation techniques, agroforestry and reforestation, ecotourism, and credit. These programs are focused on the invasive slash and burn agriculture of communities of small farmers, and have not yet addressed other major threats, such as logging, clearing of steep slopes for cattle grazing, or the impact of irrigated agriculture on wetlands.
- o Institutional Strengthening. Both CARE and TNC work to strengthen the technical and managerial capability of their counterpart NGOs. CARE has developed an effective diagnostic tool for rapid assessment of institutional capacity which it uses to focus its subsequent programs. Beneficiary NGOs give high praise to both the diagnostic tool and subsequent TA.
- o Policy. CARE's policy advisor has been a primary resource in testing the Green Book's use by NGOs (see above). TNC also provides support on environmental policy to its counterpart NGOs.

B2b. Paseo Pantera (PASEO) (Wildlife Conservation Society and Caribbean Conservation Corporation)

PASEO's program is the most experimental of the innovative RENARM program, and the riskiest, since its focus is almost entirely on the wetter, more fragile Caribbean side of the isthmus. PASEO invests small amounts of funds in a wide variety of actors, which lowers risk while it enhances experience. A few of PASEO's investments have been spectacularly successful innovations (e.g., Biodiversity Legal Project, Rio Plátano-Tawahka Sumo Awareness Campaign); others are solid accomplishments (e.g., Bay Islands and Tortuguero environmental education, Bay Islands land use study); and a few important concepts are in an advanced stage of the learning experience (e.g., ecotourism, biological corridor, buffer zones, environmental awareness). These last four are the most intriguing because of their potential.

- o Biological Corridor. The linch pin of the PASEO strategy is the concept of a Central American biological corridor stretching from Mexico to Panama. PASEO orients all its other activities (research, ecotourism, buffer zone management, environmental education, planning) around the overall goal of establishing both land-based and marine biological corridors. However, if the biological corridor concept is to prosper, it needs to be reflected in a clear and defensible plan to achieve the consolidation of parks and reserves into reserve complexes, with an effective strategy for integrating the gaps in the corridor into the concept. Basically, PASEO needs to complete its corridor management plan before PACD if this concept is to influence the design of RENARM II. This effort should include analysis by anthropologists and sociologists working with ecologists to (1) define the biological significance of man-made and natural gaps; (2) understand the sociocultural situation on the ground in these gaps; and (3) design a series of options to integrate gap populations into the corridor concept.
- o Buffer Zones. The concepts of buffer zones under which PASEO and others have operated are not well-defined or classified, nor is there agreement about what kinds of activities are appropriate for different types of zones (nuclear, multi-use, buffer) under different conditions (e.g., reef habitats, collections of small protected areas). In some cases, buffering may be a process, rather than an area. Because of its experience and contacts, PASEO should take the lead in organizing a Central American conference on buffer zones, to include a wide selection of individuals and organizations with varied experience, in order to forge a consensus on buffer zone classification and the actions indicated in specific situations. Since buffer zones involve people, experienced social scientists should be involved in these discussions.
- o Ecotourism. Ecotourism has been a major focus of PASEO activities, as a way to give value to natural resources and to develop a constituency for their preservation. PASEO has held ecotourism conferences, published guidelines, promoted public-private national tourism councils, and prepared and implemented site-specific ecotourism activities. Many other PASEO activities have an ecotourism connection, as well as a biological corridor relationship. In combination these represent important experience which should be documented. PASEO should analyze and consolidate the information it has gathered on ecotourism, and should produce a document of lessons learned in the field with recommendations for future action.

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B3a. Pesticide Management

Overuse and indiscriminate use of pesticides in Central America is a serious problem for human health and sustainable natural resource use. This program, whose main environmental objective is to reduce the use and misuse of pesticides while maintaining economic productivity, consists of Integrated Pest Management (IPM) and Pesticide Management Information.

B3a(1) Integrated Pest Management. IPM reduces the use of toxic chemical pesticides by increasing biological control, improving cultural practices, and limiting pesticide use to biologically critical conditions. RENARM supports IPM technology generation and transfer activities at CATIE and EAP. IPM research and adaptation in both places were started well before RENARM and are beginning to have an impact on production methods and pesticide use in the region. Both the CATIE and Zamorano IPM programs have met their intermediate targets. The program has had a significant impact in promoting more rational pesticide use and introduced IPM systems which complement or substitute synthetic pesticides. These activities have great potential economic and environmental importance. Some of them, particularly extension of IPM techniques in buffer and multi-use zones, should be continued in RENARM II.

B3a(2) Pesticide Management Information. This is a high impact educational program designed to reduce pesticide use and misuse by getting pesticide information into the hands of the users as fast as possible through the following activities:

- Pesticide Information. Detailed information on pesticides is provided by EPA/FDA to CATIE, which distributes it to subscribers and serves as a reference center.
- Pesticide Extension. This training and advisory program enables Peace Corps agricultural extension volunteers to provide proper counsel and training on safe pesticide management and to transfer appropriate IPM technologies to their farmer clients.
- Pesticide Management Short Courses for Farmers. This EAP-designed course was adapted for delivery to other audiences, e.g., homemakers, extensionists, trainers, farm managers, policy makers
- Pesticide Management Correspondence Courses for Health Workers. This program was designed and directed by INCAP for administration by national public health agencies. It provides information on diagnosis and treatment of pesticide poisoning to doctors and nurses throughout the isthmus.

The pesticide management information program addresses a widely felt need and involves several effective and concerned implementors (EPA/FDA, EAP, USDA, PC, INCAP, CATIE) in a synergistic program. The methods and contact points for all four activities are being institutionalized in Central American regional institutions.

RENARM support for the pesticide management training program should be allowed to end, as programmed at PACD, precisely because all activities will have become institutionalized by that time. Training and information services have been designed, proven and installed in a permanent regional institution which is now recognized as a preferred provider. However, alternatives should be investigated for maintaining the EPA/FDA PASA. The EPA/FDA PASA has been a critical component of the pesticide management program, particularly to service the CATIE pesticide database service, but also as a source of technical advice and laboratory training.

S U M M A R Y (Continued)

B3b. Production from Natural Forests

Production from Natural Forests (PNF) seeks to maintain the natural forest resource by managing it for continuous production of timber and non-timber products. The objective of this activity is to validate natural forest management as a viable land use alternative to shifting agriculture or short-lived pasture, by demonstrating the economic value of managed forests as commercial enterprises which are still compatible with the conservation of protected areas.

CATIE has established a core staff of specialists in tropical forest management whose extensive experience in both primary and secondary forest management enables it to command international respect for its efforts both in teaching and applied field research tailored to local conditions. Silvicultural and management practices are being demonstrated in several pilot management areas in Costa Rica, Guatemala, and Nicaragua. This project and RENARM technical advisors collaborated with two USAID bilateral natural resource projects (FORESTA in Costa Rica and MAYAREMA in Guatemala) to plan the sustainable management of natural forests in protecting important areas of biodiversity. This activity should be strengthened, and continued in RENARM II.

B3c. Tree Crop Dissemination (MADELENA-III)

This program, the result of CATIE work in fuelwood started 15 years ago with ROCAP financing, has promoted growing trees for production of poles, posts, and saw logs, with fuelwood as a by-product. RENARM enabled CATIE to refocus this activity on transfer of the developed technology, while continuing its research monitoring program.

Although, MADELEÑA III has made great strides since 1991 in changing emphasis from research to technology transfer services, its technology is adapted to the drier western side of the isthmus, and is inappropriate for the wetter Caribbean side, where it is recommended that most second phase activity will be concentrated. Since adaptation to this environment will require 5 to 10 years of testing, this project should be dropped at PACD.

B3d. Watershed Management

The RENARM watershed management activity refocused an earlier CATIE watershed program on land use planning for the rehabilitation of degraded watersheds and extending integrated technological packages that will improve farmers' production while reducing soil erosion and surface water runoff.

The results have been impressive. The watershed management activity has applied land use planning techniques and demonstrated successful technology for sustainable hillside agriculture on five watersheds in four countries. An integrated technical package of low input technologies such as absorption trenches dug on the contour, supplemented by productive living barriers, and stabilizing gullies with rock dams and plantains will, in the short term, increase agricultural production while reducing soil erosion and run-off of surface water. Good agricultural practices such as eliminating burning, minimum tillage, improved seed selection and higher planting density further increase returns. This program should be adapted to a focus on steep slopes in the buffer zones surrounding the protected areas.

B4. Technical Specialization

A group of activities with comparable ends were separated out of these three global programs. They have as their common objective to prepare and support Central Americans to generate, transfer and apply the information and technology essential for the sustained use of natural resources in Central America.

B4a. The University of Idaho Masters Program in Environmental Education

This subactivity seeks to create a mutually reinforcing network of Central American professional environmental education communicators by providing M.Sc. degree training in environmental education, communications, and interpretation simultaneously to 14 participants from C.A., along with team-building activities to create a post-degree network. This is a very promising activity, but will not need to be repeated in the second phase.

S U M M A R Y (Continued)

B4b. The CATIE Post Graduate (M.Sc.) Program

CATIE operates the premier postgraduate agricultural school in Latin America, awarding from 20 to 50 M.Sc. degrees per year to students from throughout the hemisphere. Although this program has a direct relationship to the CATIE activities which RENARM finances, the fellowships are not essential to the near term needs of RENARM. Given AID's own precarious budget situation, these fellowships should be dropped in Phase II.

B4c. The TNC Fellowships

The Nature Conservancy (TNC) fellowships (nine awarded, so far) seek to enhance the capacity of environmental NGO employees, selected for their direct role in managing protected areas. The quality of NGO work depends directly on the capability of its key staff. The TNC Fellowships are non-degree activities which are highly targeted on strengthening the park management capacity of key employees of NGOs responsible for protected area management, and immediately beneficial. They should be continued as a part of PACA/TNC's program, provided that they are concentrated on the RENARM-designated protected areas.

B4d. The Wildlife Conservation Society Small Research Grants

The Small Grants Program uses WCS' scientific grant awarding system to make small grants to Central American scientists to enable them to perform research which will enhance the availability of scientific knowledge in central America. It is improbable that any of the current grants of the WCS Small Grants Program will directly address significant RENARM operational problems, since the program operates without meaningful criteria to require such a relationship. This program is not warranted by experience to date, given the limited funding expected to be available for Phase II.

C. Recommendations for Refocusing RENARM for Phase II

The planned second phase of RENARM is warranted by the program accomplishments in the first phase and the potential for learning more from this experience in Phase II. RENARM's second phase will likely have to be much leaner than originally planned. It follows that the array of activities for a second phase will have to be carefully selected and justified by the experience gained in this first period. This process of selection (and deselection), design, and justification must be completed in the fifteen months remaining before PACD, not only to authorize funding for a second phase, but to permit the orderly completion of deselected activities. The following recommendations are addressed to this concern:

1. Adopt a unifying strategy whose objective is the conservation of biodiversity of near pristine critical ecosystems and direct sustainable land use efforts towards ameliorating major threats to those sites.
2. Structure activities for geographic concentration. Revise the project structure to concentrate activities and management on critical ecosystems already identified and their buffer zones, and on resolving the major threats to those ecosystems.
3. Since bilateral mission protected area activities follow a similar model to that used by RENARM, RENARM management should invite the managers of protected area projects to participate in a protected area management confederation whose purpose would be to work together to identify and solve problems of mutual interest.
4. PVOs and NGOs are a critical factor in active programs to conserve biodiversity in Central America. The experience which they have gained should be documented and used to guide design of RENARM II.

S U M M A R Y (Continued)

5. Using these guidelines, project management should seek to achieve the proposed program concentration as quickly as possible, in order to enable implementors and staff to complete RENARM I activities in an orderly manner and contribute to the design of RENARM II. Besides recommendations with regards to individual activities, the following are suggestions for major program elements:

- Concentrate policy efforts on mitigating the major threats to biodiversity conservation identified in the specifically defined protected areas.
- Concentrate watershed management and management of natural forests, and agricultural and agroforestry support on the multiple use zones and settled buffer zones of protected areas.
- Assign monitoring and evaluation responsibility for specific sites to individual PSC coordinators, who will be expected to spend at least five days per month at those sites.
- Assure that any research funded by RENARM is on problems whose solutions are of direct and pertinent value to biodiversity conservation and sustainable agriculture in the selected project sites.
- Phase out all other activities by PACD, as recommended in individual activity assessments.

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A T T A C H M E N T S

K. Attachments (List attachments submitted with this Evaluation Summary: always attached copy of full evaluation report, even if one was submitted earlier; attach studies, surveys, etc., from "on-going" evaluation. If relevant to the evaluation report.)

- (A) Mid Term External Evaluation of the Regional Environmental and Natural Resource Management Project (RENARMO)
- (B) MSI, "RENARM and the USAID Bilateral Missions," September 1993.
- (C) MSI, "RENARM, USAID and Central American NGOs: Voices from the Field," December 1993.
- (D) Renzi, Mark, Leslie Lannon, Hillary Lorraine, "Using Multi-NGO Consortia in Wildlands Projects: Lessons for RENARM," MSI, January 1994.

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COMMENTS

L. Comments By Mission, AID/W Office and Borrower/Grantee On Full Report

The primary purpose of this evaluation was to initiate the Mission's efforts to identify appropriate interventions for a next generation regional environmental intervention. As such, its recommendations focus on future strategic direction, not corrective actions to be taken vis a vis any specific activities. The Mission accepts the validity of all of the major recommendations; however, the extent to which they are implemented will be determined during the design of the follow-on project to RENARM (expected to be completed by February/March 1995).

At the concept phase, the Mission has decided to focus design around the unifying principles of a Central American biological corridor and a regional approach to preparation for accession to an environmental side agreement to a possible Western Hemisphere Free Trade Agreement. (Recommendations #1 and #2) In the development of this concept, the Mission will formally consult and involve NGO and bilateral missions to analyze and further define the biological corridor, and suggest appropriate regional approaches. (Recommendations #3 and #4) The Mission has already discussed the phase out of the RENARM Project with key counterparts and funding plans for FY 1995 will reflect the priorities that have been and will be set during preliminary design work for the follow-on project. (Recommendation #5)

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LIST OF ACRONYMS

ADO	Agricultural Development Officer
AGUADEFOR	Asociación Guanacasteca de Desarrollo Forestal (Guanacaste, Costa Rica)
AID	Agency for International Development (see USAID)
AID/LAC	Bureau for Latin America and the Caribbean
ASOMA	Asociación de Maestros Ambientalistas (San Pedro Sula, Honduras)
BAS	Belize Audubon Society (Belize)
BCES	Belize Center for Environmental Studies
BECONGO	Belize Conservation NGOs
BZ	Belize Zoo
C.A.	Central America
CARE	Cooperative for American Relief Everywhere
CCC	Caribbean Conservation Corporation
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza (Turrialba, Costa Rica)
CCC	Caribbean Conservation Corporation
CCGI	Comité Contra Incendios de Guanacaste (Costa Rica)
CDC	Centro de Datos para la Conservación
CECON	Centro de Estudios Conservacionistas
CEL	Comisión Ejecutiva Hidoeléctrica del Río Lempa (El Salvador)
CEMPLA	Centro de Evaluación y Manejo de Plaguicidas, EAP
CEDARENA	Centro de Derecho Ambiental y de los Recursos Naturales (Costa Rica)
CGR	Center for Government Responsibility
CI	Conservation International
CICAD	Comisión Interparlamentaria Centroamericana del Ambiente y Desarrollo
CONAMA	Consejo Nacional para el Medio Ambiente
CONAP	Consejo Nacional para Areas Protegidas (Guatemala)
CS	Cultural Survival
DA	Development Assistance
Defensores	Defensores de la Naturaleza (Guatemala)
EAP	Escuela Agrícola Panamericana, Zamorano, Honduras
E/NR	Environment and Natural Resources
EPA	Environmental Protection Agency
EU	European Union
EXITOS	Export Industry Technology Support Project
FDA	Food and Drug Administration
FHRPF	Fundación Héctor Rodrigo Pastor Fasquelle (San Pedro Sula, Honduras)

FN	Fundación Neotrópica (San José, Costa Rica)
FSN	Foreign Service National
FUNBANHCAFE	Fundación del Banco Hondureño del Café (San Pedro Sula, Honduras)
FUNDAECO	Fundación para el Ecodesarrollo y Conservación (Puerto Barrios, Guatemala)
FUNDECOR	Fundación de Conservación de Recursos (Costa Rica)
FUNDEMABV	Fundación de Desarrollo del Medio Ambiente de Baja Verapaz (Salamá, Guatemala)
GIFAP	Groupement International des Associations Nationales de Fabricants de Produits Agrochimiques)
GPS	Geographic Positioning System
IDEADS	Instituto de Derecho Ambiental y Desarrollo Sostenible (Guatemala)
IIED	International Institute for Environment and Development
INCAP	Instituto de Nutrición para Centro America y Panamá
INEHSCO	Instituto Ecomómico Hondureño de Servicio a la Comunidad (San Pedro Sula, Honduras)
IPM	Integrated Pest Management
INRENARE	Instituto Nacional de Recursos Naturales Renovables (Panamá)
IRENA	Instituto Nicaragüense para Recursos Naturales y el Ambiente
LAC	Latin America and the Caribbean
MARENA	USAID/Panama Natural Resources Management Project
MAYAREMA	Maya Biosphere Project
MINAG	Ministry of Agriculture
MIP	Manejo Integrado de Plagas (see IPM)
M&E	Monitoring and Evaluation
MSI	Management Systems International
NAFTA	North American Free Trade Agreement
NGO	Nongovernmental Organization (Central American)
NIS	Newly Independent States
NRM	Natural Resources Management
NYZA	New York Zoological Society (now WCS)
O/	Office of (USAID)
OICD	USDA Office of International Cooperative Development
ONARM	Office of Natural Resources Management, now O/ENR (USAID)
PACA	Proyecto Ambiental para Centro America (CARE and TNC consortium)
PACD	Project Assistance Completion Date
PASA	Participating Agencies Service Agreement
PASEO	Paseo Pantera (WCS and CCC consortium)
PfB	Program for Belize
PP	Project Paper
PSC	Personal Services Contract
PVO	Private Voluntary Organization (U.S.)
REA	Rapid Ecological Assessment
RENARM	Regional Environmental and Natural Resources Management Project

ROCAP	USAID Regional Office for Central American Programs (Guatemala City, Guatemala)
RPPM	Rational Pest and Pesticide Management training course
SARS	Semi-Annual Reports
SGP	Small Grants Program for Conservation Biology
TCN	Third Country national
TNC	The Nature Conservancy
USAID	U.S. Agency for International Development
USAID/G-CAP	USAID/Guatemala and Central American Programs
USDA	U.S. Department of Agriculture
USDH	U.S. Direct Hire (Foreign Service Personnel of USAID)
USG	U.S. Government
WCI	World Conservation International
WCS	Wildlife Conservation Society
WRI	World Resources Institute
WRI/CIDE	Center for Conservation and Environment
ZAMORANO	Pan American Agricultural School (see EAP, Zamorano, Honduras)

EXECUTIVE SUMMARY

RENARM (Regional Environmental and Natural Resources Management project) is a large, complex regional program, designed by ROCAP as the regional response to the strategy for AID assistance to environmental and natural resource management in Central America. It involves more than 20 implementors performing over 20 multi-activity programs in eight countries, at an authorized level of \$61.1 million, including buy-in authority of \$10.9 million.

A. Objective of Evaluation

This evaluation, which took place 4 1/2 years after authorization and roughly 3 years after the start of field implementation, is intended to provide a basis for the following planning activities to be carried out by RENARM over the following year:

- Implementation refinement for the rest of RENARM's first funding period (i.e., to 9/95)
- Confirmation or rejection of the original intention to continue RENARM as a ten year effort through 9/99
- Design refinement for RENARM's second funding period (9/95-9/99)
- Alignment of RENARM with new AID management structures which may evolve in Central America and worldwide

The evaluation report includes the following sections which together address these considerations:

- I. Introduction
- II. Analysis of RENARM's Design, Plans and Objectives
- III. Assessment of RENARM's Performance
- IV. Management Structure and Systems Analysis
- V. Reporting, Documentation and Lessons Learned
- VI. Lessons and Recommendations Summary

B. Performance

RENARM is an innovative, risk taking activity that is exploratory and experimental. It seeks to bring together a variety of alternative approaches and implementors to create the conditions necessary for the sustained use of natural resources in the Central American region. The project paper anticipates the need for implementors and management alike to learn from doing. It overtly recognizes the need to explore alternatives to traditional USAID

project design paradigms, and a corresponding need for "paying as much attention to process as to product." Consequently, the project paper, although formally conventional, provides less specific guidance than usual and more opportunity for innovation by the implementors.

From a regional perspective, RENARM set out to accomplish three things:

- (1) To get a handle on Central American E/NR policy
- (2) To involve U.S. PVOs in Central America E/NR programs
- (3) To focus CA regional institutions (particularly CATIE) on E/NR matters

It is well on its way to accomplishing all three objectives, although few activities are complete, nor will their full potential be realized by PACD. The anticipated four-year second phase will be needed to get the full benefit of the investment made in the establishment and initial learning phase.

B1. Central American Environmental and Natural Resource Policy

This effort has focused on four interrelated efforts:

- Participatory Policy Analysis Package (the Green Book)
- Institutional Strengthening of CCAD and the CONAMAs (World Resources Institute)
- Environmental Policy and Strategic Planning aimed at the NGOs (PACA-CARE)
- Mesoamerican Legal Project (U. Florida/CEDARENA/IDEADS)

B1a. Participatory Policy Analysis Package (the Green Book) (Abt Associates)

This effort involves both product and process. The products are a series of four documents (the Green Book Complex) which provide (1) a classification of E/NR policies and their effects; (2) a methodology for creating and updating national E/NR policy inventories; (3) a description of how to structure a participatory policy dialogue process using the first two instruments; and (4) a workbook to familiarize readers with the policy analysis process and application of volumes I-III. Only the Green Book itself has been published. The other three are approaching final drafts, following field testing. All are expected to be available in Spanish by October 1994.

The process is the concept of policy as the resultant of competing interests rather than as analysis for decision makers. Providing environmental NGOs with a tool which enables them to assess the impact of E/NR policy on their collective and individual interests enables them to decide what those interests are, and whether and how to advocate them. In essence, it helps to level the playing field, and thus provides a broader spectrum of informed opinion for decision makers.

At this point, both the product and the process are close to definition, but not to institutionalization. The full effect of the last two products—how to structure the policy dialogue process and the workbook—and the process itself cannot be assessed until these are

widely available in Spanish. A strong demand for these products by environmental NGOs is evident, and the field experience with those conversant with the English version is promising.

B1b. Environmental Policy and Strategic Planning aimed at the NGOs (PACA-CARE)

This sub-component, managed by PACA/CARE, seeks to increase the capability of the PACA national NGO counterparts to understand the impact of policy on rural populations and on NGO programs and activities, and to enable them to participate in policy dialogue and advocacy. Accomplishments/activities to date include:

- Collection and analysis of laws, regulations and policies related to forest fire control in Costa Rica and agricultural modernization in Honduras; publication of environmental impact assessment (EIA) guidelines in Belize; case studies on policy analysis and formulation roles of environmental NGOs in Costa Rica, Belize, and Guatemala.
- Capacity building through the installation of an e-mail network; training/workshops on environmental impact assessments (Belize) and participation in the policy change process (Regional); contracting local legal NGOs (CEDARENA, IDEADS) to support policy analysis and formulation activities and the analysis of the legal frameworks for protected areas; and facilitation of policy dialogue involving NGOs and government in Costa Rica (forest fire control) and Honduras (agricultural modernization laws) and support to OTS' Policy Dialogue Program for Incoming Governments.

B1c. Institutional Strengthening of CCAD and the CONAMAs (World Resources Institute)

The Central American Commission on Environment and Development (CCAD) is an initiative of the Central American Presidents. RENARM has provided direct financial support to the CCAD Executive Secretariat to enable it to perform essential support and coordination services. USAID/G-CAP should continue its close relationship with and support of CCAD in RENARM II. CCAD's Executive Secretariat is attracting both Central American and international donor support, because of its undeniable value. Among its accomplishments:

- Setting the agenda for environmental issues for the Central American presidential summits.
- Developing the Central American Agenda for Environment and Development, which was presented at ECO 92 in Rio de Janeiro and stands as the strategy for C.A. activities in environment and development.
- Instrumental in setting up CICAD, the interparliamentary commission, and CCAP, an organization of all Central American park directors.

- Development of the Tropical Forestry Action Plan for Central America, and continuing work to finance its implementation.
- Currently working on development of the Alliance for Sustainable Development which is intended to move Central America into a NAFTA-like agreement with the U.S. CCAD will also be involved in setting the C.A. agenda for the Summit of the Americas.

CCAD recommended that countries establish national commissions on the environment (CONAMAs) to respond to environment and development initiatives, and they have done so. A RENARM buy-in enables World Resources Institute (WRI) to assist CCAD to strengthen the policy-making and outreach activities of the CONAMAs. WRI will help the CONAMAs develop the capacity to do rapid policy assessments, build consensus, mobilize public support, and resolve conflicts on critical environmental issues. WRI will use the Green Book materials described above in this effort. This activity has just begun with a diagnostic assessment of each CONAMA and is to be completed by the end of RENARM's first phase.

B1d. Mesoamerican Biodiversity Legal Project (University of Florida/CEDARENA/IDEADS)

This joint effort of a U.S. university and two Central American environmental law NGOs conducts legal research in the Central American region to help conserve biodiversity through the development of legal and administrative tools. Supported by a cooperative agreement financed by LAC and monitored by RENARM, it has established a network of national cooperators, including a specialist on indigenous peoples; completed an inventory of current protected area legislation; drafted a comparative analysis of the environmental legal situation in each country; drafted a model national environmental law (of particular importance for multi-national protected areas); and prepared a report on national laws governing indigenous peoples and protected areas. It has attracted international support, including a three-year institutional support grant from the Ford and MacArthur foundations to continue its work.

B2. Involvement of U.S. PVOs in Central American E/NR Programs

Development PVOs have operated in Central America for decades. Environmental PVOs and national counterpart NGOs are a more recent phenomenon (although CCC has been on the scene for more than three decades), but one which signaled its utility under the LAC-funded Parks in Peril program. RENARM sought increased utilization of PVOs in Central American E/NR programs, primarily in the management of biodiverse protected areas and their related buffer zones. To achieve this, AID executed Cooperative Agreements (Grants) with two consortia: PACA (CARE International, The Nature Conservancy, and Conservation International), and Paseo Pantera (Wildlife Conservation Society and Caribbean Conservation Corporation).

B2a. PACA (CARE International, The Nature Conservancy)¹

The general model which PACA uses is that which TNC used in its LAC-sponsored Parks in Peril program, i.e., a U.S. PVO working with local NGOs to manage a protected area and a buffer zone, with functional foci on environmental policy and information, environmental monitoring, and public awareness. In each case, PACA provides technical assistance for problem diagnosis and planning, followed by training/workshops and small grants of equipment and materials. PACA has established four model program sites in Guatemala, Belize, Honduras, and Costa Rica. TNC works with the NGOs protecting the nuclear zones, CARE with those involved in buffer zone communities.

- **Environmental Education.** Environmental awareness is higher now in Central America than ever before. Although PACA is only one among many public and private influences, PACA and its collaborators have contributed significantly in their areas through training and the production of didactic materials and exhibits for parks and for general in-school and extracurricular use.
- **Protected Area Management.** NGOs are either directly responsible for nuclear zone management or are influential collaborators with the responsible government agencies. PACA/TNC support of these NGOs includes their strengthening through fellowships in park management, technical assistance in work planning and providing data for research and management. TNC developed a methodology for rapid ecological assessments (REAs) and has funded REAs in Belize, Guatemala, Costa Rica, and Honduras. TNC is also an implementor of model bilateral projects in Nicaragua and Belize, and a GOP project in Panama.
- **Buffer Zone Management.** PACA/CARE works with NGOs outside the nuclear zone, not only in environmental education, but also in a wide variety of community development efforts, including terracing and other agro-conservation techniques, agroforestry and reforestation, ecotourism, and credit. These programs are focused on the invasive slash and burn agriculture of communities of small farmers, and have not yet addressed other major threats, such as logging, clearing of steep slopes for cattle grazing, or the impact of irrigated agriculture on wetlands.
- **Institutional Strengthening.** Both CARE and TNC work to strengthen the technical and managerial capability of their counterpart NGOs. CARE has developed an effective diagnostic tool for rapid assessment of institutional capacity which it uses to focus its subsequent programs. Beneficiary NGOs give high praise to both the diagnostic tool and subsequent TA.
- **Policy.** CARE's policy advisor has been a primary resource in testing the Green Book's use by NGOs (see above). TNC also provides support on environmental policy to its counterpart NGOs.

¹ Conservation International has withdrawn from the PACA consortium.

The PACA consortium teams an environmental and a development PVO. Although CARE and TNC have learned from each other, their formal teaming appears to confer few advantages and poses some administrative limitations, compared with separate agreements.

B2b. Paseo Pantera (PASEO) (Wildlife Conservation Society and Caribbean Conservation Corporation)

PASEO's program is the most experimental of the innovative RENARM program, and the riskiest, since its focus is almost entirely on the wetter, more fragile Caribbean side of the isthmus. PASEO invests small amounts of funds in a wide variety of actors, which lowers risk while it enhances experience. A few of PASEO's investments have been spectacularly successful innovations (e.g., Biodiversity Legal Project, Rio Plátano-Tawahka Sumo Awareness Campaign); others are solid accomplishments (e.g., Bay Islands and Tortuguero environmental education, Bay Islands land use study); and a few important concepts are in an advanced stage of the learning experience (e.g., ecotourism, biological corridor, buffer zones, environmental awareness). These last four are the most intriguing because of their potential.

- **Biological Corridor.** The linch pin of the PASEO strategy is the concept of a Central American biological corridor stretching from Mexico to Panama. PASEO considers that all its other activities (research, ecotourism, buffer zone management, environmental education, planning) can and should be oriented around the overall goal of establishing both land-based and marine biological corridors. They have a good background document, have initiated documentation and mapping of the remnants of the corridor and its gaps, along with other related actions. However, if the biological corridor concept is to prosper, it needs to be reflected in a clear and defensible plan to achieve the consolidation of parks and reserves into reserve complexes, with an effective strategy for integrating the gaps in the corridor into the concept.

Basically, PASEO needs to complete its corridor management plan before PACD if this concept is to influence the design of RENARM II. This effort should include analysis by anthropologists and sociologists working with ecologists to (1) define the biological significance of man-made and natural gaps; (2) understand the sociocultural situation on the ground in these gaps; and (3) design a series of options to integrate gap populations into the corridor concept.

- **Buffer Zones.** The concepts of buffer zones under which PASEO and others have operated are not well-defined or classified, nor is there agreement about what kinds of activities are appropriate for different types of zones (nuclear, multi-use, buffer) under different conditions (e.g., reef habitats, collections of small protected areas). In some cases, buffering may be a process, rather than an area.

Because of its experience and contacts, PASEO should take the lead in organizing a Central American conference on buffer zones, to include a wide selection of individuals and organizations with varied experience, in order to forge a consensus

on buffer zone classification and the actions indicated in specific situations. Since buffer zones involve people, experienced social scientists should be involved in these discussions.

- **Ecotourism.** Ecotourism has been a major focus of PASEO activities, as a way to give value to natural resources and to develop a constituency for their preservation. PASEO has held ecotourism conferences, published guidelines, promoted public-private national tourism councils, and prepared and implemented site-specific ecotourism activities. Many other PASEO activities have an ecotourism connection, as well as a biological corridor relationship. In combination these represent important experience which should be documented.

PASEO should analyze and consolidate the information it has gathered on ecotourism, and should produce a document of lessons learned in the field with recommendations for future action.

- **Environmental Education and Awareness.** PASEO has carried out intensive efforts in both formal environmental education and non-formal public awareness in the Bay Islands. Its small investment in a public awareness campaign for Río Plátano had an extraordinary impact and resulted in extending the Río Plátano reserve to the border, completing a link to Nicaragua's Bosawas Reserve.

As with ecotourism, PASEO should analyze and consolidate the information it has gathered on environmental education and awareness, and produce a document of lessons learned, with recommendations for future action.

B3. Focus CA Regional Institutions on E/NR Matters

USAID has provided major support to strengthen several Central American regional institutions. RENARM seeks to utilize this installed capacity to carry out E/NR work, either through continuance of effective activities or by reorienting programs for greater impact. The major programs include pesticide management, primarily through Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) and Escuela Agrícola Panamericana (EAP); and natural forest management, tree crop production and watershed management, also through CATIE.

B3a. Pesticide Management

Overuse and indiscriminate use of pesticides in Central America is a serious problem for human health and sustainable natural resource use. This program, whose main environmental objective is to reduce the use and misuse of pesticides while maintaining economic productivity, consists of Integrated Pest Management (IPM) and Pesticide Management Information.

B3a(1). Integrated Pest Management

IPM reduces the use of toxic chemical pesticides by increasing biological control, improving cultural practices, and limiting pesticide use to biologically critical conditions. RENARM supports IPM technology generation and transfer activities at CATIE and EAP. IPM research and adaptation in both places were started well before RENARM and are beginning to have an impact on production methods and pesticide use in the region.

The IPM programs of both institutions include applied research, information and documentation, technology validation and transfer, technical assistance, and education and training. CATIE's work is region-wide, and includes a significant element of support for national, primarily public sector programs. EAP's activities are concentrated in Honduras, Nicaragua and El Salvador, with strong private sector connections.

Both the CATIE and Zamorano IPM programs have met their intermediate targets, and have become even more effective and responsive as they have focused attention on higher value crops and larger farmers and commodity associations. The program has had a significant impact in promoting more rational pesticide use and introduced IPM systems which complement or substitute synthetic pesticides. These activities have great potential economic and environmental importance. Some of them, particularly extension of IPM techniques in buffer and multi-use zones, should be continued under RENARM II.

B3a(2)Pesticide Management Information

This is a high impact educational program designed to reduce pesticide use and misuse by getting pesticide information into the hands of the users as fast as possible through the following activities:

- **Pesticide information.** Detailed information on pesticides is provided by EPA/FDA to CATIE, which distributes it to subscribers and serves as a reference center.
- **Pesticide extension.** This training and advisory program enables Peace Corps agricultural extension volunteers to provide proper counsel and training on safe pesticide management and to transfer appropriate IPM technologies to their farmer clients.
- **Pesticide management short courses for farmers.** This EAP-designed course was adapted for delivery to other audiences:
 - Homemakers Course
 - Train the Trainer Edition
 - Farm Managers Edition
 - Policy Edition (in process)

- **Pesticide management correspondence courses for health workers.** This program was designed and directed by INCAP for administration by national public health agencies. It provides information on diagnosis and treatment of pesticide poisoning to doctors and nurses throughout the isthmus.

The pesticide management information program addresses a widely felt need and involves several effective and concerned implementors (EPA/FDA, EAP, USDA, PC, INCAP, CATIE) in a synergistic program. The methods and contact points for all four activities are being institutionalized in Central American regional institutions.

RENARM support for the pesticide management training program should be allowed to end, as programmed at PACD, precisely because all activities will have become institutionalized by that time. Training and information services have been designed, proven and installed in a permanent regional institution which is now recognized as a preferred provider.

However, alternatives should be investigated for maintaining the EPA/FDA PASA. The EPA/FDA PASA has been a critical component of the pesticide management program, particularly to service the CATIE pesticide database service, but also as a source of technical advice and laboratory training. This capability will continue to be needed in Central America. The following are some alternatives for exploration:

- As a direct and continuing service of EPA/FDA to NAFTA, and by extension to other prospective NAFTA members.
- As an AID-funded PASA under some program supporting a Central American Alliance for Sustainable Development.
- As a RENARM-funded PASA funded under the CCAD support activity, aimed at strengthening regional environmental policy and regulation.

B3b. Production from Natural Forests

Production from Natural Forests (PNF) seeks to maintain the natural forest resource by managing it for continuous production of timber and non-timber products. The objective of this activity is to validate natural forest management as a viable land use alternative to shifting agriculture or short-lived pasture, by demonstrating the economic value of managed forests as commercial enterprises which are still compatible with the conservation of protected areas.

CATIE has established a core staff of specialists in tropical forest management whose extensive experience in both primary and secondary forest management enables it to command international respect for its efforts both in teaching and applied field research tailored to local conditions.

Silvicultural and management practices are being demonstrated in several pilot management areas in Costa Rica, Guatemala, and Nicaragua. This project and RENARM technical advisors collaborated with two USAID bilateral natural resource projects (FORESTA in Costa Rica and MAYAREMA in Guatemala) to plan the sustainable management of natural forests in protecting important areas of biodiversity.

This activity should be strengthened as suggested in Chapter III, and continued in RENARM II.

B3c. Tree Crop Dissemination (MADELENA-III)

This program is the result of CATIE work in fuelwood started 15 years ago with ROCAP financing. With growing sophistication, it has promoted growing trees to provide replacement production of poles, posts, and saw logs, with fuelwood as a by-product. RENARM enabled CATIE to refocus this activity on transfer of the developed technology, while continuing its research monitoring program.

Since 1991, MADELEÑA III has made great strides in changing emphasis from research to technology transfer services:

- CATIE's Turrialba-based core staff provides technical support in training, research, extension, and socio-economic studies to six country coordinators and their network of 31 collaborating organizations for extension through their own services and have trained 350 extensionists in short courses. Audio-visual materials for use by extensionists for transfer of this technology have been developed and distributed.
- Research continues, including the monitoring of formal regional research trials (72), permanent growth plots (169), and selected seed tree stands (24), with all pertinent information recorded in the MIRA database. The MIRA database is accessible through 23 installations to national counterparts for their own analysis.
- A joint venture with Finland contributes \$2 million (25 percent of the total) to the project budget, reducing its dependence on RENARM. The network of supporting organizations have contributed the equivalent of \$1.08 million as of September 1993.

The proposed emphasis on biodiversity conservation as a unifying strategy for the remainder of RENARM I and for RENARM II focuses attention on maintaining remnants of tropical forests on the wetter Caribbean slope of the isthmus. MADELENA's technology was developed on the dryer Pacific slopes. Comparable technology for the moist tropics would probably require five to ten years of additional field trials, exceeding the duration of the second phase of the RENARM project. Unless CATIE can present a viable alternative for working within the proposed strategy, this activity should not be considered for RENARM II.

Before PACD, CATIE should undertake an independent evaluation of the economics of plantation forestry in the Nicoya Peninsula. This evaluation should look at both arable land and hillsides, and compare plantations with both agriculture and livestock. CATIE should also consider alternative arrangements for maintaining its multi-use tree program if RENARM funding is no longer available. Transfer of CATIE technology for multi-use trees will have become institutionalized in the network of collaborating institutions by the end of RENARM I. This suggests a continued high pay off with a lower maintenance budget.

B3d. Watershed Management

It is estimated that 70 percent of the C.A. rural population farm steep hillsides, with attendant deforestation and soil erosion. The RENARM watershed management activity refocused an earlier CATIE watershed program on land use planning for the rehabilitation of degraded watersheds and extending integrated technological packages that will improve farmers' production while reducing soil erosion and surface water runoff.

The results have been impressive. The watershed management activity has applied land use planning techniques and demonstrated successful technology for sustainable hillside agriculture on five watersheds in four countries. An integrated technical package of low input technologies such as absorption trenches dug on the contour, supplemented by productive living barriers, and stabilizing gullies with rock dams and plantains will, in the short term, increase agricultural production while reducing soil erosion and run-off of surface water. Good agricultural practices such as eliminating burning, minimum tillage, improved seed selection and higher planting density further increase returns.

Between 1990 and 1993, 467 natural resources technicians from throughout Latin America were trained in watershed management techniques in 27 short courses. Twenty-three students from Central American received masters degrees with a specialty in watershed management. Twenty-eight technical reports and/or professional articles on watershed management topics have been published. The project has established a Central American GIS network and developed a valuable methodology with broad application for using this tool to identify and prioritize critical land use practices.

Much of the success of these activities stem from their concentration, in this case, on a watershed. However, they would be just as effectively applied to the management of any concentrated area of steep lands, such as buffer zones around protected areas. The land use planning and conservation capabilities of the watershed management team should be integrated into management of buffer zones, multiple use areas and connecting corridors associated with protected biodiversity areas and continued in RENARM II.

B4. Technical Specialization

Another group of activities with comparable ends were separated out of these three global programs. They have as their common objective to prepare and support Central Americans to generate, transfer and apply the information and technology essential for the

sustained use of natural resources in Central America. Technical specialization is carried out as four sub-activities, involving different implementors:

- The University of Idaho Masters Program in Environmental Education
- The CATIE Post Graduate (M.S.) Program
- The TNC Fellowships
- The Wildlife Conservation Society Small Research Grants

B4a. The University of Idaho Masters Program in Environmental Education

This subactivity seeks to create a mutually reinforcing network of Central American professional environmental education communicators by providing M.Sc. degree training in environmental education, communications, and interpretation simultaneously to 14 participants from C.A., along with team-building activities to create a post-degree network. Fourteen Central Americans, representing all Central American countries except Nicaragua, were selected from over one hundred applicants. Their progress has been excellent, judged by grade point averages, faculty perceptions, and participation in university affairs.

The impact of this program requires these participants to return to Central America, find suitable employment, and use their training to communicate environmental principles formally through the school system and informally through adult education, mass communications, and promotional activities. The probability that this will occur is enhanced by the long-standing relationship of the program's Academic Director with Central American educational institutions, and his stated intent to follow and support the progress of these scholars after their return.

The University of Idaho Environmental Education Program is a sophisticated, specialized activity which is tightly focused on a significant Central American problem. Its high risk and high unit costs may be offset by high gains. However, it has no geographic specificity and its returns will not be evident for some time after the PACD. Therefore, the program should not be repeated in a second phase.

B4b. The CATIE Post Graduate (M.Sc.) Program

CATIE operates the premier postgraduate agricultural school in Latin America, awarding from 20 to 50 M.Sc. degrees per year to students from throughout the hemisphere. AID/ROCAP provided major support to upgrade the quality of this institution, enabling it to focus its program into ten specialties, of which six are of direct relevance to RENARM objectives.

The CATIE grants include fellowships for M.Sc. degree training of Central Americans in subject matter of the four programs which it implements. CATIE implementors of these programs design the subject matter curricula, teach these courses, and supervise student thesis research.

CATIE is probably the most important source of M.Sc. level professionals (more than 360) in Central America. CATIE graduates in the region are a major network resource for CATIE activities. Each of these students has prepared a thesis which is incorporated in the general body of science in Central America. During the years 1989-1992, CATIE awarded 46 M.Sc. degrees to CA students in Plant Protection & Pesticide Management (23); Silviculture & Forestry (13); and Watershed Management & Protected Areas (10).

The CATIE M.Sc. Program is broadly related to the CATIE programs which RENARM finances, but direct program benefits will not be evident by PACD. Fellowship support is not critical to the provision of CATIE services to RENARM, but is largely continuing budget support to a long-time client. Given its own budget limitations, AID should continue to phase out budget support and focus on buying services needed by RENARM.

B4c. The TNC Fellowships

The Nature Conservancy (TNC) fellowships (nine awarded, so far) seek to enhance the capacity of environmental NGO employees, selected for their direct role in managing protected areas. The quality of NGO work depends directly on the capability of its key staff. The TNC Fellowships are non-degree activities which are highly targeted on strengthening the park management capacity of key employees of NGOs responsible for protected area management, and immediately beneficial. They should be continued as a part of PACA/TNC's program, provided that they are concentrated on the RENARM-designated protected areas.

B4d. The Wildlife Conservation Society Small Research Grants

The Small Grants Program uses WCS' scientific grant awarding system to make small grants to Central American scientists to enable them to perform research which will enhance the availability of scientific knowledge in Central America. The program also seeks by this process to train scientists, enhance the value of RENARM activities as a scientific resource, and provide information to support attainment of RENARM objectives. The small grants program amounts to \$809,000, or 20 percent of PASEO's total funding.

As of December 1993, a total of ten grants worth \$137,000 had been awarded. The process for awarding grants appears to involve good scientific review, but it is improbable that any of the current grants of the WCS Small Grants Program will directly address significant RENARM operational problems, since the program operates without meaningful criteria to require such a relationship. Devoting 20 percent of the PASEO budget to this program is not warranted by experience to date, given the limited funding expected to be available for Phase II.

C. Refocusing RENARM for Phase II

The planned second phase of RENARM is warranted by the program accomplishments in the first phase and the potential for learning more from this experience in

Phase II. The interesting question is how to select activities to be continued within the leaner budget environment anticipated for the second phase.

Budget shifts and USAID restructuring have introduced in Central America greater uncertainty and competition within USAID for a reduced level of funding. RENARM's second phase will likely have to be much leaner than originally planned. It follows that the array of activities for a second phase will have to be carefully selected and justified by the experience gained in this first period. This process of selection (and deselection), design, and justification must be completed in the fifteen months remaining before PACD, not only to authorize funding for a second phase, but to permit the orderly completion of deselected activities.

These choices will not be easy, given the fact that nearly all activities are doing useful things and meeting their intermediate targets. Although a number of activities will have been completed and institutionalized by PACD, they still present opportunities for further returns. The choices will be clearer, and the design of RENARM II facilitated, if the objectives of RENARM II are better defined and a unifying strategy to meet those objectives is clearly articulated. The following recommendations are presented with this intent.

1. Adopt a unifying strategy whose objective is the conservation of biodiversity of near pristine critical ecosystems and direct sustainable land use efforts towards ameliorating major threats to those sites.
2. Structure activities for geographic concentration. Revise the project structure to concentrate activities and management on critical ecosystems already identified and their buffer zones, and on resolving the major threats to those ecosystems.
3. Since bilateral mission protected area activities follow a similar model to that used by RENARM, RENARM management should invite the managers of protected area projects to participate in a protected area management confederation whose purpose would be to work together to identify and solve problems of mutual interest.
4. PVOs and NGOs are a critical factor in active programs to conserve biodiversity in Central America. The experience which they have gained should be documented and used to guide the design of RENARM II.
5. Using these guidelines, project management should seek to achieve the proposed program concentration as quickly as possible, in order to enable implementors and staff to complete RENARM I activities in an orderly manner and contribute to the design of RENARM II. Besides recommendations with regards to individual activities, the following are suggestions for major program elements:
 - Concentrate policy efforts on mitigating the major threats to biodiversity conservation identified in the specifically defined protected areas.

- Concentrate watershed management and management of natural forests, and agricultural and agroforestry support on the multiple use zones and settled buffer zones of protected areas.
- Assign monitoring and evaluation responsibility for specific sites to individual PSC coordinators, who will be expected to spend at least five days per month at those sites.
- Assure that any research funded by RENARM is on problems whose solutions are of direct and pertinent value to biodiversity conservation and sustainable agriculture in the selected project sites.
- Phase out all other activities by PACD, as recommended in individual activity assessments.

D. Technical Support to Missions

The demand for RENARM staff's technical advisory services was greatest in forestry and policy. However, buy-ins have reached only 16 percent of authorization, and in 1993 amounted to five buy-ins totaling less than \$500,000.

There is little chance that missions will increase their use of RENARM's PSC advisors, nor will buy-ins reach the authorized amount before PACD. Missions have found other ways to satisfy their needs for technical support; worldwide, buy-ins are not a preferred option, except for acquiring unique capability. Servicing buy-ins is still a tedious and unrewarding process for missions, RENARM, and the implementors, and holds only marginal value for the program.

RENARM II designers should lower expectations, but maintain buy-in authority. Missions continue to buy in to RENARM-sponsored training programs and might value other RENARM innovations as these are publicized. Buy-ins might provide a way to protect the protected area investments of closing bilateral missions.

SECTION I

INTROEUCION

SECTION I INTRODUCTION

The Regional Environmental and Natural Resources Management (RENARM) project is a large and complex program, developed by USAID's Regional Office for Central American Programs (ROCAP) as the regional response to the strategy for USAID assistance to environmental and natural resource management in Central America. RENARM is ambitious and risk taking, bringing together a variety of implementors to test new modalities. It is an experimental undertaking with a rolling design approach, seeking better answers to the natural resource crisis in Central America.

A. Objective of Evaluation

RENARM was designed as a 10-year activity, but was authorized for only 6 years. This evaluation, which takes place 4 1/2 years after authorization (August 1989) and approximately 3 years after the beginning of field implementation, is intended to provide a basis for the following planning activities to be carried out by RENARM over the following year:

- Implementation refinement for the remainder of RENARM's first funding period (to September 1995);
- Confirmation or rejection of the original intention to continue RENARM as a 10-year effort (through September 1999);
- Design refinement for RENARM's second funding period (September 1995 to September 1999); and
- Alignment of RENARM with new USAID management structures that may evolve in Central America and worldwide.

B. Current RENARM Project Environment

When RENARM was designed, Central America had a very high profile and abundant USAID funding. Since then, the relative needs of other areas for USAID funding, notably Central and Eastern Europe and the Newly Independent States (NIS), have become more important, and funds available for Central America have been correspondingly reduced. The evaluation team was not provided with a specific planning level, but was led to believe that second phase funding would probably be no more than one-half of previous levels of funding.

In the meantime, USAID has begun a major internal restructuring that has altered both USAID/W and field structure as well as USAID strategic planning. USAID/W is in the

process of restructuring its organization and its program strategies, reducing both direct hire staff and personal service contract (PSC) staff, centralizing its technical staff, and concentrating its programs around four key areas. The emerging alignments and strategies are not yet complete; interim guidance is still in draft, and significant refinements must be expected over the next two years.

As new Missions are established in NIS, some Missions in other areas of the world are being closed. In Central America, ROCAP merged with USAID/Guatemala in 1993 to form USAID/G-CAP (Guatemala-Central American Programs), and Missions in Belize and Costa Rica are on a track to phase out by October 1995. The operational effects of these changes are not yet clear, but it appears that future support of USAID Central American (CA) Environmental and Natural Resource (E/NR) strategies in these countries will only be possible through regional mechanisms, such as RENARM. However, regional programs also compete for their funding with major bilateral programs in Guatemala, El Salvador, Honduras, Nicaragua, and elsewhere.

At a time when USAID funding is declining in the Central American region, other donor funding is expanding. Multilateral agencies are responding to the improved political climate in Central America with major levels of support. Bilateral donors, particularly the German, Finnish, Nordic, and European Union (EU) assistance programs are targeting E/NR activities, both in individual countries and regional institutions. The result is an improvement in institutional sustainability as other donors assume part of the costs formerly provided entirely by USAID. The obverse is that USAID no longer plays as dominant a role in Central American development and E/NR policy and strategy.

B1. Conclusions

The effect of changes in the Central American USAID environment is heightened uncertainty and competition within USAID for a reduced level of funding. If RENARM is to have a second phase, it will likely be much leaner than originally planned. It should also be more tightly concentrated on narrower, highly specific objectives, based on the experience gained in Phase I. Future funding and continuance of ongoing programs depends also on progress made and potential identified during the first four years of the RENARM program. This evaluation seeks to be responsive to these conditions.

C. Description of RENARM

C1. Regional Strategy

"Throughout Central America, the overwhelming evidence is that pressures from growing populations and expanding economies are causing people and governments to overexploit the natural resources at their disposal in order to satisfy immediate daily needs, increase employment opportunities, increase current revenues, and avoid difficult political decisions.... As a consequence, depletion rates of forests, soils, fisheries, and other crucial resources far exceed renewal rates, and secondary problems such as soil erosion,

sedimentation of hydroelectric dams and coastal harbors, and water pollution have reached critical levels in many parts of the region." (Leonard, p. xvi)¹

Leonard's book, quoted above, synthesized the elements from the USAID-financed environmental and natural resource profiles in each Central American country. This book recorded the evidence of environmental devastation in the region, most dramatically expressed by the loss of four-tenths of the natural forest cover since 1950, with attendant erosion of fragile tropical soils, siltation of reservoirs, pollution of coastal zones, and loss of habitat.

Publication of Leonard's book, which documented the dangers of the situation, identified constraints, and suggested solutions, triggered an effort by ROCAP and bilateral USAID Mission Agricultural Development Officers (ADOs) to prepare a joint strategy to guide both regional and bilateral agendas in Central America.² This strategy summarized the problem as expressed by Leonard; identified the constraints as policy, public and private institutions, cultural and social forces, and technology; described the goal; and set five priority areas:

- Sustainable agriculture
- Production from natural forests
- Management of wildlands and protection of biodiversity
- Management of critical watersheds
- Policy formulation, institutional strengthening, and environmental education

For each area, the strategy states an objective, a rationale for its selection, and the type of actions needed (Exhibit I-A).

The strategy also delineates the responsibilities for execution. ROCAP's responsibility was stated as follows:

"The primary responsibility of ROCAP is to support bilateral environmental programs with a combination of regional institutional programs and direct technical support. In some areas where problems do not respect international boundaries, and where pilot or generic interventions are needed, ROCAP will take the lead in developing regional programs, in collaboration with country Missions. ROCAP will also provide a means to stimulate other donors to support programs in the region." (Strategy, p. 44)

¹ H. Jeffrey Leonard, *Natural Resources: Economic Development in Central America — A Regional Environmental Profile*, International Institute for Environment and Development (IIED). Transaction Books, New Brunswick (USA) and Oxford (UK), 1987.

² "Strategy" citations refer to *Environmental and Natural Resource Management in Central America: A Strategy for AID Assistance*, AID/LAC, 2nd ed., Washington, D.C., 23 October 1989.

Exhibit I-A. Priority Areas, Objectives, and Actions Needed

PRIORITY AREA	OBJECTIVE*	ACTIONS NEEDED*
Sustainable Agriculture	Encourage farmers to apply environmentally sound practices that contribute to the sustainability of agriculture.	Develop, disseminate, and integrate technologies that lead to the use of land in accordance with its ability to sustain that use.
Production from Natural Forests	Assist institutions to manage existing natural forests with high productive potential for the sustainable production of forest products, water, and other environmental benefits.	Identify priority forest areas and concentrate protection and management efforts on those areas. Specific targets will be pine forests and hardwood production forests that form buffer zones around important wildlands.
Management of Wildlands and Protection of Biodiversity	Support programs to consolidate and manage, on a sustainable basis, legally declared national parks and reserves.	Define wildland systems, consolidate systems, and acquire funds for their recurrent operating costs.
Management of Critical Watersheds	Assist countries to improve land use and manage water resources in high priority upland watersheds to reduce impact on infrastructure, agriculture, water supply, and coastal areas.	Examine ongoing watershed projects to determine what additional resources are needed to establish successful demonstration projects that incorporate political support, institutional cooperation, and private action.
Policy Formulation, Institutional Strengthening and Environmental Education	Encourage creation of a policy framework, effective institutions, and public consciousness favorable to the sustained use of natural resources.	<ul style="list-style-type: none"> •Examine the policy set to establish a foundation for change. •Increase effectiveness of public sector institutions and incorporate local and community organizations, NGOs, and firms.

Source: Strategy, pp.17-40.

*Summarized

C2. Project Description

C2a. General Structure

RENARM was created as the unifying element of the USAID Central American E/NR strategy, seeking "to catalyze host government and other donor support to arrest and reverse the rapid deterioration of the natural resource base in order to assure continued economic growth over the coming decades." (PP, p. 1)³ RENARM was designed as a 10-year, \$69

³ PP refers to "Regional Environmental and Natural Resources Management," ROCAP Project Paper 596-0150, 8 August 1989.

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million project, including \$50 million from ROCAP,⁴ \$6 million from bilateral mission buy-ins, and \$13 million as matching funds from nongovernmental organizations (NGOs) and other donors.

RENARM's *Goal* is "to produce, with the citizens of Central American countries, the conditions for sustained exploitation of natural resources in a manner that minimizes the damage to the environment, protects bio-diversity, and provides the means for equitable and sustainable economic growth." RENARM's specific *Purpose* is "to create the conditions for public and private institutions to generate, transfer, and apply the information and technology essential for the sustained use of natural resources." (PP, p. 1)

RENARM designers recognized the multiple challenges involved in trying to reverse a trend a half century in the making, involving many domains: "technical interventions with inappropriate policies cannot work; weak institutions with cloudy mandates and few trained staff are not effective; and, finally, people focussed on economic survival, or maintenance of traditional rights to public resources, cannot be expected to stop exploiting available resources without a sense that neighbors are also paying a share." (Strategy, p. 7)

RENARM designers were not starting with an entirely clean slate. They were also faced with the need to continue core support to regional institutions (for example, Centro Agronómico Tropical de Investigación y Enseñanza [CATIE]) and to include continuing funding for certain ongoing projects that were deemed important to E/NR (for example, integrated pest management [IPM], MADELEÑA), albeit with changed emphases.

No one knew how to create the conditions described above in the project goal under current Central American conditions — political instability, centralized but weak public institutions, extraordinarily complex social and cultural characteristics, introduction of sometimes inappropriate technologies, and an inequitable favor-seeking policy environment.

"No one person sets out to destroy the environment; rather, the millions of individual decisions incrementally add to a destructive force." (Strategy, p. 8) How do you bring these millions of decisions into consonance with sustainable economic growth? This is the fundamental challenge that RENARM faces. The design is essentially experimental: bring together diverse but reasonable approaches, embodied in a variety of implementors; observe and analyze the results; and adjust to maximize the impact on the purpose. The evaluation must focus more on the progress made toward this impact than on measuring against pre-set indicators.

RENARM appears to be exceptionally complex because it involves 17 agreements covering 22 activities with 20 implementors, each performing a distinct aspect of the program (see Exhibit II-B). These implementors work under an array of agreements, including grants, joint ventures, contracts, participating agencies service agreements (PASAs), and two buy-ins to USAID/W projects, and are managed by U.S. direct hire

⁴ Only \$40 million is authorized for the six-year Phase I of the project, reserving \$10 million for subsequent authorization (PP, p. 1).

(USDH) staff and PSCs. Although all of these implementors and their managers are dedicated to achievement of the common purpose, nearly all operate under their individual and institutionalized ideologies, methods, and ultimate goals. Project management is therefore focused on coordination, rather than command and control. The evaluator sees the project as organized around implementors and their coordinators, rather than in terms of objectives. This impression is derived both from the PP structure and as implemented. It seems like a collection of projects with no guiding or overarching analytical framework.

The RENARM PP is organized around four components:

- I. Natural Resources Policy Initiatives and Technical Support, which contains the Policy Analysis and Technical Support subcomponents, the latter including both technical advisors and subcomponent managers for the entire project.
- II. Environmental Awareness, Education, and Biodiversity Conservation. This component includes subcomponents for Regional Strategic Planning and Policy Formulation; Regional Environmental Awareness and Education Programs; Environmental Specialist Training and Research; Regional Wildlands Management; and Improved Conservation Information Availability and Use. In the budget this is called "NGO Activities"; in other words, the subcomponents reflect the proposed work outputs of the NGO implementors.
- III. Sustainable Agriculture and Forestry includes Watershed Management; Production from Natural Forests; and Regional Plant Protection. CATIE is the implementor of the first two subcomponents, and CATIE and EAP manage the third. The fourth and fifth subcomponents, Pesticide Management and Tree Crop Dissemination, were added by Amendment No. 2.⁵
- IV. Institutional Support. This component was directed to support regional science and education, with an initial focus on CATIE. However, it faced design issues that could not be resolved and the component was never initiated.

The first phase of RENARM was authorized on August 8, 1989, for a total not to exceed \$46,300,000 for a six-year period from the date of authorization (August 8, 1995). There have been four amendments:

Amendment No. 1, April 1990. Included Panama and Nicaragua as cooperating countries.

Amendment No. 2, August 3, 1991. Increased funding authorization to \$59.4 million, including mission buy-ins of up to \$10,992,000, and added new activities in tree crop dissemination and pesticide management, described in a PP supplement, which became part of Component III, Sustainable Agriculture and Forestry.

⁵Seeds for Farm Forestry, included in the Project Paper, was not started, following a negative consulting report.

Amendment No. 3, September 4, 1992. Raised authorized funding to \$61,122,000, including the buy-in provision already authorized, to provide an assistant project manager, administrative support for the Natural Resources Policy Initiatives and Technical Support component, monitoring and evaluation (M&E), and midterm and final evaluations and audits (beyond that originally included in some subcomponent activities).

Amendment No. 4. 23 September 1993. Authorized inclusion of the Forests for the Future/MAYAFOR component (which involves Guatemala, Belize, and Mexico) as a buy-in to Component II, and includes Mexico as a cooperating country.

C2b. Buy-in Authority

RENARM was authorized to accept up to \$10.9 million for buy-ins to RENARM activities financed by bilateral missions. This provision enables bilateral missions to acquire the services of any RENARM implementor by "buying-in," that is, transferring funds needed to finance those services to RENARM for adding to the contracting or grant agreement already negotiated.

The following sections describe the results of the evaluation:

- Section II.** Analysis of RENARM's Design, Plans, and Objectives
- Section III.** Assessment of RENARM's Performance
- Section IV.** Management Structure and Systems Analysis
- Section V.** Reporting, Documentation, and Lessons Learned
- Section VI.** Lessons and Recommendations Summary

SECTION II

ANALYSIS OF RENARM'S DESIGN, PLANS, AND OBJECTIVES

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SECTION II ANALYSIS OF RENARM'S DESIGN, PLANS, AND OBJECTIVES

A. Assessment of Design Structure

RENARM is an innovative, experimental activity that is risk taking and exploratory. It seeks to bring together a wide variety of alternative approaches and implementors to "...create the conditions necessary for the sustained use of natural resources in the Central American region...." (PP, p. 15). It does not state what or how these changes are to be brought about, except in rather general descriptions of component and subcomponent activities, anticipating the need for implementors and management alike to learn from doing. It overtly recognizes the need "...to explore alternatives to traditional USAID project design paradigms..." and a corresponding need for "paying as much attention to process as to product (PP, p. 16). Consequently, the PP package, although formally conventional, provides less specific guidance and more opportunity for innovation by the implementors. It accepts as a given that USAID has limited capacity in this broad new area and that it will learn more and produce better if it adopts as an objective the acquisition of on-the-job experience by multiple implementors and USAID evaluation of the utility of that experience to achieve USAID objectives.

RENARM's design was assessed as a guide to implementation, management, and evaluation.

A1. As a Guide to Implementation

The component structure is centered around the "who" — the types of implementors. This is a reversal of the principle of first the "what," then the "how," then the "who" characteristic of more traditional USAID programming. Among other things, this reflects a desire to involve new actors (for example, private voluntary organizations [PVOs] and NGOs), or traditional actors (such as CATIE) in different roles, and to provide them with room to innovate within an exceptionally broad array of activities (Exhibit II-A).

This type of structure is adequate for getting the activities under way, but is neither programatically nor managerially useful for guiding the implementors in developing the activities or evaluating their progress. The tie-in of RENARM to the USAID Central American E/NR strategy is not always clear. The structure of the PP tends to confuse the implementors and their work plan objectives with regional and project objectives, therefore leading to independent rather than cooperative action. Ultimately, it contributes both to the appearance of complexity and dispersion of effort. The absence of a clear strategic focus in the project structure to demonstrate to multiple participants exactly where and how they might contribute to the project purpose leads to dispersion rather than cohesion.

Exhibit II-A. RENARM Component Structure

COMPONENT I Natural Resources Policy and Technical Support	COMPONENT II Environmental Awareness, Education, and Biodiversity Conservation	COMPONENT III Sustainable Agriculture and Forestry
Policy Initiatives Inventory Policy Analysis Policy Dialogue and Reform Process Monitoring Environmental Policy and Information Dissemination	Regional Strategic Planning and Policy Formulation Decision Maker Workshops Monitoring Deforestation and Environmental Degradation Environmental Profile and Maps Conservation Strategy Papers	Watershed Management Support Geographic Information Systems Regional Coordination Research National Coordinators Short-term Technical Assistance Training
Technical Support Technical Assistance Coordination Buy-ins	Environmental Awareness and Education Environmental Awareness Strategy Mass Media Campaign Short-term Training on Environment Communications Environmental Education Materials Pilot Interpretation Programs	Production from Natural Forests Outreach Pilot Management Areas Training Research Wood Utilization and Market
	Environmental Specialist Training and Research Scholar Clearing House M.S. Training Wetlands/Wildlife Research Grants	Seeds for Farm Forestry (not stated)
	Wetlands Management Pilot Wetlands and Buffer Zone Management Short-term Training and Newsletter Prototype Conservation Corps Projects Peace Corps Support	Plant Protection Research and Training Center Research Training Outreach Private Sector Activities
	Conservation Information Survey of Sources Workshops on Quality Control and Analysis Software and Manuals National Data Center Support	

Handwritten mark or signature.

A2. As a Guide to Management

The design lacks a coherent strategy to focus a variety of activities by multiple implementors with diverse ideologies and methods on intermediate objectives that could lead to EOPS. In fact, the emphasis on individual initiative has encouraged implementors to select their cooperators and collaborators without regard to synergism with other implementors. Implementors have subcontracted with nonproject institutions for services that could have been provided by another implementor. Implementors have selected cooperators on the basis of their interest and willingness to collaborate on the particular implementor's assignment, and these are seldom in the same location as other RENARM efforts.

Collaboration can have a high cost if it is not the natural outgrowth of design strategy, particularly if it has to be established after the fact. Extraordinary management effort would be required to successfully correct the observed dispersion, if indeed it could be corrected without a coherent strategy to provide an incentive for mutual reinforcement. However, the management structure is also organized around the components — that is, around classes of implementors. Individual coordinators focus almost exclusively on the work of the implementors in their component, hence are unable to provide a reliable bridge with other implementors in other components. Periodic coordination meetings have not proved to be an adequate response to dispersion.

A2a. Redesign

RENARM was intended to be experimental, with a flexible rolling design process that would allow the design to be corrected with experience. It is not clear that management has the authority to correct and redirect activities, or to realign the management structure without redesigning or amending the project. In fact, project management was denied the authority to make changes prior to completion of an evaluation.

Some activities not foreseen in the project design — for example, CCAD and indigenous peoples — were added and activities were reallocated among remaining implementors when others dropped out. The Nature Conservancy (TNC) absorbed Cultural Survival's functions, and TNC and CARE absorbed Conservation International's (CI's) strategic planning and environmental analysis function. However, these modifications are in line with the general approach of the project. Management functions (implementation, organization, reporting) generally continued to follow the initial project design, with much discussion but few changes in response to lessons learned.

RENARM was designed as a 10-year activity, but was authorized for only six years. Whether or not a second phase would occur was clearly dependent on progress made during this period. Still, the project design gives no guidance on the criteria that will govern the decision on whether or not to have a second phase or what its content should be. In the absence of such guidance, project management has begun the painful process of trying to establish a conceptual framework, based on the experience to date (see IVB3a). This process has not yet yielded the desired framework nor the criteria for adjusting to the changing RENARM environment, particularly to the reduced prospective funding for a second phase

and the reduced staff available to manage it. Such adjustments must be programmed into the 15 months remaining of the project if current activities are to blend smoothly into a leaner second phase.

A3. As a Guide to Evaluation

The evaluation team found the project structure to be a weak guide to evaluation, largely because it focused on implementors rather than on the objectives they were expected to achieve. The only way the implementors can be evaluated realistically is in relation to such achievements.

RENARM was never designed to follow the usual command-and-control execution characteristic of USAID projects. Not only are the implementors grantees, whose characteristic ideologies and methods are preferred inputs to the project, and in any case not subject to rapid modification by project management, but the project was intended to permit a rolling design, based on lessons learned.

The design structure also tended to obscure the activity identity, when the activity was performed by several implementors or when one implementor contributed to several outcomes. Consequently, project activities were restructured by the evaluation team to more accurately reflect USAID's Central American strategic priority area objectives, current RENARM activities, and the respective roles of managers and implementors. A sixth component was also added to recognize specifically and permit evaluation of the critical management activities that were diffused in the general PP design. The structure in Exhibit II-B segregates and describes the component activities following a uniform format that is based on Leonard's work and more accurately reflects what is being done and who is doing it.

B. Conclusions

The project design structure is based on organizations, rather than objectives, in a reversal of the planning dictum of "first the what, then the how, then the who." This ambiguity was deliberately incorporated in the design in order to involve additional actors or actors in new roles and encourage innovation. It has served this objective. However, the current structure has been a poor guide to implementation, management, and evaluation, and does not now provide a ready means for appraisal of activities for their selection for a second phase. A modification of the structure to correspond more closely to the priority areas of USAID's strategy for assistance to E/NR programs in Central America would guide management more effectively in all three management areas and facilitate selection of activities.

C. Recommendations

Adopt a revised project structure based on more specific objectives derived from the priority areas of the strategy for Central America. Prepare a RENARM program strategy

Exhibit II-B. Revised RENARM Project Structure

COMPONENT	OBJECTIVE	ACTIVITY	IMPLEMENTOR
I. Policy Formulation, Institutional Strengthening, and Environmental Education	E/NR Policy	Inventory, Classification, and Use Coordination and Management Tropical Forestry Action Plan for Central America	Abt Associates, U/Rhode Island World Resources Institute (WRI) CCAD CCAD
	E/NR Education • Popular Awareness • Technical Specialization	Short Course Training Mass Communication Fellowships and Small Research Grants	PACA, Paseo, EAP INCAP, CATIE U/Idaho TNC Fellowships WCI Small Grants
	Institutional Strengthening	Local NGOs National Agencies Regional Organizations	PACA, Paseo CATIE and EAP IPM and Pesticides, CATIE Forestry CATIE, EAP, INCAP
II. Biodiversity Conservation	Wildlands Management	Parks and Reserves Buffer Zones Indigenous Peoples	PACA/TNC, Paseo PACA/CARE Cultural Survival
	Conservation Planning	Eco-Tourism Planning Info	Paseo PACA/TNC
III. Sustainable Agriculture	Pesticide Management	IPM Technology Pesticide Information	EAP and CATIE EAP, CATIE, INCAP, EPA/FDA USDA/OICD, PC
	Agroforestry	Multi-Use Trees	CATIE
IV. Production from Natural Forests	Forest Management	Management Research and Extension	CATIE
	Market Research	Wood Products and Markets	IMCC CATIE
V. Management of Critical Watersheds	Improved Land Use of Critical Upland Watersheds	Watershed Management	CATIE
VI. Project Management	Obtain, Direct, Coordinate, and Control RENARM Resources	Direction and Coordination	USDHs and PSCs
		Technical Support to Bilateral Missions	PSCs
		Monitoring and Evaluation	MSI Contract

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that directs all efforts toward some of these objectives, and gives implementors and managers clear guidance as to their respective roles in meeting these objectives.

D. Assessment of Plans and Objectives

D1. Compatibility with E/NR Strategy for Central America

RENARM was intended as ROCAP's response to the challenges of the CA E/NR strategy.¹ Despite the design problems identified above, the project is clearly compatible with that strategy. This is demonstrated by Exhibit II-B, above, which segregates the many activities of RENARM by CA E/NR strategic areas.

A more interesting issue is whether that strategy remains valid five years after issuance, and eight years after the field work upon which it was based. This assessment was not a function of the evaluation, because such an assessment would have required not only evaluation of RENARM, but assessment of changes brought about by national and bilateral programs and those of other donors. However, the evaluation team traveled widely in each country, and consulted with bilateral mission ADOs and others.

There appears to be a general consensus that the CA E/NR strategy should be revisited, more to observe changes that have occurred than because the strategy itself needs adjustment. There are countervailing currents: on the one hand, there have been significant changes in environmental awareness at all levels, new legislation and new public sector institutions, more and more effective environmental NGOs, and more legally declared protected areas. On the other hand, the environmental destruction continues unabated, driven by expansion of the agricultural frontier by small farmers hungry for land, continued logging and land clearing by pastoralists, and continued burning. Tegucigalpa's airport was intermittently closed for several days during the evaluation because of low visibility caused by smoke, and we saw repeated instances of burning and farming of steep slopes and fragile soils. Jorge Cabrera, executive director of CCAD, put it into words: "The situation is worse now than it was when CCAD was created three years ago." The programs aimed at natural resource conservation have had significant impact, but not enough to mitigate the forces that cause the environmental crisis in Central America.

We believe that all missions would welcome an in-depth review (perhaps by CDIE) of progress made under the CA E/NR Strategy and suggestions made for its adjustment based on experience of both bilateral and regional E/NR activities. While it would be desirable to have such a review to guide future RENARM programming, it is doubtful that an adequate in-depth review could be completed before the RENARM PACD.

¹ *Environmental and Natural Resource Management in Central America: A Strategy for AID Assistance*, AID/LAC, 2nd ed., Washington, D.C., October 1989.

D2. Comparison with USAID Mission E/NR Strategic Objectives for Central America

The potential utility of RENARM in supporting bilateral missions depends on an understanding of bilateral E/NR programs and the strategic objectives to which they are directed. We performed a rough analysis of bilateral mission strategic objectives related to "preservation and sustainable use of the natural resource base," within USAID's objective tree format. In essence, we examined each outcome (outputs) included in the bilateral mission objective statements with a view to identifying whether it matched one or more of the CA E/NR strategy priority areas. The results are summarized below:

Bureau Objective. Support broadly based, sustainable economic growth.

Bureau Subobjective. Encourage preservation and sustainable use of the natural resource base.

**Mentions of CA E/NR Strategy Priority Areas
in Outcomes of Bilateral Mission Objective Statements**

Country and No. of Outcomes	Central American E/NR Strategy Priority Area ²				
	1	2	3	4	5
Guatemala, N-3	1	1	2	1	2
Nicaragua, N-3	2	2	1	2	3
Panama, N-5	1	1	1	1	2
El Salvador N-3	1	1	1	1	2
Belize, N-5	1		1		4
Costa Rica, N-2		1	1		1
Honduras, N-3	2	2	1	2	3

Key: CA E/NR strategy priority areas:

- (1) Sustainable Agriculture
- (2) Production from Natural Forests
- (3) Management of Wildlands and Protection of Biological Diversity
- (4) Management of Critical Watersheds
- (5) Policy Formulation, Institutional Strengthening, and Environmental Education

Notes: (a) Two countries (Belize and Costa Rica) mentioned only three priority areas; the other countries mentioned all five. (b) The priority area most mentioned was 5, which includes three types of activities. Policy was most frequently cited, then institutional strengthening.

²Numbers indicate the number of times a strategic area was mentioned in any of the expected outcomes (outputs).

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It is evident that most missions have attempted to program their E/NR activities to cover the priority areas of the CA E/NR strategy. It is also evident from Exhibit II-B that RENARM components include activities and implementors with the potential to support these bilateral efforts.

D3. Comparison with a Draft Paper, "Strategy of Alliance for Sustainable Development in Central America"

A recent meeting of Central American presidents with the president and vice president of the United States with regard to possible entry into the North American Free Trade Agreement (NAFTA) resulted in a suggestion for an alliance for sustainable development. CCAD has presented a draft suggesting a focus on biodiversity conservation. USAID has circulated a draft for a broader program, which may become the vehicle for a future assistance program for Central America. We reviewed the draft "Strategy of Alliance for Sustainable Development in Central America" for its implications for RENARM. The draft that we reviewed was at an early stage. Its full development will involve a broad range of consultation, first by a U.S. government interagency working group, then successive consultations with the U.S. NGO community, other donors, embassy and USAID mission staff, and regional and national entities before being forwarded to the U.S. and Central American presidents for their consideration.

The draft is framed by the current situation in Central America and proposes a program in four priority areas:

- National reconciliation and reintegration
- Democracy and human rights
- Broad-based economic growth
- Protecting the environment

The most obvious connection with RENARM is "Protecting the Environment," the more so because this section cites the Leonard book, the source book for the CA E/NR strategy.³ However, this priority area goes well beyond the biodiversity conservation and sustainable agriculture focus of RENARM to include industrial and urban pollution, and "promotes the practice of including environmental considerations in all national and regional economic decision-making." By the same token, some aspects of the RENARM program — environmental laws, regulations, and policies — are specific elements of the strategy of broad-based economic growth. RENARM methods, particularly in helping communities recognize and respond to the implications of policy, have direct application to democracy and human rights. In fact, the biodiversity protected areas targeted by RENARM and the bilateral missions provide an active laboratory for working with the kinds of concerns reflected throughout the document.

³ Jeffrey Leonard, *Natural Resources and Economic Development*.

D4. Conclusions

The objectives and focus of the Central American E/NR strategy remain valid because the nature of the crisis has not changed. Although that strategy has led to significant change in Central American E/NR institutions and popular environmental awareness, the crisis continues unabated because the behavior that led to this crisis has not changed. RENARM, in collaboration with the bilateral missions, has the potential to contribute to finding solutions to this behavioral problem, if it concentrates its efforts on finding solutions to major threats. The RENARM program remains attuned to the Central American assistance strategy, and individual activities are progressing well but are generally too new and unfocused to have yielded significant answers to the behavioral problem.

D5. Recommendation

Direct management efforts toward concentrating the RENARM program on identifying and finding solutions to major behavioral threats to biodiversity conservation.

SECTION III

ASSESSMENT OF RENARM'S PERFORMANCE

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SECTION III
ASSESSMENT OF RENARM'S PERFORMANCE

A. Overall RENARM Performance Assessment

A1. Methodology

The evaluation methodology included initial orientation briefings and review of summary data prepared by USDH and PSC management and coordination staff and specialists. Iterative reviews of: (1) AID CA E/NR strategy and program documents; (2) the RENARM project paper, amendments and semi-annual reports; and (3) implementor agreements, work plans, reports, special studies and internal evaluations were interspersed with repeated interviews of direction and coordination staff as well as implementor management and technical staff. Each country involved in the RENARM program was visited for interviews with bilateral mission staff and program staff at implementor headquarters and/or program sites. Field trips to representative program sites provided an opportunity for exchange of views with other implementor staff, NGOs, and farmers. Multiple examples of all types of sites (laboratories, research and demonstration sites, watersheds, protected areas (including nuclear and buffer zones and threat areas), training programs, and operating farms were visited in each country, providing an opportunity to develop, compare, and interpret impressions.

A2. General Observations on Performance

The following general observations are based on the reviews described above and the activity descriptions which follow in B, below. Generalized characterizations of dispersed programs are difficult, particularly when activities are performed by multiple implementors (20) following the beat of different drummers, but the team was favorably impressed by program progress.

Individual activities are generally well-performed, particularly when they follow the traditional functions of the implementor. There have been some false starts and any program has weaknesses, but the activities described below are generally good; some are great, and none are bad. Not infrequently, the implementor has had to adjust traditional methods or take on a function not originally planned. Although organizations seldom like to depart from traditional approaches, some of the best learning experiences (see Chapter V) resulted from such stimuli.

RENARM is a highly dispersed program, geographically as well as programmatically. Each implementor plans and implements its own program, generally following its own established ideology and methods. There is very little joint planning and two implementors seldom operate in the same geographic area. When multiple implementors do operate in the same biosphere or province or with the same NGO, their work tends to be

segregated—programmatically, geographically, and organizationally. Communication among implementors therefore is weak. Few can describe the programs and objectives of others. As a general rule, mutual support is neither sought nor offered. This dispersion limits overall program benefits and increases costs, but does not detract from individual performance.

A3. General Conclusions about Performance

RENARM activities are beginning to exhibit evidence of innovation and moderate success in dealing with the problems of natural resource preservation and maintenance. Individual activities are generally well-managed, although they are sometimes peripheral to critical problems. Few of these activities have developed specific lessons to the point of general diffusion, but many are promising and warrant further support.

The lack of synergism among these activities undoubtedly limits their overall impact. The limited communication among activities and implementors prevents the stimulating flow of ideas and the reinforcement of different approaches, methods, and talents. Implementors sometimes contract with external sources when RENARM sources could provide equivalent or better services, which suggests that program coordinators are also ignorant of the capabilities of all RENARM implementors. A tighter focus on common objectives within a strategy which demonstrates the role of each implementor should facilitate management and communication, and the resulting synergism should accelerate progress and lower costs for external services.

A4. Recommendations to Improve Performance

Assume that a second phase (RENARM II) will be authorized. The decision to extend the RENARM program will depend upon what happens in the remainder of RENARM I to document lessons learned and to concentrate the focus of the program by a strategy which should continue into RENARM II. Because of a year's delay in performing this evaluation, only 15 months remain before PACD. Therefore, planning for RENARM II must be conducted on a parallel track with reforming RENARM I.

Continue the RENARM program to PACD, but concentrate increasingly on particular objectives. At this point, we believe that a second phase will be warranted. However, the full potential of the RENARM experience will not be documented much before the current PACD, and evidence of impact will be needed to justify a second phase. Given the reduced funding anticipated, the second phase program will need to be much more concentrated. The remainder of Phase I should be devoted to achieving that more focused condition.

Focus program implementation with a strategy which brings essential actors together. Individual implementors must know how they fit into the program, and what, specifically, is expected of them.

Eliminate peripheral and mature activities at or before PACD by concentrating program activities on selected protected areas of high biodiversity significance and related buffer zones. Several activities will have achieved their objectives by PACD and will not require repetition in Phase II. Similarly, a number of activities which are peripheral to the main focus on biodiversity conservation and sustainable agriculture and forestry closely related to protected areas should be eliminated.

Recommendations on ways to achieve these changes are included in the individual activity descriptions. Recommendations for achieving the proposed focus and strategy are found in Chapters IV and V.

B. Performance of Individual Activities

The evaluation team used the structure outlined in Exhibit II-B to review and describe activities. However, that classification is neither precise nor exclusionary. In this chapter, we have tried to group sub-activities in ways which can be readily understood, sometimes according to the type of impact expected, and sometimes according to the program in which they are embedded, in order to facilitate description of similar activities:

- I. Policy and Environmental Education
 - A. Policy
 - B. Technical Specialization

- II. Protected Areas, Buffer Zones and Environmental Awareness
 - A. PACA
 - B. Paseo Pantera

- III. Pesticide Management
 - A. Integrated Pest Management
 - B. Pesticide Management Training

- IV. Forestry
 - A. Production from Natural Forests
 - B. Tree Crop Dissemination (MADELEÑA II): Plantation Forestry and Agroforestry

- V. Watershed Management

Time did not permit evaluation of all activities, particularly those which have been completed (e.g., Tropical Forestry Action Plan and Wood Products and Markets) or recently initiated (CCAD CONAMA Strengthening by World Resources Institute). Others have been summarized elsewhere in the report.

B1. Policy and Environmental Education

B1a. Policy

The RENARM policy component seeks to use participatory methods and tools to demistify the policy analysis and formulation process so as to expand the scope of debate and allow access and knowledge to all relevant stakeholders. It comprises four major sub-components:

- The Green Book participatory analysis package (Abt Associates)
- Institutional Strengthening of CCAD and the CONAMAs (World Resources Institute)
- Environmental Policy and Strategic Planning aimed at the NGOs (PACA-CARE)
- Mesoamerican Legal Project (U. Florida/CEDARENA/IDEADS)

The Green Book

The Green Book package enumerates the types of policies that affect the decisions of natural resource users, providing information about likely policy impacts and guidelines for the conduct of policy inventories and participatory policy analysis. The complete package consists of:

- A classification of the types of policies which impact natural resource use, including a policy taxonomy, policy matrix and notes on impact, description and assessment of policies by country. (Volume 1).
- A methodology for creating and updating inventories of policies affecting resource use in a particular country or project setting (Volume 2).
- A description of how to structure a participatory policy dialogue process using Green Book Volumes 1 and 2 (Volume 3).
- A workbook designed to familiarize individuals or groups with basic policy analysis as well as facilitate the use of Volumes 1-3 (Volume 4).

Volume 1 was published by Abt Associates as part of the APAP technical series. Volumes 2-4 are in various stages of drafts, with Volume 2 near completion (published draft) and Volumes 3 and 4 in progress.

Institutional Strengthening of CCAD and the CONAMAs

The Central American Commission on Environment and Development (CCAD), an initiative of the Central American Presidents, has recommended and countries have established national commissions on the environment (CONAMAs). RENARM has provided direct financial support to the CCAD Executive Secretariat to enable it to perform essential supporting and coordination services. USAID/G-CAP should continue its close

relationship with and support of CCAD in RENARM II. CCAD's Executive Secretariat is attracting both Central American and international donor support, because of its undeniable value. Among its accomplishments:

- **Setting the agenda for environmental issues for the Central American presidential summits**
- **Developing the Central American Agenda for Environment and Development, which was presented at ECO 02 in Rio de Janeiro and stands as the strategy for C.A. activities in environment and development**
- **Instrumental in setting up CICAD, the interparliamentary commission, and CCAP, an organization of all Central American park directors.**
- **Development of the Tropical Forestry Action Plan for Central America, and continuing work to finance its implementation.**
- **Currently working on development of the Alliance for Sustainable Development which is intended to move Central America into a NAFTA-like agreement with the U.S. CCAD will also be involved in setting the C.A. agenda for the Summit of the Americas.**

A RENARM buy-in enables World Resources Institute (WRI) to assist CCAD to strengthen the policy-making and outreach activities of the CONAMAs. It will help the CONAMAs develop the capacity to do rapid policy assessments, build consensus, mobilize public support, and resolve conflicts on critical environmental issues. WRI will use the Green Book materials described above in this effort. This activity has just begun with a diagnostic assessment of each CONAMA and is to be completed by the end of RENARM's first phase.

Environmental Policy and Strategic Planning for NGOs

This sub-component, which is managed by PACA/CARE, attempts to increase the capability of the PACA national NGO counterparts:

- **To understand the impact of the policy environment on rural populations and on NGO programs and activities**
- **To increase NGO ability to participate in policy dialogue and advocacy**

The methodology helps NGOs identify local resource use problems, assess impacts of policy on resource use and the local population, develop positions on policy issues, and trains them to effectively present their positions (if they choose advocacy).

Mesoamerican Biodiversity Legal Project

The Mesoamerican Legal Project is a joint effort of the Center for Governmental Responsibility, University of Florida College of Law, and two Central American environmental law NGOs who conduct legal research in the Central American region to help conserve biodiversity through the development of legal and administrative tools. It is supported by a cooperative agreement financed by AID/LAC and monitored by RENARM. The project has just received a three year institutional support grant from the Ford and MacArthur foundations to continue its work. This helps to ensure its continuity, as well as the availability of its services for future RENARM work. Additional funding for the project comes from the North-South Center of the University of Miami, the University of Florida, and RENARM components PACA and Paseo Pantera.

The cooperative agreement helps the project expand its legal support to regional and national institutions, the development of additional applied research, and the development of long-term implementation strategies. The following specific outputs are expected:

- Inventories of the current legislative situation *vis a vis* protected areas in each country (completed);
- A comparative analysis of the environmental legal situation in each participating country (draft summary document completed);
- Draft model national environmental law (completed);
- Report on national laws governing indigenous peoples and protected areas (draft completed);
- Background documents leading to the preparation of a model legal framework for an integrated regional system of protected areas; and
- Studies on biodiversity compliance in the Andean Pact countries and in Central America.

Performance

The Green Book Complex

The Green Book and accompanying materials are a significant step towards clarifying the policy analysis and formulation process by providing information on the effects of a range of sectoral and macroeconomic policies on resource user behavior, the various types of interests and stakeholders affected by policies, and the tradeoffs and compromises among competing interests that arise during policy negotiation. This work, combined with other efforts, should promote a "leveling of the playing field" for those groups of stakeholders who were either kept out of the policy process or who were ignorant of the impacts of policy change on their particular interests or behavior.

A poor introduction led to a perception that 'The Green Book is not "user friendly." Although it effectively presents the complexity of policy questions and processes, it does not give the user or potential client sufficient guidance on how to conduct specific analyses or address specific problems. The Green Book structure facilitates the conduct of broad sectoral policy inventories, which are potentially useful in analyzing or developing proposed sectoral laws and regulations. However, users such as local NGOs will be mainly interested in learning how to address problems such as how to stop forest fires on agricultural land from destroying forests, or how to regulate settlements in protected areas. These deficiencies are being addressed by materials which guide potential users through a participatory policy dialogue process (Volumes 3 and 4). The materials are still in English draft, which limits their utilization. Translation was delayed so that all four volumes could be translated simultaneously and consistently. They will be published in Spanish by fall of this year.

The Green Book materials have been used by RENARM PSC technical staff to analyze proposed new forestry laws in Nicaragua and Guatemala, and the Agricultural Modernization Law in Honduras. They are PACA's main source book for helping NGOs better understand policies and their effects on economic interests and actors. They will also be used by WRI as part of the CONAMA institutional strengthening work.

PACA Environmental Policy and Strategic Planning

This policy sub-component got a late start due to the withdrawal from the PACA consortium of Conservation International which was initially tasked with the strategic planning subcomponent. The coordinator for the EP&SP component was not hired until June of 1993. At that time, it was recognized that the program coordinators of many PACA participants (including CARE, TNC and the majority of their NGO partners) were generally not well informed about:

- National public policies or macroeconomic conditions
- The impact of public policies and macroeconomic conditions upon local patterns of natural resource use
- How to incorporate policy information into strategies for participating in the policy process.

However, some NGO partners were ahead of PACA in understanding and dealing with policy issues and advocating and effecting changes. For example, prior to PACA, Fundación Neotrópica's forest policy work led directly to its participation in discussions in the Costa Rican National Assembly and adoption of several recommendations into Costa Rica's forestry law.

Accomplishments include:

Collection and analysis of information, including analysis of laws, regulations and policies related to forest fire control in Costa Rica, agricultural modernization in Honduras

and environmental impact assessment guidelines in Belize; case studies on policy analysis and formulation roles of environmental NGOs in Costa Rica, Belize and Guatemala.

Facilitation of communications via the installation of an E-Mail network.

Strengthening of local organizations through training and workshops for environmental NGOs on conducting environmental impact assessments (Belize) and participation in the policy change process (Regional); contracting local legal NGOs (CEDARENA, IDEADS) through the Mesoamerican Biodiversity Legal Project to support policy analysis and formulation activities and the analysis of the legal frameworks for protected areas; and facilitation of actual policy dialogue involving NGO and government representatives in Costa Rica (forest fire control) and Honduras (agricultural modernization laws) and support to OTS' Policy Dialogue Program for Incoming Governments.

Policy impact through direct support for the development of a new presidential decree on forest fire prevention on agricultural lands (Costa Rica) and guidelines for EIAs under the new Environmental Law.

Mesoamerican Biodiversity Legal Project

Legal research is leading toward the standardization of legal definitions and norms throughout the region. Modification of existing environmental laws at the national level is especially important for border areas, where similar areas receive varying legal designations from different national governments, thus creating confusion.

Model environmental legislation forms the basis of a set of pedagogical tools which are being used to promote an understanding of and a demand for better environmental law. Using the results of the research, for example, IDEADS and CEDARENA combined to assist in redrafting protected area regulations for the Honduras Forestry department.

The Project has fostered the development of local NGOs devoted to environmental law and policy at both the regional level as well as in each country. CEDARENA and IDEADS have emerged as truly regional institutions, while at the same time being models for developing NGOs. The work of the Project has been made public through such bulletin board systems as Econet and E-LAW, and many environmental groups are now looking at Central America as a learning model for testing multijurisdictional ecosystem management.

Conclusions

Despite some pretty severe "bumps in the road" along the way, the policy component of RENARM has made good progress in supporting and developing both policy "products" and "processes." It seeks to clarify the intended and unintended effects of public policies on the behavior of natural resource users and has adopted a participatory and facilitative approach to policy dialogue and advocacy by educating and giving NGOs access to policy-related information and fora.

For the reasons highlighted above, progress has been somewhat less than might have been expected given the time and resources originally allocated to the policy effort. Still, the efforts clearly support the Central American E/NR and RENARM strategy theme that "decentralization and broad-based participation are essential conditions for creating and maintaining decision-making processes and institutions that can formulate and implement policies that will lead to equitable and sustained economic growth"¹.

Recommendations

A concerted effort should be made to finish the materials needed to facilitate the Green Book's use, including their publication in Spanish.

Get the Green Book materials out to potential clients as soon as possible. This experience will likely enrich the further development of materials and methods more than isolated conceptual work.

Develop alliances and lines of communication with existing and new E/NR policy-related bilateral projects now coming on stream in Central America.² Encourage them to collaborate with RENARM efforts by adopting participatory approaches using the Green Book, and providing feedback and suggestions for improvement of the methodology.

The "policy process" (NGO EP&SP) and "policy product" (Green Book) efforts should be continued under RENARM II as a single subcomponent. Both process and product should be targeted on helping NGOs located in the RENARM-selected geographic sites become effective facilitators of dialogue leading to environmental policy change and sustainable development.

Support the Mesoamerican Biodiversity Legal Project under RENARM II through purchase of services on an as-needed basis to support ongoing policy efforts in RENARM-targeted geographical areas.

B1b. Technical Specialization

The global objective of RENARM's technical specialization activities is to prepare and support Central Americans to generate, transfer and apply the information and technology essential for the sustained use of natural resources in Central America. Technical specialization is carried out as four sub-activities, involving four implementors:

- The University of Idaho Masters Program in Environmental Education
- The CATIE Post Graduate (M.S.) Program

¹ From memo from Hilary Lorraine to the External Evaluation Team presenting an overview of the policy component, March, 1994.

² PROMESA in El Salvador, PRODEPAH in Honduras, and the Natural Resources Management Project in Nicaragua.

- The TNC Fellowships
- The Wildlife Conservation Society Small Research Grants

The University of Idaho Masters Program in Environmental Education

This subactivity seeks to create a mutually reinforcing network of Central American professional environmental education communicators to help Central Americans generate, transfer and apply the information and technology essential for the sustained use of natural resources in Central America. A contract³ with the University of Idaho provides M.Sc. degree training in environmental education, communications, and interpretation simultaneously to 14 participants from C.A., along with team-building activities to create a post-degree network, establishing ties among participants, U.S. professionals, and ongoing NGO programs in C.A.

The CATIE Post Graduate (M.S.) Program

CATIE operates the premier postgraduate agricultural school in Latin America, awarding from 20 to 50 M.S. degrees per year to students from throughout the hemisphere. AID/ROCAP provided major support to upgrade the quality of this institution, enabling it to focus its program into ten specialties, of which six (Economía y Manejo de Recursos Naturales; Manejo Integrado de Cuencas; Manejo Integrado de Plagas; Silvicultura y Agroforestería; Sistemas de Producción Agrícola; and Areas Protegidas) are of direct relevance to RENARM objectives.

The CATIE grant, which funds activities in plant protection and pesticide management, watershed management, production from natural forests, and tree crop dissemination includes fellowships for M.Sc. degree training of Central Americans in CATIE's post graduate program (25 in watershed, 34 in pest management, and 7 in forest management). The objective of these fellowships is to produce Central American scientists and managers who can design and carry out the development and transfer of technology needed to manage on a sustainable basis and conserve the natural resources of Central America.

CATIE implementors of these programs design the subject matter curricula, teach these courses, and supervise student thesis research. They also counsel the students, and later involve them in a Central American professional network which has proved useful for CATIE's research and extension efforts. Most of CATIE's off-campus research and extension is conducted through networks of public (ministerial) and private (NGOs) institutions and individuals. These individuals and institutions are CATIE's direct clients and

³ Contract 596-0150-C-00-2292-00 in the amount of \$787,214, approximately \$127,000 for administration, the rest for reimbursement of participant costs. Duration: from 29 Sep 92 to 30 Sep 95. This program is implemented entirely by the Department of Resource Recreation and Tourism of the College of Forestry, Wildlife and Range Sciences of the University of Idaho.

collaborators, and commonly provide the operational resources needed for development of CATIE's work.

The TNC Fellowships

The Nature Conservancy (TNC) fellowships seek to enhance the capacity of selected individuals to manage protected areas. TNC fellows are employees of NGOs selected for their direct role in managing protected areas. Specialization is pursued over a two-year time frame by taking short courses, observation tours, and related on-job training, in a program selected by the fellows themselves to overcome perceived weaknesses and enhance their performance. These programs are reviewed and approved by TNC, which helps the fellow locate and enter appropriate programs.

The TNC Fellowship program was initiated by TNC under LAC's Parks in Peril program and has proven to be a useful way to enhance the managerial capacity of local NGOs charged with protected area management. The individuals agree to continuing for two years of work following training, and they appear to be sincerely committed to their work.

The Wildlife Conservation Society Small Research Grants

"The Small Grants Program (SGP) for Conservation Biology" was added as a new activity by Amendment #3 (6 Mar 92) to the Cooperative Agreement with Wildlife Conservation Society, to be coterminous with that agreement. RENARM funding is \$404,515, matched 1:1 by WCI. \$306,000 of ROCAP funds and \$285,000 from WCI goes to small grants, the remainder to program operations and management.

The WCS SGP uses WCS' scientific grant awarding system to make small grants to Central American scientists to enable them to perform research which will enhance the availability of scientific knowledge in central America. The program also seeks by this process to train scientists, enhance the value of RENARM activities as a scientific resource, and provide information to support attainment of RENARM objectives. Grants are awarded on the basis of solicitations for standardized proposals, evaluated by a minimum of three peer reviews. Specific objectives are to:

1. Increase the absolute amount of conservation science in CA
2. Increase opportunities for young scientists to become proficient in conservation biology and natural resource management
3. Provide a means for established scientists to conduct research and enhance their own professional development
4. Provide research findings of value to RENARM-sponsored NRM activities
5. Enhance the value and cost effectiveness of these RENARM activities by making them the context of the research

6. Provide the systems and oversight of an experienced organization (WCI) to manage the program.

Performance

Masters Program in Environmental Education

Fourteen Central Americans who could meet rigorous University of Idaho academic standards were selected from over one hundred applicants. These represent all Central American countries except Nicaragua. All are enrolled in a detailed training plan with required and elective courses, thesis, and seminars, internships, short courses and workshops, which they are expected to complete by 30 September 1995.

Participant progress has been excellent, judged by grade point averages, faculty perceptions, and participation in university affairs; they have contributed materially to internationalization of the Department of Resource Recreation and Tourism in the College of Forestry, Wildlife, and Range Sciences. Although the last three participants entered the program with a one semester delay, they are now incorporated in the Central American team. The program's academic advisor believes that all team members will complete their work by the end of the contract.

There will be no outputs, besides their theses, before PACD. The impact of this program requires that these participants return to Central America, find suitable employment in the public or private sector, and use their training to communicate environmental principles both formally through the school system and informally through adult education, mass communications, and promotional activities.

Although there is no mechanism for assuring the effective utilization of these participants, their quality is expected to ensure their eventual positive impact. The probability that this will occur is enhanced by the long-standing relationship of the program's Academic Director with Central American educational institutions, and his stated intent to follow and support the progress of these scholars after their return. He is currently working with a former student who is seeking to establish a degree program in environmental education in the Autonomous University of San Carlos in Costa Rica.

CATIE M.S. Program

CATIE is probably the most important source of M.S. level post graduates in Central America. Between 1947 and 1993, it had trained 360 Central Americans, most after 1960. CATIE graduates in the countries are a major network resource for CATIE activities. Each of these students has prepared a thesis which is incorporated in the general body of science in Central America. During the years 1989-1992, CATIE awarded 46 M.Sc. degrees to CA students in Plant Protection & Pesticide Management (23); Sylviculture & Forestry (13); and Watershed Management & Protected Areas (10), including at least one degree in each discipline for a student from each country except Guatemala (no degree in plant protection) and Honduras (none in watersheds).

TNC Fellowships

TNC fellowships have been awarded to nine individuals (3 from Panama, 4 from Honduras, and 1 each from El Salvador and Guatemala. We note that the three Panameños and the Salvadoran come from locations with no RENARM-sponsored protected areas.

We were unable to evaluate the impact of the training itself, which still has some time to run. The individuals appear to have been well-selected, based on their position and commitment. The unit costs (\$23,000) appear to be reasonable for the type of training received.

Local NGOs are the essential element for protected area management in Central America. They identify the areas for protection, perform the studies needed to have the area legally declared a protected area, provide environmental awareness training, and either manage the areas directly or facilitate the work of the managers. The quality of the NGO work depends directly on the capability of its key staff. This training enhances that capability. This type of capacity enhancement appears to be a very reasonable way to achieve the needed capability while keeping key people in position.

WCS Small Grants

As of December 1993, a total of ten grants worth \$137,000 had been awarded in all countries except Honduras. Average value was \$13,700 (range 1,300-30,000), average duration was 12 months (range 3-40). Six grants were for species biology, four for a range of applications. WCS grants generally supplemented other funding (average 43 percent, range 5-100 percent). Few of these studies have been completed.

The small grants program amounts to 20 percent of the total Paseo Pantera activity (RENARM plus PVO match). The grants themselves are only 73 percent of the Small Grants Program; program administration absorbs 27 percent.

The process for awarding grants appears to involve good scientific review, and the subject matter fits objectives 1, 2, 3, and 6 above. Their contribution to objectives 4 and 5 is dubious. There is little or no connection between the 10 grants issued thus far and RENARM's stated priorities. Grants made to date are "good things," but not essential to nor of high priority for reaching RENARM's objectives. The Small Grant Program contribution to individual programs is mostly additional (about 45 percent of total cost) to other funding. It is not clear what the increment buys except expansion or continuance of an on-going activity.

We have seen nothing in the way of framing criteria, and can only deduce "geography" and "natural resources" from the grants which have been approved. We don't question the experience and capacity of WCS in managing scientific grants, but prudent oversight requires that RENARM management establish criteria and assure adherence to those criteria.

Conclusions

All four of these sub-activities help "prepare and support Central Americans to generate, transfer and apply the information and technology...", but they also reflect the diversity of approaches to solving the E/NR problems that are programmed into RENARM:

- The University of Idaho Environmental Education Program is a sophisticated, specialized activity whose high risk and high unit costs may be offset by high gains. It has no geographic specificity and its returns will not be evident by PACD, but it is tightly focused on a significant Central American problem.
- The CATIE M.Sc. Program is broadly related to the CATIE programs which RENARM finances, but is not essential to the attainment of program objectives. Although reasonably priced, returns will not be evident by PACD.
- The TNC Fellowships are non-degree activities which are highly targeted on strengthening the park management capacity of key employees of NGOs responsible for protected area management, and immediately beneficial.
- The WCS Small Grants Program is virtually untargeted. It is improbable that any of the current grants will directly address significant RENARM operational problems. This program operates without meaningful criteria to require such a relationship.

Recommendations

The University of Idaho Masters Program in Environmental Education should not be repeated in a second phase. Although it has much promise, it will be some time before its potential benefits are evident.

The TNC fellowships should be continued as a part of PACA/TNC's program provided that they are concentrated on the RENARM-designated protected areas.

Fellowship support is not critical to the provision of CATIE services to RENARM, but is largely continuing budget support to a long-time client. Given its own budget limitations, AID should continue to phase out budget support and focus on buying services needed by RENARM.

Given the limited funding expected to be available for Phase II, the Small Grants Research Program should be terminated or subjected to rigorously tightened criteria. Devoting twenty percent of the Paseo Pantera budget to this effort is not warranted by experience to date.

B2. Protected Areas, Buffer Zones and Environmental Awareness

The project paper description of this component is less specific about what should be done with these activities than that they would be "contracted as separate cooperative agreements with NGOs or consortia of NGOs... U.S. NGOs⁴ will work through and with Central American NGOs to carry out this set of activities. An additional requirement will be the strengthening of selected domestic NGOs to continue project activities into the future.

Two U.S. PVO consortia were contracted to perform these and other activities: (1) PACA (Spanish acronym for Central American Environmental Project) comprised of CARE International, The Nature Conservancy (TNC), and Conservation International (CI). Conservation International later withdrew from this consortium. (2) Paseo Pantera (Path of the Panther) was comprised of Wildlife Conservation Society (WCS) and the Caribbean Conservation Corporation (CCC). These two consortia developed different approaches to the general problem, and although they sometimes collaborated, their spheres seldom overlapped, so they are treated as independent operations.

B2a. PACA

The general model PACA adopted for biodiversity conservation (and now generalized throughout C.A.) was adapted from the TNC approach used in Parks in Peril. It consists of a protected area established/regulated by government, consisting of: (1) a pristine nuclear zone representing a significant ecosystem which can be preserved for scientific study and non-intrusive use; (2) a settled buffer zone where sustainable agricultural technology is applied to increase incomes and enable the occupants to avoid incursion into the nuclear zone by themselves or others; and (3) sometimes an intermediate, non-occupied multiple use zone where sustainable extractive use is permitted under strict management controls. This model is actively supported, controlled or monitored by one or more local NGOs with the support of one or more U.S. PVOs. The protection and development program is governed by a rapid ecological assessment (REA) or equivalent, which provides a baseline description and evaluation of the ecosystem, a categorization of the major threats to the nuclear zone, and a planning document.

PACA first selected the areas of each country where it proposed working based on criteria of biodiversity and the presence and characteristics of local NGOs. It then worked out its program strategy and sought the collaboration of local NGOs to implement it. TNC worked with NGOs in the nuclear zone, while CARE worked with the same or other NGOs in the buffer zone. The resulting arrangement often required an institutional analysis of the local NGO by PACA followed by an institutional strengthening plan. Field work included development of operational plans by the local NGOs and their modification and eventual approval by the individual PACA partners. The U.S. PVOs were not the direct

⁴ All environmental associations, societies, and foundations are called nongovernmental organizations (NGOs) in the project paper, regardless of their origin. In this report, we have adopted the convention of designating U.S. NGOs as Private Voluntary Organizations (PVOs) to distinguish them from similar Central American organizations, for whom the NGO designation is reserved.

implementors of the protection and management program, but worked through local NGOs. The U.S. PVOs provided funds, supervision, and training; the local NGOs carried out the work. Four areas were selected and developed.

E/NR activities developed by bilateral Missions have followed the same model, i.e., a U.S. PVO working with local NGOs to manage a protected area and a buffer zone, with functional foci on environmental policy and information, environmental monitoring, and public awareness. Some use the same implementor PVOs as RENARM. Examples include the NARMAP project in Belize, MAYAREMA in Guatemala, the Natural Resources Management project in Bosawas and Miskito Cays, FORESTA in Costa Rica, and PROMESA in El Salvador.

Performance

Environmental Education

Environmental awareness is higher now in Central America than ever before. PACA and its collaborators have contributed, although PACA is only one among many influences. PACA provides audiovisual equipment and environmental awareness materials to enable NGOs to expand ongoing educational programs. Environmental awareness activities include in-school teaching as part of the curriculum, and school-based extra-curricular activities for the community. They also include a variety of campaigns, stand-alone lectures, slide shows, field trips, guided nature tours, self-guided nature walks, and mass communications (radio, TV, newspaper articles, posters, leaflets).

In Belize, where environmental awareness is probably higher than in other CA countries, CARE worked primarily with the BZ, which works through the formal education system with primary school children. BZ opted out of CARE's more activist orientation to control slash-and-burn, and CARE no longer works in Belize. In Costa Rica, CARE worked with AGUADEFOR and CCIG on fire prevention campaigns to mitigate this primary threat to protected areas. The campaigns have been well organized and documented, and there is some evidence to show that they have reduced the incidence of wildfires and their impact on the reserves. In Guatemala, CARE has been unable to work actively in the buffer zone with Defensores in Sierra de las Minas, but has provided considerable support to their environmental education programs, as well as those of FUNDEMABV at the west end of the Sierra de las Minas Biosphere and of FUNDAECO to the east. In Honduras, CARE supports ASOMA, a rural school teachers association which includes more than 40 teachers operating in the Merendón. ASOMA provides school children with hands on experience in sustainable hillside agriculture and soil and water conservation practices.

Exhibit III-A. Summary of PACA Activities

COUNTRY	PROTECTED AREA	MAJOR ACTIVITY	PACA PVO	NGO PARTNER	
BELIZE	Bladen Nature Reserve	NZ Protect BZ Mgmt Env Educ	TNC N/A CARE	BCES; PFB; BAS BZ; BCES	Rapid Ecological Assessment No BZ; surrounded by other protected areas. Environmental Strengthening
HONDURAS	Cosuco-Merendon	NZ Protect BZ Mgmt Env Educ	TNC CARE CARE	FEHPF FUNBANH-CAFE INHESCO ASOMA	Rapid Ecological Assessment Merendon Watershed Merendon Watershed
GUATEMALA	Sierra de las Minas	NZ Protect BZ Mgmt Env Educ	TNC TNC CARE	DN; CDC DN FUNDAECO FUNDEMABV; DN	Rapid Ecological Assessment Institutional Strengthening. Neither are in Protected Area
COSTA RICA	Tempisque Palo Verde Barbudales B. Honda	NZ Protect BZ Mgmt Env Educ	TNC CARE	CCIG; FN N/A AGUADEFOR; CCIG; FN	Rapid Ecological Assessment Barra Honda work not in primary protected area. Institutional Strengthening Only fire prevention threat

Belize: BCES (Belize Center for Environmental Studies)
BZ (The Belize Zoo)
BAS (Belize Audubon Society)
PFB (Program for Belize)

Costa Rica CCIG (Comité Contra Incendios de Guanacaste)
AGUADEFOR (Asociación Guanacasteca de Forestería)
FN (Fundación Neotrópica)

Guatemala: DN (Defensores de la Naturaleza (DN))
CDC (Centro de Datos para la Conservación)
FUNDAECO (Fundación Ecológica)
FUNDEMABV (Fundación del Medio Ambiente de Baja Verapaz)

Honduras: FUNBANHCAFE (Fundación del Banco de Café)
INEHSCO (Instituto Ecueménico Hondureño de Servicios a la Comunidad)
ASOMA (Asociación de Maestros Ambientalistas)
FHRPF (Fundación Héctor Rodrigo Pastor Fasquelle)

NZ = Nuclear Zone; BZ = Buffer Zone; N/A = Not Applicable; TNC = The Nature Conservancy; CARE = CARE International

Protected Area Management

TNC's major contribution is support of NGOs primarily involved in nuclear zone management. This support includes institutional strengthening, fellowships in park management, technical assistance in work planning, and funding of rapid ecological assessments (REAs). REAs are complete or nearly so in Belize (three, in Bladen, mangroves, reefs); in Guatemala (Sierra de las Minas), in Costa Rica (Palo Verde-Barbudales), and in Honduras (Cosuco). A serious limitation on several of these is their almost exclusive focus on the nuclear zones, except in Sierra de Las Minas and Tempisque. TNC also supports a regional network of Conservation Data Centers. These data support research, as well as REAs.

Buffer Zone Management

Buffer Zone Management was expected to be a focus for CARE, but has made limited progress. A CARE/RTAT evaluation found that it was "the component experiencing the greatest delay with respect to achievement of objectives." Belize's Bladen has no buffer zone, since it is surrounded by other protected areas, while CARE was unable to work with Defensores in the Sierra de las Minas buffer zone.

The Palo Verde-Barbudales protected area in Costa Rica is an important wetlands habitat for waterfowl, wild pig, and perhaps jaguar. This area is "buffered" on the West by the Tempisque river, but seriously threatened by wildfire and irrigation on the North and East. However, PACA/CARE's primary buffer zone management activity in Costa Rica is focused on the tiny Barra Honda park with a full program of forestry nurseries, reforestation, agroforestry practices, ecotourism, wild animal husbandry, some demonstration plots, and a credit program. Its partner NGO, AGUADEFOR, works primarily in communities on the west side of the Tempisque river. There, similar ecosystems on unprotected private land are subject to some of the same threats as those faced by national parks east of the river.

In Honduras, CARE plays a pivotal supporting role with two local NGO's working in fifteen communities within the Merendón watershed buffer zone area. FUNBANHCAFE provides training and technical assistance to promote sustainable agricultural activities. INEHSCO focuses on the improving family health and nutrition through community health committees developed around the women, and developing local farm leaders to teach other farmers. Despite good progress with small farmers, no attention has been given to grazing, an even more serious threat, in part because project design focused on small and medium sized farmers. Cattle grazing on steep hillsides constitutes an estimated fifty percent of land use in the buffer zone. Existing NGOs are not now capable of addressing the issues of pastures, overgrazing, and absentee cattle owners.

Institutional Strengthening

Institutional strengthening is primarily a PACA/CARE activity, although PACA/TNC has assessed institutional capability and provided the means for NGOs to improve it. CARE designed a method for comprehensive assessment of institutional capability, and used this to

structure targeted assistance. This approach was applied successfully in Belize to BZ and BCES, enabling them to depersonalize operations by establishing functioning boards of directors, developing job descriptions, lines of authority, and other changes which will allow both institutions in the future to grow in a rational and productive fashion.

In Costa Rica, AGUADEFOR, a relatively strong NGO with its own agenda and approach, was initially a reluctant subject, but benefitted considerably from the formal institutional strengthening program provided by CARE. CCIG received considerable attention and support from the CARE environmental education specialist, who helped CCIG solidify the public awareness programs which are its focus.

In Guatemala, CARE was unable to work in institutional strengthening with Defensores, but has excellent relationships with FUNDAECO and FUNDEMABV, two other NGOs. Both of these are relative newcomers to conservation, as formal institutions, although FUNDEMABV builds on a long history of its founders' environmental activities. When CARE began working with them, both had limited funding, and both lacked the institutional experience to carry out large projects. Both organizations have benefited from CARE's institutional strengthening assistance.

Policy

PACA's policy work is discussed under the policy subcomponent.

Conclusions and Recommendations

Consortia

Conclusion. The PACA consortium, which teamed a development-oriented PVO (CARE) with one oriented to environmental protection (TNC) failed to produce the hoped for level of cooperation. Although both CARE and TNC have learned from each other, they do not work together as partners, but segregate the work not only between nuclear and buffer zone, but work with different NGOs on different functions. In Guatemala and Costa Rica, they even focused on entirely different reserves, while TNC's REA for Cusuco in Honduras was designed and completed in draft without reference to CARE's work in Merendón.

Recommendation. PVOs should not be required to work in consortia. PVOs should be selected for nuclear zone and buffer zone activities on the basis of their capacity to deal with the major threats affecting a particular reserve. A single PVO or NGO could be contracted to handle both types of zones, if capable, or several to deal with different types of threats.

Fund Matching

Conclusion. The 1:1 match proved onerous for both PACA and PASEO, reduced the number of PVOs interested in carrying out RENARM activities, and did not enhance

dedication. Since PVOs have a limited budget for international work, it concentrated these resources on RENARM at the expense of other opportunities.

Recommendation. USAID should standardize its PVO matching requirement at the customary 1:3 or 1:4 match.

PVO-NGO Relations

Conclusion. RENARM relies on U.S. PVOs as intermediaries in developing partnerships with local NGOs, and opening channels through which AID funds were delivered. Sometimes this arrangement worked smoothly, particularly when the channel had been established by earlier contacts, but many NGOs complained of feeling dominated or overwhelmed by the US PVOs. They felt that the PVOs did not treat them as equal partners or respect their accumulated experience, and were dismayed at the lack of interest in adjusting the RENARM programs to fit NGO agendas. This perceived arrogance led on occasion to rejection or otherwise unproductive relationships. The fact that U.S. PVOs and Central American NGOs share broad objectives and the NGO designation does not assure an automatic partnership.

Recommendation. RENARM should seek ways to bring the local NGOs on board sooner, to use their experience in designing their own roles and their relationships with the PVOs, and to attempt to adjust to some extent to the agendas of the local NGOs.

Site Selection

Conclusion. Four sites being supported by RENARM represent important areas worthy of biodiversity conservation: Palo Verde-Barbudales in Costa Rica, Cusuco-Merendón in Honduras, Sierra de las Minas in Guatemala, and Bladen in Belize, although there are no RENARM activities currently at Bladen. REAs and/or other ecological studies have been carried out on all sites.

Recommendation. RENARM II should concentrate its efforts on conserving the biodiversity of selected biosystems, and on mitigating the threats in their surroundings to those sites.

Environmental Education

Conclusion. General environmental education and awareness activities can have a significant effect on establishing a national consensus for protecting reserves. However, the focus and content of environmental education can and should vary to target the threats to specific reserves. The major threats to Costa Rica's Palo Verde-Barbudales are wildfire and irrigated agriculture. In the Merendon watershed adjacent to the Cusuco national park in Honduras, it should focus on improved agricultural methods of local residents and on unwise conversion of tropical forests to pastures by absentee landowners. In Guatemala, it needs to focus on educating the Q'eqchi' cultivators on the northern slope of Sierra de las Minas and on making communities aware of the damage which logging and grazing can cause.

watersheds on the southern slope. In Belize, it needs to focus on the importance of Bladen as a nature reserve with special emphasis on communities near the reserve.

Recommendation. RENARM should review current programs and the capabilities of available PVOs and NGOs in light of major threats and opportunities, and plan desirable revisions before designing RENARM II.

Buffer Zone Management (see also IIB3 below)

Conclusion. Buffer zone management, in its most basic sense, is the management of threats to the core area of a reserve, and as such must respond to the very specific threats to a given reserve. Slash-and-burn agriculture, logging, and cattle grazing on steep slopes are typical threats, but they are not the only ones. However, the political and economic influence of logging and large-scale livestock and farming interests may require a different approach than that used in dealing with settled agriculturalists or slash-and-burn squatters. In the case of RENARM's four sites, these are serious threats in Sierra de las Minas and Cusuco-Merendón. Wildfire and contaminated irrigation water are serious threats to Palo Verde-Barbudales, while hunters are an easily-controlled threat to Bladen.

Recommendation. BZM should be narrowly focused on the threats to the four parks. This includes: (1) research the scope of the irrigation water threat to Palo Verde and determine how to attack it; (2) analyze the cattle grazing threats at Cusuco and SMB and develop a strategy to attack them; (3) determine the scope of the logging threat to SMB and work with FUNDEMABV, which has developed a relationship with loggers, on how to lessen this threat; (4) focus on making the Q'eqchi's coffee and cardamom cash crops more profitable on the SMB north slope, so that they will be less tempted to move up into the reserve.

B2b. Paseo Pantera

Paseo Pantera (PASEO) is the other PVO consortium directed at Wildlands Management. PASEO's proposed solution to the problem, as stated in the Cooperative Agreement, revolve around ecotourism and a "Central American Nature Touring Circuit," which would also involve a biological corridor linking wildlife habitats, hence the name "Path of the Puma."

The PASEO objectives are to preserve Central American biodiversity through quantitative and descriptive research, promotion of ecotourism, management of buffer zones, environmental education, and the development of a regional strategy. The PASEO strategy is to promote the concept of a Central American biological corridor stretching from Mexico to Panama. PASEO considers that all of the above activities (research, ecotourism, buffer zone management, environmental education, planning) can and should be oriented around the overall goal of establishing both land-based and marine biological corridors. The program is presented as a coherent whole, building on previous work by the PASEO partners: WCS in the Belize reef and CCC in Tortuguero. As a consortium, PASEO works smoothly, since the principal partners are each headed by one of the Carr brothers.

RENARM amendment No. 3 added a small grants program. Two buy-ins from the Honduras bilateral mission provided for: (1) an operational plan for La Muralla Reserve; and (2) an operational plan for the protected areas section of the new Protected Areas and Wildlife Department of COHDEFOR.

PASEO's program is the most experimental of the innovative RENARM program, and the riskiest, since its focus is almost entirely on the wetter, more fragile Caribbean side of the isthmus. It invests small amounts of funds in a wide variety of actors. This diversification strategy lowers risk during the innovation stage.

PASEO, through WCS, has close and long-standing relationships with the reef habitat and Mayan Mountains activities in Belize, and through CCC with Tortuguero in Costa Rica. These longstanding personal relationships allow them access to high levels of government and enables them to attract conservation groups to their conferences.

Exhibit III-B. Collaborators and Focus

Ecotourism:

NECs in Guatemala, Honduras, and Costa Rica
Secretaría de Integración de Turismo Centroamericano (SITCA)
World Tourism Organization
UNDP

Park Strategy:

University of Florida
CCAD-CCAP (Central American Council of Protected Areas)
Cultural Survival (Río Plátano-Tawahka Sumo Reserves)
MAYAFOR (trinational Selva Maya, Mexico/Guatemala/Belize)
Janet Gibson and GOB Department of Fisheries (Belize barrier reef reserve)
Bruce and Carolyn Miller, Gallon Jug private reserve (Belize land-based reserves)
Universidad Del Valle (Tikal, Guatemala)

Environmental Education:

Peace Corps (Bay Islands)
Bay Islands Conservation Association (BICA)
MOPAWI (local NGO, Río Plátano)
Sam Ham, University of Idaho
Susan Jacobson, University of Florida (see Parks)

Buffer zones:

Universidad de la Paz
Tropical Research & Development (TR&D)

Performance

Ecotourism

Formally, the PASEO ecotourism program consists of three elements: (1) publications, (2) National Tourism Councils (NECs), and (3) conferences. These formal approaches have not been notably successful. PASEO will publish a handbook on the use of ecotourism as a conservation tool by the end of 1994. Three of the promoted National Ecotourism Councils (NECs) were activated, in Costa Rica, Honduras and Guatemala, each comprised of public and private sector stakeholders in the tourism industry. Only the Honduras NEC remains active, the others succumbing because they were unable to generate sustaining funding. A regional ecotourism conference and national conferences in Honduras and Panama resulted in guidelines for ecotourism in protected areas.

Informally, Paseo has conducted site specific studies on ecotourism at Tortuguero and Saripiquí, Costa Rica. Many of its other activities also have a potential impact on ecotourism and environmental education, e.g., the Belize barrier reef, Rio Plátano, and the Bay Islands.

Ecotourism serves a buffering function in biodiversity conservation. For example, it will probably function to preserve at least a part of the Gallon Jug private reserve if something happens to its owner, simply because it has become an important site for the international bird-watching community. Tourism serves a similar function in preserving the Hol Chan/Bay Islands ecosystems. There are promising opportunities for developing this buffering aspect of ecotourism by experimenting with ecotourism in more creative ways in Tortuguero and in Rio Plátano/Tawahka Sumo.

Three other promising areas for ecotourism study should be considered: (1) effective ways for ecotourism to fund park maintenance; (2) ways to avoid possible damage by ecotourism to fragile park ecosystems; and (3) evaluation of the unsuccessful aspects of the ecotourism conferences and the NECS for lessons to be learned.

Buffer Zones

Buffer Zones Workshops. PASEO has funded four Workshops on Buffer Zone Management (1991-94) given by PASEO's Jim Barborak with Felipe Matos of the University for Peace in Costa Rica. The Workshops depend on non-PASEO financing for scholarships to bring in participants. Only 17 participants out of 30 were from Central America in 1993.

Bay Islands Land Use Study. As one of its buffer zone activities, PASEO contracted TR&D to carry out a land use analysis of the entire Bay Islands in response to a Honduran government initiative to develop an environmental management plan to guide development and prevent deterioration of the Bay Islands' natural resources. This land use plan will contribute to an application from GOH to the IDB for comprehensive support of the government's efforts to enforce environmental regulations in the islands.

The comprehensive TR&D study forecasts an ambitious and valuable park/reserve project which would include both on- and off-shore core areas, multi-use areas, and buffer areas. This archipelago hosts six threatened and twelve endangered species on the islands or in the nearby reef. The economic importance of fishing and fish processing is declining while that of tourism is increasing dramatically. Protecting specific areas should improve local fishing while maintaining the local dive attractions for tourists, as they have in Belize. This is an important step toward an eventual management plan for the islands.

Tortuguero. The other buffer zone activity is the acquisition of 5000 additional hectares adjacent to Tortuguero to shield the park from upstream banana plantations.

Defining "Buffer Zones." PASEO, through both its land and reef work is elaborating the concept of buffer zone beyond that of a physical area surrounding and protecting a pristine ecosystem. All agree that a buffer zone and associated activities exist only within the context of a protected area. However, the definition of the classic buffer zone which surrounds the isolated Sierra de las Minas does not fit a non-contiguous collection of protected areas characteristic of many parts of the Paseo Pantera in Guatemala, Belize, Honduras, Nicaragua and Panama, and bears little relationship to coral reef ecosystems and the population which benefits from them.

While PASEO and PACA have both worked with the concept of "buffer," "transition," and "multi-use" zones, there is no precise determination of just what these mean in different contexts, nor precisely how they are to be managed to contribute to biodiversity conservation under different circumstances.

Environmental Education

PASEO proposed to publish two books, in English and Spanish, for the purpose of educating the Central American and international public about the natural history of the Central American land bridge and its importance to conservation of biological diversity. Both books are being drafted, but no publication date has been set. PASEO published a Spanish translation of an environmental education handbook written Sam Ham of the University of Idaho, which is to be used as a guide for developing interpretation and environmental education programs throughout the project's geographical area.

PASEO carried out site-specific environmental education activities at three locations: the Bay Islands, Tortuguero, and Río Plátano-Tawahka Sumo.

Bay Islands. Susan Jacobson of the University of Florida carried out the environmental education activity at the Bay Islands in conjunction with the Bay Islands Conservation Association (BICA), a local NGO, and with U.S. Peace Corps Volunteers. To support formal environmental education PASEO revised a marine ecology teacher's manual developed by a Peace Corps Volunteer, printed 400 copies, distributed it throughout the islands, and conducted workshops on how to use the manual. To support general public awareness of the environment, PASEO established and provided materials on environmental resources for three of the islands, and produced a bilingual photographic guidebook. More

than 4,500 copies of the guidebook were provided free to BICA, which sells them to help support its activities; free copies were also distributed to local municipal and business leaders and to teachers. A baseline survey was carried out which will later permit the evaluation of the impact of these activities.

Tortuguero. Audio/visual slide presentations that describe the history of the region, turtle exploitation, and CCC's conservation work, are underway to complement Tortuguero's stationary exhibits, the themes of which are rain forest diversity and marine turtles. The presentations will target both local people as well as visitors.

Río Plátano-Tawahka Sumo Public Awareness Campaign. The Río Plátano Biosphere Reserve (RPBR) is the oldest UNESCO-recognized reserve in Central America, but it has not been managed and was under pressure from cattle ranchers. PASEO invested \$25,000 to alert the public to RPBR's problem, with stunning success. PASEO contracted an ex-PCV writer-photographer, Vince Murphy, who produced a 28-page booklet with excellent color photos, a slide tape program, two posters, a narrated 23-minute video, and five slide libraries, all of excellent quality. The video was shown on local and international TV, the video was presented to the Honduran president and all his cabinet, and numerous other presentations were made.

The campaign had major impact in Honduras and beyond. President Callejas extended the boundary of the reserve to include the proposed Tawahka Sumo reserve all the way to the Nicaraguan border, across the Coco river from the Bosawás Biosphere Reserve. This action effectively created the Amerindian reserve of Tawahka Sumo.

A new NGO, the Río Plátano Foundation, dedicated to supporting and implementing a program for a viable biosphere reserve, and another NGO, MOPAWI, which supports Amerindian causes, were collaborators with Paseo in this effort.

Planning the Biological Corridor

The biological corridor concept is the linch pin of PASEO activities, all of which are related in some way to this concept. The management strategy for the corridor is advancing *pari passu* with other PASEO activities, but is far from complete.

A good basic document on the corridor was produced for PASEO by Thomas Ankersen of the University of Florida law school. The document reviews the biological, economic, and political rationale for the corridor, plus legal and international law aspects and proposed alternatives for a Central American institution supporting the corridor. This effort led to creation of the Mesoamerican Biodiversity Legal Project, which is considered to be one of RENARM's major achievements (see III-B1a. Policy).

Other work related to the corridor include a proposal for a single Maya Mountains biosphere reserve in Belize; research on indicator species in Belize and Guatemala; groundwork studies at Bocas del Toro in Panama; a conference on border parks; support for

the Cultural Survival-sponsored Congress on Indian Lands in the Mosquitía; and a buy-in to assist in management planning at La Muralla in Honduras.

A recent and promising participation by PASEO involves MAYAFOR, which is the first attempt to create a truly international reserve system, involving Mexico, Belize, and Guatemala. In addition to assisting with the organization of MAYAFOR, PASEO's contribution is expected to be in special studies which could contribute to the planning and implementation of the Selva Maya reserve, plus a site-specific interpretive design initiative for Tikal.

In a working document, PASEO outlined a series of protected area complexes (Greater Peten, Trifinio, Río Coco, Río San Juan-Central Cordillera, and San Blas-Darién) and major gaps between them (El Salvador, Motagua-Trujillo, Bluefields, and Canal Zone), plus lesser gaps within the complexes and a potential route for the biotic corridor.

This working document presents a few paragraphs of text on each gap, tentatively outlining how some of the gaps might be closed. Gaps, of course, mean people. It is hoped that the final products of the PASEO effort include analysis by anthropologists and sociologists working in tandem with ecologists to understand the sociocultural situation on the ground in the gaps and design a series of options to integrate gap populations into the corridor concept.

Conclusions and Recommendations

Ecotourism

Conclusions. Paseo has carried out interesting experiments involving ecotourism and has included the concept of ecotourism or nature tourism as one of its fundamental themes. Not all of these efforts (e.g., the NECs) have been successful, but in combination represent important experience.

Recommendation. PASEO should analyze and consolidate the information it has gathered on ecotourism, and should produce a document of lessons learned in the field with recommendations for future action. If PASEO believes that ecotourism should be a part of RENARM II, it should produce a detailed proposal for future ecotourism activities.

Environmental Education and Awareness

Conclusion. PASEO has not yet produced its planned two books on the Central American corridor, but it has carried out intensive effort in both formal environmental education and non-formal public awareness in the Bay Islands. Its small investment in a public awareness campaign for Río Plátano had an extraordinary impact and resulted in extending the Rio Plátano reserve to the border, completing a link to Nicaragua's Bosawas.

Recommendation. As with ecotourism, PASEO should analyze and consolidate the information it has gathered on environmental education and awareness, and produce

a document of lessons learned, with recommendations for future action. This document should specify which areas are targets for formal environmental education, which can benefit from public awareness campaigns like that at Río Plátano, and which require other types of treatment. As with ecotourism, if PASEO considers that environmental education/awareness should continue in RENARM II, it should produce a detailed proposal of possible future activities in this area.

Buffer Zones

Conclusion. PASEO has operated in the context of several buffer zone concepts. These concepts are not well-defined or classified, nor is there agreement about what kinds of activities are appropriate for different types of zones (nuclear, multi-use, buffer) under different conditions (e.g., reef habitats, collections of small protected areas). In some cases, the buffer zone definition depends on site-specific criteria; in others, buffering may be a process, rather than an area.

Recommendation. PASEO should take the lead in Central America in arranging for discussions to define types of buffer zones and propose those activities appropriate for specific situations in the context of the corridor. PASEO and the consortium partners, WCS and CCC, have considerable contacts throughout the conservation community in Central America, many of which have acquired considerable experience in buffer zone problems. The discussion of buffer zones should include a wide selection of individuals and organizations with varied experience, in order to forge a consensus on zone classification and the actions indicated in specific situations. Since buffer zones involve people, experienced social scientists should be involved in these discussions.

Biological Corridor

Conclusion. If the biological corridor concept is to prosper, it needs to be reflected in a clear and defensible plan to achieve the consolidation of parks and reserves into reserve complexes, and to have an effective strategy for integrating the gaps in the corridor into the corridor concept.

Recommendation: PASEO needs to complete its corridor management plan before PACD if this concept is to influence the design of RENARM II. This effort should include analysis by anthropologists and sociologists working with ecologists to (1) define the biological significance of man-made and natural gaps; (2) understand the sociocultural situation on the ground in these gaps; and (3) design a series of options to integrate gap populations into the corridor concept.

B3. Pesticide Management

Controlling the use and misuse of pesticides is a health, environmental, and economic problem in Central America. RENARM is approaching this problem through two complementary activities: The Integrated Pest Management activity carried out by CATIE and Escuela Agrícola Panamericana is a research and extension activity which develops plant

protection systems which reduce reliance on pesticides. The Pesticide Management activity is an education program which trains users to avoid misuse, and medical personnel to recognize and treat victims of misuse.

B3a. Integrated Pest Management

Integrated Pest Management (IPM) is a multi-faceted system of technologies which reduce the levels of toxic chemical pesticides being applied to protect plants by increasing biological control through preservation of natural pest enemies and introduction of new pest predators; improved cultural practices; limiting pesticide use to biologically critical conditions, or some combination of the preceding. IPM also seeks economic gains through increased yields and/or reduced costs which will encourage its adoption. These activities have great potential economic and environmental importance. Some of them, particularly extension of IPM techniques in buffer and multi-use zones, should be continued under RENARM II.

RENARM supports IPM technology generation and transfer activities at two regional institutions, Centro Agrícola Tropical de Investigación y Enseñanza (CATIE) and the Escuela Agrícola Panamericana (EAP) at Zamorano. IPM activities in CATIE and Zamorano were started well before RENARM and are beginning to have an impact on production and pesticide use in the region.

CATIE

CATIE's Integrated Pest Management (IPM) program seeks to improve economic well-being and health while providing for the protection of the environment and the sustainable management of the natural resources in the Central American Region. This is to be achieved by helping farmers increase crop productivity and economic returns; contributing to the production of residue-free produce for national consumers and for export; and reducing human and environmental exposure to harmful pesticides through the development of environmentally sound pest management practices.

To achieve its objectives, CATIE carries out the following activities:

1. Applied Research

Over 200 laboratory and field experiments have been conducted, concentrating on certain key pests of principal crops. With RENARM support, CATIE now has sets of non-chemical management options that have been validated on commercial farms and are now ready to be offered to agricultural producers.

2. Information and Documentation

Over 20,000 requests for information have been answered so far. Furthermore, research results have quickly reached substantial numbers of national level plant protection specialists through such information and documentation products as the quarterly IPM

Journal, Technical Fact Sheets, Current Contents, the Pesticide-Tolerance Bulletin, IPM guidebooks for several crops, books, posters and brochures.

3. Technology Validation and Transfer

Extension activities in 15 pilot areas in four countries provide continued in-service training to over 50 local researchers, a similar number of extensionists and select groups of farmers about non-chemical alternatives for the management of key pests in several important crops.

4. National IPM Program Support

RENARM support has enabled the CATIE Plant Protection Activity to promote the establishment and consolidation of the National Chapters of the Regional Diagnostic Laboratories Network, now active in five Central American countries and encompassing over 40 organizations and 350 individual members. Some 1,500 diagnostic services and corresponding recommendations have been rendered by CATIE's laboratories and experts to member institutions and individuals and other users.

5. Education and Training

More than 50 professionals have received Masters Degree level education in Pest Management specialties. Over five thousand technicians from all tiers have benefited from seminars, workshops, short courses, and in-service training events.

6. Technical Assistance

CATIE's research programs have provided information on and solutions for over 100 specific pest management problems. Diagnostic assistance has been provided to over 2,000 other users, usually including the identification of the pest or pesticide management problem, and recommendation of one or more immediate, short term solutions.

CATIE maintains a capability to provide technical assistance in a wide range of plant protection issues throughout the region. A total of 675 weeks of technical assistance, organized in 238 missions, have been provided so far, driven by the requests from field level public and private organizations.

RENARM financial support to CATIE's IPM effort supports salaries of technical staff and the basic costs of operation. Field functions must be financed through complementary resources:

- Nicaragua's MIP/MAG/CATIE Project, financed by NORAD and ASDI, is a U.S. \$4,000,000 joint venture aimed at enhancing the national IPM development and extension capabilities in that country.

- The MIP/CONCAFE/CATIE Project is a joint venture with the National Coffee Commission (CONCAFE), funded through a \$450,000 buy-in by USAID/Nicaragua. It focuses on the adaptation, validation and transfer of available IPM technologies for controlling key coffee pests, and on training of CONCAFE's researchers and extensionists.
- In Guatemala, the MIP/ICTA/CATIE/ARF Project was started as a \$1,200,000 effort that included a USAID \$320,000 buy-in. It has continued as a joint venture of CATIE, ICTA and ARF, that focuses on the transfer of the previously generated IPM technologies for the principal pests of Broccoli, Snow Peas, and Tomatoes.
- In Costa Rica, several research validation oriented joint ventures with ODA/NRI have focused on microbial control and the integrated management of soil pests. Consolidated, these amounting to more than \$500,000 of additional funding. The ODA financed the construction and equipment of a microbial control unit valued at U.S. \$150,000.
- Smaller cooperative agreements have been funded by GTZ in Costa Rica and El Salvador, the Standard Fruit Company in Costa Rica, World Relief in Nicaragua, etc.
- It is estimated that counterpart institutions such as ICTA in Guatemala and CONCAFE in Nicaragua have contributed more than U.S. \$500,000 of in-kind resources to joint ventures with CATIE over the last four years.

Escuela Agrícola Panamericana (Zamorano)

Zamorano is a private non-profit organization dedicated principally to higher education, which also maintains research and extension programs.

The overall goal of the EAP IPM program, like CATIE's, is to improve the economic well-being and health of men, women and children living in Central America. The specific objectives are:

- To help farmers increase productivity of their crops and their incomes;
- To help reduce human exposure to toxic pesticides;
- To reduce excess pesticide use in selected areas of Central America;

Zamorano approaches these objectives through teaching at the university level, research and outreach.

(1) University Education

Plant protection department staff have taught five three-credit theory courses, as well as a five-credit practicum to 594 students, as part of the three-year *agrónomo* degree program. The plant protection curriculum has been enriched with IPM techniques, and

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teaching materials have been developed which are being used throughout Central America. Zamorano also awards an *Ingeniero Agrónomo* degree, requiring an additional year or two and a thesis on an IPM-related topic. RENARM financing provides 50 percent of the scholarships for IPM students, 50 percent of the teaching costs, and approximately 70 percent of the student research costs.

Zamorano does not offer advanced degree programs, but it does encourage its students to pursue graduate studies in the U.S. or at CATIE. RENARM has provided a small amount of the costs associated with advanced degree research work for 28 graduate students. Most of the thesis work is done in Central America, and focused on research relevant to farmers' problems.

(2) Research

The EAP research program in IPM consists of work on three broad topics: sustainable IPM practices, conservation and management of native pest predators, and introduction of exotic natural predators.

Research on sustainable IPM practices is oriented toward the development of economically and environmentally viable approaches to pest control, with emphasis on finding alternatives to synthetic chemical control. Much of the research work is carried out on farmers' fields in order to ensure practicality of the results and to get farmer input and feedback.

Sustainable IPM research takes place under seven programs oriented toward certain crops, crop systems, or specific problems. Most of these programs were begun before RENARM, with participation of other donors and technical institutions. RENARM now finances from 20 to 80 percent of these programs, the rest being financed by producers or USAID mission buy-ins.

Crop/crop-system research

- **IPM in corn-bean intercrop and sorghum.** Virtually completed before RENARM. Now being extended through other IPM programs.
- **Land preparation systems in corn and beans.** Pest control under no-plowsystems
- **IPM on cucurbits for export.** Primarily melons in Honduras and Nicaragua.
- **IPM on onions.** Nicaragua buy-in. Diagnosis completed,

Pest problem research

- **IPM on Hillsides.** Largely a small farmer training program, provided to local NGOs as trainees and later extensionists. Trainees learn pest cycles, pest-predator

relationships, and natural means of pest control such as predatory insects and naturally occurring pesticides (neem, madreado). Approximately 4000 farmers from the region have received training.

- **IPM on Whitefly.** Focused on one of the most economically damaging pests, the basic information generated by Zamorano on whitefly taxonomy, biology, pesticide susceptibility and management is being used by national programs in the region.
- **Natural Enemies.** Behavior and pest control effectiveness of native natural enemies are being studied with a view toward their manipulation and conservation by farmers. A similar effort is underway with the introduction and testing of thirteen exotic organisms for their ability to control seven types of pests, including aquatic weeds.

(3) Outreach

Zamorano outreach activities are designed to facilitate interactions with collaborating institutions and farmers in Honduras and throughout the Central American region, and include: 1) in-service training, including workshops, short-courses and development of teaching materials and other publications; 2) diagnostic services and networks, and 3) production of biological pest predators.

In-Service Training and Communications

Zamorano has trained 28 technicians from around Central America and Barbados through its in-service IPM training program for technicians from other institutions in the region.

Zamorano has organized 20 workshops for 1235 participants during which the results of the IPM program are shared with other technicians, and where feedback and activity coordination take place. Approximately 294 short courses have been delivered to 7,300 participants.

RENARM has supported Zamorano's development of a publications capability to foster the teaching and communication program. Teaching materials on IPM include textbooks, field and laboratory guides and manuals, audiovisual materials and computer programs.

Diagnostic Services and Networks

Zamorano provides diagnostic and identification services on pest problems to farmers. RENARM-supported work in this area includes the establishment of computerized databases on the reference collections of important crop pests and their natural enemies. The databases are used by 22 institutions in 6 countries.

Production of Biological Pest Predators

Zamorano has established a program for production of proven pest predators on a massive scale. The objective of the program is to demonstrate that large-scale liberations of pest predators is an economically effective means of pest control. It has provided technical assistance to ten firms which are now selling natural enemies to growers.

Performance

Both CATIE and Zamorano have met or exceeded most of the targets or outputs established for them in the project paper and annual work plans. Most of them are couched in the form of numbers of people trained in both degree and non-degree courses and programs, numbers and types of research projects attempted and results obtained, numbers of documents produced and published, number of technologies developed, number of extension visits made, and the like. All of these accomplishments are relevant and necessary to developing and maintaining the institutional capability on a regional basis to address pest problems in a sustainable manner while reducing, or at least rationalizing, the use of synthetic pesticides. The evaluators are very favorably impressed with the high quality and quantity of the work undertaken so far, and with the dedication shown by the technical and administrative staffs of each institution.

Both IPM programs have many units and activities in common. The RENARM contribution supports the continuation of plant protection programs already in existence. Though some of the research and extension work is conducted in environmentally sensitive areas, none of the sites where field work is taking place are buffer zones or multi-use zones near protected areas. As a consequence, interaction between the IPM programs and other parts of RENARM is minimal.

These programs initially concentrated on field crops produced predominantly by small farmers. More recently, increased attention has been placed on higher value crops, such as snow peas, broccoli and tomatoes (CATIE in Guatemala), coffee and vegetable crops (CATIE in Nicaragua and Costa Rica), melons and onions (Zamorano in Nicaragua and Honduras). Producers of these crops are increasingly willing to pay at least a portion of IPM services, with the best examples being a check-off system accepted by snowpea producers (Q.01/lb of product exported to support CATIE/ARF/ICTA) in Guatemala, and a three-year contract signed between Zamorano and large Honduran melon exporters to help finance on-farm IPM trials and extension.

In terms of sustainability of the effort, both CATIE and Zamorano are Central American institutions, and they will remain in the region after RENARM is completed. As the programs pay attention to high-value crops, the feasibility of charging directly producers and producer associations for all or part of the services rendered increases. An additional positive effect of this is that producers are keenly interested in the type of research being conducted, and make sure that they are getting value (in terms of adoptable technologies, increased economic benefit through reduced costs and reduced risk of excess pesticide residues). This has the effect of making the researchers and extensionists more sensitive and

accountable to producers, more results-oriented, and more willing to factor farmers conditions and suggestions into their research designs.

Very little evidence is available so far as to the ultimate impact of the IPM program, particularly in terms of degree of technology adoption and the economic impacts due to reduced costs, increased productivity or a combination of the two. Field visits by the evaluation team, however, indicate that there definitely has been adoption of new techniques as well as a positive economic impact, particularly among melon, snow pea and coffee producers. WRI is carrying out a snow-pea IPM technology impact assessment of the CATIE/Guatemala efforts (in rough draft), which indicates positive results.

Conclusions

Both the CATIE and Zamorano IPM programs have been effective and have become even more effective and responsive as they have focused attention on higher value crops and larger farmers and commodity associations. There is case study and anecdotal evidence and some quantitative evidence that the program has had a significant impact in promoting more rational pesticide use (for example, based on detected pest populations rather than on a pre-set calendar) and introduced techniques for biological control and modifications in cultural practices which complement or substitute synthetic pesticides. There is also duplication of several of the activities, which may introduce some inefficiency or lower return on the RENARM investment than would otherwise be the case⁴. There has been little interaction with the other components of RENARM, which is unfortunate since there are policy implications of the work, as well as technology which could be adapted and applied to buffer zones and multiple use areas.

Overuse and indiscriminate use of pesticides in Central America is widely recognized as a serious problem with respect to human health and appropriate management of the natural resource base. The IPM effort is contributing positively to reduction of pesticide use, which will have positive environmental as well as economic effects.

Recommendations

Increase the contacts between the IPM programs and other RENARM implementors particularly to give those working in buffer zones an idea of what technologies are available and can be transferred quickly to farmers.

Encourage both CATIE and Zamorano to sell their services to direct beneficiaries as a means of recouping part of the cost of the programs. There are several services named above that could be priced at cost or above.

Integrate IPM activities in the specific sites selected for RENARM II. Efforts should concentrate on transfer of existing IPM technology as well as on-site applied research.

⁴Historical antagonisms between the two institutions have generally prevented them from working together. Though many activities are similar, there is at least a division of effort geographically.

Continue modest support for core costs of research and technology transfer activities that are not "saleable." This will be particularly true for activities that relate to small farmers and crops which may be important in buffer zones though not economically profitable enough to allow cost recovery. Consideration should also be given to continuing support of education programs, as these form the human resource base for further research and extension efforts of IPM.

B3b. Pesticide Management Training

The Pesticide Management Activity was added to RENARM in 1991 by Amendment 2 in response to (1) rejection of NTAEs at US POEs, (2) incidents of pesticide poisoning of agricultural workers and others, and (3) growing awareness of the increasing danger of agricultural pollution of land and water and endangerment of biodiversity. The pesticide management activity seeks to reduce pesticide use and misuse by educating farmers and others in the proper handling and use of pesticides, and by providing up-to-date information on pesticide toxicities, acceptable applications, and prohibitions. The program also educates doctors, nurses, and paramedicals in the symptoms and treatment of pesticide poisoning.

The basic objective is to reduce the incidence of use and misuse of pesticides through education. Ancillary benefits are a reduction in rejection of NTAE shipments to the US and Europe; a reduction in and effective treatment of pesticide poisoning; and protection of the environment from agricultural pollution.

This objective is being achieved through four activities:

Pesticide Information

This is a joint effort of EPA/FDA and CATIE. CATIE annually provides 160 subscribers with a looseleaf compendium of pesticide information, which is updated quarterly. CATIE receives this information directly from EPA and FDA sources and distributes it to libraries, ministries, and interested associations and individuals throughout Central America. EPA supplements this information with additional pesticide registrations and up-to-date pesticide news. CATIE, in turn, maintains an electronic database of pesticide information, and responds to Central American inquiries. The EPA/FDA PASA also provides a quick response consultation service by EPA and FDA authorities to questions which CATIE cannot answer directly.

The EPA/FDA PASA has also provided *ad hoc* consulting services, e.g., a pesticide disposal and storage site assessment, training seminars, a training manual and course designed to strengthen C.A. pesticide residue testing capabilities.

Pesticide Extension

This activity provides training for Peace Corps Volunteers and local trainers in a train-the-trainers program, through a USDA/OICD PASA⁶, to enable Peace Corps agricultural extension volunteers to provide proper counsel and training on safe pesticide management and to transfer appropriate IPM technologies to its farmer clients. Some 2,500 volunteers and counterparts have been trained.

Pesticide Management Short Courses for Farmers

The Escuela Agrícola Panamericana at Zamorana had already designed basic manual and 1-2 week training program on management and safe use of pesticides. The strategy adopted was to get a consistent message to different audiences by tailoring the basic course to their needs, and to get Zamorano recognized as a primary source for such training. The following modifications have been prepared:

- Homemakers Course Edition
- Train the Trainer Edition
- Farm Managers Edition
- Policy Edition (in the works)

The agreement with Zamorano provides funding to cover the costs of preparing and testing the revised editions, and giving several additional short courses, but requires Zamorano to give a larger amount of training using funding it must seek from other sources. So far, more than 4000 individuals have been trained using RENARM funding. RENARM also paid for design and printing of 30,000 safe-use posters.

Pesticide Management Correspondence Courses for Health Workers

This part of the program enables INCAP to design and administer a correspondence course in diagnosis and treatment of pesticide poisoning to doctors and nurses throughout the isthmus. Courses are delivered through the public health ministries in each country, under INCAP guidance. A first delivery reached 3200 graduates, about half the expected audience and is being repeated for those missed the first time around. Another edition is being adapted for a Phase II course to be delivered to paramedical workers and other non-medical rural professionals.

The methods and contact points are being institutionalized in Central American institutions which gain the status of preferred providers. In both CAIE and EAP, the pesticide management training and information services are collocated with their IPM operations, for mutual support.

⁶USDA/OICD PASA dated 6/1/90, as amended.

Performance

This program has been extraordinarily successful. Not only does it address a widely felt need, but an active and entrepreneurial coordinator was able to organize the efforts of several effective and concerned implementors (EPA/FDA, EAP, USDA, PC, INCAP, CATIE) into a synergistic program. Besides achieving the targeted outputs of people trained and services established, this program is noteworthy because of its approach to permanence.

Implementors. The implementors were well-chosen, not only for their ability to do the job but because the tasks allocated are in line with their institutional mandates.

Institutionalization. Three of the implementors are permanent regional institutions who welcomed the opportunity to implement a highly pertinent regional activity. The design provided a clear, restricted information delivery target, and an opportunity to design, validate, and deliver a superior product, thus becoming recognized as the preferred regional provider. These institutions agreed to find other sources of funding and provide a significantly larger amount of training, which in itself will strengthen their claim to unique capability.

Regionalization. This is an excellent example of a regional AID program developing services needed region-wide much better than they could be organized nationally. This is demonstrated by the multiple buy-ins to these training programs by bilateral missions, and by direct procurement by other agencies.

Synergism. The collocation of these training programs with the implementors of the IPM program (in CATIE and Zamorano) further reinforces the institutional mandate and strengthens the capability for both near-term and longer impact.

Results. There is evidence that NTAE producers are not only aware of pesticide damage but complying with regulations. Other pesticide users have also become more aware, and there is some evidence of behavioral change.

Conclusions

This is a massive attempt to get a pesticide situation under control in an environment of limited regulation enforcement by providing information needed to change the behavior of the user. It helps to meet the RENARM objectives of biodiversity conservation and sustainable agriculture, while supporting the concept of a regional program doing those things best done regionally.

Training increases awareness but does not guarantee a change in behavior. Although tests have shown that workers who have had training are better able to distinguish among pesticides and some understand the need for protective practices, this awareness is neither complete nor profound. Course repetition, reinforcement with mass media campaigns over time, and above all, enforcement by employers will be needed to change user behavior.

The major behavioral changes resulting from these programs will be due to personal self-interest. The enforcement of regulations in Central America is considered to be weak, and therefore, behavioral change is difficult to achieve without that personal self-interest. Although self-interest is considered high with respect to the toxic effects of pesticide misuse on personal health when these are recognized by the end-user, a continued focus on international market entry for farm products, or the cancellation thereof, can add a most effective incentive.

Recommendations

The pesticide management program should be allowed to end, as programmed at PACD for Phase I (September 1995). All activities will have become institutionalized by that time, in the sense that training and information services have been designed, proven and installed in a permanent regional institution which is now recognized as a preferred provider.

Investigate alternatives for maintaining the EPA/FDA PASA. The EPA/FDA PASA has been a critical component of the pesticide management program, particularly to service the CATIE pesticide database service, but also as a source of technical advice and laboratory training. This capability will continue to be needed in Central America, but not necessarily as a part of RENARM II. The following are some alternatives for exploration:

- As a direct and continuing service of EPA/FDA to NAFTA, and by extension to other prospective NAFTA members.
- As an AID-funded PASA under some program supporting a Central American Alliance for Sustainable Development.
- As a RENARM-funded PASA funded under the CCAD support activity, aimed at strengthening regional environmental policy and regulation.

B4. Forestry

Over three-fifths of Central America's land is primarily suitable for forests, but less than two-fifths remains under forest cover. Annual deforestation rates are estimated to be above 3.5 percent. Two RENARM activities reflect different solutions to the problem of providing a steady flow of forest products. Tree Crop Dissemination (MADELEÑA) is the result of CATIE work in fuelwood started 15 years ago with ROCAP financing. With growing sophistication, it has promoted growing trees for production of poles, posts, and saw logs, with fuelwood as a by-product. Production from Natural Forests (PNF) seeks to maintain the natural forest resource by managing it for continuous production of timber and non-timber products. Both of these activities are managed by CATIE. CATIE is the only institution in the region with a network of collaborating institutions that can provide a source of integrated natural resource management expertise to address this rapid loss of natural forests in the region.

B4a. Production from Natural Forests (PNF)

The objective of this \$3.66 million project is to validate natural forest management as a viable land use alternative. The project develops large scale pilot demonstrations that will allow land owners, colonists, concessionaires, national institutions, NGOs and industrialists to recognize the economic value of managed forests as commercial enterprises which are still compatible with the conservation of protected areas. PNF has an opportunity to demonstrate on an industrial scale, the potential of an economically attractive silvicultural alternative land use to destructive shifting agriculture or short-lived pasture.

Production from Natural Forests (PNF) has established a core staff of specialists in tropical forest management. This staff's extensive experience in both primary and secondary forest management enables it to command international respect for the quality of work being conducted, both in teaching and applied field research tailored to the local conditions in each country.

Natural forest management seeks to take advantage of expanding knowledge of ecological and biological processes to obtain an increased sustainable yield of timber and non-timber products from native forests. The management plan is based on a forest inventory, which indicates where and what can be extracted with best results. Selective logging liberates adjacent trees, enabling them to grow faster, while it opens the forest to permit regeneration. A number of logging techniques reduce damage to other trees.

Although this is an unusual practice in Central America, the principles are well known, and continued research is establishing the bio-ecological requirements of timber species in both new and secondary growth forest. Silviculturally treated field plots in Costa Rica which have been monitored for eight years demonstrate increased forest growth and regeneration at rates that are economically attractive. These pilot management areas serve as initial validation for the treatments being proposed, and also serve as training sites and areas for field days. Technical documents, based on this work, describe both the conceptual and procedural technical framework for productive forest management.

The program's objectives are to:

- Demonstrate the viability of management of natural forests as an economically competitive land use, providing a sustainable source of timber and non-timber extractive forest products which generate a competitive income for the concessionaires or land owners.
- Improve the technical capacity of counterpart organizations (NGO's, communities, government and industry) for sustainable forest management by standardizing procedures and formats.
- Continue to test and evaluate silvicultural practices suitable for primary and secondary natural forests of the low land humid tropics of Central America.

- Promote policy changes that will favor sustainable management of natural forests in Central America.

CATIE's team of specialists work with forest owners, NGO's (local and international), governments, communities, and concessionaires, to develop demonstrations and pilot management areas. These demonstrations will validate the prescribed logging interventions and silvicultural practices that will stimulate growth and regeneration of the forest without degrading the resource. These practices and interventions are being monitored periodically to evaluate their subsequent effects on stand development, including growth rates, regeneration of desirable species and any changes in species composition.

Forest management models being used start with an inventory and management plan for a given forest property. This plan is based on readily monitored standardized formats for field operations, including timber inventories, logging designs, post-logging evaluations and silvicultural treatments. GIS, Surfer and MAPVIEWER computer programs are being integrated into a database system that can facilitate analysis and management decisions in the demonstration forest and provides a basis for comparative analysis among different demonstrations. Distinct operating strategies are planned for private forest land and in both industrial and community-managed concessions.

The technologies developed by PNF are being continuously transferred to forest operators and implementing organizations through on-job observation and training and field days. The program includes the preparation and distribution of pamphlets, manuals, technical publications, videos, etc., to extend the lessons learned.

Professionals and technicians needed to expand this work are being trained at CATIE and national universities in the techniques used in field work for planning and implementation of management plans. Such training includes in-service training and workshops.

Performance

Silvicultural and management practices are being demonstrated in several pilot management areas in Costa Rica, Guatemala, and Nicaragua. In Costa Rica, these are being conducted with private forest owners and cooperatives as buffer zone activities in conjunction with FUNDECOR in the FORESTA project. In the Guatemalan Petén, management plans for developing forest concessions operated both by industrialists and by communities are entering the operational phase. In Nicaragua's Río San Juan, work plans are advancing for a community-managed forest concession.

Two USAID bilateral projects which support the conservation and sustainable use of the natural resources in strategically important areas of biodiversity, FORESTA in Costa Rica and MAYAREMA in Guatemala have used PNF technical assistance for planning the management of natural forests.

RENARM forestry advisors provided critical help to MAYAREMA in developing a strategy for managing forest concessions, and formulating the legal framework within which

forest management will be conducted in the Petén. By pooling resources it was possible to initiate a commercial scale demonstration that neither project could organize or finance alone. Another collaborator (OLAFO with Nordic funding) is developing a community organization which will become the concessionaire to manage the forest under a management plan developed by PNF. This forest activity will reduce the community's dependence on agriculture for cash income, thus helping to protect the shallow soil resource.

In Costa Rica, the FORESTA project provides an opportunity to demonstrate the utility of standardized formats of silvicultural and management practices for preparing management plans for owners of private forests. Specific outputs include management plans for small private forest properties including standardized guidelines for inventories, growth plots, logging plans, post harvest evaluations and silvicultural evaluations.

The process of forest management in Nicaragua's San Juan River pilot management area was initiated by PNF with a training program which involved industry, governmental foresters and a local NGO working with communities. This training is beginning to produce promising results.

Conclusions

Natural forest management is an innovative land use alternative for colonists situated on forest soils that can not support sustainable agriculture. Management of natural forests presents an alternative to deforestation from shifting slash and burn agriculture, cattle growing, and indiscriminate high grade logging that degrades the resource base. Forest management is a sustainable activity for maintaining forest cover and should be integrated into the buffer and multiple-use zone management for the conservation of biodiversity in protected areas where illegal logging is a threat.

The PNF project has successfully initiated work in pilot management areas in Costa Rica, Guatemala and Nicaragua, providing technical services in preparation of management plans, training in management practices, developing a legal framework, and establishing research plots with collaborating institutions. Public attention focused on natural forest management is creating a demand for PNF services which surpasses its capacity. Limiting factors are dependence on collaborating institutions for implementation and the centralization of project technical staff at Turrialba.

Recommendations

This activity should be strengthened, as outlined below, and continued in RENARM II.

PNF should consider decentralizing its field personnel by assigning them to work directly in the three or four most promising pilot management areas, at least until national professionals can be trained and incorporated in the forest management activities. Few Central American foresters are experienced in natural forest management, which is not a traditional forestry concept in the region.

The success of the project requires that the CATIE senior silvicultural advisor be retained. An experienced senior forester is needed to help field staff review working procedures and maintain the high technical standards that have been established to date.

The PNF team would be greatly strengthened by hiring and integrating into the management team an economist to emphasize the business side of forest management. The economist should design and initiate the collecting of cost data for economic evaluation, using standardized formats, that would be collected during the monitoring of the logging operations at the same time that silvicultural data was being collected. This information is absolutely critical as the basic commercial test for validating the technology. Forest management must pay for itself, and the property owners or concessionaires must be compensated for their work, including the costs of silvicultural treatment, protection, etc. Forest management must be demonstrably a sustainable business, by helping to find ways of industrializing and marketing secondary species.

PNF should carefully consider environmental and global land use issues when working in buffer or multiple use zone areas so as not to alienate conservation interests. At the same time, the public (and many conservation NGOs) need to understand that forest management is a viable and sustainable alternative to uncontrolled logging and land clearing.

PNF leadership should investigate the potential of sustainable management of secondary forests. Secondary forests cover a large area in the humid lowlands. This kind of forest will increase as marginal pastures and unsustainable agriculture are abandoned. These forests tend to be easily accessible to markets. Simple treatments could increase their value.

RENARM foresters should look to private sector promotion activities to provide market information on wood utilization. Information on wood utilization and market development for small dimension products, as well as for secondary species, is urgently needed. RENARM experience with this type of activity indicates that it tends to be expensive and uncertain, especially if addressed through public sector approaches.

Management plans must be integrated, with due attention given to cultural dimensions and potential economic conflicts, particularly if the forest has other uses. Besides timber management, the plans must consider non-timber extractive products, wildlife management, eco-tourism, and measures to protect against encroachment or illegal extraction, as well as environmental parameters responsive to a landscape management strategy that is not detrimental to conservation of protected areas.

In choosing working areas, PNF should take into account to a greater extent the policies, institutional and economic framework that can influence the success of a demonstration area. The PNF team needs to look at policy issues as well as legal and social constraints in each country where they work. PNF must associate itself to a greater extent with local and national groups that can influence the policy issues as they effect management.

B4b. Tree Crop Dissemination (MADELEÑA III): Plantation Forestry and Agroforestry

Firewood provides approximately 65 percent of the energy consumed in Central America and imposes a heavy cost in collection or purchase. This was the impetus for the initial attempt to address this issue on a regional scale in 1980. In 1985, a second five year project expanded the research efforts to include multipurpose tree species. The current MADELEÑA III (1990-1995) project emphasizes the transfer of the generated technology.

Eleven years of silvicultural research and socio-economic studies conducted primarily on the dryer Pacific slope led to the identification of twenty fast growing tree species which are well adapted to Central American environments and produce timber or other valuable products. This work provides the technological bases for the transfer of appropriate technology for producing trees in economically viable production systems. Such systems include farm wood lots or plantations as well as agroforestry systems and fence rows. CATIE has developed a regional network of 6 counterpart institutions and 25 affiliated organizations, who extend this technology to private farmers.

A research database—MIRA (Information Management of Tree Resources)—has been developed to centralize project and research data related to species selection, growth studies and to a lesser extent social and economic information. A network of 23 terminals located in collaborating organizations enables users (foresters, planners, students, scientists) to access systemized information so that they may then analyze and process the data for their own use.

Establishment of commercially viable timber plantations has become the thrust of the MADELEÑA III project efforts. In some cases this activity has been subsidized with financial incentives provided from national budgets and foreign donors. For small farmers fuelwood production has become a by-product to commercial timber production. Agroforestry systems are being promoted by the collaborating organizations where production systems permit, particularly for coffee and cocoa. Plantations are frequently established intercropping trees with corn or other annual crops as farmers develop their own taungya (tree/crop) combinations.

The objectives of MADELEÑA III are:

- Promote the cultivation by small and medium sized farmers of multiple use trees for the supply of forest products such as firewood or round wood for rural construction, and to provide other benefits such as protection for soil and water conservation and soil and shade for crops and animals.
- Strengthen the capacity of national institutions and NGO's to promote through their extension systems the use of fast growing multiple use trees.
- Continue the standardized monitoring of existing research trials to complete the longitudinal record and update technical publications on multi-use tree species.



- Promote the use of forest seed of good genetic quality for reforestation in the region.

The MADELEÑA activity consists of a core staff based in Turrialba and six National Coordinators for the transfer of appropriate technology to the region. This CATIE staff is complemented by national public sector counterparts in each country and a network of 25 NGOs and other private organizations, each using its own extension system. This participative network not only extends and promotes the technology in each country, but provides feedback to CATIE on their particular requirements.

Extension programs help small farmers to establish community or family nurseries, by providing technical supervision, improved seeds, and plastic bags. The most successful extension practice has been field days, with successful farmers demonstrating the advantages of fast growing trees as construction material for their homes and for cash income. Field days are also used for training farmers in thinning and other management practices.

Performance

Since 1991, MADELEÑA III has made great strides in changing from a research based project towards a project providing services:

- CATIE's Turrialba-based core staff provide technical support to six country coordinators and their network of 31 collaborating organizations in training, research, extension and socio-economic studies. Thousands of small farmers clustered in rural communities have established small wood lots from which they are gathering fuelwood, posts, and poles for construction and for sale. Farmers are increasingly growing tree's in plantation systems, as a cash crop which is a viable land use alternative to agriculture or cattle production, most notably in the AGUADEFOR project in the Nicoya Peninsula, Costa Rica and La Máquina on the south coast of Guatemala.
- The MIRA database provides systemized information for monitoring promising multiple use species, including growth studies and management experiences for each of the six countries. This database is accessible through 23 installations to national counterparts for their own analysis.
- Regional and national training programs have trained 350 extensionists in 31 collaborating institutions. Audio-visual materials for use by extensionists for technology transfer of technology have been developed and distributed. Core staff has continued teaching post graduate students and orienting their thesis projects.
- Research continues, including the monitoring of formal regional research trials (72), permanent growth plots (169), and selected seed tree stands (24) maintaining all pertinent information in the MIRA database, a permanent memory bank for participating institutions that suffer frequent changes in personnel.

- A joint venture with Finland contributes \$2 million dollars (25 percent of the total) to the project budget, reducing its dependence on RENARM. These funds support plantation and agroforestry research, training and extension, with emphasis on plantation management. The network of supporting organizations have contributed the equivalent of \$1.08 million dollars as of September 1993.
- All field activities are conducted through counterpart organizations. MADELEÑA III's activities are therefore located where their counterpart organizations are working. This restricts the opportunity for important links with other RENARM activities. The Rio de las Cañas watershed project and the Costa Rica work with AUGUADEFOR are the only two examples of MADELEÑA's collaboration with other project activities, and even here the relationship is tenuous.

Conclusions

MADELEÑA III has developed a successful program for transferring its technology for establishing fast growing timber species that are economically interesting to small and medium sized commercial farmers. These trees are frequently produced on agricultural land, in small wood lots or plantations and as living fences, alleviating the pressures on natural forests by contributing to the supply of building materials and fuelwood. The sale of posts and polewood provides a source of cash income. In some cases (e.g. Nicoya Peninsula in Costa Rica), plantations are a demonstrably viable land use alternative to destructive traditional production systems.

The MIRA database provides a standardized memory bank readily accessible for institutions that have difficulty sustaining programs, particularly research activities. The system provides continuity that survives changes of governments and staff and the possibility to pool data.

A limiting factor in incorporating MADELEÑA's activities in biodiversity conservation is the fact that its technology was developed on the dryer Pacific slopes. This reflects its origins as a project to replace fuelwood supplies where population pressure had virtually eliminated natural forests. The proposed emphasis on biodiversity conservation as a unifying strategy for the remainder of RENARM I and for RENARM II, focuses attention on maintaining remnants of tropical forests on the wetter Atlantic slope of the isthmus. It is estimated that at least five to ten years of additional field trials would have to be conducted in these environments to develop and adapt comparable technology for these sites.

Recommendations

For extension, recommended species should be grouped by their uses and develop modules for extension for distinct production options (e.g., plantations, agroforestry). This will facilitate dissemination of information by affiliated organizations and make it easier to adjust to the needs of different communities and individual farmers. It will also reduce the dependence of national extension agencies on direct assistance by CATIE experts for adaptation of recommendations.

Graphic materials used for technology transfer and training should reflect hillside conditions, reflecting the conditions under which it will be used.

Undertake an independent evaluation of the economics of plantation forestry in the Nicoya Peninsula. This evaluation should look at both arable land and hillsides, and compare plantations with both agriculture and livestock.

CATIE staff engaged in MADELEÑA III should evaluate alternatives for working within the proposed project strategy of focusing on the protected areas of greatest biodiversity, including the buffer zones, multiple use zones and connecting corridors. The fifteen years of the three MADELEÑA projects have created a rich legacy of research and extension, and the generation of methods which will shorten the time required for generation of comparable technology for the wetter Atlantic slope of the isthmus. Nevertheless, the time required would exceed the duration of the second phase of the RENARM project. As currently structured, neither MADELEÑA III activity nor its technological base are geographically aligned with the proposed RENARM II strategy of concentrating activities in regions of high biodiversity located for the most part in the humid caribbean coast where the only remaining natural forest in Central America exist.

CATIE should also consider alternative arrangements for maintaining its multi-use tree program in the event that RENARM funding is no longer available. Transfer of CATIE technology for the establishment of the multi-use trees by means of the network of collaborating institutions will have become institutionalized by the end of RENARM I. This provides an opportunity for high pay off with a lower maintenance budget, now that it is beyond the initial research and development phase.

B5. Watershed Management

It is estimated that seventy percent of the C.A. rural population farm steep hillsides, the root cause of deforestation and soil erosion. ROCAP sought to address this problem by supporting CATIE's Regional Tropical Watershed Management project, which focused with limited success on working with national organizations trying to generate bankable projects for critical watersheds.

CATIE's watershed management efforts now seek to develop and transfer improved technologies for restoration of degraded watersheds, by promoting soil conservation and water retention practices. The RENARM watershed management activity (\$US 4.390 million) refocused the effort on land use planning for the rehabilitation of degraded watersheds and developing integrated technological packages for improved land use techniques that will improve farmers' production while reducing soil erosion and runoff of surface water, i.e. promoting sustainable hillside agriculture.



The CATIE watershed management team works with national organizations on five types of activities:

- Preparation of management plans and work plans for rehabilitation of critical watersheds with national organizations.
- Promotion of the GIS for land use planning to improve institutional capacity for planning, evaluating and monitoring natural resource activities.
- Provision of technical assistance for watershed restoration.
- Developing hydraulic models for correcting river channel siltation to reduce flooding.
- Assisting in the development of extension techniques that encourage voluntary participation of farmers in adopting improved technologies.

Performance

The 1993 budget went primarily to pay a core staff of six specialists and scholarships for twelve graduate students in watershed management. AID budget cuts have forced the project to eliminate part of the RENARM scholarships, and seek funding from other sources. Approximately 30% (US\$220,000) of the 1993 budget supported 26 training and T.A. activities in the six C.A. countries, with a counterpart budget equivalent to US\$ 1.208 million. Like many CATIE programs, watershed management activities are dependent on finding institutions that can finance watershed field work. Much time is still being devoted to project proposals, because national agencies are also underfunded.

Watershed Rehabilitation. Five demonstration watersheds in four countries have benefited from TA and training courses, and have produced annual operating plans. Among these rehabilitation projects, the Rio las Cañas Project in El Salvador and the San Marcos Project in Honduras, have reached the critical stage where leading farmers from the communities have been identified and trained in extension techniques for training other farmers.

GIS Network. A Central American GIS network is being established by training operators in GIS technology and its application to planning. This program supplements the modest equipment requirements (GIS now operates on desktop computers), and provides standardized procedures for planning, monitoring, and evaluation of projects.

The establishment of GIS capability in at least one institution in each country has created a tool of great utility. The application of this tool to a bilateral project in Costa Rica led to development of a valuable methodology, with broad application for identifying and prioritizing critical land use practices.

Stream Channel Rehabilitation. In Costa Rica the restoration of sedimented stream channels based on a hydraulic model operated in CATIE, has permitted the recovery of high value agricultural land, stimulating local economies and generating employment. The strategies used resulted in low cost, timely and effective solution to annual flooding problems.

Training and Technology. Between 1990 and 1993, 467 natural resources technicians from throughout Latin America were trained in watershed management techniques in 27 short courses. Twenty-three students from Central American have received master degrees with a specialty in watershed management. Twenty-eight technical reports and/or professional articles on watershed management topics have been published.

Technology Transfer. Land use planning is essential to watershed management, but the effectiveness of rehabilitation depends on the adoption by farmers of soil conservation and water retention techniques. Such adoption requires farmers to apply major inputs of their own labor; they are reluctant to do so on the basis of persuasion alone. Some collaborating agencies have provided modest incentives (improved planting stock or fertilizer), released AFTER the farmer has done the physical work of digging absorption trenches along a contour. The benefits of this work shows up rapidly, in reduced erosion, a growing season extended by water retention, and increased dry season stream flow. Once these benefits are evident on a large treated area, neighboring communities are much more responsive to extension efforts.

Farmer or community participation methodology has been used to determine their needs. The project uses an integrated farming system approach that often includes the participation of the family. Technologies are as close as possible to the farmers traditional production practices and integrated into local systems, with community leaders used to teach others. This approach has been successful whether applied to perennial production systems (coffee), basic grain crops (corn, sorghum, beans) and vegetables when conducted through communities of small and medium size farmers for whom this activity was designed. CATIE and its collaborators have little experience dealing with large ranchers who run cattle on steep hillsides that have been cleared of forests. A different approach may be needed for dealing with such ranchers if the threat to protected areas and stream flow of deforestation and soil erosion is to be contained.

Conclusions

The watershed management activity has applied land use planning techniques and generated successful technology for sustainable hillside agriculture, using an integrated farming system approach. This is achieved by using an integrated technical package that will in the short term, increase agricultural production while reducing soil erosion and run-off of surface water. The low input technologies used include such soil conservation practices as absorption trenches dug on the contour, frequently supplemented by productive living barriers (e.g., pineapple); stabilizing gullies with rock dams and plantains; planting trees as living barriers or in woodlots; combined with good agricultural practices like eliminating burning, zero tillage, improved seed selection and increased planting density.

These technologies draw much of their success from the fact that they are concentrated on a watershed. However, they would be just as applicable to the management of any concentrated area of steep lands, such as buffer zones around protected areas. CATIE has trained a good many professionals in watershed management planning techniques, and the extensionists of its collaborators in the methods applied successfully on pilot watersheds.

Recommendations

The planning methodology developed in FORESTA, using the GIS system, should be developed for use in planning the management of utilization zones associated with protected areas. This should be seen as a complement of the REA used to inventory and plan the management of high biodiversity ecosystems in the nuclear zone. This buffer zone planning would encourage the systematic evaluation of each link in the area surrounding a core protected area in order to determine priority areas for sustainable land use activities. CATIE should develop a users manual for this approach similar to the TNC manual for Rapid Ecologic Assessment (REA).

The watershed management team should tap other expertise from CATIE's staff or elsewhere, as needed to respond to major threats identified for a particular area, including the encroaching agricultural frontier, unmanaged logging and cattle grazing.

The land use planning and conservation capabilities of the watershed management team should be integrated into management of buffer zones, multiple use areas and connecting corridors associated with protected biodiversity areas and continued in RENARM II.

C. Performance with Respect to Overall Objectives

C1. Supporting Regionalism

C1a. Developing Regional Institutions

RENARM's program continues to provide support to regional institutions, both directly, and by buying services from CATIE, INCAP, and EAP. It has financed the creation of CCAD, and is now helping to strengthen the national CONAMAs.

C1b. Doing Those Things Best Done on Regional Basis

RENARM is the primary mechanism to focus regional institutions on current Central American E/NR problems and finances those activities which would not be cost effective on a national basis. Beyond the institutional strengthening mentioned above, RENARM has used regional institutions to provide training on pesticide management that has received favorable acceptance throughout the region. Research on IPM being developed by CATIE and EAP could not be done efficiently by individual countries. CATIE and EAP produce some of the best agricultural and E/NR professionals in Central America; both programs also require theses which add to the scientific knowledge of the isthmus.

Development and testing by CATIE of methods for natural forest management and watershed management will be applicable to all countries. MADELEÑA III has developed a technology diffusion process which is extending the results of its research through a Central American network of six public sector and 19 collaborating institutions.

The regional policy emphasis on developing ways of cataloging and identifying the effects of policy, and on programs for helping NGOs analyze self interest and opportunities to express it, are being developed regionally, but validated in specific country situations to assure general applicability.

C1c. Supporting USAID Missions

RENARM was designed to provide technical assistance to bilateral Missions from individual technical advisors and from its implementors through buy-ins. Missions have alternative sources for individual and institutional assistance which they generally prefer, so this service is less significant than planned. RENARM has provided individual assistance to USAID Missions and their clients primarily in design of forestry activities, participatory policy analysis, and development of management information.

RENARM developed a reasonably facile process to deliver buy-in assistance. It works effectively for providing some unique services developed by RENARM implementors, e.g., pesticide management and IPM training programs. It is much more difficult to arrange Mission buy-ins with PVO implementors whose agenda is not necessarily compatible with the Mission's. Besides, the Missions really prefer alternative sources of expertise, which has kept Mission buy-ins to only 16 percent of authorization. All over the world, Missions are disenchanted with buy-ins generally, since they feel that they cannot control the product.

The development of better models for biodiversity conservation and mitigation of threats to protected areas, and for the sustainable management of natural resources (watersheds, natural forest management, conservation agriculture) are still under development. These models would be developed much faster if the experience of bilateral and regional programs of a similar nature could be jointly researched in a collaborative manner (see Chapter V, Recommendation E).

C2. Supporting the CA E/NR Strategy

RENARM and bilateral Mission E/NR Strategic Objectives for Central America closely overlap, since both are responsive to the CA E/NR Strategy. The RENARM program has the potential to facilitate both its own and the bilateral programs' activities by developing and testing models which serve both. Closer collaboration on this process between the regional and the bilaterals will speed this process.

As bilateral missions phase out, the regional program will provide the only opportunity for continued support and collaboration with those bilateral E/NR activities which are still important to the Central American isthmus, as a whole.

SECTION IV

MANAGEMENT STRUCTURE AND SYSTEMS ANALYSIS

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**SECTION IV
MANAGEMENT STRUCTURE AND SYSTEMS ANALYSIS**

A. Description of Management Structure

The RENARM management structure consists functionally of three parts:

- Direction and coordination
- Technical support to bilateral missions
- Monitoring and evaluation

A1. Direction and Coordination

This activity includes the direction and supervision provided to RENARM by the USDH ADO and the RENARM project officer, as well as the coordination of the implementors by the personal services contractor (PSC) coordinators.

The RENARM direction and coordination activity is an in-house operation. Direction is provided by the USDH Office of Natural Resource Management (ONARM) office director and the RENARM project officer, supported by a PSC assistant project manager and a foreign service national (FSN) assistant program officer. Coordination is provided by three PSCs who coordinate the work of implementors of each of the three design components (Policy, Biodiversity Conservation, Sustainable Agriculture). These and other PSCs coordinate the documentation and reporting functions, manage particular activities (such as pesticide management), and provide field support and supervision. Financial analysts and secretarial staff support these efforts.

The management structure adheres closely to that described in the PP.¹ This structure was originally comprised of three USDHs, one located in Costa Rica and supported by a third country national (TCN); a technical management unit of three US-PSCs, each supported by a local professional; and four other US-PSCs, for a total professional staff of 14 to 18 professionals, depending upon whether the four "other" US-PSCs had national professional counterparts. Another PSC was added to design and implement the pesticide management activity added by Amendment No. 2, and a contract employee was added as the resident M&E advisor under the MSI contract.

The two environmental advisors, the plant protection advisor and their counterparts, and the assistant NGO advisor had left and not been replaced by the initiation of this evaluation. Another USDH and the TCN located in Costa Rica will be out by this summer. The remaining management staff are eight professionals, not counting the program assistant and accountant, only one-half of the number originally contemplated:

¹ RENARM Project Paper, Section V.A. Administrative Arrangements, pp. 86-90.

Chief, E/NR Office (USDH)
RENARM Project Officer and Manager (USDH)
Asst Project Manager (US-PSC)
Regional Forestry Advisor (US-PSC)
Associate Forester (TCN-PSC)
Policy Coordinator (US-PSC)
NGO Coordinator (US-PSC)
Pesticide Coordinator (US-PSC)
Monitoring and Evaluation Advisor (US-MSI contract)

These nine professionals are responsible for the following functions:

- **To manage (guide, direct, and coordinate) the work of the RENARM implementors so that their efforts achieve the purpose of RENARM;**
- **To assure that RENARM documents and measures its progress, learns from experience, and communicates lessons learned, internally and to bilateral missions and other donors;**
- **To evaluate RENARM activities and implementors and reorient both in accordance with lessons learned, adjusting the project design as necessary; and**
- **To provide technical support to missions, directly or through arranging buy-ins with RENARM implementors.**

A2. Technical Support to Bilateral Missions

Since inception, ROCAP has provided selected technical expertise to missions through individual PSC advisors and through regional contracts (such as the Export Industry Technology Support [EXITOS] project). RENARM intended to make available a large staff of PSC specialists (environment, forestry, pest management, NGOs, policy) for individual consultation as well as management. A large buy-in authorization of \$10.9 million would make available to bilateral missions the services of any of the RENARM implementors.

A3. Monitoring and Evaluation

As described in the PP, M&E was a complex and continuing management function. The M&E plan foresaw RENARM working as a secretariat for regional and bilateral E/NR projects to sum up what has happened and draw lessons learned. M&E would be carried out by management and coordination staff, supplemented by an M&E contractor and a management information specialist. Objectives were to:

- **Measure progress toward achievement of outputs, effects, and impact and to propose needed corrective action;**

- Facilitate linkages, meshing, and mutual reinforcement between and among the project's several components;
- Build accountability into ongoing project actions;
- Facilitate coordination between RENARM and bilateral environment and natural resource management programs or projects; and
- Build the evaluation capacity of institutions and national counterparts who participate in project implementation.

B. Assessment of Direction and Coordination Structure

B1. Accomplishments

RENARM was in a holding pattern for almost a year following authorization until the first full-time project officer arrived. The second year was devoted to completing the staffing and getting all the activities up and running. By late 1992, RENARM had achieved the form it has now, with staff, funding and components (except MAYAFOR) in place and functioning at an expenditure rate that would utilize available funding by PACD. This is a remarkable accomplishment in project management, and led to the effective performance of individual activities described in Section III.

B2. Effects of USAID Restructuring

Progress was made despite disruptions caused by frequent changes in mission management, five office moves, a 40 percent reduction in professional staff, and ultimately by the melding of ROCAP and USAID/Guatemala into USAID/G-CAP. The RENARM project officer was also acting ADO during much of the last two years, and a major player in effecting the G-CAP combination. He has now become ADO for the combined missions, a position he richly deserves, but which restricts his day-to-day supervision of RENARM.

The large staff anticipated in the project design has been halved, and this reduces time for oversight and documentation of lessons learned. The demands of bureaucracy will almost always take precedence over field work unless controlled by management. One of management's most important functions is helping staff allocate its time to the most vital functions. Coordination with principals and review of work plans and reports does not replace the constant field visits essential to the experimental nature of the project.

USAID is not only "right sizing," but restructuring its organization, its programs, and its strategy. This has already had a strong negative effect on LAC funding and staffing levels, will soon eliminate two Central American missions, and will change USAID/W backstopping arrangements and strategic guidance. Neither of the USAID/W functions are solidly in place, and may have an unforeseeable effect on RENARM's future.

B3. Continuing Weaknesses in the Management Structure

Despite these accomplishments, RENARM management is still left to deal with a program that is widely dispersed, both geographically and programmatically, without a centralizing conceptual framework, and without clear criteria for evaluating and organizing the lessons learned from the effort. These problems stem from a flawed design, the disruptions of USAID restructuring, mission management decisions, and limited control over implementation. The management and coordination structure will have to adapt to or alter these conditions if it expects to accomplish the learning for which Phase I was intended, and design a Phase II to exploit this knowledge. The following comments are not intended to diminish the accomplishments cited above, but to identify problems and suggest ways in which to refocus the management effort.

B3a. Lack of Strategic Focus

Nothing automatically directs RENARM implementors toward a common goal, nor defines their respective roles. The dominant inherent management factor is inertia; implementors will continue to pursue their own agenda unless they buy into a coherent strategy that defines their roles and relationships. Development of this strategy (and its supporting methods and mechanisms) is the concept behind RENARM's experimental approach and rolling design. It is the essence of the management task, because it will not arise unaided; although there has been much good accomplished, there are few examples of synergism among implementors — even among consortium partners — in practice, and implementors located in one component seldom contribute to the work of other components, or even understand what the others do.

Given the absence of a conceptual framework in the PP, project management attempted to create one in a series of implementation meetings beginning in early 1993. In essence, all of the intended outcomes of RENARM activities were charted in a standard objective tree format (the innovation diffusion model), to illustrate how and through what mechanism they contribute to the expected end of project status. This exercise has done much to provide order to an array of disparate activities, and has been useful in explaining RENARM to its implementors as well as to mission management. This has not been an easy process; it is difficult to arrive in mid-project at a consensus on a more restrictive program.

B3a(1) Conclusion

This conceptualization process is far from complete. The innovation diffusion objective tree is a way to array activities, and to demonstrate interrelationships. However, it does not provide a comparative measure of their value or importance. Consequently, it does not provide reliable criteria for selecting among them when the program must be concentrated. Such criteria must reflect the relative importance of the objectives being pursued. The conservation of biodiversity represented by significant natural ecosystems is arguably the most time-critical E/NR objective in Central America, given the rapidity of their destruction and the improbability of their restoration.

B3a(2). Recommendation

Emphasize the strategic objective of conserving biodiversity of critical ecosystems and direct sustainable land use efforts toward ameliorating major threats to those sites.

B3b. Geographic Dispersion and Peripherality

RENARM's work is widely scattered. This is largely because implementors generally selected their own work sites. These selections were based on their own criteria, including the need to find suitable collaborators, which did not take into account criteria of other implementors. Individual implementors do good things that conform to their agreements, but they do it separately, with their own clients, following their own agendas. Implementors have contracted with outsiders to do work that might be done by another RENARM implementor. Implementors normally work in different geographic areas; for the most part, they are unaware of the details of each others' work, despite attempts at cross-fertilization.

Much of the work done by RENARM implementors, although useful and well-performed, is peripheral to the main objectives of RENARM, namely "preservation and sustainable use of the natural resource base," at least in part because of the inertia of their prior efforts and the lack of a coherent strategy and overall work plan. For example, PACA/CARE focuses on the development of established small farmer communities in areas surrounding protected areas, but not on the major threats to those protected areas—such as unmanaged logging, extensive land clearing for pasture, agricultural pollution, and the slash-and-burn agricultural frontier. MADELEÑA promotes forest plantations rather than agroforestry, while watershed management and natural forest management are not evident in the buffer zone communities surrounding the nuclear zones where PACA works. The expected reduction in financing for RENARM II will require a tighter focus on a few significant objectives in order to be effective.

B3b(1). Conclusion

Dispersion derives not only from initial site selection, but from the organizational isolation conferred by a management structured around types of implementing organizations and the institutional orientation of those implementors. Among other things, a management structured by organizations tends to segregate both implementors and coordinators from other implementors and coordinators.

Peripherality is also the result of the selection of work sites and cooperators by individual implementors, both of which also reflect the implementors' pre-RENARM efforts, as well as the lack of a coherent program strategy and overall work plan.

B3b(2). Recommendation

Focus biodiversity conservation on critical pristine or near-pristine sites, and direct sustainable use efforts toward ameliorating major threats to those sites. Reducing geographic dispersion makes it possible for implementors to work together on solutions to an

overarching problem. However, they must also accept the desirability of working together, and they will also need help in phasing out of less suitable work sites. Some specific recommendations for achieving concentration are as follows:

- **Concentrate policy efforts on mitigating the specific threats to biodiversity conservation identified in the specifically defined protected areas. These policy efforts might include identification and analysis of the effects of inimical policies and proposed modifications, encouraging groups that are hurt by these policies to recognize and articulate their countervailing interests, and providing legal research directed specifically at these problems.**
- **Concentrate watershed management, management of natural forests, and agricultural and agroforestry support on the multiple use zones and settled buffer zones of protected areas. Assure that any program carried out in these areas is based on sound appropriate agricultural and forestry technology, and is backstopped by good problem-solving technical advisors.**
- **Assign M&E responsibility for specific sites to individual PSC coordinators, who will be expected to spend at least five days per month at those sites.**
- **Assure that any research funded by RENARM is on problems with solutions that are of direct and pertinent value to biodiversity conservation and sustainable agriculture in the selected project sites.**
- **Phase out by PACD all other activities.**

B3c. Limited Management Flexibility

Virtually all implementors are grantees, with their own ideologies and methodologies, which may make them incompatible partners, and limits project management's ability to direct them. USAID procurement policies further limit management's capacity to redirect or restrict grants or cooperative agreements once signed, particularly when all the money has been obligated.

B3c(1). Conclusion

To be effective, the rolling design approach requires strong leadership at all levels, close and continuous oversight, and frequent decisions on program operations, all of which are somewhat inconsistent with the limitations on management's ability to guide the partners.

B3c(2). Recommendation

When working with grantees, continue close oversight and frequent counseling. RENARM management's care in work plan approval and monitoring could be further strengthened by more frequent visitation of field sites.

C. Assessment of Technical Support to Missions

The expected demand for RENARM staff's technical advisory services never developed, except for forestry and policy. The anticipated buy-ins have reached only 16 percent of authorization, and in 1993 amounted to 5 buy-ins totaling less than \$500,000.

C1. Conclusion

There is little chance that missions will increase their use of RENARM's PSC advisors, nor will buy-ins reach anywhere near the authorized amount before PACD. The reason is that missions have found other ways to satisfy their needs for technical support; buy-ins are not a preferred option, except for acquiring unique capability. Servicing buy-ins is still a tedious and unrewarding process for missions, RENARM, and the implementors, and holds only marginal value for the program.

C2. Recommendation

Lower expectations, but maintain buy-in authority. Missions continue to buy in to RENARM-sponsored training programs and might recognize the value of other RENARM-supported innovations as these are publicized. Buy-ins might provide a way to protect the protected area investments of closing bilateral missions.

D. Appraisal of Monitoring and Evaluation

Despite the effusive and unrealistic description of the M&E process in the PP, the programming for that effort was quite restrictive. The budget line item for M&E for a \$60 million program was only \$800,000, incorporated into selected CATIE programs. Inflation and contingency line items were each twice that amount! The RENARM project is an experimental design in which cut-and-try methods are used to reorient the program in a rolling design approach. Such a program requires continuous monitoring and operations research to define and solve problems and help select among options. Operating staff seldom have the time or freedom to devote the intellectual effort required to perform these tasks, but neither should these tasks be delegated to evaluation specialists. M&E is a collaborative function involving both the project management team and M&E specialists.

A continuous M&E contract, which includes a resident advisor, was let early in the program, in recognition that direction and coordination staff were heavily burdened with the management of implementation. Funding for M&E was more than doubled that originally proposed. However, the TCN-PSC management information specialist was dropped and not replaced. Partly as a result, the resident M&E advisor's time has been preempted to help organize reporting by implementors, and to help satisfy the quantitative reporting requirement of the semi-annual reports (SARs).

At this point, much experience has been garnered by implementors and RENARM staff (see Section V), but little has been documented as lessons learned, either through operations research studies of problems encountered and their solutions, or as case studies of

individual activities. The M&E contractor's home office has worked with RENARM staff to conduct several useful problem-related studies. The resident advisor also participated with EAP in designing a survey to evaluate pesticide management training.

The M&E resident advisor has introduced the innovation diffusion model (a standardized E/NR decision tree) to help implementors and RENARM management think through the internal relationships of their activities and to see their interrelationships as well. This has been an important step in building a consensus for change. However, as stated above (II-A2a) the decision tree does not provide effective criteria for determining the relative value of different activities, nor for prioritizing their selection when program concentration is required.

D1. Conclusion

The in-house evaluation and documentation process is still incipient. The few limited but useful evaluative studies are on the right track, but do not constitute the body of evidence that was anticipated when RENARM was designed. The remainder of RENARM I should continue and expand this process, which will require the concerted effort of management and coordination staff, as well as the M&E contractor.

D2. Recommendation

Revitalize the M&E effort in consonance with the management decisions recommended above. This includes not only the documentation of the impact of these changes and their effects on program coordination and communication, but development of an agenda of problems that must be solved in order to make the programs effective in achieving their objectives. Making coordinators responsible for overseeing specific protected sites should provide additional support for the M&E function, as originally proposed in the PP. Assigning responsibility for developing activity case studies to RENARM management and coordination staff will help to appraise and document the lessons learned from these activities.

The M&E contract with Management Systems International (MSI) should continue to provide a useful backstopping function, particularly for designing and conducting discrete operations research type studies. Short-term advisors are preferable for this work, both because they can be selected to fit the specific requirement, and because they are independent. A resident advisor should be selected for and dedicated to assisting project management and implementors install evaluation systems, but not to evaluating their performance. A resident advisor tends to become part of the management team.

SECTION V

REPORTING, DOCUMENTATION, AND LESSONS LEARNED

SECTION V
REPORTING, DOCUMENTATION, AND LESSONS LEARNED

This section examines whether the RENARM project is documenting and measuring progress, learning from experience, and communicating lessons learned.

A. Reporting and Documentation

A1. Reporting

A1a. Implementor Reporting

There are many implementor reports—at least two per year per implementor—but most of these are compendiums of what the implementors did, or input level information. These reports are more detailed than necessary and are not organized in a way that is useful for management or evaluation. The design problem stems from lack of clear objectives for each implementor against which they can report.

Inexperience with management reporting leads implementors to report everything that happens as a way of expressing their diligence. Because the implementors don't know what may be important, they frequently append all available documentation (for example, the training or research grant applications, intermediate reports, and final reports), but they seldom provide a statistical summary or abstract that gives meaning to these activities.

The M&E advisor has spent a great deal of time working with implementors to improve their reporting. By initiating this assistance with an introduction of the decision tree used in the innovation diffusion model, he has helped implementors understand the structure underlying their activities. This assistance from the M&E advisor, which improves the design of the implementors' reports and clarifies work planning, has been well-received.

The assistant project manager spends much effort sorting through these reports for information to report to management and to condense for the SARs to Washington. Coordinators use these reports to keep track of project operations. They can describe progress and status clearly, but when asked for data are apt to give the evaluator a stack of these reports with a "you look through these for that kind of information" rather than present a coherent table that would allow one to measure progress quantitatively. Reports seldom provide an accurate description of the problems the reporter is having; to identify and deal with these problems requires more time spent in the field with the implementors than has been the case.

A1b. Semi-Annual Reports

The SARs can be very useful in enabling one to see what has happened during a particular period. These reports are the basis for detailed internal reviews by mission management. However, RENARM is not a normal project, but a collection of 20-plus activities performed by 20 implementors. Mission management does not have the time to review 20-plus SARs or a single SAR that elaborates 20-plus activities. No meaningful way has been found to squeeze RENARM program data into a SAR format without restructuring the program. This is another example of the conflict between a program designed for innovation and the limits of institutional procedures.

A1c. Conclusions

Reporting has taken up a great deal of staff time, without much useful data to show for it. Part of the problem is clearly the result of a weak project design and part is the inexperience of implementors with good management reporting. Although better reporting is clearly desirable, the time required for improving reports is time not spent in more useful pursuits.

A2. Documentation

A2a. Work Plans

Implementors prepare two-year work plans that vary greatly in organization, detail, and comprehensiveness. They generally include a narrative description of the main lines of work and the actions that are expected to take place in a given period. However, many (by no means all) are weak in definition of targets and expected outputs, or lack a time line for accomplishments, which reduces their utility as a management tool. All include line item budgets; few express the budget in program terms or provide the detail needed for a crosswalk between line item and program budgets. Budget monitoring is a good management tool, providing early signals of an implementation problem.

Coordinators approve the work plans, and implementors tend to follow them; some tie their quarterly reports to them. However, the work does not always follow intentions, and work plans are seldom updated to reflect the shifts that occur over a two-year period. Except for consortia, work plans are prepared by individual implementors and seldom show the relationship of the particular implementor to other RENARM implementors. Consortia work plans may show the respective functions of consortia members but not in relation to other RENARM implementors.

A2b. Conclusions

A well-prepared and -monitored work plan is the most meaningful management tool available to coordinators. The review and approval process has been used with good effect to require certain activities and to avoid others. Monitoring compliance with a work plan helps to identify problems in time to correct them and/or to modify the planning targets.

A2c. Operations Research

RENARM's intent was to learn from the experience of giving a number of organizations things to do and observing their progress. The experience would be used in the rolling redesign. This implies some level of systematic analysis of the operations of each activity, something beyond observing different implementors at work, although lessons have been learned from that.

In fact, there is no systematized research agenda, nor are the various operations being looked at from the point of view of finding solutions to specific problems that affect the protected areas. A problem-oriented research agenda might include such questions as those presented in the annex to this section.

The M&E contractor has conducted three special studies dealing with RENARM problems¹: surveys on the nature of bilateral relations, surveys of NGO opinion about RENARM program relations, and an analysis of the effectiveness of consortiums of environmental and development PVOs. These were well done and provided useful input to RENARM and bilateral mission management. They are the kind of problem-oriented operations research studies that RENARM needs to provide to fulfill its mandate.

A2d. Case Studies

Each RENARM activity was created with the intent of learning from its development and performance. Each activity represents innovation and experience in design and execution, including false starts and mistaken assumptions, as well as breakthroughs and significant accomplishments. The RENARM staff is challenged by the need to document the lessons learned in each of its many activities before the PACD, and while the remaining staff is available to describe and interpret. One might consider drafting a case study of each activity, focused on "lessons learned," as a supplement to the more problem-focused operations research studies.

B. Learning from Experience

RENARM is a "learn by doing" operation. Its designers sought better understanding of how to preserve and sustain the use of the natural resource base by encouraging innovation along three lines:

- How to define and manage E/NR policy.
- How to involve environmental PVOs/NGOs in biodiversity conservation.

¹ (1) "RENARM and the USAID Bilateral Missions," MSI, September 1993.
(2) "RENARM, USAID and Central American NGOs: Voices from the Field," MSI, December 1993.
(3) "Using Multi-NGO Consortia in Wildlands Projects: Lessons for RENARM," MSI, January 1994.

- How to rechannel related continuing activities of CATIE for greater impact on E/NR problems.

The primary modality was to define the broad problem, then enable the chosen implementor to develop the approach. Collaborative monitoring of this process would enable both USAID and the cooperating implementor to learn from experience, and this experience could be described, evaluated, and communicated. It is still too early in the project to get the full benefits of the experience, but anecdotal information indicates its promise.

Because little was known about how to address E/NR issues, RENARM was intended to be modified as information accumulated, but not designed in a way that would facilitate this. It is ironic that although USAID's entire history has had to be one of adaptive implementation as an approach to management, many of RENARM's management problems stem from a lack of fit between management structures that are needed to support adaptive programs and that permitted by standard USAID procedures, regulations, and structures. Some organizations have developed structure and management procedures that isolate the innovative unit until new approaches become routine. USAID has required change to emerge from conflict — for example, the competitive, conflictive, frequently acrimonious, and sometimes petty relationship between bilateral and regional missions that has persisted for 30 years. Despite the aggravation that this conflictive approach has caused RENARM management, significant lessons are emerging from the RENARM experience (see Section III).

B1. USAID

Both regional and bilateral missions have been learning from the RENARM experience, although attribution is unclear. As used here the RENARM experience includes some pre-RENARM activities that were expanded and redirected in RENARM. RENARM did not start *tabula rasa*; for example, The Nature Conservancy (TNC) was already operating in Central America through the AID/LAC-funded Parks in Peril project, and many other RENARM activities were refinements of earlier efforts. Further, the learning experience is not uni-directional. Bilateral mission activities yield experience that informs regional activities. Finding better ways to exploit both lanes of this two-way street is vital to fulfilling USAID's Central American E/NR strategy.

B1a. Working with Environmental PVOs on Protected Area Management

A major objective of RENARM was to involve environmental PVOs more broadly in Central American E/NR work. Such PVOs have been a major force in the U.S. conservation movement, and several became very active internationally during the 1980s. These PVOs have demonstrated a unique ability to stimulate the designation of protected areas and their effective management. RENARM funded TNC in a consortium (PACA) with Conservation International (CI) and the development PVO, CARE, as well as Wildlife Conservation International (WCI) and Caribbean Conservation Corporation (CCC) (as Paseo Pantera). It also brought in Cultural Survival to address indigenous peoples issues in RENARM and World Resources Institute (WRI) to provide technical assistance to CCAD. These were

successful introductions. Bilateral missions currently support TNC and Paseo Pantera, as well as Panamerican Development Foundation and other PVOs to carry out E/NR activities. In the process, both regional and bilateral missions have acquired useful experience in dealing with U.S. environmental PVOs.

B1a(1). Environmental-Development Consortia

RENARM sought to develop consortia of environmental and development PVOs on the theory that their complementarities would contribute to park protection and buffer zone development more effectively than either one alone could accomplish. In fact, both environmental and developmental PVOs learned from each other, but their formal linkage in a consortium was unnecessary in practice and an impediment to program flexibility.²

B1a(2). Matching Funds

PVOs were required to match RENARM funding 1:1, based on USAID's desire to create a full partnership by ensuring that PVOs had an equal say with USAID in program implementation decisions. It was reasoned that a 1:1 match would increase the commitment of the PVO to the program, and increase project funding as well. This requirement had adverse effects, eliminating a preferred provider who would not guarantee to meet the 1:1 match, and artificially concentrating resources. PVOs have limited funds for foreign investment; a 1:1 match eliminates the possibility of their participating in three equivalent programs at a more normal 1:3 or 1:4 match, and does not increase total funding. PVOs are committed organizations; that commitment is not enhanced materially by the 1:1 matching requirement.

B1a(3). The PVO Agenda

Learning to work effectively with U.S. environmental PVOs is like learning how to work effectively with U.S. universities. Both are established institutions with their own objectives, ideologies, methods, competencies, and agendas. Collaboration is based on finding a confluence of interest, rather than a tradeoff. PVOs are pleased to pursue a joint agenda with USAID, but not to substitute USAID's agenda for theirs in return for funding. Failure by bilateral missions to recognize this characteristic created problems in processing early buy-ins and disappointment in the results. Missions now recognize the differences among PVOs and seem pleased with the PVOs involved with their bilateral program.

B1a(4). PVO-NGO Relations

USAID's reliance on U.S. PVOs as intermediaries has brought to the surface a number of issues with regard to their relations with local NGOs. Local environmental NGOs, like their U.S. counterparts, are heavily involved in the conservation movement. They have provided the information and the political support needed to get an ecosystem designated for

² Mark Renzi, Leslie Lannon, Hillary Lorraine, "Using Multi-NGO Consortia in Wildlands Projects: Lessons for RENARM," MSI, January 1994.

protection. In some cases, they have been assigned the responsibility for its administration; in all cases, they monitor and actively support protection.

Problems arise if either U.S. PVOs or USAID disdains the acquired environmental competence or fiduciary responsibility of the NGO and attempts to interpose the former. NGOs are willing to be helped, but not supplanted; when approached correctly, the results can be felicitous. In some cases, at least, USAID could benefit from the local environmental and institutional knowledge of a local NGO without automatically using a U.S. intermediary.

B1b. Common Protected Area Model

A common protected area model has emerged throughout the isthmus, whether funded bilaterally or regionally. This model consists of a protected area established and regulated by government, consisting of:

- A pristine nuclear zone representing a significant ecosystem that can be preserved for scientific study and nonintrusive use;
- A settled buffer zone where sustainable agricultural technology is applied to increase incomes and enable the occupants to avoid incursion into the nuclear zone by themselves or others; and
- Sometimes an intermediate, nonoccupied multiple-use zone where sustainable extractive use is permitted under strict management controls.

This model is actively supported, controlled, or monitored by one or more local NGOs with the support of one or more U.S. PVOs. The protection and development program is governed by a rapid ecological assessment (REA) or equivalent, which provides a baseline description and evaluation of the ecosystem, a categorization of the major threats to the nuclear zone, and a planning document.

B1c. Common Concerns

Common concerns are emerging from both bilateral and regional protected area experience. These range from ways to handle major threats through the impact of policies and laws, to park management and financing. The commonalities of both regional and bilateral E/NR programs strongly suggest a collaborative effort to fully document the experience gained and to seek definition and solution of common problems.

B2. Implementors

Most RENARM implementors began by "doing their own thing," following their established methods. The degree to which they learn from experience is directly proportional to the need they feel to try new approaches or different methods. The experiences presented below are noteworthy.

B2a. Proyecto Ambiental para Centro America (PACA)/CARE: Executing Programs through NGOs

Participation in PACA required CARE to revise its normal method of direct implementation to one of working through local NGOs. With encouragement from its home office and support from CARE's technical support group and RENARM's USAID staff, the PACA operation became a test bed of this method of operation. Detailed evaluations of the work in Guatemala, Honduras, and Costa Rica provided the information needed to describe this approach and sponsor workshops with other CARE country project managers. We have been told that this approach is now the preferred method of project execution for other CARE activities.

Working with and through NGOs required institutional strengthening. PACA/CARE developed an institutional assessment tool for analyzing NGO management. These assessments are used to negotiate a program for strengthening NGO management. Several NGOs have been enthusiastic beneficiaries of this institutional strengthening.

The PACA/CARE policy advisor has worked with the RENARM policy advisor to adapt the Green Book policy tool to helping NGOs recognize the impact of policies on their programs and how to develop a response. Initial reception of this approach has been very positive, but additional field testing is planned.

B2b. PACA/TNC: Rapid Ecological Assessments

When CI dropped out of PACA, it took with it the capacity to perform strategic planning of protected areas. TNC took on the job of developing a method for performing REAs. This method has now been refined by its application in Sierra de las Minas (Guatemala), Bladen Nature Reserve (Belize), Cusuco National Park (Honduras), and Palo Verde-Barbudales Parks (Costa Rica). None of these have yet been published in final draft, but are nearing completion. They hold great promise as a basis for planning protected area management, assessing threats to the integrity of nuclear zones, and establishing some kind of an index of the biodiversity being protected.

B2c. Paseo Pantera: Sponsorship of Eco-Tourism and Mesoamerica Legal Project

Paseo Pantera has been working on eco-tourism as a method of getting communities to recognize the value of protected areas — creating a value that will encourage its protection — with some success in Ambergris Key in Belize, the Honduras Bay Islands, and Tortuguero Island. However, efforts to establish national ecotourism councils were not notably successful; only one of three establish remains active. PASEO continues to promote ecotourism, notably through sponsoring eco-tourism workshops in Bocas del Toro and more recently in Tikal. Lessons are being learned, and more must be before a definitive answer can be found.

The Mesoamerican Legal Project was spawned as a result of Paseo Pantera's recognition of the importance of the legal process in biodiversity conservation, and the general ignorance of the various layers and impacts of laws and their interpretation. This project has acquired multiple sponsors, including Ford Foundation, MacArthur Foundation, PACA, and Paseo Pantera. It now has legally specialized NGOs in Guatemala and Costa Rica, and individual corresponding scholars in the other Central American countries, as well as a Central American specialist in indigenous affairs.

B2d. CATIE: Watershed and Forestry Programs

CATIE has reorganized its watershed expertise into a land-use planning format. It has established a geographic positioning system (GPS) network in all countries in Central America, and is using this methodology to facilitate its planning. This expertise was applied to strategic planning in USAID/Costa Rica's FORESTA project with excellent results. This land use planning process is not a substitute for the REA of the pristine biodiversity conservation areas, but it may be better than the REA for planning work in the multiuse and buffer zones. Incidentally, the Guanacaste REA is being performed in Fundación Neotrópica by a CATIE graduate who is the Costa Rican link in the GPS network.

CATIE has also assembled its forestry expertise to manage the RENARM natural forest management activity, and is establishing demonstration programs in Costa Rica, Guatemala, and Nicaragua. CATIE has also developed an outreach program to promote the utilization of the methods and materials resulting from research under MADELEÑA. This outreach is being conducted through a network of 6 public sector agencies and 25 NGOs.

B2e. Pesticide Management

Uncontrolled use of pesticides was harming Central American exports of high value nontraditional crops, leading to agricultural pollution and pest resistance, and posing a severe health hazard to users. The CATIE and Escuela Agrícola Panamericana (EAP) IPM programs seeking the reduction of pesticide use would not achieve widespread adoption in time to deal with the immediate threat. A multilevel education program was sponsored by RENARM, including adaptation of EAP pesticide management training programs for multiple audiences, development and delivery by Instituto de Nutrición para Centro America y Panama (INCAP) of a correspondence course in symptomology and treatment of pesticide poisoning, and inclusion of pesticide management training in the Peace Corps agricultural extension program.

At the same time, a PASA with EPA provided a regularly updated database on pesticides to the CATIE IPM program, and provides technical backstopping on pesticide problems. The CATIE IPM program distributes a loose leaf compendium of pesticide information to more than 150 public and private subscribers, and has become recognized as the Central American source for that information. All of these activities have become institutionalized in the appropriate organization.

B2f. Environmental Awareness Training

Casual observation and interviews demonstrate vastly increased environmental awareness in all Central American countries, even if this has not been transformed into more environmentally benign behavior. This change has many roots, ranging from international wire services and the Central American presidential summit to the activities of myriad new environmental NGOs. RENARM provides audiovisual aids and other assistance to some of these NGOs, but they provide the manpower and connections that make these effective. School teachers are beginning to play a major role in this effort, both in the classroom and in the community. We saw two excellent manuals on environmental teaching, one developed with the collaboration of the University of Idaho, which under RENARM is also training 14 Central American communicators to establish a professional environmental education network.

C. Communicating Lessons Learned

With the exception of the pesticide management activity, which was conceived as largely a communications activity, and the three MSI studies, lessons learned have not generally been formally communicated within RENARM, to bilateral missions, and to other donors. Having said this, there is much evidence that useful information is getting out and being used, sometimes in bilateral USAID programs, in national programs, by other RENARM implementors, or by unassociated NGOs. The rapid adoption by all USAID missions of a single protected area management model, the spread of manuals and methods for teaching environmental awareness, and the eagerness of NGOs for institutional strengthening and policy training are indications that informal communication is particularly effective when the message is needed.

D. Conclusions and Recommendations

Identifying and solving protected area management problems and communicating the answers to them is the greatest potential benefit of the RENARM program. It deserves and requires focused management attention during the remainder of RENARM I. Despite the delays in RENARM's implementation, the examples above and others described in the performance of individual activities in Section III are evidence of the potential learning opportunities that this program offers. RENARM management now needs to concentrate on formalizing lessons learned in RENARM before the PACD.

Problem-focused operational research and case studies of each activity are more important at this stage than routine reporting, particularly to utilize the experience of current RENARM and implementor staff.

Recommendation: RENARM management should formalize the lessons learned in RENARM I by conducting problem-focused operational research and drafting case studies of each activity.

Involvement of the managers of bilateral mission protected area projects in the process of defining and solving protected area management problems is key to exploiting the

accumulated experience (bilateral and regional) from application of AID's Central American E/NR strategy.

Recommendation: RENARM management should invite the managers of protected area projects to participate in a protected area management confederation whose purpose would be to work together to identify and solve problems of mutual interest.

The annex to this section presents the rational for and description of the proposed protected area management confederation.

ANNEX
PROPOSED PROTECTED AREA MANAGEMENT CONFEDERATION

A. Rationale for Protected Area Management Confederation

RENARM's major biodiversity conservation emphasis is focused on several carefully selected areas. The model seeks to establish the legal declaration of a protected area, and its management by a combination of public and nongovernmental organizations. The objective is preservation of a pristine nonuse protected area (the nuclear zone) by ensuring the sustainable and limited use of a surrounding multiuse zone managed under careful direct oversight, and encouraging sustainable use of a populated surrounding buffer zone through environmental education, conservation technology, and community development.

These RENARM-supported areas are all located within one of the countries. Their "regional" orientation derives from the opportunity to learn from a comparison of the peculiarities, similarities, and differences in the operational implementation on several sites, the results of which can be fed back to strengthen bilateral activities over time. We note that most bilateral missions also have a project that supports management of a specific protected area, following models similar to those used in the RENARM Biodiversity Conservation component — for example, Costa Rica's FORESTA, El Salvador's PROMESA, Nicaragua's BOSAWAS, Guatemala's MAYAREMA, and Honduras' LA MURALLA.

We believe that more would be learned quicker about the real problems inherent in managing protected areas using this model by involving all such USAID-supported activities in a working-level confederation. This would also facilitate communication of lessons learned among the participants in the confederation.

B. Description of Proposed Protected Area Management Confederation

The proposed protected area management confederation would consist of working-level USAID project management level staff, supplemented as needed by the implementors' operational staff. The subjects of study would be the bilateral and regional protected areas, which would continue to be funded and managed by their respective missions. The confederation of technical-level management staff would identify the differences and commonalities characteristic of these protected areas, the constraints to effective management, and the different approaches used to deal with these constraints. As problems were identified, the members of the confederation would name working groups (task forces) to seek solutions. These solutions could be validated on the sites where applied and the results analyzed by the managers.

The M&E contractor might serve as secretariat of the confederation, assisting the members of the confederation to prioritize and define the problems to be solved. Technical support should be available from the implementors.

Some common problems already identified include:

- **How to relate to settlers or indigenous groups who were in the nuclear zone at time of declaration?**
- **How to prioritize the threats to the protected area and adopt program strategies that focus on the priority threats? How do you stop burning or limit the agricultural frontier?**
- **How to deal with powerful interest groups (for example, loggers, ranchers, and large farmers) whose operations are major threats?**
- **How best to achieve a consonance of interests among local NGOs and with foreign PVOs? How do you operationalize these interests? How do you resolve the conflicts that inevitably arise?**
- **What fora, processes, and methods are most effective for identifying community self-interest? For expressing those interests?**
- **How can the adequacy of technological content be assured in plans and performance in managing such areas?**

SECTION VI

LESSONS AND RECOMMENDATIONS SUMMARY

SECTION VI
LESSONS AND RECOMMENDATIONS SUMMARY

A. A Future for RENARM?

The Regional Environmental and Natural Resources Management (RENARM) project is a large, complex regional program, designed by USAID's Regional Office for Central American Programs (ROCAP) as the regional response to the strategy for USAID assistance to environmental and natural resource management in Central America. RENARM involves regional activities in eight countries and more than 20 implementors, each performing multiple activities at an authorized level of \$61.1 million, including buy-in authority of \$10.9 million.

A second phase was intended, based on progress made during the first six years. Whether that second phase should take place will depend on: (1) the progress made in RENARM I in learning how to respond to the Central American environmental crisis; (2) the development of a unifying strategy to guide design of RENARM II and to smooth the transition between I and II; (3) the continuing validity of the C.A. E/NR strategy for USAID assistance; (4) how a RENARM II would fit the current USAID environment. The decision point for Phase II authorization will come shortly before the PACD for RENARM I (September 1995). Because of delays in implementation and evaluation, only 15 months remain for satisfying these various conditions AND designing RENARM II.

A1. Current RENARM Project Environment

When RENARM was designed, Central America had a very high profile and abundant USAID funding. Since then, funds available for Central America have been reduced and USAID has begun a major internal restructuring that has altered both USAID/W and field structure as well as USAID strategic planning. The effect of these changes in the Central American USAID environment is heightened uncertainty and competition within USAID for a reduced level of funding. If RENARM is to have a second phase, it will likely be much leaner than originally planned.

A2. The Central American E/NR Strategy for USAID Assistance

The objectives and focus of the Central American E/NR strategy remain valid because the nature of the crisis has not changed. Although that strategy has led to significant change in Central American E/NR institutions and popular environmental awareness, the crisis continues unabated because the behavior that led to this crisis has not changed. RENARM, in collaboration with the bilateral missions, has the potential to contribute to finding solutions to this behavioral problem, if it concentrates its efforts on finding solutions to major threats to biodiversity in significant ecosystems. The RENARM program remains attuned to the Central American assistance strategy, and individual activities are progressing well but are

generally too new and unfocused to have yielded significant answers to the behavioral problem.

A3. Progress in RENARM I

Future funding and continuance of ongoing programs depends on progress made and potential identified during the first four years of the RENARM program. Results to date are certainly promising, if not compelling.

RENARM was intended to accomplish three things:

- Get a handle on the complexities of E/NR policy.
- Involve U.S. PVOs as implementors of Central American E/NR programs.
- Continue but revise on-going CATIE programs to accommodate them to E/NR objectives.

These were considered to be innovative, high risk experiments from which lessons could be learned best by permitting the implementors an opportunity to implement without forcing them into a pre-conceived pattern. This ambiguity was deliberately incorporated in the design in order to involve additional actors or actors in new roles and encourage innovation. It has served this objective.

However, the resulting project paper did not provide a framework for management, nor a strategy for relating the diverse program elements, nor a way of defining their relative importance in meeting the ends of USAID's CA E/NR strategy. Neither does it facilitate description of program goals nor encourage inter-organizational collaboration in a hostile environment where the expectations of bilateral missions differ from those of the regional mission.

Management's principal tasks in the remaining 15 months to PACD will be: (1) to establish a unifying strategy for RENARM as a means of selecting activities for a concentrated second phase; (2) to reorient its structure to provide effective oversight to implement that strategy ; (2) to document the lessons being learned in RENARM I as a guide and justification for RENARM II; and (3) to develop an effective system for involving bilateral missions in solving the major problems still facing biodiversity conservation in Central America. The recommendations and lessons learned in this evaluation can guide management in completing these tasks. Not all of these tasks can be accomplished by RENARM management alone. Some, particularly (3) will require assistance from senior Mission or AID/W management.

A4. Recommendation

Proceed with RENARM II design in parallel with adjustment of RENARM I activities to comply with recommendations of this report.

B. Recommendations

B1. Section II. Analysis of RENARM's Design, Plans, and Objectives

Adopt a revised project structure based on more specific objectives derived from the priority areas of the strategy for Central America. Prepare a RENARM program strategy that directs all efforts toward some of these objectives, and gives implementors and managers clear guidance as to their respective roles in meeting these objectives.

Direct management efforts toward concentrating the RENARM program on identifying and finding solutions to major behavioral threats to biodiversity conservation.

B2. Section III. Performance

B2a. General Recommendations to Improve Performance

Assume that a second phase (RENARM II) will be authorized. The decision to extend the RENARM program will depend upon what happens in the remainder of RENARM I to document lessons learned and to concentrate the focus of the program by a strategy which should continue into RENARM II. Because of a year's delay in performing this evaluation, only 15 months remain before PACD. Therefore, planning for RENARM II must be conducted on a parallel track with reforming RENARM I.

Continue the RENARM program to PACD, but concentrate increasingly on particular objectives. At this point, we believe that a second phase will be warranted. However, the full potential of the RENARM experience will not be documented much before the current PACD, and evidence of impact will be needed to justify a second phase. Given the reduced funding anticipated, the second phase program will need to be much more concentrated. The remainder of Phase I should be devoted to achieving that more focused condition.

Focus program implementation with a strategy which brings essential actors together. Individual implementors must know how they fit into the program, and what, specifically, is expected of them.

Eliminate peripheral and mature activities at or before PACD by concentrating program activities on selected protected areas of high biodiversity significance, and their respective buffer zones. Several activities will have achieved their objectives by PACD and will not require repetition in Phase II. Similarly, a number of activities which are peripheral to the main focus on biodiversity conservation and sustainable agriculture and forestry closely related to protected areas should be eliminated.

B2b. Recommendations to Improve Performance of Individual Activities

B2b(1). Policy and Environmental Education

B2b(1)a. Policy

USAID/G-CAP should continue its close relationship with and support of CCAD in RENARM II.

A concerted effort should be made to finish the materials needed to facilitate the Green Book's use, including their publication in Spanish.

Get the Green Book materials out to potential clients as soon as possible. This experience will likely enrich the further development of materials and methods more than isolated conceptual work.

Develop alliances and lines of communication with existing and new E/NR policy-related bilateral projects now coming on stream in Central America. Encourage them to collaborate with RENARM efforts by adopting participatory approaches using the Green Book, and providing feedback and suggestions for improvement of the methodology.

The "policy process" (NGO EP&SP) and "policy product" (Green Book) efforts should be continued under RENARM II as a single subcomponent. Both process and product should be targeted on helping NGOs located in the RENARM-selected geographic sites to become effective facilitators of dialogue leading to environmental policy change and sustainable development.

Support the Mesoamerican Biodiversity Legal Project under RENARM II through purchase of services on an as-needed basis to support ongoing policy efforts in RENARM-targeted geographical areas.

B2b(1)b. Technical Specialization

The University of Idaho Masters Program in Environmental Education should not be repeated in a second phase. Although it has much promise, it will be some time before its potential benefits are evident.

The TNC fellowships should be continued as a part of PACA/TNC's program provided that they are concentrated on the RENARM-designated protected areas.

Fellowship support is not critical to the provision of CATIE services to RENARM, but is largely continuing budget support to a long-time client. Given its own budget limitations, USAID should continue to phase out budget support and focus on buying services needed by RENARM.

Given the limited funding expected to be available for Phase II, the Small Grants Research Program should be terminated or subjected to rigorously tightened criteria. Devoting twenty percent of the Paseo Pantera budget to this effort is not warranted by experience to date.

B2b(2). Protected Areas, Buffer Zones and Environmental Awareness

B2b(2)a. PACA

PVOs should not be required to work in consortia. PVOs should be selected for nuclear zone and buffer zone activities on the basis of their capacity to deal with the major threats affecting a particular reserve. A single PVO or NGO could be contracted to handle both types of zones, if capable, or several to deal with different types of threats.

USAID should standardize its PVO matching requirement at the customary 1:3 or 1:4 match

RENARM should seek ways to bring the local NGOs on board sooner, to use their experience in designing their own roles and their relationships with the PVOs, and to attempt to adjust to some extent to the agendas of the local NGOs.

RENARM II should concentrate its efforts on conserving the biodiversity of selected biosystems, and on mitigating the threats in their surroundings to those sites.

RENARM should review current programs and the capabilities of available PVOs and NGOs in light of major threats and opportunities, and plan desirable revisions before designing RENARM II.

Buffer zone management should be narrowly focused on the threats to the four parks.

B2a(2)b. Paseo Pantera

PASEO should analyze and consolidate the information it has gathered on ecotourism, and should produce a document of lessons learned in the field with recommendations for future action. If PASEO believes that ecotourism should be a part of RENARM II, it should produce a detailed proposal for future ecotourism activities.

PASEO should analyze and consolidate the information it has gathered on environmental education and awareness, and produce a document of lessons learned, with recommendations for future action. This document should specify which areas are targets for formal environmental education, which can benefit from public awareness campaigns like that at Río Plátano, and which require other types of treatment. As with ecotourism, if PASEO considers that environmental education/awareness should continue in RENARM II, it should produce a detailed proposal of possible future activities in this area.

PASEO should take the lead in Central America in arranging for discussions to define types of buffer zones and propose those activities appropriate for specific situations in the context of the corridor. PASEO and the consortium partners, WCS and CCC, have considerable contacts throughout the conservation community in Central America, many of which have acquired considerable experience in buffer zone problems. The discussion of buffer zones should include a wide selection of individuals and organizations with varied experience, in order to forge a consensus on zone classification and the actions indicated in specific situations. Since buffer zones involve people, experienced social scientists should be involved in these discussions.

PASEO needs to complete its corridor management plan before PACD if this concept is to influence the design of RENARM II. This effort should include analysis by anthropologists and sociologists working with ecologists to (1) define the biological significance of man-made and natural gaps; (2) understand the sociocultural situation on the ground in these gaps; and (3) design a series of options to integrate gap populations into the corridor concept.

B3. Pesticide Management

B3a. Integrated Pest Management

Increase the contacts between the IPM programs and other RENARM implementors, particularly to give those working in buffer zones an idea of what technologies are available and can be transferred quickly to farmers.

Encourage both CATIE and Zamorano to sell their services to direct beneficiaries as a means of recouping part of the cost of the programs. There are several services named above that could be priced at cost or above.

Integrate IPM activities in the specific sites selected for RENARM II. Efforts should concentrate on transfer of existing IPM technology as well as on-site applied research.

Continue modest support for core costs of research and technology transfer activities that are not "saleable." This will be particularly true for activities that relate to small farmers and crops which may be important in buffer zones though not economically profitable enough to allow cost recovery. Consideration should also be given to continuing support of education programs, as these form the human resource base for further research and extension efforts of IPM.

B3b. Pesticide Management Training

The pesticide management program should be allowed to end, as programmed at PACD for Phase I (September 1995). All activities will have become institutionalized by that time, in the sense that training and information services have been designed, proven and installed in a permanent regional institution which is now recognized as a preferred provider.

Investigate alternatives for maintaining the EPA/FDA PASA. The EPA/FDA PASA has been a critical component of the pesticide management program, particularly to service the CATIE pesticide database service, but also as a source of technical advice and laboratory training. This capability will continue to be needed in Central America, but not necessarily as a part of RENARM II. The following are some alternatives for exploration:

- **As a direct and continuing service of EPA/FDA to NAFTA, and by extension to other prospective NAFTA members.**
- **As a USAID-funded PASA under some program supporting a Central American Alliance for Sustainable Development.**
- **As a RENARM-funded PASA funded under the CCAD support activity, aimed at strengthening regional environmental policy and regulation.**

B4. Forestry

B4a. Natural Forest Management

This activity should be strengthened, as outlined below, and continued in RENARM II.

PNF should consider decentralizing its field personnel by assigning them to work directly in the three or four most promising pilot management areas, at least until national professionals can be trained and incorporated in the forest management activities.

The success of the project requires that the CATIE senior silvicultural advisor be retained. An experienced senior forester is needed to help field staff review working procedures and maintain the high technical standards that have been established to date.

The PNF team would be greatly strengthened by hiring and integrating into the management team an economist to emphasize the business side of forest management.

PNF should carefully consider environmental and global land use considerations when working in buffer or multiple use zone areas so as not to alienate conservation interests. At the same time, the public (and many conservation NGOs) need to understand that forest management is a viable and sustainable alternative to uncontrolled logging and land clearing.

PNF leadership should investigate the potential of sustainable management of secondary forests. Secondary forests cover a large area in the humid lowlands. This kind of forest will increase as marginal pastures and unsustainable agriculture are abandoned. These forests tend to be easily accessible to markets. Simple treatments could increase their value.

RENARM foresters should look to private sector promotion activities to provide market information on wood utilization. Information on wood utilization and market development for small dimension products, as well as for secondary species, is urgently needed. RENARM experience with this type of activity indicates that it tends to be expensive and uncertain, especially if addressed through public sector approaches.

Management plans must be integrated, with due attention given to the cultural dimensions and potential economic conflicts, particularly if the forest has other uses. Besides timber management, the plans must consider non-timber extractive products, wildlife management, ecotourism, and measures to protect against encroachment or illegal extraction, as well as environmental parameters responsive to a landscape management strategy that is not detrimental to conservation of protected areas.

In choosing working areas, PNF should take into account to a greater extent the policies, institutional and economic framework that can influence the success of a demonstration area. The PNF team needs to look at policy issues as well as legal and social constraints in each country where they work.

B4b. Tree Crop Dissemination

For extension, group recommended species by their uses and develop modules for distinct production options (e.g., plantations, agroforestry). This will facilitate dissemination of information by affiliated organizations and make it easier to adjust to the needs of different communities and individual farmers. It will also reduce the dependence of national extension agencies on direct assistance by CATIE experts for adaptation of recommendations.

Graphic materials used for technology transfer and training should project hillside conditions, reflecting the conditions under which it will be used.

Undertake an independent evaluation of the economics of plantation forestry in the Nicoya Peninsula. This evaluation should look at both arable land and hillsides, and compare plantations with both agriculture and livestock.

CATIE staff engaged in MADELEÑA III should evaluate alternatives for working within the proposed project strategy of focusing on the protected areas of greatest biodiversity, including the buffer zones, multiple use zones and connecting corridors.

CATIE should also consider alternative arrangements for maintaining its multi-use tree program in the event that RENARM funding is no longer available. Transfer of CATIE technology for the establishment of the multi-use trees by means of the network of collaborating institutions will have become institutionalized by the end of RENARM I. This provides an opportunity for high pay off with a lower maintenance budget, now that it is beyond the initial research and development phase.

B5. Watershed Management

The planning methodology developed in FORESTA, using the GIS system, should be developed for use in planning the management of utilization zones associated with protected areas.

The watershed management team should tap other expertise from CATIE's staff or elsewhere, as needed to respond to major threats identified for a particular area, including the encroaching agricultural frontier, unmanaged logging and cattle grazing.

The land use planning and conservation capabilities of the watershed management team should be integrated into management of buffer zones, multiple use areas and connecting corridors associated with protected biodiversity areas and continued in RENARM II.

B6. Section IV. Management Structure and Systems Analysis

Emphasize the strategic objective of conserving biodiversity of critical ecosystems and direct sustainable land use efforts toward ameliorating major threats to those sites.

Focus biodiversity conservation on critical pristine or near-pristine sites, and direct sustainable use efforts toward ameliorating major threats to those sites. Reducing geographic dispersion makes it possible for implementors to work together on solutions to an overarching problem. Some specific suggestions for achieving concentration are as follows:

- **Concentrate policy efforts on mitigating the specific threats to biodiversity conservation identified in the specifically defined protected areas.**
- **Concentrate watershed management, management of natural forests, and agricultural and agroforestry support on the multiple use zones and settled buffer zones of protected areas. Assure that any program carried out in these areas is based on sound appropriate agricultural and forestry technology, and is backstopped by good problem-solving technical advisors.**
- **Assign M&E responsibility for specific sites to individual PSC coordinators, who will be expected to spend at least five days per month at those sites.**
- **Assure that any research funded by RENARM is on problems with solutions that are of direct and pertinent value to biodiversity conservation and sustainable agriculture in the selected project sites.**
- **Phase out by PACD all other activities.**

When working with grantees, continue close oversight and frequent counselling. RENARM management's care in work plan approval and monitoring could be further strengthened by more frequent visitation of field sites.

With respect to buy-ins, lower expectations, but maintain buy-in authority. Missions continue to buy in to RENARM-sponsored training programs and might recognize the value of other RENARM-supported innovations as these are publicized. Buy-ins might provide a way to protect the protected area investments of closing bilateral missions.

Revitalize the M&E effort in consonance with the management decisions recommended above.

B7. Section V. Reporting, Documentation, and Lessons Learned

RENARM management should formalize the lessons learned in RENARM I by conducting problem-focused operational research and drafting case studies of each activity.

RENARM management should invite the managers of protected area projects to participate in a protected area management confederation whose purpose would be to work together to identify and solve problems of mutual interest.

LESSONS LEARNED

Chapter V provides anecdotal evidence of the lessons being learned by USAID and program implementors as a result of the RENARM program. The following are more fundamental lessons which may guide the designers of RENARM II.

Accommodative Project Design

An accommodative project design leads to confusion, second guessing, and selective interpretation. RENARM intended to accomplish three things: (1) get a handle on the complexities of E/NR policy; (2) involve U.S. PVOs as implementors of Central American E/NR programs; and (3) continue but revise on-going CATIE programs to accommodate them to E/NR objectives. When designed, these were considered to be innovative, high risk experiments, difficult to accommodate to USAID's normal control-oriented project design process, particularly when seeking consensus among both bilateral and regional interests.

The resulting project paper does not clearly identify the uncertainties. Neither does it provide a framework for management, nor a strategy for relating the diverse program elements, nor a way of defining their relative importance in meeting the ends of USAID's CA E/NR strategy. Neither does it facilitate description of program goals nor encourage inter-organizational collaboration in a hostile environment where the expectations of bilateral missions differ from those of the regional mission.

A Unifying Strategy

Complex programs like RENARM absolutely must have a unifying strategy which provides specific high-level objectives and defines the roles of individual implementors in

achieving those objectives. The RENARM experimental orientation expected implementors to make their own choices; they and management would learn from their experience and redirect the program as necessary. In fact, this led to a highly dispersed program, geographically and programmatically, with a resulting lack of synergism. Although individual activities may be performing well, RENARM management is now faced with the major task of pulling these pieces together against the inertial forces of established activities. Otherwise, they will make their own choices, which inertia usually directs along the path of least resistance.

Effective Interactions are Essential

Frequent, prolonged, and enforced interactions among management staff, among implementors and with the bilateral missions are essential to effective communication. This is not so much salesmanship as "getting to know you". Such interactions will NOT occur naturally; they must be programmed. And not just by periodic meetings, but through frequent contact on the job, working together to achieve something specific. Such effective team building is the only way to draw dispersed elements into a common effort.

PVO Management

PVOs and NGOs play a unique role in biodiversity conservation, because they are the only players who have the strong moral and ethical drive necessary to counter economic incentives and governmental inertia. This institutional objective is why they must be kept in E/NR programs. USAID support must recognize and play to this unique characteristic.

- **Attempts to consolidate unlike organizations in consortia will fail when the centrifugal forces of their incompatibilities are stronger than their similarities. USAID should learn that it can't directly manage the institutional culture of autonomous organizations. U.S. PVOs must learn to achieve effective partnerships with national NGOs for the same reason. There is nothing automatic or inevitable about a common goal or a common organizational principle that makes a partnership work; it requires effort, understanding, and good interpersonal relationships.**
- **The 1 to 1 match should be abandoned in favor of the more common 1 to 4 ratio. PVOs have only limited resources to invest in international work, so inequitable matches just distort the market for their services.**

Appropriate Technology

Appropriate and effective technology (agricultural, silvicultural, production management, marketing) is absolutely essential for sound development. Capacity for social organization does not obviate the need for good technology of the kind which is needed and utilizable by the subjects being organized.

Central American Involvement

Central Americans must have an active, participative role in planning and execution. A more active effort to identify and attract Central American expertise in the early design phase of RENARM would have brought more good talent to bear and might have shortened the learning experience. USAID should actively seek ways of financing local organizations through Central American institutions and not rely entirely on those with a U.S. base.

ANNEX A

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BIBLIOGRAPHY**

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ANNEX B

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**ANNEX B
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