

UNCLASSIFIED

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

ROCAP

PROJECT PAPER

REGIONAL ENVIRONMENTAL AND
NATURAL RESOURCES MANAGEMENT

AID/LAC/P-468

Project Number: 596-0150

UNCLASSIFIED

PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number

DOCUMENT CODE

3

2. COUNTRY/ENTITY

ROCAP

3. PROJECT NUMBER

596-0150

4. BUREAU/OFFICE

Latin American/Caribbean

05

5. PROJECT TITLE (maximum 40 characters)

Regional Environmental and Natural Resources Management

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
09 30 95

7. ESTIMATED DATE OF OBLIGATION

(Under Review, enter 1, 2, 3, or 4)

A. Final FY 89 B. Quarter 4

C. Final FY 95

8. COSTS (\$000 OR EQUIVALENT \$)

A. FUNDING SOURCE	B. FX	FIRST FY 89			LIFE OF PROJECT	
		C. Y/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(7,975)	()	7,975	40,000	()	(40,000)
(Loan)	()	()	()	()	()	()
Other						
U.S.						
Host Country						
Other Donor(s)	2,000	()	2,000	19,300	()	19,300
TOTALS	9,975	()	9,975	59,300	()	59,300

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ARDN	233	090				20,000		20,000	
(2) PSEE	233	090				15,000		15,000	
(3)						2,500		2,500	
(4)						2,500		2,500	
TOTALS						40,000		40,000	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

066 067 069

11. SECONDARY PURPOSE CODE

283

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code PVOU PVOV ENV
B. Amount 9,000 1,000 20,000

13. PROJECT PURPOSE (maximum 180 characters)

The purpose of the project 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.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY
06 02 04 04

15. SOURCE ORIGIN OF GOODS AND SERVICES

Foreign Local Other (Specify) CACM

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of 1 pages)

I certify that the methods of payment and audit plan are in compliance with the Payment Verification Policy.

Joe Hill, Jr., CONT

17. APPROVED BY

Signature: *Madeline Hogan*
Title: Regional Director/ROCAP
Date signed: MM DD YY
08 08 89

18. DATE DOCUMENT RECEIVED BY AID/W. OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

PROJECT AUTHORIZATION

Name of Country: Belize, Costa Rica, El Salvador, Guatemala, Honduras and the Regional Office for Central America and Panama (ROCAP)

Name of Project: Regional Environmental and Natural Resources Management Project

Number of Project: 596-0150

1. Pursuant to Sections 103, 104, 105 and 106 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Regional Environmental and Natural Resources Management Project for Belize, Costa Rica, El Salvador, Guatemala and Honduras (the "Cooperating Countries"), involving planned obligations not to exceed Forty Six Million Three Hundred Thousand United States Dollars (US\$46,300,000) in development assistance grant funds over a six-year period from date of authorization subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local costs for the project. The planned life of the project is six years from the date of initial obligation.

2. The project will 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. In order to accomplish this purpose, the project's resources are to be channeled through three components to a number of private and public institutions. Component 1, Natural Resources Policy Initiatives, will provide technical assistance and associated support commodities to public and private leaders (a) to identify the constraints to effective natural resource management and protection and (b) to develop the policy and legislative framework needed to address these constraints. Component 2, Environmental Awareness, Education, and Bio-diversity, will provide training and support for educational and research activities to promote environmental awareness and conservation and to protect key wildlands as biological reserves. Component 3, Sustainable Agriculture and Forestry will provide technical assistance, support commodities and training to research and other institutions to support watershed management, forestry and plant protection.

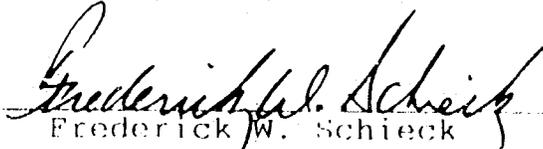
3. The Project Agreements, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following terms and conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a. Source and Origin of Commodities, Nationality of Services.

Commodities financed by A.I.D. under the project shall have their source and origin in the Cooperating Countries or in the United States, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have the Cooperating Countries or the United States as their place of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

b. Waiver Regarding Nationality of Technical Assistance.

I hereby approve a waiver of normal A.I.D. requirements with respect to the nationality of services to permit the suppliers of technical services under this Project to have any country included in A.I.D. Geographic Code 941 as their place of nationality (in addition to the Cooperating Countries and the United States).


Frederick W. Schieck
Acting Assistant Administrator, Latin
America and Caribbean

September 11, 1989
Date

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PROJECT PAPER (PP)
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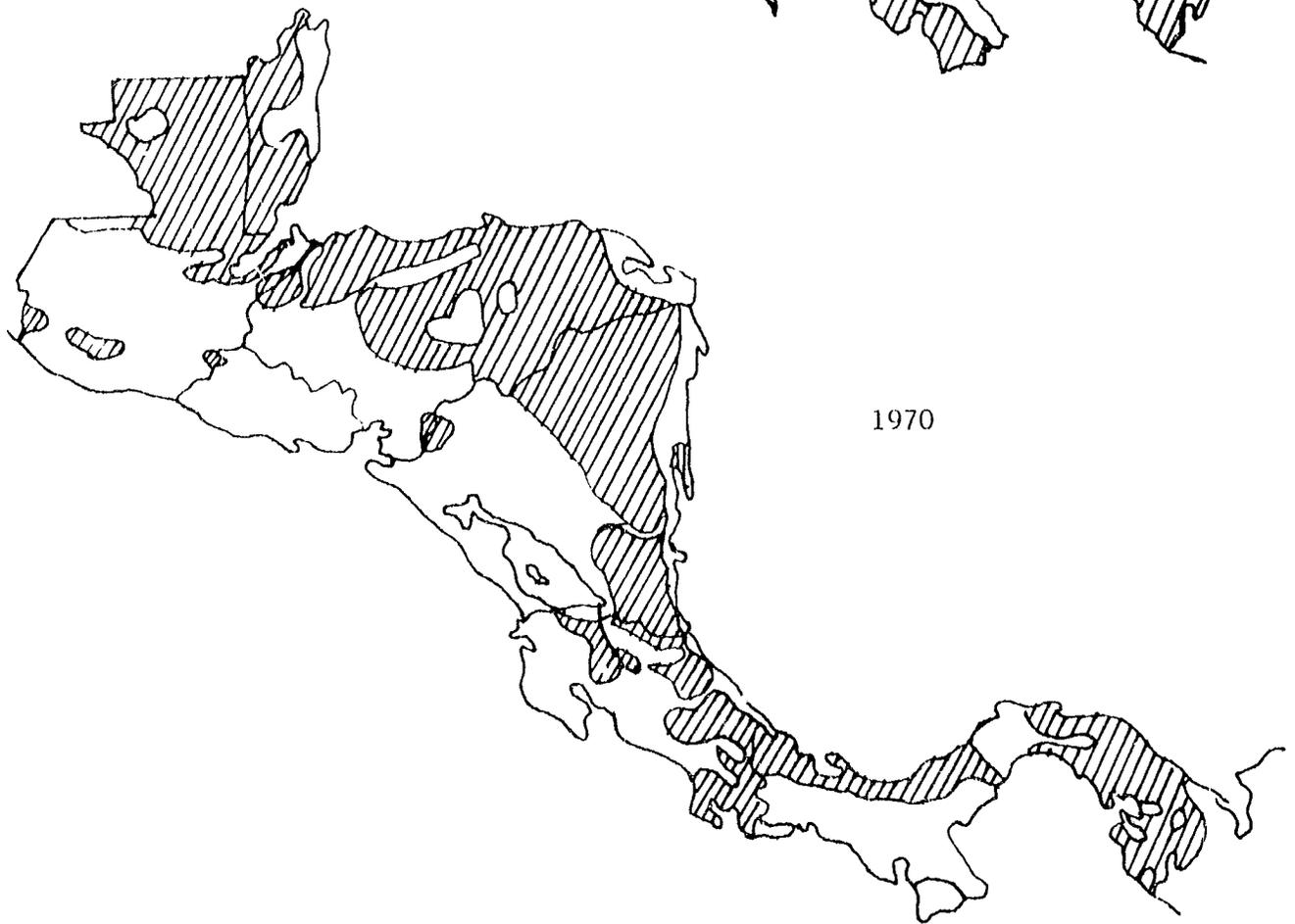
- * ROCAP Bulk Files

ACRONYMS

AID	US Agency for International Development
APAP	Agricultural Policy Analysis Project (S&T/AG)
CATIE	Tropical Agriculture Center for Research and Education
CBD	Commerce Business Daily
DAEC	Development Assistance Executive Committee
DEMS	Environmental Management Support Project (USAID/LAC)
DRADO	Deputy Regional Agricultural Development Officer (ROCAP)
EAP	Panamerican Agricultural School
EARTH	Regional Agricultural School for the Humid Tropics
ENRM	Environment and Natural Resources Management
EPA	US Environmental Protection Agency
ESNACIFOR	National School for Forestry Sciences (Honduras)
FAO	Food and Agriculture Organization
FY	Fiscal Year
GIS	Geographic Information System
HADS	Highland Agricultural Development Project (USAID/Guatemala)
IBRD	International Bank for Reconstruction and Development (The World Bank)
IDB	InterAmerican Development Bank
IEE	Initial Environmental Evaluation
IFI	Intermediate Financial Institutions
IICA	InterAmerican Institute for Agricultural Cooperation
INCAE	Central American Institute for Business Administration
IPM	Integrated Pest Management
LAC	Bureau for Latin American and the Caribbean, USAID
LDH	Local Direct Hire
LUPE	Land Use Productivity Enhancement Project (USAID/Honduras)
M&E	Monitoring and Evaluation
NASA	US National Aeronautics and Space Agency
NOAA	US National Oceanographic and Atmospheric Agency
OYB	Operating Year Budget
ORISA	International Regional Organization for Animal Health
PASA	Participating Agency Service Agreement
PCV	Peace Corps Volunteer
PIO/T	Project Implementation Order, Technical
PPM	Plant Protection Manager
PROEXAG	Non Traditional Ag. Export Support Project (ROCAP)
PSC	Personal Services Contractor
PVO	Private Voluntary Organization
RADO	Regional Agricultural Development Office (ROCAP)
PY	Project Year
REDCA	Regional Cooperative Network for Education in Agriculture and Renewable Natural Resources
RENARM	Regional Environmental and Natural Resources Management Project (ROCAP)

RFA	Request for Application for Cooperative Agreement
ROCAP	Regional Office for Central America Programs
RSSA	Reserve Service Support Agreement
S&T/AG	Science and Technology Bureau, Office of Agriculture
S&T/FENR	Science and Technology Bureau, Office of Forestry, Energy, and Natural Resources
SNRA	Senior Natural Resources Advisor (ROCAP)
TCN	Third Country National
TOR	Terms of Reference
UNA	National Autonomous University (Costa Rica)
USAID	US Agency for International Development
USDA/OICD	US Department of Agriculture, Office of International Cooperation and Development
USDH	US Direct Hire
USG	US Government

(4483j)



DEFORESTATION IN CENTRAL AMERICA:
1950 - 1985*

*Does not include coastal mangrove forests and open pine savannah.



1985

I. Summary and Recommendations

A. Summary

The Regional Environmental and Natural Resources Management Project is a direct response to urgent and widespread needs in Central America. It provides the unifying element of the implementation of the AID Central American Environmental and Natural Resources Strategy a ten year effort. The program is expected 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.

The proposed Project covers the initial six years of the ten year E/NR Strategy. The PID approval cable authorized ROCAP to develop a ten year program with initial funding of \$56 million over a six year period. The collaborative design process with the five bilateral Missions identified requirements totalling \$56.3 million, \$40 million of which is currently requested for authorization with bilateral buy-ins providing an estimated level of \$6.3 million. ROCAP wishes to reserve \$10 million for subsequent authorization for additional elements of the total program currently under design. In addition, of the \$56.3 million in appropriated funds over the life-of-the-project, \$13.0 million 1/ is expected as matching funds from NGOs and other donors bringing projected Project funding to \$69.3 million. These proposed elements are described below.

The goal of the Project 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. The more 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.

In order to accomplish the purpose, the Project's resources are to be channeled through four components including a number of private and public institutions. Component 1, Natural Resources Policy Initiatives, is directed at public and private leaders. Component 2, Environmental Awareness, Education, and Bio-Diversity conservation, is aimed at people from all walks of life. It is to create the conditions for new policies and regulations to balance growth and conservation, and to protect

1/ This assumes a 1:1 match. If AID/W decides to modify that requirement, the NGO contribution will be less. Due to this uncertainty, the \$13.0 million is not shown in the summary budget tables.

key wildlands as biological reserves while the educational process occurs. Non-governmental organizations, both Central American and foreign, will play major roles in these components. Component 3, Sustainable Agriculture and Forestry will build on work under way with A.I.D. support in watershed management, forestry, and plant protection. The adaptation of technology will be supported at CATIE and the Panamerican Agricultural School, while outreach of existing and new methods will be accomplished through a mix of private and public entities. The additional two activities proposed under this Component, Private Sector Actions in Plant Protection and Seeds for Farm Forestry are under design and are not included in the Project Authorization. Component 4, still in the design stage, and not included in the Authorization is expected to address the institutional sustainability of CATIE.

The Project will be implemented through agreements with U.S. NGOs, CATIE, the Pan American Agricultural School at Zamorano, and individual specialists. U.S. government agencies, including the Department of Agriculture, the National Park Service of the Department of Interior and the Peace Corps will be involved through interagency agreements (PASAs). Monitoring and evaluation will receive special attention continuously throughout the life of Project and will form part of a major evaluation in the fifth year of the project.

Project management, headquartered in Guatemala, will also include two specialists in Costa Rica and a USDH stationed at CATIE. The ROCAP team will work in close collaboration with the bilateral USAIDs in the design and technical support for their parallel or complementary projects. Annual reviews will be conducted of the bilateral and regional programs implementating the LAC E/NR Strategy which will be chaired by the AA/LAC and attended by the Mission Directors.

The Project does not pretend to solve all of the environmental and natural resource problems of the Region on its own, but to mobilize and provide direction to a host of talents and resources from within Central America and abroad. By linking with bilateral programs and supporting policy studies, research, general and specialized education, outreach demonstrations and models, and new forms of information exchange, the Project will open the way for new kinds of action, rechannelled investments, and reversal and arrest of environmental destruction.

B. Project Inputs

The Project's financial plan is summarized as follows:

**BUDGET SUMMARY AND FINANCIAL PLAN BY ACTIVITY
(\$000)**

<u>ACTIVITY</u>	<u>ROCAP</u>	<u>OTHER A.I.D.</u>	<u>TOTAL</u>
1. POLICY INITIATIVES AND TECHNICAL SUPPORT	<u>9,140</u>	400	<u>9,540</u>
ADVISORS	5,640	0	5,640
POLICY ANALYSIS	3,500	400	3,900
2. ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION	<u>9,000</u>	<u>4,000</u>	<u>13,000</u>
NGOs ACTIVITIES	9,000	4,000	13,000
3. SUSTAINABLE AGRICULTURE AND FORESTRY	<u>17,750</u>	<u>1,400</u>	<u>19,150</u>
PLANT PROTECTION	9,700	1,000	10,700
WATERSHED MANAGEMENT	4,390	400	4,790
PRODUCTION FROM NATURAL FORESTS	3,660	0	3,660
MONITORING, EVALUATIONS AND AUDITS*	806	0	806
INFLATION	1,652	261	1,913
CONTINGENCIES	1,652	261	1,913

<u>TOTAL</u>	<u>40,000</u>	<u>6,322</u>	<u>46,322</u>

* Mid-term evaluations incorporated in the budgets of Plant Protection, Watershed Management, and Production from Natural Forests

C. Recommendation

The Project Committee recommends authorization of this Project based on analyses of its institutional, technical, social, financial and economic feasibility.

II. PROJECT BACKGROUND

A. Introduction

Generation of economic wealth in Central America is heavily dependent upon the exploitation of natural resources. While the exploitation of the region's limited gas, oil, coal, and minerals resources is significant, it is the region's renewable natural resources, its forests, farm lands and water that provide most of the employment and income generated in the region and feed its rapidly expanding population. The unbridled depletion of these resources for immediate gain or, in the case of the landless poor, for survival, has reached the point where continued growth is threatened. Continued depletion of the region's natural resource base at current rates will soon--in some cases by the 1990s--reverse the development process. Thus Central America, despite U.S. aid in the 1980s, may well enter the 21st Century in a state of economic decline, with all the attendant problems that this implies for its nascent democracies and in turn for U.S. goals for stability and security in the region.

The belief and practice of treating the natural resource base as infinite and inexhaustible must be replaced by one which recognizes it as finite and depletable. This is a political as well as economic imperative both for the nations of the region and for the United States. To raise standards of living within the region and limit migration to the U.S., the leadership of the region must evolve a new development strategy premised upon long-term resource use. Critical resources--such as biodiversity and watersheds--must be preserved. Erodable resources--such as soils--must be conserved. And renewable resources--such as forests--must be replaced. Only in this way will future generations inherit a natural resource base adequate to their needs.

There is a growing recognition among the leadership of the region that they face a common problem with grave consequences. Forty per cent of the forest cover in Central America has been cut since 1950; and, in some areas ninety per cent of that wood is either burned or left to rot. Such mismanagement has already destroyed watersheds, increased river sediment loads, shortened the life of reservoirs for hydroelectricity and potable water, and upset the ecological balance of coastal areas. The financial toll of these events for the national economy is significant, as large capital investments financed by international loans do not produce the expected benefits. The

human and political consequences are also becoming manifest. Pesticide related illness and deaths receive heavy press coverage. The accelerating flows of rural families to urban areas spurred, in part, by their inability to earn a living from a deteriorated and overburdened land base is rapidly outstripping the costly and limited physical and social infrastructure of the cities and holds real potential for political unrest.

Constraints to Sustainable Long-Term Resource Use

There are several significant constraints to real progress in achieving the twin goals of conservation and sustainable production. Public policy constitutes a primary obstacle. Laws and regulations exist. But some are inappropriate for today's situation; others are appropriate but are not enforced; and, overall, different policies conflict, overlap, or act at cross purposes.

Institutional weakness is a second constraint that contributes to ineffective management of renewable natural resources. Public agencies have overlapping charters, insufficient staff, and inadequate training, and, in recent years, severe financial limits following current economic crises. Private institutions are either weak or their actions are limited by public policy.

Non-profit environmental groups have limited membership and a weak financial base. Private firms -- farms, agricultural service industries, banks -- are encouraged to look for short-term gain with little consideration of the long-term environmental consequences.

Attitudes and beliefs of citizens of Central America present another constraint. Growing urban populations are unaware of the impact on the environment of their needs for fuel, electricity, lumber and water. Rural populations, who, though physically closer to nature, share many of the same attitudes. Moreover, some producers respond more or less predictably to macro-economic incentives and penalties. Many others affected by these same policies now are faced with other constraints that limit "rational" behavior. Social and cultural differences within the region pose significant problems for environmental and natural resources management.

The availability and adoption of appropriate technologies for a sustainable exploitation of natural resources is a fourth

critical constraint. Where technology is lacking research is needed to determine appropriate treatment under specific conditions. In other cases, appropriate techniques are already known -- terraces, contour and infiltration ditches, mulching, rock walls, tree planting, gully plugs and grasses all reduce runoff and protect watersheds -- but have yet to be extended and applied on a wide scale basis.

Adoption by urban consumers of improved conservation techniques, limited in part by policies that encourage waste, is needed. In brief, where appropriate technologies are wanting, a scientific base must be established to devise needed solutions. Where appropriate technologies already exist, education and information programs are needed for target audiences. Finally, most needed are systems for validation, transfer, and adoption of technologies with the active participation of users.

B. The Need for a Concerted Action Program

Remedial action is required on many fronts. First, legislative and regulative policies must be assessed for their consequences. Second, private and public leaders must acquire a greater environmental awareness, and they must act on that awareness within their spheres of influence. Third, creative environmental education programs must stimulate the political consensus necessary to support policy changes. Fourth, producers of different economic circumstances must have access to technology of demonstrated utility that is appropriate to their circumstances. Fifth, effective forest and parks management strategies must be developed that preserve the esthetic and economic potential of biological diversity and incorporate people directly in the execution of the Strategy.

C. Bilateral and Regional Programs

The major environmental and natural resource issues of the region have been well identified, but solutions are less clear. While a number of national and international agencies are attempting to redress specific problems, only A.I.D. has begun a comprehensive approach to save the region's natural resource base.

The A.I.D. Strategy

USG actions are set forth in The LAC Environmental and Natural Resource Management Strategy for Assistance in Central America. That strategy is the culmination of several years of analysis at

both the regional and bilateral levels and captures the combined experience of the bilateral USAIDs and ROCAP in implementing a wide range of E/NR projects. ROCAP's primary responsibility under the strategy is to support bilateral programs with a combination of regional programs and expert advisory support. Where problems do not respect international boundaries, or where pilot or generic interventions are needed, ROCAP will develop regional programs, in collaboration with country Missions. ROCAP will also work with AID/W to stimulate other donors to support programs at the regional level. Primary responsibility for policy dialogue rest with the bilateral missions. Similarly the USAIDs will bear primary responsibility for tailoring the overall LAC E/NR effort in the region to local realities.

A.I.D. Policy Guidelines

This Project closely follows A.I.D.'s policies for natural resources and environmental conservation as described in Policy Determination Number 6 (PD-6) of April 26, 1983. PD-6 sets out specific problems for priority consideration: range degradation, declining soil productivity, soil erosion, loss of biological diversity, and development pressures on coastal zones. A.I.D.'s policy response to these problems is "through appropriate natural resources management (programs)... such as those addressing watershed protection, soil stabilization, social forestry, establishment or enhancement of natural areas or reserves, coastal zone management, and identification of plant and animal species in remote areas..." The Project also conforms with the guidelines of PD-7 (Forestry Policy and Programs, May 16, 1983), the A.I.D. Policy Paper on Energy (July, 1984), and with directives to promote biological diversity and conserve wildlands and humid tropical forests.

Nine recommendations of the Kissinger Commission (NBCCA Report) and the Jackson Plan will be followed in project implementation (NBCCA recommendation numbers 21, 22.1, 22.2, 22.4, 22.6, 22.7, 22.8, 22.9 and 24). For example, the Project will "clarify the legal status and use of public lands to check deforestation and degradation of the environment," and "study the holding of idle but productive land, and programs to capture capital gains from public works for the public." In concert with USAID Missions, the Project will also implement recommendations which will encourage individual initiative, private investment and credit programs in rural areas, and provide a basis for sustained economic growth.

THE BILATERAL PROGRAMS:

The five USAIDs in Central America were requested by LAC management to articulate their present and projected E/NR strategies, to be annexed to this PP, thus showing how the Bureau E/NR Strategy for the region would be carried out in a collaborative fashion. The highlights of each country program are provided below, organized according to the priority action areas of the Strategy. The country papers are contained in Annex III. H.

Sustainable Agriculture

In Belize, one project amendment and a new natural resources/sustainable agriculture project will assist the GOB and NGOs into the 1990s in agroforestry and pesticides/pest management, with special efforts to control or modify slash and burn agriculture, especially as practiced by immigrants and refugees from other CA countries.

Costa Rica's agriculture portfolio is nearly all directed at sustainable practices, with five projects that now or in the future will foster agroforestry (including export-oriented tree crops), management of buffer zones, and resources conservation as an integral part of their activities.

The El Salvador program includes sustainable practices in the agrarian reform project, and is initiating a fragile farmlands management pilot incorporating soil conservation, pest/pesticide management and agroforestry. A major effort in pest management and tree cropping is also part of the coffee production improvement project.

Guatemala presently combines watershed management with sustainable agriculture, building on 15 years of work with highland farmers in crop diversification. The amended project will place increased emphasis on soil conservation, water conservation, and pest/pesticide management. Irrigated areas will be expanded, reforestation in key watersheds (using local currencies) will continue, and a new grant that could lead to a discrete watershed management program is being launched.

In Honduras, a new major project will build on several years of work in soil and water conservation, agroforestry, and crop diversification for small hillside farmers. A new IPM project is planned.

Production from Natural Forests

In Belize, the extensive forests, especially hardwoods, are a potential source of national wealth if policies can be changed and management improved. Two projects will support the formulation of a forest development plan, and its execution.

Costa Rica has two projects aimed at sustained yields and management of second growth forest, managed harvesting, and processing of hardwoods.

El Salvador's remaining forest area is too small to be managed, and is treated under USAID's wildlands/biodiversity plans.

Guatemala has drafted a new forestry law (with USAID and ROCAP assistance) to be complemented by a Tropical Forestry Action Plan which will be carried out through a new natural resources management project and ongoing highland agriculture development. Fuelwood and pine production will have emphasis, along with work on broadleaf forest areas, seed banks, and improved wood utilization by the private sector.

In Honduras pine forests will be managed for sustained yield under a new project, and two broadleaf forests will be set aside for wildlife. Community and agroforestry activities are major parts of the land use project.

Wildlands Management and Protection of Biodiversity

Belize possesses possibly the richest stock of terrestrial and aquatic wildlife in the region, and is considering a biosphere approach to protect the Maya Mountains area. A planned tourism management project will work with government and NGOs to establish environmentally responsible uses of both the forests and the great expanse of reef.

In Costa Rica three projects will support land use management and conservation in protected areas, along with income generation for and active participation of residents of buffer zones. An endowed foundation will be established to oversee biodiversity efforts, and forest management practices will be established in buffer areas.

El Salvador is developing a natural resource management strategy with the GOES to cover wildlife protection, fishing regulation, management of protected areas and buffer zones. Coastal (especially mangrove) resources are to be managed, and water quality monitored.

Guatemala's planned resources project will help carry out the new Protected Areas Law, working with government, NGOs and universities on inventories, data banks and baselines, and training of park managers and guards.

Honduras plans to expand the policy dialogue on biodiversity, wildlife management and coastal lands conservation. Wildlife inventories will be carried out, and areas for protection identified. Coastal lands and waters are of special concern for sustained fisheries, tourism, and health. Local currency endowments will strengthen key private conservation institutions.

Management of Critical Watersheds

For Belize, watersheds are key to preserving the reefs, as well as for potable water and potential hydro power. Planned approaches will require cooperation with Guatemala and Honduras, whose runoff is affecting the Belizean coast.

Costa Rica's new watershed management project will focus on watersheds affecting key municipalities and hydroelectric projects. Three other projects have elements of reforestation, soil conservation and water quality monitoring.

El Salvador carries out tree planting with PL 480 resources and CATIE assistance, and as security permits, will launch upland watershed efforts in future.

The Guatemala watershed efforts are now subsumed in sustainable agriculture, but in future will become a distinct project as a planned pilot takes form.

Honduras' watershed problems affect the capital city and other areas severely, and continued work is planned under two agriculture projects and as a health matter through rural water and sanitation.

Policy Formulation, Institutional Strengthening, and Environmental Education

For Belize, the E/NR policy agenda (including agriculture/land use, forestry, fisheries and tourism) is one of two broad dialogue topics. Natural resource conservation planning, land use planning, training of the limited number of GOB officials, and coordination of GOB and NGO actions are of central concern.

Costa Rica places major emphasis on merging the mandates, policies and operations of three agencies into the National

System of Conservation Areas that will consolidate 35 protected areas into eight endowed regional conservation units. This will require combined efforts of the GOCR, NGOs, and universities. Environmental education is a key component of two projects, and is aimed at children, teachers, and families in project areas.

El Salvador approaches some E/NR policy through PL 480 self-help, and will build a agenda into the natural resources strategy being prepared. Institutional assistance is provided to the agriculture ministry and NGOs, and an environmental education program is contemplated.

Guatemalan policies are progressing with new laws passed or drafted for protected areas, forestry, and water use. An E/NR policy inventory is to be developed for dialogue on watershed management, reforestation, and private sector utilization of forest resources. Institutional development is focused on the GOG, NGOs, and corporate groups. Planned environmental education is directed at schools, at rural leaders through CAPS, and at universities, decision-makers, and mass audiences.

For Honduras, E/NR policy issues are linked to major natural resources and agriculture projects, as well as in the health sector. The country environmental profile will be updated as the basis for additional policy formulation. Training of technicians for government, educational, and technical institutions has a high priority. Environmental education is built into the primary education project, as well as CAPS and other projects. Environmental contamination is a special concern for USAID/H, especially in urban areas. RHUDO is helping to design solutions for the future.

The Regional Programs:

Research and training benefit from economies of scale at the regional level. Because the Central American countries face many of the same problems, training courses for practitioners do not have to be invented independently in every place. A regional institution can develop courses for delivery in each of the participating countries, with a modicum of adaption to local conditions. Similarly, research on watershed, forestry or agricultural problems is relevant to comparable agro-ecological zones, regardless of country. The RENARM Project will build on the current base of ROCAP-funded and other A.I.D.-funded projects to set the policies and institutional base for further interventions in the environmental and natural resource field. The bottom line is that the countries benefit from better technology, and donors, such as AID, get a much greater return on their investment.

The rationale for regional approaches to common problems in Central America is underscored when considering impact on the environmental and more effective means to manage natural resources for long-term economic benefit. The foundation for interventions proposed under this project lies, to some degree, in previous AID supported programs.

Watershed Management. Built the technical competence for problem identification, established institutional linkages, supported degree and short-courses training, and provided the means for data collection for country-level projects.

Tree Cropping. Supported identification of promising species for on-farm tree production, technical backstopping, and outreach strategies for national programs.

Integrated Pest Management. Developed IPM protocols for important crops through linkages with national research and extension agencies.

Regional Higher Education. Improved the M.Sc. degree program at CATIE and increased offerings of technical short courses. This activity also provides complementary funds for EARTH.

Non-Traditional Agricultural Exports. Targeted new crops for export and identified problems associated with pesticide residuals.

This collection of projects, and the technical experts associated with each activity, has provided a means to identify continuing issues and to elaborate the LAC E/NR Strategy and this Project.

Modalities for US AID, ROCAP and AID/W Collaboration and Coordination.

The overall LAC E/NR Strategy and the RENARM project were developed with the close collaboration of the managerial and technical staffs of ROCAP, the USAIDs and strong support from LAC/W and S&T. That same model of coordination will be continued throughout the implementation of the Strategy of which this Project is a part. Some of the specific steps to ensure coordination include:

--Annual reviews of the bilateral and regional programs implementing the E/NR Strategy will be held in the region, will be attended by the Mission Directors and chaired by the AA/LAC. The pre-DAEC review of the RENARM project would initiate this process.

--ROCAP will act as the Bureau's executive secretary for the overall E/NR effort in the region, preparing semi-annual and ad hoc reports for AID/W and for the annual submission to Congress.

--ROCAP will continue to work closely with LAC/DR/RD, the Administrator's Special Assistant for E/NR matters and central AID/W staff offices on support for the overall program.

--Joint ROCAP, USAIDs and AID/W will orchestrate USG representation to the IFIs and other donors for increased involvement and coordination in the E/NR sector in the region.

--Periodic technical level reviews and programming sessions will be chaired on a rotating basis by the ROCAP RADO and his bilateral counterparts.

--Because much of the RENARM project is "demand driven," i.e., the services being generated are for the bilateral USAIDs and hopefully, over time, other donors, and NGOs, the ROCAP team of technical advisors will spend a considerable portion of their time on the road working and consulting with their bilateral clients.

--the RENARM project is designed to include "cost sharing" and "buy-in" mechanisms particularly in those areas where the regional institutions are providing TA, long-term training and short courses; and,

--the project includes ample funding for evaluations, many of which will address crosscutting issues of relevance to several of the USAIDs. These evaluations will be designed jointly with the USAIDs and will have as their primary focus problem-solving for the Project administrators.

Clearly, the E/NR Strategy is an ambitious but vital undertaking. It will require innovation and risk taking from all the parties involved. Most assuredly there will be conflicts and disagreements. It is our hope that the spirit of collegiality which has characterized this process to date will continue to rule, minimizing friction when it occurs and maximizing the synergism needed to succeed.

Other Donor Programs: Central America received close to \$1.2 billion in assistance from both multi- and bilateral development

agencies in 1986. The Inter-American Development Bank (IDB) and the International Bank for Reconstruction and Development (IBRD or the World Bank) contributed almost half of these funds: \$336 million, \$161 million, respectively. USAID is the largest bilateral donor, with the Germans, Japanese, Italians, Dutch, and Scandanavians contributing smaller amounts.

The commitment of development assistance agencies in the region to environmental problems is surprisingly low, considering the intensity of the problems and the overall level of funding. Most donors have only a few (two to five) active projects with a strong emphasis on environmental and natural resources concerns. Fiscal obligations of donors other than USAID for environmental matters currently represent only \$50 million US, or between 4 and 5 percent of the total assistance. (See Annex III. F for further detail.)

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III. PROJECT DESCRIPTION

A. Goal and Purpose

The goal of the Regional Environmental and Natural Resources Management Project is, to produce, with the citizens of Central American countries, the conditions for sustained exploitation of natural resources in a manner that minimizes damage to the environment, protects bio-diversity, and provides the means for equitable and sustainable economic growth.

The purpose of the Project 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.

B. End of Project Status

This Project aims to create the conditions necessary for the sustained use of renewable natural resources in the Central American region, providing guidance and tools, backed by increasing investments of AID, other donors, and host governments. This aim is complex, and it requires action on several fronts simultaneously. Essentially, at the end of the Project there will be: changed public policy conducive to sustainable natural resource use; heightened public awareness of environmental concerns; effective management plans in national parks and nature reserves for the preservation of biological diversity; development and dissemination of sustainable production technologies in watershed management, forestry and plant protection that are appropriate to different classes of producers; and strengthened national and regional institutions for professional training, environmental research, and regional coordination.

This Project does not stand alone, but requires for its success corollary efforts in bilateral policy dialogue and projects, creative and intensive work by NGOs, a continuing commitment to mobilizing funds through such techniques as debt-for-nature swaps, and a number of other actions over which ROCAP, its contractors and grantees have only indirect influence. The challenge is to depict, in a project of this scope and complexity, how "conditions" will have changed at the end of five years when the Project, and the Strategy of which it is part, will be examined. This is even more true for a pioneering initiative that seeks to promote environmental awareness and to convert sustainable natural resource use strategies into regional development planning and implementation.

The Project combines in its many elements and activities a mix of analytical and advisory work and direct, practical hands-on interventions. In some areas, such as tree seed production, directly attributable results can be expected, while in others such as training NGO leaders, the Project's impact will be difficult to separate from the work of many organizations-- international, regional, national and local.

The vision of the future for Central America is obviously not for ROCAP to define on its own. However, with the right kinds of selective support and a long-term commitment, a relatively small investment could go a long way in shaping the region's future. By paying as much attention to process as to product, we can leave a lasting and continuing socio-political framework for constructive environmental change in the region. Through RENARM we can accelerate positive actions which support sustainable development and help apply the brakes to activities which are presently putting the future of the region's productivity in jeopardy. This will require a willingness to explore alternatives to traditional AID project management paradigms which evolve around short-term "outputs".

In RENARM, the process -- like the product -- must be sustainable. This requires the establishment of long-term, trust relationships between the principal players. Criteria for evaluating the process towards the establishment of sustainable benefit streams exist and will be applied in this Project, especially with respect to the different participating institutions and local NGOs. It must be recognized, however, that the process of facilitating lasting change and benefits, in the opposite direction of strong existing trends and currents, represents an immense challenge.

Policy

The Project will effect a number of important changes for sustainable development. First, the Project will foster public policy changes that facilitate a more appropriate use of land and water resources throughout the region. It is impossible to specify the extent to which policies will be affected because other important political forces will affect the outcome. But requisite policy studies with close national collaboration will be completed and will have been disseminated to key individuals and the widest audiences possible. By PY 5, policy choices will be more generally understood, and the consequences of continuing present policies will be clear to a broad cross-section of Central Americans and the development community.

Expected EOPs at the end of the Project include:

- New legislation and rules, with effective execution, to conserve natural resources and protected areas;
- Improved national capacity to implement and finance policies to improve resource management;
- Improved inter-agency and international cooperation in managing Central America's environment and natural resources;
- Greater national and regional awareness of natural resource and environmental policy issues; and
- Improved national and regional assessments of the impact of natural resource policies on development and investment programs and projects.

The long-term goal for the end of the full ten year strategy period is to have established effective government policies and improved mechanisms for enforcement in each participating country with as much regional harmonization as possible in the following key areas:

- reserves and systems for protecting biological diversity;
- incentives (or removal of existing disincentives) for improved forest management and reforestation;
- improved control and application of agricultural chemicals;
- incentives promoting appropriate land use according to rational classification systems; and
- improved management of critical watersheds.

Progress in these and other policy areas will be assessed in the mid-term evaluation.

Information and Education

By PY 5 most Central Americans will be exposed to environmental messages and will have seen or heard about problems and solutions in this area. Hundreds of newly trained technicians and decision-makers will be working with better, more current information, and will have more technical sources, both within government and outside, on watersheds, land use, wildlands and coastal areas.

The ten year goals: (1) educational systems in every participating country will have environmental topics integrated into standard curriculums; (2) to have reached at least 50% of the total population with the environmental message, as measured in standard, repeated polling which should indicate increased awareness of environmental issues; and (3) to have successfully

changed key behavior patterns of the general populations living in target areas for specific campaigns (watersheds, parks/buffer zones, farmers using chemicals, forest owners and users, and key environmental change actors in government, NGOs and the private sector).

Technology

The Project will extend, through a wide range of channels and methods, proven technologies in such areas as natural forest management, soil conservation and plant protection. The Project will also further strengthen efforts to develop, test and adapt new techniques for managing nature preserves, handling and applying pesticides, and growing trees rapidly and profitably. By PY 5 the Project will not have found answers to all the questions, but many more of these technologies will be in farmers' and extensionists' hands. A growing cadre of researchers, with a practical problem-solving orientation, will be working in regional and national organizations. CATIE will be attracting funds from diverse sources as a center of excellence, and be providing leadership in a number of scientific areas.

The long-term goals after ten years are:

- (1) rates of net deforestation in the countries will be reduced by at least half by 1999 (as compared to the rates for the 1985-88 period and measured through satellite imagery/remote sensing techniques);
- (2) at least eight priority areas for biodiversity will be effectively managed and protected including appropriate land use in buffer zones;
- (3) the rate of soil erosion in 12 priority watersheds will be reduced by at least half (comparing average annual sedimentation loads in rivers prior to implementing the Strategy);
- (4) Pesticides will be selected and used by producers under established controls and at environmental sound and economic levels; and
- (5) participating regional institutions and local NGOs will continue to provide key project services and implement related activities, using non-ROCAP sources of funding to cover up to 50% of their total budgets.

Investment

AID's contribution to Central American attention to natural resource management will be measured by the summation of projects and programs addressing the goal of the LAC Strategy. Underwritten initially by the ROCAP project, the Strategy will be addressed by separate bilateral projects addressing specific national goals, parallel projects which address common regional objectives, and combined ROCAP and bilateral projects, the products of buy-ins to ROCAP programs and buy-outs from ROCAP to bilateral initiatives.

Buy-ins are effected when bilateral missions join in ROCAP initiated programs in order to intensify project activities in a particular country. Examples include integrated pesticide management or watershed management, supported by ROCAP in CATIE but where additional resources are added in order to address country specific activities. Buy-outs are where project resources provided by ROCAP are used directly in conjunction with bilateral programs. It is expected, for example, that Project resources supporting NGO Programs in environmental education will become part of bilateral supported NGO actions in a particular country. Buy-ins and Buy-outs will be determined by Bilateral Missions, and in most cases confirmed in joint programming meetings. The combination of the two will produce a coordinated AID program addressing the strategic goals for Central America.

Funding from ROCAP and the A.I.D. bilateral programs cannot meet all financial needs to reverse existing environmental degradation and prevent future damage in Central America. Yet, without this Project, the likelihood of greatly increased funding is small, or at best, will occur over a much longer period. Regional conditions include policies that encourage responsible resource management; human resources to manage programs; information for additional interventions by other donors; and a political climate that encourages innovation and change. ROCAP's aspiration is that evaluators in PY 5 will encounter additional funds supporting new initiatives, whether they be from private investors, national governments, international agencies, or other countries.

Another change that will be important to evaluate is the extent to which conservation and resource management investment is occurring in smaller ways, on individual farms, in communities, in municipal watersheds, in businesses, in educational campaigns, and possibly other efforts that cannot be anticipated. While the causality may not always be direct, we

expect that traces of RENARM's work in public education, and in demonstrating workable, affordable solutions will be present.

Over the life of the LAC E/NR Strategy it is anticipated that several hundred million dollars in local currency equivalent can be raised for the projects and activities described in this Project Paper.

Total amounts will depend on several variables, e.g. whether and when Panama and Nicaragua can be integrated back into the program; whether multinational banks such as IDB and CABEI will be willing to donate, sharply discount certain loans, or permit local currency repayments to special funds for purposes of this program; whether commercial creditors and foundations will continue to participate in donations for debt-for-nature enterprises; and finally, whether Western European nations will maintain debt-for-nature donations for debt reduction.

The accumulation of these relatively large amounts of local currency through the swap procedure is seen as being critical to the success of many PVO and NGO undertakings. It is visualized that many such organizations can become sustainable and professional through the creation of trust funds--funded by debt-for-nature swaps. Such funds could be utilized to finance over the long term such institutions with interest payments, much as has been done through the debt equity superfund created in Costa Rica over the past year.

Given the successful examples set by countries such as Bolivia, Ecuador and Costa Rica over the past two years, the continuing burden of heavy foreign debt being experienced by most of the countries of Central America--and the much greater sophistication and competence of these governments in executing such creative financial procedures--give some assurance that as much as three to four hundred million dollars in local currency equivalents can be achieved for funding projects stimulated by the E/NR program.

These are the conditions that RENARM, in concert with many others, aspires to affect during the first five years. The components described below are the means to these outcomes, setting the stage for effective resource management and economic well-being in the region.

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C. Project Components

The RENARM project, like the AID projects and strategy on which it builds, will evolve as needs and opportunities arise. The present project design contains four components. Two of these components--natural resources policy initiatives, and environmental awareness and bio-diversity conservation--are fully designed. Sustainable agriculture and forestry, the third component, contains major, follow-on activities in watershed management, forestry management, and plant protection. Other activities within this component--seed for farm forestry, and private sector actions in plant protection--will be designed more fully in early FY 1990. Institutional development, the fourth component, will also be fully designed in FY 1990, once the management assessments that are now underway have been completed.

COMPONENT 1. Natural Resources Policy Initiatives and Technical Support

The rapidly worsening environmental situation in Central America impels immediate action since the difficulty and cost of remedies increase with the extent of degradation. Action is required on two fronts simultaneously: implementation of long-range country strategies for the sustainable use of natural resources; and, in the meantime, preservation of existing wildland areas. Implementation of the strategy must be based on the creation and acceptance of appropriate policies. This, in turn, is predicated on building a public consciousness of the need for careful management of the resource base, and translating that consciousness into active policies and regulations. To build the consensus is a long-range proposition that must begin now. At the same time, effective wildlands preservation is an immediate need, or else they will be irreparably damaged or disappear altogether.

This component describes a set of regional activities that address these needs.

a. Policy Initiatives

The Environment and Natural Resource Strategy for Central America stated that: "Attention to the political and legal framework which governs economic policies, regulation, enforcement, land use, economic incentives, and environmental protection is a required element to a successful strategy. Project interventions, program initiatives, and strategic long-

range planning cannot proceed effectively without supporting the compatible national policies and laws. Concerted policies, laws and actions are required to attain the broad, dual objectives of sustained economic growth and the preservation of a viable natural resource heritage for future generations."

Policy reform is an arduous process of analysis and dialogue with the aim of harmonizing diverse and different interests within a country. The process has several stages: inventory, analysis of consequences, options and tradeoffs; policy dialogue and reform; evaluation of policy effectiveness and enforcement mechanisms; and monitoring. To assist in this endeavor, ROCAP will provide a Policy Research Advisor that will coordinate component activities as well as advise ROCAP and the bilateral missions on critical policy issues affecting the environment and natural resources in the region.

Inventory. The initial step in policy reform is an inventory and assessment of existing legislation, regulations, and policies. A policy inventory defines and groups key national policies that effect natural resource use. It assesses the national agencies responsible for implementing each policy. It estimates the impact of each policy on selected variables of concern to decision makers. Lastly, it ranks each policy according to its relative impact on the environment.

Several areas critical to policy concerns have already been identified in national and regional reports: economic policies affecting environmental and natural resource management; colonization policies; export incentives for both traditional and non-traditional crops; regulatory and environmental policies for new industries; and policies regulating land and water use, forestry management, and pesticide recommendations. Other areas may prove important in time. Through a buy-in to the AID/W APAP project, each of these and any other relevant policy topics will be assessed in each of the countries and for the region as a whole.

Although this endeavor may appear wide-ranging, much information is already available. The bilateral missions can guide the inventory effort, and national experts can greatly facilitate the compilation and analysis. Thus, the inventories will each require only four to six weeks. Biological scientists will participate in the review as environmental and resource policy concerns involve natural as well as economic interdependencies. For similar reasons, social scientists will often be incorporated into policy teams. Regardless of disciplinary specialization, host-country nationals must participate since they are profoundly knowledgeable about legislation and regulations.

Policy Analysis. Policy analysis in this project encompasses three broad areas of inquiry. First and most importantly, it will examine alternative natural resource policy options. Second, it will adapt and improve a range of methods for analyzing policy options. And, third, it will characterize the political and institutional milieu in which policies are developed and implemented.

ROCAP will contract a U.S. educational institution to assist in policy analysis in the region. Natural resource policy analyses will be determined by their impact on the environment and by their importance to other project activities, namely, parks and reserves, watershed management, forestry, plant protection, and pesticide use. The analysis will consider the salient medium and long-term costs and benefits as well as the distributional issues of each option. The analysis will also assess tradeoffs among options. They will include evaluation of consequences for neighboring countries. Close cooperation will be maintained between the policy component analysis efforts and the NGO policy work which will focus on wildlife and wildlands.

Methodological techniques for assessing some of the costs and benefits associated with natural resource and environmental issues exist and are being refined and developed. The process of identifying, further refining, and elaborating analytic methods; for policy evaluation will be an integral part of the policy component of this project.

Political and institutional analyses provide important background information for policy dialogue. It is important to know how effectively existing legislation has been implemented, as well as the administrative context in which implementation occurs. One must be aware of the most significant constraints to, as well as of those factors that facilitate implementation and enforcement.

Policy dialogue and the policy reform process. Sound policy research findings are an important output, but studies alone will not stimulate policy change. The information must be available to host governments, interested professionals, other donors, and the general public.

ROCAP will provide a PSC Contract Policy Advisor and will have primary responsibility to maintain communication among NGOs, bilateral missions and regional institutions and developing and maintaining an effective regional dissemination network for resource policy analyses and experience. In Central America, the possibility for off-site or unanticipated consequences of policy changes is substantial. Coordination will avoid

inadvertent and unintended consequences. Moreover, sharing information on what has worked and what has failed, and why, can assist bilateral missions in more effective policy dialogue. ROCAP can thus provide important assistance to the USAID missions, which have the primary responsibility for developing national policy dialogues on legislative and enforcement agendas.

Monitoring Environmental Policy and Information

Dissemination. A framework for monitoring the impact of environmental and natural resource policies will be developed and refined during the first five years of the project. Tracking the process in policy change and the impact of policy changes in each country can provide important information about success and difficulties that can be useful elsewhere in the region. Moreover, such continuous monitoring provides one means for periodic evaluation of project activities.

Dissemination of research and other findings will occur through many channels, including seminars, workshops, articles, and media releases. The aim is to diffuse information as widely as possible in order to foster informed national and regional discussions on the revision of national laws and regulations.

The implementation of this activity will include a PSC Contract Advisor, a Cooperative Agreement with a U.S. educational institution for policy analysis and a buy-in to the AID/W APAP Project for policy inventories. INCAE (Instituto Centro Americano de Administracion de Empresas) in agreement with the organization contracted to perform the policy analysis activity is expected to play a leadership role at the national and regional levels in the dissemination of policy analysis results. This activity can also provide input into the Central American Presidential Commission on the Environment as it develops. The Policy Research Advisor will work closely with the other components of the Project to ensure that the results of this endeavor are incorporated into the Project's other activities and that these results are disseminated as widely as possible. Finally, to further both regional and national understanding of the process and uses of policy analysis, an annual two-week training course will be organized for appropriate individuals from each of the participating countries. This regional forum, organized by INCAE and focused on environmental and natural resource use issues, will be held in collaboration with the public awareness activity (Section III C 2.b). Actively involving professionals and government personnel in this way and diligently informing the general public will generate a climate of support of appropriate policy changes.

b. Technical Support

ROCAP will undertake a number of activities in diverse technical areas, including public education, policy harmonization, reserves conservation, sustainable agricultural technologies, and institutional development. Each of these areas requires pertinent technical support for advice as well as coordination. Thus, a core of regional advisors based in ROCAP will be expanded to guide project implementation and assist the bilateral USAID missions in their project development activities.

The advisors to be contracted directly by ROCAP will include: a senior natural resources advisor, a policy research advisor, an NGO advisor, a forestry advisor, a plant protection and pesticide advisor, and an environmental advisor. Each technical advisor will be supported by a Central American professional in the same field, who will also be hired by the Project. Each of these specialists will provide pertinent advice to the Project in his or her areas of expertise, and each will assist the USAID bilateral missions in the conduct of their programs upon request. Four of these advisors are already in the job. Although J. Vaughn, Senior Natural Resource Advisor is the newest on the team, he is well-known in the region. F. Zadroga, Regional Environmental Management Specialist, A. Chiri, Regional Pest Management Advisor, and H. Tschinkel, Regional Forestry Advisor have established working relationships through many years of assistance to Missions. Moreover, the advisor teams will coordinate efforts being undertaken in the different countries in their areas of expertise, provide liaison with other donors in the implementation of sustainable natural resources use, and provide general programmatic assistance in their topical areas. (See Section V A-1, Administrative Arrangements, for further details on the operation of the project management and the technical support unit.)

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COMPONENT 2. Environmental Awareness, Education and Bio-diversity Conservation

Few regions in the world harbor greater biological diversity than Central America. With less than one half of one percent of the earth's land surface, this region contains approximately ten percent of the plant and animal species known worldwide. The economic importance of these species--and of the wildlands and marine ecosystems that harbor them--is enormous. These resources provide many primary materials--food, fiber, construction materials, pharmaceuticals, germplasm for crop improvement, timber, ornamental plants. And, at least as importantly, these areas perform vital environmental functions. Cloud forests, for example, prevent erosion and floods, while ensuring sustainable, high quality supplies of potable water, hydro-electricity, and irrigation. To take another example, mangrove forests serve as nursery grounds for many commercially important shell and fish while at the same time providing harvests of fuelwood and wildlife for consumption.

The important roles of wildlands and marine ecosystems are still little understood and appreciated in Central America. As a consequence, the resources are fast disappearing. Two-thirds of Central America's forest have been destroyed, most in just the past three decades. Wildlife populations have been decimated, even exterminated in some areas. Coastal zones have been ravaged in many ways--by increased sedimentation caused by poor upstream watershed management, pesticide poisoning, mangrove destruction, overfishing, poorly planned tourist developments, and other factors.

Most of the countries in the region have taken positive steps in recent years to redress these problems. Protected areas have been created. Legislation to protect wildlife has been improved. Incentives that promote resource degradation have been reduced and removed. These important and necessary political decisions are allowing A.I.D. activities to support the transformation of paper parks into managed and sustainable entities.

Under this component, ROCAP will undertake five interconnected activities in the area of environmental awareness and conservation in support of national and regional objectives. Specifically, the project will strengthen coordinated strategic planning and policy for conservation. It will foster environmental awareness and education. It will undertake conservation training and strengthen environmental research institutions. It will institute wildlands management

programs through coordinated pilot projects. And, it will support conservation information centers and environmental monitoring capabilities. It is anticipated that four of these five activities will be contracted as separate cooperative agreements with NGOs or consortia of NGOs, coupled with a PASA arrangement with the Peace Corps and USDA. As a general rule, U.S. NGOs 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. For NGO activities, ROCAP will target a one-to-one match as counterpart.

a. Regional Strategic Planning and Policy Formulation.

Regional strategic planning and policy formulation is designed to improve the information base for policy dialogues and to facilitate national and regional strategic planning on the issues of wildlife, wildlands, and coastal zone management. The implementation of a long-range strategy for sustainable use of natural resources requires the creation and acceptance of appropriate policies by the people of Central America. Building a public consciousness on the need for careful management of the resource base and then translating that consciousness into active policies and regulations is a requirement for success. Without this foundation, technical interventions and ad hoc regulatory actions by governments cannot meet the long-term objectives. A concerted effort to establish partnerships with local NGOs and both private and public sector institutions will be a critical element in the implementation of this activity.

1) Decision-maker Workshops.

At least two decision-maker workshops of approximately one week in length will be held annually in the region. These workshops will bring together different groups that play key roles in the policy formulation process. These groups include: business leaders, high-ranking government officials, planners, economists, leading lawyers, political and social scientists, engineers, architects, medical professionals, trade union leaders, representatives of influential local conservation and development NGOs, and, lawmakers and their advisors. Participants will also be provided with information and publications, such as environmental monitoring studies, policy papers, and environmental profiles. The workshops will focus on major policy issues, and will create awareness among key groups that are in a position to influence the policy debate on needed institutional, legislative, and regulatory reforms for environmental improvement in the region.

2) Regional Monitoring of Deforestation and Environmental Degradation.

Available data on rates of deforestation and other resource degradation in Central America are incomplete and scattered, and

data analysis is often weak. These materials must be consolidated and augmented with new, regional analyses of remote sensing data in order to monitor trends in deforestation, coastal zone degradation, severe erosion, and land abandonment. These studies will be carried out in close collaboration with conservation information centers (Section e.4) and with other national and regional institutions, such as CATIE, the National University of Costa Rica, and the national geographic and cadastral institutes that have resource monitoring and mapping programs. These studies, which will be carried out twice--at the beginning of years 2 and 5--will document regional trends. The results will be reported in regional environmental profile updates and regional data atlases.

The information will be used in various ways. It will be relayed to decision makers so as to impact on policy making through the wide dissemination of publications. It will be used in the design of the pilot interpretive program and media campaigns. And, it will be discussed in the regional decision-maker workshops.

3) Regional Environmental Profile and Maps.

The book, "Natural Resources and Economic Development in Central America," which provides an environmental profile of the region, is having an impact on the policies of a number of national, regional, and international programs. This profile will be updated in year 5 in order to incorporate the environmental monitoring information, the recommendations of the policy studies and the regional strategies. The updated profile will be an important tool for defining future priorities for bilateral and regional programs, including the later years of RENARM.

Preparation of the updated profile will incorporate, through seminars and workshops, the recommendations of key individuals in government, research, and training organizations, and from the private sector. The profile will be published in both English and Spanish. Executive summaries, press releases, short videos, slide and tape programs, and journalist information packets will accompany the profile, when it is used at the decision-maker workshops.

In addition, quality maps and atlases with information on protected areas, forest cover, deforestation, and resource degradation rates, among other matters, will be compiled for resource managers, planners, and policy makers. The formats for

these publications will be similar to those used on a global level by most conservation NGOs. While the atlases and maps will be produced only once, the protected areas directory will be published in binder form and the information maintained in a data base so that updates can be issued on a yearly basis as the protected areas system of the region evolves.

4) Conservation Strategy Papers.

Strategy papers provide information and options directly to decision makers--and to NGOs and others--who can influence the policy process. While definition of specific research themes and projects must remain flexible, a particular focus will be on the role of the private sector in funding and implementing conservation programs.

To set the regional and national agendas and to increase cooperative efforts for resolution of common problems, three regional strategies will be prepared under the project, one for wildlife, one for wildlands, and one for coastal zone management. To address the strong interest in Honduras and El Salvador, early attention will be given to a regional examination of a Coastal Zone Strategy. The format proposed for preparation of these strategies is similar to that for the environmental awareness strategy. That is, initial national-level workshops will be held to develop draft national strategies for each subsector. A major regional strategy conference will then be held, including participation of key national and regional institutions and international conservation and development organizations. Participants from each country will then organize another short national workshop to prepare a final national strategy based on recommendations of the regional meeting. The regional and national strategies (or action plans) will then be prepared and disseminated, along with the proceedings of the workshops and regional conferences. It is anticipated that the responsibility for implementating these strategies will be national governments, local NGOs, bilateral missions and other donors.

Other potential topics include: privatization of protected areas management; mechanisms for debt-for-nature swaps; the role of autonomous, quasi-governmental agencies in managing conservation programs; mechanisms for increasing nature-based tourism in the region; harmonization of refugee, agrarian reform and settlement policies with those for wildlands conservation; and review of the potential for a regional treaty or convention on conservation issues, possibly within the framework of the recently established regional environmental commission set up by

the Central American presidents at their most recent summit. These papers will be commissioned to policy researchers in regional institutions or as joint projects between U.S. and Central American organizations.

Finally, weak government institutions and conservation NGOs, inadequate legal frameworks and financial resources, and insufficient regional collaboration on issues of joint concern are endemic problems affecting the success of wildlands and wildlife programs throughout the region. Technical assistance to national governments, local NGOs, and regional institutions can help redress this situation. Particular emphasis will be placed on: promoting debt swaps, local currency endowments, and other innovative sources of financing conservation programs; developing improved wildlife and wildlands legislation; strengthening the role of NGOs, local governments, and autonomous institutions in the management of conservation programs; developing new channels of cooperation on conservation issues among Central American governments; and, developing national conservation strategies.

b. Regional Environmental Awareness and Education Programs

Public consciousness on the need for careful management of the resource base must be built before that consciousness can be translated into active policies and regulations. The first need, then, is to expand and enhance public awareness of the importance of sound resource use and urban and rural conservation programs. Fulfilling this need will require several interrelated activities: 1) development of a regional environmental awareness strategy; 2) a regional mass media campaign; 3) short-term training in environmental education; 4) screening and development of stocks of environmental education materials; and 5) planning and implementation of pilot interpretation programs.

1) Development of a Regional Environmental Awareness Strategy.

A regional urban and rural environmental education strategy or action plan will be developed from the results of an environmental education baseline survey which will be performed under the project. This will be followed by a series of national workshops, a major regional strategy conference, and follow-up national meetings. The meetings will bring together representatives from education and natural resource ministries, major environment and development PVOs, public radio and television networks, and mass media, marketing, and public relations firms. These participants will define priority

methods, activities, and messages that must be relayed to the general public, as well as to targeted audiences, such as schools and universities, and decision-maker groups. They will also assess training needs, institutional strengthening requirements, and financial requirements. The proceedings of these meetings, and the national and regional action plans that result, will serve as guidelines for detailed planning of the other activities to be undertaken.

2) Regional Mass Media Campaigns

Without broad and enduring use of mass media, it is difficult to reach a wide Central American audience with environmental messages. Because of the similarity of environmental problems throughout the isthmus, regional mass media campaigns will be mounted. These campaigns will combine cost-effective media-spot preparation with design of messages about environmental problems specific to certain national or thematic target audiences. The techniques of social marketing devised in other regions for quite different purposes will likely prove useful in this endeavor. Therefore, the expertise of U.S. based conservation NGOs and firms specializing in public relations, media, and educational communications will be drawn upon for leveraging additional funds and donated services and for program planning. The support of local conservation NGOs and of radio and television stations will be enlisted in order to maximize the use of free public-interest advertising space in the media.

3) Short-term Training on Environmental Education, Interpretation, and Communications.

This activity will address a major problem in increasing public awareness of conservation issues: the lack of technical personnel at all levels in specialist fields related to environmental education. Workshops will be held for three groups of specialists, educators, conservation personnel, and communicators.

For educators, at least two formal workshops of approximately two weeks in length will be held each year on issues in environmental education. These workshops will focus on planning and implementation of formal programs in schools at all levels--primary and secondary schools, as well as universities. The workshops will be designed for regional education supervisors, program planners, and key personnel from collaborating conservation NGOs and government ministries.

For conservation personnel, the workshops will focus on planning and implementation of interpretive programs at museums, botanical gardens, and protected areas near major cities. These sites are important because they are visited by thousands of Central Americans each year, even though the visitors go mostly for recreation. These institutions are nonetheless strategic places for educating the visitors about environmental issues.

For communicators such as journalists and public- and private-sector media and audiovisual specialists, the workshops will aim to stimulate more coverage of environmental issues. Specifically, the workshops will assist in the preparation of more and improved extension materials, public service advertisements, and television and radio programs.

In addition to these formal short-term training events, the Project will also fund staff interchanges among pilot sites so that field personnel can share experiences first hand. The project will also publish a regional newsletter on environmental education and awareness as an outreach mechanism.

4) **Screening and Development of Stocks of Environmental Education Materials.**

While current environmental education materials--school texts, teacher guides, audiovisual programs, posters, radio and TV spots, documentaries--are inadequate for a massive formal or non-formal campaign, many excellent materials do exist. Due to the lack of a strong regional environmental education program, however, these materials do not receive adequate testing and distribution.

To help eliminate this problem, the project will screen existing Spanish-language materials to select the best materials for a regional audience. Stocks of such materials will be acquired where available, or permission will be sought to reprint them. (Wherever possible, donations of such materials or subsidized sales or printing will be sought.) In each participating country, at least two repositories of these materials will be established, one in the Ministry of Education and one with a leading conservation NGO. These agencies will be responsible for distribution of the printed materials and for the loan of the audiovisuals. Small equipment stocks will also be provided to facilitate wider use of the audiovisual materials. Additionally, stocks of these materials will be provided to key regional institutions such as CATIE, EAP, ESNACIFOR, EARTH, and the University of Costa Rica Regional Wildlife Program for their use in courses and outreach activities. The stocks will be updated and expanded constantly over the life of the project.

The U.S. based NGO responsible for implementation of this activity will screen and distribute the materials, and, wherever possible, will provide additional matching funds, as well as seek donations of equipment and materials from the private sector.

5) Pilot Interpretation Programs.

Interpretive talks, plaques, and audio-visual programs are used in parks, zoos, botanical gardens and other sites visited by the public to help the observer understand the flora and fauna, visualize and internalize the significance of changes that may be occurring, and return home more knowledgeable.

While a few small and poorly funded interpretive programs on environmental conservation themes exist in the region, inadequate design and construction of exhibits have been a major problem in imparting knowledge and awareness to the general public. This activity will therefore fund pilot interpretative programs at three sites managed by regional institutions, such as Lancetilla Botanical Garden in Honduras, which is managed by ESNACIFOR; the Uyuca Biological and Forest Reserve, also in Honduras and managed by EAP; and, the Reventazon River corridor in Costa Rica, managed by CATIE. In addition, the activity will fund the planning and implementation of pilot interpretation programs at the La Aurora National Zoo in Guatemala, the National Natural History Museum in El Salvador, and at one protected area in Belize. As part of the planning and exhibit design process for these areas, at least one professionally prepared large standardized exhibit that is suitable for use throughout the region will be prepared for each pilot site. This exhibit will be distributed to other zoos, parks, museums, and botanical gardens in the region. The U.S. based NGO or consortium responsible for the implementation of this activity will provide additional counterpart funding and procure donations of services for professional exhibit design.

Because environmental education is a new field in Central America, and because no regional institution has a strong expertise in this area, the provision of technical assistance to national and regional institutions will be an important activity of this program. Concretely, assistance will be offered in organizing national training workshops, developing environmental education curricular materials, planning interpretive programs at protected areas, developing audiovisual programs on environmental themes, and similar fields.

c. **Environmental Specialist Training and Research**

Existing programs in wildlands and wildlife conservation, environmental education, and field research in conservation biology must be strengthened at regional and national universities and other institutions.

1) **Information Clearinghouse for Faculty Exchanges, Scholarships and Technical Assistance.**

The research and training programs in wildlife, wildlands and environmental education have improved significantly in recent years at Central American universities. However, few universities have sufficient trained staff. Funding for short courses, field research, and research station management is limited. University curricula have serious deficiencies, and staff interchange seldom occurs.

An information clearinghouse for available technical and financial support will facilitate intra and extra-regional exchanges, such as sabbaticals. It will make available information about specialized grants for skill enhancement and training for Central American faculty. It will maintain a roster of technical assistance for curricular reform, not only in conservation degree programs, but also in engineering, law, economics, public administration, and planning.

The implementing institution(s) for this activity will publish a newsletter publicizing the opportunities for faculty exchanges, short-term training opportunities, new research projects and publications, and similar matters. The newsletter will be distributed to all cooperating institutions in Central America and the U.S. Selected meetings of university rectors and department heads will further this improved communication. Wherever possible, links will be forged with existing mechanisms for inter-university cooperation in Central America. Particular emphasis will be placed on strengthening cooperation among regional research and training centers, such as CATIE, the UNA Wildlife program, EAP, EARTH, ESNACIFOR, and INCAE. In addition, assistance will be provided to the last four institutions to expand their programs and courses in environmental conservation.

2) **M.S. Training.**

The critical lack of trained personnel in environmental education, interpretation, and communications has limited the

scope and effectiveness of environmental programs. To build a critical mass of trained personnel, fourteen Central Americans affiliated with conservation education programs in the region will obtain M.S. degrees in the United States. The degrees will be in one of three specializations: formal, school-based environmental education, environmental interpretation, and, environmental communications. The trainees will follow a customized, intensive program of no more than two years that is designed by the implementing U.S. institution(s). The students will be expected to take many of their courses together, and to participate in joint field trips. Each will also take specialized courses in his or her chosen field, and will be assigned a summer internship with a U.S. based environmental institution. Each student will carry out thesis research on an appropriate topic in his or her home country. Upon their return to Central America, the graduates will form a corps of skilled environmental educators in key institutions in the region.

3) Grants for Applied Research on Wildlife and Wildlands.

The small research grants program will facilitate applied research in the reserves areas. This program will fund both short-term research and some longer-term studies.

The short-term grant program is designed for M.S. and Ph.D. research by faculty members at Central American universities. Priority will be given to proposals for research at the pilot and demonstration sites associated with the project. Topics of particular interest include: sustainable management of wildlife species to benefit buffer zone inhabitants and improving the quality and range of conservation data.

Longer-term research initiatives will focus on major issues in regional conservation programs. These issues include: restoration ecology of degraded cloud forests and of coastal zone ecosystems; studies of the economic benefits from wildlife and wildlands conservation; and studies to monitor environmental attitudes and behavior that may have been affected by the environmental awareness programs.

d. Regional Wildlands Management.

The number and the total area of parks and reserves in Central America has increased dramatically in the past decade. Nonetheless, most protected areas lack adequate staff and funding, and the survival of many is threatened. Furthermore, many fundamental issues have yet to be resolved. There has been

little study of techniques to stabilize land use in buffer zones. There has been little attempt to promote management of wildlands by local governments, NGOs, indigenous groups, and universities. Pilot projects that demonstrate alternative techniques for managing different sizes and categories of protected areas in distinct ecosystems are notably lacking. Consequently, there have been few tests of approaches to funding parks, promoting sustainable development in buffer zones, or fostering greater use of parks by the public, by researchers, or by eco-tourists. All of these matters warrant careful study through controlled experimentation during Project implementation, so that wildlands management techniques can be refined.

1) Pilot Wildlands and Buffer Zone Management.

At least five pilot wildlands management and buffer zone projects will be carried out. The reserves selected will cover a variety of ecosystem types, such as coral reefs, mangroves, lowland rainforests, dry forests, and highland cloud forests. Both USAIDs Honduras and El Salvador have expressed a keen interest in coastal management which will receive priority attention under this activity. In addition, a range of alternative management approaches, institutional arrangements, and sizes of protected areas--from very large biosphere reserves and international parks to small national monuments and community and university managed reserves--will be included. Selection of pilot sites will be made on recommendations by interested NGOs, national conservation agencies, bilateral USAID missions, and ROCAP advisors. The potential replicability of lessons learned at each site will be a major consideration in the final selection of sites. A major factor will be the expressed interest of donors and others in providing additional funds and assistance for the pilot project.

For each pilot site, biannual operational plans will be prepared and updated each year by all agencies involved in management. The plans will define all training, protection, infrastructure, education, recreation, research, and administrative functions and activities, and will prioritize actions in the buffer zones. While most pilot projects will involve one protected area, several might involve clusters of adjacent or nearby parks and reserves. In most cases, specific programs for stabilizing buffer zone land use and more fully involving residents, as well as national NGOs, in reserve management will be implemented.

2) Short-term Training and Technical Newsletters

At least one workshop on different aspects of park and buffer zone management will be organized each year. The workshops will

cover practical themes, such as operational planning, site planning, buffer zone management, fund raising, protected area administration, and ranger training. Participants in the workshops will be drawn principally from the staffs of the pilot areas.

In addition to the workshops, in-service training will be provided for personnel from the pilot sites. This training will involve visits to other parks and reserves, including other pilot sites, so that the field personnel can see the programs and problems in other areas. Funding will also be available for participation of pilot site personnel in short courses on themes such as wildlands, wildlife, and buffer zone management. These courses will be organized by regional training institutions, such as CATIE, EAP, and UNA.

A quarterly technical newsletter will link the pilot project personnel and the staff of the over 400 Central American protected areas. The newsletters will provide technical notes, spotlights on pilot or endangered areas, information about technical assistance and training opportunities for protected area personnel, and brief information on new publications, threats to parks, changes in key personnel, institutions and legislation, and similar topics.

3) Prototype Conservation Corps Projects.

Insufficient staff often reduces the effectiveness of protected areas management programs. At the same time, the lack of employment and income-generating activities almost always underlies conflict between protected areas personnel and nearby human populations. To help resolve these two concerns, pilot conservation corps programs will be implemented in at least five of the pilot protected areas.

This activity will begin with a study of similar programs in the U.S., Central America, and elsewhere. Examples include: civil conservation corps, state conservation corps, food for work programs, social service programs required of students, and Peace Corps. This background study will be followed by a regional workshop drawing together specialists experienced in planning and managing such programs. Workshop participants will include representatives of key conservation NGOs and of government natural resource agencies, as well as coordinators of volunteer service (including Peace Corps) and rural employment programs. Immediate priorities will be determined as a result of the workshop. The terms and conditions of service--supervisory mechanisms, length of service, remuneration, other benefits, supplementary use of food for work--will be determined in view of experience elsewhere.

The focus of the program will be to provide employment and skills training in agriculture and forestry to young persons drawn primarily from park buffer zones. Local university students and Peace Corps volunteers will assist in training and supervising work crews. The crews will carry out a number of tasks in accord with the park management plan. They will work in fire control, maintain trails, carry out resource inventories, develop recreation sites, do extension work, help in environmental education campaigns, and so on. Special emphasis will be placed on institutionalizing the programs, that is, on identifying permanent funding sources and promoting broader adoption of the conservation corps ideas throughout the region.

4) Operational Support for Peace Corps Projects

The implementation of park management plans can be greatly facilitated by Peace Corps volunteers (PCVs) who are already engaged in conservation work. Conversely, the effectiveness of PCVs and their counterparts in implementing conservation projects can be enhanced through a small grants program which will be implemented through a PASA. PCVs will be required to prepare, together with their counterparts, proposals for small grants up to a maximum of \$5,000 US for individual projects and \$10,000 US for grants involving more than one PCV. Priority will be placed on activities that enhance financial sustainability of conservation projects, on activities that actively involve buffer zone communities, and on outreach activities. The grant process will be competitive, and Peace Corps Associate Directors for Natural Resources and Education will review applications on a quarterly basis, and make final determinations. Peace Corps coordinators in each country will be responsible for managing the program.

e. Improved Conservation Information Availability and Use

Improved conservation planning requires better access to more reliable and up-to-date information. On a regional basis, data are too scanty and incomparable to guide the definition of common policies and regional strategies. At the national level, decisions on environmental protection and natural resource programs are taken despite the paucity of reliable, up-to-date information on the status of the physical and biological resources of the country. At the operational level, natural-resource managers lack necessary information for effective conservation programming and for managing resources sustainably while fully using their productive potential. Moreover, baseline data are not available for monitoring trends in resource utilization and the impacts of policies and programs.

The LAC E/NR Strategy statement recognizes this need when it calls for "information centers on natural resource conservation...(in order to) collect, store, retrieve, and analyze natural resource information, on a regionally standardized basis." ROCAP on a regional basis and the USAID bilateral missions on a national basis, as well as other donors, have over the years financed some activities--natural resource surveys, data collection, and mapping projects. Nonetheless, information in the region on the environment, bio-diversity and natural resources is often limited in coverage, not standardized for ease of comparison, obsolete and of uneven quality. While regional coordination can help overcome these difficulties, it will also be important to provide pertinent information in a form that is immediately usable and to provide continuous technical assistance, as has been done, for example, with the biological information systems introduced into the Conservation Data Centers established in Panama, Costa Rica and, most recently, Guatemala with private donations and some A.I.D. assistance. The opportunity now exists to build upon and enhance this environmental and natural resource information system.

The program to improve the availability and use of natural resource information involves four inter-related activities. It will survey the regional information sources. This survey will facilitate the standardization of data entry and of analytic procedures, and subsequently enable the preparation and distribution of software programs and analytic manuals. Lastly, the information centers will also require some assistance with equipment.

1) Survey of Regional Information Sources

The first step in establishing conservation information centers is a regional survey of existing centers and their holdings. This survey will cover conservation information sources, data bases, mapping systems and archives, aerial photography and satellite imagery, and documentation centers that exist in the participating countries. To facilitate this undertaking, a workshop will be held in each country to determine which sources of information are used by planners and managers, to assess the needs for updated or additional data, and to define informational priorities for the future.

From this review of existing data, thematic maps on deforestation, land use and other environmental issues will be compiled and published on a provisional basis. Maps of national parks and protected reserves will also be compiled for each country and for the region. These maps will be prepared in such

a way that they can be updated readily. An index of data sources and their availability will be made for each country, and offered for sale either as a computer diskette or in a print format.

These actions will provide immediate publicity on the availability of environmental information in each country and the region. They will make available maps and information bases for regional and national planning. And, they will create a basis for planning the development of standardized information systems and data analysis that will guide resource allocation decisions long after this project has ended.

2) Workshops on Data Quality Control and Analysis

Once entered into a data base, available information often has a life of its own, regardless of its reliability and validity. In order to improve the quality of data and their analysis, regional workshops will be held for data managers and users. These workshops will deal with questions of quality control, analysis, and the exchange of data among centers. Four such regional workshops will be given to promote the interchange and use of environmental and natural resource information.

3) Preparation and Distribution of Software and Manuals

This component will provide the materials used for training the centers' staff, and for the preparation of users guides. Specifically, data management systems and software adapted to the needs of the region will be developed for the conservation information centers. These systems will be written up in manuals and technical notes for distribution to all data users and information centers. All written materials and workshops will be in Spanish.

Technical assistance will also be provided to the staff of the information centers. Advisory assistance to new conservation information centers will be contracted from existing centers to the extent possible. Moreover, planners and land use managers will be consulted throughout the development of the information systems in order to ensure the practicality of both the data bases and the analytic techniques. A special effort will be made to advise all potentially interested parties of the existing and newly developed information systems.

4) Support to National Data Centers

Equipment, materials and supplies will be provided for the establishment of new national conservation information centers. Any new centers will be located in an appropriate national host institution, and a basis for sustained financing will be developed. This latter activity, management and financial technical assistance to the centers for the development of a sustainable program, is considered fundamental for the eventual and lasting success of the undertaking. Training for the staff of the new centers will be provided through existing centers in Costa Rica and Guatemala.

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COMPONENT 3. Sustainable Agriculture and Forestry

Sustainable agriculture is a loosely defined term for a range of agricultural and natural resources management strategies. The American Society of Agronomy has settled on the following working definition. "A sustainable agriculture is one that, over the long term, 1) enhances environmental quality and the resource base on which agriculture depends, 2) provides for basic human food and fiber needs, 3) is economically viable, and 4) enhances the quality of life for farmers and society as a whole."

This component focuses on those areas that have been identified as critical in the LAC E/NR Strategy for Central America. **Watershed management**, particularly soil and water conservation, is indispensable for sustainable agriculture. The major problem is the lack of political consensus within countries to govern private land use and resolve overlapping public sector responsibilities. Additionally, new mechanisms are needed to provide appropriate technologies through effective outreach so that producers adopt new approaches even though the benefits cannot be realized for years. **Natural forest management** promises to reduce the extent of uncontrolled cutting in these forests. And the adoption of sound **plant protection and pesticide management** policies and programs should achieve relatively rapid results in checking some aspects of current pesticide misuse trends, particularly those leading to health and environmental contamination problems. In brief, the overall objective is to develop, integrate, and disseminate technologies that lead to the use of land in accordance with its ability to sustain that use.

The activities to be undertaken in this part of the Project are designed to support that objective. Through CATIE and other regional institutions, the Project will continue to study and promote or support varied watershed management programs. It will foster innovative programs in natural forest management. The Project will make a major effort in plant protection through the development of alternative methods, including integrated pest management, that promise significant reductions in pesticide use. In each of these technical areas, the Project will undertake training, outreach, technical assistance and research on a regional level, and it will provide policy guidance, regional coordination and information-sharing among national agencies. In this regard, the Project will support public and private national institutions in their efforts to provide quality services to project beneficiaries.

a. Watershed Management.

Watershed misuse leads to onerous environmental and socio-economic costs that threaten agriculture, potable water supplies, hydroelectric generation, irrigation, flood control, navigation, and tourism. Inappropriate policies (e.g., the failure to charge water users for municipal watershed protection) are common in many of the countries. Poor coordination among many agencies typically results in ineffective public oversight and extension activities, and contradictory actions. Men and women who are qualified to deal with the intricate and cross-cutting watershed issues are very scarce in Central America. Appropriate technologies are available in most instances, but there is a critical need for more effective transfer of technologies to extensionists and end-users. CATIE, the regional institution with a demonstrated capacity in research and training for watershed management, will play a lead role in improving the regional capability for restoration and sustained management of watersheds.

1) **Support of Watershed Management Endeavors in Central America.**

In recent years national governments, bilateral AID Missions, other donors, municipal water agencies, utilities generating hydropower and others have become increasingly concerned about and active in watershed management. (Examples are USAID/Costa Rica's FORESTA Project, its proposed watershed management project and its financial support to protected areas; the USAID/Guatemala HADS project which manages watersheds supplying irrigation developments; the USAID/Honduras LUPE Project, the IDB initiatives in the Chixoy watershed of Guatemala; the pilot areas of CATIE; and numerous more modest efforts). These initiatives are often constrained by inadequate capability to plan and carry out watershed management.

Since 1983, ROCAP has supported CATIE's Regional Tropical Watershed Management Project (596-0106) to build the knowledge base and human resources in Central America to respond to this growing demand for watershed support services. CATIE has established a major data base, a cadre of researcher/advisors, a range of information resources and organizational networks and a strong masters program and training capability that the RENARM Project will build upon.

Geographic Information System. CATIE now has a geographic information system (GIS). Centered on geographic coordinates, the data base contains information on soils, climate, land tenure patterns, farm incomes, organizations in the areas, and other physical and socioeconomic factors. The data are

collected from satellite imagery, ground surveys, and official records in the countries. This powerful tool can be used to support watershed management planning, monitoring, technical assistance, training, and extension activities. On request, the Center can produce manuals on data collection, analysis, and management, and it can run workshops to train national staff in the uses of GIS for watershed management. Such training and assistance will be promoted in several national institutions, such as the Instituto Geografico Nacional in Guatemala, the Catastro in Honduras, and the Comision Ejecutiva del Rio Lempa in El Salvador. Other GIS data base systems are currently being developed in each of the countries, so that regional coordination will assure standardization, compatibility and division of labor that benefits all.

Regional Coordination. The Regional Tropical Watershed Project established in each participating country a national watershed management committee charged with improving coordination among agencies, disseminating information, providing a forum for cooperation, and defining national goals and strategies for the more efficient use of resources. The committees are composed of senior members of the national agencies responsible for watershed management, as well as technical personnel from those agencies. Each committee is headed by a senior ministry official or agency director.

These committees now operate in each country with varying degrees of formality and effectiveness. At the outset, each committee prioritized the watersheds in its territory, and is now preparing, with CATIE support, a "bankable" management plan for a priority watershed. Each committee pays for its meetings out of the national budget. These advances are uneven and must be consolidated. Some committees have yet to be legally established. Perhaps as a result, agencies (and even more importantly, donors) continue to devise unilateral interventions in watershed areas, without coordinating them through the committees. The new Project will provide strategic support to the less established committees and pertinent technical assistance in coordinating donor and national development planning for important watershed areas.

Problem-solving research. Although lack of knowledge of solutions is not the most important constraint to watershed management, practitioners often run up against problems which need research in order to overcome them. The Project will continue to respond to these needs through CATIE by carrying out or catalyzing applied research. Some of these investigations will be the responsibility of the professional staff based in Turrialba, who will carry them out directly or in conjunction with students doing their M.S. thesis. In many cases it is

expected that the CATIE professionals will stimulate and guide the other donor-supported projects cited above in doing the studies with their own resources. Because this research will respond to real local needs, the probability of results being applied are high. Whenever appropriate, the results will be distributed through existing CATIE and country publications, as well as being used as input to the various training activities.

National coordinators. The current Watershed Project funded country program coordinators have proved useful and necessary to initiate watershed management activities in each country. Under the RENARM Project it is expected that they would continue to fulfill their functions. Too often, though, the role of coordinator has been diverted by the need to focus on issues and actions best carried out by host country entities. Establishment of national watershed committees has typically taken 18 to 24 months, followed by additional time and effort to establish implementing regulations and budgetary allocations for follow-on coordination and implementation. This component requires that host countries define, program, and carry out all of the steps necessary to make watershed projects an operational reality. Until the host country demonstrates that it has taken the lead in meeting these threshold requirements, full Project support will not be made available. Cost of the national coordinators and the budget support necessary to operate will be provided by RENARM only when national, bilateral USAID and other donor funding has been secured. Until these conditions are met, Project coordination in the countries will be carried out by the CATIE Representative as one of his or her many responsibilities.

Short-term Technical Assistance. At the national level, assistance will be provided to the watershed committees and their member institutions, who now require more site- and problem-specific technical advice geared to key watersheds. Technical assistance will also support the extension activities in specific watersheds. Help will be provided in soil conservation, extension methods, incentive schemes and forest management. The expected needs will be filled by specialists from the region, including Project staff, who will be identified and provided by the CATIE national coordinators in cooperation with the national watershed advisory committees.

At the regional level, technical assistance will be provided to CATIE to enhance its capability to refine such watershed models and methods as remote sensing, socio-economic analysis, policy reform, legal considerations in watershed management, and strategy formulation.

The Project will fund an estimated 47 technical assistance efforts over its life. Twenty-nine of these will be provided to

national institutions, to support on-going activities and eighteen will enhance CATIE's watershed management capabilities.

In summary, the Project will offer direct support through the services of a geographic information system, facilitation of ongoing country and regional collaboration, problem-specific research, technical assistance, and publications leading to sharing of experience.

2) Training.

Degree training. Building on the achievements of the Regional Tropical Watershed Management Project, the new Project will continue to support the M.S. program at CATIE, the only institution in the region offering an advanced degree in this field. The Project will fund several teaching and research positions at CATIE and up to 25 scholarships during six years.

The Project will provide technical assistance to CATIE to help review the academic curriculum for its relevance to the increasing technical capacity in national institutions and its pertinence to new developments in watershed management generally. In particular, two existing courses--the socio-cultural aspects of watershed management (including gender issues and extension) and natural resource economics-- will be refined and strengthened.

Short courses and workshops. Regional and national short courses and workshops are an efficient means for disseminating information to professionals. Generally, regional courses are better adapted to higher echelon professionals or specialized topics; national courses are better suited for field personnel. Regional short courses to be given at Turrialba include applied image processing, use of geographic information systems for watershed planning, and economic assessment of watershed projects. Local short courses for field personnel include integrated watershed planning, land use planning applications, watershed hydrology, environmental impact assessment, and communications and extension techniques. These courses will pay explicit attention to means of reaching women and members of marginal households living in or directly affected by watershed area interventions. Additional courses that might be developed include rapid rural appraisal techniques and economic analysis of management plans.

CATIE will develop and implement eight regional short courses for an average of 20 students each. In addition, national coordinators will identify and help sponsor the pertinent

national short courses, with assistance in course materials and audiovisual aids from CATIE. A total of 35 national short courses lasting on average one week will be funded by the Project.

Workshops and seminars usually focus on a single theme. These training sessions are most useful at the national level. The topics to be covered will be suggested by the national coordinators in consultation with public and private agencies. The institutions requesting this training will undertake the logistics of the sessions. The project will support a total of seven seminars and 34 workshops (including one regional and 19 national encounter sessions to assess and adopt new innovations) over the life of the Project.

Special workshops will be held for extension personnel. Two workshops on watershed management will be offered to NGO personnel in the participating countries. Refresher courses that include consideration of socio-economic, cultural, and gender issues will also be offered for extension personnel. CATIE and the NGO project representatives, together with their local counterparts, will develop the in-service training agenda and accompanying materials. Eleven such in-service training activities are planned over the life of the project. Finally, two cross-site visits per country will be incorporated into the project so that practitioners in one country can learn from the operation of programs in other areas.

Instructional Materials. The development of national short courses, seminars, and workshops will help refine existing training materials and help prepare new ones. Specific materials that will be produced in the countries include training manuals, video and slide and sound programs, and a quarterly newsletter on economic, social, and policy issues in watershed management. These materials will be produced by the CATIE information office.

(4415j:SHED)

b. Production from Natural Forests.

One solution to the problem of deforestation is conservation of forests of outstanding value in protected areas, an activity already covered in this project. However, not all forests can be reserved without harvesting. Central America still has considerable areas of natural forest that can provide economic and ecological benefits if managed properly. Because they are erroneously perceived as being of very low value, these forests tend to be converted to pastures, an economically marginal and ecologically inappropriate use for most of the remaining forest. One of the most effective means to assure that the land will remain in forest is to demonstrate to the owner that his forest can provide him with a competitive, sustainable income if properly managed.

Because the most extensive areas are the lowland humid broadleaf forests, this component will concentrate on this forest type in Costa Rica, Honduras and Guatemala. Pine forests are excluded from direct ROCAP support because constraints are usually not technical and because other projects already deal with them. The high altitude and the dry forests are not covered because of their relatively low productivity and limited area.

As remaining natural production forests dwindle there is increasing awareness of the need for urgent action. Several promising initiatives for productive natural forest management are occurring in Costa Rica and Honduras, with important socio-economic implications. Forest industries are acquiring forest land in Costa Rica and are searching for ways to manage them sustainably by involving the former owners and local residents. Several cooperatives (e.g. near San Carlos and San Isidro) own forest land and are interested in managing these in an integrated operation with their own processing equipment. There are possibilities for developing the 300 ha forest of EARTH's land holdings into a demonstration and teaching forest. Other national universities may become involved in "experimental" forest management. In Honduras a sustained management plan has just been drawn up for a plywood plant operating in broadleaf forest. In both countries several bilateral projects (FORESTA, BOSCOA) and other donor projects (COHDEFOR/CIDA) include components for natural forest management but do not have the specific expertise to implement a strong technical program. In Guatemala, the institutional situation is improving due to new legislation, restructuring of the forest service, the demise of the semi-autonomous institution responsible for the Peten and the preparation of the Tropical Forestry Action Plan financed by USAID.

The objective of this component is to demonstrate the viability of commercial management, including natural regeneration and some replanting, of the humid lowland broadleaf forest in Central America. It will achieve this aim by building on appropriate aspects of the small existing outreach program at CATIE so as to give practical advice and assistance on natural forest management directly to forest landowners in Costa Rica, Honduras and Guatemala, and to establish pilot areas of ecologically and economically sustainable natural forest management.

1) Outreach.

CATIE will contract a team of specialists to deliver practical advice and assistance. The specialists will first identify priority areas for sustainable natural forest management. They will then contact the landowners, forest industries, cooperatives or other projects connected with these areas. The Project will work only with those owners or groups showing high levels of interest and with a potential for success. It will advise on forest management and silviculture, harvesting and extraction, and community involvement and organization. The emphasis will be on pragmatic, dynamic assistance. The Project will promote the preparation of short, practical management plans, and help train forest service staff and private forestry consultants in their preparation.

The Project will organize short courses and workshops to disseminate the experiences and findings of the program to interested individuals. A total of 19 such sessions is planned for government foresters, private-sector specialists, landowners and farmers.

Although during the first years the extension services will be provided at no charge to the landowner, once it has been demonstrated that management of these forests is a financially viable activity, it is expected that a gradually increasing fee will be applied. Eventually this service should become financially self-supporting. It could be taken over by the forest owner and industry associations which are becoming stronger and are taking steps to assure productivity of an increasingly scarce resource.

2) Pilot management areas.

The most important vehicle for the outreach program and for demonstrating the viability of sustainable commercial management will be the establishment of at least 15 pilot areas covering more than 10,000 ha, chosen among the projects and interested owners mentioned above and others to be identified. (Special efforts will be made to work with cooperatives and other local community groups.) Project technical assistance, monitoring, research, demonstrations and training will be concentrated on, but not exclusive to, these pilot areas. However, implementation of the management activities and bearing their cost will be the responsibility of the owner.

Once operational, pilot areas will be used for demonstration and training in forest management. The information derived from these carefully monitored sites will be used to publish technical and promotional documents concerning forest management. An often invisible social cost of better forest management--the displacement of households illegally occupying forest lands and the implications for resettlement--will be considered in the monitoring effort. The project will build on its regional perspective to use success in any one area to stimulate action in others. Demonstration and field days will be geared to foresters, forest landowners, farmers and political leaders.

For "instant impact" the Project will actually offer the owners a service: applying silvicultural treatments to their forests. The purpose of the treatment is to identify the future crop trees and remove those other trees of lesser value that compete with them. CATIE will employ a five-person team of skilled forest laborers in each country. After making the proper arrangements with the owner, and in accordance with the management plan, this team will identify and mark the trees, and fell those marked for cutting. Extraction will be carried out by the owner, but under guidance of the team. During all operations it will be required that the team be assisted by laborers employed by the owner so that these can be trained on the job. The first few hectares treated will be free of charge, larger areas will have to be paid for.

A timber processing unit, consisting of a tractor with winch and a portable sawmill and accessories for processing small logs, will be used to demonstrate simple forest harvesting and processing techniques within the reach of small producers. The unit will be taken to the forest areas selected for sustainable management, preferably those of cooperatives or other local groups. The farmers will supply the labor, and the project will loan the equipment, which will be operated by skilled technicians. Harvesting will be carried out in strict accordance with the previously developed management plan. The lumber will be the property of the farmers, thus serving as an incentive to participate in the management program.

3) Training.

To build up a corps of forest management professionals in the region, the Project will sponsor nine scholarships in this specialty at CATIE. A special effort will be made to include employees of public and private agencies who will return to their institutions upon completion of degree training. To the maximum possible, the master's research will be undertaken on the pilot areas and will be coordinated with the policy studies discussed below.

4) Research.

The Project will finance problem-solving research through a small-grant research program. The purpose is to refine the management guidelines and recommendations for natural forest management, taking land tenure and socio-economic considerations into account. Moreover, local community participation in tree harvesting of pilot areas or in cooperating bilateral project sites will be given emphasis in research funding.

The Project will call for research proposals, specifying the subject areas that are eligible for funding, including socio-economic and gender issues. Selection of topics and grantees will be made jointly by the project team. They will also offer guidance for implementing the studies and monitor research progress.

5) Wood utilization and market development

One of the constraints to management of the broadleaf forest is the large variety of tree species. Because the wood of many of these is not well known on the market, the forest owner can only harvest part of his stand, which limits his returns and presents an obstacle to regeneration of the forest. The economic returns of farm forestry also need to be improved by finding higher quality uses for the small dimension logs and new species which are being grown by farmers.

To address these constraints, the project will finance wood utilization and marketing support to existing forest projects and enterprises, many of them connected to the pilot areas mentioned above. Because CATIE lacks the expertise in this field, it will subcontract this activity, possibly with INFORDE/CAEM/DIGEBOS, a USAID/ST/FENR supported project based in Guatemala.

The support will follow two directions: First, problem oriented research will be done on the properties, workability and processing of secondary species from the natural forest and of farm-grown trees. This would involve, for example, compiling existing information and doing studies to answer application questions by wood users.

Second, markets will be developed, through building wood product prototypes, doing test marketing, carrying out market studies and through other techniques.

Most of the above work will be implemented through grants given to such institutions as the Instituto Tecnológico de Costa Rica (ITCR), ESNACIFOR or ICAITI, and progressive forest industries, working closely with private enterprise producers and users of forest products.

(4416j:TREES1)

c. Seeds for Farm Forestry

Since 1980, the ROCAP-supported Fuelwood Project and Tree Crop Production Project have carried out research, training and outreach on multi-purpose trees for small and medium-scale farmers. This work has identified the most promising tree species, developed management practices and evolved successful extension approaches. Partly because of these projects, as well as a general expansion of reforestation in Central America, the demand for quality seed is growing rapidly. It now remains to produce sufficient seed of high quality to meet this demand.

Traditionally most of the tree seed in the region has been supplied by the forest tree seed banks managed by the forest service of each country. With the exception of Honduras, these banks are weak institutions which are short of staff, training, equipment and operating funds. A well operated seed bank can be a good business. Many species are in high demand and have a ready market within the country and abroad, as demonstrated in the case of Honduras. The seed banks have never been able to make the initial investment in equipment, personnel and operating capital to demonstrate that they can become financially sound operations. However, all four countries have laws and regulations prohibiting revenues generated by government agencies to be used directly by that agency. Revenues are usually required to be deposited in the national treasury. Mechanisms must be developed to return earned income to the seed banks. Until these mechanisms are in place, support to the banks cannot be justified as cost-effective.

The aim of this activity is, therefore, to help Central American countries meet their need for quality tree seed by developing more financially sound ways of producing and marketing seeds, and once the system is established, supporting the initial operation of these endeavors with equipment, training, technical assistance and coordination within the region.

Options which should be explored are: financing of the banks through a special "forestry fund" which exists in most countries, the conversion of each of the banks into a private enterprise in which the government is a stockholder, or even the creation of a regional enterprise made up of the member banks. Over the next few months ROCAP will finance with PD&S the analysis of options and the negotiation of a workable and financially sound system. Once agreement has been reached with the respective governments and USAIDs, the Project will be amended accordingly.

d. Regional Plant Protection

The biological control practices and integrated pest management concepts embodied in plant protection are promising measures to deal with the dilemma of pesticide abuse and agricultural productivity.

The problems that exist with pesticide use and misuse in the region are significant, but manageable. Project resources will be directed toward correcting these imbalances, ameliorating the downstream effects of pesticide usage, and addressing the varied, often competing interests of an increasingly interdependent market. In addition to long-term research and experimentation to validate improved plant protection practices, project extension activities will focus on redressing short-term problems such as:

1. Compliance with restrictions governing pesticide use on on export crops;
2. Regulation of pesticide formulations, bottling, labelling, distribution, marketing and promotion; and
3. Reducing the dependency on the pesticides generally through the promulgation of improved farming practices, particularly IPM.

Longer term strategies will be directed at managing resistance, prolonging the effectiveness of approved pesticides, and permanently reducing the environmental contamination caused by excessive use of chemicals. This will depend in great measure on a better understanding of pest resistance resulting from more effective methods to detect and monitor resistance, and better coordination of interdisciplinary research in such critical areas as genetics, biochemistry and population biology.

This will involve the active participation of a number of diverse public and private sector agencies, producer groups and NGOs. The Plant Protection component will support the response most indicative of regional research and training institutions like CATIE and EAP (sections 1-5 below). Other actions such as those undertaken by the private sector are initially described in section 6, below.

1) **Regional Research and Training Center Actions**

Two regional teaching and research institutions, CATIE and EAP, have special expertise in the area of plant protection and pest management. CATIE not only provides specialized services in pest research and identification, the center also has a M.S. program in integrated pest management. EAP, an undergraduate institution, has special facilities for the study of biological control. These two institutions will collaborate closely in the implementation of project activities.

2) **Research.**

Sustainable pest management practices and integrated pest management programs are often hampered by the lack of appropriate validation procedures. In some instances, basic technical information exists, but must be integrated and tested through adaptive research. In many other cases, fundamental gaps in knowledge seriously impede the design of solutions. This is true not only for new crops or export crops where higher quality controls are required, but also for traditional crops such as maize and beans. For example, the transmission cycle of soil insect pests and of plant bacterial diseases is still unknown even for traditional crops. The generation of this basic knowledge is essential if sustainable pest management is to become a reality. To this end, the project will support both short-term responsive or emergency research into specific pest problems and longer term sustainable pest management research.

Responsive research. Responsive research will provide information on and solutions for specific pest management problems. More specifically, the assistance will diagnose pest and pesticide management problems, devise immediate solutions, and develop pest and pesticide management recommendations for selected crops. When requested, the project will also provide short-term advice on the development and design of pest management programs. This assistance will be available to all organizations working at the field level--private and public agencies, NGOs, and other entities involved in pest control and technology transfer activities.

Responsive research proceeds in stages. The first step is usually the identification of the problem, its nature and causes. This may require field surveys and complementary laboratory work. Recommending a solution to that problem depends on previous observations and diagnostic work. If a simple solution is not readily available, some short-term

research may be necessary in order to devise a viable solution. This additional research could involve bibliographic searches, further laboratory analyses, or field work.

Responsive research will build up a pertinent body of knowledge about specific pests that attack important crops in the region. The publication and distribution of recommendation guides for these crops will be an important output of this research. These guides will be developed, maintained, and updated over the life of the project.

Sustainable pest management research. Economically and environmentally appropriate pest management tactics emphasize nonchemical pest control alternatives. Long-term research will examine potential biological controls, mechanical or cultural controls, and alternative pesticide formulations. One aspect of this research will focus on determining the threshold decision levels at which farmers must react to the problem. The studies will be performed in farmers' fields, on experiment stations, or in greenhouses or laboratories, as appropriate.

Biological control research entails three areas of investigation. These are: manipulation of indigenous natural enemies; introduction of exotic natural enemies for the control of major introduced and native agricultural pests; and, identification and utilization of microbiological control agents. Pests targeted for classical biological control include the major pests of basic grains, vegetables, and fruits, as well as widespread terrestrial and aquatic weeds. The research will be carried out at EAP, which has the quarantine facilities required for the import and breeding of exotic insect predators. These control insects will be released through collaborating national agencies under strict guidelines.

Many opportunities also exist for enhancing the effectiveness of indigenous and already established exotic natural enemies through the use of cover crops, tillage systems, and other techniques. Such studies promise great utility for small producers, including women, who can adapt cultural practices more readily than they can adopt costly inputs. Such studies are also useful for nontraditional export crops with chronic pest problems caused by ecological imbalance. In addition, the effectiveness of nonchemical cultural practices in reducing pest damage will be investigated. These include resistant plant varieties, row spacing, intercropping, planting dates, crop rotation, crop-free periods, cropping systems, and tillage systems, as well as the effects of combined practices.

The identification and testing of alternative pesticides that are more pest-specific and less toxic to humans and nontarget organisms than those often used by Central American farmers are major aims of this research. Emphasis will be placed on finding means to use pesticides in the least ecologically disruptive manner possible--and on means for transferring those techniques. Specific research sites will be identified early in the design of crop-specific research programs. CATIE has already initiated the identification of priority resource development zones in the region, where much of the plant protection off-station research and outreach efforts will be concentrated. In turn, EAP will become involved in pesticide research through its newly created Pesticide Evaluation and Management Center. These activities will be designed in collaboration with national institutions and NGOs, as well as USAID bilateral missions, and will be carried out in such a manner as to strengthen the capacity of the national institutions.

The development of pest-control decision criteria (action thresholds) is an important research objective. Such pest-specific action thresholds help farmers decide whether or not to apply control measures, usually pesticides. Previous work indicates that simple but functional thresholds can significantly reduce pesticide use and thus increase farmer net income. This research into when to apply a particular type of control measure, and the extent of that application, must take into account not only the monetary costs of action but also the labor required for action and the availability of that labor within the cropping cycle. Working with farmers on their fields can help incorporate these concerns into the research process.

3) Training.

There is a serious shortage of personnel adequately trained in plant protection throughout the region. This factor hinders both the development and implementation of plant protection programs. Thus, ROCAP will support the training of male and female plant protection specialists at both the bachelors and the masters levels. Further, the project will support the development of teaching materials and their distribution to other educational institutions in the region.

Masters degree training. CATIE initiated an M.S. degree program in plant protection in 1986. The program includes three integrating courses: pest diagnostics, production economics, and integrated pest management. Other courses are taught in the main plant protection disciplinary areas, such as plant pathology, insect pest ecology and control, and weed science.

Complementary courses are required in statistics, experimental design, agroecology and computer use. Finally, students structure individualized curricula by taking optional courses in biochemistry, extension and training techniques, rural sociology, systems analysis, simulation modeling and agrometeorology.

CATIE's entire M.S. program is presently undergoing restructuring to increase the interdisciplinary collaboration that characterizes the future work situations of the students. The plant protection curriculum, for example, will be broadened to include biological control and pesticide management. In addition, CATIE is considering offering one or more advanced plant protection courses for non-specialists. Students will also work on interdisciplinary research teams. At present, 90 per cent of the thesis students do field research, which exposes them to diverse aspects of farming.

Men and women trained in plant protection are in high demand. The number of masters-level professionals does not yet meet the demand from the region's universities, Ministries of Agriculture, non-governmental and private voluntary organizations. In fact, all ten graduates of the CATIE program are now employed. To redress this situation, 32 Central Americans will have received master's degrees in plant protection by the end of this project. (An additional number of students will be funded from sources outside the project.) Candidates will be selected on the basis of disciplinary orientation, scholastic and professional abilities, gender and socioeconomic considerations, country of origin, and position available upon completion of training (e.g., teacher, extension agent, researcher, administrator). Promising graduates of EAP in particular will be encouraged to seek enrollment in CATIE's advanced program.

Bachelor degree training. Undergraduate training at EAP emphasizes five basic plant protection courses plus advanced plant protection, biological control, pesticide management, social sciences, production courses, research techniques, and computer skills. In addition to its basic three-year curriculum, the school offers a bachelors degree in plant protection.

The EAP plant protection curriculum is now being reviewed. Specialists from the University of Costa Rica and UNA will assist in redesigning selected courses and in developing a new pest diagnostics course. Gender issues in agriculture also will soon be explicitly incorporated into the program. The EAP

program will continue to stress hands-on learning, supplemented with rigorous course work, disciplinary integration, the incorporation of socio-economic concerns, and direct contact with both men and women farmers in technology generation and transfer. Moreover, students conduct thesis research as part of interdisciplinary research teams. A non-research option, involving a supervised, fully documented IPM internship will be offered in the future to selected male and female students, especially those who will return to production or teaching positions.

Over the course of the Project, ten students each year will receive a bachelors degree in plant protection from EAP. It is anticipated that many of the best qualified Central American students will be channelled upon graduation into CATIE's masters program.

4) Outreach.

The Project will undertake four principle outreach activities: nondegree training and training materials development; information services; diagnostics services and networking; and technical assistance.

Nondegree training. In-service training, short courses, workshops and seminars will all be used to upgrade the training of technicians in the region.

Eighty male and female technicians will receive one to six months of specialized in-service training in selected plant protection topics. This training will be held at CATIE, EAP, and other collaborating institutions. The program is designed to provide trainees with special skills in crop protection. Areas to be covered will include: pesticide management, socioeconomic aspects of plant protection, diagnosis of pest problems, plant protection disciplines (e.g. entomology, virology), IPM tactics and techniques (e.g. biological control), and research techniques. In most cases sponsoring institutions and projects will cover the salary of in-service trainees; this project will cover travel and living costs only.

Short Courses. Short courses are a useful means for imparting needed technical knowledge to field personnel of public and private extension agencies, such as growers associations and NGO community workers. The priority areas for this training will be determined in collaboration with counterpart institutions during Project implementation. These courses will be organized and

hosted by CATIE and EAP, both of which have broad and successful experience in training technicians, teachers, and producers. These short courses, like the in-service training and the workshops and seminars, encourage networking within the region, and facilitate the refinement and validation of teaching materials.

Workshops. Workshops and seminars provide a flexible means to disseminate specialized information to technicians in the region. The project will particularly emphasize specialized training in plant protection to key policy makers and for technical personnel in Ministries of Agriculture, and NGOs. It will also use the workshop approach to obtain essential feedback information from collaborators in order to enhance the relevance and productivity of the plant protection work. Analysis of the collaborators' assessments will be disaggregated by sex, agency of employment, and other critical variables. CATIE and EAP staff will be the primary organizers and trainers; other specialists will be contracted when necessary.

Pesticide management will be a major concern in all of these training activities. Building on teaching materials already available, EAP and CATIE will collaboratively develop modularized, multi-media pesticide user safety programs. The prototype programs will be validated in work areas with male and female audiences. The project will train key national groups in the use of these materials, in collaboration with existing related programs, in order to strengthen and complement such programs. It will be the responsibility of national agencies to carry out large scale training programs using the materials. Target audiences will include policy makers, technicians, capital intensive producers, and resource-scarce producers.

These different training activities will result in comprehensive, up-to-date teaching materials that are specifically adapted to the needs in the region. These materials--textbooks, laboratory guides, audiovisuals, and computer aided instructional programs--will be provided to agricultural training institutions in the region, so that they can upgrade their plant protection curricula. These institutions will provide important feedback in the development and refinement of these materials. This activity builds upon efforts initiated during the earlier regional plant protection project.

Information center. The regional information center located at CATIE will continue to provide publications and data bases to specialists and institutions.

Publications. The information center will publish and distribute three periodicals, a quarterly journal, a quarterly index of recent plant protection publications, and a newsletter. The quarterly "Revista MIP" is distributed within the Central American plant protection community. It is intended to strengthen communication among the region's pest management workers, while providing them with useful and timely information on a wide variety of pest and pesticide management topics. The newsletter "Boletín Informativo MIP" provides information on new technical developments, and announces meetings, short courses, and other activities of interest to Central American professionals in crop protection. The quarterly "Paginas de Contenido" reproduces tables of contents for 100 plant protection journals and proceedings.

The materials to be distributed by the information center of both CATIE and EAP include textbooks, journal articles, catalogs, pest and pesticide lists, practical field guides, pest keys, taxonomic keys, and diagnostic aids for specialists. These materials will be produced by CATIE, EAP, or both institutions in collaboration.

Data bases. The CATIE plant protection department maintains two data bases at present. The first contains bibliographic citations of relevant pest management literature. The emphasis here is on technical literature that is not readily accessible through standard data retrieval services in the region and on citations that relate to social and gender issues in pest management. The second data base contains the name, disciplinary specialty, work experience, and address of pest and pesticide management workers, institutions, and programs in Central America. This data base will be revised to incorporate more readily the women working in this specialty.

In addition, three new data bases will be created. The first, a registry of EPA approved pesticides for food and export crops produced in Central America will be build upon the pesticide data base being developed under the regional PROEXAG project based in Guatemala. The crop-specific listing will include parameters such as toxicity, restrictions, special handling and application considerations, days-to-harvest, and FDA residue tolerances for EPA approved products. Constant updates via established contact with EPA will make this an invaluable resource to exporters, national regulatory agencies, and USAID agricultural projects.

The second data base will consist of a registry of results of Central American pesticide efficacy trials. A cross-referencing

system will allow users to access data on a pest, crop, or geographical basis. Third, catalogs of pest and beneficial organisms found in Central American agroecosystems (i.e., agroecological inventories) will be initiated.

CATIE will continue its search and referral service for national technicians and institutions, teachers, private-sector personnel, and others interested in access to information on plant protection topics. CATIE will also continue to provide low-cost photocopy and library loan services.

Diagnostic services. The regional diagnostic center and its associated network, established under the ROCAP/CATIE project, provide an important service to national agencies, namely, the correct diagnosis of specific pest problems and the accurate assessment of their potential impacts. In Central America, national personnel are often unable to identify correctly the organisms in agroecosystems. These incorrect diagnoses are responsible for much crop loss and unnecessary pesticide use. This problem can only be redressed through proper equipment in the national laboratories and pertinent training of the personnel.

CATIE in collaboration with EAP will therefore undertake a series of coordinated actions. They will devise, improve, and standardize diagnostic procedures and techniques. They will maintain live and museum collections of pests and beneficial organisms. They will develop field and taxonomic keys, fact sheets, guidebooks and other diagnostic tools. Lastly, they will provide short courses and in-service training for nationals. Both institutions will redouble their efforts to obtain additional financing outside this project to support these network activities.

In addition, CATIE and EAP will themselves provide diagnostic services and maintain agroecological inventories. These services are necessary because some diagnoses are very technical, and cannot be prepared in even a well-equipped national laboratory. Inventories of indigenous natural enemies of pests that attack Central American crops will be given special emphasis. The aim is to identify the major natural enemies of 20 key pests of priority crops. The effectiveness of these natural enemies will be studied in order to gain vital information for the implementation of IPM and biological control programs. Institutions outside the region will be encouraged to participate in this work. Foreign specialists can also contribute to the reference collections while on sabbatical or through short-term consultancies.

Technical assistance. Central American plant protection institutions often require specialist services to resolve immediate problems, as well as for longer-term problems. Depending upon the nature of the problem, CATIE and EAP will selectively respond to such requests either with staff or outside assistance. The range of topics for such assistance is wide. It includes: diagnosis of pest problems, pest and pesticide management recommendations, development of IPM technology generation and transfer programs, and development and implementation of biological control programs, including manipulation of natural enemies.

5) Private Sector Actions in Plant Protection

The development of alternative pesticide regimes is not sufficient to address problems associated with improper use. Concerns about food safety, environmental contamination, and worker protection are creating support for more aggressive programs to educate applicators and regulate the sale, storage, distribution and application of pesticides. This is an opportunity for AID to promote and support programs of rational pesticide management, covering all aspects of pesticide supply and use--product registration, formulation, packaging, labelling, distribution, equipment calibration, and disposal. Complementing the support for improved pesticide regimes for specific crops, AID will explore avenues, primarily through the private sector, directed towards: (a) awareness and understanding of the pesticide problem in Central America; and, (b) building the capacity of private and public agencies to develop, disseminate, and adopt improved pesticide management strategies.

The proposed program has three components:

1. Private Sector Institutional Development: Support private organizations to regulate and police pesticide use among members. The types of organizations include: commodity associations, cooperatives, suppliers of agricultural chemicals, manufacturers, laboratories, export promotion groups, and private development organizations.

2. Public Sector Institutional Development: Support regulatory and policy making agencies charged with oversight of imports, licensing, training programs, and specific government sponsored projects.

3. Information Management: Wide dissemination of regulatory information; approved recommendations for pesticide use, storage, and disposal; and product safety information for consumers.

This Project activity will be designed over the next several months and initiated in early FY90 and is not included in the Project Authorization.

(4418j:PLANTS)

COMPONENT 4. Institutional Development

a. Problem Statement

Sustained agricultural development requires continuing attention to the scientific foundation to develop techniques for management of natural resources. Multidisciplinary teams of agricultural and social scientists must work to define ways to manage long-term exploitation with environmentally sound practices to produce income for current and future generations. In tropical Central America many of the technologies used today to transform soil, water, climate, and forested lands into income generating activities by the people do not pass a "sustainable agriculture" test.

Even when suitable technologies exist their use is governed by several factors: pressure for rapid exploitation for short-term gain by people who require income in the short-term or where economic decisions are dictated by policies that only reward short-term exploitation and punish a long-term perspective. Relaxing those pressures, there is a constant requirement for research, development, and modification of technologies to solve problems unique to the region. Part of that process is training both technicians and users who can translate solutions into practice.

The problem is clear; resolution requires a set of public and private institutions to collectively transform existing and new scientific information into practices which promise a rational, profitable and sustainable exploitation of natural resources.

In Central America today, a network of public institutions exists, albeit on a scale that is inadequate to the task, with insufficient financial resources, and for the most part, with diffuse research and training objectives.^{1/}

Strengthening the scientific and technological capability of the region is a sine qua non to designing and executing successful interventions to achievement of the LAC E/NR Strategy. Current

^{1/}: The financing of science is a choice between public investment and private gain. Societies require continuing investments in science. Private investment in research and development is determined by their ability to capture income from the result. In the field of natural resources, the gain largely accrues to society, over generations, even through application of new technologies is financed by private parties.

programs in the region are possible only because of past investments in research and training. Accelerating the pace of future programs will require continuing support for research and development and an expanded capacity to train Central Americans in new or modified techniques needed if sustainable agriculture is to become a reality.

Regional institutions can provide the scientific foundation for sustainable agriculture in Central America and play an increasing role in rational management of the natural resource base through research, degree programs, and specialized training, providing the content for multichannel outreach to producers of Central America. The Tropical Agricultural Research Center (CATIE) in Turrialba, Costa Rica, the Escuela Agrícola Panamericana (EAP) in Zamorano, Honduras, and the Escuela Agrícola Regional para el Tópico Húmedo (EARTH) in Guapiles, Costa Rica, all have distinct niches, and have or are developing programs linked to sustainable agriculture or management of natural resources. CATIE is linked to the national agricultural universities and research organizations, some with specialized programs which can address problems beyond national boundaries.

The role of these regional institutions is increasing in importance due, in part, to the continuing financial crisis in national economies. Tied to national budgets and personnel systems for operating funds and salary structures, national institutions are limited, if not by available funds, by restrictions that severely limit salaries to key personnel and operating traditions that prohibit serious attention to continuing and new research challenges. Even if these constraints could be reduced, consideration of economies of scale for some research and education programs call for regional approaches.

Taking the results of research or field testing of promising technologies to a wider rural audience is, traditionally, the responsibility of national institutions: ineffective models, budget restrictions, and a host of constraints point to the need for a revitalized examination of "outreach" strategies to reach targeted populations. Private (for profit and not-for-profit) institutions, as identified in the LAC E/NR Strategy, must be incorporated into the operational strategies of these regional institutions.

b. Program Focus.

CATIE will be the primary focus of the RENARM Project during the first five years. While EARTH is still in the construction

phase a more active role in regional programs will evolve as faculty and students are present and teaching programs are formulated. EAP is an established institution that requires support for individual programs related to environment and natural resources but the institutional structure and core financial base are sound.

The Interamerican Institute for Agricultural Cooperation (IICA) was founded in 1942 as the Latin American agricultural research institution. Changes in the charter and mandate of IICA resulted in the separation of CATIE as an research and educational institution in 1973. CATIE is "owned" by the member governments and supported, in part, by the Interamerican Board for Agriculture (IAB). The institutional history is one of seeking a regional research and educational niche among the network of agricultural institutions in Central America. This niche is established.

International experts consistently emphasize two characteristics of CATIE. First, the scientific output and technical training courses are unparalleled in the region and in some fields, CATIE enjoys world class acclaim. As A. Brown et al. have observed "No single institution in the world has greater experience and capability in tropical technology."

Secondly, CATIE is known for cycles of managerial and financial crises. One financial expert, D. McKinney, has stated that "it has been the failure of the management processes that has shaken the credibility of the institution, not the failure to produce educational results, although the two are obviously connected."

The scientific and education reputation of CATIE are recognized by their peers; the managerial and financial crises undermine the ability to move to higher levels of excellence and reduce, in the eyes of many, the very excellence they have achieved.

Most recently, following a period of severe financial crisis, significant and potentially powerful changes have taken place. The Board was re-constituted, permitting for the first time personal appointments for board members.

The second change was the charge given the Director General of CATIE to examine the research and education program of CATIE and to formulate a long-term strategy to govern institute programs. This too was accomplished, and the CATIE Ten Year Strategy was reviewed by member governments and approved by the board. Putting this strategy into operation is now the primary objective of CATIE management.

CATIE's new strategy goes beyond identifying priority areas for research and education programs. First, outreach activities are now more closely identified as "programmatic" objectives. In the past outreach has taken the form of distribution of publications, graduate programs, short-term training program, and special workshops and seminars involving professional staff from national institutions with limited attention to reaching the intended private sector user of information generated by CATIE. This final link in the outreach chain was reserved for the national extension programs, a custom inherited from past practices. The strategy recognizes the limitations of past reliance on weak extension programs and has sought complementary and additional channels to stimulate the transfer of technology from research and education to user.

Although the weaknesses of current outreach programs are well recognized, a recent management review appraisal by an international consulting firm found that "CATIE has one of the best outreach programs in the isthmus." The strengths of the program stem from:

- * Excellent linkages with the international agricultural science and education community;

- * A network of CATIE country representatives who provide a continuous presence in member countries;

- * National country coordinators for several programs.

- * Frequent in-country short courses and a large number of Central Americans who hold CATIE M.Sc. degrees.

- * National committees of REDCA (a network established by CATIE) consisting of agricultural education institutions, the Ministry of Agriculture, and other participating institutions.

Secondly, the strategy identifies critical staffing levels necessary to carry out the approved strategy. A critical minimum corps of professionals, by subject area, is clearly spelled out in the document.

Thirdly, a new organizational structure is called for in the Strategy. This new structure is described by a management expert familiar with U.S. land grant universities, as enlightened, "replacing the traditional 'academic' discipline structure with a multidisciplinary three program structure."

The Strategy permits, for the first time, a clear and systematic means to define "broad program direction and emphases, goals,

and objectives. It is a good guide for strategic decision-making for defining criteria for recruiting key scientific staff, for communicating to and cultivating prospective donors, and for establishing broad resource allocation priorities. The need now is for the administration to institutionalize the strategic plan into operational management processes. While there have been fundamental decisions made about broad program emphasis and direction, there now needs to be an integration of these strategic decisions into the annual budget-planning processes and resource allocation decisions that are guided by the strategic plan."

Formulation of the plan has also resulted in a clearer picture of the financial vulnerability of CATIE and underscores the contribution of uncertain funding on program execution. CATIE has lived with the dilemma of financial instability obscuring the need for improved management and weak management systems contributing to financial instability. Additional funds alone cannot solve the problem without improved management; improved management without additional financial resources cannot produce the science and educational programs required by the region.

CATIE's financial situation is characterized by an imbalance between core, unrestricted funds and tied project funds from donors. U.S. research and educational institutions rely on outside "project" funds for many of their programs; about one-half of total program costs come from project specific funds. The international research centers of the CGIAR system, enjoy a higher level of core funding; eighty to ninety per cent of total program costs come from unrestricted core funds.

The situation in CATIE is the reverse from the international research centers. Less than 25 per cent of the total program funding comes from the core budget. This is a generous estimate; examination of the source of core funding reveals little stability.

Source of Core Funding for CATIE

IAB Contribution through IICA	32 %
Member Quotas	13 %
Overhead	38 %
Matriculations	9 %
Other	8 %

The only "stable" source of funding is from the Interamerican Board of Agriculture (IAB) contribution, totalling about \$1 million per year. Country quotas are not paid regularly nor on a timely basis. The captured overhead is derived from donor funded projects and is, by definition, determined by the level of project funds, itself a source of instability. Matriculations and other contributions account for only 17 per cent of the core budget.

The result is that CATIE is managing a program level of over \$13 million per year with an assured source of funds of about \$1 million. As projects reach their designate termination date, major programs of CATIE are eliminated or reduced until another benefactor can be found. This financial situation clearly is inconsistent with the long-term vision required of scientific and educational institutions.

CATIE is undergoing a transformation of purpose and direction. It is a regional agricultural research and education institution with established and increasing linkages to national and private educational and agricultural institutions in the region. Execution of the AID Environmental and Natural Resource Management Strategy in Central America requires attention to the institutional weaknesses in order to assure that programs financed by AID and other donors can result in the generation and dissemination of science based solutions for regional problems.

c. Design Issues

This component requires further design effort on the part of ROCAP and CATIE to become fully operational. ROCAP will devote its efforts over the next year in assisting CATIE to implement institutional reforms required for project implementation. Following the rolling design concept, this Project component will be designed over the next twelve months and a PP amendment authorized o/a August, 1990. Design activities have already been initiated, and are addressing the following objectives: (1) to develop and incorporate management systems that guide the execution of the CATIE Ten Year Strategy; (2) rationalization of the core budget to meet identified requirements, and; (3) the role of the Board of Directors. In addressing these issues with CATIE during the design of this component, ROCAP will establish specific targets for achieving CATIE's financial sustainability in order to ensure a continuation of benefits after completion of the project.

(1) **Management Systems.** The three program organizational structure approved by the CATIE Board addresses well known

weaknesses of research and educational programs based on disciplines, the approach traditionally favored in the United States. As disciplines have become more specialized, the scope of inquiry often obscures or eliminates research factors known to affect identified problems, especially in developing countries. AID past support for integrated rural development, farming systems research, and current programs in integrated pest management all attempt to overcome the narrow vision inherent in a discipline approach by supporting multidisciplinary teams of agricultural and social scientists. Many programs have not been successful, due in part to the high cost of the team. Notwithstanding the lack of success in all endeavors, the need for holistic approaches to development problems is recognized as a key element in finding solutions.

CATIE has recognized the limitations of the disciplinary approach and is attempting to build an integrated, problem solving organization to serve Central America. Unlike land grant universities and to some degree, established international research centers, they are not as fettered by disciplinary bias. In this case, the institutional weaknesses caused by unstable funding provides an opportunity for bold institutional organization. Additionally, current and proposed research programs are heavily biased toward applied research and scientists recruited for CATIE positions accept that "bench" research has little scope in CATIE's mandate.

The task is to create the management structure that permits the creative forces of individual scientists to flourish within a multidisciplinary program. That structure must be developed with the full participation of current faculty and professional staff. Top down directives will not work; participatory development of new managerial guidelines is a requirement.

A key element in the new management system is the integration of program budgeting systems. A new financial accounting system is nearing completion in CATIE, a data based system replacing traditional "book" accounts. Completion of this computer based system will permit more rapid oversight of the financial system by project staff and senior management. Folding this accounting system into a program and budgeting system is the next step. Specific delineation of authority and assignment of responsibility for program execution will permit allocation of resources according to established priorities.

(2) **Core Budget.** Rationalization of the core budget is much more complex. Based on the requirements established in the Ten Year Strategy, the "best case" projected annual cost of salaries and

necessary support is estimated at approximately \$9 million. As the prospects for an endowment to cover these costs are low, other avenues have to be explored to provide stable and predictable sources of core funds: increased contribution from IAB; increased member quotas; limited contributions to an endowment by donors; and self-generated savings.

(3) **Board of Directors.** The role of the Board of Directors is critical in developing and executing the new organizational structure and solving the financial problem. Recent modifications in the charter of CATIE (Ley de Contrato) resolved many long standing problems. Board members now receive personal appointments instead of representative appointments. Frequent appearances of new faces in annual board meetings caused by frequent political changes in member governments will be reduced. In the past there is little continuity in Board direction or oversight.

Notwithstanding this important change, an examination of the Board composition, number of members, and the specific role of the Board is needed. Membership representation by donors, particularly the USG, is an issue that requires examination. These questions must be explored in depth with member governments before institutional support from AID can be warranted.

IV. PROJECT ANALYSES SUMMARY

A. Institutional Analysis

The RENARM will work with non-governmental organizations (NGOs), regional educational and research institutions, and private sector organizations. The NGOs will implement the public awareness and reserves conservation components of the project. The regional education and research institutions will implement the sustainable agriculture and forestry activities. The NGOs and private sector organizations together will collaborate in outreach activities from the research institutions. Finally, public-sector agencies will be represented in several activities, specifically, in the policy analyses and the outreach activities, but their collaboration is limited to regulatory considerations and, where appropriate, extension.

1. Non-governmental Organizations.

For public awareness and reserves conservation, ROCAP will call on non-governmental organizations (NGOs) that specialize in conservation. The strength of these organizations is their focus on outreach and service to their clientele, particularly in areas where government agencies are generally not effective. In each instance, an international conservation NGO will work in partnership with one or more national NGOs whose program focuses on environmental concerns.

The international NGOs in conservation are themselves diverse in doctrine, programs, organization, geographic focus, and resources. Nonetheless, these organizations have a history of collaboration in project implementation. In the case of the AID centrally funded Bio-diversity Conservation project, for example, three conservation NGOs joined together to manage a global conservation project. World Wildlife Fund is the lead organization, with The Nature Conservancy and the World Resources Institute equally represented as voting members on the project management board. Furthermore, this cooperative agreement specifically directs the three primary NGOs to involve other qualified NGOs in the implementation of the project.

The international conservation NGOs invariably work in partnership with environmental and conservation organizations in each country. A large number of national and local NGOs that are concerned with environmental issues have been formed in recent years. A recent survey estimates some 600 environmental NGOs now work in the Central American region. Few of these organizations, however, have resources or experience. In many cases, they are truly voluntary, operating with an unpaid staff

and an erratic budget. ROCAP, will provide technical assistance to these national conservation organizations so that they can play a more critical role in defining national conservation goals and in implementing those programmatic aims.

The project will promote partnerships with international NGOs that already work with and through national organizations in order to take advantage of existing institutional relationships, and, by so doing, to facilitate the development of indigenous environmental organizations. The major institutional issue concerns the ability of the international NGOs to match AID funds for the component activities. This concern has been alleviated by carefully scaling each of the component activities so that each is of a size that can be managed by a single or a consortium of NGOs.

2. Regional Education and Research Institutions

At the outset, two regional educational and research institutions, CATIE and EAP, will implement most activities in sustainable agriculture and forestry. Both of these institutions have the capacity to implement the assigned activities, and both have significant experience in bilateral and regional AID projects. It is expected that as the project progresses, other institutions that now have more limited, national mandates will also participate significantly in the project. For example, some training in forestry will take place at ESNACIFOR in Honduras. Other institutions that could in time collaborate in project activities include the national universities in Costa Rica and in Guatemala.

The institutional capacities of these centers are reviewed in depth in the section on Institution Building and in the institutional analysis annex. Thus, here it only warrants mention that both centers have demonstrated institutional capacity to implement project activities. CATIE is Central America's leading center for tropical agricultural research and graduate education, and has undertaken various AID and other donor projects in the past. EAP, an undergraduate teaching and research institution located in Zamorano, Honduras, also has the capability to implement the proposed project activities.

3. Outreach Activities through NGO and Private Sector Agencies

An important institutional issue is the linkage between the regional educational and research centers and the NGOs and other private sector agencies for outreach. Both centers have a history of bringing producers and technicians to the school for

short courses and workshops. But neither CATIE nor EAP has a strong record of working with either NGOs or private-sector agencies for outreach. By history and mandate, CATIE has worked mostly through government agencies; its major association with PVOs and NGOs has been through watershed and wildland conservation efforts. EAP, as an undergraduate institution, has established some linkages and has endeavored to reach farmers.

4. Private Sector.

Advances in sustainable agriculture depend upon the cooperation and compliance of farmers. As has been mentioned, efficient outreach may require organizations that regroup producers into units that can be provided relevant information. New organizations are being formed in Central America today, beyond the traditional export organizations. These include pesticide manufacturers groups, non-traditional export commodity associations, and others. These groups must be involved in the definition and implementation of sustainable agricultural activities under the project.

5. Public Sector Agencies.

Public sector agencies in the participating countries, such as forestry directorates, ministries of natural resources, public utilities concerned with watersheds, and local governments, will be among the beneficiaries of this Project. In most cases the benefits will come through interactions with CATIE, with NGOs, and through USAID projects that draw on RENARM technologies, policy analyses, and training. The analysis of these institutions is more appropriately done by the bilateral Missions, and therefore is not treated in this PP. The Project will monitor the adoption and implementation of legislative and regulatory measures, as well as application of technologies and practices developed or promoted by RENARM grantees and contractors as one of the measures of its effectiveness.

6. ROCAP/USAID Missions.

The Central American E/NR program requires close collaboration between the six missions in the region and LAC. New modes of collaboration will be established -- joint ROCAP and bilateral committees -- to facilitate an integrated and cross fertilized effort. Bilateral buy-ins to ROCAP managed activities, through OYB transfers, and joint PIOs, will facilitate this objective. Assignment of ROCAP financed activities, buy-outs, as integral components of USAID supported programs, is another mechanism. The end result will be an AID supported ENR program.

B. Technical Analysis

In general the technologies proposed for this project have been used in Central America and elsewhere, so that there should be few unknown technical difficulties encountered during the course of the project. Also, short-term technical assistance will be provided under each activity to ensure that project initiatives are carried out in a technically sound manner. Because different techniques will be used in each activity, the technical feasibility of each will be reviewed activity by activity--policy, public education and reserves conservation, and sustainable agriculture and forestry.

1. Policy Analysis

Policy analysis will encompass three broad areas of inquiry. First, it will identify and analyze alternative environmental and natural resource policy options. Second, it will characterize the political and institutional milieu in which policies are developed and implemented. Third, it will adapt, improve and evaluate a range of methods for analyzing policy options. The methodologies for the first two areas of inquiry are based on economic, political and sociological theories applied to the specific problems of interest. The stated purpose of the third is, however, to improve methodologies for examining the costs and benefits of environmental and natural resource projects. By definition, the improved analytic techniques do not yet exist.

2. Public Awareness and Bio-diversity Conservation

The technologies to carry out the environmental awareness and bio-diversity conservation activities are generally known and proven. Most have undergone extensive testing and refinement.

The regional environmental awareness and education campaign, for example, will take advantage of the vast experience in the area of social marketing for the preparation of mass-media campaigns and interpretive programs. Similarly, there is already wide experience in the preparation of regional thematic conservation strategies, and many agencies have organized and carried out short courses with conservation themes. Finally, the program will select, adapt, and disseminate only materials that are currently available in environment and conservation education.

The regional wildland management programs will also use widely tested and known techniques. Indeed, these approaches have been used in protected areas around the world for as much as a century. The innovative aspect of this program is the adaptation of these existing technologies to the specific social

settings and biomes of the pilot sites. In particular, various rural development technologies for soil and water conservation, e.g., bench terraces, farm reforestation, will be adapted for specific situations in buffer zones around wildlands.

3. Sustainable Agriculture

The three activities in sustainable agriculture--watershed management, natural forest harvesting, and regional plant protection--are all follow-on activities to earlier projects implemented by USAID and other donors. In each instance, the earlier project has defined problems and developed techniques that condition the proposed new initiatives. Where the outreach technologies are uncertain--as is the case with natural forest harvesting--applied research will be conducted to refine the approaches, before extending the new technology. Where technologies are known but must be adapted to new conditions, technical assistance will be provided to ensure that the activities are carried out in the optimal technical manner.

a. Watershed Management.

In as much as the watershed management initiatives of the project are follow-on activities to the earlier watershed project with CATIE, the watershed program is demonstrably feasible from a technical perspective. Contour planting, bench terracing and other techniques have all been widely used in the region and elsewhere.

b. Natural Forest Harvesting.

Research results in natural forest management in Central America are accumulating rapidly. More is now known about natural forest harvesting than is being applied in the field. CATIE, for example, has considerable technical capacity for natural forest management and silviculture. Further, CATIE's current projects in applied research are already responding to the growing demand for technical assistance.

c. Regional Plant Protection

To achieve sound pest control economically and environmentally requires the integration of several pest control tactics for each specific crop. A great deal of technical work in plant protection and integrated pest management has been carried out at regional research and education centers in Central America. These centers have already performed the types of activities involved in this project--research programs, degree and short-term training courses, technical bulletins and literature, and limited outreach programs.

C. Social Soundness Analysis

1. Socio-cultural Context

The Central American countries participating in the project--namely, Belize, Costa Rica, El Salvador, Guatemala, and Honduras--are physically, culturally, and economically diverse. When variations in urban and rural population densities, extent of industrial development, types of agricultural activities, and land tenure patterns are taken into account their socioeconomic and cultural variation is even more markedly pronounced, and the need to take their differences into account underscored.

2. Project Beneficiaries

Technically qualified personnel are critical to Project success, and persons receiving training are among the foremost project beneficiaries. Two components--environmental awareness education and bio-diversity conservation, and sustainable agriculture and forestry--provide for 80 masters and 80 bachelors degree candidates, and approximately 4000 participants in workshops, seminars, and short courses.

The number of direct beneficiaries will increase manyfold to the extent that the Project is successful not only in channelling its activities through participating private and public agencies, but also in acting as a catalyst for parallel projects through bilateral missions, and in generating information and technology within the project components. Beneficiaries will include all Central Americans exposed to media messages aimed at heightening awareness of environmental issues. Other direct beneficiaries will include persons who modify their agricultural techniques to promote sustainable natural resource use because that technology has been developed, refined, and disseminated through project-associated activities, frequently by persons who are themselves training beneficiaries. They would easily number in the hundreds of thousands.

Indirect Project Beneficiaries

Persons experiencing some benefit as a result of project intervention, whether they are aware of the intervention or not, are considered indirect project beneficiaries. This category includes persons experiencing improved water supply, decreased flooding, improved soil quality, and decreased toxic residues on fruits and vegetables, to give but a few examples. In short, the number of beneficiaries in the participating countries of Central America is large.

Watersheds span political boundaries; information crosses frontiers; preserved and properly managed forests provide fuelwood, lumber, and better quality air. Urban residents of all Central American countries and citizens of neighboring Central American countries not participating in the Project will be foremost among the indirect project beneficiaries.

Not only do Central Americans benefit when indigenous wildlife is protected and biodiversity preserved, but visitors and tourists are afforded views of nature that would not otherwise be available. Finally, future generations of Central Americans will benefit because resources sustainably managed today will preserve their rights to a patrimony tomorrow.

3. Participants in Project Development

The Project is designed to provide a framework of concerted action for Central American AID missions to assist host governments, regional educational institutions, and private, local, and international groups to strengthen their pursuit of environmentally sound policies and practices. To date representatives of CATIE, EAP, and various international, regional, and national NGOs, in addition to bilateral USAID missions have been consulted and have participated in several design workshops. Their views, concerns and recommendations have been actively solicited and incorporated as appropriate.

4. Socio-cultural Feasibility

While recognizing the relevancy and applicability of the environmental and natural resource management intervention strategies across countries, it is imperative that they be adapted to area-specific socio-cultural contexts to be fully effective. Distinctive patterns of landholdings, land use, traditional access to "common property resources", and gender roles and statuses further complicate an already complex patchwork of cultural variability for projects in given settings. The Project is designed to permit bilateral USAID missions, together with collaborating public and private institutions, to modify pilot projects and models to site-specific conditions to facilitate acceptance and success.

5. Impact

The ROCAP Project is intended to galvanize the Central American people into action to preserve their patrimony, assisted by bilateral USAID missions who, together with ROCAP, will work to mobilize international, regional, and local NGO activity toward that end. A spread effect of

ever-broadening proportions is anticipated as pilot projects are replicated, and parallel and complementary projects initiated through bilateral AID missions and regional and local NGOs.

6. Issues

The major socio-economic issues are a set of related concerns about outreach--specifically, that outreach activities of a specific project may most adversely affect marginal households which are disproportionately headed by women. This is essentially an implementation issue that must be taken into account in the design and execution of parallel projects by bilateral missions and other donors. These issues are nevertheless raised here, so that they may be more fully incorporated into field projects.

Project Impact and Marginal Households. Just as resource-scarce households are more likely to confront problems of scarcity on a day-to-day basis, so too will the solutions more directly affect them. Gender issues are of major importance here because women of marginal households frequently play pivotal roles in sustaining them. Especially in the short run, rural marginal households will experience severe limitations from project implementation via actions such as restricted access to "common property resources," expulsion from national lands used for "slash and burn" subsistence agriculture, displacement, and relocation.

Mechanisms will be put in place from the outset to monitor for such occurrences whether they are anticipated or not. Contingency plans will be developed. The issue is how to forestall marginal households' becoming a burden on society by seeking timely, viable economic alternatives.

Gender Specific Concerns. As already stated, gender issues take on added significance in marginal households. They can be of particular importance in indigenous households as well. In contrast with ladino culture, indigenous cultures more likely accord an economic role to women within the household. Before interventions in resource use are introduced, it is important to know traditional patterns of natural resource access and control to assess who the proposed interventions will affect. This requires collecting baseline data, monitoring once the intervention is in place, and anticipating strategies to be drawn upon should undesirable consequences occur.

Outreach. People need to become aware not only of why natural resource management and conservation is important but

what they can personally do about it. Outreach that provides that information is traditionally the weakest link. In this project the role of regional and national NGOs is critical. NGO extension and community development workers must be in a position to facilitate information flow and target technical information to their audiences selectively and more expeditiously than most public institutions have been able to in the past. This requires close coordination early on between the NGOs and the various agencies working with the technology to be transferred.

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D. Financial and Economic Analysis

1. Introduction.

Natural resources and the productivity of natural systems are critical elements for economic development. Economic development implies sustained increases in welfare derived from conventional goods and services, the production of which often requires natural resources and productive natural systems. Moreover, the environment directly provides services that contribute to increased welfare. At the same time, economic growth often is accompanied by increasing stress on natural systems and significant adverse effects on environmental quality. The central issue is to conduct development activities in a fashion that preserves the long-run productivity of natural systems for sustained development and that minimizes deterioration in environmental quality.

2. Financial Analysis Issues.

Since this is a regional institution building project there will be little or no direct financial benefits to the Project in terms of revenue. Under such circumstances least cost analysis is recommended by AID Handbook 3. In this case, there are no significant differences between an economic and financial least cost analysis. Even should benefits be quantifiable and some shadow price estimated, that information would not have any relevance to the financial analysis.

Another aspect of financial analysis is the individual or group financial effects of involvement with the Project. Again, while the Project will not in most cases directly deliver technology to target beneficiaries, ultimate success or failure of this Project in terms of reducing natural resource and environmental problems or preventing problems from developing will depend upon the ability and willingness of natural resource users to change their behavior. This is often a short-term financial decision by people who have few choices. Therefore, an essential element within the project components is explicit examination of the incentive and cost structures faced by resource users.

Finally, financial analysis should address the issue of the recurrent costs of the project. Two conclusions are reached on recurrent costs. First, the NGO activities of the Project, with matches to ROCAP funds, provide an excellent opportunity for continued funding of some project activities after project closure. There will also be NGO activities working with debt-for-nature swaps and user fees to support natural areas.

Second, the CATIE recurrent cost issues are currently being addressed and therefore funds are not presently being authorized for the institutional development component of the Project. Clearly neither CATIE nor the member governments of CATIE are currently capable of covering recurrent costs. Those governments are similarly unable to cover the recurrent costs of other development projects. These countries will be even less able to address long-term recurrent costs if their resource base is depleted by the continuation of non-sustainable resource use.

3. Economic Analysis Issues.

There are three groups of issues which shape the kind of economic analysis which is possible for this Project.

First, this Project focuses primarily on research, formal and non-formal training, demonstrations, coordination and technical support. The outputs from institution building are usually not quantifiable or only so in intermediate terms, for example, the estimated value of an M.Sc. to its holder. The effect of an individual with that degree on the economic and environmental variables of interest, improved watershed management, for example, is not readily quantifiable, even though we recognize the importance of human capital investment in order to reach desired, long-term goals. Thus both quantification and valuation are difficult.

Second, the regional approach further abstracts the line of causation between project activities and substantive changes in performance within the economic/natural resource system. If outputs were quantifiable the regional approach of the Project would require the analyst to assume a chain of events with implicit costs and benefits taken into account. Those implicit costs and benefits could be substantial but they would certainly be a guess. They do point, however, to the critical role of the USAID bilateral missions and host-country governments in the implementation of the Environmental and Natural Resource Management Strategy for Central America.

Third, analysis of environmental and natural resource sustainability projects will be ill served by a benefit-cost methodology which favors current consumption over conservation. Benefit-cost analysis is often weak in dealing with distributive issues but is even more so when addressing intergenerational distribution issues. The problem is compounded when the benefits are difficult to quantify due to lack physical information and/or have public good (or other non-monetizable) characteristics.

For these reasons least-cost analysis is used to examine the economic viability of the project. An extensive discussion of least-cost analysis as well as potential project benefits appears in the Financial and Economic Annex.

4. Least-Cost Analysis.

There are three fundamental conclusions in the analysis of the least-cost characteristics of this Project.

First, many of the problems of sustainable natural resource use in Central America are common to all the of countries in the region. Natural areas preservation, watershed management, integrated pest management, among others, can be successfully addressed through research and training by a regional institution such as CATIE which then disseminates the results to national institutions. This sharing of information can result in significant economies of scale as well as the provision of services which would not be provided because of the fiscal and budgetary problems of many of the countries in Central America. Thus a regional institution can build a critical mass of expertise that would not be possible on a national basis. Other economies can be achieved by training at the regional level in those areas of need where one training institution can meet the needs of the region. Should the same programs be attempted on a country by country basis fixed costs would increase significantly, if not on an order of magnitude equal to the number of countries attempting to provide these services.

Second, this is a project which is designed to provide the fundamental technological and human capital inputs to achieve a sustainable pattern of natural resource use. Such a goal represents a long-term process that requires the building of institutions which continue to generate the needed human capital and technology after the closure of the Project. Other alternative approaches, for example using only U.S. based university expertise, would not yield the same level of long-term benefits and are furthermore often costly in the short-term. Technical advisors hired through U.S. universities or consulting firms instead of CATIE or EAP would increase the cost of the Project by 6 to 12 million dollars or 200 % to 300 % of CATIE and EAP advisor staffing costs currently in the Project design.

Since many of the components of this Project are follow-on activities to existing projects or complementary to on-going projects with regional institutions, the incremental benefits should be compared to the relatively small incremental costs of

continuation of these activities or the complementarities gained from these activities. The institution building approach of this Project is appropriate within the sometimes very long time horizon needed to successfully develop and implement solutions* to Central America's environmental and natural resource problems.

Third, a number of the components of this Project are designed to include NGOs (non-governmental organizations) in various aspects of project implementation. By using NGO expertise, both U.S. and Central American, the Project improves the effort to develop local interest and capacity in the areas of environmental awareness, protected areas, and biodiversity. Furthermore, many of these activities will involve NGO matching contributions and thus increase the per unit effectiveness of the A.I.D. contribution. The target match rate is one to one. Once established with matching funds, these activities can be expected to continue after the termination of the Project.

5. Conclusion.

Typically projects need to be evaluated on a with and without basis. Failure to begin now the process of addressing the environmental and natural problems of Central America will result in a set of much more serious and costly problems in the future. The cost of re-establishing a productive resource base or, if possible, re-creating natural environments is significantly greater than preventing their loss in the first place. Some losses are irreversible, for example wildlife species. However, the costs and benefits of both the with and without situation are differently distributed across individual and groups. That reality will have to be considered throughout project implementation. Otherwise the Project will not succeed and the costs will increase both within and without the region.

E. Environment Assessment

The initial environmental evaluation (IEE) prepared for the Project Identification Document (Annex I.C) recommended a positive determination. Subsequently, an environmental assessment was carried out in accordance with AID guidelines. Compliance with recommendations in the assessment will be monitored as part of the scheduled RENARM evaluations.

It is expected that, overall, RENARM will have a significant positive impact on the human and natural environment of the region. The environmental assessment is presented in Annex III.F.

V. PROJECT IMPLEMENTATION

A. Administrative Arrangements

This section describes the administrative arrangements within the Project. Because RENARM involves activities with different cooperator groups, the overall responsibilities of ROCAP are described first, then the role of A.I.D. bilateral missions, followed by the relationship with private voluntary organizations, and finally that with regional institutions, such as CATIE and EAP.

1. ROCAP Responsibilities.

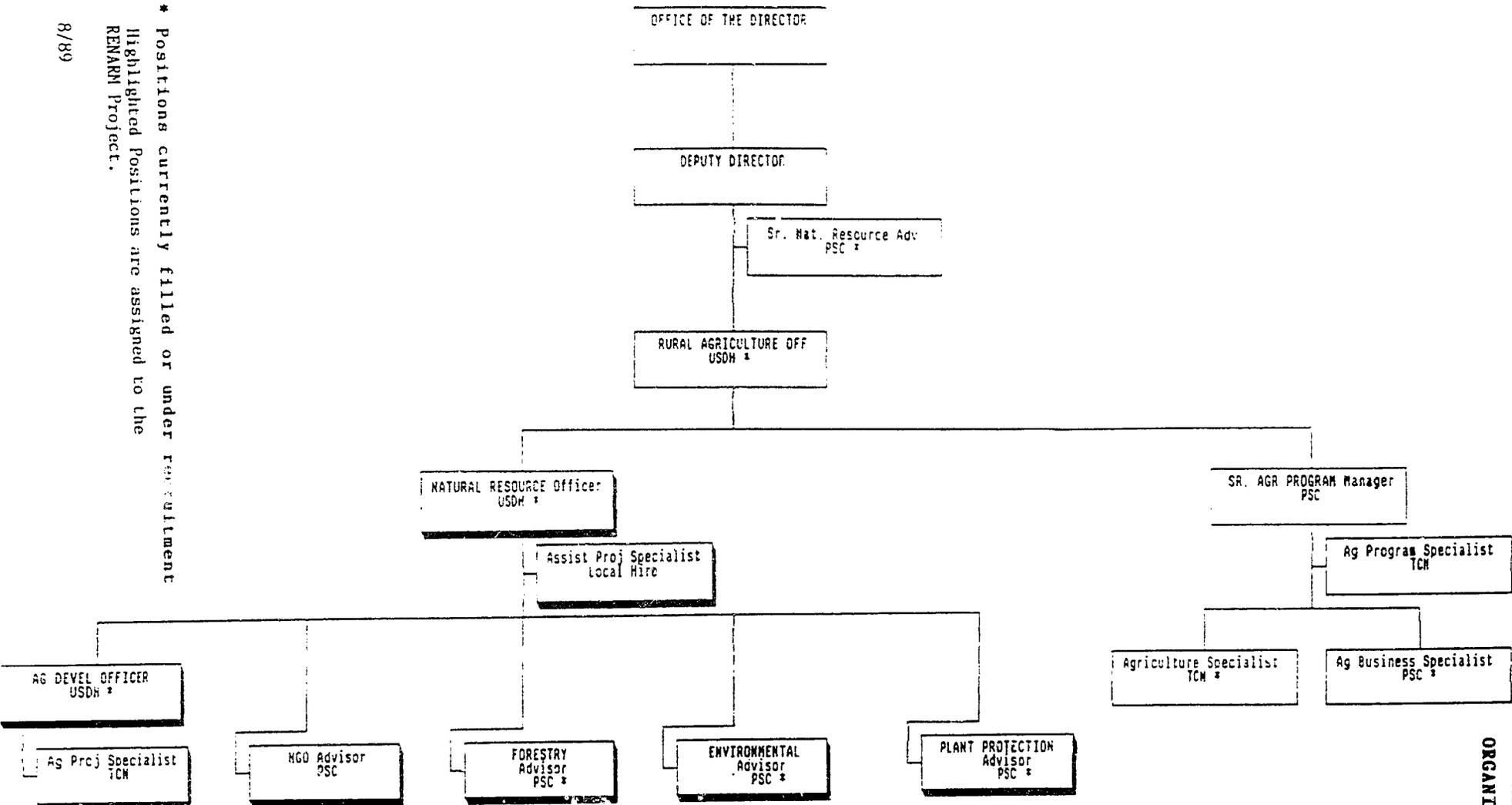
ROCAP's primary responsibility is to support bilateral USAID environmental programs with a combination of regional institutional programs and direct technical support. Where problems do not respect international boundaries, ROCAP will take the lead in developing regional networks, brokering programs, and ensuring that activities are closely coordinated with USAID bilateral efforts.

The ROCAP Regional Agricultural Development Officer (RADO) will be charged with overall oversight and guidance of the Project (See Table 1). He will be assisted by a Natural Resources Officer and a PSC project coordinator. This unit will be responsible for the daily implementation of the Project. In addition, the Project will support a technical advisory unit. This unit will comprise a senior environmental advisor, an NGO advisor, and a forestry advisor. In addition, a resident policy advisor will be provided by the institutional contractor that addresses policy targets. Each technical advisor will be supported by a contracted Central American professional in the same field.

The group of activities described under the sustainable agriculture component of the Project will be carried out by CATIE, located in Turrialba, Costa Rica and EAP, located in Zamorano, Honduras. CATIE will establish a program management unit (PMU) to support both CATIE and EAP from Turrialba given CATIE's lead position in Plant Protection and other areas.

The PMU will be appended to CATIE's organizational structure and staffed by project funded personnel. Project funding will also be provided for operating expenses, material, vehicles and equipment and other costs associated with managing the sustainable agriculture component of the Project. Substantive guidance will be provided by a USDH ROCAP Agricultural Officer, resident at CATIE.

TABLE I
Regional Environment/Natural Resources
Management Project
ORGANIZATION/KEY FUNCTIONS



* Positions currently filled or under recruitment
Highlighted Positions are assigned to the
RENAM Project.

Support for the Regional Plant Protection Advisor and Regional Environmental Management Advisor and staff will continue to be provided through ROCAP's Regional Agricultural Development Office in San Jose, Costa Rica. RADO/Costa Rica will be managed by a senior TCN regional agricultural development officer who will be assisted by a project funded assistant and local currency funded office staff.

The technical advisory unit will continue to provide direct assistance to the bilateral missions. The senior environmental advisor will assist in the area of environmental policy, the environmental advisor in the area of environmental impact assessment, the policy research advisor in the area of macro-economic policy, and the Plant Protection advisor in the area of pest management and pesticide control, and the forestry advisor in the areas of natural forest production and tree seed for farms. The NGO advisor will work in close collaboration with the project management unit in the implementation of the public awareness and reserves conservation activities, and will assist the USDH at Turrialba in the implementation of the CATIE outreach activities through private voluntary and other non-governmental organizations. In other words, these advisors are charged with ensuring that the RENARM activities complement and further bilateral actions in the areas of environmental awareness, reserves and bio-diversity, and sustainable agriculture.

2. Role of A.I.D. Bilateral Missions

The A.I.D. bilateral missions, to varying degrees, have established a set of projects directed towards natural resources management. These projects have created a baseline of experience in forestry, watershed, park, and pesticide management, which has improved A.I.D.'s ability to carry out E/NR projects in the region. In addition, the bilateral missions were requested by AID/W to develop country annexes for the RENARM Project to reflect how USAID projects will directly support the implementation of the A.I.D. LAC Central American E/NR Strategy.

As the RENARM Project requires a collaborative approach to implementation, bilateral Mission involvement will be crucial for the successful implementation of the E/NR Strategy. Due to the number and variety of project activities, ROCAP proposes to meet with USAID Missions initially on a quarterly basis to develop work plans and schedule and coordinate activities. The purpose of these meetings is to lay out proposed activities that complement

bilateral activities, identify new areas of concern and propose joint efforts including cost-sharing to address E/NR constraints. Implementing agencies (CATIE, USDA, NGOs) will be required to consult with USAIDs in the development of their work plans. The overall authority for approval of country plans activities, and selection of NGOs will be with the USAID Mission.

3. Non-governmental organizations (NGOs).

International NGOs, in partnership with national non-governmental organizations, will implement both the public awareness and park and reserve management activities under cooperative agreements with ROCAP. The cooperative agreement simplifies management, shortens response time, and allows a lead institution, in this case an NGO, to collaborate with other agencies in the provision of services necessary for the successful achievement of Project aims. Technical outreach activities will also be carried out largely by NGOs, in collaboration with the regional educational and research institutions. In these instances, the regional institution will enter into a relationship with the appropriate NGOs, either directly or through a consortium umbrella. In all this work, the international NGOs will work in partnership with national organizations. To begin this effort, ROCAP is currently negotiating an agreement with an international NGO to initiate work with local NGOs in the region. The purpose of this activity is to identify, with bilateral Mission support, national NGOs, which have the potential to become viable change agents. Once identified, the international NGO will support the institutional development of these NGOs through the provision of technical assistance in the preparation of country-specific strategies to develop natural resource management programs that sustain and increase current economic development.

The public awareness education and reserves conservation initiatives will be carried out as five distinct activities. One NGO or consortium will undertake the regional environmental awareness and education program; another will perform the regional strategic planning and policy activities; a third will strengthen regional training capabilities and regional environmental institutions; a fourth will strengthen regional wildlands management programs; and a fifth will strengthen regional conservation information and environmental monitoring. Although each activity set represents a distinct constellation of related activities, an NGO or consortium of NGOs might undertake more than one activity set. Regardless of the number of cooperators, all NGOs involved in this component activity will meet annually, as part of the evaluation process, to review together the progress achieved by each in its specific area.

4. Regional Institutions.

ROCAP will sign grant agreements with CATIE and EAP for the implementation of the sustainable agriculture activities. Each institution will assign a senior administrator to oversee the daily operation and auditing of the project at his or her institution. In addition, a director will be named by the institution for each component activity at the institution (e.g., watershed management, forestry, IPM). This activity director will be responsible for developing an outreach program that includes private-sector agencies and national NGOs, as well as the traditional public-sector agencies. The directors will collaborate in this activity in order to coordinate outreach initiatives. Further, the directors along with the ROCAP technical advisors will consult closely with the bilateral missions in the implementation of this activity in order to ensure mutually compatible efforts.

CATIE and EAP will each be responsible for the administrative arrangements for their training, research, and agency outreach activities. The senior administrator of each institution will oversee each component activity. The activity directors will actually manage and implement the activities in a timely fashion, supervise their staff and all consultants, integrate their activities into the overall programs at their institutions, serve as the liaison agents for all other agencies, seek additional support and collaborative agreements, and be jointly responsible for preparing and executing detailed work plans, and assuring that all component activities are effectively coordinated.

B. Cost Estimate and Financial Plan

This Project consists of technical assistance, the purchase of equipment, materials and supplies, training, policy analysis and research, travel and per diem and administrative support in the form of institutional overhead. The budget also includes a line item for evaluations and audits and a line item for contingencies and inflation. The implementation strategy calls for a project agreement with CATIE to administer its portion of the Project. There will also be a separate agreement with the EAP for administering a smaller portion of the Project in order to meet specific objectives. Also, agreements with NGOs will provide broader participation in the region. It is expected that NGOs and the USAID bilateral missions will contribute funds as well as in-kind contributions for administering various Project activities.

The grand total current estimated cost of the first 6 years of the RENARM Project is \$59,300,000 (excluding \$10.0 million in reserve), of which ROCAP will provide \$40,000,000, other bilateral Missions will represent approximately \$6,300,000 and \$13,000,000 is expected as a matching contribution from NGOs.

1/ The PID approval cable authorized ROCAP to develop a ten year program with initial funding of \$50 million over a six year period. The collaborative design process with the five bilateral Missions identified requirements totalling \$56.3 million, \$40 million of which is currently requested for authorization with bilateral buy-ins providing an estimated level of \$6.3 million. ROCAP wishes to reserve \$10 million for subsequent authorization for additional elements of the total program currently under design.

Project activities include interventions in the areas of sustainable agriculture, educational awareness, including the health considerations of a deteriorating environment, policy reform and bio-diversity. The proposed use of ARDN and PSEE accounts for funding project activities are evident and require no explanation of their use. However, the project does propose the use of EHR and HE funding during project implementation. Since the project includes various educational activities, EHR funds are being included in the project's funding. These activities will include the provision of educational materials for school children, mass media events and the training of environmentalists. The project also proposes the use of HE funding for Health activities; since the mass media events proposed will deal with the health considerations of polluted water sources and environmental contamination. Moreover, under the plant protection activity, a considerable focus will be on the health effects of the misuse of pesticides involving crop

production. Therefore, the project anticipates expenditures in the ARDN, PSEE, EHR and HE accounts. The financial mix contemplated is: \$20.0 million (ARDN), \$15.0 million (PSEE), \$2.5 million (EHR) and \$2.5 million (HE).

We anticipate that bilateral missions will buy services through ROCAP from CATIE, EAP and Earth in the form of technical assistance and training in the areas of plant protection, farm forestry, watershed management and production for natural forests. NGO activities under the Project will additionally provide missions with a unique vehicle for supporting national conservation efforts. ROCAP's contribution will comprise 67 percent of the grand total Project budget. Table No. 1 breaks down the budget by activity and Table No. 2 breaks down the budget by project inputs. Each of these tables further breaks down the ROCAP-funded portion by activity and inputs, as well as the bilateral funding of NGOs and grants by other donors.

The projection of expenditures by project year for ROCAP, NGO and bilateral missions are shown in Table 3. The methods of implementation and financing are detailed in Table 4. The detail budgets supporting the cost estimates for all components are contained in Annex II. D. All disbursements will be made in dollars to the implementing institutions. The implementing institutions will be required to convert dollars to local currency in order to meet local currency requirements. Conversion to local currency will be made at the highest exchange rate not unlawful at the time of the conversion.

1/ This assumes a 1:1 match. If AID/W decides to modify that requirement, the NGO contribution will be less. Due to this uncertainty, the \$13.0 million is not shown in the summary budget tables.

TABLE 1
BUDGET SUMMARY AND FINANCIAL PLAN BY COMPONENT
(\$000)

COMPONENT	ROCAP	A.I.D. AND OTHER DONORS	TOTAL
1. POLICY INITIATIVES AND TECHNICAL SUPPORT	<u>9,140</u>	400	<u>9,540</u>
ADVISORS	5,640	0	5,640
POLICY ANALYSIS	3,500	400	3,900
2. ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION	<u>9,000</u>	<u>4,000</u>	<u>13,000</u>
NGOs ACTIVITIES	9,000	4,000	13,000
3. SUSTAINABLE AGRICULTURE AND FORESTRY	<u>17,750</u>	<u>1,400</u>	<u>19,150</u>
PLANT PROTECTION	9,700	1,000	10,700
WATERSHED MANAGEMENT	4,390	400	4,790
PRODUCTION FROM NATURAL FORESTS	3,660	0	3,660
MONITORING, EVALUATIONS AND AUDITS*	806	0	806
INFLATION	1,652	261	1,913
CONTINGENCIES	1,652	261	1,913

TOTAL	40,000	6,322	46,322

* Mid-term evaluations incorporated in the budgets of Plant Protection, Watershed Management, and Production from Natural Forests

TABLE 2
BUDGET SUMMARY AND FINANCIAL PLAN BY INPUTS
(\$000)

INPUTS	ROCAP	A.I.D. AND OTHER DONORS	TOTAL
1. PERSONNEL	16,815	490	17,305
2. TRAINING	1,967	910	2,877
3. POLICY ANALYSIS AND RESEARCH	1,878	400	2,278
4. TRAVEL AND PERDIEM	1,239	0	1,239
5. EQUIPMENT	975	0	975
6. MATERIALS AND SUPPLIES	1,896	0	1,896
7. ADMINISTRATIVE SUPPORT (OVERHEAD)	2,009	0	2,009
8. EVALUATIONS AND AUDITS	917	0	917
9. NGOs ACTIVITIES	9,000	4,000	13,000
10. INFLATION	1,652	261	1,913
11. CONTINGENCIES	1,652	261	1,913

TOTAL	40,000	6,322	46,322

REGIONAL ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT PROJECT

ROCAP PROJECT No. 596-0150

Cost Estimates

Figures in US\$

ALL COMPONENTS

Line Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	ROCAP Total	AID & Other Donors illustrative	Project Total
PERSONNEL									
Technical Personnel	2,331,900	2,380,900	2,276,400	2,153,400	1,987,400	1,974,900	13,104,900	490,000	13,594,900
Support Personnel	454,460	449,660	446,660	438,860	452,060	433,460	2,675,160	0	2,675,160
Short Term TA	162,550	245,550	187,450	169,350	145,350	125,550	1,035,800	0	1,035,800
TRAINING									
M.S. Scholarships	157,000	304,000	246,500	246,500	216,500	121,500	1,292,000	350,000	1,642,000
Seminars and Workshops	85,600	193,600	130,100	120,600	58,100	86,600	674,600	560,000	1,234,600
POLICY ANALYSES and RESEARCH									
Policy Analyses	427,720	450,000	200,000	200,000	200,000	200,000	1,677,720	400,000	2,077,720
Research Grants	0	100,000	100,000	0	0	0	200,000	0	200,000
TRAVEL and PERDIEM									
Extra Regional	26,416	26,416	26,416	26,416	26,416	19,800	151,880	0	151,880
Regional	157,000	173,800	157,700	155,600	143,700	91,900	879,700	0	879,700
Local	12,440	27,000	37,000	45,000	45,000	41,000	207,440	0	207,440
EQUIPMENT									
Special Equipment	173,700	12,000	73,100	31,700	10,200	200	300,900	0	300,900
Vehicles	241,500	32,000	70,000	16,000	86,000	0	445,500	0	445,500
MicroComputers	103,500	500	3,000	51,000	9,000	2,000	167,000	0	167,000
Office Equipment	47,900	7,000	2,000	12,900	2,000	0	61,800	0	61,800
MATERIALS and SUPPLIES									
Maintenance of Equipment	26,885	29,360	36,665	41,700	47,060	47,170	228,840	0	228,840
Vehicles Operation	39,200	44,800	47,600	50,400	56,000	56,000	294,000	0	294,000
Office Supplies	32,300	37,300	42,300	39,900	39,900	31,300	223,000	0	223,000
Communications	25,500	31,500	31,500	31,000	31,000	31,000	181,500	0	181,500
Other Authorized Expenses	234,700	138,700	194,600	186,600	135,600	78,600	968,800	0	968,800
ADMINISTRATIVE SUPPORT									
CATIE's Overhead	263,711	345,579	327,397	293,480	249,891	211,745	1,691,804	0	1,691,804
EAP's Overhead	78,314	55,642	49,195	44,777	44,680	44,530	317,138	0	317,138
EVALUATIONS and AUDITS									
	100,000	151,606	262,124	151,606	246,782	5,000	917,118	0	917,118
NGOs ACTIVITY									
	140,000	1,870,000	1,860,000	1,745,000	2,045,000	1,340,000	9,000,000	4,000,000	13,000,000
INFLATION 4.5%									
	239,503	319,811	306,257	281,331	282,494	222,305	1,651,701	261,000	1,912,701
CONTINGENCIES 4.5%									
	239,503	319,811	306,257	281,331	282,494	222,305	1,651,701	261,000	1,912,701
TOTAL	5,801,303	7,746,535	7,118,220	6,814,450	6,842,626	5,386,865	40,000,000	6,322,000	46,322,000

REGIONAL ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT PROJECT
 ROCAP PROJECT No. 596-0150
 Cost Estimates
 Figures in US\$

Component No.1: POLICY INITIATIVES AND TECHNICAL SUPPORT

Line Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	ROCAP Total	AID & Other Donors illustrative	Project Total
PERSONNEL									
Technical Personnel	1,190,000	1,085,000	1,085,000	1,085,000	1,085,000	1,190,000	6,720,000	0	6,720,000
Support Personnel	102,000	102,000	102,000	102,000	102,000	102,000	612,000	0	612,000
Short Term TA	0	0	0	0	0	0	0	0	0
TRAINING									
M.S. Scholarships	0	0	0	0	0	0	0	0	0
Seminars and Workshops	0	0	0	0	0	0	0	0	0
POLICY ANALYSES and RESEARCH									
Policy Analyses	427,720	450,000	200,000	200,000	200,000	200,000	1,677,720	400,000	2,077,720
Research Grants	0	0	0	0	0	0	0	0	0
TRAVEL and PERDIEM									
Extra Regional	0	0	0	0	0	0	0	0	0
Regional	4,500	4,500	4,500	4,500	4,500	4,500	27,000	0	27,000
Local	0	0	0	0	0	0	0	0	0
EQUIPMENT									
Special Equipment	0	0	0	0	0	0	0	0	0
Vehicles	16,000	0	0	0	0	0	16,000	0	16,000
MicroComputers	10,000	0	0	0	0	0	10,000	0	10,000
Office Equipment	3,600	0	0	0	0	0	3,600	0	3,600
MATERIALS and SUPPLIES									
Maintenance of Equipment	1,480	1,480	1,480	1,480	1,480	1,480	8,880	0	8,880
Vehicles Operation	2,800	2,800	2,800	2,800	2,800	2,800	16,800	0	16,800
Office Supplies	5,000	5,000	5,000	5,000	5,000	5,000	30,000	0	30,000
Communications	3,000	3,000	3,000	3,000	3,000	3,000	18,000	0	18,000
Other Authorized Expenses	0	0	0	0	0	0	0	0	0
ADMINISTRATIVE SUPPORT									
CATIE's Overhead	0	0	0	0	0	0	0	0	0
EAP's Overhead	0	0	0	0	0	0	0	0	0
EVALUATIONS and AUDITS									
	0	0	0	0	0	0	0	0	0
TOTAL	1,766,100	1,653,780	1,403,780	1,403,780	1,403,780	1,508,780	9,140,000	400,000	9,540,000

REGIONAL ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT PROJECT
 ROCAP PROJECT No. 596-0150
 Cost Estimates
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Component No.2: SUSTAINABLE AGRICULTURE AND FORESTRY

Line Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	ROCAP Total	AID & Other Donors illustrative	Project Total
PERSONNEL									
Technical Personnel	1,141,900	1,295,900	1,191,400	1,068,400	902,400	784,900	6,384,900	490,000	6,874,900
Support Personnel	352,460	347,660	344,660	336,860	350,060	331,460	2,063,160	0	2,063,160
Short Term TA	162,550	245,550	187,450	169,350	145,350	125,550	1,035,800	0	1,035,800
TRAINING									
M.S. Scholarships	157,000	304,000	246,500	246,500	216,500	121,500	1,292,000	350,000	1,642,000
Seminars and Workshops	85,600	193,600	130,100	120,600	58,100	86,600	674,600	560,000	1,234,600
POLICY ANALYSES and RESEARCH									
Policy Analyses	0	0	0	0	0	0	0	0	0
Research Grants	0	100,000	100,000	0	0	0	200,000	0	200,000
TRAVEL and PERDIEM									
Extra Regional	26,416	26,416	26,416	26,416	26,416	19,800	151,880	0	151,880
Regional	152,500	169,300	153,200	151,100	139,200	87,400	852,700	0	852,700
Local	12,440	27,000	37,000	45,000	45,000	41,000	207,440	0	207,440
EQUIPMENT									
Special Equipment	173,700	12,000	73,100	31,700	10,200	200	300,900	0	300,900
Vehicles	225,500	32,000	70,000	16,000	86,000	0	429,500	0	429,500
MicroComputers	93,500	500	1,000	51,000	9,000	2,000	157,000	0	157,000
Office Equipment	44,300	7,000	2,000	12,900	2,000	0	58,200	0	58,200
MATERIALS and SUPPLIES									
Maintenance of Equipment	25,405	27,880	35,185	40,220	45,580	45,690	219,960	0	219,960
Vehicles Operation	36,400	42,000	44,800	47,600	53,200	53,200	277,200	0	277,200
Office Supplies	27,300	32,300	37,300	34,900	34,900	26,300	193,000	0	193,000
Comunications	22,500	28,500	28,500	28,000	28,000	28,000	163,500	0	163,500
Other Authorized Expenses	234,700	138,700	194,600	186,600	135,600	78,600	968,800	0	968,800
ADMINISTRATIVE SUPPORT									
CATIE's Overhead	263,711	345,579	327,397	293,480	249,891	211,745	1,691,804	0	1,691,804
EAP's Overhead	78,314	55,642	49,195	44,777	44,680	44,530	317,139	0	317,139
EVALUATIONS and AUDITS									
	0	0	110,518	0	0	0	110,518	0	110,518
TOTAL	3,316,197	3,431,527	3,390,321	2,951,403	2,582,077	2,088,475	17,750,000	1,400,000	19,150,000

NGO's ACTIVITIES
ENVIRONMENTAL AWARENESS, PROTECTED AREAS AND BIODIVERSITY COMPONENT

	Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
1	Plan and implement Regional Environmental Awareness and Education Programs							
	a. Develop Regional Strategy on Environmental Awareness	140,000						140,000
	b. Regional Mass Media Campaign		200,000	200,000	200,000	200,000	200,000	1,000,000
	c. Short Term EE/interp/communications Training		100,000	100,000	100,000	100,000	100,000	500,000
	d. Screening/Developing Stocks of Environmental Education Materials		120,000	30,000	30,000	30,000	30,000	240,000
	e. Planning and Implementation of Pilot Interpretation Programs		80,000	130,000	180,000	180,000	180,000	750,000
	f. TA Missions EE/Interp/Env. Communications		40,000	40,000	40,000	40,000	40,000	200,000
		140,000	540,000	500,000	550,000	550,000	550,000	2,830,000
2	Strengthen Regional Strategic Planning and Policy Formulation							
	a. Decision Maker Workshops		80,000	80,000	80,000	80,000	80,000	400,000
	b. Regional Monitoring of Env. Degradation		175,000			175,000		350,000
	c. Update Regional Environmental Profile					200,000		200,000
	d. Preparation of Policy Papers		40,000	40,000	40,000	40,000	40,000	200,000
	e. Preparation of Region Wildlife, Wildlands, and Coastal Zone Management Strategies		140,000	140,000		140,000		420,000
	f. Prepare/Maintain Protected Areas Directory & Biodiversity Profile and Prepare Atlases/Maps		70,000	20,000	70,000	70,000	20,000	250,000
	g. Technical Assistance on Policy Issues		40,000	40,000	40,000	40,000	40,000	200,000
		0	545,000	320,000	230,000	745,000	180,000	2,020,000
3	Strengthen Regional Training and Research Institutions							
	a. Clearinghouse for Faculty Exchanges, Scholarships, and TA		150,000	150,000	150,000	150,000	150,000	750,000
	b. M.S. Level Training in U.S. on EE/ Interpretation/Env. Communications		350,000	350,000				700,000
	c. Pilot Research Fund		120,000	120,000	120,000	120,000	120,000	600,000
		0	620,000	620,000	270,000	270,000	270,000	2,050,000
4	Strengthening of Regional Wildlands Management Programs							
	a. Pilot Protected Area/Buffer Zone Projects		200,000	400,000	600,000	400,000	400,000	2,000,000
	b. Short Term Training/Scholarships/ Newsletter		100,000	100,000	100,000	100,000	100,000	500,000
	c. Rapid Response Technical Assistance		40,000	40,000	40,000	40,000	40,000	200,000
		0	340,000	540,000	740,000	540,000	540,000	2,700,000

NGO's ACTIVITIES
ENVIRONMENTAL AWARENESS, PROTECTED AREAS AND BIODIVERSITY COMPONENT

	Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
5	Strengthening of Regional Conservation Information and Environmental Monitoring Capabilities							
	a. Survey of Regional Information Sources and Compilation of Existing Data		100,000	100,000				200,000
	b. TA to Improve/Standardize Data Collection/Analysis/Interchange		25,000	25,000	25,000	50,000	50,000	175,000
	c. Support to Installation/Strengthening of CDCs		75,000	50,000	75,000	25,000	25,000	250,000
	d. Preparation of Training Materials and Software Updates on Information Use		25,000	25,000	25,000	25,000	25,000	125,000
	e. Workshops on Conservation Data Quality Control, Analysis, Management and Utilization			30,000	30,000	40,000	50,000	150,000
		0	225,000	230,000	155,000	140,000	150,000	900,000
6	Strengthen Cooperative USG Programs with Central American Conservation Agencies							
	a. Interagency Agreement via USDA to access TA and Training Support via USFS, USNPS, USFWS, and Other Federal Agencies		200,000	200,000	200,000	200,000	200,000	1,000,000
	b. Operation Support for Projects Involving PCV's and Counterparts		100,000	100,000	100,000	100,000	100,000	500,000
	c. Prototype Conservation Corps Projects		100,000	150,000	300,000	300,000	150,000	1,000,000
		0	400,000	450,000	600,000	600,000	450,000	2,500,000
	SUMMARY OF ELEMENTS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
1	Plan and implement Regional Environmental Awareness and Education Programs	140,000	540,000	500,000	550,000	550,000	550,000	2,830,000
2	Strengthen Regional Strategic Planning and Policy Formulation	0	545,000	320,000	230,000	745,000	180,000	2,020,000
3	Strengthen Regional Training and Research Institutions	0	620,000	620,000	270,000	270,000	270,000	2,050,000
4	Strengthening of Regional Wildlands Management Programs	0	340,000	540,000	740,000	540,000	540,000	2,700,000
5	Strengthening of Regional Conservation Information and Environmental Monitoring Capabilities	0	225,000	230,000	155,000	140,000	150,000	900,000
6	Strengthen Cooperative USG Programs with Central American Conservation Agencies	0	400,000	450,000	600,000	600,000	450,000	2,500,000
	SUB-TOTAL	140,000	2,670,000	2,660,000	2,545,000	2,845,000	2,140,000	13,000,000
	LESS: Other Donors Illustrative Budget	0	(800,000)	(800,000)	(800,000)	(800,000)	(800,000)	(4,000,000)
	Total	140,000	1,870,000	1,860,000	1,745,000	2,045,000	1,340,000	9,000,000

<u>Component</u>	<u>Cooperative Agreement</u>	<u>HB 3 Project Agreement</u>	<u>PSC Contracts</u>	<u>PASA</u>	<u>Institutional Contract</u>	<u>TOTAL</u>
1. Policy Initiatives and Technical Support						<u>\$9,140,000</u>
a) Policy Initiatives					\$3,500,000	\$3,500,000
b) Technical Support			\$5,640,000			\$5,640,000
<hr/>						
2. Environmental Awareness, Education and Biodiversity Conservation						<u>\$9,000,000</u>
a) Regional Strategic Planning	\$1,000,000					\$1,000,000
b) Regional Environmental Awareness	\$2,800,000					\$2,800,000
c) Environmental Training	\$1,100,000					\$1,100,000
d) Regional Wildlands Management Conservation	\$1,600,000					\$1,600,000
e) Conservation Information	\$ 500,000					\$ 500,000
f) USG Technical Assistance				\$2,000,000		\$2,000,000
<hr/>						
3. Sustainable Production						<u>\$17,750,000</u>
a) Watershed Management		\$4,390,000				\$4,390,000
b) Natural Forests		\$3,660,000				\$3,660,000
c) Plant Protection						
1) CATIE		\$7,000,000				\$7,000,000
2) EAP	\$2,700,000					\$2,700,000
Evaluation					\$ 806,000	\$ 806,000
Inflation						<u>\$1,652,000</u>
Contingencies						<u>\$1,652,000</u>
TOTAL						<u>\$40,000,000</u> =====

C. METHODS OF IMPLEMENTATION AND FINANCING

The required assessment of the methods of implementation and financing is based on ROCAP prior experiences with CATIE. The assessment indicates that there will not be a departure for EAP from the preferred methods of financing. Quarterly advances will be made from ROCAP to CATIE, EAP, and the NGOs. All the institutions must submit a quarterly expenditure fiscal report accounting for funds previously advanced prior to receiving a subsequent quarterly advance.

The following Table 4 indicates that all methods of implementation and disbursement are in accordance with the preferred methods.

PROJECT REPLICABILITY

AID handbook 3, App. 3D provides guidance for the analysis of non-commercially operated projects; specifically it reads: "many AID projects are aimed at and designed for improving socio-economic infrastructure of the country. Projects in education, health, family planning and even in agriculture (e.g. research and extension) often do not generate any revenues or, if any, insufficient revenues to cover the costs of the project. Financial justification of such projects in the traditional financial internal rate of return terms is not possible and is unnecessary". Therefore, for this non-commercially operated project an analysis of the cost structure is required.

It is difficult to predict at what level CATIE will be able to continue project funded activities after ROCAP assistance terminates since untied financing is always difficult to project. This will only be possible to estimate during the planned in-depth evaluation of the project in year 5.

The above concept also applies to counterpart contribution. CATIE does not presently have large income-generating programs to cover its core budget and project budgets. Most of the counterpart will be in the form of in-kind contributions. That is, CATIE will provide all the necessary support so the projects will successfully accomplish their targets. The evaluation scheduled for year 5 will also address this issue.

TABLE 4
Methods of Implementation and Financing
Figures in US\$000,000

<u>LINE ITEM</u>	<u>IMPLEMENTATION METHOD</u>	<u>FINANCING METHOD</u>	<u>AMOUNT</u>
<u>PERSONNEL</u>			
Technical	ROCAP Direct Contract/PSC Institutional Procedures/PSC	Direct Pay Advance/ Reimburs.	\$ 6.7 \$ 6.4
Support	Institutional Procedures/PSC	Advance/ Reimburs	\$ 2.7
<u>TECHNICAL ASSIST</u>			
Short Term	Institutional Procedures/ Profit Making Contractors	Advance/ Reimburs	\$ 1.0
<u>TRAINING</u>			
M.S. Scholarships	Place by Mission/Direct Placement	Direct Payment	\$ 1.3
Seminars & Workshops	Institutional Procedures/ Contractor or Institutional	Adv/Direct Payment	\$ 0.7
<u>POLICY ANALYSIS & RESEARCH</u>			
Policy Analysis	ROCAP Procedures/RFP	Direct Pay	\$ 1.7
Research Grants	ROCAP Direct Contract/Contractor or Institutional	Direct Pay/ Reimburs	\$ 0.3
<u>TRAVEL & PERDIEM</u>			
Int'l & Local	Institutional Procedures/ Separate Invoices	Advance	\$ 1.2
<u>EQUIPMENT</u>			
Special Equipment, Vehicles, MicroComputers, Office Equipment	Institutional Procedures/ Bids/Purchase Orders/ Separate Invoices	Advance	\$ 1.0
<u>MATERIAL & SUPPLIES</u>			
Operating Expenses	Institutional Procedures/ Purchase Orders/Combined invoices/Separate billing.	Advance/ Reimburs	\$ 1.9
<u>ADMINISTRATIVE SUPPORT</u>			
Overhead	Institutional Procedures, OMB circular/Audit Report	Reimburs	\$ 2.0
<u>EVALUATIONS & AUDITS</u>			
	ROCAP Direct Contract/ Profit Making Contractor	Direct Payment	\$ 0.9
<u>NGOs ACTIVITIES</u>			
	US, NGOs/Miscellaneous Grant & Coop. Agm PASA Agreements	Advance/ Reimburs Reimburs	\$ 7.8 \$ 1.2
<u>INFLATION & CONTINGENCIES</u>			
	-----	-----	\$ 3.2
USAID BUY-INS			\$ 6.3
	Total		<u>\$46.3</u>

The following section summarizes inputs by component and the various cost elements that comprise each one.

1. Policy Initiatives and Technical Support

Advisors: Under this element, ROCAP is funding a Project Manager, an Environmental Advisor, a Plant Protection Advisor, a Forestry Advisor, a Senior Natural Resources Advisor, and a Coordinator for NGO activities. The staff is supported by four Central American Senior Advisors and Secretaries. Logistical support will be provided by ROCAP. Total budgeted cost for the life of Project amounts to \$5,640,000.

Policy Initiatives: This element has three sub-elements, a PSC Policy Research Advisor supported by a Central American Advisor, a policy inventory element funded through AID/W APAP project, and technical assistance through a U.S. educational institution to perform policy analysis. The total budgeted cost for the life of the project is \$3,900,000 which includes \$400,000 that is budgeted to come from other bilateral missions for local seminars and training activities.

2. Sustainable Agriculture and Forestry

Watershed Management: During the six-year LOP, ROCAP will provide \$4,390,000 with \$400,000 programmed from other donors or bilateral missions. This element will include seminars, workshops, technical assistance and training. Salaries of technical personnel and the cost of 25 scholarships will absorb most of the remaining funds.

Production from Natural Forests: ROCAP has programmed \$3,600,000 for this activity. Resources will be used to finance technical personnel, training and equipment.

Plant Protection: This component will be implemented by CATIE in Costa Rica, and the Escuela Agricola Panamericana (EAP-Zamorano) in Honduras. CATIE will implement a total of \$7,720,000 and EAP will implement \$2,980,000. ROCAP is funding technical personnel, special equipment, and \$155,000 for the construction of a building to be used as a laboratory.

3. Environmental Awareness, Education, and Bio-diversity Conservation

NGO Activities: The budget for this component totals \$13.0 million of which ROCAP will provide \$9.0 million and \$4.0 million from the bi-lateral Missions and other donors.

4. Other Project Budget Elements

Administrative Support (Overhead): The Project budget incorporates overhead amounts which are provisional.

CATIE does not have a methodology to compute an overhead rate applicable to any contract with different suppliers of funds. Using ROCAP funds, an overhead audit is being contracted, and it is expected that the final report will be ready prior to the signature of the agreement. In any event a provisional overhead rate of 15% was used for budget purposes. In the case of EAP, a provisional rate of 15% has been used for budget purposes. The rate will be audited to assure that ROCAP shares a reasonable portion of the indirect cost pool.

Both provisional overhead rates were computed using the Project Direct Cost Base without considering capital costs such as special equipment, vehicles, computers, office equipment; and scholarships that are actually income for the institutions. Should the resulting overhead rate be higher than the budgeted, the Contingencies line item can be reprogrammed to cover the increase.

Contingencies and Inflation:

Inflation allowance was estimated at 4.5%, a rate that approximates the inflation rate in the United States. Most of the local procurement will occur in Costa Rica, a country that has a system of minidevaluations of the Colon to compensate for differences in inflation rates between Costa Rica and its main trading partners.

Contingencies were estimated at 4.5% of annual expenditures without including the inflation factor. The amount for contingencies is intended to cover all those expenses that cannot be adequately estimated at the beginning of the project. In order to keep control of expenditures, it will be required that the implementing institutions submit an annual budget that will be used to earmark and commit funds at the beginning of each year for anticipated activity in the follow-on budget year.

Evaluations, Audits and Financial Reviews: The major evaluation will be conducted in year 5 to determine the success for future funding beyond current life of project. Funds have been provided for mid and end of project audits to be performed under the IQC for non-federal audits controlled by the Inspector

General's Office. The Mission Controller's Office will conduct annual financial reviews either under the IQC mechanism or utilizing Controller's in-house financial analyst personnel. In addition, it is expected that the major implementing institutions, CATIE and EAP as well as the NGOs will undertake independent external audits on an annual basis and submit the audit reports to the Mission Project Manager and the Mission Controller.

Justification for Code 941

The Regional Environmental and Natural Resources Management Project (596-0150) requires the strengthening of key regional institutions with indigenous talent and participation by qualified personnel from throughout the developing world to allow for the successful execution of the Project, which is designed in part, to promote the expertise of the LAC Region. To satisfy this requirement, the list of countries eligible to supply the professional talent for the Project should include, in addition to Central America and the U.S., the other countries in A.I.D. Geographic Code 941.

Regional agricultural institutions in Central America serving the entire LAC Region will be supported, through the Project, to continue to provide the educational, research, and outreach programs in support of the objectives of the Project. Key local institutions, participating in the Project, are currently staffed with qualified (MSc. and Ph.D.) Spanish speaking professionals from Central and South America and other developing countries. Nationals from Central America, South America, other developing countries and the United States form the pool of required talent to fill staff research and teaching positions. Experience with current A.I.D.-funded projects shows that the number of available and qualified graduate level professionals from Central America is not sufficient to assure the availability of qualified long term staff for the technical skills required. Expanding the pool of professionals beyond Central America and the U.S. to include other countries in A.I.D. Geographic Code 941, in particular, other Latin American countries, will permit the recruitment for the Project of more Latin American nationals and of other qualified personnel from other developing countries which, in turn, will increase the indigenous expertise of the LAC region in the relevant technical areas, will assure the continuation of improved research and educational programs in the region, and will result in a better qualified and a more responsive talent pool to implement the Project.

In addition, expanding the list of countries eligible to supply professionals will enhance the quality of the research conducted under the Project. Generally, research and educational institutions are required to draw on the widest array of talent in order to create quality programs. For example, recruitment and selection of faculty and research staff for the United States is worldwide. Expanding the search beyond Central America and the U.S. will reduce the possibility of intellectual inbreeding (graduates from the same university filling staff positions), anathema to high quality, long term research and education programs.

D. Implementation Plan

1. Overview of Implementation Arrangements

The RENARM Project will build upon ongoing efforts and initiate new ones, requiring an approach to implementation which is complex and challenging. Initial implementation activities in FY 1989 will focus on continuity of ongoing activities with CATIE, and during the first six months of FY 1990, recruiting the core U.S.-hire management and technical team. By the second semester of FY 1990, most technical, managerial and support staff and NGO or PASA agreements will be in place, as well as the final design elements for the private sector action in Plant Protection and Seeds for Farm Forestry activities and for the Institutional Development Component.

The Project will be partly implemented through a HB 3 Project Agreement with CATIE, with the initial '89 obligation to support the Watershed and Plant Protection activities. Additionally, FY89 funds will be obligated for ongoing PSC contracts for the Watershed, Forestry and Pest Management Technical Advisors. One new activity will be launched through a pre-implementation buy-in (using an '89 OYB transfer) to the AID/W Agricultural Policy Analysis Project (APAP) to initiate work on the policy inventory.

In FY 90, three new PSC advisors and their supporting assistants and staff will be contracted, including the RENARM Project Manager, the Policy Advisor and the NGO Advisor.

Also in FY 90, there will be a cooperative agreement with EAP (Zamorano) for its role in the plant protection aspect of the Sustainable Production Component. A Project Implementation Unit, under the leadership of a USDH Ag/RD Officer, will be established at CATIE/Turrialba to manage this component. The Environmental Awareness, Education and Bio-diversity Conservation component will be implemented through Cooperative Agreements and PASAs. The Cooperative Agreements with NGOs will require the preparation of five RFAs for competitive bidding and award. ROCAP will utilize PD&S funded short-term contract assistance to help prepare these documents, which will be vetted with USAID representatives at a November planning conference. ROCAP will enter into PASA arrangements with Peace Corps for the Prototype Conservation Corps Activity and with USDA/OICD for technical assistance on wildlands management and other areas discussed in part 3 of this section.

The Project Implementation Plan for the first year of execution is detailed below. The plan concentrates on the management and administration requirements for the initiation of activities. It is based on the achievement of pre-implementation activities by ROCAP, and on close planning collaboration with bilateral missions. Annex II. B contains a six year implementation schedule by project component.

2. RENARM First Year Implementation Events

<u>DATE</u>	<u>EVENT</u>
PRE-IMPLEMENTATION ACTIVITIES	
July 15, '89	Management Assistance to CATIE
July 15, '89	Policy Inventory Buy-in to APAP Completed.
Aug. 15, '89	Detailed Procurement Plan.
Aug. 15, '89	Short-Term Contract Assistance Hired
Aug. 30, '89	World Wildlife Fund Grant executed
IMPLEMENTATION ACTIVITIES	
Sept. 15, '89	Project Agreement Signed
Sept. 15, '89	Funds Obligated for 4 Current PSC Advisors
Oct. 1, '89	Project Implementation Letter No. 1
Oct. 15, '89	SOWs Prepared and Advertised for 3 Additional Advisors.
Nov. 1, '89	Initial CPs Met by CATIE
Nov. 1, '89	SOWs Prepared for PASA and NGO Activities.
Nov. 1, '89	Private Sector Pesticide Activity Designed
Nov. 1, '89	First ROCAP and Bi-lateral Coordination Meeting.
Dec. 1, '89	Seeds for Forestry Production Component Designed.
Jan. 15, '90	Recruitment of 3 Advisors Completed
Feb. 1, '90	First PP Amendment (Seeds and Pesticide).
March 1, '90	Arrival of 3 Advisors
March 15, '90	RFP for Policy Component Completed.
April 15, '90	Evaluation of Proposals for NGO Activities Completed.
April 15, '90	Recruitment Initiated for Central America Professional and Support Staff.

May	1, '90	Second ROCAP and Bi-lateral Coordination Meeting
May	1, '90	NGOs Selected to begin Work.
July	1, '90	Institutional Development Component Designed.
Aug.	15, '90	Central American Strategy Review (Annual Event).
Aug.	15, '90	Central America Professional and Support Staff on Board.
Sept.	1, '90	Second PP Amendment (Institutional Strengthening).

3. USG Technical Assistance

For more than two decades, U.S. government agencies have provided technical assistance and training to Central American conservation agencies. Under the terms of the Western Hemisphere Convention on Nature Conservation, and recent amendments to the Foreign Assistance Act, the National Park and the Fish and Wildlife Services of the U.S. Department of the Interior have seconded trained personnel to assist in park planning and to serve as instructors in training courses on wildlife and wildlands management. Both have also organized courses, seminars, and in-service training in Central America and the U.S. Both have prepared training manuals in Spanish, and both have played a major role in the evolution of wildlife and wildlands conservation in the region. The U.S. Department of Agriculture Forest Service has provided similar technical assistance and training. The Peace Corps has played a fundamental role in protected areas and wildlife management and in environmental education. Currently, there are some 200 PCVs in the region who are assigned to environmental activities. Other USG agencies have also provided assistance. NASA has provided remote sensing technologies for forest mapping, and NOAA has sponsored training on marine reserve management. The Smithsonian Institution has supported marine research, and offers numerous courses and internships on zoo and museum management, exhibit design and maintenance, and wildlife management. Accessing these USG resources directly will greatly facilitate project implementation.

Funds will be provided to the existing AID-USDA/OICD PASA to undertake a number of activities in technical assistance and training. Technical assistance from USG conservation agencies would be appropriate for the pilot protected areas and

interpretive programs. Scholarships can be provided for Central Americans to attend international short courses in such areas as wildlife and wildlands management, extension program reform, environmental communications, and forest management. In-service training visits to U.S. protected areas can be facilitated through this mechanism. Finally, USG personnel can be seconded for short-term technical assistance missions, and to serve as instructors in training events sponsored by Central American organizations, by international PVOs, and by regional universities and research centers.

Definition of specific training and technical assistance activities will be coordinated by the RENARM Project Manager and the ROCAP technical advisor in charge of overall implementation of the NGO activities.

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E. Monitoring and Evaluation Plan

1. General Purpose and Approach

Monitoring and evaluating will be continuous processes during the six years of Phase I, and are intended to serve the E/NR Strategy and Program as well as the RENARM Project. The overall purposes are: (1) to measure progress toward achievement of outputs, effects, and impact and to propose needed corrective actions; (2) to facilitate linkages, meshing, and mutual reinforcement between and among the project's several components; (3) to build accountability into ongoing project actions; (4) to facilitate coordination between RENARM and bilateral ENRM programs or projects; and (5) to build the evaluation capacity of institutions and national counterparts who participate in project implementation. In ROCAP's role as secretariat for the regional E/NR program, data that track the effects of the efforts of the six A.I.D. missions will be gathered.

This monitoring and evaluation process should be both summative and formative, and it should be decision-driven, rather than purely knowledge-driven or compliance-driven. It should sum up what has happened and draw lessons learned, e.g., conclusions as to RENARM goals, purposes, and the effectiveness of actions taken. It should formulate these lessons as analytical information for future redesign and for the inclusion of new elements in the Project.

The M&E system will be based on a set of agreed-upon key indicators, appropriate for each stage of the Project (startup/organization; specific outputs, effects, and impact). These indicators will be formatted along the lines of LAC Objective Six of the Action Plan process and drawing on each USAID Mission's annual Action Plan reporting under that objective. They will reflect both the programmatic or technical objectives of the Project, and the institutional development objectives. These will be used for oversight of Project progress against plans, and provide the basis for evaluations and special studies. The indicators will be related to strategic action plan level objectives, and efforts will be made to integrate them with the management information needs of participating institutions.

Monitoring and evaluation in most instances will use the collaborative mode, with highly selective participation of non-Project personnel as external evaluators or as evaluation facilitator/trainers. Contract evaluators will be used when

specialized or comparative expertise is required, or to look at sensitive institutional or teamwork issues. In most instances, external evaluators will work with those implementing the project to share knowledge, sum up what has happened and the causes for identified outcomes, draw conclusions about coming project directions or actions, and generally make the Project and the overall program work better. The emphasis will be on repeating success.

2. Specific Monitoring and Evaluation Actions

Over the first six years, all of the following actions will occur:

- a) Establish a set of key indicators of progress/impact with each grantee or cooperating institution, and maintain/revise en route.
- b) Prepare and review yearly work plans and twice-yearly progress reports.
- c) Provide periodic short-term technical assistance (TA) in support of the design/redesign of parallel bilateral projects and the meshing of RENARM project actions.
- d) Conduct annual reviews of regional and bilateral progress on implementing the AID Central America Strategy for Environment and Natural Resources Management.
- e) Conduct periodic impact assessment studies of specific, selected project actions, and of combined effects of the regional strategy.
- f) Conduct a major evaluation in Project Year 5.
- g) Conduct annual external audits.

In most instances workshops and seminars will be used to define monitoring or study requirements (who needs what information for what decision; how data shall be collected), followed by data collection and summary analysis. This will be fed into workshops and retreats featuring the collaborative participation of project staff, supported by the limited participation of external evaluation facilitators/analysts, and leading to followup action plans. The emphasis will be on decisions and

action, with reports serving to document the process, the data, and the results of each exercise. For events that are organized to review progress of the regional program, USAID mission representatives will participate, helping to assess data, draw conclusions, and plan followup actions.

3. Products and Deliverables

More specifically, the major M&E efforts will include:

a. **Key indicators:** In order to have a coherent approach to the formulation and tracking of key indicators in this complex Project and Program, ROCAP will contract a consulting firm with evaluation expertise and demonstrated skills in the collaborative evaluation mode, rapid assessment techniques, and decision-driven information and evaluation systems. Expertise of PPC/CDIE will also be tapped as appropriate. The firm will work with ROCAP and the various grantees to identify key indicators of startup progress, output accomplishment, and effects or impact. They will also work with bilateral missions, holding such seminars or workshops as may be needed, to gain broader understanding and adoption of the key performance indicators approach as it may relate to the regional strategy for ENR management. Initial Key Evaluation Indicators can be found in Annex III. F.

b. **Annual Workplans/Semi-Annual Progress Reports:** under the direction of RADO, the Natural Resources Officer will prepare an annual implementation and financial workplan. The Natural Resources Officer will request annual workplans from RENARM component managers, and base his overall annual implementation plan on these. Each workplan will include a number of operational targets and activities geared to the limited number of key performance indicators as well as others to be monitored at the technical management level.

Using the same approach as for the annual workplans, twice-yearly reports of progress toward component and overall goals will be prepared. In addition to reporting the status of activities and outputs, these progress reports should highlight accomplishments, identify major problems or delays (and actions proposed to resolve them), report lessons learned and recommend future project directions, using the specific performance indicators.

c. **Support to Bilateral ENRM Actions; Meshing and Reinforcing RENARM Actions:** RENARM is the regional program to implement aspects of the AID Environment and Natural Resource

Management Strategy for Central America. Implementation of the Strategy is premised upon collaborative bilateral actions. Under the direction of the RENARM Natural Resources Officer, the Project will provide periodic, ad hoc, or ongoing TA services to bilateral USAID missions, to support the design of related bilateral ENRM projects, and to integrate bilateral and regional ENRM programs and projects. Short-term TA in monitoring may also be periodically provided to project components for design and integration.

TA provided in this way should be collaborative in nature, utilize round-table meetings and mini-workshops with involved RENARM staff-beneficiaries, and rely on non-project staff only to coordinate and report.

d. Annual Strategy Reviews: These reviews will be an opportunity for the Bureau and the Central America USAID missions to look at the broad picture of actions being taken by AID, other donors, the national governments, and the NGO sector. These reviews will enable project officers to move forward on the key elements of the Agency's ENRM strategy. They will be a means of making sure that the strategy does not become a shelf document, and may, by PY 3 or 4, lead to an update or revision of the Strategy. The M&E contractor will act as the secretariat for these meetings.

e. Periodic Special Studies - Impact Assessments: To assess the impact of specific project actions, and at the direction of the RENARM Natural Resources Officer, periodic special studies will be undertaken. Keyed to the EOPS-indicator variables, these studies will measure the impact of project actions, specific to particular components that may be at an important turning point, assess the relative efficacy of alternative actions designed to meet EOPS, and conclude as to the direction of future project actions to make it better. RENARM overall project management may also be a subject of assessment.

Performance and accountability should be key foci of these studies. They should be collaborative in nature, utilize round-table meetings and mini-workshops with involved RENARM staff-beneficiaries, and rely on non-project staff only to direct the studies and to write portions thereof.

f. A Major Evaluation in Year 5: The major RENARM evaluation will be conducted by a team of external evaluators, in close collaboration with project personnel during PY 5. This should report successes, lessons learned, discarded

ideas, and focus on the design of RENARM Phase II. Workshops to decide on key program, management, and institutional issues will be used to define the scope of the evaluation, and USAID and LAC Bureau views will be solicited. Specific performance indicators will be measured.

g. Periodic Review of Indicators: The performance indicators will be such a key element of this process that they will need to be reviewed, revised, and/or added to with experience during the project, including implementation experience, and use of the indicators by key decision-makers and other receivers of project information. The consulting team that is contracted at the startup of the project will be brought back at least once a year to review the indicators' validity in terms of taking the pulse of the project, how and by whom the information is used, the cost and effectiveness of data collection methods, and any other concerns or new proposals that may emerge.

h. Annual Audits: Annual audits are discussed under the financial plan/management section of the PP.

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REGIONAL ENVIRONMENTAL AND NATURAL RESOURCES MANAGEMENT

PROJECT PAPER (PP) ANNEXES

TABLE OF CONTENTS

<u>ANNEX</u>	<u>I. Legal Exhibits</u>	<u>Pages</u>	<u>Format</u>
*	A. PID Approval Message/DAEC Guidance	6	Cable Copy
*	B. Statutory Check List	18	Doc. Copy
	C. Environmental Determination	8	Doc. Copy
*	D. Draft Project Authorization	2	WANG Diskette 2
 <u>ANNEX II. Technical Exhibits</u>			
	A. Logical Framework	32	WANG Diskette 2
	B. Implementation Schedule	26	WANG Diskette 2
	C. Contracting/Procurement Plan	5	WANG Diskette 2
	D. Project Budget Estimates	34	LOTUS Diskette 1
*	E. Project Advisors - Job Descriptions	9	WANG Diskette 2
 <u>ANNEX III. Project Analyses</u>			
*	A. Institutional Analysis	8	WANG Diskette 2
*	B. Technical Analysis	21	WANG Diskette 2
*	C. Social Soundness Analysis	10	WANG Diskette 2
*	D. Financial and Economic Analysis	23	WANG Diskette 2
*	E. Environmental Assessment	28	WANG Diskette 2
*	F. Donor Programs in Central America	11	and Doc. Copy
	G. Evaluation Indicators	5	WANG Diskette 2
	H. Country Annexes		
	Belize	17	Doc. Copy
	Costa Rica	19	Doc. Copy
	El Salvador	20	Doc. Copy
	Guatemala	25	Doc. Copy
	Honduras	27	Doc. Copy

* ROCAF Bulk Files

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

LAC-IEE-89-38

ENVIRONMENTAL THRESHOLD DECISION

Project Location : CA Regional

Project Title : Regional Environmental and
Natural Resources Management
(RENARM)

Project Number : 596-0150

Funding : \$50 million

Life of Project : Six years (FY 89-94)

IEE Prepared by : Frank Zadroga
ROCAP/San Jose

Recommended Threshold Decision : Positive Determination

Bureau Threshold Decision : Concur with Recommendation

Comments : An Environmental Assessment for
the project will be carried out
focusing on issues identified in
the IEE and EA Scoping Exercise,
including pest and pesticide
management, and natural forest
management.

Copy to : Nadine Hogan, Director
ROCAP/Guatemala

Copy to : Ron Curtis, ADO,
ROCAP/Guatemala

Copy to : Frank Zadroga, ROCAP/San Jose

Copy to : Alex Sunderman, LAC/DR/CEN

Copy to : IEE File

James S. Hester Date APR 18 1989
James S. Hester
Chief Environmental Officer
Bureau for Latin America
and the Caribbean

H. ENVIRONMENTAL ANALYSIS

ROCAP has recommended a positive determination and plans to carry out an assessment of the environmentally sensitive activities of the project. While the primary objective of the project is to promote improved natural resources management and environmental protection, certain activities have the potential for significant impact if appropriate technologies, mitigative measures and monitoring are not made an integral part of the design. The following paragraphs outline the analytical framework that will be used to carry out the EA as part of the project paper design.

Three of the project components are intended to have only positive environmental effects and will have little or no impact on the natural or human environment.

Strengthening the Capability of Key Regional Institutions

1. Development of the regional and national institutions in priority areas (to carry out research, and provide technical assistance, training and database/information services);

Technical Support to Protect and Manage Natural Resources and the Environment

2. Natural Resource Policy Initiatives and Technical Support; and
3. Public Awareness, Education and Information.

These elements of the project will be carefully designed to maximize their positive environmental impact and cost effectiveness and will not be subject to direct analysis as part of the environmental assessment.

Other project components will lead to the implementation of certain actions that have the potential for significant impact. These actions and the principal environmental issues associated with each one are outlined below. These issues will be analyzed as part of the component design activities, and an environmental assessment will be presented as a technical annex to the project paper indicating what mitigative measures and controls are to be implemented to assure environmental soundness.

<u>ACTIVITY</u>	<u>OBSERVATIONS</u>
Pest/Pesticide Mgmt. Procurement and Use of Pesticides for Research, Demonstration and Outreach	The activities to be implemented by CATIE and the Panamerican Agricultural School (EAP) under this component are basically continuations of IPM projects being implemented at CATIE and EAP. Both of these will have approved environmental assessments before the RENARM project paper and EA are finalized and presented in AID/W. The RENARM EA will analyze the environmental implications of the new aspects or changes in this activity as well as the long term implications of the proposed P/PM work over 10 years in accordance with AID Environmental Procedures (22 CFR Part 216) Section 216.3(b).
Farm Forestry Efficient Utilization of Farm Grown Trees: Seeds for Farm Forestry	The research and development of ten promising multipurpose tree species have been tried and tested and no significant adverse impacts are expected from their further propagation. Tree seeds from these species will be collected, stored and used for reforestation and agroforestry. Aside from possible impacts due to introduction of exotic species, the environmental effects of this activity are positive. The environmental assessment team will review the list of species to be propagated in order to eliminate exotics posing unwarranted environmental risk.

<u>ACTIVITY</u>	<u>OBSERVATIONS</u>
Improved wood Utilization	<p>The wood utilization activity proposed will facilitate the use of small diameter logs and assist in the purchase and use of wood processing and sawmilling equipment. This activity, however, will be deferred and designed at a later date in the project, perhaps in year 4 or 5. In accordance with the letter and spirit of sections 117, 118 and 119 of the amended FAA of 1961, the potential impacts of these activities on tropical forests and biological diversity will be assessed as a part of the deferred design activity.</p>
Watershed Management	Outreach: Implementation of Watershed Management Practices
	<p>A continuation of discrete activities of the Regional Tropical Watershed Management Project (RTWMP) will be carried out in the areas of research/demonstration, technical assistance, training, database/information and other support services. These activities were assessed as part of the RTWMP and no significant impacts are foreseen as a result of new or different activities. Operational watershed management projects, however, will be supported and promoted in the countries.</p>

<u>ACTIVITY</u>	<u>OBSERVATIONS</u>
Production from Natural Forest Management Forests	<p>Appropriate environmental assessment procedures will be incorporated as an integral part of watershed planning, implementation and monitoring functions. These environmental assessment procedures will be presented as part of the EA and project design.</p>
	<p>A program geared toward the generation testing, and demonstration of improved forest management practices for select areas of mixed natural broadleaf forest will be carried out practically in pilot areas where current AID funded forest management projects are underway. The project will focus on refinement, validation, adaptation and demonstration of successful silvicultural and management techniques. The environmental mitigation measures appropriate for such forest management will be illustrated in a general way in the PP. It is expected that as a result, large operational forest management projects using these improved practices will be promoted and funded by AID in the countries. For each of these projects specific EAs will be carried out (by AID) which will be subject to routine review and approval procedures.</p>

<u>ACTIVITY</u>	<u>OBSERVATIONS</u>
Wildland, Park and Reserve Management	Outreach: establishment, consolidation, and management of wildlands In a similar fashion as for the watershed management component, wildlands management and bio-diversity protection actions will be carried out as part of the outreach element of this component. Likewise, environmental assessment procedures will be incorporated as an integral part of wildlands planning, implementation and monitoring functions and will be presented as a part of the EA and project design.

In summary, the RENARM E.A. will analyze the environmental issues associated with the following components: P/PM, farm forestry, production from natural forests, watersheds and wildlands management. The institutional strengthening and technical support activities indicated in the second paragraph of this section (above) will not be analyzed in the EA. Each mini team on the project design will be charged with providing the information essential for the EA. The ROCAP REMS will be in charge of guiding these teams and overseeing the overall EA development. ROCAP will request LAC/DR/E assistance in writing and reviewing the final draft EA.

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PROJECT DESIGN SUMMARY - LOGICAL FRAMEWORK
Regional Environmental and Natural Resources Management Project (596-0150)
 LOP: FY 1989 - FY 1995 Total U.S. Funding \$46.3 Million

NARRATIVE SUMMARY

GOAL:

With the citizens of Central America, to produce the conditions for managed exploitation of natural resources in a manner that minimizes damage to the environment, protects bio-diversity, and provides the means for equitable and sustainable economic growth.

PURPOSE:

To create the conditions for public and private initiatives to generate, transfer and apply the information and technology essential for the sustained and managed use of natural resources.

OUTPUTS:

See attached output section for each component

INPUTS:

See attached input table

OBJECTIVELY VERIFIABLE INDICATORS

1. Creation of private organizations for environmental conservation.
2. Changes in legislative and regulatory policy on the environment and natural resources
3. Decline in the rate of environmental and natural resource degradation
4. Improvement in quality of life for Central American citizens

1. Heightened public awareness of environmental concerns.
2. Changed natural resources laws and regulations
3. Effective management of national parks and preserves

MEANS OF VERIFICATION

- Regional and national registers of private voluntary organizations
- National legislative records
- Project monitoring records on environmental and natural resource degradation
- National statistics on standards of living and quality of life

- Project monitoring and evaluation records
- Enforcement agency records
- NGO records or project liaison with development activities
- USAID records

IMPORTANT ASSUMPTIONS

- Improved political stability in the region
- Enhanced regional coordination and collaboration among participating governments

- Exposure to new pertinent information will foster behavioral change
- New laws and policies will be enforced
- USAID Missions, NGOs and other donors will provide financial resources to the region.

TABLE 2
BUDGET SUMMARY AND FINANCIAL PLAN BY ACTIVITY
(\$000)

ACTIVITY	ROCAP	OTHER	TOTAL
1. POLICY INITIATIVES AND TECHNICAL			
SUPPORT	<u>9,140</u>	400	<u>9,540</u>
ADVISORS	5,640	0	5,640
POLICY ANALYSIS	3,500	400	3,900
2. ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION			
NGOs ACTIVITIES	<u>9,000</u>	<u>4,000</u>	<u>13,000</u>
3. SUSTAINABLE AGRICULTURE AND FORESTRY			
PLANT PROTECTION	<u>17,750</u>	<u>1,400</u>	<u>19,150</u>
WATERSHED MANAGEMENT	9,700	1,000	10,700
PRODUCTION FROM NATURAL FORESTS	4,390	400	4,790
	3,660	0	3,660
MONITORING, EVALUATIONS AND AUDITS*	806	0	806
INFLATION	1,652	261	1,913
CONTINGENCIES	1,652	261	1,913

TOTAL	<u>40,000</u>	<u>6,322</u>	<u>46,322</u>

- * Mid-term evaluations incorporated in the budgets of Plant Protection, Watershed Management, and Production from Natural Forests

COMPONENT I: POLICY ANALYSIS

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

Magnitude of Outputs:

Assumptions for achieving outputs:

POLICY INVENTORIES

- 1 Local advisory groups/Councils fostered.
- 2 Policy inventories completed for four countries.
- 3 Inventory results reviewed and disseminated.

- 1 Reports of advisor and local NGO contractor.
- 2 Minutes of meeting of advisory groups/Councils
- 3 Completed inventories.
- 4 Copies of reports to national leaders and general public.

- 1 Countries and national expertise willing to cooperate.

POLICY ANALYSIS STUDIES

- 1 Regional Environmental Research Council fostered.
- 2 Policy research studies completed.
- 3 Policy analysis by Environmental Policy Research Advisor.
- 4 Policy Research reviewed and disseminated.
- 5 Workshops, seminars and conferences held as needed.

- 1 Regional NGO and Policy Advisor reports.
- 2 Regional advisory group/Council minutes.
- 3 Policy analysis reports.
- 4 Policy analysis dissemination to general public.
- 5 Workshops, seminars and conferences on policy analysis results proceedings.

- 1 Regional groups willing to collaborate.
- 2 National and regional audience for policy analysis develops.

POLICY DIALOGUE/REFORM

- 1 Advisory group/Council established with regular quarterly meetings.
- 2 Inventory results disseminated to national leaders and general public.

- 3 Inventories and analysis discussed with bilateral missions.

- 1 Advisory group/Council minutes.
- 2 NGO and Policy Advisor reports.
- 3 Copies of media releases.
- 4 Conference proceedings.

- 5 Training course materials and reports.

- 1 National and regional audience for policy analysis develops.
- 2 Political and economic ability to consider and implement solutions to problems.

COMPONENT I: POLICY ANALYSIS

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

Magnitude of Outputs:

Assumptions for achieving outputs:

ENVIRONMENTAL POLICY MONITORING

- 1 Inventories establish monitoring baseline.
- 2 Monitoring updates by local NGO and Policy Advisor.
- 3 Quarterly reviews by advisory groups/Councils.
- 4 Economic analysis methods and refinement studies.
- 5 Framework for monitoring policy changes.
- 6 Fifth year monitoring and evaluation report.

- 1 Inventory reports.
- 2 Reports by Advisor and local NGO.
- 3 Advisory group/Council minutes.
- 4 Economic methods studies.
- 5 Reports on framework.
- 6 Fifth year report.

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COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

ASSUMPTIONS FOR ACHIEVING
OUTPUTS

1. Strengthen regional strategic planning and policy formulation process regarding conservation issues.

a. Workshops for decision makers.

4 workshops per year for approximately 25 persons.

Review final reports on workshops including participants evaluations.

Sufficient suitable applicants; organizational support from C.A. NGOs and U.S. PVOs.

b. Monitor regional deforestation and degradation.

Resultant studies and reports.

Review studies.

Access to baseline data and monitoring information.

c. Update, publish and distribute revised regional environmental profile.

10,000 copies of books produced and distributed along with press releases, slide tape programs.

Review book and distribution records.

Contracting of suitable author; inputs from C.A. specialists; updated info derived from CDCs and monitoring studies.

d. Prepare policy studies on key wildlife, wildlands, EE and NGO issues.

Four studies per year prepare and published and 1000 copies distributed.

Examine studies.

Contract of qualified authors; requests received to do studies.

COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

<u>NARRATIVE SUMMARY</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
e. Prepare regional wildlife, wildlands, coastal zone mgt. strategies.	Three regional strategies produced as well as five national strategies; planning meetings held.	Review strategy documents.	C.A. country agencies actively participate in meetings and preparation of strategies.
f. Prepare/maintain directory on protected areas and biodiversity and publish protected area maps and env. data atlas.	Directory published in yr 2 and updated yearly; regional protected areas map published in yr 2; one national map yearly yrs 2-6; Data Atlas yrs 4-5.	Examine directory; maps; atlas; and distribution lists.	Access to baseline data from agencies in C.A. and elsewhere.
g. Provide TA on strategic planning and policy issues related to parks, wildlife, coastal zone and NGO issues.	Approximately 24 man months of TA provided per year.	Revised consultant reports.	Location of suitable consultants and sufficient requests for TA.

COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

<u>NARRATIVE SUMMARY</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
<p>2. Implementation of Regional Environmental Awareness and Education Program.</p>			<p>ASSUMPTIONS FOR ACHIEVING OUTPUTS</p>
<p>a. Develop regional and national environmental education strategies.</p>	<p>National and regional planning sessions held.</p>	<p>Examine strategy documents and meeting proceedings volumes.</p>	<p>Support by government agencies and NGO's for meetings and strategy preparation.</p>
<p>b. Plan and implement regional mass media campaign.</p>	<p>TV, radio, theater, bill-board, print media spots, action plans.</p>	<p>Tapes, copies of media ads.</p>	<p>Access to free pub. service time through broadcast media; US PVO cooperation.</p>
<p>c. Carry out short term training of EE/env. education and communications and publish newsletter.</p>	<p>On workshop held per year 2-6 for 25 participants in-service training for 12 persons per year 2-6; and 4 issues of newsletter distributed each year 2-6.</p>	<p>Review materials, workshop final reports, participant evaluations.</p>	<p>US PVOs, USG agencies and C.A. agencies provide instructors.</p>
<p>d. Screen and distribute stocks of EE materials to key institutions.</p>	<p>15 stocks selected and distributed to Education ministries, NGOs and region institutions and updated yearly.</p>	<p>Examine stocks of materials and report on activity.</p>	<p>Sufficient high quality materials exist; matching funds, subsidized printing support from C.A. private sector, U.S. PVOs.</p>

COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

ASSUMPTIONS FOR ACHIEVING
OUTPUTS

e. Plan and implement
pilot interpretation
programs.

5 programs implemented: zoos, museums, parks, and
botanical gardens and 35 prototype exhibits
distributed.

Plans, completed exhibits
and overall programs.

Matching funds from U.S.

f. Provide TA on EE,
Interpretation and
env. awareness.

4 man months of TA provided per year 2-6.

Consultant reports.

Location of qualified
available consultants;
requests for TA services.

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COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

<u>NARRATIVE SUMMARY</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
			ASSUMPTIONS FOR ACHIEVING OUTPUTS
3. Strengthening Environmental Training and Research			
a. Develop clearinghouse for faculty exchanges, scholarships, and TA.	Carry out 20 faculty exchanges per year, 20 scholarships, 2.5 months of TA; and publish 4 newsletters each (year 2-6.)	Review annual reports on clearinghouse implementation; individual reports on interchanges; consultant reports for TA; and newsletter/distribution lists.	Sufficient interest on part of C.A. and U.S. faculty and requests for TA received and suitable consultants found. Matching funds from U.S. coordinating institutions.
b. M.S. level training in EE, interpretation and environmental communications.	14 students trained at U.S. university during 2 years.	Review final university report on activity and student theses.	Suitable candidates found and U.S. universities show interest in hosting program; students have guaranteed jobs upon return.
c. Applied research grants program.	10 small grant and 4 long term projects supported per year.	Review annual research project progress reports and resultant scientific articles.	Suitable research proposals received; matching support from U.S. PVOs.

COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

1. Coop. program with Peace Corps volunteers and counterparts.

Approximately 50 pilot projects per year.

Review proposals and progress reports; field visits.

ASSUMPTIONS FOR ACHIEVING OUTPUTS

Peace Corps maintain current strength levels in C.A.

Suitable candidates.

COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

PERFORMANCE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

ASSUMPTIONS FOR ACHIEVING
OUTPUTS

Strengthen regional
wildlands mgt.
programs.

At least one pilot project implemented in each
country by year 6.

Review plans and progress
reports for each site;
field visits.

Support from US AID missions
for local currency costs;
suitable sites found in each
country; strong local
administrative organization
found; US. PVO matching
support.

Pilot protected
areas and buffer
zone mgt. projects.

1 workshop per year for 25 students; 4 issues of
newsletter per year; 20 scholarships per year for
courses and in-service training yrs 2-6.

Review final report on
each workshop and
participant evaluations;
review reports on courses
and in-service training
visits prepared by
grantees.

Suitable candidates found;
USG agencies, PVOs and C.A.
agencies provide instructor.

Short term training
program and regional
newsletter.

Study of existing projects and regional workshop
in year 2; implementation of 5 pilot projects by
end of year 5.

Review study of existing
projects; proceedings of
workshop; annual reports
on each pilot project;
field visits.

Local govt. or NGO agency
accepts coordinating role;
supplemental local currency
available for operating
costs.

Plan/Implement pilot
conservation corps.

COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

ASSUMPTIONS FOR ACHIEVING
OUTPUTS

d. Provide rapid
response TA on
protected areas
issues.

At least four months of TA provided per year
(2-6).

Consultant reports.

Suitable consultants avail-
able and requests for TA.

COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

<u>NARRATIVE SUMMARY</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
			ASSUMPTIONS FOR ACHIEVING OUTPUTS
5. Strengthen Regional conservation Info. and Monitoring Capabilities.			
a. Survey info sources, data bases; compile existing data.	Study and info collection completed during year 2.	Review study.	C.A. and U.S. agencies provided access to data.
b. Provide TA to improve/standardize data collection, analysis and interchange.	Approximately 2.5 person months of TA per year 2-4; 5 person months per year (5-6).	Review consultant reports.	Requests for TA received and suitable consultants found.
c. Installation and improvement of data centers.	New CDCs established in Honduras, El Salvador and Belize; existing CDCs in Guatemala, Costa Rica strengthened.	Review annual work plans and reports; visit CDCs.	Strong support from C.A. agencies to house and "adopt" new CDCs; CDCs will be able to raise additional funds through contracts for services.
d. Prepare and distribute training materials/software.	Materials prepared and distributed to CDCs in years 2-6.	Review materials.	Support collaboration U.S. PVOs.

COMPONENT II: ENVIRONMENTAL AWARENESS, EDUCATION, AND BIO-DIVERSITY CONSERVATION

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

ASSUMPTIONS FOR ACHIEVING
OUTPUTS

e. Workshops on control
of quality, analysis,
mgt., and utilization
of data.

At least one workshop per year for 25 reps. of
CDCs, universities, CATIE, etc.

Review workshop final
reports and participant
evaluations.

Suitable candidates and
instructors located.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

<u>NARRATIVE SUMMARY</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
<p>Program of Sector Goal: objective to which this contributes:</p> <p>To promote WS planning and the management of watershed resources (water, soil, plants) to help obtain the equitable and sustainable socio-economic development of the region.</p>	<p>Measures of Goal Achievement</p> <ol style="list-style-type: none">1. Productivity and quality of affected potable water supplies improved.2. Useful lives of targeted hydroelectric projects extended.3. Agricultural production improved by irrigation and sustained by soil and water conservation in targeted priority watersheds.4. Downstream damage by flooding and drought reduced in targeted watersheds.5. When downstream of managed rivers, quality and productivity of coastal zones maintained.	<p>PSHD, WHO and AIDIS (Inter-american Association of Sanitary Engineers) statistics.</p> <p>Project evaluation which will take into account field assessments, component monitoring and other regional statistics.</p> <p>National statistics. IICA and other regional reports.</p> <p>Newspaper articles and personal observations.</p> <p>Project monitoring. Project evaluations.</p>	<p>Assumptions for achieving goal targets:</p> <ol style="list-style-type: none">1. Central Americans willing to cooperate and pay for services derived from improved watershed management.2. In the long run, hydroelectric power is cheaper than thermally (petroleum) produced electricity.3. Other production factors are amenable4. Central Americans are willing to pay for services derived from improved watershed management.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

Project Purpose:

Conditions that will indicate purpose has been achieved: End-of-Project Status.

Assumptions for achieving purpose:

To improve institutional capacity in Central America at the regional, national and local levels to plan and manage priority watersheds.

1. Permanent capacity to provide appropriate and cost-effective research, training and technical assistance is established at CATIE and in targeted WSM institutions of participating countries.

1. CATIE documents and records
National Documents and Plans
USAID documents and project evaluations.
External project evaluations.

1. Political situation in Central America allows national governments to provide human resources and funding for watershed and natural resources management and does not prevent implementation of plans and measures in watersheds.

2. Increased local capacity, administrative mechanisms and financial resources in place to protect targeted community watersheds on a sustainable basis.
This includes the existence of local organizations with willingness and demonstrated capability for implementing WSM practices.

2. Field visits.
Periodic project evaluations.
NGO records and reports.

2. Local organizations and national WSM institutions willing and able to collaborate

3. Cooperating Ministries of natural resources, municipalities and other institutions are utilizing improved plans to manage watersheds.

4. Periodic surveys over the LOP.
Periodic external evaluations.

4. Countries and participating public and private institutions willing and able to collaborate in WSM activities.

4. More and better trained technicians involved in watershed or related natural resources management in the countries.

5. Periodic surveys over the LOP.
Periodic external evaluations.

5. Economic stability maintained in the participating countries.

5. Decision makers are more aware of the benefits of watershed management and correspondingly, watershed management receives more support from national governments.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

6. Improved coordination and collaboration among national public institutions and private organizations active in watershed management within countries.

6. WSME progress reports. NGO reports and evaluations.
Periodic external evaluations.

6. That these are not legal impediments to the "officialization" of the CAs.

7. At least one priority bankable (macro) watershed project and at least two community (macro) watersheds benefiting 600 or more users implemented effectively in HON, COS, GUA and planned and initiated in ELS and Belize.

7. WSME progress reports. NGO files and reports.
Periodic external evaluations.

7. External donors willing to fund bankable plans.

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COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

A. INSTITUTIONAL STRENGTHENING

Over the LOP CATIE and/or the cooperating countries have internalized:

A.1 A consolidated and self-sustaining regional center of expertise in tropical watershed management, maintaining an interdisciplinary staff of professionals in watershed sciences and providing regional support for WSM via training, research, demonstration and technical assistance.

1. The six senior WSM professionals carrying out research, training and technical assistance.

2. Seven junior professionals and support personnel to complement and assist senior staff in implementation.

3. The five phased national coordinators (CNs) to strengthen and make self-sustaining national WSM institutions and CANS in Honduras, Guatemala, Costa Rica, El Salvador, and Belize.

1. WSME files and records.

2. Periodic outside evaluations.

3. WSME files and progress reports.

1. Demand and support for WSM continues and increases in C.A. and CATIE maintains WSM as a priority. CATIE is successful in getting financing to support its 10 year plan.

2. Other major donors and USAID's continue to increase their support for WSM in C.A. through direct bilateral cooperation or through CATIE.

3. IBID.

A.2 An international WSM Research Advisory Council (IRAC) providing guidance and assistance regarding WSM research program development, methods and procedures.

1. IRAC operating effectively for PMIRN/WSME.

2. The quality and quantity of WSM research in C.A. increases over the LOP.

1. IRAC annual reports.

2. WSME annual work/plans reports.

3. Periodic outside evaluations.

1. Countries willing and able to cooperate.

2. CATIE administrative/management structure will fully support the IRAC over the LOP.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

A.3 Two experimental/demonstration watersheds providing representative sites for teaching, student-staff and collaborative research, demonstration and experimental extension activities.

OBJECTIVELY VERIFIABLE INDICATORS

First-The Rio TuIs (Mid-Evaluation Wet Atlantic Environment/Watershed)

1. Continue development and successful implementation of the Rio TuIs Operational and Research Plans.

2. Collaborative research, training and demonstration from at least three other CATIE subprograms.

MEANS OF VERIFICATION

1. WSME files and reports

1. Files, records and reports of collaborating CATIE subprograms.

3. Periodic outside evaluations.

IMPORTANT ASSUMPTIONS

1. CATIE senior management willing to promote cooperative mechanisms.

2. Continued support of the GOCR with the Rio TuIs reserve.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

Second-A-Mid-Evaluation Pacific Dry Environment Watershed.

A.4 WSME technical publications and research results edited and published through a CATIE journal and/or in international journals, books or proceedings.

1. A cooperative research agreement developed, funded and implemented successfully between CATIE and second regional institution for WSM research and training.

2. The cooperative research activity providing meaningful research results.

1. 44 professional technical publications generated and published over the LOP.

2. One professional editor and support structure established and operating efficiently in PMRN.

3. The CATIE professional journal Turrialba regenerated and being published regularly and efficiently.

A.5 Create and temporarily support a regional WSM commission representing national advisory committees (CANs) and attending to multinational/regional WSM issues and needs.

1. Commission established, meeting on an annual basis and operating efficiently.

2. Costs of commission fully internalized and assured by CANs and CATIE.

1. Field visits.

2. EAP/ERIS files, records and reports.

3. Periodic outside evaluations.

1. WSME progress reports.

2. RTWMP files and records.

3. Periodic external evaluations.

1. Commission annual reports and work plans.

2. WSME progress reports.

3. Periodic outside evaluations.

1. Willingness and availability of research funds of EAP/ERIS.

1. That the average publication cost for a 5 page article in an internationally recognized book/journal/proceedings is approximately \$250.00.

2. That other CATIE research products will be sufficient to supply the regional journal.

3. Other CATIE programs and projects support this journal equitatively.

1. There is a clear interest in creating such WSMC and that horizontal cooperation within the Region is an effective tool to attain development.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

B: TRAINING

B.1. Support and consolidation of the CATIE M.S. degree program offering a major in WSM.

1. 35 or more M.S. degrees with a major in WSM awarded over LOP to Central Americans.

1. WSME progress reports.

1. Qualified scholars interested in such a program existing and are willing to participate.

2. 6 guest lecturers collaborate with the WSM degree program each yielding at least one professional publication and one collaborative lectureship.

2. Periodic outside evaluations.

B.2 Specialized training in WSM to upgrade WSME and national institutions CAH staff, financing up to one year of studies in the United States or Latin America.

1. 3 scholarships for WSME staff and 8 for cooperating countries successfully carried out, each producing a technical report of professional quality and utility for the WSME.

1. WSME progress reports.

1. That specialized WSM training programs exist that meet the needs of the WSME.

2. Scholar reports.

3. Periodic outside evaluations.

B.3 Informal training in the form of short courses, workshops and seminars to strengthen national WSM capabilities.

1. 8 regional and 40 in-country short courses successfully given over the LOP with results/proceedings published and evaluated.

1. WSME progress reports. WSME technical library. CATIE training bulletin and WSM Newsletter. Participant evaluations.

1. Countries and national WSME institutions willing and able to develop and promote such training.

2. 16 workshops, 8 seminars, 2 regional encounter events and 27 national encounters carried out successfully over the LOP with results/proceedings published and evaluated.

2. Periodic outside evaluations. WSME technical library. CATIE training bulletin and WSM Newsletter.

2. Local funds are available for logistics and basic organizations.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

B: TRAINING

B.4 Outreach training to support community WSM extension activities.

1. 2 extensionist training short courses successfully designed and delivered with evaluations leading to improvement over time.

2. 12 in-service extensionist training workshops (3 per country) successfully implemented and leading to improvements in WSM community extension work.

3. 8 cross-site visits carried out within or between cooperating countries that lead to improved WSM technology transfer.

1. WSME progress reports.
Participant evaluations.

2. NGO records and reports.

3. Periodic outside evaluations.

1. Communities willing to cooperate and participate in WSM project.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

C: RESEARCH

C.1 WSME staff research (40% of senior staff time) in the five areas of economic-policy legal, socio-cultural, hydrology and sedimentation, environmental, watershed and image processing/GIS. 80% or more of the research will be applied, leading to practical applications and short term improvement in WSM technologies in C.A.

1. Research products over LOP estimated at: 4 handbooks; 6 guidelines/ 10 interpretative and instructional materials; 44 scientific papers; 39 field reports, case studies or desk studies.

1. IRAC reports.
2. Results of the "users meeting".
3. WSME progress reports.
4. Periodic external evaluations.

1. Participating countries and national WSM institutions willing and able to participate.
2. CAWs are able to identify priorities for research in each country.

C.2 WSME student research leading to a thesis and technical publication on a topic related to senior staff research and addressing a WSM issue of interest, normally in his/her country of origin.

1. 35 or more professional papers resulting from student research/thesis work over the LOP.
2. 7 or more joint student/professor publications.

1. IRAC reports.
2. WSME progress reports.
3. WSME technical library.

1. Qualified students available to participate in M.S./research program.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

JTPUTS:

ARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

<u>ARRATIVE SUMMARY</u>	<u>OBJECTIVELY VERIFIABLE INDICATORS</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
RESEARCH			
3. NGO promoted and supported research carried out by university and national WSM institutions.	Each of the research grants (40) awarded would yield one or more of the following: 1. Case study papers (15 or more). 2. Reports or scientific publications. 3. Contributions to CATIE staff research.	1. NGO files and reports. 2. WSME progress reports. 3. Periodic external evaluations.	1. Qualified WSM researchers and are allowed to participate in cooperative research.
4. Users meetings to help select priority applied research topics, select sites and promote cooperation with ANS and national WSM institutions.	1. One meeting/yrs/country, as part of the national encounter sessions.	1. WSME progress reports. 2. Periodic external evaluations. 3. Minutes of the National Encounter/user meetings.	1. IBID.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

D: ADVISORY/SUPPORT SERVICES

D.1 Technical assistance to strengthen CATIE, CANS and national WSM institutions, each producing a technical report and resulting in an institutional strengthening benefit.

1. 12 long term T.A. missions over the LOP to strengthen CATIE (2) and targeted national WSM institutions in Costa Rica (2), Guatemala (2), Honduras (2), El Salvador (4).

2. 50 short-term T.A. missions over the LOP to strengthen the national WSM institutions, 10 for CATIE/RTWMP, and 8 to support the NGO community extension activities, and 32 consultations within the region to strengthen CAN, and/or national WSM institutions.

1. WSME progress reports.
2. Periodic outside evaluations.

1. IBID.

1. Countries are willing to cooperate.

D.2 Support services to assist and strengthen national WSM institutions in WS planning, management and training.

1. Regional data base for WSM consolidated at CATIE and with a national satellite office in each of 4 cooperative countries. WSME services provided include: a computerized reference library, a map and photo collection, priority watershed descriptive tables and data base, simulation programs, a professional roster, and a strengthened GIS and image processing capability.

2. Instructional design and materials office and assistance generating and disseminating to targeted national WSM institutions training materials, training packages and audiovisuals.

1. WSME progress reports.
2. Periodic outside evaluations. Field visits to instructional design/materials office.

1. The national institution to provide the data base/GIS linkage is willing and able to provide effective and sustained support.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

: ADVISORY/SUPPORT SERVICES

3. Project information office providing timely and cost effective services to the Region including: technical library services, press releases, regional quarterly newsletter, dissemination of WSM information to interactive roster members, displays and demonstrations and public relations.

3. Periodic project evaluations.
WSME progress reports.

COMPONENT III: SUSTAINABLE PRODUCTION

a. Watershed Management

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

E: COMMUNITY EXTENSION/OUTREACH

E.1 Community extension work in WSM to demonstrate feasibility, develop local capabilities, promote public-private institutional linkages, and provide feedback for CATIE research and training.

1. An NGO/CATIE outreach program established and operating effectively benefiting 600 or more users or priority micro watersheds in each cooperating country.
2. WSM practices being carried out in a sustainable manner by one or more local community in each national priority watershed.

1. WSME progress reports.
2. NGO files and reports.
3. Field visits.
4. Periodic external evaluations.

1. An international NGO with interest and WSM capability is available.
2. Countries and national institutions are willing to cooperate fully.

COMPONENT III: SUSTAINABLE PRODUCTION
 b. PRODUCTION FROM NATURAL FORESTS

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

b. Natural Forest Production

Magnitude of Outputs:

Assumptions for achieving
Outputs

b1. An outreach program to give practical advice and assistance to landowners, industrialists and communities to encourage them to manage lowland tropical moist forests.

1. Capable team of natural forest specialists functioning.
2. Surveys of and contacts with forest owners who could potentially collaborate.
3. Practical guidelines for management of different types of Central American lowland moist forest officially accepted by forest services.
4. (Number)...field days, short courses and other formal training events.
5. Nine students with MS degree from CATIE, with specialization in natural forest management.

1. CATIE reports & documents.
2. Forest service reports and interviews.
3. Interviews with selected forest owners during project evaluation.
4. The grapevine.

1. A minimum number of forest owners can be motivated to collaborate.
2. Forest services are receptive to making administrative changes.

b2. At least four pilot areas (totalling 10,000 ha) of lowland tropical moist forests under sustainable commercial management.

1. Four pilot areas with combined area of 10,000 ha identified and owners committed to forest management.
2. One small portable sawmill in each country demonstrating processing of timber.
3. Management plans following project guidelines, approved by forest services and being implemented in pilot areas.

1. CATIE reports & documents.
2. Field inspections.
3. Review of management plans.
4. Interviews during project evaluation.

1. A minimum number of forest owners with suitable forests can be motivated to collaborate.
2. Forest services are receptive to making administrative changes.
3. Domestic market for tropical timbers continues to improve.

COMPONENT III: SUSTAINABLE PRODUCTION
 b. PRODUCTION FROM NATURAL FORESTS

OUTPUTS:

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Outputs:	Magnitude of Outputs:		Assumptions for achieving Outputs:
b3. Applied research on public and private lands supplying information necessary for developing natural forest management recommendations.	<ol style="list-style-type: none"> 1. Twenty research projects financed with project grants, finished or in progress. 2. Research results used to refine management guidelines. 	<ol style="list-style-type: none"> 1. CATIE reports & documents. 2. Field inspections. 3. Review of forest management guidelines and of research reports. 4. Interviews with researchers. 	<ol style="list-style-type: none"> 1. Sufficient qualified applicants can be motivated to apply for research grants.
b4. Studies and recommendations to overcome policy constraints for natural forest management forcefully communicated to decision makers.	<ol style="list-style-type: none"> 1. Significant and promising policy issues identified and studies clearly described in scopes of work. 2. Studies completed and results published. 3. Results of studies used by decision makers in government, private sector, USAIDs, ROCAP, or other target group. 4. Results of studies used in public policy debate and educational campaigns on EHR matters. 	<ol style="list-style-type: none"> 1. CATIE reports & records. 2. Routine reports from organizations dealing with EHR (gov't, private, AID, etc.). 3. Interviews with selected decision makers during project evaluation. 	<ol style="list-style-type: none"> 1. Agencies receptive to receiving advice and assistance. 2. Social & political situation permits open public debate of issues.

PROJECT III: SUSTAINABLE PRODUCTION

c. PLANT PROTECTION

JTS:

OBJECTIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

Magnitude of Outputs:

Assumptions for achieving Outputs:

DEGREE TRAINING

Central American professionals receive graduate training in Plant Protection.

1a. 80 students, at least 32 of whom are from the ROCAP region, receive M.S. degrees at CATIE.

1a. CATIE postgraduate records

High level of interest in plant protection among Central American students and professionals is maintained for the duration of the project; job and study opportunities exist; resources exist to purchase materials.

Central American professionals receive specialized undergraduate training in Plant Protection and are employed in key positions.

1b. 120 students, at least 80 of whom are from the ROCAP region, receive B.S. degrees at EAP, and 70% of them either work in Plant Protection or continue M.S. studies in plant protection.

1b. EAP records and surveys

RESEARCH

Immediate plant protection problems are identified and stop gap solutions are developed.

2a(i). 100 plant protection problems identified and stop gap solutions developed.

CATIE records and fact sheets produced.

Demand for responsive research exists.

2a(ii). Yearly fact sheets developed and updated for 10 crops.

Sustainable pest management techniques and practices are developed and validated for inclusion in national Pest Management programs.

2b(i). 50 pest management techniques and practices are produced.

RPP records and documents.

2b(ii). 100 technical reports will be published.

Reports published.

2.(iii). Exotic natural enemies introduced for 15 agricultural pests. Partial success for in at least 5 cases.

RPP records and economic analysis.

Exotic natural enemies are available for introduction and can become established. Appropriate national institutions will cooperate.

COMPONENT III: SUSTAINABLE PRODUCTION
 c. PLANT PROTECTION

OUTPUTS:

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

Magnitude of Outputs:

Assumptions for achieving Outputs:

c3. OUTREACH

c3a. Central American personnel are trained in specific plant protection areas through the development of training materials and the offering of specialized training programs.

3a(i). 1 modular pesticide management training program consisting of at least 12 separate modules developed, validated and distributed in the region.

Training program produced.

Regional training needs in plant protection exists.

3a(ii). 80 plant protection workers receive in-service training.

RPP records.

3a(iii). 60 workshops presented to 720 regional participants.

RPP records.

3a(iv). 70 teaching modules produced and made available.

Teaching modules produced.

c3b. CATIE Regional Information Management Center in plant protection supports region-wide efforts in Plant Protection.

3b(i). 40 technical journals, 40 newsletters, 30 extension publications, 20 teaching materials, field and laboratory guides are published and distributed to specialists and institutions in Central America.

Documents produced.

Demand for information in plant protection continues in Central America.

3b(ii). 5 computerized data bases (bibliographic, pest, natural enemies, pesticides, and human resources) are made available.

Data Bases available.

COMPONENT III: SUSTAINABLE PRODUCTION
 c. PLANT PROTECTION

PUTS:

RATIVE SUMMARY

puts:

Regional capabilities in agricultural pest diagnosis, including agroecological inventory activities, are strengthened and expanded.

Technical assistance in plant protection is provided to national public institutions, NGO's and PVO's.

OBJECTIVELY VERIFIABLE INDICATORS

Magnitude of Outputs:

3c(i). 500 diagnostic assistance actions provided to region.

3c(ii). 1 computerized pest data base operational in each collaborating country.

3c(iii). 1 pest reference collection established in each collaborating country for five priority crops.

3c(iv). 10 Diagnostic training activities offered.

3d(i). 50 pest/pesticide problem evaluation missions.

3d(ii). 50 plant protection research planning missions.

3d(iii). 50 nonproject sponsored plant protection and training missions.

MEANS OF VERIFICATION

RPP records.

Data base available.

Pest reference collection available.

RPP records.

RPP records.

RPP records.

IMPORTANT ASSUMPTIONS

Assumptions for achieving Outputs:

Demand for diagnostic assistance continues.

Computers available in countries.

Demand for technical assistance in plant protection continues.

6j)

ANNEX III. Project Analysis
 G. Evaluation Indicators

Project Actions - EOPS	Key Indicator Variables	Process/Item to Monitor
<u>A. Policy</u>		
1. Policy inventories completed in 4 countries.	Policy advisor in place. National NGOs, policy groups meet and advise. Inventory reports.	Workplan, actions of advisors. Dialogue, meeting minutes of advisory group. Completeness, dissemination, impact of inventory reports.
2. Policy analysis studies	Studies. Participation of C.A. NGOs, advisory councils. Impetus, awareness of study results.	Peer review, quality, impact of study: Did it motivate dialogue, debate, and change if needed??
3. Policy dialogue, monitoring, and reform	Public and policy maker debate. Numeric and conceptual impact assessments. Distribution, awareness of alternatives. Distribution of reports, studies. Periodic updating of inventories.	Changes in destructive policies and laws, and reinforcement of beneficial ones. Updated inventories. Evidence of pluralism with respect to public debate on natural resource use. Actions, progress reports of advisor.
<u>B. Production from Natural Forests</u>		
1. Four 10,000 ha. Pilot management areas	Areas delimited and under management for sustained yield. Research, training, outreach ongoing in the pilot areas.	Areas exist and under managerial control. Areas support training, research, and outreach and these define region-wide management recommendations for natural forests.
2. Outreach	Research, M.Sc. training, field days, short courses. Management advice/publications.	Quality, dissemination, acceptance of the management advice/publications on natural forest management. Field day and short course participant numbers trained. They use the training received.
3. Research/Policy Studies	M.Sc. theses, peer review studies. Integration of these into the pilot areas, management, and outreach programs.	Extent to which these actions define, reinforce the outreach, management, pilot areas programs.

C. Watershed Management

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|---|---|---|
| 1. Theses, handbooks, and peer review articles produced by applied research in five topic areas (economic, cultural, hydrology-sedimentation, g.i.s., environmental). Policy studies. | Publication of at least 25 theses and 25 articles by project year six, covering the five topic areas and the whole program defined by IWRAC. | Appearance of these written products. Their increasing quality. Peer review. |
| 2. An International Watershed Management Advisory Council (IWRAC) established, and working with national, bilateral WM committees. | Council meets regularly, interacts with bilateral councils, effectively guides research and publications programs. | Meeting minutes, contacts, products. Scope, depth, breadth of research, dissemination, and outreach programs. |
| 3. Dissemination and Outreach | Extension handbooks, workshops, short courses, professional articles. | Volume and quality of these; proceedings; short course attendance and content. Use of materials, ideas taught or advocated. Peer review. |
| 4. Pilot areas program | Areas delimited and under managerial control. Visits to areas. Data on them from NGO's. Results, successes transferred to other areas monitoring updates. | Reports; reactions of users. Special studies on impacts. Adoption outside pilot areas. Lessons learned. Focus of research and outreach affected by pilot areas experiences. |
| 5. Training: formal and informal | M.Sc. degrees awarded; short courses held attendance. | Numbers of degrees awarded, subject areas of research. Short course numbers. Diplomas awarded. Content of courses. Does the training lead to field-level impacts. |

D. Seeds for Farm Forestry

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|--|--|--|
| 1. Establishment, Operation of C.A. Tree Seed Commission | Commission functional. Standards and norms for collection, processing, marketing published. Demand measured, monitored. Regional research agenda promulgated, coordinated. | Impact, use, effect, observance of standards and norms. Progress on research and policy agenda. Market news reports. Research results. Evidence of coordination of norms, research, policies, markets. |
|--|--|--|

- | Project Actions -- EOPS | Key Indicator Variables | Process/Item to Monitor |
|--|--|---|
| 2. National tree seed banks operating in each of four countries. | Development plans in place and in use. Staff training accomplished. National banks integrated to regional agenda. Awareness of importance of high-quality seed. Financial Stability. Adequate equipment. | Content, completion of training courses. Existence, impact of plans. Level of regional integration of seed banks. Financial self-sufficiency of national banks by year 6. Presence/absence of equipment constraints. Demand for, use of seeds. Who users are. |

E. Pest Management

- | | | |
|--|--|---|
| 1. Sustainable pest management practices developed, introduced, used | 15 natural biological controls introduced with some impact on five specific pests. | Numeric and narrative data showing statistically significant impact on 5 to 15 specific pests. These pests are of economic importance on widely grown food or commercial crops. Impact on large areas, many producing hectares. Awareness of this plant protection alternative. |
| 2. Training and research in pest management | Conferral of degrees and preparation of theses. 80 B.Sc. and 32 M.Sc. degree recipients remain in the region. Relevance of research to applied pest management problems. | Relevance of research to C.A. plant protection. Research results disseminated and in applied use. Breadth of research, training across the spectrum of pest management (not just IPM). |
| 3. Training Materials, Information Center, diagnostic center, technical assistance | Modular training program with materials developed is in place. Workers trained. Short courses, workshops held. Information, diagnostic centers function with staff, equipment, collections. Technical assistance available and used. | Numbers, participants, impact of workshops and short courses: is the information/training used and effective? Is pesticide use diminished? Computerized data base. Pest reference collection. Impact of technical assistance on research agenda, outreach materials, volume of pesticide use. |

F. Natural Resources Information

- | | | |
|---|--|---|
| 1. Survey of Holdings, formats, procedures, equipment. Workshops. | Survey results published. Thematic index available. Manuals prepared. Data formats and software packages standardized. Workshops held. | Survey leads to greater knowledge of availability, accessibility to ENRM data. Formatting, software standardized as a survey result. Workshop participants spread news of available ENRM data/information. Data Center personnel trained, in touch with each other. |
| 2. National Data Centers Established/Supported | Centers exist, with adequate number of trained staff, equipment, software. These housed in appropriate national institutions. | Centers, data and information are used, responsive. They provide useful quality data on request. Absence of staff, equipment problems. Financial stability-budget problems not serious. |

G. Environmental Awareness/
Protected Areas/Biodiversity

- | | | |
|---|---|--|
| 1. Regional Environmental Awareness and Education Program | | |
| a. National and Regional E.Ed. & awareness strategies and action plans. | Regional Strategy document is produced. National and regional action plans result. | Workshops held. Documents are disseminated. Action plans guide programs. Evidence of Strategy implementation. |
| b. Regional Mass Media Campaign. Newsletters. | Visible Mass Media Campaigns (TV, radio, billboards, music, ads, etc). Newsletter contents, distribution list. | General public surveyed and aware of campaign, message. Participation of celebrities. Messages coordinated regionally, newsletters received, read by recipients. |
| c. Pilot Programs and training | Teachers, park, and protected areas staff trained. Workshops held. Model pilot site plans developed. Standardized exhibits. | Training visible in school teachers and park staffs. Workshop products examined. Site plans in use. Exhibits visible to visitors. |

Project Actions - EOPS	Key Indicator Variables	Process/Item to Monitor
2. Regional Strategic Planning, Policy		
a. Decision Maker Workshops	Workshop held. Attendance lists.	Workshop outcomes: Evident focus, discussion of long-range strategic planning, policy on protected areas and public awareness.
b. Regional and national strategies for protected areas. Policy papers.	Three regional strategy documents on protected areas. National action plans. Policy analysis, conclusions on protected areas.	Participation of national policy makers. Content and acceptance of the strategies. Evidence of use of policy and strategy in decision making and budget allocation.
c. Regional deforestation monitoring and atlases/maps. Protected areas directory.	Atlases and maps showing location and extent of forests-deforestation and degradation, years 2 and 5. Directory published, data base exists, yearly updates.	Existence, distribution, use, understanding of atlases and maps. Quality completeness, and updates of directory/data base.
3. Strengthen Regional Training and Research Institutions		
a. Clearinghouse for faculty exchanges, M.Sc. training, and small research grants	C.A. Clearinghouse with advisory Committee. Faculty exchanged. 14 M.Sc's in e.ed. and parks. Small research grants.	Clearinghouse operates. Newsletter publishes advice of possibilities on faculty exchange, M.Sc. scholarships, research grants. Research, training, exchanges occur and are coordinated.
4. Regional Wildlands Management		
a. Pilot protected areas and buffer zones	8 pilot areas delimited, 8 plans produced, 8 projects carried out. Outreach linked.	Areas, representing a variety of eco systems and located in several countries, are protected. Research, training, outreach are ongoing, and lessons being learned, publicized, and transferred. Annual operating plans made and followed.
b. Prototype conservation corps projects in pilot areas and buffer zones.	National conservation corps formed. Projects implemented, according to a management plan that sets priorities.	Projects completed, with visible and tangible results.