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**UNCLASSIFIED**

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

**Guatemala**

**PROJECT PAPER**

**Maya Biosphere Project**

**AID/LAC/P-584**

**Project Number: 520-0395**

**UNCLASSIFIED**

<b>AGENCY FOR INTERNATIONAL DEVELOPMENT</b> <b>PROJECT DATA SHEET</b>	<b>1. TRANSACTION CODE</b> <input type="checkbox"/> A = Add <input type="checkbox"/> C = Change <input type="checkbox"/> D = Delete	Amendment Number _____ <b>DOCUMENT CODE</b> 3
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<b>2. COUNTRY/ENTITY</b> GUATEMALA	<b>3. PROJECT NUMBER</b> 520-0395
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<b>4. BUREAU/OFFICE</b> LAC <span style="margin-left: 100px;">05</span>	<b>5. PROJECT TITLE (maximum 40 characters)</b> MAYA BIOSPHERE PROJECT
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<b>6. PROJECT ASSISTANCE COMPLETION DATE (PACD)</b> MM DD YY 07 30 96	<b>7. ESTIMATED DATE OF OBLIGATION</b> (Under 'B.' below, enter 1, 2, 3, or 4) A. Initial FY <u>90</u> B. Quarter <u>4</u> C. Final FY <u>93</u>
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8. COSTS (\$000 OR EQUIVALENT \$1 = )						
A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	( 824 )	( 486 )	( 1,310 )	( 6,983 )	( 3,517 )	( 10,500 )
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S.						
1.						
2.						
Host Country		2,200	2,200	--	7,500	7,500
Other Donor(s)		--		4,410	--	4,410
<b>TOTALS</b>	824	2,686	3,510	11,393	11,017	22,410

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				4,500		4,500	
(2) PSEE	233	090				6,000		6,000	
(3)									
(4)									
<b>TOTALS</b>								10,500	

<b>10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)</b> 066      067      069	<b>11. SECONDARY PURPOSE CODE</b>
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<b>12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)</b>				
A. Code	PVOU	PVON	ENV	
B. Amount				

**13. PROJECT PURPOSE (maximum 480 characters)**

To improve the management of renewable natural resources and protection of biological diversity and tropical forests in the Maya Biosphere Reserve.

<b>14. SCHEDULED EVALUATIONS</b> Interim MM YY MM YY Final MM YY 06 93      06 96	<b>15. SOURCE/ORIGIN OF GOODS AND SERVICES</b> <input checked="" type="checkbox"/> 000 <input type="checkbox"/> 941 <input checked="" type="checkbox"/> Local <input type="checkbox"/> Other (Specify) _____
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**16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a \_\_\_\_\_ page PP Amendment.)**

I certify that the methods of payment and audit plans are in compliance with the payment verification policy.

  
 Gary Byllesby  
 Controller

<b>17. APPROVED BY</b>	Signature Terrence J. Brown	<b>18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENT, DATE OF DISTRIBUTION</b> MM DD YY 08 24 90
	Title Mission Director	

## PROJECT AUTHORIZATION

Name of Country: Guatemala  
Name of Project: Maya Biosphere Project  
Number of Project: 520-0395

1. Pursuant to Sections 103 and 106 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Maya Biosphere Project for Guatemala involving planned obligations of not to exceed \$10,500,00 in 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, if AID should otherwise agree in writing, local currency costs for the project. The planned life of the project is six years from the date of initial obligation.
2. The project will assist the Government of Guatemala in improving the management of renewable natural resources and protection of biological diversity and tropical forests in the Maya Biosphere Reserve. The Maya Biosphere Reserve is one of the most important repositories of biodiversity and tropical forest species in the Americas and provides a habitat for numerous endangered endemic species. The conservation of biological diversity and tropical forests will provide Guatemala with future economic, scientific, cultural and recreational resources. On the global level, the conservation of these areas will preserve genetic resources and counteract the global warming trend. Therefore, the implementation of the proposed activities will produce local, national and international benefits.
3. The Project Agreement(s) which may be negotiated and executed by the officer(s) to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major 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 United States (A.I.D. Geographic Code 000), except as A.I.D. may otherwise agree in writing.

Except for ocean shipping, the suppliers of commodities or services shall have 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. Conditions Precedent to Initial Disbursement

Prior to the first disbursement under the Project, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D. the following:

- (i) An opinion of counsel acceptable to A.I.D. that the Project Agreement has been duly authorized and/or ratified by, and executed on behalf of, the Grantee, and that it constitutes a legally binding obligation of the Grantee in accordance with all of its terms.
- (ii) A statement of the name of the person holding or acting in the office of the Grantee and of any additional representatives, together with a specimen signature of each person specified in such statement.
- (iii) A comprehensive time-phased Implementation Plan for the first year of project activities.
- (iv) A detailed description of the administrative and management mechanisms that the GOG institutions involved in project implementation will use to assure appropriate execution, coordination, monitoring and evaluation of project activities.

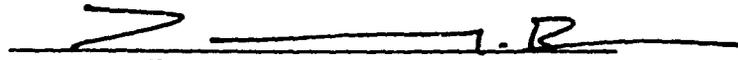
c. Covenants

The National Council for Protected Areas (CONAP) shall covenant the following:

- (i) CONAP agrees to establish an evaluation program as part of the project. Except as the parties otherwise agree in writing, the program will include, during the implementation of the project and at one or more points thereafter:

C

- (1) Evaluation of progress toward attainment of the objectives of the project and the targets of the project delivery plan.
  - (2) Identification and evaluation of problem areas or possible constraints which may inhibit such attainment.
  - (3) Assessment of alternative actions to help overcome such problems: and
  - (4) Evaluation, to the degree feasible of the overall development impact of the project.
- (ii) The National Council for Protected Areas (CONAP) agrees to submit a yearly implementation plan covering activities for the following calendar year.



Terrence J. Brown  
Director, USAID Guatemala

Aug. 27, 1990  
Date



**MAYA BIOSPHERE PROJECT PAPER**  
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- E. NPD Guidance Cable and GOG Guidance**
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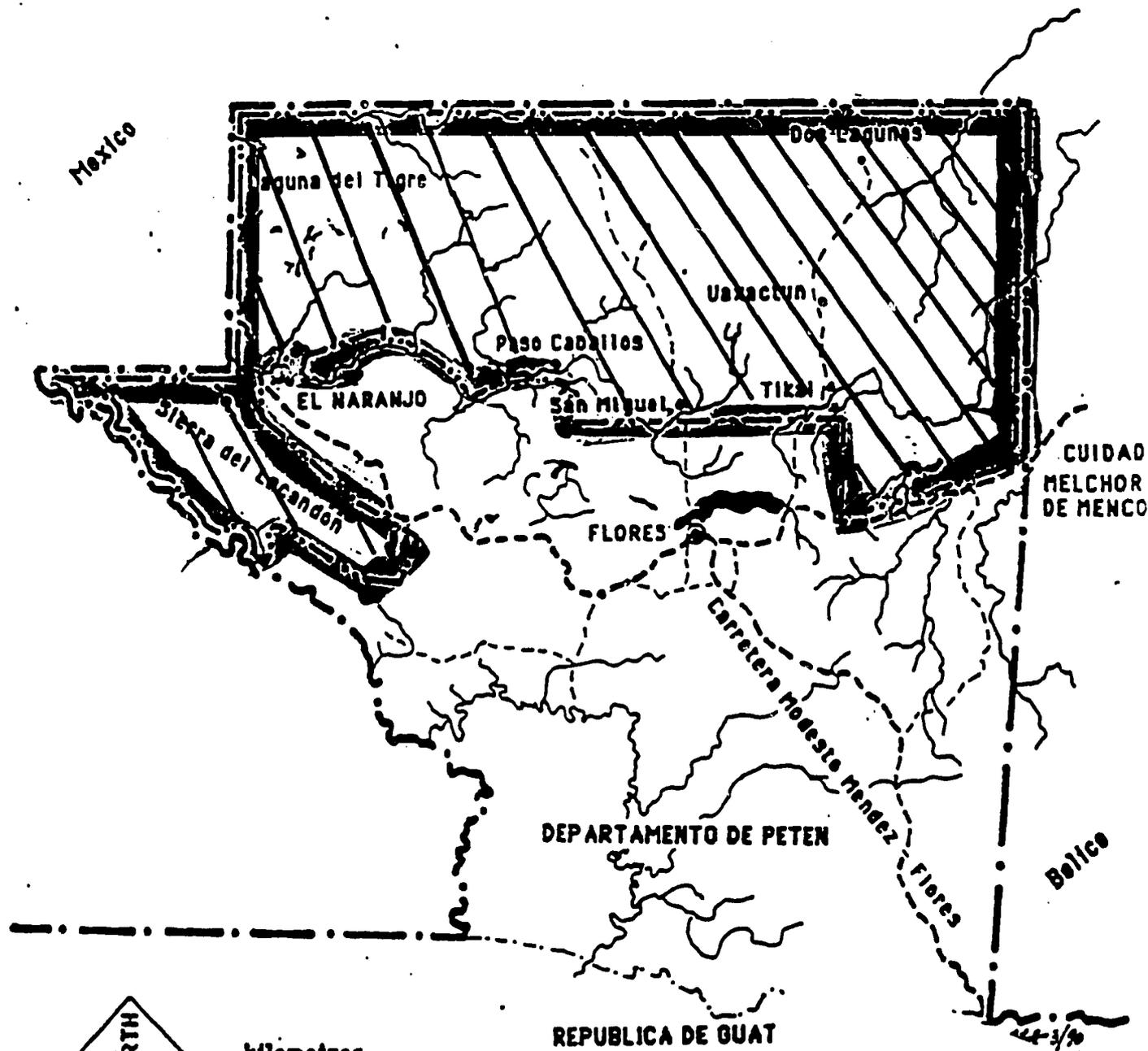
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## LIST OF ABBREVIATIONS

A.I.D.	United States Agency for International Development
APAP	Agricultural Policy and Analysis Project
CATIE	Tropical Agronomy Research and Education Center (Centro Agronómico Tropical para Investigación y Enseñanza)
CDSS	Country Development Strategy Statement
CECON	Conservation Studies Center of the National University (Centro de Estudios Conservacionistas)
CONAMA	National Environmental Comisión (Comisión Nacional del Medio Ambiente)
CONAP	National Council for Protected Areas (Consejo Nacional de Areas Protegidas)
CY	Calendar Year
DIGEBOS	Forestry and Wildlife Directorate (Dirección General de Bosques y Vida Silvestre)
ENR	Environment and Natural Resources
EOPS	End of Project Status
EPS	Supervised Professional Practicum (Ejercicio Profesional Supervisado)
FAA	Foreign Assistance Act
FAO	Food and Agricultural Organization of the United Nations
FY	Fiscal Year
GCM	Guatemala Component Manager
GOG	Government of Guatemala
HAD	Highlands Agriculture Development Project
IDAEH	Institute of Anthropology and History (Instituto de Antropología e Historia)
INGUAT	National Tourism Institute (Instituto Guatemalteco de Turismo)
IUCN	International Union for the Conservation of Nature
LAC	A.I.D. Bureau for Latin America and the Caribbean
LOP	Life of Project
MAGA	Ministry of Agriculture, Livestock and Food (Ministerio de Agricultura, Ganadería y Alimentación)
NGO	Non-governmental organization
NPD	New Project Description
ORD	USAID's Office of Rural Development
PACD	Project Activity Completion Date
PASA	Participating Agency Service Agreement
PIC	Project Implementation Committee
PID	Project Identification Document
PIU	Project Implementing Unit
PP	Project Paper
ProAg	Project Agreement
PSC	Personal Services Contractor
PSU	Project Supervisory Unit
RENARM	ROCAP's Regional Environmental and Natural Resources Management Project
RFA	Request for Applications for Assistance
ROCAP	Regional Office for Central American Programs of A.I.D.
SEGEPLAN	General Secretarial for Economic Planning (Secretaría General de Planificación Económica)
TFAP	Tropical Forest Action Plan
UNEPET	Peten Development Plan Implementing Unit (Unidad Ejecutora del Plan de Desarrollo del Petén)
USAID	United States Agency for International Development Mission to Guatemala

PROYECTO DE MANEJO PARA LA MUYA  
 MAYA RESERVE MANAGEMENT PROJECT

Consejo Nacional de Areas Protegidas de la Republica de Guatemala y  
 Agencia Internacional de Desarrollo de los Estados Unidos



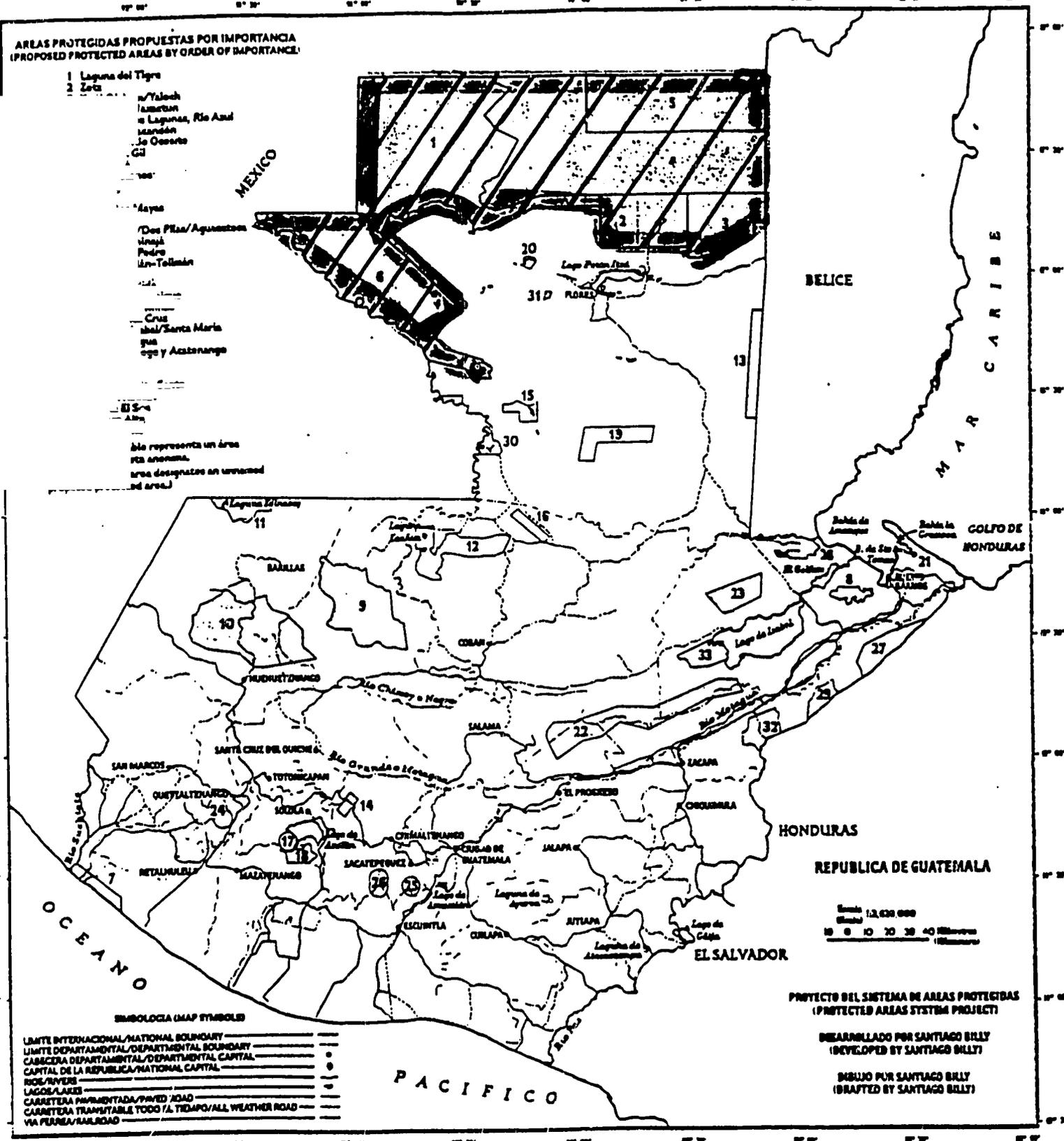
LEYENDA/LEGEND

-  Limite Internacional/International Border
-  Limite Reserva de la Biosfera/Biosphere Reserve Boundary
-  Carretera/Road
-  Rio/River
-  Laguna/Lake

**AREAS PROTEGIDAS PROPUESTAS POR IMPORTANCIA  
(PROPOSED PROTECTED AREAS BY ORDER OF IMPORTANCE)**

- 1 Laguna del Tigre
- 2 Zona
  - a) Yalosh
  - b) Usumacint
  - c) Lagunas, Rio Azul
  - d) Marabon
  - e) Jo Ocorito
  - f) Gá
- 3 Aysa
- 4 Dos Pías/Aguastón
- 5 Usumacint
- 6 Piedra
- 7 Usumacint
- 8 Cruz
- 9 Usumacint/Santa María
- 10 Usumacint y Acatenango

El símbolo  
A) representa un área  
B) un área designada en un  
orden de importancia.



**SIMBOLOGIA (MAP SYMBOLS)**

- LIMITE INTERNACIONAL/NATIONAL BOUNDARY
- LIMITE DEPARTAMENTAL/DEPARTMENTAL BOUNDARY
- CABECERA DEPARTAMENTAL/DEPARTMENTAL CAPITAL
- CAPITAL DE LA REPUBLICA/NATIONAL CAPITAL
- RIO/RIVER
- LAGO/LAKE
- CARRETERA PAVIMENTADA/PIVED ROAD
- CARRETERA TRANSMITABLE TODO EL TIEMPO/ALL WEATHER ROAD
- VIA FERREA/RAILROAD

PROYECTO DEL SISTEMA DE AREAS PROTEGIDAS  
(PROTECTED AREAS SYSTEM PROJECT)

DESARROLLADO POR SANTIAGO BILLY  
(DEVELOPED BY SANTIAGO BILLY)

MAPA DRAFTED POR SANTIAGO BILLY  
(DRAFTED BY SANTIAGO BILLY)

Escala 1:2,000,000  
(Scale)

0 10 20 30 40 Kilómetros  
(0 10 20 30 40 Miles)

## **I. SUMMARY AND RECOMMENDATIONS**

### **A. Recommendations**

The following recommendations are submitted for approval:

1. \$10,500,000 in grant funds be authorized for the Maya Biosphere Project to be implemented over a six year period from the date of authorization.
2. Project counterparts will provide, as a minimum, the equivalent of \$5,000,000 as counterpart contribution to the Project.
3. Goods and services financed by A.I.D. under this Project shall have their source and origin in the United States, Guatemala, or in countries that are members of the Central American Common Market, except as A.I.D. shall otherwise agree in writing.
4. The principal Grantees will be U.S. NGOs or NGO consortia to be awarded Cooperative Agreements to carry out Project activities in conjunction with GOG implementing institutions and local counterpart organizations. In addition, the GOG acting through the Secretariat for Economic Planning (SEGEPLAN) and the National Council on Protected Areas (CONAP) will also be signatories to the Grant Agreement.

### **B. Summary Project Description**

#### **1. Goal and Purpose**

The goal of the Maya Biosphere Project is to improve the long-term economic well-being of Guatemala's population through the rational management of renewable natural resources. The purpose of the Project is to improve the management of renewable natural resources and protection of biological diversity and tropical forests in the Maya Biosphere Reserve.

#### **2. Rationale**

The Maya Biosphere Reserve, located in Guatemala's northernmost department, the Peten, comprises 1.5 million hectares. The Peten department is one of the poorest areas of the country, lacking adequate health, education, infrastructure and economic opportunities, despite having perhaps the most significant economic potential of all departments due to its wealth of natural and cultural resources. The ecosystems in the Reserve hold valuable tropical hardwoods and important extractive reserves. Most of the land in the Reserve has low-nutrient, karstic soils characterized by shallow topsoils, poor drainage and fragility, and thus agricultural production is not only economically unsustainable, but causes severe environmental degradation in very short periods of time.

Largely unsettled after the decline of the ancient Maya civilization, Peten's population has increased ten-fold since 1964 to approximately 250,000, and the land area in agricultural production has increased fifty-fold. Slash and burn agricultural practices are currently deforesting approximately 40,000 hectares per year. As a result of these factors, primary forests are projected to disappear within thirty years. If action is not taken immediately to promote natural resource management and environmentally benign development in this area, the degradation of the environment and the natural resources will continue to accelerate and cause further irreversible damage, preventing sustainable economic growth.

According to Amendments 118 and 119 of the Foreign Assistance Act, A.I.D. has been directed to support protection of biodiversity and tropical forests. The Maya Biosphere Reserve is one of the most important repositories of biodiversity and tropical forest species in the Americas and provides a habitat for numerous endangered endemic species. The hundreds of archaeological sites represent an equally impressive cultural resource, which is capable of generating significant foreign exchange through tourism. These natural and cultural resources offer great potential for sustainable economic development of the Reserve area if appropriate resource management activities, such as those described in this Project paper, are undertaken.

#### **C. Summary Findings**

This Project is ready for implementation and is judged to be socially, financially and environmentally sound, and technically and administratively feasible.

#### **D. Statutory Criteria and Mission Director Certification**

1. The Project meets all applicable statutory criteria. Appropriate checklists are included in Annex A.
2. A certification by the USAID/Guatemala Mission Director that the proposed counterparts have the capability to implement and maintain the Project is included in Annex B.

## **E. Project Beneficiaries**

Direct beneficiaries will include independent forest resource extractors, cooperatives and industries related to tourism and forest products in the Maya Biosphere Reserve and in the Peten. The conservation of biological diversity and tropical forests also provides the nation with future economic, scientific, cultural and recreational resources. On the regional and global level, the conservation of these areas will preserve genetic resources and counteract the global warming trend. Therefore, the implementation of the proposed activities will produce local, national, regional and international benefits.

Primary beneficiaries of this Project include the institutions which receive support and their professionals who receive training. The increased effectiveness of CONAP, DIGEBOS, CECON and IDAEH resulting from these institutional development and training activities will have a multiplication effect over the country as their personnel participate in long-term activities in the Peten, in other regions of the country, and at the national level. These institutions will receive benefits from technical assistance, commodities that will promote more efficient and effective programs, and new research information which will provide them with the basis for making more informed decisions about protected area management and sustainable natural resource management for income generation. Increased public sector ability to integrate the concerns of conservation and socioeconomic development will lend to long-term stability of production systems of the country.

Other public (e.g., Ministry of Education) and private institutions (e.g., NGOs) and their personnel also will receive benefits from institutional development, research, awareness, and environmental education activities made available through the Project.

Other residents of the Peten will be secondary or indirect beneficiaries of the Project. A number of them will receive direct impacts from job creation and local hiring practices. Many children and some adults in literacy programs will receive the direct benefits of better oriented teachers with educational materials. Individuals working in natural forest management, extractive reserves, and tourism oriented to nature and culture will benefit from the availability of new information on more sustainable resource management practices that will be provided by better trained outreach personnel.

The global community may be considered to be an indirect beneficiary of Project activities as well. Efforts to integrate conservation and development provide political, environmental and economic stability to individual countries which, in turn, contribute to global stability.

#### F. SUMMARY PROJECT BUDGET (\$000's)

DESCRIPTION	AID	NGO	GOG	TOTAL
Biosphere Administration	1,732	866	2,281	4,879
Environmental Education, Public Awareness and Policy	2,591	1,435	265	4,291
Sustainable Resource Management	3,439	2,109	3,871	9,419
Project T.A. & Management	<u>2,738</u>	<u>0</u>	<u>1,083</u>	<u>3,821</u>
<b>TOTAL</b>	<b>10,500</b>	<b>4,410</b>	<b>7,500</b>	<b>22,410</b>

#### G. Response to NPD Guidance Cable

The design proposed in this Project Paper addresses all the points expressed in the NPD guidance cable (see Annex E). These points and the sections in the PP which address them are listed below.

1. Description of Project outputs: Section III.D (Outputs)
2. Prioritization of Project activities: III.A (Strategy) and IV.B.4 (Phasing)
3. Appropriate timing of implementation: IV.G (Implementation Schedule)
4. Institutional capabilities of proposed implementing agencies: IV.B (Institutional Analysis Summary) and Annex G (Institutional Analysis)
5. Donor coordination: II.D (Other Donor Assistance)
6. Economic needs of populace on periphery of protected areas: III.D.3 (Sustainable Resource Management) and II.E (Relationship to Other A.I.D. Projects)

#### H. Response to GOG Guidance

On March 20, 1990 a meeting was held with representatives of CONAMA, SEGEPLAN, CECON, TFAP, IDAEH, INGUAT, DIGEBOS and CONAP to discuss the preliminary design for the Maya Biosphere Project. At this meeting the GOG endorsed the Maya Biosphere Project, and subsequently the participating institutions summarized their comments in a letter contained in Annex E. The design proposed in this Project Paper incorporates the recommendations contained in this letter. Since the Project design reflects the priorities of each of these institutions, it is expected that they will fully support its implementation.

## II. PROJECT BACKGROUND

### A. Project Setting

The Maya Biosphere Reserve is located in Guatemala's northernmost Peten department which comprises approximately one-third of the country's total land area. The Peten department is one of the poorest areas of the country, lacking adequate health, education, infrastructure and economic opportunities, despite having perhaps the most significant economic potential of all departments due to its wealth of natural and cultural resources. It is the department with the highest rate of immigration. Studies have shown that approximately 250 new colonists, mostly landless poor, arrive each day.

The Maya Biosphere Reserve comprises 1.5 million hectares of the northern area of the Peten. It is an area that is predominately composed of savanna, subtropical wet forest, subtropical rain forest and wetland ecosystems. These ecosystems are of economic value because they hold valuable tropical hardwoods such as mahogany and cedar, and extractive reserves such as chicle (gum), xate (an ornamental palm), pimienta gorda (allspice) and rattan. Most of the land in the Biosphere has low-nutrient, karstic soils with little or no topsoil, poor drainage and fragile structure. The large majority of these soils can only be used for forestry or extractive reserve activities. Agricultural production on soils of this type is not only economically unsustainable, but causes severe environmental degradation in very short periods of time.

The Reserve has very high flora and fauna biodiversity, containing one of the most important repositories of germplasm in the Americas and numerous endemic species because this important tropical habitat bridges the North and South American continents. In addition, it has hundreds of archaeological sites, including Tikal, which are capable of generating foreign exchange through tourism. Despite the poverty of the expanding population in this department, potential exists to remedy the economic problems if appropriate natural and cultural resource management activities are undertaken.

Largely unsettled after the decline of the ancient Maya civilization, Peten's population has increased ten-fold since 1964 to approximately 250,000, and the land area in agricultural production has increased fifty-fold. A large percentage of this area has now been degraded by nutrient depletion and severe erosion. Slash and burn agricultural practices are deforesting approximately 40,000 hectares per year. As a result of these population pressures and unmanaged growth, primary forests are projected to disappear within thirty years, while the limited water supplies are becoming increasingly polluted. Erosion is reducing land productivity and flora and fauna biodiversity is being eliminated. If action is not taken immediately to promote natural resource management and environmentally benign development in

this area, the degradation of the environment and the natural resources will continue to accelerate and cause further irreversible damage. This would not only cause the loss of invaluable natural and cultural resources, but would also destroy any chance of developing sustainable economic growth to benefit the local population and the country in general.

### **B. GOG Plan/Strategy**

The Maya Biosphere Project comes at a propitious time in Guatemala. The current government has supported more environmentally harmonious development, and has created the legal framework for the largest and potentially most important system of protected areas in Central America. It has passed the following three significant laws within the last 15 months:

1. The Biosphere Reserve Law which establishes the 1.5 million hectare Maya Biosphere Reserve and designates institutional responsibility for managing the reserve.
2. The Protected Areas Law which establishes a national system of protected areas and also establishes the National Council for Protected Areas (CONAP) to oversee these areas.
3. The new Forestry Law and regulations strengthen the General Directorate of Forestry (DIGEBOS), and provide improved mechanisms for forest management and control of forest harvesting.

These laws supplement 1988 legislation which established the National Environmental Commission (CONAMA), an umbrella agency responsible for formulating national environmental policy and coordinating all environmental activities. The new laws will need strong enforcement, and the institutions responsible for regulation are still young and require institutional strengthening to effectively deal with the problems associated with natural resources management. However, the new laws and the work that these institutions have accomplished thus far with very limited resources are very encouraging, and signal changing attitudes in Guatemala's public and private sector which recognize the importance of conservation and sustainable development of renewable natural resources.

In addition, the implementation of this Project will be carried out in coordination with, and in support of, the Guatemalan Tropical Forestry Action Plan and the Integrated Development Plan for the Peten.

The heads of GOG institutions and national NGOs involved in environmental and natural resource management played a major role in the elaboration of this Project Paper, and the activities proposed herein represent the priorities of their institutions. The Project therefore not only conforms to recipient country policy, programs and legislation, but was designed together with the GOG and as a result will have strong host country support.

#### **C. Sector/Program Constraints**

Sectoral and program constraints are numerous, complex and cannot be solved in the short term. However, they need to be confronted immediately to slow further irreversible natural resource losses and to begin a process of sustainable economic growth based on the management of these resources. The Project will address the problems summarized below, and support activities to help overcome them.

1. **Education and Awareness:** From farmers to politicians, the Guatemalan population has historically not understood the importance of conserving and managing the natural resource base.
2. **Political:** Many existing laws and regulations do not promote, and in some cases counter, appropriate management of natural resources.
3. **Technical:** The principal economic activities in the Biosphere have employed destructive and unsustainable techniques such as slash and burn agriculture.
4. **Institutional:** Government extension agents and protected area management personnel have neither had adequate training or equipment to provide outreach services or park control.
5. **Demographic:** Population growth (Peten's rate is estimated at 5-7 times higher than any other department in Guatemala), uncertain land tenure, low incomes, migration and other demographic factors have generated pressures which have led to the rapid degradation of natural resources throughout the country.

#### **D. Other Donor Assistance**

At this time, there are numerous activities being implemented by the GOG, NGOs and other bilateral and multilateral donors. CONAMA, which serves as the GOG coordinating body for all environment and natural resource (ENR) activities, will undertake efforts to provide overall management guidance for the implementation of these activities and to avoid duplication of efforts. USAID/Guatemala has been coordinating directly with all donors with major ENR management programs in the Peten, and has coordinating meetings with CONAMA, DIGEBOS and CONAP staff on a frequent basis. The most significant ENR programs of other donors are briefly summarized below.

1. The Tropical Forestry Action Plan, developed under auspices of the Food and Agriculture Organization (FAO) of the United Nations, brought together Guatemalan public, private and NGO representatives to analyze the national forestry situation and recommend a series of prioritized investments in forestry.
2. The Government of West Germany is producing a Master Plan for the integrated development of the Peten aimed at providing a strategy for environmentally sound development. The program focuses on natural and cultural resource management and provides basic planning services and infrastructural support for the entire Department of the Peten. Activities include a study of land tenure based on sampled interviews, a forest inventory, soils mapping, air photographs at 1:20,000, and financial support for consolidation of archaeological sites.
3. The Government of Japan is providing machinery and vehicles for the maintenance of secondary roads in the Peten.
4. The Republic of China (Taiwan) has ongoing projects on vegetable production and fish farming on Lake Petén Itzá. The vegetable production project consists of a demonstration plot of garden vegetables on raised-bed plots on the north shore of the lake. The fish production project is examining survivability and growth rates of Tilapia fish species raised in wire cages in Lake Petén Itzá.
5. The World Wildlife Fund-U.S. includes two Petén biotopes in a nation wide project to help consolidate CECON's biotope system. In Biotopo Cerro Cahuí, located within the buffer zone of the Maya Biosphere Reserve, activities concentrate on environmental education and the construction of a visitor center. Within the Biotopo San Miguel/El Zotz, which forms one of the core areas of the Maya Biosphere Reserve, activities focus on constructing guard houses and providing guard salaries. Initiated in December, 1989, the project is funded by USAID-LAC and is scheduled to run through May, 1991.
6. The Nature Conservancy is supporting CONAP's basic budgetary requirement for Petén activities, as well as providing \$50,000 for protection of the Maya Biosphere Reserve in the form of reserve guard training, guard houses, and guard salaries. The Nature Conservancy also provides salary funds for the acting director of the biosphere reserve.
7. Conservation International is providing \$300,000 over three years to improve CECON's capacity to manage the three biotopes which fall within the Maya Biosphere Reserve. Activities include technical training for CECON personnel, training courses for reserve guards, and development of a scientific field station in Dos Lagunas.

8. The Peregrine Fund is in the first year of a three year, \$170,000 project to provide base-line biological and ecological data on birds of prey in the Petén, focused primarily on Tikal National Park.
9. CATIE is currently implementing a program that has three components in the Peten. They are studying the economic potential of wetlands, establishing a sustainable development demonstration site in San Miguel, and have assisted the USAID-financed Biodiversity and Conservation Planning Project being implemented by The Nature Conservancy.
10. IUCN is currently planning a natural resource management and protected areas pilot zone in the Yaxha-Naranjo-Nakum triangle in conjunction with the GOG Archeology and History Institute.

#### **E. Relationship to A.I.D. Policy, A.I.D. Strategy and other A.I.D. Projects**

This Project will directly support the Mission Action Plan's Objective 6 (Manage and Preserve Natural Resources), A.I.D.'s "Environment and Natural Resources Policy Paper", Amendments 118 and 119 of the Foreign Assistance Act and the Mission Agriculture Sector Development Strategy. This Project also complies with the A.I.D. Strategy for Environmental Protection and Natural Resource Management for Central America, published in 1989, which creates the overall framework for U.S. Government assistance in the region over the next decade.

The Project will directly contribute to the achievement of the following goals described in the current Country Development Strategy Statement (CDSS): 1) Realize rapid and sustained economic growth, and 2) Achieve greater participation of all Guatemalans, primarily the historically disadvantaged, in the generation and benefits of that growth. These goals will be accomplished by the establishment and promotion of activities that will provide more sustainable incomes for impoverished populations. The Project will directly address cross-cutting natural resource management problems described in the CDSS, including biodiversity loss, deforestation, soil erosion and forest mismanagement.

The Mission has initiated several environment and natural resource management related projects which have provided the Maya Biosphere Project with valuable design and implementation lessons. Through the Highlands Agricultural Development (HAD) Project, the Mission has gained extensive experience in soil and water conservation, institutional strengthening focussed on ENR management and working with small farmers to enhance and stabilize their incomes based on natural resources. Other Mission projects related to ENR management include the INFORDE Project, which is promoting private sector

initiatives in forestry and the wood products industry, the Biotope Strengthening Project, the Biodiversity and Conservation Planning Project, the Park Guard Training Grant, the ENR NGO Strengthening Grant, the Peten Environmental Education component of the Development Training and Support Project, and environmental education activities under the Farm to Market Access Roads Project. The design of the Maya Biosphere Project has benefitted from the lessons of these other Mission projects, and represents an outgrowth of, and progression from them.

The Mission is currently requesting the local currency equivalent of approximately US\$ 7 million for ENR management purposes in the Peten under the Section 416 Program. Though at this time it is not clear whether these funds will be obtained, preliminary planning for their use has been undertaken. Potential uses include a research, extension and tourist center to demonstrate sustainable agricultural practices in the Peten based in part on ancient Maya techniques, a potable water and integrated health program for residents of the Peten, NGO support programs, a credit fund for natural resource management-oriented economic activities and support for other assistance programs for the residents of the Peten.

Within the Latin America and Caribbean region, A.I.D. has many ongoing or completed ENR projects with high relevance to the Maya Biosphere Project. These projects have addressed issues including sustainable agriculture and forestry, reforestation, park protection and maintenance, buffer zone management and tourism development. Particularly relevant are USAID/Costa's Rica Forest Resources for a Stable Environment (FORESTA) Project and USAID/Jamaica's Protected Areas and Resource Conservation (PARC) Project, whose protected areas management goals broadly overlap with this Project. Also highly relevant is USAID/Peru's Central Selva Resource Management Project, which initiated cutting-edge research in sustainable tropical forestry, and was implemented in conjunction with the establishment of protected areas.

In addition, ROCAP's and LAC/DR/E's extensive experience in ENR issues, as well as the accumulated experience and service provided by the recent development of RENARM will be fully utilized. The ROCAP RENARM Project provides training, information, research and technical assistance in conservation and sustainable management of renewable natural resources throughout Central America. The ROCAP-financed policy inventory and analysis (conducted through the Agricultural Policy and Analysis Project) has analyzed Guatemala's natural resources policies, highlighting strengths and weaknesses and recommending avenues for increasing effectiveness.

A.I.D.'s ENR experience outside of the LAC Bureau will also be evaluated and applied where feasible. As an example, PPC has recently analyzed resource management projects in Nepal and Kenya. In summary, USAID, the LAC Missions and AID/W have extensive experience in ENR projects, and this experience will be utilized to the extent feasible in the implementation of this Project.

### III. DETAILED PROJECT DESCRIPTION

#### A. Project Goal and Purpose

The goal of the Maya Biosphere Project is to improve the long-term economic well-being of Guatemala's population through the rational management of renewable natural resources. The purpose of the Project is to improve the management of renewable natural resources and protection of biological diversity and tropical forests in the Maya Biosphere Reserve.

#### B. Project Strategy

The Maya Biosphere Project proposes to achieve its purpose by the phased implementation of three mutually reinforcing and complementary activity components and one management component. The basic strategy promotes the protection, study and use of the natural and cultural resources of the Reserve. The first component will focus on the immediate strengthening of certain GOG institutions to enable them to enforce the legal protection of Biosphere resources before current widespread destructive practices cause further irreversible damage. The second component of the Project will provide long-term support by developing the human resource base in ENR management through education, awareness and policy activities. The third component will promote viable economic alternatives for residents of the Biosphere which are more sustainable than present destructive practices and which promote the conservation of natural resources. These three components represent an approach that not only protects the natural resources of the Biosphere, but provides the population with environmentally sound means of improving their standard of living, and educates them to provide long-term, grass roots support for these management practices.

This Project places strong emphasis on strengthening public and private sector ENR institutions and the development of human resources. The success and sustainability of ENR management depends on these two activities, and NGOs selected to participate in the Project will be required to focus particularly on institutions in the Peten. In addition, coordination between the public and private sectors, and between those who work in the Biosphere and the decision makers in the capital, has received special attention during the design of the Project, and will become a central theme during implementation. This emphasis on inter-institutional and inter regional coordination is essential to the success of the management of the Biosphere. For example, the NGOs will be required to engage community participation in the implementation of Project activities while strengthening local organizations

U.S. NGOs and/or NGO consortia will undertake most of the implementation of the three components of this Project through Cooperative Agreements. NGO implementation has numerous advantages, including proven expertise in ENR

activities, interest and capability to offer sustained support in this area, leverage from their counterpart funds (NGOs are expected to increase Project resources by more than \$4 million); capability to work harmoniously with and strengthen local institutions, sound financial management and reduction of A.I.D. management responsibility. This mechanism also provides additional opportunity for joint implementation with the ROCAP RENARM Project.

The implementation of this Project will be complicated, not only due to the number and complexity of activities, but also because of the number of institutions the Project must deal with. NGO implementation of Project activities will alleviate much of the management burden, allowing the Mission to focus on supervision and coordination. An additional design feature is the phasing of activities so that a relatively even flow of activities exists over the six year life of the Project.

This Project represents a new area of activity for the Mission, involves a new geographic area and new institutions. To a large degree, this Project is experimental in nature, and the strategy and specific activities will undoubtedly need to be adjusted during the Project life to address the changing political, technical and economic realities. The Project will be evaluated on a yearly basis, and it is expected that this will provide ongoing lessons to improve the Project during its LOP, and make future ENR efforts achieve their natural resource management goals effectively. In addition to this flexibility, the design may also be modified according to the proposals submitted by NGOs which assist with Project Implementation. Acknowledging the built-in flexibility of the Project design, this Project Paper provides a general framework for ongoing design improvements. The monitoring, evaluation and planning process, coupled with applied research, will provide the Project with additional technical information necessary to reorient and refocus its resources during Project implementation. This flexibility is meant not only to provide the selected NGOs with the ability to provide feedback and input, but also to provide A.I.D. with an important management tool to address Guatemala's evolving ENR management problems as a function of the availability of resources and methods of solution.

Environmental protection and natural resource management in the Peten is also a new area of work for the GOG. The institutions responsible are relatively new and weak. There are numerous other potential problems and serious issues that face this Project, including security, underdeveloped infrastructure, the lack of appropriate land tenure and colonization regulations, and imminent political changes in the country. Despite the numerous risks and uncertainties, it is clear that if measures such as those proposed in this Project are not undertaken, destruction of the unique and invaluable resources of the Maya Biosphere is a short-term certainty.

### **C. End of Project Status**

The Maya Biosphere Project will result in the following conditions essential for achievement of the Project purpose:

1. Strengthened and institutionalized protected areas management capabilities within CONAP and other counterparts.
2. Increased number of equipped and trained park guards to protect the Biosphere Reserve from destruction of natural and cultural resources.
3. Formation of a large body of applied research in the areas of conservation, environmentally benign economic activities and marketing techniques that will provide the bases for future sustainable Biosphere natural resource management activities.
4. The development of economically and technically viable activities in and around the protected area of the Maya Biosphere that will increase the incomes of target populations while conserving renewable natural resources.
5. Extension agents trained and equipped in the use of these sustainable income-generating activities that conserve natural resources and in the elaboration and enforcement of forestry management plans.
6. Increased ENR awareness of decision-makers and the general Guatemalan population, especially in the Biosphere area itself.
7. Students educated in ENR concepts at the primary and secondary school level, and university ENR management programs developed in order to produce more professionals in this field.
8. Propagation of a clear understanding of the impact of laws and regulations that impact ENR management in Guatemala, and improved GOG capability to analyze and redress unsuitable policies, laws and regulations that negatively affect the environment and natural resources.
9. A demonstration unit for sustainable timber production and harvest of extractive reserves.

#### **D. Project Components**

The Project will be implemented through three activity components and one management component phased over the life of the Project. In keeping with the Project strategy, these are designed to protect, study and sustainably use the Maya Biosphere Reserve area. The first component, Biosphere Administration, will establish an effective Biosphere Administration and strengthen the GOG institutions responsible for the protection of the Reserve. The second component of the Project, Environmental Education, will address environmental issues through the formal education sector, through public awareness campaigns and through policy activities. The third component, Sustainable Resource Management, will develop the resource management basis for income generation through environmentally compatible forestry, resource extraction, tourism and other small-scale commercial activities. The final component, Project TA, Management and Evaluation, will provide necessary planning, coordination and evaluation functions, and conduct baseline and monitoring studies which serve the other components of the Project.

##### **1. Biosphere Administration (\$1,732,000)**

This component of the Project will provide immediate support for Biosphere Administration through the strengthening of CONAP's Maya Biosphere headquarters and three regional offices, the development of the Maya Biosphere Master Plan and the demarcation of Reserve boundaries. The component also provides significant support to strengthen the GOG institutions responsible for the protection and management of natural and cultural resources in the Maya Biosphere Reserve.

##### **a. Establish Biosphere Administration**

###### **Strengthen Regional Offices**

This activity will strengthen the three regional CONAP Biosphere Offices in Naranjo, Uaxactun and Yaxha, and the Biosphere headquarters in Flores with technical assistance and the necessary materials and equipment. This component will also provide remote sensing material, maps, literature and reports to the headquarters. This component will help CONAP to effectively carry out the protection and management functions authorized under the Maya Biosphere Law and the objectives of this Project.

###### **Maya Biosphere Reserve Master Plan**

This activity will finance the master plan that determines which specific areas of the Biosphere Reserve may be used for permissible economic activities. This Plan will also designate specific private and public sector institutional responsibilities, and will include an action plan to achieve the objectives of the Reserve.

### **Physical demarcation of Biosphere Boundaries**

Essential to the effective protection of the Biosphere Reserve is the establishment of clear Reserve boundaries and, within those boundaries, the identification of nuclear protected areas and multiple use zones. The physical demarcation activity will be conducted by CONAP park guards. Project support will include the acquisition of survey equipment, boundary signs and kiosks to support this activity.

#### **b. Strengthen Resource Management Institutions**

Through this activity, Guatemalan personnel working in CONAP, CECON, IDAEH and DIGEBOS will receive training in park protection, natural and cultural resource management and administration (see Training Plan in Section VI.D for more details). This activity will also finance short-term technical assistance and the purchase of equipment and vehicles to help these institutions effectively carry out their protection and management functions (see the Procurement Plan in Section VI.C). In addition, nine field posts and twenty remote area patrol shelters will be established within the Reserve for CONAP, CECON and IDAEH park guards with Project funds.

#### **Participants**

CONAP, DIGEBOS, CECON and IDAEH will be the principal participating agencies in this component. Local NGOs may also participate. These organizations will benefit from training, technical assistance and the equipment/material support to be provided under this component. The Institutional Analysis (section IV.B) contains a detailed description of these counterpart institution's responsibilities in the Biosphere Reserve.

#### **Phasing**

The implementation of this component will begin as soon as possible, and the bulk of activities will be undertaken in Project years two and three. Activities in the component will continue throughout the Project, but will be reduced after year three (see Implementation Schedule, section VI.G).

## Summary of Anticipated Inputs

### Illustrative Component Budget (US\$000's)

Item	USAID	NGO	GOG	TOTAL
Personnel	40	326	820	1,186
Technical assistance	515	58	0	573
Travel and per diem	219	104	60	383
Training	120	30	0	150
Vehicles	80	80	0	160
Equipment	78	60	204	342
Office & furnishings	280	10	690	980
Supplies & operating expense	114	45	210	369
Special studies	<u>60</u>	<u>40</u>	<u>0</u>	<u>100</u>
Subtotal	1,506	753	1,984	4,243
Contingencies	151	75	198	424
Inflation	<u>75</u>	<u>38</u>	<u>99</u>	<u>212</u>
<b>TOTAL</b>	<b>1,732</b>	<b>866</b>	<b>2,281</b>	<b>4,879</b>

### Outputs

1. Three regional offices and Biosphere headquarters equipped and functioning.
2. Maya Biosphere Reserve Master Plan adopted.
3. Maya Biosphere boundary, nuclear protected areas and multiple use zones demarcated.
4. Nine field posts and 20 remote area patrol shelters to support the guards.
5. GOG institutions with personnel trained and equipped for the improved management of the Maya Biosphere Reserve.

## **2. Environmental Education, Public Awareness and Policy (\$2,591,000)**

This Project component will develop long-term support of Project objectives through environmental and natural resource management education in primary and secondary schools, and the strengthening of university ENR programs. Support will also be provided for environmental awareness programs directed towards the general public. More effective ENR policy formulation will also be promoted through policy analysis activities.

### **a. Environmental Education**

In order to improve the formal education sector program in environmental education, a series of training workshops and events will be conducted with school administrators, teacher associations, teachers, university students and representatives from NGOs. Grant support will also be provided to help develop university ENR programs.

School administrators will participate in planning workshops for in-service teacher training. The component will work closely with teacher associations in the Peten department to develop an in-service teacher training program addressing the specific needs and interests of teachers and students in the department of Peten. The actual training of teachers will address special environmental education issues at the local level, the development of simple classroom field activities to understand the Peten physical environment, guidance for working with Parents' Associations and other groups in their community and incorporating ENR materials into literacy programs for adults.

At the university level, during the second year of the Project a series of seminars, workshops, and/or short courses on environmental education should be presented to the students of at least three institutions in the country to enhance their professional education and increase their awareness of environmental education tools and methods. This activity will finance the strengthening of university-level ENR programs in Guatemala City as well as in the Peten.

Because of the important role that NGOs play in development activities in the Peten region, training workshops will be conducted with representatives of NGOs to provide an overview of the state-of-art of environmental education as well as provide examples of the range of activities that can be developed for environmental education for primary and secondary schools, adult literacy programs, and health, agricultural extension, or other community development activities.

Finally, a special fund will be set aside to support the activities of teachers, university students and professors, and NGOs to undertake special environmental education programs. This fund may support, for example, student activities in the Peten under the Supervised Professional Practicum (EPS) programs, special projects for university thesis work, or NGO preparation of environmental education materials for on-going training programs. This should encourage the development of new training materials, support activities that might otherwise never occur and promote increased participation in the Maya Reserve management activities.

#### **b. Environmental Awareness Programs**

Preparation of public awareness environmental education strategies and materials will be undertaken with the assistance of the NGO awarded responsibility for this component. Workshops will be conducted with the participation of public and private sector institutions involved in environmental issues. The types of materials in the public awareness program will include newsletters, audio-visuals, technical and popular articles, radio education programs and simplified guides (e.g., to protected area laws). In addition, funds will be set aside to study and strengthen the role of women in natural resource management.

Dissemination of the materials will be conducted at public meetings, in schools, during workshops, seminars and other Project events, and through various media services. A mass media campaign will be conducted to provide information to the public about the values of the tropical forest, environmental laws, and Project activities in the Biosphere. Schools and public offices will be provided with posters and other visual materials, emphasizing messages to Peten residents. Radio programs, posters and other materials that can be disseminated more broadly will also be provided to other locations in the country (e.g., La Aurora National Zoo and the Museum of Natural History).

An interpretive educational program at the Reserve will be developed and include descriptive trail signs, posters, photo exhibits, slide programs, brochures, and related materials for visitors.

Policy maker workshops and study tours will be conducted to bring together groups of local and national decision-makers in both the public and private (e.g., NGOs, business) sectors. These workshops will provide opportunities for presentation and discussion of environmental and natural resource management topics, results from

policy and other applied research, and viewing of audio-visuals and other materials. A national conference will also be hosted, with the participation of policy-makers, public and private sector representatives and the general public, to promote environmental awareness and discuss the importance of sustainable resource management in Guatemala.

### **c. Policy**

The policy activities of this Project are expected to be undertaken through a buy-in to RENARM and/or the Agricultural Policy and Analysis (APAP) Project. The work will focus on policy research and dialogue on specific issues related to natural resource management, such as legislation for exploitation of non-forest products in national parks and biosphere reserves, impact of land colonization on the protection of biological diversity, and recurrent cost financing of natural resource based activities. Policies that provide economic and fiscal incentives for the private sector and Biosphere colonists to contribute to the achievement of Project objectives will be explored under this component. An inventory of these policies has already been completed under APAP. Additional policy analysis and institution building activities, described in Annex E, will be supported under this subcomponent.

### **Participants**

The environmental education activity of the component is oriented primarily towards primary and secondary schoolteachers and university faculty and students in the ENR field. The public awareness activity will involve public and private sector decision-makers and Guatemalan citizens, particularly in the Peten. The policy analysis activity is directed at those GOG officials and institutions involved in policy formulation and application.

### **Phasing**

Implementation of activities under this component will commence shortly after the Biosphere Administration component is underway. The majority of component activities will be conducted during Project years three and four, and will continue throughout the Project, but will be reduced in years five and six (see Implementation Schedule, section VI.G).

## Summary of Anticipated Inputs

### Illustrative Component Budget (US\$000's)

Item	USAID	NGO	GOG	TOTAL
Personnel	210	615	60	885
Technical assistance	735	92	0	827
Travel and per diem	261	138	16	415
Training	320	0	0	320
Vehicles	20	40	0	60
Equipment	135	10	51	196
Office & furnishings	110	70	72	252
Supplies and operating expense	132	103	30	265
Special studies	<u>330</u>	<u>180</u>	<u>0</u>	<u>510</u>
Subtotal	2,253	1,248	229	3,730
Contingencies	226	125	23	373
Inflation	<u>112</u>	<u>62</u>	<u>11</u>	<u>187</u>
<b>TOTAL</b>	<b>2,591</b>	<b>1,435</b>	<b>263</b>	<b>4,290</b>

### Outputs

1. Training workshops conducted with Peten schoolteachers.
2. Mass media campaign programmed and implemented.
3. Interpretive educational program in place and functioning at the Biosphere Reserve.
4. Educational field trips conducted to the Biosphere Reserve.
5. Policy-maker workshops conducted.
6. National environmental awareness conference held.

### 3. Sustainable Resource Management (\$3,439,000)

The sustainable resource management component is comprised of four subcomponents: natural forest management, extractive reserves, tourism oriented towards nature and culture, and other small scale commercial activities. These subcomponents will promote improvements in sustainable income levels for residents of the Biosphere Reserve area through environmentally compatible activities. Particular emphasis will be placed on an integrated approach to improving forest management and extractive reserve harvesting in a coordinated manner through CONAP.

Summary of Illustrative Budget by Sub-Components (\$ X 1,000)

Sub-Component	USAID	NGO	GOG	TOTAL
Natural Forest Management	939	762	3036	4737
Extractive Reserve Management	649	638	625	1913
Tourism	1394	587	210	2191
Other Enterprises	457	122	0	578
<b>TOTAL</b>	<b>3,439</b>	<b>2,109</b>	<b>3,871</b>	<b>9,419</b>

#### a. Natural Forest Management

The objective of this subcomponent is to promote the conservation, management and rational utilization of forests in the multiple use areas of the Maya Biosphere Reserve for sustainable production of primary and secondary timber species. This will be accomplished by implementing low-input, natural forest management practices based on sustained yield and natural regeneration of the forest.

#### Strengthen Tropical Forest Management Capacity

Under this activity, DIGEBOS and CONAP personnel and timber extraction operators will be trained to assess and enforce forest management plans required from the lumber industries with granted concessions. The plans will draw from field analysis of the concession areas. Through this subcomponent, CONAP and DIGEBOS will also be

trained to make field determinations on whether the plans are being implemented appropriately. The timber industry will be able to draw on acquired DIGEBOS and CONAP expertise to improve harvesting techniques oriented towards long-term sustained yield and compliance with approved management plans.

Research grants and/or contracts to universities and private institutions are anticipated in order to develop and improve techniques in natural forest management. In addition, a contract or grant will be awarded for marketing studies to stimulate the demand for secondary species of tropical hardwoods.

#### **Natural Forest Management Demonstration Unit**

This subcomponent activity will set up and operate a 5,000-10,000 hectare demonstration unit of sustainable harvesting and silvicultural practices in the Biosphere. Through the collaboration of DIGEBOS and the timber industry, a management plan for the demonstration unit will be prepared. Due to the strong interrelationship, it is anticipated that this unit will also incorporate the investigation and demonstration of improved techniques in harvesting extractive reserves such as xate and chicle. This activity is expected to be implemented through NGOs in conjunction with CONAP, DIGEBOS and the private sector.

#### **Participants**

DIGEBOS and CONAP will be the principal government agencies participating in this subcomponent. The timber industry association will be closely involved in the demonstration plot.

#### **Phasing**

Training of DIGEBOS and CONAP personnel under this component will begin in the early stages of the Project, and subsequently research and marketing studies will be undertaken. The development of the demonstration unit may require several years to establish, since it relies in part on information produced by other Project components. The natural forest management activities will become more pronounced in the final three years of the Project (see Implementation Schedule, section VI.G, for details).

## Summary of Anticipated Inputs

### Illustrative Subcomponent Budget (US\$000's)

Item	USAID	NGO	GOG	TOTAL
Personnel	30	319	2,436	2,785
Technical assistance	294	90	0	384
Travel and per diem	134	102	24	260
Training	120	20	0	140
Vehicles	40	40	0	80
Equipment	33	15	102	150
Office & furnishings	15	5	30	50
Supplies and operating expense	20	32	48	100
Special studies	<u>130</u>	<u>40</u>	<u>0</u>	<u>170</u>
<b>Subtotal</b>	<b>816</b>	<b>663</b>	<b>2,640</b>	<b>4,119</b>
Contingencies	82	66	264	412
Inflation	<u>41</u>	<u>33</u>	<u>132</u>	<u>206</u>
<b>TOTAL</b>	<b>939</b>	<b>762</b>	<b>3,036</b>	<b>4,737</b>

#### Outputs

1. Technical capacity in DIGEBOS, CONAP and in the timber industry to prepare and implement effective plans for natural forest management.
2. Functional natural forest management demonstration unit, managed through collaboration between the GOG and the timber industry.
3. Special studies to develop and improve the utilization of secondary species of tropical woods.

#### b. Extractive Reserves

This subcomponent will develop techniques for the sustainable management of the extraction of wild forest products, primarily chicie (gum), pimienta gorda (allspice), and xate (ever green) palm, that will lead to higher sustainable incomes for Biosphere residents. Marketing and product development of extractive reserves will also be supported.

### **Improved Production and Harvesting Methods**

Under this activity, grants and contracts will be awarded to universities and/or private institutions to investigate ways to increase efficiency and reduce waste in the extractive industries at the harvest site and in the successive steps that carry the harvested products to international markets. As part of this activity, extractors of wild forest products will be trained in these improved techniques of extraction and in the long-term conservation of the renewable natural resource base they depend on. A demonstration plot will be established to research and improve the applied techniques of natural forest management and extractive reserves (see above). This demonstration plot is expected to be implemented by NGOs in conjunction with CONAP, DIGEBOS and the private sector.

In addition, this subcomponent will develop a system for allocating extraction areas for wild forest products, licensing extractors and regulating extraction.

### **Market and Product Development**

Market studies for wild products will be undertaken to determine how to expand markets for current and new extractive reserves in the Biosphere. In addition, socio-economic studies of extractors will be performed by this activity, in which manners to improve the living and working conditions of the extractors will be determined. This subcomponent activity will concentrate primarily on those wild forest products with existing international markets: xate palm, chicle, and allspice.

### **Participants**

The main participants and beneficiaries in this subcomponent are those who earn their livelihoods from extraction, processing, and export of wild forest products. The subcomponent will work with existing private organizations of the extractive reserve industry to the extent feasible. CONAP will participate in developing the licensing and regulatory activities.

### **Phasing**

Though research and marketing studies can be undertaken immediately, training and establishing a licensing and regulatory program will require the completion and approval of studies. Therefore, most activities in this subcomponent will occur in the second half of the Project life, primarily in years four and five (see the Implementation Schedule, section VI.G, for details).

## Summary of Anticipated Inputs

### Illustrative Subcomponent Budget (US\$000's)

Item	USAID	NGO	GOG	TOTAL
Personnel	16	273	190	479
Technical assistance	202	70	0	272
Travel and per diem	102	78	30	210
Training	110	20	0	130
Vehicles	20	20	0	40
Equipment	12	10	60	82
Office & furnishings	0	5	144	149
Supplies and operating expense	13	19	120	152
Special studies	<u>90</u>	<u>60</u>	<u>0</u>	<u>150</u>
Subtotal	565	555	544	1,664
Contingencies	56	55	54	166
Inflation	<u>28</u>	<u>28</u>	<u>27</u>	<u>83</u>
<b>TOTAL</b>	649	638	625	1,913

### Outputs

1. Studies for sustainable extraction of wild forest products.
2. Trained extractors and regulators.
3. System devised to allocate extraction areas for wild forest products, licensing extractors and regulating extraction.
4. Marketing studies for existing and new wild forest products.
5. Socio-economic studies of extractors and ways to improve their working and living conditions.

### **c. Tourism oriented towards Nature and Culture**

This subcomponent promotes development of tourism sites and national and international tourism oriented toward nature and culture. Key activities include institutional development, site management, visitor information and promotion and support for the development of the Centro Maya Visitor Center. The subcomponent will also promote the increase in locally available funds for tourism site management by restructuring tourism fees.

#### **Institutional Development**

This activity will sponsor workshops to present tourism information relevant to the Maya Biosphere Reserve. These workshops will support formation of a national steering committee for tourism oriented toward nature and culture and a technical working group that reports to the steering committee. Local organizations will participate actively in the workshops.

The steering committee and technical working group will formulate a strategy for tourism development in the Peten. This strategy will orchestrate training for people in the tourism industry, management of tourism sites, and visitor information and promotion. Training will be provided to public and private sector personnel in tour operation, facilities and site management, and other specific skills related to tourism.

This activity will also support research and development of improved systems of user fees, and recommend allocation of these fees to field administration of tourism.

#### **Site Management**

Improved tourism management plans will be developed based on studies of the economic and social impact of tourism in the Biosphere Reserve and on the environmental impacts of tourism on selected sites and facilities. These studies will produce an inventory of current and prospective tourism sites and design management plans for selected sites.

The management plans will indicate specific infrastructure and personnel requirements to operate the sites effectively. They will also incorporate information obtained from visitor surveys performed separately under this subcomponent and suggest interpretive materials.

### **Visitor Information and Promotion**

This activity will conduct periodic visitor surveys at selected tourism sites in the Peten. These surveys will provide information about visitor characteristics, interests, expectations and needs. This information will orient tourism industry actions in management and promotion of tourism sites.

Tourism officials and industry representatives will participate in study trips to well managed tourism sites in Guatemala and other countries. The trips, financed by the Project, will teach practical techniques to promote and develop tourism oriented toward nature and culture.

An important part of site management is the development of interpretive materials specifically oriented toward visitor interests in nature and culture. This activity will support the development of appropriate interpretive materials in conjunction with the environmental education component.

#### **Centro Maya Visitor Center**

Support will be provided for the establishment of a center that will study and demonstrate agro-silvo techniques which sustained the Maya civilization for many centuries. This center is expected to serve as a tourism and research facility which will draw visitors and income, and will also serve as an information and demonstration site for the benefit of the local population. The Centro will be implemented by NGOs in coordination with the GOG and local organizations.

#### **Participants**

Selected public and private sector individuals and organizations involved in the tourism industry in the Biosphere Reserve will participate in subcomponent activities. The principal public institutions strengthened through this subcomponent will be INGUAT, IDAEH and CECON. NGOs will also benefit through participation in the steering committee and technical working group.

#### **Phasing**

Institutional development under this subcomponent will start in the third year of Project implementation, as will visitor surveys. The tourism strategy will be completed by the end of Project year three. This strategy will set out timing of the remaining activities of the subcomponent, which are expected to occur primarily in the last three years of the Project (see Implementation Schedule, section VI.G).

**Summary of Anticipated Inputs**

**Illustrative Subcomponent Budget (US\$000's)**

<b>Item</b>	<b>USAID</b>	<b>NGO</b>	<b>GOG</b>	<b>TOTAL</b>
<b>Personnel</b>	24	348	30	402
<b>Technical assistance</b>	443	20	0	463
<b>Travel and per diem</b>	186	108	12	306
<b>Training</b>	220	0	0	220
<b>Vehicles</b>	20	20	0	40
<b>Equipment</b>	23	5	26	54
<b>Office &amp; furnishings</b>	30	0	85	115
<b>Supplies and operating expense</b>	26	9	30	65
<b>Special studies</b>	240	0	0	240
<b>Subtotal</b>	1,212	510	183	1,905
<b>Contingencies</b>	121	51	18	191
<b>Inflation</b>	61	26	9	95
<b>TOTAL</b>	1,394	587	210	2,191

**Outputs**

1. Tourism workshops held to produce the tourism development strategy for the Biosphere Reserve.
2. Tourism steering committee and technical working group operational.
3. System to perform regular visitor surveys in place.
4. Six tourism impact studies completed.
5. Inventory of tourism sites completed; management plans prepared for five sites.

6. Improved system for collecting and applying tourism fees in place.
7. Four study trips to tourism facilities conducted.
8. Training workshops and short courses for tourism operators, officials and workers conducted in accordance with tourism strategy.
9. Interpretative materials designed and in use at five tourism sites.

**d. Other Small-scale ENR Commercial Activities**

This subcomponent will study opportunities to expand extraction and small scale manufacture of forest products in addition to those described in section (c) above. It will look into such possibilities as extraction of rattan-like vines for wicker work, honey production, small camping facilities, artisanry using byproducts from sawmilling, and raising animals like paca and deer in semi-captivity.

The studies undertaken in this subcomponent will explore availability of materials, extraction and processing techniques, and market demand. Setting up small scale demonstrations of the most promising activities and training and technical assistance for prospective producers will be undertaken.

**Participants**

People who live in the Biosphere Reserve and buffer zone and who derive their livelihoods from extractive industries will constitute the principal group of participants in this subcomponent.

**Phasing**

This subcomponent will start up after the other Project activities in sustainable natural resources management have gotten well underway. Activities will begin in the fourth year of the Project and continue through year six.

## Summary of Anticipated Inputs

### Illustrative Subcomponent Budget (US\$000's)

Item	USAID	NGO	GOG	TOTAL
Personnel	14	51	0	65
Technical assistance	136	10	0	146
Travel and per diem	44	15	0	59
Training	60	0	0	60
Vehicles	0	0	0	0
Equipment	15	5	0	20
Office & furnishings	0	0	0	0
Supplies and operating expense	8	5	0	13
Special studies	<u>120</u>	<u>20</u>	<u>0</u>	<u>140</u>
Subtotal	397	106	0	503
Contingencies	40	11	0	50
Inflation	<u>20</u>	<u>5</u>	<u>0</u>	<u>25</u>
<b>TOTAL</b>	457	122	0	578

#### Outputs

1. At least six feasibility studies for innovative extractive industries.
2. At least one demonstration of an innovative extractive industry including appropriate training and technical assistance.

#### 4. Project Planning, Management, TA, Evaluations and Audits (\$2,738,000)

This component provides for technical/advisory assistance, planning, information exchange, and coordination across all Project components. It will employ a Guatemalan Coordinator who will oversee the implementation of Project activities in the Biosphere. This component will also commission baseline studies, evaluations and audits, conduct appropriate monitoring of baseline information, and maintain libraries and data bases for the Project.

#### **a. Management and Technical Assistance**

Under this component, A.I.D. will finance the contract for a Guatemalan Project Coordinator who will provide on-site supervision and coordination between NGOs, GOG institutions, local authorities and the private sector. An Environmental and Natural Resource Advisor (PASA) for the Office of Rural Development will be financed to provide technical and management assistance particularly for components 1 and 2 of the Project. This component will also provide funds for training Project personnel in technical and management areas to strengthen the implementation.

#### **b. Project Planning and Coordination**

Under this component, the Project will organize annual meetings to coordinate and plan the upcoming year's operations in order to effectively achieve the Project objectives. Each annual exercise will consist of two parts. A workshop will be held to review the accomplishments and problems of Project implementation as analyzed in the yearly monitoring/evaluation studies (see below), and to discuss the next year's operating plan for the NGOs and the GOG. Disbursement of A.I.D. funds will be subject to approval of these yearly plans. In addition, a mid-year, workshop to evaluate the on-going progress of each Project component and attainment of Project objectives will be held in the Peten.

#### **c. Baseline Studies, Monitoring, Evaluations and Audits**

This component of the Project will provide for baseline and yearly monitoring/evaluation studies for all aspects of the Project. Some of these studies will be carried out through buy-ins into the RENARM Project. The baseline studies will determine initial values for measurable indicators of the several Project components. Subsequent monitoring/evaluation of the indicators will indicate degree of Project success and serve as a basis for recommending improvements in Project implementation. The baseline studies will determine land use capability and actual land use throughout the Project area. These studies will also produce inventories of biological and cultural resources and of specific economically important resources, notably timber, xate palm, chicle and allspice. Additionally, the baseline studies will yield information about attitudes of the local population including information on gender issues.

This component will also finance the formal mid-term and final evaluations and audits of the Project. (See the Monitoring and Evaluation Plan in Section VI.B. for additional details.)

### Participants

This component will provide CONAP with management assistance and with important monitoring/evaluation information to help make management decisions for the Maya Biosphere Reserve. CECON, DIGEBOS and IDAEH, which all have important protection and management functions in the Biosphere Reserve under CONAP coordination, will benefit indirectly from improved CONAP management capability. All Guatemalans, particularly the residents of the Biosphere Reserve, will benefit from the enhanced capabilities provided to CONAP through this component.

### Phasing

This component will begin immediately, and will operate at an approximately uniform level of activity over the life of the Project.

### Summary of Anticipated Inputs

#### Illustrative Component Budget (US\$000's)

Item	USAID	NGO	GOG	TOTAL
Personnel	750	0	240	990
Technical assistance	190	0	0	190
Travel and per diem	90	0	60	150
Training	150	0	0	150
Vehicles	40	0	0	40
Equipment	20	0	210	230
Office & furnishings	0	0	282	282
Supplies and operating expense	0	0	150	150
Special studies	301	0	0	301
Audits	540	0	0	540
Evaluations	300	0	0	300
Subtotal	<u>2,381</u>	<u>0</u>	<u>942</u>	<u>3,323</u>
Contingencies	238	0	94	332
Inflation	<u>119</u>	<u>0</u>	<u>47</u>	<u>166</u>
<b>TOTAL</b>	<b>2,738</b>	<b>0</b>	<b>1,083</b>	<b>3,821</b>

**Outputs**

1. One Project Coordinator and ENR Advisory Assistance (PASA) to support Project management.
2. Project personnel trained in technical and management skills.
3. Library of remote sensing materials, maps, inventories, data bases, and reports for the Biosphere Reserve headquarters.
4. Approximately twelve baseline studies with subsequent monitoring.
5. Six annual planning exercises.
6. Six annual operating plans.
7. Mid-term and final evaluations and audits.

#### **IV. SUMMARY OF PROJECT ANALYSES**

##### **A. Technical Analyses**

###### **1. Biosphere Administration**

###### **a. Conclusions**

It is technically feasible to establish and maintain a protection and management program for the biological and cultural resources of the Maya Biosphere Reserve. Achievement of the program objectives depends upon the strengthening of the capacity of CONAP and associated institutions to carry out essential component activities in planning, protection, coordination, and supporting research.

###### **b. Proposed Technologies**

###### **Description**

The major activities of the program are the establishment of improved management of the Maya Biosphere Reserve through training, elaboration of baseline and applied studies, and implementation of a master plan to promote sustainable and economically viable uses of biological and cultural resources. This should counteract present trends of increasing destructive and inappropriate uses of the area's resources.

###### **Mechanisms**

The Project will develop technical capacity in Guatemalan institutions to survey and mark Reserve boundaries and construct and operate guard and patrol facilities. CONAP will coordinate deployment of guard patrols and will involve other institutions in protecting the Reserve including CECON Biotope guards, IDAEH personnel and the military (for international border protection). Management will result from a participatory planning process which will involve Guatemalan implementing institutions as well as residents of the Reserve and surrounding areas. Major efforts in community outreach and environmental education will promote acceptance of the management strategies for the Reserve.

###### **Suitability and cost effectiveness**

The tremendous growth in tourism attracted to the Tikal National Park provides ample proof of the income generating potential of complementary biological and cultural resources. The alternative use of the area for subsistence agriculture and livestock raising does not approach the income generating potential of a well managed Biosphere Reserve.

## **Risks**

The greatest threat to program success would be the lack of rapid and decisive action by the Guatemalan government to protect the Reserve and promote economically attractive and sustainable resource management. Security problems related to guerrilla activity pose a safety risk, as well as a potential impediment to GOG control over protected areas and to tourism development.

## **2. Environmental Education, Public Awareness and Policy**

### **a. Conclusions**

It is technically feasible to implement the environmental education, public awareness, and policy activities of the Project.

### **b. Proposed Technologies**

The public awareness, environmental education, and policy activities of the Project will rely on technologies which are generally well-known, tested, and refined and which present low risk. For example, social marketing techniques can be used to guide the development of the public awareness programs. Computers, slide projectors, vehicles, and other simple equipment provide the technologies proposed for these activities.

Only a few limits to the functionality, suitability, and cost effectiveness of the proposed technologies exist. Commodity procurement, insofar as possible, should purchase equipment that can be locally maintained. While video equipment is an important tool and is increasingly used for public awareness and environmental education in many places, it has limitations that must be recognized: the potential for technical difficulties will probably limit its use to more central facilities rather than use in smaller, more remote areas. Slide programs, puppet shows and other activities have lower risk of breakdown than video equipment. They are effective means for presentation and are cost effective as well. Computers are essential for the implementation of activities in this component. Training for staff, availability of appropriate software and supplies, and protection for machines (e.g., air-conditioned facility) will be required for this technology to be viable.

### **3. Natural Forest Management**

#### **a. Conclusions**

The technologies proposed for natural forest management reconcile production of forest products, primarily timber, with conservation of forest resources. This subcomponent of the Project promotes continuous harvest of timber, at approximately constant volume, and continuous maintenance of forest cover, primarily through natural regeneration of the forest after timber extraction.

#### **b. Proposed Technologies**

##### **Description**

This subcomponent proposes achieving its objectives by strengthening field capacity in DIGEBOS and CONAP, the agencies responsible for regulating forest harvesting, to assess, approve, and enforce management plans for timber concessions, and administering all protection and multiple use activities in the Reserve. Under the subcomponent DIGEBOS and CONAP will improve their ability to select areas for harvest, determine which trees to harvest, recommend harvesting practices, monitor compliance with the management plans, and determine successful regeneration of the forest. The Project will provide DIGEBOS and CONAP with equipment and in-the-field training in forest management.

The subcomponent will also involve the timber industry in establishing and testing various silvicultural practices on forest demonstration sites operated under the Project.

##### **Mechanisms**

This subcomponent will function by applying a variety of harvesting practices in the field and comparing them with each other for effectiveness at producing adequate timber yields, minimizing damage to the residual timber stand, maintaining or enhancing growth rates of standing timber, promoting natural regeneration of timber trees and maintaining biological diversity. Research and documentation of these practices has begun elsewhere in Latin America, so the results from experiences outside Guatemala should be applied to the Project as appropriate.

The demonstration forest set up under this subcomponent will provide the sites and variety of forest types necessary to test various harvesting practices. Suitable forest for the demonstration areas exists in many places in the Maya Biosphere Reserve and should be made available by CONAP from public lands. The demonstration sites selected should have good road access to facilitate their operation and access for training.

### **Suitability and cost effectiveness**

Success of this subcomponent rests on the assumption that the Guatemalan government will devise mechanisms for authorizing timber concessions which will encourage the timber industry to invest in long term forest management. It also assumes that markets for secondary species will open up as availability of the most valuable species - mahogany and Spanish cedar - declines. This second assumption holds true in other places in Central America and underlies the willingness of the timber industry in the Peten to start cutting and processing lower value trees that formerly went unharvested. Harvesting more species, even if the individual trees have relatively low value, increases harvesting efficiency and reduces harvesting costs per tree.

### **Risks**

The proposed natural forest management subcomponent requires cooperation and collaboration between the timber industry, DIGEBOS, and CONAP. It can only succeed in a climate of good will between the industry and the agencies and not in a climate of hostility.

Success also depends on the ability of the Project to build technical capacity in DIGEBOS quickly and effectively and to promote long-term support in the timber industry for sustained forest management.

## **4. Extractive Reserves**

### **a. Conclusions**

It is technically feasible to establish and sustain the extraction of non-timber natural resources from designated areas of the Biosphere Reserve. Success of an extraction industry depends on acceptance of regulations to assure sustained yield by all those involved, including control over the number of extractors and real control over movement of new people into the extraction areas. It also requires increased efficiency in resource use, broadening the base of potential products, greater value added locally, and greater participation of the local population in the profits from the industry.

## **b. Proposed Technologies**

### **Description**

This subcomponent will test various options for achieving its objectives. Under one option, CONAP would supervise a control system in which the location and amount of a given product extracted will be governed by either a concession or quota system. Under the other option, the private sector will apply a similar system directly. Training in efficient and sustainable harvesting technologies would be implemented and the graduates licensed. Regulation will be achieved through use of incentives and the imposition of penalties.

### **Mechanisms**

Implementation will be guided by applied research. The socioeconomic structure of the extraction industry will be studied to identify constraints imposed by debt peonage and near monopoly control of the export market in several commodities. Research on ecological productivity and stress will contribute to improved harvesting techniques and better regulated harvests. Based on known markets for non-lumber forest products, inventories of promising candidates will be carried out in the Peten.

### **Suitability and cost effectiveness**

As a sustained yield use of a relatively small number of species with minimal biomass removal, extractive reserves are compatible with the biodiversity conservation goals of the Maya Biosphere Project. Such a use serves as an effective buffer around areas designated for complete protection. Export of three products, xate palm, chicle and allspice, already generates approximately \$7 million in foreign exchange earnings annually. This figure should go up based on improvements in the industries introduced under this Project.

### **Risks**

If migration to the Peten continues to increase, there is a major risk of over-exploitation. People engaged in extracting designated resources are also frequently engaged in illegal hunting and removal of Pre-Colombian artifacts.

## **5. Tourism oriented towards Nature and Culture**

### **a. Conclusions**

Tourism oriented toward nature and culture was specifically chosen to emphasize the distinctive characteristics which make it appropriate for the Maya Biosphere Reserve and for Guatemalan conditions generally.

### **b. Proposed Technologies**

#### **Description**

Currently, many of the natural and archeological areas in the Peten are only marginally prepared to satisfy the special interest tourist. They also require improved planning, management and protection, including protection from the visitors themselves. For these reasons, this subcomponent of the Project establishes applied research networks to study new tourism sites and to develop, for existing sites and for new sites, the scientific and interpretative materials which tourist visitors will require.

#### **Mechanisms**

A legal framework for regulation and promotion of tourism is in place. However, improving tourism will require greater inter-institutional cooperation which the Project will promote through new coordinating bodies. The Project will provide training to the new bodies. It will also develop mechanisms for a self-supporting funding base for tourism. Involvement of NGOs will facilitate establishing a decentralized tourism administration.

#### **Suitability**

The widespread publicity and attention which tourism oriented toward nature and culture has received in the last few years has generated considerable interest in it as a development opportunity. Exceptional sites for tourism exist in the Maya Biosphere Reserve, offering both natural and cultural attractions. They represent a clear opportunity to the Project especially because several of them, notably Tikal which attracts 60,000 international visitors annually, are already well known and enjoy reasonably good management.

#### **Risk**

An external risk which could influence this subcomponent is the potential reduction in visitors if violence in Guatemala were to return to the levels of the early 1980's. Information and awareness campaigns developed under the Project will reassure the public while steering them away from high risk areas.

## **B. Institutional Analysis**

### **1. Conclusions**

The proposed Project is institutionally feasible based on the determination that functional national institutions for conservation and management of natural resources currently exist in Guatemala. These institutions are weak and relatively inexperienced in performing their responsibilities, especially in the Peten. Indications show they have high levels of competence and dedication, however. Under the Project these institutions will receive the strengthening they need to become fully effective.

Provided below is a summarized version of (2) the background, (3) the description and relationships of participating GOG institutions, (4) the viability of CONAP as GOG counterpart for this Project, (5) requirements for institutional strengthening, and (6) mechanisms the Maya Biosphere Project will use for institutional strengthening. A more detailed description of all these sections is contained in the Institutional Analysis Annex.

### **2. Background**

For approximately twenty years prior to 1990, a branch of the military known as Fomento y Desarrollo de El Peten (FYDEP), provided most national government services in the Peten. This agency oversaw sale of public land to private owners and issued titles to purchase lands, controlled forest harvesting and access to forest lands, built and maintained roads, and provided water and sewerage services. FYDEP has recently undergone liquidation. Its four major functions have been assigned to four separate agencies--land titling to INTA, forest control to DIGEBOS, and roads, water and sewers to the Ministry of Public Works. In the Maya Biosphere Reserve, IDAEH maintains archaeological parks, CECON manages biotope areas, and the Protected Areas Law and the Maya Biosphere Reserve Law have empowered CONAMA and CONAP with regulatory and implementing authority.

### **3. Description and Relationships of Participating Institutions**

The Maya Biosphere Reserve Law designates CONAP, Consejo Nacional de Areas Protegidas, as having principal responsibility for managing the Maya Biosphere Reserve and planning and coordinating activities in the Reserve. CONAP ties closely to CONAMA, Comisión Nacional del Medio Ambiente, in that the National Environmental Coordinator, who heads CONAMA, also serves as President of CONAP. These two agencies therefore, will have major

responsibility for administration of the whole Project and for formulating the master plan for the Reserve under the protection and management component. The whole Project will coordinate with UNEPET, Unidad Ejecutora del Plan de Desarrollo del Petén, an arm of the Ministry of Planning, responsible for overall development planning in the Peten.

CECON, Centro de Estudios Conservacionistas, a dependency of San Carlos University, currently administrates three protected areas within the Reserve. The Project anticipates continuing involvement of CECON under the protection and management component. CONAP will have general responsibility for protection throughout the Reserve and particularly in the core areas.

The environmental education, public awareness, and policy component of the Project will work with CONAMA at a general level and with universities and NGOs with regard to specific activities.

Implementation of the natural forest management subcomponent should involve DIGEBOS, Dirección General de Bosques y Vida Silvestre, in the Ministry of Agriculture. DIGEBOS oversees forest harvesting in Guatemala and authorizes concessions for timber extraction. Private sector associations representing the timber industry will be involved also in implementing this subcomponent.

The extractive reserves subcomponent will primarily work with people involved in extraction and with the private sector organizations they might form. CONAP, CECON, and, possibly, DIGEBOS, would also participate in implementing this subcomponent.

IDAEH, Instituto de Antropología e Historia, manages the protection, study, and enjoyment of Guatemala's cultural resources including the important Mayan ruins inside the Reserve. The agency has a longstanding, active presence in the Project area and will be especially involved in the subcomponent on tourism oriented toward nature and culture. INGUAT, Instituto Guatemalteco de Turismo, and private sector tourism associations will also participate in this subcomponent.

#### 4. Viability of CONAP as GOG Counterpart

On June 5, 1990, Guatemalan President Vinicio Cerezo signed into law the Regulations for the Protected Areas Law. Together with the Protected Areas Law and the Maya Biosphere Reserve Law, it defined and consolidated a) the legal and institutional framework of CONAP, b) the delegation of authority to CONAP's Executive Secretary, and c) the role of CONAP in managing the Maya Biosphere Reserve. These documents, attached in the Annex G, provide CONAP with the appropriate executive attributes and powers to be the official GOG counterpart for the Project.

**Legal and Institutional Framework:** CONAP was created in the Protected Areas Law to undertake the following responsibilities: 1) promote conservation and enhancement of Guatemala's natural resources; 2) organize, manage and develop the Guatemalan System of Protected Areas (SIGAP); 3) plan and implement a national strategy to conserve Guatemala's natural resources; 4) coordinate the administration of flora and fauna resources through the responsible implementing agencies.

CONAP is directly tied to the Presidency, has functional autonomy, and is incorporated into the National Budget. Its Board of Directors is composed of representatives of the following government organizations: CONAMA, DIGEBOS, INGUAT, IDAEH, CECON, INTA, OCREN (Office of Control of the Nation's Reserve Areas) and ANAM (National Association of Municipalities). The following non-governmental organizations are also represented on the Board: NGO Friends of the Forest, NGO Defenders of Nature, Technical Education Council, National Council of Rural and Urban Development, and CACIF.

The President of this Board is the Coordinator of CONAMA. The President convenes Board meetings in which decisions are made by absolute majority votes when a quorum of at least two thirds of the Board members are present.

**Delegation of Authority to CONAP's Executive Secretary:** CONAP's Executive Secretary has numerous authorities which are listed in their entirety in Annex G.

The most significant authorities related to this Project are listed below:

1. Manage the technical and administrative activities of CONAP
2. Carry out the policies and strategies approved by the Board of Directors
3. Execute resolutions and directives approved by the Board
4. Authorize utilization and protected areas management concessions
5. Carry out the plans, programs and projects of CONAP.
6. Approve expenditures up to ten thousand Quetzales
7. Propose to the Board the nomination, contracting and promotion or demotion of CONAP employees
8. Carry out the administration, supervision and technical management of personnel
9. Sign contracts and agreements authorized by the Board
10. Evaluate and supervise the implementation of programs, projects and activities of CONAP
11. Elaborate an annual plan of coordination between all institutions which form part of CONAP

The Board has numerous authorities which are listed in their entirety in Annex G. The most significant of these authorities related to this Project are listed below:

1. Create the national conservation policies and strategy for natural resources
2. Approve CONAP's work plans
3. Approve the contracting, promotion or demotion of CONAP employees proposed by the Executive Secretary
4. Approve agreements and contracts with international enterprises or entities
5. Approve the annual budget
6. Approve disbursements of greater than ten thousand Quetzales
7. Approve master and operating plans for SIGAP

Role of CONAP in Managing the Maya Biosphere Reserve: The Executive Secretary of CONAP will undertake the direct administration of the entire Biosphere Reserve. The Executive Secretary will also supervise and coordinate the administration of the Tikal National Park to be carried out by IDAEH, and of the Laguna del Tigre, San Miguel La Palotada and Dos Lagunas Biotopes to be carried out by CECON.

In order to achieve strong coordination between entities working in the Reserve, the Biosphere Reserve Committee composed of the Executive Secretary of CONAP, and a representative of IDAEH, CECON and the military was established in the the Biosphere Reserve Law. The head of this Committee is the Executive Secretary of CONAP. This Committee will receive the cooperation of other public and private, national and regional institutions.

#### 5. Requirement for Institutional Strengthening

CONAMA and CONAP are both newly established institutions which are just beginning to build a presence in the Peten. DIGEBOS was reorganized a few years ago and is working with a new forestry law and regulations which it has no experience applying in the Peten. These institutions need support at the managerial level and at the operational level in all aspects of their work.

CECON, IDAEH, and INGUAT do have substantial experience and histories of effective performance as do several of the private sector trade associations. The Project will expand and reinforce the capabilities of these more experienced organizations.

In general, all the institutions prospectively involved in the Project would benefit from enhanced information, expanded staffs of more highly trained people, better equipment, more adequate budgets for field operations, and, most of all, greater direct experience in managing resources in the field.

#### **6. Mechanisms for Institutional Strengthening**

The Project expects to strengthen Guatemalan counterpart institutions through a combination of technical assistance, training, and financial support. The technical assistance will confer on-the-job training to national counterpart personnel at all levels. Training, by way of short courses, seminars and workshops, will increase specific skill levels, especially of field personnel. Financial support will purchase equipment and augment funds for operations. Field implementation of the Project by Guatemalans will confer direct managerial and technical experience.

The Project anticipates overall implementation through cooperative agreements with international NGOs. The advantages of involving international NGOs are numerous. They have professional expertise and significant field experience in Latin America. They are flexible organizations with an action-oriented staff. Most importantly, they have proven effective in working with national public and private institutions. Well-managed and experienced international NGOs can provide assistance to national organizations in all phases of their program: design, implementation, evaluation, financing and organizational development. As has been mentioned, this last advantage is fundamental for the long-term sustainability of the national organizations. International NGOs invariably make a long-term commitment to working with and through national organizations on specific programs and projects in a country. Though few of the local NGOs have adequate resources or experience, and their absorptive capacity is low, the international NGO will provide important technical assistance in organizational development, small grants to develop institutional capability, and assistance in financial management and fundraising techniques. Over the long run, these relationships result in strong indigenous organizations that can sustain environmental activities in the region.

#### **C. Social Analysis**

##### **1. Conclusions**

The Project as designed is socially workable because most of the Project's implementation activities are already being undertaken in the Peten. Therefore they already have demonstrated social acceptability, and will be strengthened to benefit the local population.

Provided below is a summary of (2) the background, (3) compatibility of the Project with the socio-cultural environment, (4) immigration, (5) the role of women, (6) spread effects, and (7) the distribution of Project benefits. A more detailed description of each of these sections is contained in the Social Soundness Analysis Annex.

## 2. Background

The Peten and the Maya Biosphere can be characterized fundamentally as a frontier. The population of the Peten in 1950 was approximately 15,880, and in 1990 the population has grown to an estimated level of 250,000, and the projected population for the year 2000 is over 400,000. Between 1982 and 1987, the Peten had the highest rate of population growth--approximately 6 percent per year. The Department has the youngest population in the country, with the average age being 14.85 years vs. the national average of 16.93. Population densities have increased rapidly from 0.44 inhabitants per square kilometer in 1950 to 5.37 inhabitants per square km in 1986. Immigration is currently the major source of population increase. Very few native Mayan Indians have remained in this Department; most of the present "indigenous" population has recently migrated to the Peten from the Highland Departments and from Alta Verapaz.

## 3. Compatibility of the Project with the Socio-cultural Environment

The vast majority of the activities promoted by the Maya Biosphere Project design are compatible with the existing social, cultural, and organizational environment. For example, extractive activities will continue, with improved practices and more controls. Timber operations will continue to provide employment in the forests, sawmills, and wood processing industries. On the other hand, the biosphere administration component of the Project will be a new concept in the area that will have to be addressed sensitively. Special efforts will be made to incorporate and engage local populations and promote local organizations, especially through environmental education and sustainable resource management activities.

In general, the biosphere administration component of the Project will be a "hard sell", which underscores the importance of the environmental education and public awareness elements of the Project. Protection will be difficult for many to understand. It will bring little direct benefit to the majority of those living in the area in the short term and will attempt to manage, rather than promote, many types of development. Protection and management for sustainable yields are long term concepts in an area that has many people with critical short term needs. Project

implementors will need to be sensitive to these issues throughout the life of the Project. Employment opportunities in the reserve such as resource guards and as laborers maintaining protected area boundaries will make protected area administration of interest to some local people. USAID's intent to develop agroforestry and related activities with other funds will complement this and other components of the Maya Biosphere Project nicely.

#### 4. Immigration

Estimates of immigration into the Peten range from 200-400 people per day. Migration seems to follow a pattern, first of settlement in the more southerly portions of the Department, then internal migration begins. More people are migrating into areas along the road just south of the 17°10' parallel, and many settle within the recently designated Maya Biosphere Reserve. Significant numbers have entered the central areas of the reserve over the past two years.

Migration to these areas consists of peasants seeking: a) land and resources to plant corn, beans and other subsistence crops and to produce some surplus for market, and/or b) income generating activities such as collection of xate, chicle and pimienta gorda. Production systems combine these primary activities with hunting and other off-farm and non-farm employment, in accordance with seasonal shifts in harvest schedules.

If appropriate immigration policies and non-destructive development activities are not promoted, continued destruction of the Biosphere will be exacerbated by high population growth and immigration rates. Since 1964 the Peten's population has increased more than ten times and the land area cleared for cultivation has increased more than fifty times. Due to these pressures, erosion has reduced land productivity, forests are disappearing, water supplies are becoming increasingly polluted, and plant and animal biodiversity is being eliminated.

#### 5. Role of Women

An adequate data base does not exist to allow a good diagnosis of the gender division of labor in production systems in the Peten. The systems are complex, combining extraction of various forest products with agriculture and other off-farm activities. Women's precise participation in these systems, in different parts of the region, have yet to be studied. There are no published or systematic studies about the division of labor by gender in the Peten, nor how it might be changing because of male migration and other factors.

Women typically play a major role in the management of natural resources, as they are responsible for supplying water and fuelwood for their families' needs. Especially in communities oriented to forest extraction, women's detailed knowledge of fuelwood species could be an important resource for development and conservation efforts. Women also are actively involved in home garden production and in processing agricultural and extractive products. They also participate in most agricultural tasks when necessary.

Some women work as xate collectors or as cooks in xate camps. These productive activities tend to be invisible because of the prevailing cultural notions that assign women to tasks around the house, even though the reality of subsistence life may require them to be in the field or the forest.

Whereas the role of women in many Project protection and management activities may be limited as the Project is now defined, roles for women as participants in, and targets of, awareness, environmental education, and appropriate outreach activities should be identified and promoted during Project implementation. The Project should support research to understand the actual and potential roles of women better. It should also train Project personnel in gender awareness, sensitivity, and analysis.

#### 6. Spread Effect

Most of the social soundness analysis addresses the group of Project beneficiaries comprised of extractors, milperos (slash and burn farmers/squatters), women, and children. These people will receive benefits from the Project in the form of increased knowledge and skills for better natural resource management. Some will also obtain employment in Project-related activities. They will participate in planning and decision making related to the Reserve and benefit from income generation activities and education and awareness programs.

The Project will introduce some new technological and institutional innovations into the Project area. The training, awareness, and environmental education components of the Project have been designed to address the introduction and spread of these technologies through a range of activities. These include mass media programs, meetings with teachers, communities, and associations, training sessions for Project personnel, seminars, workshops, study tours and other activities that will diffuse information Project innovations. Additionally, Project implementors will work closely with local, regional, and national leaders through a range of study tours, meetings, workshops, and conferences.

## 7. Equity Issues: Distribution of Benefits and Burdens

The primary beneficiaries of the Project are the institutions that will have responsibility for the protection and management of the reserve. The Project, additionally, will provide real opportunities at the truly local level. These opportunities include: giving priority to hiring guards who live in the Reserve area, having local xateros train other xateros, and providing continued access to resources such as timber and xate even though land tenure inside the reserve will be restricted.

The actual execution of this kind of approach will provide more motivation for local people to work with the Reserve rather than against it. Institutional development activities, such as training, will promote greater consideration by GOG personnel of the social aspects of the Project and the need to ensure the spread of benefits and resources to both men and women.

Some local people who currently reside in areas now designated as part of the Reserve may be relocated. Because final decisions have not yet been made, a preliminary aspect of Project planning should be to look at the potential costs and benefits of taking such action. Alternatives may exist that avoid forced eviction; they should be identified and carefully assessed.

### D. Economic Analysis

As described earlier, the Biosphere Project is an innovative effort to address the deterioration of the environment. However, evaluation of these efforts is in its infancy, and significant gaps exist in our knowledge and understanding of the effects of environmental degradation. The Project will seek to fill that lack of knowledge through a flexible design. As information becomes available, changes may be introduced.

Formal benefit-cost analysis is difficult to implement. Lack of data and a variety of theoretical issues surrounding the appropriate valuation of inter-generational flows are unresolved. However, steps need to be taken to address such measurement and valuation issues. The Project will seek to improve our understanding through a variety of efforts. First, the Project will incorporate efforts to collect information on physical data covering the stock of environmental assets, demand for the service of such assets and the negative consequences of the satisfaction of such demand.

The second step will be to place monetary value on the use of physical assets. Such efforts may be difficult but proxies such as the value of waste disposal, the cost of soil regeneration and the cost of fertilizer use might be considered. This portion of the Project, therefore, will include a dynamic research effort and data collection and evaluation. The results gathered will permit the Project to move closer to a more rigorous benefit-cost analysis.

The objective of the Project is not to eliminate all environmental degradation, but rather, to limit it to a level which is consistent with the overall objectives of society. Inappropriate use of environmental assets often results from the failure to internalize their costs in investment and consumption decisions. The third aspect of the on-going economic evaluation is to identify why such costs are inappropriately valued and why a disassociation exists between the scarcity of the asset and its price, the costs and benefits and ownership rights.

There are a variety of market failures that can lead to such disassociations. Among examples of such failures can be 1) the absence of property rights, 2) the existence of unpriced resources, 3) externalities and spillover effects, 4) the existence of public goods, and 5) the lack of competition for the resources, and 6) relatively high private rediscount rates arising from poverty compared with the social rediscount rates. The Project will seek to identify such market failures, and evaluate the impact they have on the pace of environmental degradation. As new information is collected, the Project design will be modified to incorporate information learned and to make the Project more efficient.

Because these activities will be developed over the course of the Project, the immediate evaluations will be limited to determining the cost effectiveness. Several experts were consulted to assure that the components of the Project were not only least cost in terms of Project inputs, but were propitious. The Project design team benefitted, for example, from the experiences of persons who designed the recently developed RENARM Project. Several of their suggestions are built into the Maya Biosphere Project. The Project is also designed to complement similar projects of the region and will benefit from several economies of scale from exchange of information, training materials and instructors, and management expertise. A number of the components of this Project include NGOs in various aspects of Project implementation. By using NGO resources and expertise, both U.S. and Central American, the Project improves the effort to develop interest and capacity in the areas of environmental awareness, protected areas, biodiversity and income generation based on sound resource management practices. Since many of the components of this Project are complementary to on-going projects with NGO and regional institutions, the incremental benefits from this Project will be much greater than from a similar project implemented without complementary activities.

The least-cost analysis contains a detailed description of a five step method for evaluating the future economic returns of the Project. The method includes a list of Project outputs which can be quantified. The actual quantification will depend upon the results of the Project's baseline studies. In particular, baseline data will be used for estimates of the net incremental benefits from various components of the Project. The proposed analysis will make it possible to compare and contrast Project worth from the various interests of conservation, resource protection and sustainable income generation. It thus contains information intended to facilitate monitoring and evaluation of the Project.

## **E. Environmental Assessment**

### **1. Conclusions**

The environmental analysis concludes that the proposed Maya Biosphere Project is environmentally sound and preferable, from an environmental standpoint, to all of the other alternative project approaches analyzed.

### **2. Analysis of the Project**

The proposed Project, which advocates a blend of activities focusing on protection with activities oriented toward sustainable natural resources harvesting, is superior, environmentally, to a more narrow focus on either protection, exclusively, or natural resources development, exclusively.

The Maya Biosphere Reserve includes a variety of habitats which support rich biodiversity and also contain important cultural resources in the form of extensive Mayan ruins. These resources currently enjoy some protection but they are under threat from advancing agriculturalists who would clear the forest and also from possible over-extraction of resources, both legal and illegal. Absent some type of concentrated effort in both protection and sustainable development, the Reserve would almost certainly suffer serious deterioration in the near future. The Project proposes a strategy for dealing with this unstable and vulnerable situation consisting of three elements - protection, study, and use of the Reserve's natural and cultural resources.

The Project proposes three components to advance its strategy. The first, the biosphere administration component, will strengthen direct protection of vulnerable resources by delimiting boundaries, training resource guards and patrolling the boundaries. The environmental education, public awareness, and policy component of the Project, supports

the study element of the strategy by increasing knowledge about the Reserve in general terms. Specific studies of resources and resource capacities performed under the other Project components increase the information base for this component. The use element of the strategy entails improving natural resource extraction through subcomponents that treat natural forest management and extractive reserves and enhancing tourism to the Reserve through the subcomponent on tourism oriented toward nature and culture.

Public perceptions of the Maya Biosphere Reserve currently vary from supportive, to uninterested, to uninformed, to hostile. Because the Reserve is so new, few people have a clear idea of what it really means for them. The long-term well being of the Reserve relies on establishing a community of interests who support the Reserve because the Reserve supports those interests. The Project promotes this end by meeting the interests of scientists, the timber industry, extractors of wild products, and the tourist trade. Through its environmental education and public awareness subcomponents, the Project also explains the Reserve to a broader audience who also have interests, though less immediate ones, in maintaining the integrity of the Reserve.

The environmental analysis supports the decision to concentrate Project activities inside the Maya Biosphere Reserve. Although it is important to foster overall socio-economic development in the Peten outside the Reserve, such development belongs more appropriately to separate development efforts from those included in this Project.

### **3. Areas of Controversy and Issues to Resolve**

#### **a. Core areas and multiple use areas**

The Maya Biosphere Reserve centers around core areas, areas dedicated primarily to strict protection of biological and cultural resources but open for scientific study, tourism, and other non-consumptive uses. The Maya Biosphere Reserve Law establishes the boundaries of the principal core areas within the Reserve. As currently designated, about half of the Reserve lies within core areas. The law also states that the Reserve will include multiple use areas and recuperation areas. The law does not, however, specifically delimit these areas nor indicate the types or locations of uses allowed within them. CONAP, as part of the biosphere administration component of the Project, will coordinate preparation of a master plan for the Reserve which will designate the multiple use and recuperation areas and the uses permitted within them. This will require resolving conflicts in the multiple use and recuperation areas among competing interests in extraction of timber, extraction of wild products, and expansion of existing agriculture based on short cycle cropping, mostly of maize and beans, interspersed with longer cycle forest fallow.

#### **b. Protection and extraction technologies**

The Project embodies the concepts of permanent protection of vulnerable resources and sustained yield management of other natural resources. But the precise technologies to achieve permanent protection and sustained yield are not currently in place in the Maya Biosphere Reserve. The Project will attempt to develop these technologies. By beginning with a group of baseline studies, the Project will have a series of reference points on resource availability and condition. Sustainable technologies should maintain or improve the availability and condition of the resources. As implementation advances, the Project will monitor and evaluate the effectiveness of the technologies it promotes at maintaining the resources it seeks to protect and use.

#### **c. Oil development**

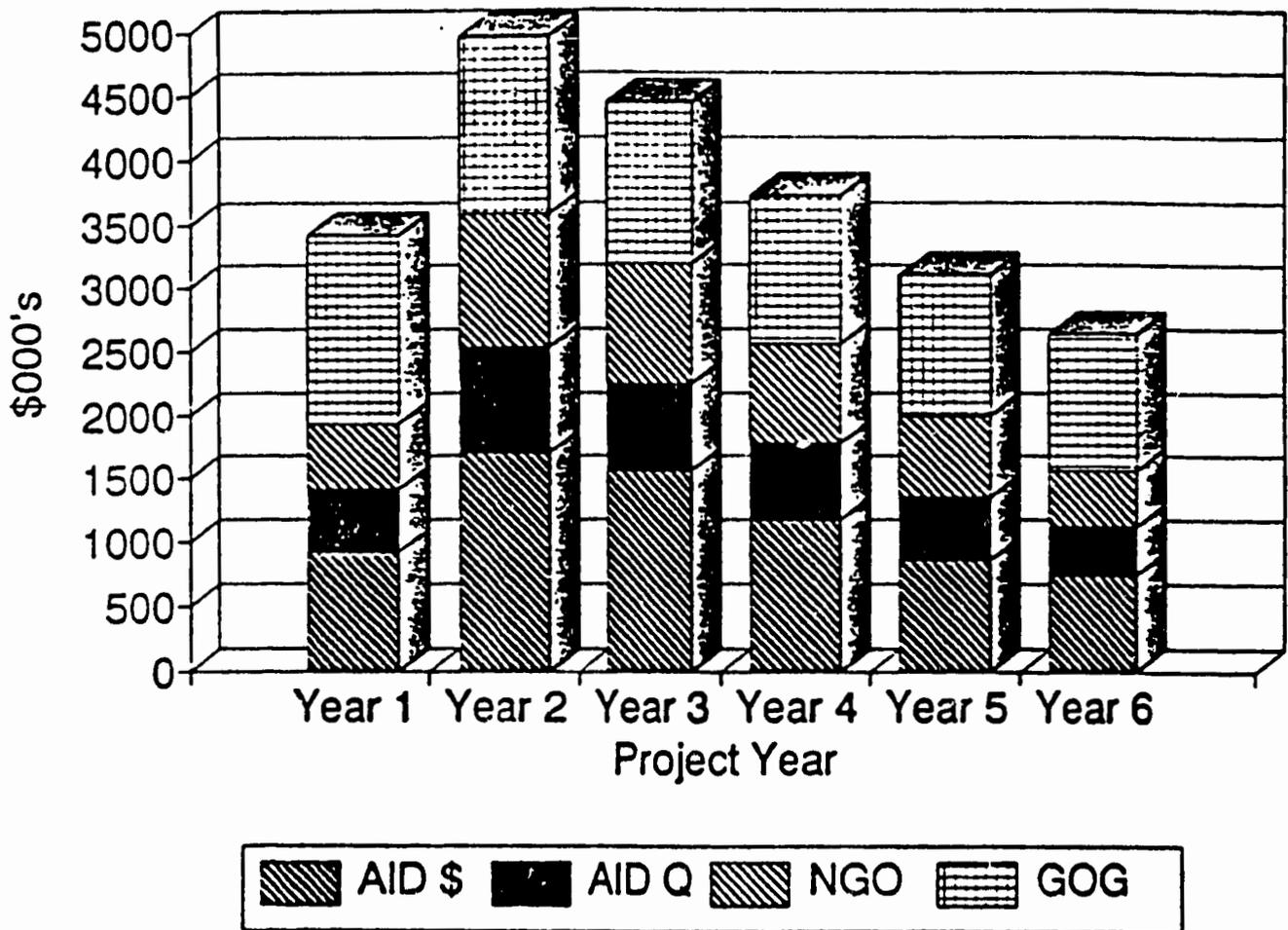
Crude oil is currently produced inside the Maya Biosphere Reserve. Oil production carries two significant negative impacts for the Reserve: spills which pollute, especially in wetlands, and roads which can provide uncontrolled access. CONAMA monitors the oil extraction in the Reserve and reports that it obtains adequate cooperation from the oil company in curtailing and cleaning up spills and controlling access to the Reserve. The situation requires continuing vigilance and continuing cooperation from the oil company.

#### **d. Roads**

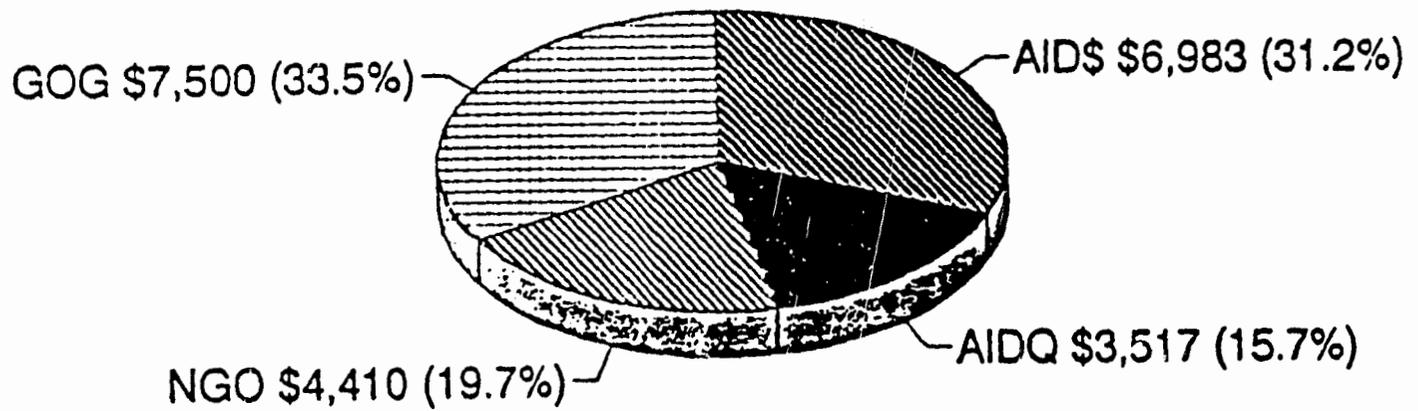
Roads, inside and outside the Reserve, produce positive and negative impacts on the Reserve. Roads provide access for appropriate activities in the Reserve and contribute to the general socio-economic development of the Peten. But roads also facilitate access to the Reserve for poaching, unlawful timber cutting, and unauthorized land clearing and settlement. The Project does not anticipate the construction or maintenance of public roads. But road building and maintenance, by public authorities and by timber companies, continues in and around the Reserve. The Project must take these roads into account as it seeks to accomplish its objectives.

V. FINANCIAL ANALYSIS AND PLAN

MAYAREMA Project 520-0395  
 Projected Expenditures by Source & Year



MAYAREMA Project 520-0395  
Contribution to Total Project Cost



**PROJECT PAPER**  
**MAYA BIOSPHERE PROJECT**

**USAID/Guatemala**  
**Project No. 520-0395**

**June, 1990**

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**A. Total Project Budget by Source of Funds, Activity and Year**

**MAYA BIOSPHERE PROJECT (520-0395) All Components**

***** AID \$ *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	19	124	124	123	118	117	625
Technical assistance	316	435	438	382	281	183	2,035
Travel & per diem	112	198	196	141	124	90	861
Training	127	206	180	171	70	41	795
Vehicles	0	160	60	0	0	0	220
Equipment	35	72	56	38	25	7	233
Office & furnishings	28	46	18	18	18	18	146
Supplies & op. expense	12	24	24	19	18	16	113
Special studies	155	215	114	136	94	30	744
Audits	0	0	0	0	0	0	0
Evaluations	0	0	150	0	0	150	300
<b>SUBTOTAL</b>	<b>804</b>	<b>1,480</b>	<b>1,360</b>	<b>1,028</b>	<b>748</b>	<b>652</b>	<b>6,072</b>
Contingencies	80	148	136	103	75	65	607
Inflation	40	74	68	51	37	33	304
<b>TOTAL</b>	<b>925</b>	<b>1,702</b>	<b>1,564</b>	<b>1,182</b>	<b>860</b>	<b>750</b>	<b>6,983</b>

**MAYA BIOSPHERE PROJECT (520-0395) All Components**

***** AID Q *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	64	86	85	83	71	70	459
Technical assistance	49	111	128	87	70	35	480
Travel & per diem	24	37	39	31	26	18	175
Training	48	84	70	64	25	14	305
Vehicles	0	0	0	0	0	0	0
Equipment	10	22	17	16	12	6	83
Office & furnishings	55	94	35	35	35	35	289
Supplies & op. expense	21	42	44	34	32	27	200
Special studies	71	159	85	96	72	44	527
Audits	90	90	90	90	90	90	540
Evaluations	0	0	0	0	0	0	0
<b>SUBTOTAL</b>	<b>432</b>	<b>725</b>	<b>593</b>	<b>536</b>	<b>433</b>	<b>339</b>	<b>3,058</b>
Contingencies	43	73	59	54	43	34	306
Inflation	22	36	30	27	22	17	153
<b>TOTAL</b>	<b>497</b>	<b>834</b>	<b>682</b>	<b>616</b>	<b>498</b>	<b>390</b>	<b>3,517</b>

MAYA BIOSPHERE PROJECT (520-0395) All Components

*****AID TOTAL*****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	83	210	209	206	189	187	1,084
Technical assistance	365	546	566	469	351	218	2,515
Travel & per diem	136	235	235	172	150	108	1,036
Training	175	290	250	235	95	55	1,100
Vehicles	0	160	60	0	0	0	220
Equipment	45	94	73	54	37	13	316
Office & furnishings	83	140	53	53	53	53	435
Supplies & op. expense	33	66	68	53	50	43	313
Special studies	226	374	199	232	166	74	1,271
Audits	90	90	90	90	90	90	540
Evaluations	0	0	150	0	0	150	300
SUBTOTAL	1,236	2,205	1,953	1,564	1,181	991	9,130
Contingencies	124	221	195	156	118	99	913
Inflation	62	110	98	78	59	50	457
TOTAL	1,421	2,536	2,246	1,799	1,358	1,140	10,500

MAYA BIOSPHERE PROJECT (520-0395) All Components

*****NGO*****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	192	319	394	411	349	267	1,932
Technical assistance	20	120	117	43	30	10	340
Travel & per diem	51	118	117	109	91	59	545
Training	5	35	30	0	0	0	70
Vehicles	100	100	0	0	0	0	200
Equipment	20	37	24	10	9	5	105
Office & furnishings	6	19	17	17	16	15	90
Supplies & op. expense	14	42	43	41	38	35	213
Special studies	50	120	90	50	30	0	340
Audits	0	0	0	0	0	0	0
Evaluations	0	0	0	0	0	0	0
SUBTOTAL	458	910	832	681	563	391	3,835
Contingencies	46	91	83	68	56	39	384
Inflation	23	46	42	34	28	20	192
TOTAL	527	1,047	957	783	647	450	4,410

MAYA BIOSPHERE PROJECT (520-0395) All Components

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	646	646	621	621	621	621	3,776
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	33	33	34	35	34	33	202
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	178	112	101	96	83	83	653
Office & furnishings	335	317	252	167	130	102	1,303
Supplies & op. expense	101	99	97	97	97	97	588
Special studies	0	0	0	0	0	0	0
Audits	0	0	0	0	0	0	0
Evaluations	0	0	0	0	0	0	0
SUBTOTAL	1,293	1,207	1,105	1,016	965	936	6,522
Contingencies	129	121	111	102	97	94	652
Inflation	65	60	55	51	48	47	326
TOTAL	1,487	1,388	1,271	1,168	1,110	1,076	7,500

MAYA BIOSPHERE PROJECT (520-0395) All Components

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	921	1,175	1,224	1,238	1,159	1,075	6,792
Technical assistance	385	666	683	512	381	228	2,855
Travel & per diem	220	386	386	316	275	200	1,783
Training	180	325	280	235	95	55	1,170
Vehicles	100	260	60	0	0	0	420
Equipment	243	243	198	160	129	101	1,074
Office & furnishings	424	476	322	237	199	170	1,828
Supplies & op. expense	148	207	208	191	185	175	1,114
Special studies	276	494	289	282	196	74	1,611
Audits	90	90	90	90	90	90	540
Evaluations	0	0	150	0	0	150	300
SUBTOTAL	2,987	4,322	3,890	3,261	2,709	2,318	19,487
Contingencies	299	432	389	326	271	232	1,949
Inflation	149	216	195	163	135	116	974
TOTAL	3,435	4,970	4,474	3,750	3,115	2,666	22,410

NOTE: Detailed budgets are presented in Annex H: Financial and Economic Analysis.

## VI. IMPLEMENTATION PLAN

### A. Administrative Arrangements

#### 1. Methods of Obligation and Disbursement

The Project will employ a mix of obligating mechanisms including a Handbook 3 Project Agreement with the GOG, Handbook 13 Cooperative Agreements with U.S. NGOs, and direct AID procurement through Project Implementation Orders. Tables below detail the breakdown between the GOG and the NGO's, the Method of Implementation and Financing and a Project Obligation Matrix.

Upon Mission approval of the Project Paper, A.I.D. will negotiate with the GOG to obtain agreement on the counterpart contribution to the Project, signature of the Project Agreement and obligation of approximately \$1.4 million funds available for this fiscal year. The remainder to be obligated to the GOG will be incrementally funded. Some of these funds will be disbursed directly by A.I.D. to the GOG implementing institutions, and A.I.D. will procure goods and services on the GOG's behalf with some of these funds, as shown in the Project Obligation Matrix.

Upon signature of the Project Agreement, a Request for Applications (RFA) will be prepared according to Handbook 13 Cooperative Agreement regulations to solicit offers from interested and qualified U.S. NGOs and NGO consortia that will work together with the GOG and local counterparts to carry out the activities described in the Project Agreement. The Project Agreement as well as the RFA will provide descriptions of project components, the relationships of participating public and private institutions, the implementation plan and the Project budget. Procurement of goods and services for all AID funded activities will conform to AID regulations for open competition.

#### SUMMARY BUDGET IN US\$ 000's

<u>Item</u>	<u>Total</u>	<u>GOG (HB 3)</u>	<u>NGO's (HB 13)</u>
Personnel	1,084	792	292
Technical Assistance	2,515	653	1,862
Travel and Per Diem	1,036	309	727
Training	1,100	280	820
Vehicle	220	160	60
Equipment	316	98	218
Office and Furnishings	435	280	155
Supplies & Operating Expenses	313	114	199
Special Studies	1,271	361	910
Audits	540	540	0
Evaluations	300	300	0
Contingencies	913	389	524
Inflation	<u>457</u>	<u>194</u>	<u>263</u>
T o t a l	10,500	4,470	6,030
	=====	=====	=====

METHOD OF IMPLEMENTATION  
AND FINANCING

<u>Input</u>	<u>Method of Implementation</u>	<u>Method of Financing</u>	<u>Amount 000's</u>
Technical Assistance	AID Direct	Direct Pay	653
	AID Direct	Direct Reimbursement	1,862
Training	Host Country	Direct Reimbursement	280
	AID Direct	Direct Reimbursement	820
Commodities	AID Direct	Direct Pay	258
	AID Direct	Direct Reimbursement	278
Special Studies	AID Direct	Direct Pay	361
	AID Direct	Direct Reimbursement	910
Operating Costs	Host Country	Direct Reimbursement	1,495
	AID Direct	Direct Reimbursement	1,373
Audit & Evaluation	AID Direct	Direct Payment	840
Contingencies/Evaluation	--	--	<u>1,370</u>
T O T A L			10,500 =====

**Project Obligation Matrix**

<u>Component and Activity</u>	<u>Obligation Mechanism</u>	<u>Responsible Implementor</u>	<u>Cost \$ (000)</u>
<b>I BIOSPHERE ADMINISTRATION</b>			
a. Establish Biosphere Admin.			
1) Strength.Reg.Offices (includes 9 field posts and 20 remote shelters)	HB3	GOG	317
2) Biosphere Master Plan	HB3	GOG	60
3) Demarcate Boundaries	HB3	GOG	300
4) GOG Cont/Infl.	HB3	GOG	120
b. Strengthen Res. Mgmt Institutions			
1) ST TA/per diem	HB3	AID	515
2) Training	HB3	AID	120
3) Purchase of Equipment	HB3	AID	158
4) AID Cont/Infl.	HB3	AID	142
<b>Total</b>			<b>1,732</b>
<b>II ENVIRONMENTAL EDUCATION, PUBLIC AWARENESS AND POLICY</b>			
a. Environmental Education	HB13	NGO	
b. Environmental Awareness	HB13	NGO	
c. Policy	HB13	NGO/RENARM	
d. Cont/Infl.	HB13	NGO	
<b>Total</b>			<b>2,591</b>
<b>III SUSTAINABLE RESOURCE MANAGEMENT</b>			
a. Natural Forest Management	HB13	NGO	
b. Extractive Reserves	HB13	NGO	
c. Ecotourism	HB13	NGO	
d. Other ENR Activities	HB13	NGO	
<b>Total</b>	HB13		<b>3,439</b>
<b>IV PROJECT MANAGEMENT, COORDINATION, TA, EVALUATION &amp; AUDITS</b>			
a. Technical/Advisory Assistance			
1) LT TA/(PSC/PASA)	HB3	AID	750
2) ST TA/per diem	HB3	AID	300
3) Training	HB3	AID	150
4) Equipment/vehicle	HB3	AID	40
b. Annual Plng. Mtgs/Studies	HB3	AID	300
c. Baseline, Non. Eval. Aud.	HB3	AID	840
d. Cont/Infl.	HB3	AID	358
<b>Total</b>			<b>2,738</b>
<b>Total Project</b>			<b>10,500</b>

The decision to implement the Maya Biosphere Project through the private sector, and particularly through U.S. NGOs, was considered carefully by the Project Paper development team. After examining several alternatives, it was decided that the numerous advantages, summarized below, outweigh possible disadvantages to this approach. The advantages include:

1. Simplified project management and administration
2. Leverage of private funds
3. Increased probability of sustainable benefits
4. Improved financial management and responsibility
5. Proven dedication and responsibility of NGOs
6. Avoidance of potentially high overhead costs
7. Reduction of risks and complications during a period of political uncertainty in Guatemala

US NGOs already have a great deal of experience working in Guatemala and will be active in similar activities under the regional RENARM Project. The Mission perceives significant advantages to buy-ins to the RENARM Project for some activities. All other activities to be executed through Cooperative Agreements will be included in the RFA. NGOs will be allowed to bid on all or part of the activities in the RFA. The Maya Biosphere Project NGO Selection Committee will establish fair selection criteria and evaluate applications based on a variety of factors which will avoid unfair advantage for NGOs participating in the RENARM Project.

If there is a lack of interest, experience or expertise in the U.S. NGO community for particular aspects of the Maya Biosphere Project, USAID will seek qualified institutional contractors to provide services necessary to complement available NGO capabilities.

In performing the scopes of work to be provided in the RFA, the NGOs will be required to work together with the GOG, local NGOs and A.I.D. under the regulations governing Cooperative Agreement grants. Funds will be disbursed directly to the NGOs, and implementation of the Project components will be carried out directly by the NGOs in collaboration with local counterparts and in coordination with the activities of the other components (See the Implementation Schedule in Section VI.G, below).

It is anticipated that a minimum of 1:2 matching funds will be required of the NGOs. NGO matching funds must come from non-federal sources (e.g. RENARM and other AID resources will not count towards the matching requirement under this Project). The GOG will also be required to provide approximately 1:2 matching funds in local currency for all money obligated to the GOG and disbursed by A.I.D. to GOG implementing institutions. These funds will cover recurrent costs of Project activities. In order to further increase Project leverage and increase the probability of sustainable Project benefits, the selected U.S. NGOs will be required to work with local institutions and organizations (especially NGOs), and assist their development for long-term effectiveness in Project activity areas. U.S. NGOs may require local NGOs to contribute counterpart funds as well.

## 2. Relationship between Institutions

This Project Paper is the result of a joint design effort between the GOG, A.I.D. and a contracted team of ENR specialists. The design was elaborated with the participation of eight GOG institutions (CONAMA, SEGEPLAN, CONAP, DIGEBOS, CECON, IDAEH, UNEPET and PAFG) and received written approval (see Annex E). The implementation of this Project will similarly be carried out with the full and continuing participation of the involved institutions.

According to the Maya Biosphere Law, the Executive Secretary of CONAP will undertake the direct administration of the Biosphere Reserve, and will coordinate and supervise the administration of nuclear protected areas under IDAEH and CECON. The Secretary will also preside over the Biosphere Reserve Committee (which includes CECON, IDAEH and the military), established under the Law to achieve effective coordination between entities working in the Reserve. CONAP will therefore be the official GOG counterpart to this Project.

A.I.D. will reach an agreement with CONAP, the Ministry of Finances and SEGEPLAN on the Project activities, implementation plan, management strategy and GOG counterpart contributions. These three GOG institutions will subsequently be signatories to the Project Agreement.

To assure the full and continuing involvement of the GOG, the Executive Secretary of CONAP will be a voting member of the Technical Committee that will select the NGOs that will undertake implementation activities under this Project. Upon award of the HB13 Cooperative Agreement(s), a Memorandum of Understanding defining the Project activities, operating plan, institutional relationships and reporting requirements will be signed by the participating NGO(s), CONAP and A.I.D. This MOU will authorize the NGO(s) and A.I.D. to implement all Project activities in the Maya Biosphere Reserve.

It is believed that the Project Agreement, participation in the Technical NGO Selection Committee and the MOU will assure the clarification of responsibilities between the participating institutions, and promote effective coordination and management of Project activities.



#### **b. Supervisory level**

The overall management and direction of Project activities will be provided by A.I.D. in coordination with CONAP. Project management will also work closely with the GOG Maya Biosphere Reserve Committee, which was established in the Maya Biosphere Reserve Law. This committee consists of the heads of CONAP, CECON, IDAEH and the military. U.S. law does not permit A.I.D. to provide assistance to the military. Therefore, no A.I.D. funds can be used to support or equip the military under this Project.

#### **4. A.I.D. Responsibilities**

The A.I.D. Direct Hire Environmental and Natural Resource Officer in the Office of Rural Development (ORD) will be the Mission official directly responsible for AID management of the Maya Biosphere Project. This Project Manager will be the principal USAID contact with all institutions and individuals involved in the Project. The Project Officer will continuously monitor Project implementation, and will coordinate closely with other related projects of the Mission and of ROCAP.

The Project Officer will be assisted by the Mission Forestry Officer, a long-term Natural Resources Management PASA, and a contracted Guatemalan Project Coordinator who will reside in the Peten. The Mission will also establish a Project Implementation Committee (PIC), chaired by the Maya Biosphere Project Officer, with representatives from the following Mission offices: Controller, Project Development Office, Program Office, Office of Economic and Policy Analysis, and the Administration Office. Technical support will also be provided by ROCAP's Regional Environmental Officer and Regional Forestry Officer.

#### **5. GOG Responsibilities**

Technical representatives of participating GOG institutions will be selected to coordinate their institutions' participation with the Project and work closely with the GCMs, as established and agreed upon in the Cooperative Agreements. In addition, the chief of the participating GOG institutions will participate at the supervisory level, responsible for the overall management and direction of counterpart Project activities. The Organizational Diagram shown above illustrates these relationships.

## **6. NGO Responsibilities**

The U.S. NGO(s) selected to implement the three Project components will be responsible for carrying out the activities described in their respective Cooperative Agreements/Scopes of Work (based upon the Project Paper). These NGOs will work closely with GOG counterpart institutions and local NGOs and private sector entities. The NGOs will hire Guatemalan Component Managers (GCMs) responsible for the day-to-day management of all component activities, liaison with GOG institutions and other counterparts, and supervision of all fieldwork.

### **B. Monitoring Plan**

#### **1. Objectives**

Monitoring and evaluation will be a continuous process during the life of the Project in order to: (1) measure progress toward achievement of desired outputs and impacts and to propose needed corrective actions; (2) facilitate linkages, meshing and mutual reinforcement between and among the Project components; (3) build accountability into ongoing Project activities; (4) facilitate coordination between recipient and other ENR programs or projects; and (5) build the evaluation capacity of institutions and national counterparts who participate in Project implementation. The monitoring and evaluation process should result in useful information for future redesign and for the inclusion of new elements in the Project in order to orient program resources towards the most successful interventions.

Selected NGOs will be required to submit quarterly reports to A.I.D. on the progress of implementation activities, and will submit to A.I.D. yearly operating plans as described in section III.4.b.

#### **2. Specific Monitoring and Evaluation Criteria by Project Component**

##### **a. Biosphere Administration Component**

Baseline studies will help determine actual levels of forest cover, land use trends and land use capability. Using remote sensing materials purchased under the Project, subsequent monitoring will help estimate deforestation rates, integrity of nuclear protected areas, biodiversity conservation, changes in land use trends and changes in conditions of vegetation.

#### **b. Environmental Education, Public Awareness, and Policy Component**

In the baseline study current levels of environmental education and public awareness will be determined at the onset of the Project. Gender desegregated information will be obtained in this study. Results of subsequent, periodic monitoring studies will help determine the success and possible modification of Project activities to help achieve the objectives of the component.

#### **c. Sustainable Resource Management Component**

The Project will support baseline studies under this component to help produce inventories of timber, xate, chicle, allspice, other economically promising wild resources, tourism sites and wildlife. The inventories will indicate amounts, location, quality, and tendencies toward depletion or deterioration of the resources studied. Gender desegregated data will be obtained that will indicate the degree to which women participate in these activities. Periodic monitoring of key indicators will determine continuing trends for each resource. Monitoring for this component will also determine the effectiveness of the natural forest management demonstration sites, the extractive reserves access and licensing system, and tourism site management.

### **3. Monitoring Criteria for Factors that cross Project Components**

#### **a. Social Factors**

The Project will monitor how much levels of information about the Reserve and about sustainable resource management have increased as a result of its activities. It will also determine changes in public attitudes toward conservation. Monitoring will pay particular attention to women's participation in the Project: have women been trained effectively and has that training led to employment and other opportunities; have women benefitted from Project technical assistance and technologies.

The principal social indicator of Project success is general well being of the population. As a result of the Project, people in the Project area should be better off, not just in terms of more sustainable economic activities, but in terms of their knowledge, security, access to services, and expectations of a satisfying future.

#### **b. Economic Factors**

To determine the economic impact of the Project, monitoring will measure current levels of economic indicators and then will compare them to estimated future levels with and without the Project. Enhanced levels of the indicators under the with-Project hypothesis indicate economic success of the Project. The Project will measure indicators such as hectares benefitting from protection and management, professional and technical personnel trained, levels of environmental education and public awareness attained, etc. The Economic Analysis in Annex H presents details on economic indicators.

#### **c. Environmental Factors**

The baseline studies and subsequent monitoring described above for the Project components in biosphere administration and sustainable natural resource management will adequately encompass environmental monitoring. The two most important environmental indicators monitored under these components will be deforestation rates and habitat management for the protection of biodiversity.

#### **d. Institutional Factors**

The Project will monitor whether participating institutions have been strengthened by focusing on two types of indicators. One type of indicator is the relatively mechanical one of counting training events and research studies and evaluating their quality. The other, more subjective type of indicator will measure institutional capability.

By the end of the Project, CONAP should be fully competent to administer all aspects of the Maya Biosphere Reserve, from planning to field activities. DIGEBOS should have a firm grasp on managing forest resources inside and outside the Reserve and should be fully competent to evaluate and enforce forest management plans on the timber concessions it authorizes. CECON, IDAEH, and participating NGOs should stand up against similar criteria pertinent to their institutional functions.

The most significant indicator of Project progress will be the degree to which the participating institutions have adequate human and financial resources, to continue essential activities initiated by the Project.

#### **4. Phasing**

Baseline studies will be completed mid-way through the second year of the Project. Thereafter, monitoring will concentrate on periodic remeasurement of selected key indicators and on new information from studies such as those in marketing. All monitoring efforts will feed into the annual Project planning exercises, which, in turn, will influence the course of subsequent monitoring. The results of Project monitoring will be made available for the evaluations programmed for the Project.

#### **C. Procurement Plan**

The A.I.D. contribution to the Project -\$10.5 million- contemplates the procurement of 11 vehicles, 10 boats with outboard motors, 20 motorcycles, 24 computers, communications and video equipment, office furnishings, and other equipment and supplies related to the establishment of proper management of the Maya Biosphere. The Project will also procure personal services and technical assistance, primarily through HB 14 contracts. Assistance instruments to be signed with US NGOs shall be processed according to HB 13. A critical path schedule indicating the specific steps to undertake, the responsible parties and the schedule for these actions will be created to assure procurement of these commodities and services according to this plan.

The host country organization responsible for approval of procurement actions is CONAP. CONAP will also be responsible for the procurement of a small number of minor goods and services, in coordination with a USAID/G procurement officer. CONAP has undertaken small procurements under other projects, and is deemed capable of doing the same under this Project; however, any large procurement actions will either be undertaken by A.I.D., or with the appropriate certifying approvals of the Mission Director and the Regional Legal Advisor. CONAP will receive AID approval of its procurement procedures prior to undertaking contracting actions with Project funds as required by recent Agency guidelines for the assessment of host country contracting capabilities.

##### **1. Vehicles/boats/motors/cycles**

PIO/Cs with specifications issued to AID/G. Most vehicles are expected to be 4WD pickups; at least one 4WD passenger carrier is also envisioned. These will be US-made vehicles. Additional vehicles are expected to be procured by NGOs using their own funds. A blanket waiver exists for the 125cc motorcycles to be procured under the Project. Other commodities in this category will be purchased from Geographic Code 000 (USA).

## **2. Computers, communications and video equipment**

PIO/Cs will be submitted to AID/G for these foreign exchange purchases. Procurement will normally be from Geographic Code 000. Some video equipment may not be available from the US and will require a waiver. Some minor procurements which are locally available and which can be purchased more efficiently locally may be purchased from CBI Central American Common Market Countries. Prior to the procurement of computers and accessories, AID/IRM will either draft or review the specifications and the proposed use of equipment.

## **3. Office Furnishings and minor equipment and supplies (local currency purchases)**

To the extent that these goods are available as local shelf items, they will be purchased by the GOG with AID oversight to assure that they fulfill the requirements of HB1, Supplement B, Chapter 18.

## **4. Video equipment**

Video equipment and other permissible small goods not manufactured in the U.S. may be purchased under the project in accordance with the waiver in the Project Authorization.

Annex L details anticipated commodity procurements, responsible organization for the procurement (GOG, NGO or AID), and estimated date of delivery. Personal Services and TA financed by the Project will be provided primarily through the NGOs. The Cooperative Agreements to be signed with NGOs will be prepared in full accordance with HB13. Some specific activities which fit with the objectives of NGO projects being developed under RENARM are expected to be accessed through buy-ins to the RENARM Project. The buy-ins will be negotiated by the Regional Grants Officer.

The major share of NGO activities under the Maya Biosphere Project will be competitively bid using a Request For Applications for Assistance (RFA) process similar to that utilized in RENARM. One RFA is contemplated which would allow NGOs to bid on all or part of the required assistance. The RFA is expected to be issued by the second quarter of FY 91 and NGOs should be on the job prior to the end of FY 91.

A buy-in to RENARM may also be used to assist with base-line studies, policy analysis, monitoring and evaluation of the MBP. The procurement of any additional personal services and technical assistance will be conducted according to AID regulations. The terms of reference for both buy-ins to RENARM and the RFA will be prepared in conjunction with CONAP.

It should be noted that a major portion of the MBP will be implemented with the assistance of US NGOs which will contribute counterpart funds from private sources. The procurement plan may, therefore, be adjusted during implementation to account for commodities which NGOs procure with their own funds (any vehicle or major commodity procurement executed directly by NGOs would be done with their own funds). The GOG is also expected to procure commodities in support of Project objectives with its counterpart monies.

#### **D. Training Plan**

##### **1. Overview**

Training under the Project will address a key constraint to protecting biological and cultural resources and to managing resources for sustainable income generation in Guatemala: the general lack of trained personnel.

Over the past few years, the ability of Guatemala's professional and technical schools to educate and train professionals and technicians in environmentally related fields has improved. These institutions, however, lack the resources to provide sufficient numbers of professionals and technicians who can perform at the needed level. Because of the importance the Project places on it, training will be initiated at the outset of the Project and continue throughout, with heaviest emphasis in the earlier stages.

The major output of the Project's training activities will be building the administrative, professional, and technical capabilities of personnel in the primary institutions working in the Maya Biosphere Reserve, specifically CONAP, DIGEBOS, CECON, and IDAEH.

##### **2. Project Activities in Training**

The Project will provide training through the following mechanisms:

Preparation of a training strategy to guide development and implementation of the project training activities. A workshop for representatives of participating institutions will discuss, modify, and refine the strategy. The training activities listed below are illustrative and will be refined based upon the strategy.

Preparation and dissemination of materials for use in training. Project implementors will use and adapt existing materials as well as develop new materials. The library of materials prepared should include: course outlines and reading materials; manuals, guides, and technical notes; workbooks; visual materials; and outreach guides.

**Short courses.** These are specialized courses, usually from one to three months long, for professionals. Some short courses will be taught in-country. For others, the Project will provide support for travel to other countries, especially in Central America, for specialized training. Topics for short courses might include: wildlands planning and management; natural forest management; skills and knowledge in how to train others and how to do outreach and extension.

**Study tours.** Typically, these are three to five day training opportunities for in-country or international travel. They will involve small groups of professionals and, in some cases, technicians to travel to other Reserves to learn what is being done elsewhere and to discuss problems with their colleagues at other sites.

**Workshops/seminars.** Typically, these one to five day training events focus on a single theme, e.g., how to resolve the problem of poaching. The audiences might be mixed (scientists with park guards) or might be focused (administrators being trained in information management). Workshops and seminars will cover such topics as scientific information management, public awareness, communications skills, and gender sensitivity and analysis. Other workshops will focus on increasing general awareness of ENR issues and the Biosphere.

**In-service courses.** These are practical one to three day courses for field level personnel, designed specifically to meet their needs and levels of education. In-service courses will cover such topics as practices and techniques to account for and maintain equipment, boundary marking, and laws and regulations of the Reserve.

### **3. Inputs**

The major inputs for training under the Project are technical assistance and equipment. The component by component descriptions of activities and budgets set out above in the Project Paper indicate specific levels of inputs for training.

### **4. Outputs**

An illustrative list of Project training outputs follows:

1. Project training strategy and associated workshop.
2. Training materials:
  - a. 50 book reference library;
  - b. 20 course outlines and associated reading materials (manuals, guides, technical notes, and workbooks);
  - c. 10 audio-visual programs.

3. Short courses:  
Five short courses for Guatemalan counterparts.
4. Study hours
  - a. Visits by 40 Project staff to other protected areas in Guatemala;
  - b. Visits by ten participants to the Plan Piloto Forestal in Mexico;
  - c. Trip by ten participants to Costa Rica.
5. Workshops/seminars
  - a. Project management seminar at Project start-up;
  - b. Five annual planning workshops;
  - c. Five seminars on public awareness and environmental education, to include gender awareness issues;
  - d. Six workshops on community relations and communications skills;
  - e. Ten seminars on administration and information management;
  - f. Seminars to train guards about procedures, regulations, outreach and extension;
  - g. Five research planning workshops.
6. In-service Courses
  - a. Courses for forest guards in natural forest management;
  - b. Courses on equipment maintenance;
  - c. Courses on public awareness and communications skills;
  - e. Courses on environmental education;

#### **E. Applied Research Plan**

Applied research activities will address research needs in all components of the Project. The primary goals of the applied research will be to provide:

- 1) better understanding of the biological, ecological, social, economic, institutional and related resources inside and outside the Maya Biosphere Reserve and the factors affecting conservation of the Reserve and the generation of income;
- 2) input into decision-making and action;
- 3) information for complementary training, education, awareness, and outreach activities;
- 4) systematic procedures to improve overall project management.

Baseline research will be conducted at the outset of the Project through direct Project funding and/or through buy-ins to the USAID/ROCAP RENARM Project.

The research activities will cover topics in all components of the Project and may include:

- ecological characterizations;
- studies of carrying capacity;
- life histories of major and minor forest species;
- forest regeneration;
- maximum sustainable production and harvest of non-timber species;
- assessments of training needs;
- profiles of audiences for public awareness and environmental education programs;
- study of the debt-peonage system;
- opportunities and incentives to enhance the role of women;
- inventory of potential tourism sites;
- land tenure and rights of access to natural resources.

The applied research program will support the development of a systematic planning process which should assist counterparts to:

1. identify prospective institutions to carry out applied research;
2. assess the research capabilities and comparative advantages of each institution;
3. establish a research advisory group to set goals and objectives, establish criteria and procedures, and evaluate results of the research;
4. provide forums to identify issues and problems related to the Project so that research will contribute effectively to meeting Project management objectives;
5. provide forums to share research results, monitor the research effort, and provide feedback to the Project.

The applied research program will coordinate all information collection, storage and management with the overall information systems to be developed for the Project. This activity will also coordinate with the RENARM Project to ensure that data are comparable and contribute to an accelerated learning curve.

The potential major cooperating entities in applied research for the Project include:

1. GOG: CONAP, CONAMA, DIGEBOS, IDAEH, INGUAT, UNEPET.
2. Universities: San Carlos (CECON), Del Valle and Rafael Landívar.
3. Guatemalan NGOs: Local associations and cooperatives, Asociación Guatemalteca Pro-defensa del Medio Ambiente, Asociación Amigos del Bosque, Amigos de la Naturaleza, Museum of Natural History.

4. Regional institutions: CATIE, ICAITI, EAP
5. International donors: USAID, FAO, OAS, German Government Mission
6. International NGOs: The Nature Conservancy, Conservation International, World Wildlife Fund.

#### **F. Audit and Evaluation Plan**

The Project budget includes funding for annual audits of Project finances. The USAID Controller's office will supervise and review the audits to ensure conformity with sound fiscal management practices. The Guatemalan government performs annual audits of each ministry which will include audit of Guatemalan counterpart agencies participating in the Project. The government will make the results of these audits available to USAID.

This Project Paper proposes conducting annual mini-evaluations of progress as well as two formal external evaluations of the Project. Mini evaluations will be conducted at the end of PYs 1, 2, 4 and 5. These evaluations are expected to be performed with the participation of USAID, GOG and NGO experts and the support of external consultants provided under the RENARM M&E (Monitoring and Evaluation) contract. The formal evaluations will occur in the second quarter of year three of Project implementation and the second quarter of year six (final evaluation). Select teams of short-term consultants will perform the two formal evaluations. The USAID Mission and Guatemalan agencies and NGOs working in the Project will provide resource personnel to facilitate these evaluations.

The baseline studies undertaken in the early years of the Project will provide comparison data for the formal evaluations, supplemented by additional information obtained from periodic monitoring of Project implementation and the mini-evaluations. Annual Project planning exercises will also contribute to the evaluation data base. See Section VI.B of the Project Paper above for the Project Monitoring and Evaluation Plan.

The first formal evaluation will note the course of the Project and compare actual Project achievements to statements of anticipated achievements contained in Project work plans. The evaluations will recommend revisions of emphasis in the Project and future orientation of Project efforts. They will also make recommendations as to how to overcome any obstacles to effective implementation that the Project has encountered.

The final evaluation will sum up what the Project has accomplished over its lifetime and will provide the Mission with information and commentary to assist in decisions about future activities recommended to follow the Project. At that time the Mission will determine whether a subsequent, full-scale development assistance Project should follow the Maya Biosphere Project.

The Mission will complement the audits and evaluations noted above with annual Project reviews chaired by the Mission Director or his or her designee.

#### **G. Implementation Schedule**

The complexity of the Maya Biosphere Project, the difficult conditions under which Project activities will be implemented in the Peten, and the relative inexperience of GOG counterpart institutions in Project activities, mean that implementation plans must remain flexible and will require close monitoring and control. The implementation schedule and the financial plan were carefully coordinated during the design phase of the Project, and resulted in a strategic, phased sequence that will ease Project management burdens and facilitate control of the numerous activities to be implemented by the NGOs.

The phased sequence of Project activities was developed with the assistance of protected areas management specialists, has been endorsed by numerous natural resource management institutions, and has been adopted in many other established protected areas programs. The sequential plan of action is divided into the following three phases:

**Phase I:** The most immediate priority is to improve management and protection of the natural resource base before further irreversible degradation occurs. This mainly involves the institutional development of the government entities responsible for protection and management activities.

**Phase II:** As Phase I gets underway, the Project area's resource base must be studied, people must be educated on the value of the resources and appropriate management policies must be developed. Applied research must be conducted to determine ways to conserve while sustainably exploiting the natural resources.

**Phase III:** After protection and adequate study have been undertaken, sustainable economic activities must be developed and implemented to benefit the local population, increasing their long-term standard of living based on the sustainable utilization of natural resources in the Project area.

This strategically phased sequence reflects an ideal which is implicit in the three components of the Maya Biosphere Project described in Section III of this Project Paper: Administration of the Maya Biosphere Reserve, Environmental Education and Public Awareness, and Sustainable Resource Management for Income Generation. Therefore, Project implementation will be sequentially phased in approximate order of the Project components. The illustrative implementation schedule, showing the shifting of Project focus by year, is presented on the following pages. Key Project implementation events are also included. Greater detail of the planned year-by-year activities may be obtained from an examination of the detailed illustrative component budgets in Annex H.

## ILLUSTRATIVE IMPLEMENTATION SCHEDULE

### Project Year One

#### First Quarter

- prepare and sign Project Agreement with GOG
- draft scopes for RENARM buy-ins
- perform planning phase of annual Project planning exercise

#### Second Quarter

- start Maya Biosphere Reserve Master Plan
- procure basic equipment for demarcating boundaries of core areas
- make initial selection of forest management demonstration sites
- draft RFA

#### Third Quarter

- start procurement of vehicles
- start procurement of equipment
- issue RFA
- start training and deploying resource guards
- begin baseline studies
- begin training for institutional strengthening

#### Fourth Quarter

- NGOs selected in response to RFA
- perform evaluation phase of annual Project planning exercise
- Biosphere Reserve regional offices functioning
- initiate long term technical assistance
- first mini-evaluation

### Project Year Two

#### First Quarter

- NGOs begin work
- Maya Biosphere Reserve Master Plan completed and adopted
- environmental education and public awareness planning under way
- initiate marketing and products development studies
- perform planning phase of annual Project planning exercise
- annual audit

#### Second Quarter

- forestry demonstration sites fully operational
- extractive reserve sites identified
- vehicles and equipment in country, operating
- baseline studies completed

### Third Quarter

- set up institutional structures for tourism; start inventory of sites
- core area boundaries fully demarcated, patrols established
- commission natural resources policy study
- DIGEBOS trained to implement forest management plans
- perform evaluation phase of annual Project planning exercise

### Fourth Quarter

- begin tourist surveys
- second mini-evaluation
- environmental education and public awareness programs operating

## **Project Year Three**

### First Quarter

- marketing and products development studies completed
- determine, initiate additional sustainable resource management activities
- perform planning phase of annual Project planning exercise
- annual audit

### Second Quarter

- formal mid-term Project evaluation
- tourist site inventory completed
- extractive reserve harvest control system operational

### Third Quarter

- formal mid-term Project evaluation
- perform evaluation phase of annual Project planning exercise

### Fourth Quarter

- tourism informational and promotional materials available

## **Project Year Four**

### First Quarter

- perform planning phase of annual Project planning exercise
- additional sustainable resource management activities operational
- annual audit

Second Quarter

Third Quarter

- perform evaluation phase of annual Project planning exercise

Fourth Quarter

- mini-evaluation

**Project Year Five**

First Quarter

- perform planning phase of annual Project planning exercise
- annual audit

Second Quarter

Third Quarter

- perform evaluation phase of annual Project planning exercise

Fourth Quarter

- mini evaluation

**Project Year Six**

First Quarter

- perform planning phase of annual Project planning exercise

Second Quarter

- end of Project evaluation
- determine post Project activities, e.g., follow-on Project

Third Quarter

- perform evaluation phase of annual Project planning exercise

Fourth Quarter

- final Project audit

## **VII. CONDITIONS PRECEDENT, COVENANTS AND NEGOTIATING STATUS**

### **A. Conditions Precedent to First Disbursement**

Prior to the first disbursement under the Grant, or to the issuance by AID of documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to AID in form and substance satisfactory to AID:

- (1) An opinion of counsel acceptable to AID that the Project Agreement has been duly authorized and/or ratified by, and executed on behalf of the Grantee, and that it constitutes a legally binding obligation of the Grantee in accordance with all its terms.
- (2) A statement of the name of the person holding or acting in the office of the Grantee specified in Section 8.2 of the Project Agreement, and of any additional representatives, together with a specimen signature of each person specified in such statement.
- (3) A detailed time-phased Implementation Plan for the first year of project activities. This plan shall include a detailed procurement plan for materials, equipment and services.
- (4) A detailed description of the administrative mechanisms that the GOG institutions involved in project implementation will use to assure appropriate execution, coordination, monitoring and evaluation of project activities. This description shall clearly define the role, authority and responsibilities for project-related activities of CONAMA, CONAP, DIGEBOS, IDAEH and other GOG institutions as well as for the NGOs or other private institutions that will participate in the project. The administrative mechanisms shall be in accordance with relevant GOG laws such as the National Environmental Law, the Biosphere Reserve Law, the Protected Areas Law, the Forestry Law and their by-laws as well as with the grant Agreement and AID regulations.
- (5) Evidence that CONAP has designated a Project Director acceptable to AID.

### **B. Covenants**

The parties agree to establish an evaluation program as part of the project. Except as the parties otherwise agree in writing, the program will include, during the implementation of the project and at one or more points there after:

- (1) Evaluation of progress toward attainment of the objectives of the project and the targets of the project delivery plan.

- (2) Identification and evaluation of problem areas or possible constraints which may inhibit such attainment.
- (3) Assessment of alternative actions to help overcome such problems; and
- (4) Evaluation, to the degree feasible of the overall development impact of the project.

The National Council for Protected Areas (CONAP) agrees to submit a yearly implementation plan covering activities for the next calendar year. The plan is to be submitted for AID approval by November 30 of each year of the project life.

#### C. Negotiating Status

The GOG institutions involved in the Biosphere Reserve (CONAP, DIGEBOS, IDAEH) actively participated in the design of the Mayarema Project. A formal presentation of the project to the Ministry of Finance took place on June 14 with the participation of Dirección de Financiamiento Externo y Fideicomiso, Dirección Técnica del Presupuesto y SEGEPLAN. During the presentation the GOG counterpart requirements were discussed. CONAP will formally present to SEGEPLAN a project document in Spanish requesting them to issue their approval for the project. Final negotiations are scheduled for July, and it is expected that the project agreement will be signed in August.

**ANNEX A**



**STATUTORY CHECKLISTS**

SC(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A includes criteria applicable to all projects. Part B applies to projects funded from specific sources only: B(1) applies to all projects funded with Development Assistance; B(2) applies to projects funded with Development Assistance loans; and B(3) applies to projects funded from ESF.

A. GENERAL CRITERIA FOR PROJECT

1. FY 1988 Appropriations Act Sec. 523; FAA Sec. 634A.

If money is sought to obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified to Congress, has Congress been properly notified?

A Congressional Notification for the planned 1990 obligation was sent to Congress on June 5, 1990 and expired on June 21, 1990 as notified in STATE 200549.

2. FAA Sec. 611 (a)(1).

Prior to an obligation in excess of \$500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

a) Yes.  
b) Yes.

3. FAA Sec. 611 (a)(2). If legislative action is required within recipient country, what is the basis for a reasonable expecta-

Not applicable.

tion that such action will be completed in time to permit orderly accomplishment of the purpose of the assistance?

4. FAA Sec. 611(b); FY 1989 Appropriations Act Sec. 501. If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq)? (See A.I.D. Handbook 3 for guidelines.) Not applicable.
  
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and total U. S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively? Not applicable.
  
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. The project is specific for Guatemala. However, lessons learned through this project will be applicable in the Central American Region to improve the management of renewable natural resources and protection of biological diversity. The project also has strong linkages with ROCAP's Regional Natural Resources Management (RENARM) Project.

7. FAA Sec. 601(a). Information and conclusions on whether projects will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. Not applicable
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). Project will use US public and private sector institutions for project implementation.
9. FAA Secs. 612(b), 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars. The Government of Guatemala will provide a substantial counterpart contribution in salaries and per diem of project personnel. This counterpart contribution will be formalized in the Project Agreement.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? No.
11. FY 1989 Appropriations Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? Not applicable.
12. FY 1989 Appropriations Act Sec. 549. Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U. S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for export to the United States or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods Not applicable.

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(such as wallets or coin purses worn on the person), work gloves or leather wearing apparel?

13. FAA Sec. 119(a)(4)-(6) & (10). Will the assistance (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas?
- a) Yes, the project has an educational component which includes environmental awareness, specifically focused on preventing loss of biological diversity.
- b) Yes, the project will improve the management of renewable national resources and protection of biological diversity in the Maya Biosphere, specifically designated by Guatemalan Law as a protected area.
- c) Yes, the project will support studies for this purpose.
- d) No.
14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (either dollars or local currency generated therefrom)?
- Not applicable.
15. FY 1989 Appropriations Act. If assistance is to be made to a United States
- PVO's participating in the project will be selected on a competitive basis. Selection criteria will

PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government?

include requirement that at least 20 percent of their total annual funding for international activities be obtained from sources other than the US Government.

16. FY 1989 Appropriations Act Sec. 538. If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.?

Selection criteria for PVO's participating in the project will include these requirements.

17. FY 1989 Appropriations Act Sec. 514. If funds are being obligated under an appropriation account to which they were not appropriated, has prior approval of the Appropriations Committees of Congress been obtained?

Not applicable.

18. State Authorization Sec. 139 (as interpreted by conference report). Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision).

Not applicable.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance  
Project Criteria

- a. FY 1989 Appropriations Act Sec. 548 (as interpreted by conference report for original enactment). If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities (a) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U.S. exporters of a similar agricultural commodity; or (b) in support research that is intended primarily to benefit U.S. producers?

Not applicable.

b. FAA Secs. 102(b), 111, 113, 281(a). Describe extent to which activity will (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries.

a) The Project's Sustainable Resource Management Component will promote improvements in income levels for residents of the Biosphere Reserve area through environmentally compatible activities. These activities include natural forest management, extractive reserves, tourism and other small scale commercial activities, which will be managed by US PVO's in coordination with CONAP.

b) Organization of groups to promote activities described above will strengthen the democratic institutions in the project area.

c) The project will strengthen the capability of local institutions such as CONAP, CONAMA and DIGEBOS, enabling them to effectively manage Guatemala's natural resources in the future.

d) Women will be direct beneficiaries of the sustainable Resource Management Component. Women's participation will be closely monitored throughout the project.

e) Lessons learned from this project will be directly applicable to other Central American Countries. Exchange of information with other environmentally-oriented PVO's in Central American will be encouraged through this project in Coordination with ROCAP's RENARM project.

- c. FAA Secs. 103, 103A, 104, 105, 106, 120-21; FY 1989 Appropriations Act (Development Fund for Africa). Does the project fit the criteria for the source of funds (functional account) being used? Yes.
- d. FAA Sec. 107. Is emphasis placed on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses and small incomes of the poor)? The income generating activities which will be promoted through the Sustainable Resource Management Component will place emphasis on use of appropriate technology.
- e. FAA Secs. 110, 124(d). Will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)? Yes
- f. FAA Sec. 128(b). If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to The increased effectiveness of GOG institutions such as CONAP, DIGEBOS, CECON and IDAEH will have a multiplication effect over the country. Increased public sector ability to integrate the concerns of conservation and socioeconomic

stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority?

development will lend to long-term stability of production systems in the country. Residents of the Peten and of the Maya Biosphere will receive direct impacts from the project through job creation and local hiring practices.

g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

The project is specifically designed to address the long term needs of the country, protecting natural resources and assuring sustainable development. The project will make ample use of local expertise in the public and private sector and will strengthen the local capability to effectively manage the country's national resources.

h. FY 1989 Appropriations Act Sec. 536. Are any of the funds to be used for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions?

No.

Are any of the funds to be used to pay for the performance of involuntary sterilization as a method of family planning or to coerce or provide any financial incentive to any person to undergo sterilization?

No.

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Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning? No

i. FY 1989 Appropriation Act. Is the assistance being made available to any organization or program which has been determined to support or participate in the management of a program of coercive abortion or involuntary sterilization? No

If assistance is from the population functional account, are any of the funds to be made available to voluntary family planning projects which do not offer, either directly or through referral to or information about access to, a broad range of family planning methods and services? No

j. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? Yes

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k. FY 1989 Appropriations Act. What portion of the funds will be available only for activities of economically and socially disadvantage enterprises, historically black colleges and universities, colleges and universities having a student body in which more than 40 percent of the students are Hispanic Americans, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)?

To be determined. Gray Amendment Organizations will be given strong consideration in the procurement of services.

1. FAA Sec. 118 (c). Does the assistance comply with the environmental procedures set forth in A.I.D. regulation 16? Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent feasible: (a) stress the importance of conserving and sustainably managing forest resources; (b) support activities which offer employment and income

- a) yes
- b) yes
- c) yes
- d) yes
- e) yes
- f) yes
- g) yes
- h) yes
- i) yes

alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (c) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (d) help and destructive slash-and-burn agriculture by supporting stable and productive farming practices; (e) help conserve forests which have not yet been degraded' by helping to increase production on lands already cleared or degraded; (f) conserve forested watersheds and rehabilitate those which have been deforested; (g) support and training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (h) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (i) conserve biological diversity in forest areas by sup-

j) yes

k) yes

In general terms, the project includes all the specific activities described in this section.

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porting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation, and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas: (j) seek to increase the awareness of U.S. government agencies and other donors of the immediate and long-term value of tropical forests; and (k) / utilize the resources and abilities of all relevant U.S. government agencies?

- m. FAA Sec. 118 (c) (13). If the assistance will support a program or project significantly affecting tropical forests (including projects involving the planting of exotic plant species), will the program or project (a) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the

a) yes

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land, and (b)/take full account of the environmental impacts of the proposed activities on biological diversity?

b) yes

- n. FAA Sec. 118 (c) (14). Will assistance be used for (a) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in a environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; or (b) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas?

a) No.

b) No. Project will protect national parks and reserve areas.

- o. FAA Sec. 118 (c) (15). Will assistance be used for (a) activities which would result in the conversion of forest lands to the rearing of livestock; (b) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively

a) No.

b) No

undegraded forest lands; (c) the colonization of forest lands; or (d) the construction of dams or other water control structures which flood relatively undegraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development?

c) No.  
d) No.

p. FY 1989 Appropriations Act. If assistance will come from the Sub-Saharan Africa DA account, is it (a) to be used to help the poor majority in Sub-Saharan Africa through a process of long-term development and economic growth that is equitable, participatory, environmentally sustainable, and self-reliant; (b) being provided in accordance with the policies contained in section 102 of the FAA; (c) being provided, when consistent with the objectives such assistance, through African, United States and other PVOs that have

Not applicable.

demonstrated effectiveness in the promotion of local grassroots activities on behalf of long-term development in Sub-Saharan Africa; (d) being used to help overcome shorter-term constraints to long-term development, to promote reform of sectoral economic policies, to support the critical sector priorities of agricultural production and natural resources, health, voluntary family planning services, education, and income generating opportunities, to bring about appropriate sectoral restructuring of the Sub-Saharan African economies, to support reform in public administration and finances and to establish a favorable environment for individual enterprise and self-sustaining development, and to take into account, in assisted policy reforms, the need to protect vulnerable groups; (e) being used to increase agricultural production in ways that protect and restore the natural resource base, especially food production, to maintain and improve basic transportation and communication net-

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works, to maintain and restore the natural resource base in ways that increase agricultural production, to improve health conditions with special emphasis on meeting the health needs of mothers and children, including the establishment of self-sustaining primary health care systems that give priority to preventive care, to provide increased access to voluntary family planning services, to improve basic literacy and mathematics specially to those outside the formal education system and to improve primary education, and to develop income-generating opportunities for the unemployed and underemployed in urban and rural areas?

- q. FY 1989 Appropriations Act Sec. 515. If deob/reob authority is sought to be exercised in the provision of DA assistance, are the funds being obligated for the same general purpose, and for countries within the same general region as originally obligated, and have the Appropriations Committee of both Houses of Congress been properly notified?

Not applicable.

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Economic Support Fund Project  
Criteria

- a. FAA Sec. 531(a). Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA? Yes
- b. FAA Sec. 531(e). Will this assistance be used for military or paramilitary purposes? No
- c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? Not applicable.

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**ANNEX B**



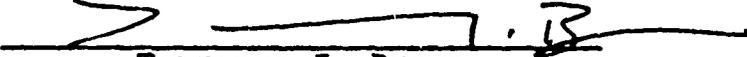
**FAA CERTIFICATION**

101-

CERTIFICATION PURSUANT TO SECTION 611 (e)  
OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Terrence J. Brown, the principal officer of the Agency for International Development in Guatemala, CERTIFY that to the best of my knowledge and belief Guatemala possesses both the financial capability and human resources to effectively maintain and utilize the infrastructure and equipment to be financed under the \$10,500,000 Maya Biosphere Project (520-0395) which will be implemented by the National Council for Protected Areas (CONAP).

This judgement is based primarily on the fact that CONAP and the GOG Forestry and Wildlife Directorate (DIGEBOS) possess the technical capacity, personnel and resources necessary to effectively maintain and utilize the infrastructure to be built. The proposed project will further improve this capability providing additional equipment, training and technical assistance.

  
Terrence J. Brown  
Director, USAID/Guatemala

08/27/90  
Date

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**ANNEX C**



**GOG LETTER OF INTEREST**



CONSEJO NACIONAL DE AREAS PROTEGIDAS

PRESIDENCIA DE LA REPUBLICA

GUATEMALA

REFERENCIA 265/90  
AL/zgdec

Accion	
USAD	FOCAP
ORO	
INFO	
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RECEIVED  
JUL 30 1990  
US AID/EL SALVADOR

Guatemala, julio 30 de 1990

Señor  
Anthony J. Cauterucci  
Director  
Agencia Internacional  
para el Desarrollo -AID-  
Guatemala, Guatemala

Estimado Señor Cauterucci:

Tengo el agrado de dirigirme a usted en relación al Proyecto de la Biósfera Maya, que tiene como principales objetivos el mejoramiento del manejo de los recursos naturales renovables y la protección de la diversidad biológica y los bosques tropicales en el área de la Biósfera Maya en el departamento del Petén.

Como es de su apreciable conocimiento, el Gobierno de la República de Guatemala, por medio del Decreto Legislativo No. 5-90 del 30 de enero de 1990, creó el Area de Reserva de la Biósfera Maya en el norte del departamento del Petén, con una extensión aproximada de 1.5 millones de hectáreas, con el objeto de proteger los ecosistemas, diversidad biológica y monumentos histórico-culturales en esa extensa zona.

Aunque la creación del Area de Reserva de la Biósfera Maya y su declaración como Area Protegida es un importante paso hacia la conservación del medio ambiente y los recursos naturales y culturales en esa área, se hace indispensable complementar dichas medidas legales con acciones que hagan efectivos los objetivos de la ley.

De esta forma, la Comisión Nacional del Medio Ambiente (CONAMA) y el Consejo Nacional de Areas Protegidas (CONAP) y otras instituciones del Gobierno de Guatemala, conjuntamente con personeros de la Misión AID en Guatemala y

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## CONSEJO NACIONAL DE AREAS PROTEGIDAS

PRESIDENCIA DE LA REPUBLICA

GUATEMALA

REFERENCIA 265/90

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misiones técnicas específicas, han trabajado en el diseño del Proyecto de la Biósfera Maya, que consideramos contribuirá eficazmente a la protección del medio ambiente y por ende al desarrollo sostenible de nuestro país.

El documento básico del Proyecto de la Biósfera Maya, así como el proyecto final de Convenio tuvo su revisión final y aprobación por el Consejo Nacional de Areas Protegidas en su sesión del día 18 de julio del presente año.

Por lo anterior, la Comisión Nacional del Medio Ambiente y el Consejo Nacional de Areas Protegidas, por este medio somete a la consideración formal de AID para el financiamiento del Proyecto de la Biósfera Maya para complementar las contribuciones que se espera recibir de Organizaciones no Gubernamentales y la contribución de contrapartida del Gobierno de Guatemala.

De acuerdo al diseño del Proyecto, este incluirá tres componentes básicos. El primero se enfocará en el esfuerzo inmediato de las instituciones del Gobierno de Guatemala encargadas de la biósfera para mejorar su efectividad y eficiencia en la administración de los recursos del área. El segundo componente proporcionará educación y concientización en aspectos ambientales y el tercero fomentará el manejo sostenible de los recursos naturales del área.

El costo total estimado del proyecto es de \$22,410,000.00, de los cuales \$10,500,000.00 serían fondos no reembolsables de AID, \$4,410,000.00 serían contribuciones de Organizaciones no Gubernamentales y \$7,500,000.00 serían fondos de contrapartida del Gobierno de Guatemala, que incluyen contribuciones en especie. Los fondos de contrapartida se espera obtenerlos en su mayoría provenientes del Fondo PL-480.

Creemos que este Proyecto logrará salvar para el futuro de Guatemala, recursos naturales y culturales que son esenciales para un desarrollo sostenible, especialmente por el énfasis que dará el proyecto al fortalecimiento de instituciones nacionales, a la concientización y educación ambiental y al manejo productivo de los recursos.

Agradeciendo de antemano la colaboración de AID para este importante esfuerzo, nos es grato suscribirnos atentamente,

Arq. Jorge Cabrera Hidalgo  
Presidente del Consejo Nacional  
de Areas Protegidas



Arq. Andreas Lehnhoff Tenme  
Secretario Ejecutivo del Consejo  
Nacional de Areas Protegidas

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**ANNEX D**



**LOGICAL FRAMEWORK MATRIX**

SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Goal</b></p> <p>To improve the long-term economic well-being of Guatemala's population through the national management of renewable natural resources.</p>	<p>1) Increased income from the responsible use of renewable resources.</p> <p>2) Reverse in decline of existing natural resources</p>	<p>1) Economic data from various sources</p> <p>2) Environmental studies and analysis</p>	<p>- Sustained political and social will to conserve natural resources.</p> <p>- Crucial institutions will be sustained or sustainable.</p>
<p><b>Purpose</b></p> <p>To generate sustainable economic activities for Guatemalans through the improved management of renewable natural resources and protection of biological diversity and tropical forests with special emphasis on the Maya Biosphere Reserve.</p>	<p>1) Institutional development, increased efficiency and impact of CONAMA, CONAP, and DIGEBOS</p> <p>2) Mechanisms, structures and policies in place to help assure sustainability of renewable resource based economic activities.</p> <p>3) Increased per capita income of Guatemalans engaged in renewable resource based economic activities in project area.</p> <p>4) 1 X increase in Guatemalans in target area involved in environmentally sustainable activities.</p> <p>5) 1 extension agents trained in the application and communication of sustainable, renewable natural resource based, income generating activities.</p> <p>6) 1 resource guards trained and equipped involved in creating a permanent protection and management presence in the MAYA Biosphere Reserve.</p> <p>7) Effective control of deforestation and maintenance of biological diversity.</p> <p>8) Reduce deforestation rate to 70% of current level.</p>	<p>1) Comparison of institutional analyses done at beginning, mid point and end of project.</p> <p>2) Mid-term Evaluation</p> <p>3) Mid-term evaluation and impact evaluation.</p> <p>4) Base line study and impact evaluation.</p> <p>5) Training reports and field evaluations of extensionists effectiveness.</p> <p>6) Training reports and field evaluation of extensionists' effectiveness.</p> <p>7) Baseline study of forest cover and biological diversity at EDP.</p> <p>8) Periodic and EDP determination by remote sensing and ground truthing.</p>	<p>- CONAMA, CONAP and DIGEBOS will become increasingly effective.</p> <p>- CONAMA, CONAP and DIGEBOS will receive sufficient ODS support.</p> <p>- Technology for renewable resource based economic activities is transferable and is accepted by the beneficiaries.</p> <p>- The renewable resource based economic activities do, in fact, generate sufficient income.</p> <p>- The extension agents will effectively train the target groups in renewable natural resource based income generating activities.</p>

SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<b>Project Outputs</b>			
<b>1. Training</b>	<b>1. Training</b>	<b>1. Training</b>	<b>1. Training</b>
a) Adequately trained people (see training plan) working on the project.	a) See training plan	a) Training documents, evaluations project reporting documents	a) Appropriate types of training available - Trained individuals will stay with organization - Trained personnel given opportunity to perform appropriate functions
<b>2. Materials</b>	<b>2. Materials</b>	<b>2. Materials</b>	<b>2. Materials</b>
Maintenance system in place and in operation.	N/A	Evaluation and field reports	Equipment and materials will be used in the project Effective maintenance system will be put in place and adopted
<b>3. Research and Studies</b>	<b>3. Research and Studies</b>	<b>3. Research and Studies</b>	<b>3. Research and Studies</b>
a) Baseline studies (see detailed research plan)	a) Studies performed	a) Studies information available	a) Study well designed and properly executed
b) Other studies	b) Studies performed	b) Studies information available	b) Studies well designed and properly executed
<b>4. Evaluation</b>	<b>4. Evaluation</b>	<b>4. Evaluation</b>	<b>4. Evaluation</b>
a) See evaluation plan	a) Evaluations carried out	a) Evaluation reports	a) Evaluation well designed and timely b) Recommendations appropriate and adequately responded to.
<b>5. Areas established</b>	<b>5. Areas established</b>	<b>5. Areas established</b>	<b>5. Areas established</b>
<b>Maya Biosphere</b>			
a) Multi institutional plan developed for protection and management of Maya Biosphere Reserve	a) N/A	a) Review of plan	a) - Plan contains local and interinstitutional input - Has enforcement power - implementable - Qualified people to carry it out - Financial and management mechanisms in place
b) Sufficient trained and equipped guards in place.	b) 100 guards	b) Field report and evaluations	b) Enough qualified individuals for guards Sufficient resources to keep them trained and equipped
c) Critical boundaries surveyed and	c) 300 kms of boundary lines on	c) Field survey	c) Qualified personnel and other

SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>d) Basic protection infrastructure and equipment in place and operating (field offices, guard stations, remote patrol stations)</p> <p>e) Yearly maintenance of trails</p>	<p>d) 3 district offices 9 guard stations 20 remote patrol stations</p> <p>e) 300 hrs</p>	<p>d) Field reports and evaluations</p> <p>e) Field checks</p>	<p>d) Availability of land - resources - trained personnel</p> <p>e) Availability of resources</p>
<b>6. Tourism</b>	<b>6. Tourism</b>	<b>6. Tourism</b>	<b>6. Tourism</b>
<p>a) Establish mechanisms to collect and use tourist fees.</p> <p>b) Development and updating of visitors database.</p> <p>c) Broad spectrum of interpretive materials developed (field guides, monographs for general public, serious students, etc.)</p> <p>d) Trained guides</p>	<p>a) At least a tripling of tourist fees</p> <p>b) Existence of systems</p> <p>c) N/A</p> <p>d) 1 guides licensed</p>	<p>a) Review of GOS records compared to baseline study</p> <p>b) Field visits, project reports</p> <p>c) Observation, evaluations, field visits</p> <p>d) Field visits</p>	<p>a) - Carrying capacity of Pelen has been established for the overall plan (SA) - Mechanism can be designed and is acceptable to the GOS - Money is effectively channeled and used</p> <p>b) A unit will be set up to run and maintain this system during and after the project</p> <p>c) Resources available</p> <p>d) - Sufficient qualified personnel - Adequate training available - Sufficient resources to attract and retain qualified personnel</p>
<b>7. Forest Management</b>	<b>7. Forest Management</b>	<b>7. Forest Management</b>	<b>7. Forest Management</b>
<p>a) Specific areas selected and placed under management for sustained yield.</p> <p>b) Trained forest management technicians</p> <p>c) Specialized operating entity formed and functioning (administration of the forest management component).</p> <p>d) Develop and utilize a multi-species marketing plan</p>	<p>a) 1 areas comprising 1 hectares</p> <p>b) 2 foresters per logging company plus 3 for BIGEDOS</p> <p>c) 1</p> <p>d) N/A</p>	<p>a) Field reports</p> <p>b) Field reports</p> <p>c) Evaluations, institutional analyses</p> <p>d) Evaluations</p>	<p>a) Land available Resources availability and adequately managed</p> <p>b) Sufficient trained technicians</p> <p>c) The project will strengthen institutions to the point where they can develop and sustain this organization</p> <p>d) - Acceptance of new species in the market - Price for new species must cover cost of extraction and</p>

SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
e) Effective system of stumpage fees established.	e) N/A	e) Audits and evaluations	e) - Fees reflect timber values - Step (f) below, is carried out successfully
f) Effective mechanism for tracking market prices and production and management costs	f) N/A	f) Evaluations	f) - Effective scaling system - Adequately trained personnel and resources available - Adequate information from procedure
g) Timber trees incorporated into farm management system	g) 2 farms	g) Evaluations	g) Farmers willing to plant timber trees
h) Demonstration farms established and operating	h) 100	h) Evaluation and field visits	h) - Farmers willing to house and sustain demonstration farms - Farms successful
i) Timber trees nurseries established and operating	i) 20	i) Evaluations and field visits	i) Technification and resources available to help establish farms
<b>8. Agroforestry</b>	<b>8. Agroforestry</b>	<b>8. Agroforestry</b>	<b>8. Agroforestry</b>
Same as 7 b, c, d, g, h, i above except refers to agro forestry species such as fruit trees, fodder trees and fuel wood and multi purpose trees.			
a) More stable long-term income and improved nutrition	a) Greater variety of activities and perspective income sources - more stable income trends by EDP	a) EDP evaluation Field report	a) - Market exists or can be developed - Agroforestry techniques are successfully adopted
b) Appropriate land use because of introduction of trees.	b) 2 HAs in agroforestry	b) Remote sensing, field visits evaluations	b) Trees correctly planted Soil protection structures in place
			c) Existing traditions and conditions enable women to work in the production and processing of Agroforestry products
<b>9. Extractive Reserves</b>	<b>9. Extractive Reserves</b>	<b>9. Extractive Reserves</b>	<b>9. Extractive Reserves</b>
Same as 7 a, c, f, h, i and 8 a, b.			
a) Extension system in place to enable harvesters and producers to be more efficient (chicle, piniento, sate)	a) Decrease in waste, less rejected at export point - 2 HAs and 2 areas under production	a) Field surveys, evaluations	a) Extensionists well trained and equipped - Their guidance is followed
b) Study and introduction of non-traditional products (wildlife,	b) 1 non-traditional product studied and developed	b) Field visits, evaluations	b) Study identifies non-traditional products that are marketable

LOGICAL FRAMEWORK - MAYA RESOURCE MANAGEMENT PROJECT, 520-0395

23-Mar-90

SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
10. Human Resources	10. Human Resources	10. Human Resources	10. Human Resources
a) More diversified sources of income for women as a result of this project's activity.	a) N/A	a) Evaluations	a) Existing traditions and conditions enable women to work on various project activities (production, harvest, processing, extension)
b) An environment education program established and operating (school oriented).	b) Didactic material produced and in use	b) Field observation	b) Availability of resources to produce materials
c) Public awareness program established and operating (radio, TV)	c) Didactic material produced and in use	c) Field observation	c) Resources to develop materials - Financing to place them on TV and radio - Desired impact achieved
d) Development of demonstration sites used for instruction purposes	d) Demonstration sites developed and in use	d) Field observation	d) - Sufficient resources to develop sites - Successful use of sites
e) Specific information programs oriented toward women (professional, technical and field level)	e) Courses developed and operating	e) Field observation	e) Women could participate successfully in such program
f) Increased number of trained professionals, technicians and field workers	f) 20 managers 50 technicians 200 field people	f) Interviews, observations	f) - Sufficient qualified personnel - Willingness to learn - Resources are available

LOGICAL FRAMEWORK - MAYA RESOURCE MANAGEMENT PROJECT, 520-0395

23-Mar-90

SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	A.I.D. Input		
I. PERSONNEL	3,120	1) AID records and audits.	- AID funding available
A. Technical Assistance	LT : 1,440 ST : 1,005 LT : 825 ST : 40		
II. TRAINING	1,185		
A. ST	485		
B. Seminars/Workshops	500		
III. EQUIPMENT	1,445		
IV. MATERIALS	871		
V. RESEARCH/STUDIES	1,866		
A. Areas Established			
B. Sus. Income			
VI. EVALS/AUDITS	563		
VII. INFL.	525		
VIII. CONTINGENCIES	925		
TOTAL	10,500		

**ANNEX E**



**NPD GUIDANCE CABLE  
AND GOG GUIDANCE**

ACTION AID/C

VZCZCGT0214  
FF RUEHGT  
DE RUEHC #2069/01 1511913  
ZNR UUUUU ZZH  
F 311905Z MAY 89  
FM SECSTATE WASPEC  
TO AMEMBASSY GUATEMALA PRIORITY #412  
BT  
UNCLAS SECTION 21 OF 02 STATE 172069

31-MAY-89

TOR: 19:42  
CN: 35447  
CHRG: AID  
FIST: AADM  
ADD:

AIDAC

A.O. 12356: N/A

TAGS:

SUBJECT: REVIEW OF USAID/GUATEMALA FY 90-91 ACTION PLAN

1. REVIEW OF USAID/GUATEMALA FY 1990-91 ACTION PLAN WAS HELD ON TUESDAY, MAY 16, 1989. THE MEETING WAS CHAIRED BY A-AA/LAC WILLIAM WHEELER. AID/W REPRESENTATIVES INCLUDED MEMBERS FROM FUNCTIONAL AND GEOGRAPHIC OFFICES. ALSO IN ATTENDANCE WERE REPRESENTATIVES FROM STATE AND OMB. THE MISSION WAS REPRESENTED BY DIRECTOR ANTHONY CAUTERUCCI, PROGRAM OFFICER RICHARD BURKE, ECONOMIST SAM SKOGSTAAD AND AGRICULTURAL DEVELOPMENT OFFICER GORDON STRAUB.

-- THE MISSION IS COMMENDED FOR PREPARING A CLEAR AND COMPREHENSIVE ACTION PLAN, CONSISTENT WITH THE RECENTLY APPROVED CDSS.

-- IT WAS AGREED THAT THE MISSION WOULD BE GUIDED BY THE FOLLOWING PLANNING LEVELS FOR FY 90 AND 91:

	FY 90	FY 91
IA TOTAL	35,275 (1)	35,000 (1)
ESF	87,000	80,000 (1)
PL-420 I	18,000	18,000
FI-420 II	8,800	6,800
GRANI TOTAL	149,075	141,800

(1) THE DA FUNCTIONAL ACCOUNT DISTRIBUTION FOR FY 90 IS AS INCLUDED IN THE FY 90 CP. BASED ON RECENT AGENCY GUIDANCE THE FY 91 LEVEL INCLUDES DOLS 30 MILLION DA AND DOLLARS 62,000,000 ESF CORE LEVEL WITH A POTENTIAL DOLS 5 MILLION DA AND THE BALANCE OF DOLS 12,300,000 ESF HELD AS PART OF AN AGENCY-WIDE RESERVE TO BE ALLOCATED BASED ON PERFORMANCE. THE FY 91 PLANNING LEVELS DO NOT YET HAVE OMF AND INTERAGENCY CONCURRENCE.

2. IN HIS OPENING STATEMENT DIRECTOR CAUTERUCCI CITED THE IMPORTANT PROGRAMMATIC ACCOMPLISHMENTS OF THE PAST YEAR AS REFLECTED THROUGHOUT THE ACTION PLAN. HE NOTED THAT THE OVERALL GCG PERFORMANCE AT THE MACROECONOMIC LEVEL UNDER PRESIDENT CEREZO'S LEADERSHIP DURING THE LAST

PRM  
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OEPA-HRD  
ORD-OPED  
PDSO CONT  
6/3/89

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FINANCING WILL BE BASED ON ITS EXPERIENCE WITH THIS PROJECT AND INCORPORATED INTO THE DESIGN OF THE FY 91 RURAL LAND FINANCING PROJECT OR OTHER PROJECT AMENDMENT ACTIVITIES WHICH THE MISSION MAY PROPOSE.

520-0296 - COOPERATIVE STRENGTHENING (AMENDED LOP-DOLS 16 MILLION): IAC/W APPROVES DEVELOPMENT OF THE PROJECT AMENDMENT DURING FY 90, AND THE MISSION IS DELEGATED AUTHORITY TO APPROVE THE PP AMENDMENT IN THE FIELD. MISSION REPRESENTATIVES NOTED THAT DELAYS IN PROJECT IMPLEMENTATION TO DATE HAVE BEEN SUBSTANTIALLY OVERCOME WITH ACCEPTANCE OF STRICT CREDIT AND CAPITALIZATION POLICIES BY THE TWO LARGEST COOPERATIVE FEDERATIONS. THE AMENDMENT WILL INCLUDE A LAND PURCHASE COMPONENT TO THE CREDIT PROGRAM, COMPLEMENTING ONGOING LAND FINANCING BY COOPERATIVES WITH THEIR OWN LIMITED RESOURCES. THE AMENDMENT WILL ALSO INCORPORATE SUCCESSFUL EXPORT MARKETING COOPERATIVES FROM THE AGRIBUSINESS DEVELOPMENT PROJECT (520-0276). DURING THE DEVELOPMENT OF THE PP AMENDMENT, THE MISSION SHOULD PAY PARTICULAR ATTENTION

TO ASSURING THAT ADDITION OF THESE COOPERATIVES DOES NOT OVERWHELM THE PROJECT MANAGEMENT STRUCTURE OR OVERSTRETCH TECHNICAL ASSISTANCE RESOURCES.

520-0395 ECONOMIC STABILIZATION (LOF-DOLS 77.4 MILLION): THE CONCEPT PAPER AND PAAD FOR THE FY 1992 ESP PROGRAM WILL BE REVIEWED AND APPROVED IN AID/W.

520-0395 - NATURAL RESOURCES MANAGEMENT (LOP-DOLS 10.5 MILLION): IAC/W APPROVES DEVELOPMENT OF THE PROJECT DURING FY 90, AND THE MISSION IS DELEGATED AUTHORITY TO APPROVE THE PID AND PP IN THE FIELD. THE MISSION SHOULD USE THE DEVELOPMENT OF THE GUATEMALA COUNTRY ANNEX TO THE ROCAF NATURAL RESOURCE MANAGEMENT PROJECT TO SORT OUT THE ISSUES RAISED IN THE NFD REVIEW, INCLUDING: 1) A DETAILED DESCRIPTION OF EXPECTED PROJECT OUTPUTS, PRIORITIZATION OF PROJECT ACTIVITIES AND THE APPROPRIATE TIMING OF THEIR IMPLEMENTATION; 2) THE INSTITUTIONAL

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CAPABILITIES OF THE PROJECT'S PROPOSED IMPLEMENTING AGENCIES (CCNAPA AND CECON); 3) THE DEGREE TO WHICH DONOR COORDINATION WILL BE REQUIRED TO AVOID REDUNDANCY AND TO LESSEN THE MANAGEMENT BURDEN ON THE PROPOSED IMPLEMENTING AGENCIES, AND THE MISSION'S PLANS FOR EFFECTING THIS COORDINATION; AND, 4) HOW AND TO WHAT EXTENT THE DESIGN WILL TAKE INTO ACCOUNT THE ECONOMIC NEEDS OF THE POPULACE ON THE PERIPHERY OF THE PROTECTED AREAS THAT WILL BE ESTABLISHED UNDER THIS PROJECT. AID/W WILL PARTICIPATE IN THE RESOLUTION OF THESE ISSUES THROUGH ITS REVIEW OF THE ROCAP PROJECT.

520-0393 - GUATEMALA PEACE SCHOLARSHIPS (LOP-DOLS 37 MILLION): THE CIASP II PID WAS APPROVED BY THE A-AA/LAC AND A SUMMARY OF THE DAEC PID GUIDANCE WAS SENT TO THE FIELD ON APRIL 13. A DRAFT OF THE PP MODEL WILL BE SENT TO THE FIELD ON JUNE 15 WITH FIELD COMMENTS DUE ON JULY 1. THE FINAL DRAFT OF THE PP MODEL WILL BE REVIEWED BY THE DAEC IN AID/W IN EARLY AUGUST. THE MISSION WILL BE GIVEN APPROVAL TO PROCEED TO DEVELOP A PROJECT WHICH CONFORMS TO THE DAEC-APPROVED PP MODEL AND WILL BE DELEGATED AUTHORITY TO APPROVE THE MISSION PP IN THE FIELD AT THAT TIME.

520-0398 - DEMOCRATIC INSTITUTIONS (LOP-DOLS 3.6 MILLION): LAC/W APPROVES DEVELOPMENT OF THE PROJECT DURING FY 90, AND THE MISSION IS DELEGATED AUTHORITY TO APPROVE THE PID AND PP IN THE FIELD.

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AS A POINT OF CLARIFICATION, ACTION PLAN NPD GUIDANCE (STATE 356829) STATES THAT THE DECISION AT THE ACTION PLAN REVIEW FOR FY 1991 PROJECTS IS WHETHER TO INCLUDE A PROPOSED PROJECT IN THE FY 1991 AIS AND SUBSEQUENT CP.

520-0389 - RURAL LAND FINANCING (LOP-DOLS 10 MILLION): LAC/W APPROVES INCLUSION OF THIS PROJECT IN THE FY 91 AIS; HOWEVER, FOR THE PURPOSES OF THE CONGRESSIONAL PRESENTATION (CP), THE FUNDING SHOULD BE SHOWN JOINTLY AS INCREMENTS TO THE COOPERATIVE STRENGTHENING AND COMMERCIAL LAND MARKETS II PROJECTS RATHER THAN AS A NEW PROJECT UNTIL THE MISSION DEFINES ITS STRATEGY FOR EXPANDING ITS LAND MARKET PROGRAM. IT WAS DECIDED THAT THE PID OR PP AMENDMENT OF AN EXISTING PROJECT WOULD BE BROUGHT TO AID/W FOR APPROVAL IN ORDER TO REVIEW THE MISSION'S STRATEGIC FRAMEWORK FOR DEVELOPING COMMERCIAL LAND MARKETS. ISSUES TO BE CONSIDERED IN PROJECT DEVELOPMENT INCLUDE: 1) WHETHER DOLS SHOULD BE CONTINUED TO BE USED TO PURCHASE LAND; 2) THE LACK OF A NATIONAL LAND MARKET POLICY FROM THE GCG AND A POLICY FRAMEWORK ON THE PART OF THE MISSION; 3) THE SUSTAINABILITY OF THE SOCIAL AND ECONOMIC INFRASTRUCTURAL COSTS INCURRED IN THE LAND MARKET PROGRAM; 4) LESSONS LEARNED FROM THE COMMERCIAL LAND MARKETS II AND COOPERATIVE STRENGTHENING PROJECTS; AND 5) WHETHER THE DOMESTIC FINANCIAL SECTOR WILL PARTICIPATE IN FINANCING COMMERCIAL LAND PURCHASES

**ANNEX F**



**TECHNICAL ANALYSES**

## **F.1 TECHNICAL ANALYSIS FOR PROTECTION AND MANAGEMENT**

### **1. Conclusions**

It is technically feasible to establish and maintain a protection and management program for the biological and cultural resources of the Maya Biosphere Reserve. The decreed functions of biodiversity maintenance and protection of cultural resources are in jeopardy due to current destructive resource uses in and around the Reserve. Achievement of the program objectives depends upon CONAP gaining the power, responsibility and authority to exercise effective custodianship and control over the Reserve. Strengthening of the capacity of CONAP and associated institutions is needed to carry out essential component activities in planning, protection and supporting research.

Activities under the program must be implemented in policy and planning, resource protection and management, and the development of compatible uses of natural resources that are economically and ecologically sustainable. CONAP and associated agencies in turn, must learn to effectively work with communities and unassimilated migrants in an evolving process of planning the protection and management of the area.

Successful implementation of the program will assure that the resource base of the Petén remains intact. These functioning natural systems are the critical raw materials for a successful economy based on tourism and forest products. The sustained benefit stream will contribute significantly to the well-being of the peteneros and the economy of Guatemala.

### **2. Proposed Technologies**

#### **a) Description**

Protection of the Maya Biosphere Reserve has been legally mandated by the government of Guatemala. This 1.4 million hectare reserve contains the largest tract of continuous tropical forest remaining in the country with a rich variety of landscapes ranging from the mountains of the Sierra de Lacandón to the west, through wetlands of the Laguna del Tigre to the rolling hills of Tikal and Uaxactún. The area contains a diverse array of flora and fauna, including various animal species that have become scarce or endangered elsewhere. Of world-wide interest are the Mayan archeological sites scattered through the Reserve, of which only Tikal has been fully developed for tourism.

The initial focus of the protection and management component is to quickly establish effective protection of the Reserve against encroaching inappropriate land use practices. The spread of shifting agriculture and pasture has resulted in the proliferation of poverty and resource destruction rather than sustainable development. Development of a comprehensive management plan will provide a vehicle for a participatory process involving interested parties at the local, national and international levels.

There have been relatively little baseline research on the Petén. Biological inventories will be

taken in the several ecological and geomorphological units of the Reserve. The patterns of existing land tenure and resource use will be assessed. These inventories will serve as the basis for delineating the several use categories for the Reserve as well as providing baseline data against which to monitor the results of the management program. The four major land use types anticipated are:

- Core zones (National Parks and Biotopos)
- Cultural areas
- Multiple use areas
- Recuperation areas

Achievement of protection of the biological and cultural resources of the Maya Biosphere Reserve will depend to a large measure on the success of the project in promoting sustainable and economically viable uses of the biological and cultural resources.

#### b) Functionality

The critical first step in establishing the integrity of the Reserve is clearly establishing boundaries and a physical presence. Boundaries of the Reserve will be surveyed, marked and facilities for guarding constructed. Deployment of guard patrols will be coordinated by CONAP and involve other institutions including CECON Biotope guards, IDEAH personnel and the military (international frontier protection). Coupled with demarcation of the Reserve will be the training and equipping of guards, establishment of district offices, and the launching of a long term process of community education. This program in community outreach and environmental education will promote acceptance of the management strategies for the Reserve.

The management plan will ultimately be a product, but more important will be the process of participation in planning by the affected population, institutions and disciplinary experts. Local participation and input is critical to assure that the project is not perceived as a government imposition contrary to their interests.

CONAP will require major institutional strengthening, both in the Petén as an effective resource management agency and at the central office level as a national protected areas policy making and supervisory institution. It is anticipated that Reserve management will require a protection and management staff of 55 including 30 guards and 9 resource technicians.

#### c) Suitability and cost effectiveness

The achievement of the economic goals of the project are predicated upon effective protection and management of the Biosphere Reserve. The tremendous growth in tourism attracted to the Tikal National Park provides ample proof of the income generating potential of complementary biological and cultural resources. The alternative use of the area for subsistence agriculture and poor pasture does not approach the income generating potential of a well managed Biosphere Reserve.

#### d) Risks

The integrity of the Biosphere Reserve is under immediate threat from the growing population of landless migrants entering the Petén every day. If CONAP and the supporting institutions are not strengthened and supported by the government the Reserve be progressively degraded by

inappropriate and destructive uses of the areas resources. the most immediate threat to program success would be the lack of rapid and decisive action in Reserve protection and promotion of economically attractive and sustainable resource management.

## D. Technical Analysis for Extractive Reserves

### 1. Conclusions

It is technically feasible to establish and sustain the extraction of non-timber natural resources from designated areas of the Biosphere Reserve. The law establishing the Reserve prohibits all extractive activities in core zones, but not elsewhere. The management plan will establish the areas suitable for extractive activities. The dominant products currently being harvested for the export market are xate palm leaves used by florists, chicle for chewing gum and allspice used as a condiment.

This activity will be expected to provide increased income largely to those who are currently practicing extractive activities in the Reserve, it is not expected to absorb a significant number of migrants. Sustainability is dependent first on the capacity of CONAP to maintain the territorial integrity of the extractive reserves in the face of pressures from loggers and farmers, and second, on agency capacity to effectively regulate and improve the extraction industry. Given effective protection of the forest resource itself, success of an extraction industry depends on acceptance of regulations to assure sustained yield by all those involved, increased efficiency in resource use, broadening the base of potential products, greater value added locally and greater participation of the local population in the profits from the industry.

It has been concluded that predominant emphasis will be placed on the extraction of products from wildlands, rather than attempting to produce xate palm and other products in plantations associated with agroforestry operations. Cultivation would obviate the justification for maintaining large areas in minimally disturbed extractive reserves. In addition, plantations would be relatively more vulnerable to pest and disease outbreaks.

### 2. Proposed Technologies

#### a) Description

Harvesting of the leaves of the xate palm involves an estimated 6000 people in the field, with an additional 300 to 500 people in the Petén and elsewhere working as sorters, contractors and exporters. Export value is estimated at US\$3.7 million. Given that there is no management of the extraction of this resource, harvesting pressure has reduced the density of palms by more than half in some areas. Contractors hold many of the leaf gatherers in virtual debt peonage, hold the gatherer's share of the wealth generated to a near subsistence minimum. During part of the year some xate gatherers also harvest chicle gum. The official US\$2 million income estimate is probably considerably below the actual figure due to notorious under-reporting. Gum extraction is sustainable unless gatherers deeply cut trees to stimulate higher flow and kill the trees. Allspice gathering is the other major extraction activity, generating from US\$1 to \$2 million in export income. This activity involves cutting seed-bearing branches, stripping the seeds and drying them. In the US, companies repackage the seeds and sell them for nearly 16 times what the Guatemalan exporter receives for the bulk product. Other products include a rattan-like vine, ornamental and medicinal plants and animals.

CONAP anticipates achieving increased sustained production from the extractive reserves through a supervised control system in which the location and amount of a given product extracted will be

governed by either a concession or quota system. What system is employed will be determined by supporting research activities. Complementing the regulatory process with its spot checks, incentives and penalties will be a mobile training program designed to reach harvesters near where they work. For Xate palm harvesters emphasis will be placed on selective leaf removal, both to reduce the existing 50% waste and to assure that enough of the growing meristem is left to permit growth and fruiting. Chicleros will be trained in how to score trees without killing them and allspice gatherers enjoined not to cut trees down to harvest fruit. Penalties for non-compliance with sustainable harvesting practices will be explained. Experienced harvesters will be used as instructors. Graduates of the training program will be licenced and only licenced harvesters will be allowed to work in the extractive reserves.

#### b) Functionality

Implementation will be guided by an applied research program that will begin as soon as the project is implemented. A high priority will be the determination of the most effective mechanism for achieving control over where and how much of different products are harvested. Long term concessions offer an incentive to the concessionaire to manage an specific area for sustained yield. Quotas are relatively easy to enforce through spot checks, but provide a strong incentive to clandestine activities. The existing vertically integrated extractive industry is characterized by debt peonage, near monopoly control by a few operators and highly skewed income distribution. However, the system works. Socioeconomic research will examine and recommend actions both in response to the concession/quota question and with regard to achieving greater equity in income distribution through structural reorganization of the industry.

Applied biological research will play a key role in support of achieving higher sustained yields. Studies of the effects of different harvesting strategies will allow the design of optimum yield promoting practices. Inventories will determine if harvestable quantities of other useful products exist. Knowledge of distribution useful plants will allow the location of concessions with known productive potential. Realistic fees/taxes can thus be established for concessions.

#### c) Suitability and cost effectiveness

Extractive reserves are seen as being complementary with complete protection of core zones as a means of maintaining biological diversity and as a buffer between the core zones and more intensive activities such as lumbering and agroforestry. Sustained yield use of a relatively small number of species with minimal biomass removal, extractive reserves are compatible with the biodiversity conservation goals of MAYAREMA. Such a use serves as an effective buffer around areas designated for complete protection.

Export of three products, Xate palm, chicle and allspice, already generates some \$7 million in foreign exchange earnings. This is a good indicator of profitability. More effective management is expected to both enhance productivity and sustainability. Greater equity in income distribution, increased value added in Guatemala and broadening of the number of products should provide further justification for extractive reserves in the overall context of the Biosphere Reserve management program.

#### d) Risks

If migration to the Petén continues to increase, there is a major risk of over-exploitation of the

extractive reserves, or even outright loss due to expanding agricultural land use. Greater organization of extractive activities has the potential for increasing the amount of illegal hunting and removal of Pre-Colombian artifacts.

## **F.2 TECHNICAL ANALYSIS FOR NATURAL FOREST MANAGEMENT**

### **I. INTRODUCTION**

The Department of the Petén extends over 35,858 square kilometers, corresponding approximately to one third of Guatemala's territory. The area of the MAYA Biosphere Reserve located north of the 17° 10' parallel, including the Lacandón mountains, covers about 45% of the Petén's total extension.

Today's Petén is best described as a rapidly expanding frontier. The growing land scarcity and the burgeoning population in the Guatemalan highlands has led the central government to "open" the tropical lowlands to colonization in order to increase food production, to exploit timber and to ease social and political tensions. Nevertheless, most settlement occurs with no governmental planning whatsoever, and frontier development has been given no priority. Colonization consists essentially of squatters following access, feeder and skid roads or waterways seeking "fertile" forest land to plant their subsistence crops including maize and black beans. The excess production of these crops joins national markets. The use of the rainforest for one-time timber harvests followed by slash and burn farming ("milpas") involves deforestation that leads to the fragmentation and ultimately destruction of the forest. This situation leads to the loss of sustainable income opportunities and rapidly alters ecological features such as soils, nutrient cycles, water balance, meso climate and, above all, species diversity of vegetation and wildlife.

The Petén with its deteriorating natural resource base is in a critical stage and the MAYAREMA project will directly support governmental and non-governmental policies, programs and initiatives designed to promote the sustainable management of its natural resources. The principal objective of the MAYAREMA Project is to generate economic activities through sustainable management of renewable natural resources as well as to protect, on-site, protection of tropical forests and biological diversity of the Maya Biosphere Reserve. The primary objective of the Natural Forest Management Component is to conserve, manage and utilize the tropical forest for sustainable volumetric production. This should be achieved by the implementation of low-input natural management systems based on sustained yield and natural regeneration, hence minimizing the loss of biodiversity.

The problems facing natural forest management (NFM) in the Petén are many: uncertainty about the biological feasibility of NFM and insufficient base line data availability, lack of trained manpower, biased market demand for timber, institutional weakness and destructive human impact on the forest. Without doubt, the problems related with the destructive activity of man and the lack of control over the forests expected to be managed are more crucial and more difficult to tackle than the problems related to forest biology, silvicultural practices and technical knowledge. The particular challenge of the NFM component of the MAYAREMA project lies in the shift from extensive, open-access to intensive, controlled forest utilization, i.e. sustainable strategies. This change in attitude about forest use practices can only be realized if the integration of the local population is assured and economic attractiveness of forest management demonstrated.

In the meantime, the high immigration rate into the Petén and the Maya Biosphere Reserve is likely to continue exerting pressure on the forest, making NFM difficult. The effective implementation of the new de facto Forestry and Protected Areas Law will leave much to be

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desired. Conflicting interests between "milperos", loggers, extractive folk, livestock raisers and conservationists will remain. Complicated institutional competition and internal rivalries will slow down progress and institutional tugs mostly fostered by large timber and cattle interests will be a constant problem. The Petén will undoubtedly stay in a stage of crisis. Its social, economical, environmental, institutional and political issues will diversify and multiply over time and bring about a bewildering array of arrangements and connections increasing its complexity exponentially. The Petén must be seen as a multifaceted, dynamic system, and its socioeconomic and environmental development must be addressed in a strategic, interdisciplinary and coordinated manner.

A narrowly designed technical NFM project component that would not take into account the sociocultural environment and the system as a whole may lead to the rejection of this new sustainable forest use by the "Peteneros". Acceptance of NFM from the beginning is crucial for the long-term success of the MAYAREMA Project as this could provoke the desired multiplying effect.

## II. OVERALL STRATEGY

The global strategic approach to NFM advocated in the introduction chapter contrasts to the low absorption potential of the MAYAREMA Project, i.e. limited financial means, nonexistent base line expertise, non-existent trained counterparts, restricted institutional support. Consequently, during the six years of the initial Pilot Phase, it is proposed to tackle the problems related to NFM at a very reduced administrative and spatial scale. Initially, the NFM component should be maintained simple and should not be implemented upon rigid, external and artificial structures (Project disconnected from reality). Therefore, the goal of the NFM-component during the pilot phase should not be set towards the mere technical establishment of large tract of managed forests. In contrast, emphasis should be given to the strengthening of structures that have the potential to develop and make this new sustainable forest-use operational, accepted and long-lasting.

Activities in NFM take much time to yield results. Thus, failure would be socially, economically and environmentally costly for the Petén and counterproductive for USAID. Risks of initial failures should be minimized in particular to assure acceptance and long-term establishment of NFM as a land use which ultimately reconciles production and conservation. A clear understanding of the biological constraints and the technical feasibility of NFM as well as good project integration with the existing socioeconomic structure are critical for success. Initiating the work at an adequate spatial level that is in accordance with the real capacity of the MAYAREMA Project and the counterpart entities is crucial.

NFM in the Petén should become operational as quickly as possible. Therefore, a pragmatic hands-on participatory approach is proposed. Nevertheless, transferring known tropical silvicultural systems as unchanged packages would be misleading, time consuming and costly. Consequently, applied ecological and silvicultural research cannot be bypassed and must constitute an intrinsic part of the NFM component. It is proposed that the silvicultural research begin by observing the results of individual silvicultural operations with an inductive, trial and error type procedure. Complex hypothetical-deductive silvicultural studies with well-repeated permanent sample plots should not be conducted by the NFM component. University involvement to address these more theoretical questions should be promoted.

The direct involvement of the local community in NFM was unfortunately found to be unsuitable within the Maya Reserve. In the vicinity of forests adequate for NFM, most settlements

are composed of newly immigrated dispersed "milperos" with no experience in intensive land and labor systems and no suitable community or local organization. Conducting NFM with these unsettled slash and burn farmers, who essentially have no linkages to the timber transformation industry, would require an incredible amount of organizational, financial and technical assistance which the project could not provide. Moreover, involving "milperos" in NFM imposing on them the rapid abandonment of their traditional open-access agriculture would increase the Project's risks of failure beyond a desirable threshold. Furthermore, working in the vicinity of an expanding agricultural matrix would bring about many problems related to the "illegal" clearings on silvicultural sites which the NFM project could not afford during the initial phase. It is planned, however, that other components of the MAYAREMA Project will support slash and burn "communities", giving emphasis to the buffer zone outside of the Reserve.

As a point of departure, the project should be instrumental in the establishment of a NFM demonstration unit. This could be a forest tract of 5000 - 10,000 ha, perhaps equivalent to a small forest district. Over the first years of the project, the utilization and development of this unit as a joint effort of the General Directorate of Forests and Wildlife (spanish acronym DIGEBOS) and the timber industry should be promoted. Emphasis should be given to the training of foresters and the preparation of both the DIGEBOS functionaries and the timber industry for the conceptual changes NFM requires. A starting point would be the formulation of management plans for this unit. To gain rapid practical experience in NFM, it is important to conduct tree harvesting and silvicultural work early in the project.

It is advisable to recruit people from the community to carry out the silvicultural work to be conducted in the NFM unit. It is suggested to focus on people who have worked in the forest such as "madereros", "chicleros" and "xateros". These groups would be well prepared to conduct inventories and silvicultural operations. Additional training would be provided by the project. Women should be integrated in this process as they may qualify better for certain types of work (nursery, data handling, training, extension) and may be more readily available. The community should benefit from new job opportunities and from training.

Implementing NFM under the aforementioned approach is confined to the Multiple Use Area of the Reserve where sufficient intact forest resources suitable for NFM are available. This is where the NFM component should concentrate its actions, i.e. where the initial NFM unit should be located.

NFM can be carried out successfully only under the condition that concessions for sustainable forest utilization within defined spatial units are allocated and guaranteed for long periods of time ( $\geq 50$  years). DIGEBOS will have to find legal solution to facilitate long-term permits for NFM. This basic principal should be understood by all actor groups and should constitute a CP for the MAYAREMA Project.

In the buffer zone, where human impact is generally high, NFM is, in general, not feasible and only tree planting activities should be taken in consideration and carried out by the Agroforestry component of the MAYAREMA Project. Nevertheless, in the buffer zone three types of natural forests with potential for management exist: the forest fragments of the lowland yet not colonized, the impacted forests of the residual limestone hills with potential for management under the coppice system for fire wood and posts, and the newly created second-

growth forests that follow the temporary or permanent abandonment of forest sites cleared for agriculture. All three types of forests should receive attention as their management could make the "milpas" more productive (goal of the Agroforestry component). This would contribute to make the buffer zone a more sedentary living place and reduce pressure on the Reserve. The management of these forests could obviously not be directly supported by the NFM component of the MAYAREMA Project during the pilot phase. Nevertheless, analyzing and fomenting ideas related to NFM in the Petén should be part of the profile of the NFM component.

### III. TECHNICAL ANALYSIS

In this context, Natural Forest Management should be understood as a land-use that ought to reconcile production with conservation objectives. It is the process by which forest trees are tended, removed, and replaced by new crops, resulting in the production of wood and simultaneously conserving the resource base. NFM should be implemented as a volumetric sustainable extractive activity that imposes a moderate impact on the forest matrix, i.e. the forest and its biodiversity at landscape level should optimally be conserved. NFM should minimize changes in forest composition and structure. In the Petén, NFM systems should aim at natural regeneration to the utmost extent. However, in the case of extremely valuable cabinet timber such as mahogany and Spanish cedar artificial regeneration in the form of enrichment planting in the lower slopes and fertile bottomlands could be considered. In general, heavy, wide, and powerful machinery does cause soil compaction and extraction damage to seedlings, saplings and advanced growth (surface roots, buttresses, boles) and is not adequate for NFM.

In this context, successful NFM is achieved when a stand of merchantable trees has been brought to maturity and is naturally regenerating on a site where it has matured before. Furthermore, soil should show no sign of deterioration.

In the Petén there is currently no experience in NFM for sustained yield. Timber companies have traditionally extracted the best mahogany and cedar with little concern about extraction damage to the residual stand, sustainability and regeneration. Furthermore, the traditional exploitative system constitutes a negative selection of trees causing a genetic degradation of the forest. The General Directorate of Forests and Wildlife (DIGEBOS) is responsible for issuing timber concessions. However, DIGEBOS delimits the area of these concessions and establishes the quotas of extractable trees behind the desk at central headquarters. The numbers are determined based on "educated" guesses, intuition and convenience. The amount of extracted timber does not reflect any approximation of any type of volumetric sustainability per area since DIGEBOS does not conduct any growth and recruitment studies. Furthermore, DIGEBOS' field office in Flores is poorly equipped and staffed. The presence of DIGEBOS' technical personnel in the forests where extraction occurs is practically nil and no monitoring of the logging operation takes place. There is no constructive professional dialogue related to management plans and sustained yield management between DIGEBOS and the extractive industry. This situation will have to change if sustainable management is to be achieved in the Petén.

NFM for the Petén has essentially to be developed and implemented by "Peteneros" with the support of the MAYAREMA Project as well as other entities hopefully interested in NFM (national institutions involved in natural resource management, national and international

universities, NGO's, international research centers such as CATIE and RODALE). As no local expertise in NFM exists, importing known silvicultural systems developed elsewhere as unchanged packages is tempting but definitively not advised. For instance, the "strip shelterwood method" (SSM) developed in the Palcazú Valley, as briefly discussed in the PID, represents only one possible forest management option for the Petén. The "selection cut method" (SCM) is a more traditional approach and constitutes perhaps a more adequate management option. The reason being that the SCM has some historical antecedent in the project area (selective logging of Mahogany and "Cedro") and leaves residual stands that deviate minimally from the initial composition and structure, as forest management within a biosphere reserve would require. In the slopes of the residual limestone hills, if management is an option at all, the coppice system or perhaps coppice with standards (with "Cedro" as selected trees as this species has been observed to grow on hill sides contrary to "Caoba") may constitute further acceptable silvicultural systems for the Petén.

In the Petén, secondary species are not yet readily harvested as low market demand and post-logging wood damage present real problems for commercialization. However, both aforementioned problems, typical for the tropics, are not as crucial as forest literature states. Silvicultural treatments to form the next crop represent undoubtedly a long-term investments and the expected raise in timber prices over the next decades should be taken in account in the financial analysis. Therefore, it would make sense to include among the selected trees of the future crop all potential trees of the not currently merchantable species. their market will be guaranteed with certainty at rotation. For Central America, I believe that in the immediate future timber classified as desirable and merchantable will encompass a plethora of species. Meanwhile, the NFM component of the MAYAREMA Project should actively support the promotion of all possible secondary species. The problems related to pathogen infections on secondary species could be solved technically (implementation of storage facilities and in situ wood treatment) as future market demand will raise prices and cover these costs. The aforementioned "strip shelterwood method" aims at a multiple species utilization and presents many advantages in this regard.

There are many biological, technical, socioeconomical and political problems facing NFM of the little-known tropical forests of the Petén. During the Pilot Phase, the NFM component of the MAYAREMA Project will have to identify these problems in detail and seek solutions. This task should not be a theoretical exercise and will be achieved as the demonstration forest is put into practice. At this point practical problems will emerge and the project will have to support and canalize the national initiatives for solutions. DIGEBOS is the logical institutional counterpart to be actively involved in this effort. The extractive industry, mostly composed by seven local timber companies, have formed an association which could serve as the point of departure to induce NFM in the field. In fact, NFM in the Petén will not be successful unless the DIGEBOS and the timber industry work together, understand each others' point of view and genuinely agree to conserve the tropical forest through sustainable state-of-the-art management.

The new forestry law is a path in this direction but will not make any difference in the Petén unless DIGEBOS massively increases its level of technical competence and its physical presence in the forest. At the same time, the logging industry will have to understand and accept the basic principle behind sustainability versus mining. MAYAREMA should strengthen the DIGEBOS office in the Petén and catalyze a close collaboration between DIGEBOS and the

extractive industry. While DIGEBOS should serve as the agent of forest regulation and control the extracting industry should carry out the harvesting operation in the forests. Further activities such as inventories, preparation of management plans, defining areas and quotas for concessions, marking trees, monitoring regeneration and conducting silvicultural treatments such as, removal of impediments, refinement, liberation, thinning etc. should all be conducted with the active participation of all the actors of this newly created NFM group, incorporating women. Conducting these tasks as a team with an adequate ad hoc training organized by MAYAREMA may slowly change on-going destructive forest utilization.

As governmental agencies such as DIGEBOS are notoriously bureaucratic and centralized, a special DIGEBOS regional NFM unit located in Flores should be created. This unit should have considerable administrative autonomy and decision making power in order to outline the concessions, approve the management plans and exercise control. Furthermore, this unit, should be field-oriented and should, together with the extractive industry and the NFM component of the MAYAREMA Project, implement the first demonstration unit to be managed on a sustained yield base. This forest tract of about 5,000 - 10,000 ha should be considered a Pilot Area for developing NFM and would serve as a living laboratory for demonstration purposes. It is believed that the successful establishment of managed forests in a Pilot Area may induce the desired multiplying effect as more people may become interested in carrying out NFM. The long-term support of the project could focus on these initiatives.

It is advisable to initiate NFM in areas of minimal risk of failure. An optimal compromise between the following prerequisites should be found: 1 meet requirement of the Maya Reserve Master Plan; 2 find productive forests with high standing volume of desirable species; 3 have little agricultural impact and no immediate threat of creeping colonization; 4 have limited impact of past logging; 5 have little logistic problems to access the forests from administration and transformation centers. Moreover, it is desirable to work in forests where extraction of timber and non-timber products are on-going, as success of NFM will depend on complete collaboration with the extractive groups ("Madereros", "Chicleros", "Xateros", "Pimienteros"). More remote areas are theoretically attractive (idea to create a managed area previous to impact, "fire-line strategy") but area scarce and logistically inaccessible.

Existing sources will have to be tapped to provide the necessary baseline to select the forest tracts suitable for NFM within the area of permitted sustainable extraction of the MAYA Reserve. SEGEPLAN, assisted by the Bureau of Soil Evaluation in Kiel, Germany is finishing the land-use inventory of the Maya Reserve. It includes information on relief, soils, vegetation and land-use. The "Instituto Geográfico Nacional" (IGN) has large-scale geological and soil maps as well as small-scale physical maps (Central America 1:250,000; maps NE 15-12 "Paso Caballo", NE 16-9 "Tikal", NE 15-16 "La Libertad" and NE 16-13 "FLORES"). DIGEBOS and the local timber extractors have rudimentary logging plans and the latter group has a good knowledge of valuable timber stand location. Local taxi aircraft pilots servicing oil companies have a clear understanding of the geomorphological features of the area and location of wetlands and human induced forest fragmentation. These sources provide only coarse information for the selection of the NFM areas. However, as time is scarce and the absorption potential of the MAYAREMA Project low, it is not recommended to conduct detailed base line studies such as large-scale inventories and aerial surveys. The team will have to conduct inexpensive ground trueing and a final decision will have to be taken based on the available information.

The selected area is expected to be geomorphologically and edaphically patchy and will bear heterogenous forests in composition and structure. It is advisable to carry out NFM in the nutrient richer sites such as lower slopes and valley bottoms (which are the sites traditionally exploited by loggers). The residual karst outcrops covered with shorter forests should be maintained for protection and impact should be restricted. Extensive firewood production under a coppice system may present an acceptable use for the long-term future, as the firewood market develops. (This sustainable income generating activity may already be relevant in the buffer zone of the Maya reserve).

#### **IV. APPLIED RESEARCH PLAN**

As not much ecological and silvicultural information on the Petén exists one is tempted to believe that the management of these forests would require much basic and applied research. Before this conclusion is reached, the project should conduct a thorough search of the literature and assemble a collection to be maintained in Flores. Emphasis should be given to the forestry literature produced in Belize. Work conducted there was carried out in forests similar to the forests of the Petén and may provide many useful insides and save much time.

As NFM areas are identified, applied research should begin as a team effort. To answer the question "What do we have?", detailed inventories of the designated areas to be managed should be conducted. The following variables should be quantified: Site description including soil and topography, type of vegetation, standing volume of desirable species (including many second class species), regeneration of these species, past logging damage, "Xate" occurrence and regeneration. Selected trees and nested plots should be permanently marked and mapped in order to monitor growth and forest dynamics. Sample density will depend on forest variability and should be determined from pilot studies.

To answering the question "Why is what we have where it is?", observational research should be conducted in parallel to the inventory. This should improve our understanding of stocking densities, diameter frequency, mortality patterns, consequences of past natural and human-induced disturbances, on-going human impact, timber quality, forest pathology etc. With this information, the management objectives for a workable spatial unit (stand) can be defined. These baseline inventories will constitute the first step in our hands-on training and will provide the necessary information to formulate the management plan required by the Forestry Law.

Management plans (MPs) should be understood as complete working plans which carefully prepare the management program of a forest area. The MPs should be visualized as tools for planning, evaluation and control. They should include Plans of Operation designated to: 1 produce utilizable crops of timber; 2 secure sound forestry practices; 3 achieve effective integration with local extractors ("Chicleros", "Xateros"); 4 provide environmental safeguards; 5 give access for Ecotourism where appropriate. In the Petén, DIGEBOS does not have any experience in the elaboration of Mps which go beyond simple harvesting permits. the extractive industry feels that Mps are essentially elaborated for intrusive control and don't understand their utility for long-term resource planning. It is therefore important that such plans are drawn together as a joint effort and their elaboration process understood by all participants. The NFM component

of the MAYAREMA Project will play an important catalytic role in this part. The first Mps should be formulated by key actors from DIGEBOS (to be identified and trained ad hoc) and the extractive industry. Special attention should be given to the people of the timber industry which should be encouraged by the NFM component of MAYAREMA to overcome their reluctance to embark in the formulation of such plans. As MPs are required by law and to provide long-term benefits to the timber industry, their acceptance should be achieved readily. Drafting MPs for NFM can only be carried out as long as specific information about the forest to be managed has previously been collected and made available. As this task has never been accomplished in the Petén, many conceptual and practical questions will emerge. Consequently, the elaboration of the first MPs should become part of the project's applied research work to be orchestrated by the NFM component of the MAYAREMA Project.

Very few ecological studies useful for NFM have been carried out in the Petén. The silvical characteristics of the desirable species as well as those of the other species that compete with the crop trees at various stages of development are not known. Specially the regeneration potential of the desirable species ought to be investigated. Applied ecological research on phenology, pollination and seed dispersal, seed viability, seedling abundance, spatial repartition and survival, shade tolerance of regeneration at different stages and response to canopy opening is needed. Furthermore, the dynamics of the forests in the Petén are poorly understood and little is known on some crucial issues such as gap dynamics, mortality, growth, recruitment. The project should encourage national and international universities in conducting ecological research relevant for NFM.

## V. TRAINING PLAN

As NFM is essentially not understood in the Petén, the NFM component should recognize the extreme importance and give special emphasis to training. The overall training strategy should be hands-on as the work progresses. The general idea is to compartmentalize training in subjects according to the specific operations to be conducted in the field (inventories, MPs, establishment of harvesting quotas, marking trees, sampling, harvesting, removal of impediments, liberation of regeneration etc.) The training should be conducted within an interdisciplinary team giving emphasis to people from the community ("Madereros", "Chicleros" and "Xateros"). Such people should be hired by the project as special support of the DIGEBOS NFM unit for their extensive knowledge of the forest.

Additionally, a more formal training for specific subjects such as data processing and analyzing should be made available to individuals. Furthermore, some key actors of the NFM unit should be provided with short travel grants for specific site visits where NFM is on-going and short courses are provided (CATIE Costa Rica, ESNACIFOR Honduras, ITF Puerto Rico, Quintana Roo México and Mahogany management in Belize).

## **VI. OUTREACH PROGRAM**

As NFM presents a new concept of forest utilization and land use in the Petén, the outreach activities of the NFM component are essential and should follow a well designed strategy of gathering, disclosing and interchanging information. In a first step, all the participants involved in the management of the pilot are should be identified, and the dialogue on questions related to NFM should be opened. General informative workshops for a wider audience should improve the dialogue and include more people in the effort to utilize the forest on a sustained-yield base. As success of NFM will depend on close collaboration of groups with divergent interests (DIGEBOS, "madereros", "Xateros", etc), the outreach activities should also foster mutual understanding of each others' problems and search for common solutions. Workshops on specific subjects such as concessions, land tenure, rights to exploit the extractive reserves, marketing, tree planting, nursery, and concepts of NFM should be conducted. As all these activities should be carried out professionally (maintaining a logical sequence of the outreach activities, keeping records of the information flow, transferring the gathered information to the NFM group), a trained specialist in extension should be hired as a staff member of the NFM group.

## **VII. INDUSTRY DEVELOPMENT AND PRODUCTS MARKETING PLAN**

Industrial development should concentrate on a better utilization of the available forest resources. Emphasis should be given to the development of markets of secondary species. It will be necessary to conduct applied research on the workability of these species. Demonstration objects to promote different woods should be created and advertized (furniture, household good, panels). The NFM component of the MAYAREMA Project should support and canalize initiatives from the wood transformation industry. However, the component should not get involved in expensive and complex activities, as its absorption capacity is low and as its main objective consists in promoting forest management. Furthermore, it is evident that the transformation industry in the Petén has generated important capital with the "mining" of valuable cabinet trees and that the financial potential to conduct the marketing of secondary species essentially exists.

## **VIII. MONITORING AND EVALUATION CRITERIA**

The management plans (Mps) should be the accepted legal and operational tool for planning, monitoring and evaluation of the NFM operations to be conducted in the Pilot Area. This approach permits that all principal actor groups (DIGEBOS, timber industry, MAYAREMA) work with the same guidelines. It is important that the Mps specify the goals, using clearly formulated measurable indicators. These indicators should be drafted by the people involved directly in field work execution. For the educational and outreach activities, specific Plans of Operation will be formulated as tools for planning and evaluation.

It is advisable to form an on-going evaluation group of the NFM component. This group would have the task to carry out a permanent participatory auto-evaluation of the NFM component and produce periodic (trimonthly) internal progress and achievement reports to be submitted to the

Project supervisor. Furthermore, it would be beneficial to conduct two external evaluations at the end of the second year and in the sixth year respectively. The first evaluation should aim at assessing the feasibility of the MP of the Pilot Area, propose corrective actions and give advise for its implementation. The second evaluation should quantify the achievements/accomplishments of the six years pilot phase and give recommendation for a further project commitment in NFM.

**GENERAL COMMENTS ON PROPOSED  
NATURAL FOREST MANAGEMENT COMPONENT  
MAYAREMA PROJECT/GUATEMALA**

MAYAREMA project documents include the following objectives of the NFM component:

1. Preservation of natural forest by demonstrating the viability of natural forest management as a land use alternative.
2. Establishment of managed natural forest buffer areas around and inside the Maya Biosphere Reserve.

It must be acknowledged that there exist different views as to what forestry techniques constitute "natural forest management." The following comments on the proposed MAYAREMA NFM component are based on my understanding of NFM as a land use strategy that considers the forest as an integral system as opposed to a stand of valuable vs. non-valuable species; thus, management techniques must have as their goal the long-term, sustainable perpetuation of the system as a whole ("natural" forest), to the maximum degree possible. The "management" aspect of NFM dictates that the chosen forestry strategies result in sufficient economic returns to the forest dwellers such that intervention in natural forests is a viable and sustainable alternative land use.

- Such an understanding of NFM leads to an identification of key elements of any NFM project which are fundamental; these have as much to do with specific silvicultural techniques as with the conceptual approach of the project which incorporates political, social, economic and environmental factors. Too often foresters devise management systems which are intensely focused on the technical aspects of the project and pay lip service to the human environment in which these systems are supposed to be implemented. A long-term sustainable forestry management system can not be successfully founded on short-term economic and conventional community development models. I would single out two aspects of the NFM component that I believe are worthy of more scrutiny and debate:

**Focus**

If the NFM project is intended to both preserve natural forest and provide economic incentives to forest owners, should it not be approached from the point of view of local communities who have the most at stake in land use decisions? Should decision-making in the project planning phase be done at bureaucracy level, with dissemination through extension administrations, or at local level with input and orientation from technical advisors? Should implementation be on a regional or local level?

## **Scale**

Should the scale of NFM activities be such that they require high capital inputs for sophisticated industrial capacity or small-scale industrial developments that are adaptable to local conditions, self-sustaining after initial inputs, easily duplicated in other areas?

These issues become central themes in my comments about the specifics of the MAYAREMA NFM component, and will be treated in greater detail below.

I would further identify the following as essential prerequisites for a successful NFM system:

1. Appropriate areas for NFM must be determined through a process of land use capacity classification and evaluation; and local community analysis of current land use trends, ethnotendencies, and determination of future land use goals.
2. Local residents must have control over project conceptualization, planning, and implementation. The community must "maintain control over crucial project parameters. It must move at its own pace and not at the pace of the 'experts'. And it must retain the final say on matters of scale. The lure of big projects, large sums of money and quick results is a sure way for the community to lose control of its own development." (Smith, R.C., 1985) If local residents don't perceive NFM as responsive to their particular needs, they won't cooperate with it no matter how perfect the project paper or how intensive the extension efforts; and the NFM plan can't be responsive to their needs without this degree of commitment to local participation.
3. The owners of the forest resource and of the wood industry should be the same entity. In any sustainable wood industry there is a strong connection between the forest and the mill. If we want to ensure both long-term stewardship of the forest resource as well as generate profit beyond the costs of the forest management activities, it is the forest owners that must receive the maximum aggregate value from the extracted wood by processing the raw wood material into a final product (i.e. furniture, parquet flooring, fruit crates).
4. The NFM project area must contain a sufficient area of operatable forest to sustain a wood industry. "Operable forest" is defined as high ground natural forest with the capacity of sustaining intensive forest production activities. It does not include areas protected due to steep slopes, wet or poorly drained areas, or areas appropriate for subsistence agricultural activity.
5. The wood industry must be designed according to the characteristics of the forest base and considering the forest's annual productive capacity (annual allowable cut). The allowable cut should be based on area and not on volume. This will force producers to concentrate harvest operations over a small area and encourage the full utilization of lesser known species. The type of product to be manufactured should be determined according to the structural characteristics of the forest

resource (average diameter and length of commerciable trunk, species composition and abundance, etc.).

For example, a full range of locally demanded wood products (housing materials, furniture, fruit crates, etc.) could be processed for local markets. Finer specialty woods could be prepared for national and international markets. In designing the processing center, low inputs should be the rule. Technology should be kept simple and appropriate in design. All equipment should be procured as locally as possible or manufactured on-site. Start with a versatile machine shop that has welding equipment, lathe, drill press, hack saw, wood working equipment, etc. With this equipment you can make all the other equipment locally, and train local people in how it is made, maintained, and repaired. Initial capital investments in a wood industry should be kept unde \$100,000.00.

6. The goal of the silvicultural system should be all-species and all-diameter utilization. Local research into market possibilities and innovative industrial capabilities will increase the percentage of species and diameters that can be commercialized. the wood industry must take advantage of the maximum number of species and diameters as is economically possible. This ensures that the management system does not try to accomodate an exploitative or inefficient industry by being prejudiced against "especies no valiosos." Export markets have changed dramatically in the past 24 months with the emergence of ecologically conscious wood buyers, making all-species utilization by small projects of viable proposition.
7. All log skidding within the perimeters of the management unit should be conducted with draft animals. Mechanized skidder technology at this time (rubber-tired and crawler-type, not including highline cable systems) does not allow for the harvest of logs on wet tropical soils without severely impacting the long-term productivity of the forest site. Draft animals are a proven efficient and reliable alternative. However, draft animals, of whatever type, would require a locally-based infrastructure (pasture and community support within close proximity to forest production areas) to be feasible.
8. The NFM wood industry must have year-round access to the local, national, and international markets.

In addition to the above perspectives on some key elements of a NFM model, the following questions and comments address more specifically the discussions of NFM in the MAYAREMA Project.

1. What incentives are there to encourage DIGEBOS and the timber industry in the "conceptial changes" that are necessary for NFM implementation? Is this feasible?

If long-term concessions are granted to existing timber industries for NFM implementation, are locals then being reduced to a cheap and available labor force? Are these project-related jobs sustainable or will they only exist during the life of

the project? What incentive does the timber industry have to employ more people? What kind of wages would they pay? What, if any, is the difference between "madereros" and timber industries? Are timber industries active in the Petén region controlled by outside interests? Are there logging/milling companies owned and run by local residents that can receive timber concessions?

Local madereros, chicleros, xateros - residents of the region - have vested interest in conserving the forest resource, and should be owners of the forest industry, not just skilled labor force for the project. NFM must always co-exist in any given region with subsistence agriculture practices, and milperos could reduce their agricultural activities if income was supplemented by forestry activities. They have clear incentives for seeing that their local forest base is managed in such a way that they can make a decent living from it on a sustained basis. "Among many of the potentially and actually competing groups in the area, a general consensus exists that conservation of the forest over the long term is important.... Poor people... seem to be interested in working for a better future for their children, a future which, in great part, depends upon the natural resources of the immediate area." (parker, J.K., 1990)

The conclusion that involvement of the local community in NFM is not feasible may be premature. Ideally, they should be given title or control of long-term concession to an operable forest resource base. If the project targets a local community group as the beneficiary group, they would need to organize themselves into an enterprise which would implement the management plan, from harvest to market. The specific organizational structure and statutes of the enterprise (i.e. cooperative, sociedad anónima, corporation) would need to be determined by the residents themselves during the organizational process. If this option is, for whatever reason, deemed unfeasible, a last resort alternative might involve a newly-formed enterprise with a board of directors made up from locally-based madereros already working in the zone. Enterprise statutes would unambiguously establish NFM and the long-term sustainability of the forest resource as a principle objective. Profit-sharing incentives could ensure a just and equitable system of distribution of earnings among the locally-employed work force.

The least desirable option would be to work with already established wood industries that are under outside control, as the premise on which they are founded is exploitative and short-sighted in nature, and lacks the basic commitment to long-term stewardship of the land.

If we accept as a given that the "multiplier effect" is a desired consequence of project activities, we have to ask, Who will possibly be in the position to imitate the developed NFM strategies if the project can't demonstrate how the local community can be involved in the process from the beginning? How can local milperos gain control of forest concessions or have the level of credit necessary to participate in NFM as proposed?

2. **Training locals, even if they have limited experience in forestry-related work, is less expensive and has more long-term benefits than trying to encourage governmental institutions and industry concerns to implement long-term planning. Development schemes derived from a top-down approach rarely gain widespread acceptance at the local level or quickly disappear once project inputs are terminated. Lack of skills is not so restrictive to migrants and immigrants as is lack of land or tenure.**

**A large, top-down approach should be avoided. It will only result in a huge payroll and major effort to establish project housing and the infrastructure to sustain it. Scale and effort should be limited to target groups with emphasis placed on the establishment of a viable model that demonstrates economic and ecological feasibility and can be easily imitated and repeated. Time frame will need to be determined and controlled by the target group involved in planning and implementation phases. After initial conceptualization phase the targeted groups should determine and control level and needed areas of TA effort.**

**Extension's biggest job is providing information that will foment discussion of basic land use classification concepts at local community level, talking about what constitutes appropriate, sustainable use of different terrains. (What works on this land that will continue to work and will provide me with a decent living?) Bare bones of NFM concept can be presented as an alternative land use in forestry classified lands. Discussions develop on how it could be implemented in local social/environmental/political situation. THEN.. what training/skills do we need to implement this? when community determines what and how much is needed. DIGEBOS/AID can respond to needs.**

**As much as possible, project participants should receive direct hands-on experience in needed skills and not receive training through the development of a crop of "trained project foresters." Turnover is typically high in these projects and valuable time is lost in "training the trainers" who may leave after a short tenure. As much as possible technical advisors should be facilitators instead of planners and administrators.**

**Concerns about including women in job opportunities and training would be moot if the NFM plan were conceptualized from the start by the community strategies for wood harvesting, business management, industrialization, and marketing would be devised to meet their specific needs... for example, if there are available women with interest, a woodworking/craft component to industry may naturally evolve.**

**A NFM project that considers the above points (and those in 1) might develop in the stages outlined in Appendix A.**

3. **The technical feasibility of NFM should not be a question. Enough experience and data exist from other regions to support a skeletal silvicultural system. Importing silvicultural systems as unchanged packages is clearly unthinkable-- but importing appropriate silvicultural systems and adopting them to local needs/conditions is possible and desirable. Why reinvent the wheel? One or two**

demonstration/research units could be implemented immediately for gathering data and providing a model to the local community. Silvicultural techniques are the least of problems.

Selection cut methods (SCM) may approximate the traditional selective harvest methods of the region (translate highgrading) but this is really irrelevant to the selection of an appropriate silvicultural system. The skills already acquired in the existing forestry industry can be easily transferred and augmented in a new system.

SCM systems normally require investments in reforestation with enrichment plantings, nurseries, and cultural interventions that are costly and constitute the economic weak link in many forestry projects. I disagree that in SCM systems the remaining highgraded residual stands deviate minimally from the initial composition and structure, as forest management within a biosphere reserve would require". (berner, 1990). In selective silviculture the favoring of certain "valuable" species and the effort to augment their abundance in the forest may negatively effect natural dynamic biodiversity processes.

One of the advantages of the strip shelterbelt methods is its close approximation of natural neotropical gap-phase dynamics by mimicking natural tree falls. Not favoring one species over another during the harvesting of the strips leaves the forest's biodiversity intact.

5. Inventories must have specific stated objectives that meet specific needs of the management plan. They will not necessarily be intensive in all cases. Research should look at the forest as an integral system with important species interrelationships, not only at "crop tree" regeneration.

The social/political/economical/biophysical complexities of the Petén are unavoidable in even a perfunctory review of the region. In the Social Soundness Analysis (Parker, J.K., 1990) it is stated, "In the design of the Maya Biosphere Project, effort was made to account for the set of key complex and interrelated biophysical, social, economic, institutional, and political factors. The commitment to this effort needs to continue and to be strengthened during project implementation." And later, "A number of policy-related issues (e.g. land and tree tenure, colonization, development opportunities and strategies in other parts of the Petén) must be included as part of USAID policy dialogue with GOG." It would seem that the results of these discussions will be the determining factor for whether the NFM component can adequately address the social and economic issues which will be key to an appropriate silvicultural design and successful implementation. I would argue that the very complexity of the situation in the Petén region is the best rationale for implementing NFM initially on a small, local scale, with limited outside inputs and maximum local determination of needs and strategies. If the NFM system fails with one group, lessons can be learned and applied in other areas; if it fails on a regional basis, where can it go from there? If problems prove to be insurmountable at the local level, how can they be resolved on a regional and vastly more complex level?

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## F.3 TECHNICAL ANALYSIS FOR EXTRACTIVE RESERVES

### MAYAREMA

#### Extraction of Renewable Non-Timber Forest Products

#### (Extractive Reserves)

##### 1.0 Description

The Law of the Maya Biosphere Reserve (Decreto 5-90) allows for the sustainable harvesting of renewable tropical forest products from specific regions of the reserve. The extractive industries based on these renewable non-timber forest products provide almost US\$7 million per year to Guatemala in export revenues. Most of this production takes place within the limits of the Maya Biosphere Reserve. Products already harvested include xate palms, chicle gum, and allspice. These products can be harvested on a sustainable basis, using techniques that have proven viable over decades of continuous use. Extractive industries also rely on the labor and knowledge of the inhabitants of the northern Petén, families whose livelihood depends upon the sustained use of the Petén's tropical forest.

Nonetheless, many challenges exist within the extractive industries of the Maya Biosphere Reserve, foremost among them assuring that the extraction of forest products is sustainable through time. The extractive industries of the Maya Biosphere Reserve are also threatened by deforestation and the over-exploitation of harvested resources, chiefly by new immigrants to the Petén.

The goals of this sub-component of the MAYAREMA project are:

- (1) to assure the sustainability of the extraction of renewable non-timber forest products from the Maya Biosphere Reserve,
- (2) to improve the efficiency of these industries, and,
- (3) to establish new industries based on the sustainable production of non-timber forest products.

In achieving this goal, this sub-component will simultaneously help achieve the conservation of the biodiversity and tropical forests of the Maya Biosphere Reserve and improve income-generation capabilities of families who depend on the reserve's natural resources.

## 1.1 Extractive Industries in the Maya Biosphere Reserve

More than 7,000 families in the northern Guatemalan Petén are involved in the extraction of renewable natural resources from the tropical forest. The most lucrative harvesting activities focus on three products that grow within the forest of the Maya Biosphere Reserve:

1.1.1 Xate Palms Approximately 6,000 individuals harvest the leaves of xate palms (principally Chamaedorea elegans and Chamaedorea oblongata, with lesser amounts of C. Ernestii-Augustii and C. erumpens). Another 300-500 individuals work in the industry as sorters, contractors, and exporters. Guatemala exports hundreds of millions of leaves of these palms every year to the United States and Europe for use in the floral industry. Florists use the xate palm leaves as green backgrounds for cut flower arrangements. Harvesters say that, properly cut, each xate palm can be harvested four times per year without damaging the resource, but research is necessary to validate this information.

Xate exports produce an average of US\$3.7 million in total export value each year. The fact that 40-65 percent of the xate leaves harvested in the forest are discarded during sorting and selection indicates that the efficiency of the industry could be greatly improved. The need exists for education and training programs for xate harvesters to improve their harvesting techniques. Guatemalan decision-makers should also be reminded that sustained harvest of xate palms is worth far more than the corn or beef temporarily produced on cleared tropical forest land.

An unknown number (200-500) of residents of the Petén and Guatemala City work as sorters in xate warehouses, selecting and sorting harvested leaves for packaging and export. The majority of these sorters are women, who earn five centavos per sorted manejo (handful) of xate (23-25 leaves of C. oblongata, 38-40 leaves of C. elegans). Average earnings are Q400 to Q800 per worker per month, a sum that makes xate sorting an excellent job, especially for the Petén, where the cost of living is higher than in other regions of Guatemala.

In sum, while the xate harvesting has strong potential as a sustainable forest product industry, both immediate action and additional research is vital to establishing effective management on the ground.

1.1.2 Chicle Many xate harvesters also work from July to December in the harvest of chicle (Manilkara achras), a latex gathered from trees in the Petén tropical forest. Chicle is exported to Europe and Japan for use in the chewing gum industry. Properly cut, chicle trees are not harmed by harvesting.

Official statistics indicate that, during 1989, chicle sales produced US\$2 million in foreign exchange income (from one million pounds) (Prensa Libre 1990). However, official statistics on forest products from the Petén are notoriously under-reported, due to attempts to avoid paying taxes on these extracted products.

Each pound of chicle sold for Q2.98 during March, 1990. Sellers are required by law to sell to the FYDEP liquidation committee (formerly directly to FYDEP), and must pay transportation costs. As a result, sellers gross Q2.15 per pound of chicle gum. Harvesters receive an unknown percentage of this sum.

1.1.3 Allspice The third major product potentially harvested on a sustainable basis from the Petén is allspice (Pimenta dioica; Spanish = pimienta gorda). Collected July through September of each year, allspice is gathered by coppicing seed-bearing trees and drying the seeds. Allspice trees begin to resprout after they are cut, and the tree can be harvested again after three to six years of recuperation. Harvesters indicate that enough trees grow in the Maya Biosphere Reserve to support the export of at least one million pounds of allspice each year.

However, the population of allspice trees in the Petén is unknown, as are the impacts of harvesting on these trees. Nonetheless, Guatemala's exports are currently worth US\$16 million retail in the United States and Europe, though only \$1 million to \$2 million of this amount accrues to Guatemalans. Guatemalan exporters state that Petén production accounts for roughly 30 percent of the world market for allspice (Heinzman and Reining 1988).

In 1987, the United States imported 1.95 million pounds of allspice at a cost of US\$ 1.688 million (Duke 1989). How much of this production came from the Guatemalan Petén is unknown. (Once within the U.S., McCormick and Schilling companies sell whole allspice berries at US\$ 1.00 per ounce, an indication that more money is being made from U.S. sales than from tropical country production.)

1.1.4 Secondary Products Other products extracted from the territory of the Maya Biosphere Reserve include mimbre (a vine similar to rattan); izote pony, an ornamental plant; bromeliads; medicinal plants, and edible forest animals. The sustainability of harvesting these products is unproven and is suspect.

Izote pony (probably Beaucarnea spp., Heinzman and Reining 1989:24) is ripped from the forest, roots and all, in a non-sustainable fashion. The plants are resprouted and exported as ornamental plants. Mimbre (unidentified), a vine that grows on

large trees in high forest, is pulled from the tree and stripped of its outer bark. The resulting inner core is dried for use in making furniture and baskets. Dried mimbre sells for US\$2.20 per kilogram in Guatemala City. Exports from Guatemala in 1986 reached 10,530 kg, valued at about \$11,000 (Heinzman and Reining 1988).

Small forest bromeliads (epiphytic plants that grow on but do not parasitize forest trees) are also exported from the Maya Biosphere Reserve. Called gallitos ("little roosters"), the plants are plucked from tree limbs and sold to a single purchaser from Guatemala City at Q4 per 100 count. Exported to Germany, the plants are attached to dry, gnarled tree limbs five at a time for resale. Prices in Miami, Florida range from US\$25 to \$100, depending on size of the final product. (It is unlikely that Germany re-exports the bromeliads to the United States; rather, products seen for sale in Miami are likely Belizean-produced gallitos.) Harvest of these bromeliads in this fashion probably is not sustainable, but opportunities exist to produce the plants in a renewable fashion, perhaps by reproducing them in nurseries or by controlling the number of plants harvested in specific areas.

Honey production is another renewable resource of the Maya Biosphere Reserve. Each hive costs approximately US\$100 in initial materials investment and can produce 90-114 kilograms of honey each year. The honey sells for around US\$1.10 per kilogram. Honey production should be focused on the buffer zones of the Maya Biosphere Reserve.

No doubt, other potentially sustainable plant products grow within the forest of the Maya Biosphere Reserve, but industries are either non-existent or poorly developed. Among these potentially renewable non-timber forest products are vines, orchids, medicinal plants, and copal incense. In the ongoing search for sustainable forest uses, research on these products must remain a high priority.

Finally, wild animals are harvested from the Maya Biosphere Reserve both for subsistence and for sale in markets and restaurants in Santa Elena and Flores, Petén. The most commonly harvested animals are white-tailed deer (Odocoileus virginianus) and tepescuintle (Cuniculus paca). The sustainability of harvesting these animals depends, of course, on the rate of harvest. Sustainable production of these animals should center on production in captivity, especially in buffer zones of the Maya Biosphere Reserve.

## 2.0 Overview

The key point about the harvest of sustainable products from the Maya Biosphere Reserve is that families who depend upon these renewable resources are strong promoters of forest conservation. Knowing that their economic future lies in the sustained use of forest products, these families are aggressive, economic allies in the protection of the Maya Biosphere Reserve. The fact that extraction of these renewable resources produces an annual income of almost US\$7 million underscores the value of these activities. As well, the net present value of Maya Biosphere Reserve land is higher for sustainable production of diverse timber and non-timber forest products than it is for cleared land for agricultural uses.

The benefits of deforestation for other land uses are marginal. Slash and burn agriculture and cattle ranching on the soils of the Maya Biosphere Reserve are not sustainable activities (Urrutia 1967). Extractive activities and sustained-yield forestry (if it can be achieved) are viable alternatives to deforestation; the forest that remains in the multiple-use areas of the Maya Biosphere Reserve is sufficient to support both the extraction of non-timber forest products and sustainable logging.

Where conflicts of interest occur, however, extractive activities should be emphasized over logging, because they employ more families, produce more income, and benefit a larger number of Guatemalans. Moreover, timber management projects have several disadvantages when compared to extractive reserves: their sustainability is unproven, they provide fewer economic and employment benefits for local populations, they provoke greater disturbance of tropical forests and biological diversity, and their management is more susceptible to corruption.

### 2.1 Objectives of this Sub-Component

Adding to the general goals of this sub-component of the MAYAREMA project, the specific objectives of the extractive reserves sub-component are these:

#### 2.1.1 To assure the sustainability of extractive industries within the Maya Biosphere Reserve.

Studies of the extractive industries in the Petén indicate that non-timber forest products are sometimes harvested in destructive manners. Xate palms are being over-harvested in some areas of the Petén. Heinzman and Reining report that xate palm densities in never-harvested areas average 8,500 plants per hectare. By contrast, densities in regularly harvested areas average only 3,100 plants per hectare, an indication that frequent harvesting is increasing plant mortality.

Chicle gatherers sometimes "bleed" chicle trees, i.e., they cut the tree deeply in order to obtain 25 percent more latex than can be obtained by cutting the tree only slightly. While this mining of the chicle tree produces slightly more latex than bleeding the tree, it does so at the cost of subjecting the tree to infection and rapid mortality.

Allspice gatherers sometimes fell the allspice tree rather than climbing it to cut off the branches that bear fruit. Felling the tree results in a one-time only harvest. Such destructive practices must be eliminated if the harvest of these products is to be practiced on a sustainable basis. Sustainable production can be assured through training, licensing, and regulation.

- 2.1.2 To sustain the economic benefits that renewable forest harvesting brings to the people of the Petén and Guatemala.

Economic self-sufficiency for harvesters is an important goal of this sub-component. Self-sufficiency will require maximizing the variety and value of products sold, as well as minimizing the drain of income to middle-men.

- 2.1.3 To increase the number of renewable forest products extracted from the Maya Biosphere Reserve.

Dependence upon only a few harvested forest products relegates harvesters to the vagaries of external markets. Diversity in economic production, like diversity in ecological systems, increases chances of survival. As well, diverse sources of income from a variety of botanical resources lessens the ecological impact of harvesting any one non-timber forest product.

### 3.0 Strategy

The proper course of action in assuring and improving the sustainability of renewable forest products from the Maya Biosphere Reserve should focus first on research and second on implementation. Much more needs to be known about these resources to effect the needed changes in production and marketing. Even then, the process must be flexible and cautious. For example, changes in the xate industry run the risk of threatening the two companies that currently control the majority of Guatemala's xate exports. Gerardo Mazariegos, owner of Maex S.A. in Guatemala City, and Carlos Gutierrez, owner of the Gutierrez xate warehouse in San Benito, Petén, control around 85 to 90 percent of Guatemala's xate exports. Any attempt to alter the xate industry will have to take into account the semi-

monopoly these two companies hold.

Clearly, there are actions that can be taken immediately to improve the sustainability of non-timber forest products from the Maya Biosphere Reserve--reducing xate waste and reducing mortality of chicle and allspice tree, for example. But other questions of sustainability point to the need for additional research.

For example, sustainable management of renewable forest resources may be predicated on the establishment of credit or production cooperatives among harvesters and/or contractors. At the same time, the establishment of cooperatives must be carried out cautiously. Rural cooperatives in Guatemala still carry negative connotations to some sectors of the power structure, being seen as Marxist-oriented activities. Here, USAID must follow the lead of local leaders in the Petén, for they alone will know when the political climate is open to the establishment of potentially misinterpreted labor organizations.

#### 4.0 Areas of Implementation

Covering approximately 1.4 million hectares, the Maya Biosphere Reserve is divided into four types of land use:

- (1) core zones (national parks and biotopos),
- (2) cultural areas,
- (3) multiple-use areas, and
- (4) recuperation areas.

According to Decreto 5-90 (Ley de la Reserva de la Biósfera Maya), within the core zones, "it is prohibited to . . . cut, extract, or destroy any specimen of wild flora, except for technical motives of management that may be necessary to assure their conservation. In all cases, this may be done only by administrative authorities of the area with proper authorization."

By contrast, the law states, "The primary objective of cultural areas, multiple-use areas, and recuperation areas shall be the buffering of core zones and the sustainable use of natural resources, without negatively or permanently affecting their diverse ecosystems. Until the Master Plan is approved, no use or extraction activities may be developed, except existing concessions and the extraction of natural products by the inhabitants of the Reserve."

Thus, the law makes clear that the extraction of forest products is prohibited within the core zones (national parks and biotopes) of the Maya Biosphere Reserve. The remaining areas of the reserve (approximately one-half of the total reserve) are open to sustainable extraction by inhabitants of the reserve and, once a Master Plan is completed, by other Guatemalans.

The areas in which the extraction of renewable forest products is allowed can be referred to as extractive reserves, following the model of the rubber tapper extractive reserves of the Brazilian Amazon. One important difference exists between the two types of extractive reserves, however. In the Amazon, rubber tappers maintain informal control of specific stands of rubber trees, though they own neither the trees nor the land on which they grow. Within the Maya Biosphere Reserve, forest product harvesters do not control specific areas of forest; instead, the resources are open to all harvesters, who rotate from zone to zone, harvesting within areas that have regrown sufficiently to produce saleable products. This open-access characteristic of the current system often leads to over-exploitation of the resources, underscoring the need to establish concessions or quota systems for harvesting.

## 5.0 Participants and Beneficiaries

The primary participants and beneficiaries of the extractive reserves sub-component of the MAYAREMA project will be CONAP and the individual Peteneros involved in the extraction of renewable forest products. CONAP will benefit through support of the institution's ability to manage the natural resources of the Maya Biosphere Reserve. Peteneros will benefit from the sub-component through assurance that extractive industries remain sustainable and continue to produce economic benefits through time. Communities that lie within the buffer zone of the Maya Biosphere Reserve will benefit from wildlife production facilities if research establishes their feasibility.

Additionally, technical assistance will be required to establish base-line data and to initiate training, licensing, and regulation mechanisms.

## 6.0 Institutional Arrangements and Responsibilities

By laws 4-89 (Ley de Areas Protegidas) and 5-90 (Ley de la Reserva de la Biósfera Maya), the Consejo Nacional de Areas Protegidas (CONAP) has sole legal authority to manage resources within the Maya Biosphere Reserve. Any other institutions seeking to become involved in the management of resources within the reserve must be authorized to participate by a majority vote of the 14 representative members of CONAP. In other words,

organizations such as DIGEBOS--although they serve as one of the 14 organizations that make up CONAP--may not attempt to manage forest resources within the biosphere reserve unless specifically allowed to do so by a majority vote of the 14 members of CONAP.

For this reason, all activities carried out under the aegis of the extractive reserves sub-component of MAYAREMA must be channeled through CONAP. If the 14 members of CONAP subsequently determine to delegate investigation, training, or regulation of the extractive industries to one or more other parties, MAYAREMA activities may then be channeled through those parties.

## 7.0 Potential Limitations

### 7.1 Socio-Economic Limitations

Extractive activities should not be viewed as a means of supporting a dense human population nor of absorbing large numbers of people migrating into the Peten from other departments of Guatemala. Individuals who are new to extractive activities frequently lack the knowledge and attitudes necessary to make extraction a sustainable activity.

Unless carefully carried out, support for extractive activities in the Maya Biosphere Reserve may encounter resistance from economic groups that currently reap great benefit from the system as now practiced. Many harvesters are currently tied to contractors (contratistas) through a debt peonage system. These harvesters are held captive by contratistas through loans (enganches) made to them prior to conducting their work. Contratistas loan money to harvesters, then require them to harvest forest products to pay off these debts. During their work, many harvesters are dependent upon the contratista for food, machetes, boots, and transportation. Contratistas may charge the harvesters at prices that are much higher than those available on the open market. As long as the value of extracted products accrues to contratistas and exporters, harvesters will remain poor, regardless of the amount of wealth they generate from the biosphere reserve.

Correcting this debt-peonage system should be a major focus of investigation and action, but with the caveat that it be carried out with caution and sensitivity to potential dangers to the participants.

### 7.2 Sustainability of forests

As stated, the major problem in the future of extractive reserves within the Maya Biosphere Reserve is the future of the forest itself. If the area is cleared and burned for agriculture or cattle ranching, non-timber forest products will go up in

smoke. Preventing colonization of the multiple-use areas of the reserve is the most important factor in the future of these potentially sustainable and lucrative industries.

### 7.3 Sustainability of harvests

Because insufficient data exist on natural populations and current harvest rates of non-timber forest products from the Maya Biosphere Reserve, it will be difficult to establish a concession or quota system immediately. Instead, the creation of such regulation systems must emerge from the research programs recommended in this project paper.

### 7.4 Other Potential Problems

Chicle harvesters compete with secondary gums harvested from the Brazilian Amazon. During 1987, for example, the Brazilian port of Manaus alone exported almost US\$28 million in non-chicle latexes for the chewing gum industry (Ghilian Prance, personal communication). Still, during the past three to five years, Japan has been the primary purchaser of Guatemalan chicle, and demand is growing.

Additionally, the United States and European markets are quickly opening to "natural forest products" which support tropical forest conservation. Companies are promoting the fact that their products come from natural forests and assist conservation efforts. U.S. consumers have demonstrated that they are willing to pay higher prices for products that support tropical forest conservation. This movement should be seized upon by promoters of renewable products from the Maya Biosphere Reserve through publicity aimed at increasing awareness of the source of these products.

At the same time, only an aggressive system of harvester training can prevent increased demand from placing severe ecological stress on chicle resources. If increased demand is met with increased harvesting by inexperienced, untrained chicleros, resources will suffer.

Be aware, also, that harvesters of xate, allspice, and chicle are opportunists while in the forest. If they encounter unexcavated and unprotected Maya ruins, they will sometimes excavate these ruins in search of polychrome pottery and jade artifacts that can be illegally sold. These artifacts follow the same trade route as the extracted forest products. Xate contractors have been seen purchasing Maya artifacts and hauling them to Santa Elena hidden within xate bundles.

Regulation of the forest product industries and training and licensing procedures should include discussions about the law on unlawful excavation of cultural remains, as well as information

about illegal hunting of animals. Product harvesters must not be allowed to carry firearms inside the Maya Biosphere Reserve.

## 8.0 Research

Investigation is required on almost all sectors of the extractive reserves sub-component of MAYAREMA to insure the sustainability of products harvested within the Maya Biosphere Reserve. At a minimum, the research activities outlined below should be conducted. Specific research methods are detailed in the Heinzman and Reining (1988) report to U.S. AID-Guatemala.

### 8.1 Ecological Sustainability

Ecological research must include studies on growth and reproduction, spatial distribution, density, and size class, as well as vegetation, soils, climate, and topographic associations. Some of these studies, such as spatial distribution, density, size classes, and ecological associations, can be done rapidly through the use of transects and baseline natural resource measurement techniques.

Growth and reproduction studies will require significantly more time. For example, little information is available on the reproduction cycle of plants and animals harvested from the Maya Biosphere Reserve. In sufficient data exist on how harvested plants reproduce, what animals may be necessary for their pollination, and what conditions are required for their survival. Guatemalan researchers--along with international researchers, if invited--should conduct studies of the basic biology of these plants with the goal of answering the question: What level of harvesting is sustainable?

Inventories of renewable forest plants and animals also must be conducted to determine where and in what densities they exist. This information is necessary if CONAP is to properly manage these valuable resources.

Ecological research must also be focused on the potential production of native animals in captivity.

### 8.2 Socio-economic Research

In addition to ecological studies, production methods and social factors must also be evaluated.

(A) Specific studies should focus on human and economic factors in harvesting, transportation, and distribution methods, as well as on secondary processing that occurs. These studies should attempt to increase harvesting efficiency while ensuring that the resource is damaged as little as possible during

harvesting and transportation. Most importantly, these studies should determine how harvesters can be organized to maximize equity, while reducing the number of middlemen who absorb profits. Toward this end, the feasibility of organizing producer or harvester cooperatives should be examined.

(B) Socio-economic baseline data is also needed. This requires descriptions of non-timber forest product market structures, variation in pricing, and distribution of wage and labor benefits. In addition, specific data concerning the socio-economic characteristics of harvesters are required:

- (1) number of people involved in extraction
- (2) income derived from extraction and percentage of total income this represents
- (3) services provided by local organizations and government agencies to harvesters.

(C) Additional information is needed on the internal and external markets of natural forest products of the Maya Biosphere Reserve. If a monopoly exists in the xate industry, for example, does this hinder or help the industry? What are the trends in international markets for these products? How can export markets be secured? What level of harvesting will external markets support?

(D) Relationships between harvesters, contractors, and exporters, as well as the role of government regulation, should be clearly documented (Heinzman and Reining 1988:81). Researchers should investigate the feasibility of establishing credit cooperatives among harvesters to break the current system of debt peonage.

### 8.3 Dove-tailing Research Findings

Information provided by research on socio-economic factors of non-timber product harvesting must be integrated with data provided by research on ecological factors. This combination of data will provide the basis for management prescriptions that will balance maximum socio-economic benefits with minimal ecological disturbance to the Maya Biosphere Reserve.

### 9.0 Training, Licensing, and Regulation

CONAP should enact a system of control over the extractive industries of the Maya Biosphere Reserve. CONAP may choose to manage this system itself or designate another organization to manage these activities. The system should consist of three

components: training, licensing, and regulation.

### 9.1 Training:

(A) Design: CONAP should initiate a training program designed to educate harvesters of sustainable forest products in the proper techniques of harvesting. The same training program should also explain the penalties for violations. For example, individuals must be taught the proper way to harvest xate: never cut the growing meristem (candela) of the palm; cut only mature, good quality leaves; always leave enough leaves on the palm to assure its survival.

Chicleros must be taught the depth to which they can score a chicle tree without killing it. Allspice gatherers must be warned not to cut down trees in order to obtain the fruit; rather, they should climb the tree and leave at least one large branch alive to assure continuing photosynthesis and survival of the tree.

(B) Location: Training courses should be mobile, going from community to community (or harvesting camp to harvesting camp), rather than requiring harvesters to travel long distances to attend the courses in a fixed location. Trainers should make certain to invite local community leaders, as well as all harvesters, to these training courses. They should also invite any protected area managers from the region, as well as contractors, and others involved in the extractive industry or forest protection and management.

(C) Personnel: Training courses should take advantage of the extensive knowledge of experienced xateros, chicleros, and pimenteros (allspice harvesters), rather than attempting to train new personnel for these purposes. In addition to increasing the role and employment of local individuals, training courses staffed by experienced harvesters will prove to be more effective.

### 9.2 Licensing:

(A) Graduates of the training program should receive two documents: an official diploma and a pocket-sized license. The diploma will be designed for public display and as a source of pride. The pocket-sized, water-proof license will serve as the official document allowing training course graduates to harvest renewable forest products from the Maya Biosphere Reserve. This license must be carried by the harvester any time he is involved in extraction activities, whether harvesting, transporting, or selling.

(B) Moreover, in order to sell his products to a contractor, selection warehouse, or exporter, the harvester must

present his license so that his license number can be recorded. At each step of production and sale, the receiver of the product must have available the license numbers of those who sold him the extracted products. Thus, a contactor must have a list of all harvesters who supplied him with the product. Receiving warehouses must have the license numbers of the contractors who supplied the products they are processing. And, exporters must have the license numbers of all warehouses who supplied the products they are attempting to export.

### 9.3 Regulation:

(A) Natural resource guards should conduct spot checks of harvesters in the forest, making sure that each is licensed. Violators should be fined according to regulations established by CONAP.

(B) Resource guard checkpoints (garitas de control) should check the licenses of all those passing with harvested forest products. CONAP employees or delegates should conduct spot checks of warehouses and export points to insure that forest products are being obtained legally.

(C) Once research has indicated the location and densities of renewable forest products, CONAP should regulate harvesting in these areas through some form of concessions or quotas. CONAP may wish to assign specific areas to individual groups of harvesters or contractors. Alternatively, CONAP may wish to restrict individual harvesters to specific quotas, much as FYDEP formerly restricted contractors to certain amounts of extracted products. The form of regulation that CONAP establishes will depend upon information produced by research activities.

(D) Finally, CONAP should follow recommendations produced by investigators on how to control wasteful harvest of xate leaves. Xate harvesters are currently paid by the number of leaves they cut and transfer to contractors or wholesalers, rather than being paid according to the quality of the leaves they harvest. As a result, 40 to 60 percent of the xate leaves harvested in the forest are discarded during the selection process.

Several ideas have been presented (Heinzman and Reining 1988; Dugleby and Heinzman 1989) to counter waste in the xate industry. Xate harvesters are aware that over-harvesting is occurring and that it threatens their livelihood. They will welcome regulatory incentives that will reinforce the sustainability of the industry. Regulatory efforts may include hiring individuals to work inside xate harvesting camps to dampen the harvest of useless leaves, and payment of harvesters according to quality, as well as quantity, of leaves. Additional research on the topic will reveal the proper course of action

that CONAP should take.

(E) Xate, chicle, and allspice production is already taxed at both municipal and national levels. This tax system could be restructured for the economic benefit of CONAP's conservation and regulation program. Currently, the municipality from which xate is harvested collects Q200 per 100 pounds of xate extracted. FYDEP formerly received Q5.00 per 100 pounds for the same product. Both taxes are paid by the contractor (or transporter), but underpayment and corruption are rife. Xate producers seriously under-report harvests in order to avoid paying taxes. Control points along highways entering the Maya Biosphere Reserve and the proposed licensing system will improve this situation.

Allspice contractors formerly paid a tax of US\$ 0.09 per kilogram to FYDEP and an additional tax of 4 percent to the national government. Now that FYDEP has been dissolved, where these taxes are going is unknown. Tax structures for chicle are also unknown, but the industry was formerly controlled by FYDEP, as that organization maintained a monopoly on legal exports of the product. Regulation of these industries by CONAP will allow that organization to redefine the tax structure and collect the tax for the benefit of non-timber forest product regulation.

#### 10.0 Extension

Once research has indicated that a viable potential exists for reproducing orchids, medicinal plants, vines, mimbre, or animals in nurseries or captive-breeding facilities, extension agents will be required to establish and carry programs forward. These agents should live in the Petén to work with participating communities.

Extension efforts for production of plants harvested from the wild should take the form of training courses and CONAP regulation, as outlined in section 9.0 above.

#### 11.0 Commercialization

11.1 Establishment of commercial plantations of xate palms is a possible future activity, but current practices do not appear promising for several reasons. The few xate plantations that have been established in the Petén have been created by:

- (1) clearing the undergrowth of standing natural forest, and,
- (2) digging up young xate plants from the natural forest for replanting in the private plantations.

The seedlings are replanted at a density of 20,000 to 30,000 plants per hectare (Heinzman and Reining 1988).

Taking young plants from the forest robs natural xate populations of their potential for regeneration, creating a forest without a xate future. At the same time, full understanding of the life cycle of xate palms would open the possibility of establishing xate plantations from seeds. This activity would not threaten natural stands of the palms. At the same time, Mr. Owen Smith, considered to be the father of the natural rubber industry in Guatemala, warns that xate plantations run the risk of any monoculture crop in the tropics--plagues of insects and plant diseases. He predicts that xate plantations will prove to be a disaster.

Other problems also exist with xate plantations. Individuals in the Petén indicate that xate plantations require the use of liquid fertilizer and herbicides to produce high yields. While these additions produce leaves of excellent quality, these added investments frequently backfire on plantation owners because unscrupulous neighbors sneak into the plantations at night to cut the xate illegally. At least one plantation owner has hired an armed guard to protect his investment.

Most importantly, establishment of plantations of xate, chicle, or allspice would negate the forest conservation incentive of harvesting from the natural forest. In addition to the income produced by harvesting renewable forest products, the industries prompt Peteneros to conserve the forest as a source of future income. If production of these products switches to plantations, this economic incentive for forest conservation is subverted.

11.2 The possibility must also be explored of adding value to non-timber forest products while they are still inside the Department of the Petén. Residents of the Petén would capture increased benefits from these products if the products were processed within the department, rather than being sent to Guatemala City or to other countries for refinement.

11.2.1 Between 25 and 50 percent of the xate collected in the Maya Biosphere Reserve is currently shipped to Guatemala City in bulk for selection and sorting in the city. Increased benefits would accrue to Petén residents if all xate were required to be selected and sorted inside the Department of the Petén.

11.2.2 Allspice should be packaged in the Petén itself, instead of being shipped to the capital city or to the U.S. or Europe for packaging. Most benefits from the allspice industry currently accrue to Guatemala City residents rather than to residents of the Department of the Petén.

11.2.3 Chewing gum could be manufactured from raw chicle in the Petén rather than being exported in raw blocks and processed in other countries. Shipping raw chicle to external markets is tantamount to shipping tropical hardwoods en rollo to foreign countries--a practice that Guatemala has outlawed.

## 12.0 Institutional Strengthening

12.1 CONAP The extractive reserves sub-component of the MAYAREMA project will strengthen the ability of CONAP to regulate the extractive forest industries of the Maya Biosphere Reserve. The organization should hire employees specifically to regulate the forest products industries.

12.2 CECON Because of their biotopo guard-training courses, the Centro de Estudios Conservacionistas (CECON) has the most experience in conducting training courses in the Petén. The group is an obvious choice for the design and implementation of forest product training courses. Their current program of mobile training courses for biotopo reserve guards serves as an excellent model for training in forest product extraction.

12.3 DIGEBOS If invited by CONAP to participate in the regulation of extractive reserves within the Maya Biosphere Reserve, DIGEBOS could be assigned the task of licensing and regulating the forest product industries. However, Guatemalan law requires that CONAP make the decision on this question.

12.4 Guatemalan Universities Guatemalan universities--del Valle, Marroquín, and San Carlos--should be utilized in the research components of this part of the MAYAREMA project. These universities are currently training the individuals who will be responsible for the Maya Biosphere Reserve during the next 40 years.

## 13.0 Sequence of Activities

Considering the six-year structure of the MAYAREMA project, activities should be sequenced in the form outlined below. It should be noted that research, training, and initial regulation efforts are heavily weighted at the beginning of this sub-component. As the six-year MAYAREMA project progresses, the sub-component should move into refinement of these initial activities. This sequence of activities is necessary because this sub-component attempts to control activities that are already on-going within the Maya Biosphere Reserve, as well as establish new activities that will benefit the reserve and the inhabitants of the Department of the Petén.

Years 1, 2, and 3:

- (A) Simultaneous research and initial training, licensing, and regulation.
  - (1) Conduct base-line soils mapping, baseline vegetation mapping and inventories of non-timber forest products, using air photographs and ground transects.
  - (2) Investigate laws and regulations that provide perverse incentives for forest clearing
  - (3) Establish training program
  - (4) Establish licensing system
  - (5) Begin regulation of industries through control points and spot checks
- (B) Establish program of institutional strengthening for CONAP.
- (C) Begin research on additional non-timber forest products.
- (D) Begin investigations on appropriate value-added industries.
- (E) Investigate feasibility of establishing wildlife production facilities in buffer zones.

Years, 4, 5, and 6:

- (F) Refine training, licensing, and regulation activities.
- (G) Carry out new research activities as identified during first three years of MAYAREMA activities.
- (H) Conduct ecological and socio-economic monitoring activities to assure that sustainable extraction of products is being achieved.

**14.0 Inputs**

Some technical assistance will be required for this sub-component of the MAYAREMA project, chiefly in the form of training and advising Guatemalan counterparts on research, licensing, and regulatory activities.

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Physical inputs required include the equipment and materials detailed in the budget. These inputs include:

1 Magellan global positioning device to establish locations of harvesting camps and boundaries of concessions

12 mules with replacement over the life of the project. These animals will be necessary because many of the harvesting camps regulators will be required to visit are located far from the nearest road.

Training equipment in the form of cameras, film, projectors, and generators. (Note that slide projectors are considered to be better suited for this purpose than video equipment, which is far more expensive and more likely to produce problems in the field.)

Air photographs and satellite images for locating stands of harvestable products.

Field equipment and research supplies

Office equipment for regulation activities.

#### 15.0 Outputs

(A) CONAP or entities it designates will establish control and regulation of extraction activities centered on non-timber forest products in the Maya Biosphere Reserve

(B) Research will be conducted on ecological and socio-economic factors of the harvest of non-timber forest products within the Maya Biosphere Reserve

(C) Licensing systems will ensure the sustainability of extractive activities with the reserve

(D) Harvesters of extracted products will be trained in the proper methods of extraction

(E) New non-timber forest products will be identified and industries built around their sustainable production

(F) CONAP or entities it designated will establish taxation systems for non-timber forest products.

(G) Baseline ecological surveys will be conducted and monitored to evaluate long-term impact of extractive activities.

(H) Residents of the Department of the Petén will benefit from sustainable industries that utilize non-timber forest products from the Maya Biosphere Reserve.

16.0 Evaluation Procedures

(A) Baseline data on ecological and socio-economic factors in extraction of non-timber forest products will flow from research conducted under the MAYAREMA project.

(B) Follow-up surveys will establish whether or not sustainable production has been achieved and is progressing according to activities planned.

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## **F.4 TECHNICAL ANALYSIS FOR TOURISM**

### **I. ANALYSIS**

#### **A. CONFUSION ABOUT ECO-TOURISM**

The worldwide interest in eco-tourism which has been seen over the last few years has recently arrived in Guatemala. In Guatemala, as elsewhere, there is widespread confusion and misunderstanding about what eco-tourism really is.

The most common misconception is to magnify its benefits and to ignore the risks associated with eco-tourism programs that are poorly conceived or commercially exploited beyond the carrying capacity of the areas. The Galápagos Islands of Ecuador are one good example of commercial over-exploitation reaching the point where tourist satisfaction is peaking and wildlife populations and habitats, which constitute the main attraction, are at risk.

Guatemalan environmentalists and natural resource managers, aware of the previous pitfalls, have reacted cautiously --almost defensively-- when the subject of tourism comes up.

A definition of eco-tourism appropriate to Guatemalan conditions is essential. This will help policy-makers, resource managers, scientists and tour operators better understand the concept as it applies to Guatemalan reality. This definition should also reflect the close collaboration which these groups will require for the Guatemalan version of eco-tourism to be socially and culturally acceptable, ecologically sustainable and economically viable.

An early Guatemalan research piece on the subject has coined the term "Turismo Orientado a la Naturaleza y la Cultura" (TONC) to describe the type of tourism oriented to nature and archeology which this project will promote.

#### **B. TOURISM ORIENTED TO NATURE AND CULTURE (TONC) AS A CONSERVATION TOOL**

As described earlier in this paper, Guatemala --as many other developing nations-- has not assigned in the past much political attention or financial resources to the conservation of its natural and cultural heritage. Well designed and managed TONC programs offer Guatemala the potential to generate the funds, the political visibility and the public awareness needed for resource conservation.

A frequently overlooked feature of TONC is its ability to attract the scientific and advanced amateur visitors which can help countries like Guatemala study and inventory protected areas. For example, the Organization for Tropical Studies --a consortium of several universities-- at the La Selva Research Station in Costa Rica has played a key role in environmental education and promoting Costa Rica as a destination for wildlands students. In addition, the total economic impact of OTS visitors has been estimated at US\$3 to 10 million annually (Laarman, 1989).

## **C. SPECIAL OPPORTUNITIES FOR TONC IN GUATEMALA**

### **1. GLOBAL TOURISM A GROWTH INDUSTRY**

Tourism ranks third worldwide among export industries, accounting for nearly 6% of total world exports and representing 25% of international trade in services (Boo 1989, after D'Amore). According to several sources it is projected to grow 3 to 4% per year during the nineties.

Trends of the past few years indicate a marked increase in the demand for special interest travel and non-traditional destinations. This trend is expected to continue as populations in developed countries become tired of traditional resort vacations, become older and run out of new accessible cultural destinations.

### **2. TOURISM IMPORTANCE IN GUATEMALA**

In 1988, 405,000 tourists visited Guatemala. Of these, 230 000 came from USA and Europe. This was a comeback to the levels of 1979 when a period of political violence halved the number of overseas tourists to less than 90 000 by 1985.

Despite the variability of the data it is estimated that the average tourist stays between 4.5 and 5.5 nights and spends between US\$64 and US\$112 a day. The most conservative estimates place hard currency earnings of incoming tourism above US\$130 million annually, second after coffee.

In the seventies, 96% of tourists visited the "traditional circuit" covering Antigua, Atitlán and Chichicastenango and only 4% went to Tikal. According to INGUAT surveys, in 1987 12.3% visited Tikal and another 5.9% visited the Río Dulce area. In 1988 a total of 61,453 foreigners visited Tikal representing 15% of all tourists and 27% of the North American and European visitors.

Guatemala has an advantage over other developing countries because the vast majority of its overseas visitors are already special interest tourists drawn to the highlands and to its archeological sites. There are good opportunities to expand the average stay per visitor by creating appropriate attractions built around its natural protected areas. If properly implemented, this effort could provide important rural development impacts and create sustainable incomes based on conservation activities.

Proper planning and implementation must be emphasized if the population of the Petén is to receive a fair share of the benefits that have historically eluded them. There are several income-generating opportunities linked to tourism which have not been adequately exploited: artisan works for sale to tourists, local fruit and fresh produce supplies to hotels, information and guide services to tourists, etc.

#### **D. GUATEMALAN NATURAL AND CULTURAL AREAS UNPREPARED FOR TOURISM**

There are several risks that need to be considered before launching any tourist development strategy in Guatemala and the Petén. The very first one is the effect of political and guerilla violence over the number of visitors. The large decrease in foreign visitors experienced by Guatemala in the early 80's provides historical evidence.

Even the relatively more established protected and cultural areas such as Tikal or the Biotopo del Quetzal near Cobán, are only marginally prepared to satisfy the average specialized interest tourist. Their most important need, which is information, is insufficiently met and hotel accommodations and travel arrangements to rural areas are more of an adventure than most special interest tourists are willing to accept.

In the case of the natural protected areas recently established in the Reserva de Biósfera Maya (RBM), much work remains to be done before they can be opened to the average special interest tourist. In the absence of minimum controls and accommodations it will be wise to restrict tourism to scientists and advanced amateurs specifically involved in studies and inventories of the area.

#### **E. TONC AS VEHICLE FOR COMMUNITY PARTICIPATION AND ENVIRONMENTAL EDUCATION**

If TONC is to effectively help value the forests and other natural and cultural resources within the RBM, it must provide some communities with better income opportunities than current unsustainable uses such as slash and burn agriculture ("milpas"), poaching timber or wildlife and looting archeological sites.

Because this is not a massive type of tourism, job opportunities for unskilled labor are relatively limited. Their impact is often more significant from the conservation and social points of view than the absolute numbers would indicate. There are also special cases where communities living close to sites can be given roles in protecting the sites, operating basic lodges and sharing the benefits of the operation.

There are quite a few opportunities to involve and benefit local rural and urban dwellers through well designed TONC programs. Typical options include: guides, porters, operators of canoes, mules and other transportation services firms, arts and crafts, etc.

## **II. OBJECTIVES OF THE SUBCOMPONENT**

1. To develop self-supporting sources for funding the protection and management of the core natural and archeological areas of the Reserva de Biósfera Maya at sustainable levels.

2. To develop the regional, national and international support groups needed to implement a sustainable and successful program of tourism oriented to nature and culture (TONC) in Guatemala, with special emphasis in the Petén.

### **III. PROJECT ACTIVITIES**

Consistently with the strategy of the overall project, the sequence of activities of this subcomponent is: protect, study and use sustainably. As may be seen in the implementation schedule in Section D, many of these activities overlap somewhat in time.

#### **A. IMPROVING KNOWLEDGE ABOUT TONC**

Before meaningful participation by policy makers and private and public institutions can be achieved, their current level of understanding about the possibilities, limitations and requirements of TONC must be improved. The following activities are planned:

##### **1. PLANNING WORKSHOPS**

Three workshops will be held during the life of the project. The agendas and participants will be selected so that local resource managers, tour operators and public officials are exposed to the problems, strategies and results experienced by their counterparts in comparable countries.

Initial workshops will address basic questions and strategic issues. Later ones will place increasing emphasis in securing partnerships with international institutions; and eventually, the image of the RBM and Guatemala, as a TONC destination, will be carefully promoted. The first workshop will be conducted early-on and used as an opportunity to gradually select the public-private working-level group to be described later.

##### **2. IMPACT STUDIES: ECONOMIC, SOCIAL AND ECOLOGICAL**

Three types of studies will be conducted:

**Economic Impact** - These studies will evaluate the direct and indirect income and employment effects of tourism over urban and rural populations.

**Social Impact** - The current sources and levels of income for inhabitants around potential tourist destination areas will be assessed. Particular attention will be given to the current activities, motivations, cultural attitudes and educational levels of men and women likely to be participants in TONC activities.

**Environmental Impacts** - A series of assessments of current and projected impacts of tourists over small town facilities, natural areas and archeological areas will be made. These studies will be carefully harmonized with baseline and other environmental assessments planned for the overall Project and with studies of carrying capacity for the individual areas.

### **3. SYSTEM FOR UPDATING REGULAR VISITOR SURVEYS**

The statistical department of INGUAT has irregularly published data on average stay and expenditure levels. This type of data, complemented by information on tourist motivations, interests socio-economic levels and travel plans is essential for developing TONC strategies and marketing plans. Of particular significance, is the feedback regarding visitors' satisfaction levels. This activity will strengthen INGUAT's capabilities to develop, update and publish this information. It will be a joint effort with private associations of tour operators such as Gremial de Operadores de CAMTUR and public institutions responsible for managing protected areas, airport controls, etc.

### **4. STUDY TRIPS**

Funds will be made available for organized visits to carefully selected examples of TONC both in and outside of Central America. The activity will be managed in conjunction with the workshops described above.

## **B. DEVELOPING MANAGEMENT AND SUPPORT GROUPS FOR TONC**

Experiences of other developing countries show that, because of the many differences between TONC and traditional types of tourism, its introduction requires a task force approach. The following activities aim to organize the multidisciplinary local teams which will guide, execute and support the proposed TONC program. As discussed later in the implementation strategy, some flexibility will be needed so an effective set-up is maintained as the younger organizations evolve.

### **1. DEVELOPING A NATIONAL STEERING COMMITTEE (NSC)**

This group will provide the guidance at policy levels and, most importantly, the political backing which will allow smoother implementation of actions which cut across existing institutions. This group should be conceived as a specialized sub-committee of the CONAP board to include heads of CONAP, INGUAT, IDAEH, CECON, supplemented by experienced private sector tour operator representatives and possibly local NGO's. Special efforts will be made to keep the NSC in close touch with the implementation issues in the RBM where most of the field actions will take place.

Project funds will assist the formation and initial functioning of this steering committee including office support and travel funds for attending meetings in the Petén.

## **2. CREATING A TECHNICAL WORKING GROUP**

Project funds will support a small Executive Secretariat composed by one full time local professional manager with technical background and managerial ability, supported by one administrative assistant. The manager would supervise and coordinate several sub-projects executed by a variety of local institutions and consultants in ways which will continue after the end of project life.

Since many of the field projects will involve RBM areas, institutions and programs, it is necessary that RBM's director or his direct reports will cooperate closely with the Technical Working Group in their management.

## **3. FORMING AN APPLIED RESEARCH SUPPORT NETWORK**

As previously described, support from a comprehensive and multidisciplinary research and extension effort is a prerequisite for designing, managing and promoting a sustainable and successful TONC program in Guatemala.

In the case of the RBM where little is known, the urgency and size of the applied research challenges facing the RBM management team, will require that a wide range of human and financial resources be attracted. Appropriate coordination will be needed to target research into priority protected areas so the different aspects (biological, archeological, recreation, community participation etc.) are covered.

A fund for research grants on topics with strong TONC implications will be set aside and will be used in close coordination with IDAEH, CECON and the RBM management committee. This fund will broaden the outlook and strengthen research efforts by Guatemalan universities and researchers. Joint efforts with foreign universities, institutes and NGO's will be promoted through the grant process. Efforts will be made to leverage project funds with other sources.

## **C. DEVELOPING INFORMATION AND BASIC INFRASTRUCTURE FOR TONC VISITORS**

### **1. INVENTORY OF TONC LOCATIONS AND RESOURCES**

A nationwide inventory of potential TONC locations will be undertaken. It will describe the sites which are currently visited and those that have interesting potential from the biological, cultural, archeological, and espeleological points of view. Although special attention will be given to the sites in the RBM area, nationwide coverage is required so a diversified menu of options can be presented to the TONC tourist. For example, tourists interested in archeology who come to visit Tikal and Copán, in Honduras, may be sold a side excursion to the Quiriguá, Izabal or Cobán areas.

This inventory will describe the attractions at each site, its present and projected conservation status, nearby communities which could be involved in protecting the site. In addition, precise location and access logistics will be recorded.

Within the RBM, sites with combined natural and archeological potential will be identified. Support will be considered for an existing IDAEH site registration program which is currently budgeted at under Q60,000 per year and has five people for the overall RBM area.

## **2. TOURIST MANAGEMENT PLANS FOR SELECTED AREAS**

Following the priorities set by CONAP and the RBM management committee, a few demonstration sites will be implemented jointly by the TONC Working Group and the corresponding RBM institution. For these, interpretive trails and longer hiking trails and excursions will be defined. Visitor centers with toilet facilities and area information will be designed and implemented.

## **3. BASIC OVERNIGHT ACCOMODATIONS IN SELECTED AREAS**

Rustic lodges to accommodate hammocks will be built in a few remote areas targeted by the RBM management for concentrated biological or archeological inventories. These will be intended, primarily, for scientists, RBM technicians and, occasionally, advanced specialized amateurs who can contribute to inventorying the areas. An attempt will be made to place these lodges under the care and operation of local people and in conjunction with RBM guard posts.

## **4. INTERPRETIVE MATERIALS**

Currently these materials are virtually non-existent at the different protected areas. The few materials that do exist are out of print and, in many cases, cannot be easily sold by institutions such as CECON or IDAEH. This activity will provide for grants and subcontracts to local researchers and institutions so they can develop trail guides and archeological site leaflets for casual visitors, wildlife lists for serious amateurs and monographs for scientists. Joint ventures of local with international institutions will be encouraged.

A video presentation with an overview of RBM attractions and activities will be produced. This will be available for showing to visitors at the main RBM visitor center. It will be sold as a souvenir and will be used as a tool to promote RBM as a research and study center.

## **D. DEVELOPING SELF-SUSTAINING FINANCING MECHANISMS FOR RBM**

Although the following activities will be designed for the RBM, many of the basic principles involved will be replicable elsewhere.

**1. INCREASING USER FEES AT PROTECTED AREAS**

Currently, a foreign visitor entering Tikal pays an entry fee of US\$1.25. After having paid over US\$1000 getting there, this can be a startling surprise. The Project, through its TONC steering committee, will promote a fee increase to the levels expected by foreign visitors. A study will be made to evaluate fees for other uses such as lodging, retail concessions etc.

**2. CREATING MECHANISMS FOR COLLECTING, ALLOCATING AND DISBURSING FEE INCREASES**

Procedures for expending and procuring by Guatemalan public institutions will be a major constraint to effective and timely implementation of MAYAREMA. For example IDAEH, the institution responsible for the operation of Tikal National Park, retains the entry fees in a bank account but can only make expenditures specifically budgeted each January. Petty cash revolving funds are insufficient or, in the case of CECON, inexistent.

This activity will use existing legal avenues to support public entities such as CECON and IDAEH with local non-profit organizations which can guarantee efficient and proper collection and disbursement of funds. The allocation of increased funds generated by the RBM institutions would be handled within CONAP.

**3. DEVELOPING OTHER SOURCES OF REVENUE**

This activity will provide Project funds for subcontracting to NGO's or private firms the development of products which can be sold as souvenirs. Products which can promote the RBM to prospective tourists will be specially sought. Examples are: high quality woodcrafts, posters, postcards, T-shirts with wildlife motives, area videos etc.

**E. TRAINING OF PERSONNEL AND INSTITUTIONS**

**1. SHORT TONC COURSES FOR TOUR OPERATORS, IDAEH, CECON, INGUAT**

The Working Group, in conjunction with the Steering Committee, will organize a series of conferences about TONC, its general features and some of the special topics such as: bird watching, research scientists, archeology, espeleology, canoeing, etc.

**2. STRENGTHENING OF TONC INSTITUTIONS**

Short duration management courses for mid- and upper-level management of IDAEH, CECON, INGUAT and tour operators will be offered. These courses would be given

by AGG and INCAE in topics such as: managerial planning, management by objectives, budgeting, team effectiveness and public relations.

A component of the applied research fund, described earlier, will be set aside and managed by the TONC Steering Committee from which RBM institutions will be able to draw for implementing smaller projects of specific demonstration value of TONC activities.

### **3. SPECIALIZED PERSONNEL TRAINING**

This activity will support training of TONC guides, service personnel for TONC operations and university level students interested in practical training and basic studies on the subject. A fund managed by the TONC Steering Committee will enable programs to be set up with CEDE, INTECAP, Universidad del Valle among others.

## **IV. IMPLEMENTATION STRATEGY**

### **A. COMPLIANCE WITH MAYA BIOSPHERE RESERVE LAW AND EXISTING INSTITUTIONAL ASSIGNMENTS**

All activities of this subcomponent have been designed and will be implemented according to Guatemalan laws. The coordinating role of CONAP and of the RBM management committee will be fully utilized to promote unity of purpose and coordinated execution of all TONC activities within the RBM.

### **B. TONC STEERING COMMITTEE UNDER CONAP**

The Steering Committee will function as a specialized subcommittee of CONAP's board. Since many of the TONC activities under the project will occur in the RBM, close contact at the operating levels will be maintained with the institutions of the RBM and their regional representatives. The Working Group, in particular, will help CONAP strengthen the operating links between RBM field personnel, regional offices of TONC institutions and private tour operators.

### **C. IMPROVING COOPERATION BETWEEN TONC INSTITUTIONS**

All activities of this subcomponent have been designed and will be implemented to achieve this cooperation which is essential for its success. For example, training activities, execution of demonstration projects, area management plans and applied research activities will all be organized and funded to promote joint participation of IDAEH, CECON, INGUAT, with private universities and tour operators.

#### **D. ROLE OF NGO'S AND PVO'S FOR ADMINISTRATION OF FUNDS**

The collaboration of carefully selected and audited NGO's and PVO's will be, actively, sought for executing parts of this subcomponent. They will be used extensively for performing the administrative and accounting functions which will allow the participating public institutions to execute in a timely fashion.

Great care will be exercised to allow for continuity after the end of the Project and not to weaken institutions by creating separate institutions within them.

#### **E. ROLE OF EXTERNAL TECHNICAL ASSISTANCE**

In Guatemala the TONC concept is new and poorly understood. Its success will require a sustained, catalytic force to gradually bring several diverse groups together. Because of this, it is recommended that a long-term advisor be retained for the first half of the program. Once the TONC Working Group is firmly established, foreign technical help should be reduced to no more than three person-months a year of short-term assistance.

### **V. OUTPUTS**

By the end of the Project's life, the following outputs are expected from the TONC subcomponent:

1. A National Steering Committee, under the auspices of CONAP, which will guide and provide political support for developing Tourism Oriented to Nature and Culture (TONC) in Guatemala.
  - With close participation of private sector.
  - With good cooperation between INGUAT, CECON, IDAEH.
  - With good integration of the natural and cultural heritage of the Reserva Biosfera Maya (RBM).
2. A TONC Working Group which, operating through field managers of RBM, CONAP institutions and private firms will have produced:
  - A system to collect and disburse increased entry fees to Tikal and other protected areas totaling over US\$200,000 annually.
  - Over twenty new TONC guides trained.

- Over 500 mid to upper level public officials and tour operators trained by TONC courses.
  - A system for regularly updating planning and marketing information about TONC visitors.
  - At least three demonstrations of community participation in new TONC activities.
  - Over ten trail guides, fifteen monographs on biological, archeological or antropological topics of interest to TONC and one promotional video.
  - Four information racks about TONC attractions, resources and logistics at main airports and bus entry points.
3. An applied research program in TONC issues of the RBM with joint participation of Guatemalan and foreign universities.
- With over 30 research projects completed or under way.
  - At least two field research stations developing.
  - Matching research funds obtained from non-AID sources.

## **VI. INPUTS**

As shown in the attached budget, USAID's contribution will total US\$1,103,400 before contingencies and inflation adjustments. Of these, US\$627,900 will be Dollar expenditures.

Proposed technical assistance totals US\$580,400 and includes 36 person-months of long term, US\$148,400 of short term and US\$67,500 of applied research grants to foreign institutions working in partnership with local entities.

Local currency funds totaling US\$105,000 will be used to start a fund for applied TONC research and small demonstration projects. A specialized TONC Working Group will be established with US\$202,000 in local currency.

Guatemalan contributions total US\$68,600 corresponding to expense sharing in some of the events organized with Project funds.

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## **F.5 TECHNICAL ANALYSIS FOR HUMAN RESOURCE DEVELOPMENT**

### **TECHNICAL PAPER**

## **PUBLIC AWARENESS AND ENVIRONMENTAL EDUCATION**

### **GENERAL ASPECTS OF THE HUMAN RESOURCE DEVELOPMENT COMPONENT**

#### **I. Introduction**

One of the major constraints to sustainable natural resource management in Guatemala today is the lack of awareness about the importance of natural resources for current and future production and economic development and understanding about how to modify the attitudes and behaviors of Guatemala's political leaders, agency personnel, farmers, students and the general public. An associated scarcity is of individuals and institutions to increase awareness and promote quality environmental education. For instance, only one person works full-time in Guatemala on environmental education.

The Maya Biosphere Reserve Project should have a strong program in Human Resource Development to support the Administrative activities and the Protection and Management and Sustainable Resource Management for Income Generation Components of the project. This, thereby, will help promote and ensure the long-term protection and sustainable management of natural resources in the Maya Biosphere Reserve and its surrounding area.

The Human Resource Development Component will have 2 sub-components: 1) Public Awareness and 2) Environmental Education. These should be strategically planned and should be integrated, insofar as possible, as parts of other project components and as discrete activities.

For the Human Resource Development Component to successfully make its contribution to meeting project objectives, it should provide: 1) technical assistance to coordinate, work with, and strengthen selected public and private institutions; 2) short-term training both in-country and internationally; 3) applied research to ensure that the awareness, environmental education, and training activities are properly designed and implemented, using appropriate media, methods, and materials; 4) commodity and services (e.g., contracting of artwork, publications, printing) support to ensure the efficiency and effectiveness of the activities.

Technical assistance should include a long-term advisor to work with a Guatemalan counterpart for the first 4 critical years of project start-up activity, planning training, and initial design and implementation. Short-term assistance (e.g., educational material development specialist) also should be provided during this period. Technical assistance in years 5-6 should include continuation of assistance by the long-term advisor but only on a periodic basis for specific activities, as well as other short-term assistance as appropriate.

A Guatemalan counterpart from CONAMA should have responsibility for long-term implementation of public awareness and environmental education activities. The implementor should coordinate principally with CONAMA and its associate institutions as well as with other

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appropriate groups such as universities and NGOs to ensure the successful implementation of this Component.

#### **GENERAL OBJECTIVES OF THE HUMAN RESOURCE DEVELOPMENT COMPONENT**

The overall objectives of the Human Resource Development component should be:

1. Increase the awareness and the understanding of the public (government agencies) and private (including citizens, business people, NGOs, etc.) sectors about the Maya Biosphere Reserve, the project itself, and the conservation of natural resources in the Peten
2. Create support for the protection of the Reserve and for the promotion and development of sustainable income generation activities in the area of the Reserve.
3. Change the attitudes and behavior of the local inhabitants
4. Strengthen public and private institutions through training of personnel in the approaches, practices, and technologies to increase public awareness and environmental education

#### **GENERAL STRATEGIC CONSIDERATIONS FOR THE HUMAN RESOURCE DEVELOPMENT COMPONENT**

The Maya Biosphere Reserve Project should:

- a. Identify and take advantage of the existing opportunities in both the formal and informal sectors in awareness and education activities
- b. Coordinate and integrate, to the greatest degree possible, with existing and planned activities in public awareness and environmental education at both the national and regional level.
- c. Establish a range of models for awareness, education, and associated orientation/training activities with general and specific information for a broad range of audiences; on the basis of experimentation, adapt the model to ensure the effective multiplication of understanding and environmental action.
- d. Strengthen institutions with existing programs; provide opportunities for the development of new programs in existing institutions
- e. Ensure the greatest participation of women in public awareness and environmental education, integrating in special form, information about the problems and priorities of life in the Peten (e.g., health, water)

- f. Promote the joint training of diverse groups of participants to increase the exchange of ideas and the better understanding of the complexity of the challenge of integrating conservation and socio-economic development.
- g. Additionally, identify and establish programs appropriate for each of the various audiences (e.g., policy makers, teachers, personnel that work in the Reserve, NGOs)
- h. Develop and disseminate general information about the project at the local, national, and international level
- i. Train project personnel in knowledge and skills to undertake awareness and environmental education activities

### **GENERAL OUTPUTS OF THE HUMAN RESOURCE DEVELOPMENT COMPONENT**

The general outputs of the Human Resource Development Component should be:

#### **A. INSTITUTIONAL DEVELOPMENT**

- a. Guatemalan institutional development to do public awareness and environmental education
- b. teachers oriented/trained in environmental education
- c. Reserve personnel and others trained in communications skills
- d. courses for NGOs in environmental education to provide skills and information for them to enhance their field activities
- e. women trained in environmental education who can enhance decisionmaking at parents' association meetings, etc.

#### **B. AWARENESS AND EDUCATION MATERIALS DEVELOPED AND DISTRIBUTED**

- a. didactic materials distributed to all the schools in the immediate area of the Reserve
- b. posters distributed in schools, public buildings, etc. for broader coverage of the population

- c. policy maker awareness increased through workshops, study tours, and conference
- d. packets of information produced about the project in both Spanish and English

### **C. CHANGE OF ATTITUDES AND BEHAVIOR**

- a. policymakers and public more committed to conservation
- b. persons reached by radio spots able to participate more actively and knowledgeably in planning and decisionmaking
- c. students begin to plant trees around school or at home
- d. decreased poaching of wildlife and illegal excavation of cultural artifacts

### **TECHNICAL ANALYSIS OF HUMAN RESOURCE DEVELOPMENT ACTIVITIES**

The technologies to be proposed for the public awareness and environmental education activities are generally well-known, tested, and refined, and they present a low risk to the project. For example, social marketing techniques can be used to guide the development of the public awareness programs. Computers, slide projectors, vehicles, and other simple equipment are the technologies proposed for these activities.

Only a few limits to the functionality, suitability, and cost effectiveness of the proposed technologies exist. Commodity procurement, insofar as possible, should be based on equipment that can be locally maintained. While video equipment is an important tool and is increasingly used for public awareness and environmental education in many places, it has limitations that must be recognized--the potential for technical difficulties will probably limit its use to more central facilities rather than use in smaller, less developed areas. Slide programs, puppet shows and other activities are lower in risk (i.e., potential for breakdown), effective means for presentation, and cost effective alternatives. Computers are essential for the implementation of activities in this component. Training for staff, availability of appropriate software and supplies, and protection for machines (e.g., air-conditioned facility) will be required for this technology to be feasible.

## **PUBLIC AWARENESS SUB-COMPONENT**

### **II. Introduction**

Some public awareness activities are on-going in Guatemala. These include television programs that feature African wildlife and other environmental themes. Also, videos, posters, children's magazines (for instance, those published by Editorial Piedra Santa), and radio spots already are being used around the nation to raise the environmental awareness of the public at large.

The Public Awareness Sub-Component of the Maya Biosphere Reserve Project should focus on two major audiences: policy makers and the general public. The premise of the activities outlined below for each of these audiences is that it is necessary to raise consciousness before policies can be changed, before attitudes and behavior can be modified, and before commitment to long-term support can be developed among the various groups. The general approach should be to implement a set of small activities at the outset that establish the direction, tone of cooperation, and priority that is given to these issues by the project; to increase the level of awareness over the early stages of the project; and to stabilize the program as the project nears its end.

For the Public Awareness Sub-Component to successfully make its contribution to meeting project objectives, it should provide: 1) technical assistance (as described for the Component as a whole) to coordinate, work with, and strengthen selected public and private institutions; 2) short-term training; 3) applied research to ensure that the awareness activities are properly designed and implemented, using appropriate media, methods, and materials; 4) commodity and service support to ensure the efficiency and effectiveness of the activities.

While a potentially large group of institutions exists for the project to coordinate with, the following are the most likely to play an active role: CONAMA (principally for coordination at the national level and with policy maker workshops, study tours and national conference, and at the regional level as per plans prepared in conjunction with Peace Corps support); CONAP, as the central authority for Reserve management; DIGEBOS (for interaction with communities and associations); CECON, Centro Universitario in the Peten, and NGOS (for interaction with local people, communities, associations, and schools). Other institutions may be tapped for orientation/training and development of materials (e.g., USAC, Del Valle and Landiver).

### **STRATEGIC CONSIDERATIONS FOR THE PUBLIC AWARENESS SUB-COMPONENT**

The Maya Biosphere Project should:

- a. Initiate some preliminary awareness activities for policy makers as soon as possible
- b. Develop a strategy and implementation plan in conjunction with the public and private sector, seeking internal and external support for implementation

- c. Focus principally on the Peten while it provides support for some activities in the capital and other parts of the nation
- d. Use existing information about the reserve, the laws, etc. to develop preliminary programs and modify them as new information is obtained from research and experience
- e. Use information and materials that are developed under other components and sub-components as appropriate
- f. Focus on the themes of: ecology of the country and especially of the Peten; conservation of natural resources; policies and laws, the values and long term contribution of natural resources to socio-economic development of the Peten, the nation, and the world
- g. Conduct research as necessary to identify audiences, their needs, levels of education, preferred materials and media
- h. Provide short-term training as appropriate to ensure the successful design and execution of public awareness activities

#### **PUBLIC AWARENESS SUB-COMPONENT ACTIVITIES**

As soon as possible after the start up of the project, implementors should initiate the development of a public awareness strategy, train project personnel, conduct applied research as appropriate, and prepare and disseminate materials for the various activities that are geared to the specific needs and interests of the various audiences. This set of activities should include:

1. *Prepare a Project Public Awareness Strategy* that will guide the development and implementation of the public awareness activities of the project. This will be prepared in draft form and be revised based upon input from a group of advisors. This strategy should include:
  - a. an inventory of existing and potential awareness and education programs (e.g., the "Educacion para la Vida" project that SEGEPLAN is designing and plans to implement in communities) with which the Project should coordinate and/or support;
  - b. a plan of action, identifying sequencing of activities and identifying and clarifying the roles, responsibilities, expectations, and inputs of the various participating institutions;
  - c. guidelines on the development of materials and use of media and their evaluation for future revision;

- d. identify needed research; and
- e. outline a more specific plan for procurement of needed commodities.

At the outset a review would be useful of what is already known (state-of-knowledge/art) about technical areas (e.g., ecology, forest management) and effectiveness of various media and materials (e.g., slide programs) would help define both opportunities on which to build and future research efforts that would identify means and mechanisms to resolve obstacles to effective public awareness. This can be done in conjunction with the development of a project environmental education strategy, insofar as appropriate.

2. **Conduct a Workshop on the Draft Project Public Awareness Strategy** which should invite 15-20 representatives of key public and private institutions (e.g., CONAMA, CONAP, MAGA, Education, NGOs, media) to discuss, modify, and refine the draft strategy and provide input into decisions about priorities, activities, and messages of the Maya Biosphere Project's public awareness program.
3. **Train Project Personnel** (see Training activities in Component 1)
4. **Conduct Applied Research** on key topics, such as profiles (e.g., age, gender, level of education, preferred media, constraints and opportunities to participation) of the various audiences. (Note: The level of effort will be determined under the applied research program.)
5. **Prepare Materials** for use in the public awareness program. The audiences will include: general public, policymakers, agency personnel, non-governmental organization personnel, and private enterprise. Many materials will be developed under the other components and sub-components that can be used directly or in modified form to support the objectives of this sub-component. An illustrative list of outputs for this activity should include, but is not limited to the following:
  - a. **Newsletter** with calendar of events (past and future); report of meetings, workshops, seminars, study tours, and other activities. [In Spanish and English]
  - b. **Brochures** to describe the Reserve and project activities [In Spanish and English]
  - c. **Audio-visuals** (e.g., slide programs) for presentation to various groups such as schools, cooperatives, teacher and other civil associations. A video for presentation to the policymakers and the general public will be produced during the first year.
  - d. **Visual materials** such as posters, tee-shirts, caps, project sign boards, etc. which promote awareness of the Reserve and the project.

- e. **Reports of meetings, workshops, study tours, etc.**
  - f. **Articles about the public awareness, environmental education and training activities of the project**
  - g. **Radio spots with new briefs, general environmental and conservation-related information, etc.**
  - h. **News releases for newspapers, radios, television about events related to the Reserve, the project and conservation of resources**
  - i. **Simple guides to protected area and forestry laws for dissemination to local people**
6. **Disseminate Materials at public meetings; in schools; during workshops, seminars and other project events; and through various media services. In order to ensure the broadest dissemination possible, the project should leverage funds from government, NGOs, and others. It should seek opportunities to make materials available for use by others (e.g., environmental education activities of NGOs such as Amigos del Bosque, Defensores de la Naturaleza or programs, the interpretive exhibits of museums and zoos). It should also solicit assistance of radio stations (e.g., Radio Tikal in Flores) to provide free time for presentations. Since the sub-component focuses primarily on the Peten, less emphasis should be placed on the development of video materials; however, any materials developed should be made available to television stations and others interested in using them to develop video programs.**

### **III. Activity by Major Audience**

The following activities by major audience are recommended:

#### **A. POLICY MAKERS**

Insofar as possible, the project should tap resources from RENARM and other sources to initiate some of the awareness-raising activities among policy makers. This might include support for the participation of some policy makers in regional workshops/seminars or study tours to investigate and discuss opportunities for the integration of conservation and socioeconomic development.

The policy maker awareness-raising activities should include the following:

- 1. **Policy Maker Workshops to bring together groups of local and national decisionmakers in both the public and private sectors to:**

- a) increase the awareness of those who are likely to influence decisions about environmental issues, especially related to protected areas and the integration of conservation and socioeconomic development (e.g., the potential of extractive reserves) in Guatemala
- b) provide information for future strategic planning and policy development for the Peten and the Nation

These workshops will provide opportunities for discussion of various environmental and natural resource management topics; presentation and discussion of the results from policy and other relevant applied research; viewing of audio-visuals and other materials prepared by the project and by other projects (e.g., RAPID--the Resources for the Awareness of Population Impacts on Development). Each year, a Policy Maker workshop will be held bringing together 15-20 individuals likely to influence policy in Guatemala. After the first year, the workshop should include a selected group of individuals from previous workshops, plus new individuals to expand the number of policy makers with raised awareness by the end of the project. Approximately 95 policy makers will participate in these workshops during the life of the project (LOP).

2. **Policy Maker Study Tours** to provide a select group of those likely to influence policy with in-country and international study tours to: increase their awareness about the potentials, means, and mechanisms for promoting protected area management and the integration of conservation and socioeconomic development in Guatemala.

These study tours will provide opportunities for policy makers to see on-the-ground the constraints to and opportunities for protecting natural resources and for integrating conservation and socioeconomic development. Each year, one domestic study tour and one international study tour for policy makers should be supported by the project. A domestic study tour should be extended each year to approximately 10 policy makers to visit the Maya Biosphere Reserve to see and discuss its status, understand project activities, and have the opportunity to interact and receive input from local residents. An international study tour should be extended to approximately 5 different policy makers each year to travel to another country (e.g., Costa Rica); to visit national parks and equivalent reserves; to discuss the policies, plans, and results of efforts to integrate conservation and development.

3. **A National Conference to Promote Environmental Awareness in Guatemala**, should be hosted by the Maya Biosphere Project, with supplementary funds from other sources (e.g., RENARM, international NGOs). The conference would be held at some mid-point during the LOP. This conference would bring together approximately 100 people (policy makers, public and private sector representatives, and the general public) to discuss the values of sustainable resource management in Guatemala, with special emphasis on the role of protected areas such as the Maya Biosphere Reserve.

These activities focused on policy makers should "create and sustain the awareness that Guatemala is a natural resource based country, and that hopes for progress depend upon harmonizing economic activity with the proper management and protection of this base" (PID, 1989).

## **B. GENERAL PUBLIC**

The awareness-raising activities for the general public should include a two-pronged approach. Primary emphasis and support should be devoted to development of activities and materials for use in the Peten; other more general activities should focus on national level issues.

Awareness activities for the general public should include the following:

1. **Mass Media Campaign** to provide information to the public about the values of the tropical forest, laws (e.g., illegal hunting, illegal excavation of cultural remains), project activities. Project implementors should coordinate closely with other public service programs, with radio stations interested in using materials developed by the project. Schools, public offices, and others should be provided with posters and other visual materials (e.g., calendars). Primary emphasis should be on messages to local residents in the Peten. However, radio briefs, posters, and other materials that can be disseminated more broadly should be provided to other locations in the country (e.g., zoos, museums). Brochures to describe the Reserve should be developed and distributed at the Reserve and in Tikal, Flores and other communities. Other visual materials such as posters, tee-shirts, caps, project sign boards, etc. should be developed to promote awareness of the Reserve and the project. Some of these can potentially be turned into income generating activities for the Reserve.
2. **Mobile Awareness Campaign** reflects (as noted in the Social Soundness Analysis) that in general, the protected area component of the project will be a "hard sell". Protection will be difficult for many people to understand; little direct economic benefit will come to the majority of those living in the area of the Reserve; much development activity will be restricted rather than promoted; protection is a long-term concept in an area that has people with many critical short-term needs. Therefore, the project should provide more targeted information through a variety of mechanisms. These include:
  - a. **Community Meetings**--Communities such as Uaxactun, Carmelita, El Zotz, and El Naranjo should be the first of the communities to receive the public awareness message of the mobile seminar unit. The programs should discuss environmental values, economically viable resource use options, laws and Reserve regulations, and project activities.
  - b. **Association Meetings**--Associations of teachers, parents, cooperatives, lumber operators, and other should receive information similar to that of the

communities. These associations will hopefully provide leadership in disseminating this information further within their communities and among the members of their associations.

- c. **School Programs**--Schools can benefit both from environmental education (described below) as well as from a provision of materials by a mobile awareness unit. While it will be impossible to visit all 400 schools in the Peten, project implementers should identify the group of schools that could benefit most directly and immediately from receiving information about the reserve.

This set of activities should start out small and should focus on communities, associations, and groups inside and on the boundary of the Reserve. As part of the strategic project activity planning exercise described above, it will be important to identify priority groups to present the awareness materials to first.

Materials developed for other public awareness activities can be used in these various forums. Additional material, depending on the specific audiences should be developed and/or adapted. Fundamentally, the approaches to awareness in these meetings and programs should be spoken and visual, and the materials must have a close fit between the message and the recipient of the message. Written materials (e.g., simple guides to forestry and protected area laws) should be developed for dissemination.

3. **Interpretive Program** at the Reserve should include posters, slide programs (as appropriate), brochures, etc. for presentation to visitors.

### **C. ANTICIPATED OUTPUTS OF PUBLIC AWARENESS SUB-COMPONENT**

The outputs for the sub-component (as described above), with a list of general inputs, would be:

- o 6 policy maker workshops for 95 policymakers over the life of the project (Inputs: TA, materials, commodities)
- o 12 policy maker study tours--6 national level study tours for 60 policy makers receiving an on-the-ground view of the status of activities and local input on the Reserve and the project; 6 international study tours for 30 policy makers receiving increased understanding of the opportunities for promoting management and the integration of conservation and development (Inputs: TA, material, travel and perdiem for policy makers)
- o Preparation of project public awareness strategy and associated workshop for 15-20 representatives of public and private institutions participating in planning and decisionmaking and with increased awareness of the project and its operations. Overall benefit from this exercise will accrue to the potentially millions of

Guatemalans who receive public awareness messages over the LOP. (Input: TA, commodities, materials, research)

- o 1 applied research effort with the production of a report providing profiles and related information for the development of public awareness activities (Inputs: TA)
- o 1 national conference on environmental awareness for 100 policy makers, public and private sector personnel, and general public to discuss the values of sustainable resource management in Guatemala with special emphasis on the role of protected areas.
- o Mass Media Campaign (Inputs: TA, materials, research)
  - 10 radio spots developed and available for presentation; 100,000 Peteneros reached by message; 2 million people in the country
  - 5 thematic posters x 2000 units each; 100,000 see message
  - 1 brochure x 100,000 units--300,000 people aware of Reserve
  - 5,000 Tee-shirts for sale--5,000 people will carry message
  - 1,000 Caps for sale--1,000 people will carry message
  - 1,000 Key chains--1,000 people will carry message (illustrative budget for many of these articles is appended)
  - Video for presentation to all groups including policy makers--5,000 viewers
- o Community Meetings--30 communities (some visited more than once) over LOP; 3000 people contacted by mobile unit with messages (Inputs: TA, commodities, materials, training)
- o Association Meetings--40 meetings over LOP; 1500 people contacted with message (e.g., 100 teachers) (Inputs: TA, commodities, materials, training)
- o School Programs--20 primary schools within the immediate area of the Reserve; 500 students with increased awareness; 50 parents with increased awareness (Inputs: TA, commodities, materials, training)
- o Interpretive Program--at Tikal at the outset viewed by 60,000 visitors per year visitors (Inputs: TA, commodities, materials)

## ENVIRONMENTAL EDUCATION SUB-COMPONENT

### IV. Introduction

Over the past decade, as Guatemalan educators have been revising the nation's educational programs and curricula, they have included some program activities in environmental education. A variety of activities has taken place that are outlined in a recent Working Paper for a seminar/workshop on a "National Environmental Education Strategy".

In the formal sector for primary education, the Ciclo de Educacion Fundamental (CEF) and the Ciclo de Educacion Complementario (CEC), the opportunity exists for the increase of environmental awareness and understanding. In 1981, a MED-UNESCO project established the Comision Nacional Permanente de Educacion Ambiental (CONAPEA) which promoted the development and incorporation at the primary school level, of an environmental studies unit in the natural science course curriculum. In 1987, the government created the Sistema de Mejoramiento de los Recursos Humanos y Adecuacion Curricular (SIMAC) that has been a fundamental instigator and leader in curriculum reform. Among the products of SIMAC are curricular guides that include environmental information as well as information about democracy, nutrition, health, and work. In 1987, new curricular guidelines for first grade entered the schools; those for second and third grade in 1988, and those for fourth, fifth and sixth grades in 1990. SIMAC also provided training to teaching instructors and to teachers themselves. SIMAC has received technical and financial assistance for UNESCO, the Netherlands, and USAID/Guatemala. SIMAC has also received technical assistance in some of its training and curricular development activities from CONAMA and ASIES (Asociacion de Investigacion y Estudios Sociales).

At the mid-level, in the "ciclo basico", schools have had an environmental studies unit in their natural science courses. CONAMA with support from Peace Corps is planning teacher training activities. The first stage of this effort has been initiated in the Department of Huehuetenango. In 1988 and 1989, the Ministry of Education provided students at the "ciclo diversificado" level, with environmental education themes in their graduation seminars. At the university level, USAC has initiated a new masters program in Design, Planning and Environmental Management. Among others that might be involved are Del Valle through its Institute of Natural Resources; Landiver through its Institute of Environmental Sciences in the Faculty of Agricultural Science; University of San Carlos masters program in Environmental Science; Centro Universitario in the Peten, and CECON through its biotopo activities.

Non-formal education also will receive input on environmental studies from governmental and non-governmental activities. The Comite de Alfabetizacion (CONALFA) and CONAMA are programming training of local "animators" in the Departments of Quetzaltenango, Huehuetenango, and Izabal.

Various governmental agencies provide some environmental awareness training to their personnel. Training for the military and police includes information about how they can incorporate environmental concerns in their activities. DIGEBOS (Direccion General De Bosques y Vida Silvestre) trains its employees (especially forestry promoters/"promotores forestales") to work

in rural schools and with local residents in environmental education. INGUAT and CECON (Centro de Estudios Conservacionistas of the University of San Carlos) work with the public in national parks and biotopos to provide environmental information. The government is also promoting tree planting, domestication of wildlife species, national park management and related programs which carry an environmental message. Other national and international activities in support of wise use of natural resources and protection of certain areas for their biological and cultural values also provide future opportunities to use materials that have been developed as well as serve as outlets for materials developed by the Maya Biosphere Reserve Project itself.

NGOS (e.g., Amigos del Bosque, Fundacion Dolores Bedoya de Molina) should also be supported in their development and presentation of environmental education workshops.

The Environmental Education Sub-component of the Maya Biosphere Reserve Project should be based on the premise that people need skills and knowledge in order to change their attitudes and behavior. The groups receiving benefit from this sub-component will include: 1) teachers who need training and materials for environmental education programs in their schools; 2) students in primary and secondary schools; 3) students in literacy programs; and 4) university students, particularly those receiving degrees in natural resource-related fields. The general approach recommended is to: develop a project environmental education strategy for the project; design a range of model programs, teaching methods, and didactic materials that are geared to the different audiences; test models, methods, and materials and adapt them to address the needs, interests, opportunities and constraints of a variety of target groups. The messages should be written, spoken, and visual.

The program should focus initially on teacher training and development of materials for primary schools. Insofar as possible, these activities can be linked to the education of university students in order to encourage a multiplication of skills and knowledge development in professional education. The project should also have a small grants fund to support the development and presentation of environmental education programs and/or materials in the Peten by teachers, university students, NGOs and others. While the emphasis of this sub-component of the Project is almost exclusively on the Peten, the materials developed should be made available for adaptation and use by programs and groups in other parts of the country.

For the Environmental Education Sub-Component to successfully make its contribution to meeting project objectives, it should provide: 1) technical assistance (as described above) to coordinate, work with, and strengthen selected public and private institutions to develop and implement environmental education programs (e.g., design of curricular materials); 2) short-term training (See Training Technical Paper) for personnel working in the design and implementation of the sub-component and for teachers who will be testing, adapting and using the methods and materials in their schools; 3) applied research to profile the various audiences and their needs, interests, opportunities and constraints and to ensure that the environmental education activities are properly designed and implemented, using appropriate media, methods, and materials; 4) commodity and service support to ensure the efficiency and effectiveness of the activities.

Again, a potentially large group of institutions exists for the project to coordinate with, however, the following are the most likely to play an active role: CONAMA (principally for coordination at the national level, including the "Educacion para la Vida" program to avoid overlap

in the development of activities and materials and implementation in the field) and with the Ministry of Education. The university community of Guatemala provides a particularly important institutional base to tap and strengthen for actual design and implementation of the programs. They have existing technical and curricular resources, and they can provide multiplication of benefit by encouraging the professional development of their students in project activities.

## **STRATEGIC CONSIDERATIONS FOR THE ENVIRONMENTAL EDUCATION SUB-COMPONENT**

The Maya Biosphere Project should:

- a. Identify and strengthen universities, institutions, governmental organizations, and non-governmental organizations in the development of a coordinated program of environmental education
- b. Study the needs, priorities, and level of education of the participants in order to focus all of the educational materials on the needs, priorities and level of education of each audience.
- c. Use and adapt existing educational materials for all levels of education and experience of the audiences.
- d. Focus primarily on the problems and potentials of the Peten, e.g., sustainable management extractive reserves and natural forests, health, water, and soils

## **ENVIRONMENTAL EDUCATION SUB-COMPONENT ACTIVITIES**

As soon as possible after the start up of the project, implementors should initiate the development of a environmental education strategy, train project personnel (under Project Component 1), conduct applied research as appropriate, and prepare and disseminate materials for the various activities that are geared to the specific needs and interests of the various audiences. Insofar as appropriate and feasible, these activities should be designed and implemented in conjunction with those of the public awareness sub-component. This activity will include:

1. **Prepare a Project Environmental Education Strategy** that will guide development and implementation of the environmental education activities during the life of the project. This should take into account the National Strategy on Environmental Education that is currently being developed in Guatemala. This should be prepared in draft form and revised based upon input from a group of advisors. This will include:
  - a. an inventory of existing and potential environmental education programs (e.g., the Educacion para la Vida project that SEGEPLAN is designing and plans to implement in communities; SIMAC, Ministry of Education) with which the Project should coordinate with and/or support;

- b. a plan of action, identifying sequencing of activities and identifying and clarifying the roles, responsibilities, expectations, and inputs of the various participating institutions;
- c. guidelines on the development of materials and use of media, and their evaluation for future revision;
- d. identify needed research; and
- e. outline a more specific plan for procurement of needed commodities.

At the outset it would be useful to review what is already known (state-of-knowledge/art) about technical areas (e.g., ecology, forest management) and effectiveness of various media and materials (e.g., slide programs) would help define opportunities on which to build and future research needs to identify means and mechanisms to resolve obstacles to effective environmental education. This might be done in conjunction with work contemplated under the public awareness sub-component.

2. **Conduct a Workshop on the Draft Environmental Education Strategy** which will invite 15-20 representatives of key public and private institutions (e.g., CONAMA, CONAP, MAGA, Education, NGOs, media) to discuss, modify, and refine the draft strategy and provide input into decisions about priorities, activities, and messages of the Maya Biosphere Reserve Project's environmental education program.
3. **Train Project Personnel** in environmental education tools and techniques (see Training section in Component 1)
4. **Conduct Applied Research** on key topics, such as profiles (e.g., age, gender, level of education, preferred media, constraints and opportunities to participation) of the various audiences. (Note: The level of effort will be determined under the research sub-component)
5. **Prepare Materials** for use in the environmental education program. Many materials should be developed under the other components and sub-components that can be used directly or in modified form to support the objectives of this sub-component. An illustrative list of outputs for this activity includes, but is not limited to the following:
  - a. Catalogue of didactic materials
  - b. Library of materials available for reference
  - c. Publications
    - 1) Books

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- a) **Nature and Society in the Peten: A Guide to Environmental Education**
  - b) **Environmental Education for Educators**
  - c) **School books/booklets**
  - d) **Biodiversity in the Maya Biosphere Reserve**
- 2) **Manuals, Guides, and Technical Notes**
- a) **Community Participation Guidelines and Methods**
  - b) **Preparation of Interpretive Programs for Visitor Centers**
  - c) **Guide to Development of Environmental Education Programs in the Schools of the Peten**
  - d) **Guide to the Development and Promotion of Environmental Education Programs for Women in the Peten**
  - e) **Guide to Development and Presentation of Public Awareness Programs in the Peten**
  - f) **Training Trainers in Environmental Education**
  - g) **Glossary of Environmental Terms for Teachers**
- 3) **Workbooks**
- a) **Personal Workbook on Environmental Education for Students (Cuaderno de Trabajo Personal)**
  - b) **Course Outlines and Materials for Trainers in Extension/Outreach Programs for Xateros and others**
- 4) **Coloring Books (with blank pages at the end to permit children to draw additional pictures or write short stories)**
- a) **Flora and Fauna of the Peten (linked with learning of the alphabet)**
  - b) **Short stories about nature and pictures**
- 5) **Pamphlets and Brochures**
- a) **Forestry Laws**
  - b) **Protected Areas Law**
  - c) **Maya Biosphere Reserve Law**
- 6) **Visual Materials**
- a) **Posters (e.g., Resources of the Maya Biosphere Reserve; Conserving Biological Diversity)**
  - b) **Maya Biosphere Reserve Calendar for local schools (e.g., with each year until the end of the century)**
- 7) **Audio Materials**

- a) Radio spots with short stories about nature (e.g., old man telling about the disappearance of trees and wildlife in his area)
    - b) Newsbriefs about the Reserve that would attract the attention of children
  - 8) Audio-Visual Materials
    - a) Slide programs
    - b) Video as appropriate
    - c) Puppets
  - 9) Materials for Speakers
    - a) Notebook of information for speakers (e.g., politicians, Reserve personnel) who might be interested in talking about environmental issues
  - 10) Reports and Articles
    - a) Workshop, Seminars, and Conference proceedings
    - b) Articles for professional national and international journals (e.g., Tools and methods for promoting environmental education in the Peten, Guatemala; Human Resource Development for the Maya Biosphere Reserve in Guatemala)
6. **Disseminate Materials at schools--**To ensure the broadest dissemination of materials possible, the project should leverage funds from government, NGOs, and others. It also should seek opportunities to make materials available for use by others (e.g., environmental education activities of NGOS such as Amigos del Bosque and Defensores de la Naturaleza, the interpretive exhibits of museums and zoos). It should also solicit assistance of radio stations (e.g., Radio Tikal in Flores) to provide free time for presentations.

#### ACTIVITIES BY MAJOR AUDIENCE

- 1. **Orientation/Training--**The major audiences for training under Component 2 are: teachers, NGOS personnel, and university students. Certificates of participation should be given for successful completion of each course. (Note: The training activities described here do not include training of staff which will be part of the institutional development activities under Component 1.)
  - a. **Schools Administrator Orientation and Training Workshop--**School administrators and educational orienters ("orientadores") in the region should

receive preliminary orientation and participate in training that is geared to prepare them to assist and lead insofar as possible in teacher training activities. Their support and input will be critical. They should have participated in the exercise to develop the project environmental education strategy. This will supplement their opportunities to receive more detailed substantive information, and provide input into the programs being developed.

b. **Teacher Orientation/Training**

1) **Orientation/Training Workshops for Members of Teachers' Association**--Over the LOP, annual workshops should be conducted to orient/train the approximately 150 teachers the working in the Peten about the use of existing materials, how to develop simple materials and field activities for use in schools, and skills and information needed to work with Parents' Associations and other groups in their community to spread environmental education messages. The training workshops will also provide project implementors with input into the development and/or refinement of didactic materials that best meet the needs of the students and general population of the Peten.

2) **In-Service/School Training**--One-on-one training with project implementors. The training will focus on the specific needs and interests of individual teachers and their students; special environmental education issues in their community; simple activities that they can develop for use in educating their students; ideas for working with Parents' Associations and other groups in their specific community to expand the reach of the environmental education; and means of incorporating materials for children into literacy programs for adults.

c. **Short course/Seminar/Workshop Training for University Students**--Beginning in year 2 of the project, a brief orientation seminar, course, or workshop on environmental education should be presented to select students of at least 3 institutions in the country. This should include an overview of the literature and state-of-the art of environmental education as well as provide examples of the range of activities that can be developed for environmental education at the primary and secondary school level. Approximately 300 university students (primarily in natural resource and education-related fields) should have the opportunity to participate in the training. Interested professors should also be invited to attend in order to enhance their awareness of tools and methods environmental education. A local field trip will be part of the training. Participants should develop some materials as part of the activity. Materials developed for other parts of the public awareness and environmental education sub-components should be incorporated into this activity.



## Anticipated Outputs

- o Preparation of draft project environmental education strategy and associated workshop for 20 representatives of public and private institutions participating in planning and decisionmaking on environmental education. Overall benefit from this exercise will accrue to hundreds of thousands of Guatemalans, especially children of the Peten who will receive a better designed and implemented educational program (Input: Ta, commodities, materials, research)
  
- o Preparation and dissemination of materials:
  - Library of materials available for reference--50 books
  - Catalogue of didactic materials --100 copies
  - 5 books published x 2000 copies each for sale
  - Series of 7 manuals, guides and technical notes--1000 copies each
  - 1 workbook for students--1,000 copies
  - Course Outlines for Teachers--150 copies
  - Series of 2 coloring books--2000 copies
  - Brochure/Pamphlet--100,000 copies
  - 2 posters x 500 units for Peten schools--2000 viewers
  - Calendar x 500 units for Peten schools--2000 viewers
  - 10 radio spots--100,000 receive message
  - 100 newsbriefs (monthly)--100,000 receive message
  - 2 slide programs--10,000 viewers
  - 2 training videos--1000 viewers
  - 3 puppet programs--3000 viewers
  - Speaker's notebook material--30,000 receive messages
  - 5 proceedings/training materials x 500 units--1000-receive message
  - 5 articles in environmental education and natural resource managment journals--40,000 international readers

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Consultation with: German Rodriguez (CONAMA); Hilda Rivera (CONAP); Ed Butler and Victor Hugo Garcia (Peace Corps/Guatemala), Lic. Zetina Puga (Ministry of Education/Peten); Drs. Michael Dix, Margaret Dix, Jack Schuster, and Michael Richards (Del Valle University); Ing. Bruno Busto (Landiver)

Comments in Letters from institutions following the Mesa Redonda.

## Additional Details

The following provides additional details/helpful hints about some of the problems of and in-country necessities for implementing public awareness and environmental education programs in Guatemala. Gerald Bauer provided the information on the problems that an implementing institution should be aware of at the outset. While many are obvious, some reflect the problems of counterpart support (e.g., office space) that may be provided but may not be adequate for the performance of work under the project.

### Helpful Hints

- o Important to speed up the procurement of vehicles for immediate use
- o Important to consider potentially negative aspect of purchasing pick-ups for the public awareness and environmental education programs. The open back end makes it difficult to keep equipment clean, dry and safe.
- o The contract should make it easy to obtain the services of local artists, printers, etc.
  
- o Creating a petty cash fund (e.g., 10,000 Q per month) would make it easier to handle day-to-day necessities.
- o Each person working in the project office should have adequate space and supplies
- o Insofar as possible, the project should consider paying Per diem and travel expenses for host-country counterparts
- o A computer tracking system for purchases should be developed immediately
- o An equipment maintenance fund is helpful to cover costs until GOG can reimburse the fund. Another alternative is to arrange for maintenance contracts with Guatemalan firms.
- o Need to program equipment purchases or upgrades for last years of the project in order to have good quality when project leaves.
- o Try to get blanket travel authorizations for team members. Bureaucracy can really slow things down.
- o Need to ensure that personnel are trained in equipment maintenance and have supplies as needed

### Commodities

#### Furniture

- Desks
- Chairs
- Light Table
- Mapping table
- 2 file cabinets/person
- Drawing table
- Poster/map files
- Storage cabinets

## Lamps

## Equipment

- 2 Computers with good graphics capability
- Printer
- Photocopy machine
- 3 slide projectors
- Calculators
- 3 Movie screens
- 2 vehicles
- Air conditioner for rooms with computers
- Phone
- (see attached lists)

## Supplies

- 3 1/2" diskettes
- Printer paper
- Photocopy paper
- Folders
- Graph paper
- Colored pencils
- Erasers
- Pencil sharpeners
- Light bulbs
- Towels and bathroom supplies
- (see attached list for more details)

- Graph paper
- Colored pencils

1991

**ANNEX G**



**INSTITUTIONAL ANALYSIS**

USAID/Guatemala

**MAYA BIOSPHERE PROJECT**

**INSTITUTIONAL AND ADMINISTRATIVE ANALYSIS**

**I. INSTITUTIONAL SETTING**

**A. Background**

For approximately twenty years prior to 1990, a branch of the military known as FYDEP, Fomento Y Desarrollo de El Petén, provided most national government services in the Peten. This agency oversaw sale of public land to private owners and issued titles to purchased lands, controlled forest harvesting and access to forest lands, built and maintained roads, and provided water and sewerage services.

Beginning in 1989 and now essentially completed, FYDEP has undergone liquidation. Its four major functions have been assigned to four separate agencies: land titling to INTA, Instituto Nacional de Transformación Agraria; forest control to DIGEBOS, Dirección General de Bosques y Vida Silvestre; roads and water and sewers to the two subdivisions of the Ministry of Public Works which handle those functions elsewhere in the country.

A new unit of the Ministry of Planning, UNEPET, Unidad Ejecutora del Plan de Desarrollo del Petén, has been established to coordinate activities among government agencies and program development assistance in the Peten.

**B. New Institutions and New Institutional Functions**

The Maya Biosphere Project enters the Peten against a backdrop of new institutions and new functions for established institutions. In addition to UNEPET, two other newly established institutions will figure prominently in the Peten and in the implementation of the Project.

CONAMA, Comisión Nacional del Medio Ambiente, was established in 1988 to formulate national environmental policy. CONAP, Consejo Nacional de Areas Protegidas, was established in 1989. In 1990, under the legislation that established the Maya Biosphere Reserve, CONAP was made responsible for managing the Reserve.

DIGEBOS, reorganized within the last two years, has general responsibility for forest management throughout Guatemala but has only recently set up a field office in the Peten where it has no prior experience.

The lack of experience of the aforementioned institutions presents difficulties, but also opportunities, for the Project. On the one hand the institutions must build capacity rapidly and require substantial strengthening quickly. On the other hand they are eager and enthusiastic and not yet encumbered with excessive bureaucracy.

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### C. Existing Institutions

Fortunately, the Project will not enter totally uncharted institutional waters in the Peten. Several institutions have been working there successfully, performing functions that relate directly to the Project.

IDAEH, Instituto de Antropología e Historia, has responsibility for protecting, studying and managing Guatemala's cultural heritage. In the Peten, the agency has successfully developed and protected Tikal as well as several other important Mayan sites. The agency has a longstanding, substantial presence in the Peten.

INGUAT, Instituto Guatemalteco de Turismo, oversees tourism facilities in Guatemala. It will continue to promote development of especially attractive sites for tourism in the Peten and throughout the country.

CECON, Centro de Estudios Conservacionistas, an arm of San Carlos University manages several officially designated conservation areas known as biotopes. Three biotopes, San Miguel la Palotada, Dos Lagunas, and Laguna del Tigre - Río Escondido, lie within the Maya Biosphere Reserve. CECON has accorded each biotope reasonable levels of protection and modest development for scientific study and nature tourism. CECON has a history of successful interaction with international conservation organizations.

## II. INSTITUTIONAL STRATEGY

The Maya Biosphere Project will put in place an institutional strategy consisting of the following elements:

### 1. Orient Toward the Peten:

Direct project assistance primarily toward operational field units in line agencies in the Peten, e.g., a unit for forest management in DIGEBOS, rather than toward agency headquarters in Guatemala City.

### 2. Strengthen Institutions through:

- a) technical assistance;
- b) training;
- c) financial support for personnel, equipment, and infrastructure;
- d) performance of project implementation functions as part of their institutional mandates and also, especially for NGOs, through small grants provided by the Project.

### 3. Phase Project Implementation to Incorporate Newly Developing Institutional Capacities

### 4. Involve the Private Sector Appropriately by:

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- a) allocating institutional responsibility so that policy setting functions remain with governmental institutions;
- b) giving the private sector responsibility for some field implementation of Project activities;
- c) enabling governmental institutions to verify policy implementation in the field.

Example: a) Forestry law and regulations require management plans for forest harvesting operations; DIGEBOS should establish specifications for the management plans. b) Timber concessionaires could produce the management plans, possibly with technical assistance from DIGEBOS, and carry them out in the field. c) DIGEBOS should then verify application of the management plans in the field - before, during, and after harvesting.

CONAP, in its capacity as overall policy setting and coordinating agency for the Maya Biosphere Reserve, should determine, ideally in consultation with DIGEBOS and other interested agencies, which parts of the Reserve are available for timber harvest.

### III. Institutional Constraints to Project Success and How the Project Can Expect to Deal With Them

#### A. Loss of Political Support and Access

CONAMA and CONAP were established under the current government of Guatemala which will change with elections scheduled for later in 1990. Should the next national government continue to accord strong emphasis to environmental quality, CONAMA and CONAP should continue to have strong political support and good access to policy makers in the government. They will still have to struggle for adequate financial support, however.

On the other hand, if the next government places weaker emphasis on environmental quality, CONAMA and CONAP could lose political support and access. Possibly the two agencies would be dissolved, in which case their functions might be distributed to other agencies or those functions might be unassigned altogether. Neither agency has had time or resources to establish a solid history which would protect it from loss of support within the government. But public opinion in Guatemala does seem to favor strong emphasis on environmental quality and that opinion should continue regardless of the outcome of the elections.

The Project should advocate for continued strong political and financial support for environmental quality with Guatemala's next government. Continuity of existing agencies is desirable even if not truly essential, whereas continuity of policy is essential to the success of the Project. The Project should underscore to the next government that general public support for efforts to maintain environmental quality in Guatemala has continuing vitality.

#### B. Inadequate Financial Support

CONAP, CONAMA, and the other major agencies the Project will rely on simply can not accomplish their jobs without more money and more financial stability. In the early years of the Project, the Project itself will provide adequate funds on a reliable basis. As time goes on it is

anticipated that the Guatemalan government will increase national funding to the agencies. Project reasoning believes that if the agencies, with enhanced capability through training and experience provided by the Project, demonstrate that they can perform capably and efficiently, the Government will fund them willingly.

Several agencies currently receive financial support from international conservation NGOs. This support, at enhanced levels, should continue throughout the life of the Project and even after it is completed. However, support from international NGOs should not constitute the financial mainstay of the agencies. That responsibility properly belongs to the Guatemalan government and the Project should continue to advocate to the government that it meet that responsibility.

### C. Bureaucracy

The Project can envision two contrasting institutional scenarios at the time of its completion. Under one scenario, streamlined, field oriented institutions capably carry out direct administration of natural resources, with qualified personnel and state of the art equipment. Under a less successful scenario, institutions which should have effective presence in the field become bogged down in red tape. They suffer from chronic shortages of financial and other resources and accomplish only a fraction of their responsibilities.

Clearly the Project will aim for the first scenario. To increase the likelihood of actually attaining effectiveness and avoiding bureaucracy, the Project will: support field offices rather than orient toward Guatemala city, purchase sufficient, good quality equipment, fund field operating costs amply, and regularly monitor performance in the field.

### D. Lack of Technical Capacity

Guatemalan institutions working in the fields of environment and natural resources lack technical capacity in two senses: they do not have enough professional and technical staff to perform all their responsibilities; and the people they do have do not have all the skills and information they need to perform their jobs as well as they could.

The Project would overcome this constraint through its emphasis on training, both through short courses, workshops and other specific training activities and through large amounts of technical assistance which will convey on-the-job training to Guatemalan counterparts.

## IV. PROFILES OF SELECTED INSTITUTIONS

This section of the institutional analysis of the Project describes in detail those Guatemalan institutions that will probably have major roles in the Project. In particular, this section forecasts specific roles for specific institutions and also discusses inter-institutional coordination. Additionally, this section sets out briefer descriptions and discussions of numerous organizations foreseen to participate in the Project less prominently. These institutions are grouped by type or theme in this section.

### A. CONAMA

Comisión Nacional del Medio Ambiente

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## National Environmental Commission

### 1. History

CONAMA was established in 1986 by Congressional Law (Decreto) No. 68-86, *Ley de Protección y Mejoramiento del Ambiente*, the Environmental Protection and Improvement Law.

### 2. Jurisdiction

CONAMA advises upon and coordinates all actions pertaining to the formulation and application of national policy for the protection and improvement of the environment.

More specifically, CONAMA:

- formulates environmental programs and projects;
- conducts environmental research and education;
- evaluates and advises on the ecological considerations of development projects, institutional activities and programs;
- supervises environmental impact studies; and
- coordinates and collaborates with governmental and non-governmental institutions.

CONAMA's important activities have included promoting establishment of an environmental commission within the National Congress, recommending environmental elements of the National Development Plan, hosting national seminars on the environment, and drafting the Protected Areas Law.

CONAMA also works with local governments to establish parks and botanical gardens that portray local plants.

### 3. Structure

CONAMA depends directly from the Presidency of the Republic of Guatemala. A Coordinator heads CONAMA, directs the agency's administrative and technical staff, and presides over its Technical Advisory Board.

The President of the Republic appoints the Coordinator under the same criteria as those for a Minister of State. The Coordinator serves as environmental advisor to the President with regard to national environmental policies and the coordination of international technical and financial assistance to protect and improve the environment.

The Technical Advisory Board is composed of ten members, one of whom is named to represent each of the following institutions:

- the Ministry of Economic Planning
- the Ministry of Agriculture
- the Ministry of Urban and Rural Development
- the Ministry of Education
- the Ministry of Public Health and Social Assistance
- the Ministry of National Defense
- the Coordinating Committee of Agricultural, Industrial, and Financial Associations

- the Newspaper Journalist Association of Guatemala
- the San Carlos University
- the private Universities of the country

The Technical Advisory Board makes recommendations on national environmental policies and also recommends studies, actions, programs, and projects to protect and improve the environment of Guatemala. The Board is responsible for implementing international environmental treaties and representing Guatemala at international environmental events. Specific statutory functions of the Board include: collecting, centralizing, and analyzing environmental information; maintaining a systematic registry of pollution sources and areas of environmental deterioration; maintaining registries of environmental laws regulations and standards; overseeing the establishment and management of a national system of protected areas; and promoting conservation of flora and fauna.

The Board is also empowered under the law to create foundations, able to receive both public and private funds, to carry out environmental activities.

CONAMA's technical staff is composed of nine permanent technical advisors and ten temporary technical advisors working under short-term contracts, two of whom are on loan to CONAP. CONAMA is organized into five technical units: 1) protected areas, 2) vegetation, 3) environmental education, 4) pollution, and 5) watershed management. Professional specialties represented on the technical staff include law, regional planning, environmental education, sanitary engineering, agricultural engineering, archaeology, architecture, biology, botany, protected areas, chemistry, journalism, media, choreography, and psychology.

#### 4. Budget

In 1988, CONAMA had an annual budget of Q.100,000. The budget allocated for 1990 is Q.710,000, including Q.175,000 for salaries for permanent staff and Q.183,000 for salaries for contractors. As of mid-March, 1990, CONAMA had not received adequate disbursements under its 1990 budget to fully pay its staff or perform basic operations.

#### 5. Capacity to Perform Project Responsibilities

Because CONAMA has primary legal responsibility for the protection of the Guatemalan environment, and environmental oversight responsibilities for all projects and programs conducted in the country, it will have an important oversight and coordination function in the Maya Biosphere Project.

Also, attendant to the Project, CONAMA could: promote the creation of new quasi-governmental or private foundations to carry out Project activities; commission and evaluate support studies; and, as part of its mandate to collect and centralize environmental information, set up a comprehensive data base of information generated by the Project.

In order to fulfill its sweeping national mandate, as well as to participate meaningfully in the Project, CONAMA would need many times its current level of financial resources. It would also need to increase its technical staff substantially.

## 6. Coordination with Other Institutions

CONAMA works particularly closely with CONAP because the Coordinator of CONAMA also serves as the President of CONAP. This close relationship should benefit the Project because CONAP will have principal responsibility for preparing the master plan for the whole Maya Biosphere Reserve.

As part of its national environmental oversight and coordination functions, CONAMA will also be involved in the Project in coordinating with UNEP, DIGEBOS, CECON and the other agencies with major implementation roles.

### B. CONAP

Consejo Nacional de Areas Protegidas  
National Council for Protected Areas

#### 1. History

CONAP was established in February, 1989, by Congressional Law (Decreto) No. 4-89, Ley de Areas Protegidas, The Protected Areas Law.

#### 2. Jurisdiction

Under the Protected Areas Law CONAP has four basic responsibilities:

- 1) restoration, protection, conservation, and management of natural areas and resources;
- 2) establishment and administration of the Guatemalan System of Protected Areas, SIGAP;
- 3) development of formal and informal environmental education programs,
- 4) coordination with other entities legally established to pursue similar natural resource conservation and protection goals.

To fulfill its responsibilities, the law directs CONAP to:

- elaborate national conservation policies and strategies;
- elaborate and approve regulations, master plans, and operational standards for the System of Protected Areas;
- promulgate regulations to carry out the Protected Areas Law;
- advise the President of the Republic in matters concerning the conservation and protection of natural resources.

In its first year of operations, CONAP drafted the law to declare the Maya Biosphere Reserve and completed the technical studies required to establish the Maya Biosphere Reserve and the Sierra de las Minas Biosphere Reserve.

#### 3. Structure

Representatives of thirteen institutions comprise CONAP:

- a) CONAMA, Comisión Nacional del Medio Ambiente, whose Coordinator serves as the President of CONAP;
- b) DIGEBOS, Dirección General de Bosques y Vida Silvestre;
- c) INGUAT, Instituto Guatemalteco de Turismo;
- d) IDAEH, Instituto Nacional de Antropología e Historia;
- e) CECON, Centro de Estudios Conservacionistas;
- f) INTA, Instituto Nacional de Transformación Agraria;
- g) OCREN, Oficina de Control de Areas de Reserva de la Nación;
- h) ANAM, Asociación Nacional de Municipalidades;
- i) Asociación, Amigos del Bosque;
- j) Consejo Técnico de Educación;
- k) Asociación, Defensores de la Naturaleza;
- l) Consejo Nacional de Desarrollo Urbano y Rural;
- m) CACIF, Comité de Asociaciones Agrícolas, Comerciales, Industriales y Financieras.

According to the law, CONAMA meets twice monthly. Decisions are taken by majority vote, two thirds of the representatives present constituting a quorum.

An Executive Secretary administers the daily activities of CONAP, particularly those concerning the System of Protected Areas. The Executive Secretary participates in the regular meeting of CONAP, but does not have a vote.

Currently CONAP shares a small office with CONAMA while it searches for more adequate space.

CONAP's staff of six people includes the Executive Secretary, one secretary, one book-keeper, a technical person to oversee the implementation of CITIES, the Convention on International Trade in Endangered Species of Flora and Fauna, an expert on flora, and an expert on fauna. A position for a protected areas specialist is currently vacant.

#### 4. Budget

CONAP's budget for 1990 from the Guatemalan government is Q.850,000. However, as of mid-March, 1990, the government had made no disbursements and CONAP did not have government funds for staff salaries or operating expenses. It is expected that the government will eventually disburse the obligated monies. In the meantime, CONAP is operating under a grant from The Nature Conservancy and expects to receive another grant from the same source later in the year.

#### 5. Capacity to Perform Project Responsibilities:

CONAP has legal responsibility for the administration of the Maya Biosphere Reserve under the law which established the Reserve. Therefore, CONAP will handle overall coordination of the Maya Biosphere Project and its several components.

CONAP enjoys several advantages at the current time:

- strong political support from the Guatemalan government and from international conservation organizations;
- clear legal mandate under both the Protected Areas Law and the Maya Biosphere Reserve Law;

- broad representation of interests on its governing council;
- a focused and dedicated staff.

Lack of adequate and dependable financial resources is a major problem for CONAP.

The agency has not been able to establish an adequate physical presence in the protected areas it manages because it has no field offices or personnel assigned to the field. CONAP must correct both these weaknesses if it is to participate effectively in the Maya Biosphere Project.

Lack of staff and money have also prevented CONAP from moving as quickly as desired to complete the technical studies required to establish new protected areas and to prepare and implement management plans for protected areas under its mandate. Much of this work has been contracted to international and national NGOs and universities; even so, personnel are barely sufficient to supervise these activities.

CONAP must expand the size of its staff and broaden the areas of professional specialization of its technicians.

The combination of reliable funding at adequate levels, larger, more experienced staff, and permanent presence in the field would give CONAP the competence and stature it must have to take a leadership role in the Project.

#### 6. Coordination with Other Institutions:

CONAP currently coordinates closely with CONAMA, whose Coordinator is President of CONAP. The two organizations share office space and overlapping agendas.

The Protected Areas Law makes CONAP responsible for all protected areas in Guatemala, including national parks and biotopes. However, IDAEH, DIGEBOS and CECON retain acting administrative responsibility for those protected areas which have historically been under their authority.

Within the Maya Biosphere Reserve, IDAEH administers Tikal National Park as well as the other important Mayan ruins in the Reserve. IDAEH currently has the largest presence in the Peten of any government agency except the army. CECON manages three biotopes in the Reserve. For the time being these arrangements for management of protected areas remain in place while CONAP and the other agencies work out the exact nature of future coordination among them.

The Maya Biosphere Reserve Law specifically names CECON, DIGEBOS, IDAEH and the army as agencies with whom CONAP will coordinate in managing the Reserve. The army will patrol the boundaries of the Reserve which coincide with Guatemala's international borders with Mexico and Belize. Authority for forest management and regulation of forest extraction concessions inside the Reserve will probably remain with DIGEBOS under the master plan for the Reserve that CONAP will oversee.

Fitting the management of the Maya Biosphere Reserve into general development of the Peten anticipates close coordination between CONAP and UNEPET. Conap also expects to work with national and international NGOs in carrying out its responsibilities to protect and manage the Reserve.

## C. CECON

Centro de Estudios Conservacionistas  
Center for Conservation Studies

### 1. History

CECON is a unit of the University of San Carlos established in 1981.

### 2. Principal Activities

CECON carries out field research in conservation of renewable natural resources and manages Guatemala's system of protected areas known as biotopes. The seven biotopes have a combined area of nearly 140,000 ha and cover habitats in mangrove, cloud forest, subtropical forest, and wetlands.

The organization's research focuses on ecosystems, flora and fauna, specific groups and species of plants and animals, and planning and management of protected areas.

CECON also works in environmental education and interpretation of natural resources. It operates the national botanical garden.

CECON also provides consulting services in forestry, reforestation, tropical forests, genetic resource conservation, endangered species, biological resources, and wildlife.

### 3. Structure

CECON has a total staff of 68 people, of whom 37 work in the Peten at four biotopes that CECOM manages. Twenty six professional staff members represent specialties in biology, anthropology, agronomy, civil engineering and tourism. The rest of the staff work in administration and support, research, and in the field as guards and laborers. CECOM operates a national Conservation Data Center. Currently 35 students are studying at CECOM.

### 4. Financial Resources

In 1989 CECOM had a budget for the year of a little over Q.600,000, a figure which should hold fairly constant for 1990. Funding comes primarily from the University of San Carlos, supplemented by technical and financial assistance from the Guatemalan government, US government natural resources agencies, and international conservation NGOs.

### 5. Capacity to Perform Project Responsibilities

CECON, with one of the largest professionally trained staffs of any Guatemalan conservation organization, is an important source of natural resource expertise. CECOM has done a good job of managing the biotopes under its charge. In so doing, however, CECOM has had to limit its efforts in ecological research.

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The Maya Biosphere Reserve Law names CECON as one of the four entities which form the coordinating committee for the Reserve. CECON should, therefore, coordinate closely with CONAP in that agency's role as overall coordinator of the Reserve. With its experience, CECON can play a significant role in training guards, designing environmental education and interpretation programs, performing ecological research and managing biological data for the Reserve. In all likelihood, CECON will continue to manage the three biotopes inside the Reserve that it currently has charge of.

#### D. DIGEBOS

Dirección General de Bosques y Vida Silvestre  
General Directorate of Forests and Wildlife

##### 1. History

DIGEBOS, a centralized agency within the Ministry of Agriculture was established by Congressional Decree in June, 1988. DIGEBOS succeeds INAFOR, Instituto Nacional Forestal, a decentralized quasi-governmental agency that was set up with FAO assistance in 1974.

##### 2. Jurisdiction

DIGEBOS has responsibility for managing and protecting Guatemala's forest lands and wood and forest resources. The agency sets forest policies, authorizes permits and concessions for forest harvesting, operates reforestation programs, controls forest fires and pests, and administers several national parks. Primary responsibility for wildlife passed to CONAP under the protected areas law of 1989.

##### 3. Structure

DIGEBOS, is organized into six Departments: Administration, Planning and Programs, Forest Management, Renewable Natural Resources, Wildlife and Protected Areas, Technical Headquarters for Regional Implementation. Each Department has several Sections organized by area of technical responsibility. DIGEBOS has field offices throughout Guatemala, including the Peten.

The regional office for the Peten is in Santa Elena and there are four district offices - in Melchor de Mencos, Sayaxche, Poptun, and La Libertad. Plans call for establishing additional district offices in El Naranjo and San Francisco.

Approximately 300 permanent employees and 1,200 temporary employees, mostly laborers, make up the DIGEBOS staff. About 30 percent of the staff works in Guatemala City. Nearly 120 DIGEBOS employees work in the Peten but very few of these are professionals and the total staff capability in the Peten does not suffice to meet the needs for forest management and controlling access to forests.

The permanent staff includes about 120 professionals, of whom only ten are forest engineers and twelve are natural resources engineers. The other professionals are mostly agronomists, though some have had some training in forestry. The University of Cunoroc offers degrees in forest

engineering and the University of San Carlos offers degrees in natural resources engineering. However, very few engineers graduate from these programs each year.

#### 4. Budget

DIGEBOS had an annual budget of approximately Q.12,800,000 in 1989, of which about 74 percent was actually spent. DIGEBOS receives funding from the government of Guatemala, mainly for salaries, from private sources, for operating expenses, and from development assistance agencies, mainly for special projects. Frequent monetary short-falls in the Ministry of Finance result in disbursements reduced below budgeted amounts. Often the disbursements only cover salaries, with no funds remaining to implement programs or field operations.

#### 5. Capacity to Perform Project Responsibilities:

DIGEBOS will probably have important responsibility for the forest management component of the Project and possibly for the extractive reserve component as well. DIGEBOS seems eager to participate in the Project and generally to become involved in the Peten and in the management of Guatemala's subtropical forests. The agency has had some success with implementing field activities, especially in conjunction with support institutions. Examples include collaboration with CARE in agroforestry and with CATIE in the USAID Madeleña Project

On the other hand, several factors discussed above handicap DIGEBOS' capacity to perform Project responsibilities. These include:

- lack of an adequate, dependable budget;
- lack of well trained professional and technical personnel;
- lack of sufficient people in the field.

Traditionally DIGEBOS and its predecessor INAFOR operated without a national forestry plan and under several different laws which gave the organizations a mixture of mandates with heavy emphasis on policing forest activities. The new forestry law has consolidated and focussed DIGEBOS' responsibilities. The national forestry action plan currently under preparation should result in further clarification of DIGEBOS' role and priorities.

#### 6. Coordination with Other Institutions:

Under the MAYA Biosphere Reserve Law, CONAP has principal responsibility for managing the Reserve, including determining uses in multiple use areas. DIGEBOS, however, under the Forestry Law, is responsible for administering timber concessions. The Reserve has long been subjected to timber harvesting and the Project anticipates timber harvesting to continue in the multiple use areas of the Reserve. Such continued harvesting in the Reserve is a core assumption of the Project's forestry subcomponent.

Clearly, DIGEBOS will have to coordinate closely with CONAP in determining how to manage forests in the Maya Biosphere Reserve. Fortunately, the two organizations do coordinate already in managing those national parks which DIGEBOS has traditionally overseen.

The Project anticipates involving NGOs in project implementation so DIGEBOS experience in working with them will be useful.

## E. IDAEH

Instituto de Antropologia e Historia  
Institute of Anthropology and History

### 1. History

IDAEH was established in 1946.

### 2. Jurisdiction

IDAEH has jurisdiction over the study, promotion, protection, and management of Guatemala's cultural heritage. IDAEH is a semiautonomous dependency of the General Directorate of Natural and Cultural Patrimony in the Ministry of Culture.

### 3. Structure

The Institute has 33 departments. The Department of Prehispanic and Colonial Monuments has charge of 32 of Guatemala's important archeological sites including Tikal National Park and 19 other sites in the Peten. The Department employs one archeologist and approximately 100 guards and laborers. Tikal National Park is administered separately from the other sites with a staff that includes an administrator, deputy administrator, 53 guards and 150 general workers. The Inspector General of Peten Monuments serves as IDAEH's principal representative in the Peten.

IDAEH manages Tikal National Park as a project. In addition to protecting and studying Tikal from an archeological standpoint, the Tikal Project has a Department of Flora and Fauna, employing a staff of 29 people, who study and classify the areas biota and carry out environmental education programs.

### 4. Capacity to Perform Project Responsibilities

IDAEH currently has more field personnel in the Peten than any other government agency except the army. The agency's success at operating Tikal, probably the best managed park in Guatemala, indicates its general capability. IDAEH has limited resources, however. It has neither the budget nor the trained staff to expand archeological research or bring additional sites under complete protection and management at the level of Tikal.

Within the Maya Biosphere Reserve, IDAEH should continue to manage the Tikal National Park and to station guards throughout the area at important archeological sites. IDAEH guards in the Peten generally could benefit from training and better equipment and supplies.

### 5. Coordination

Although its first priority is safeguarding the rich archeological rather than natural patrimony of the Peten, IDAEH's objectives overlap substantially with those of CONAP so the two agencies

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appear to have strong incentives to cooperate. IDAEH guards could supplement CONAP guards in core areas.

IDAEH should also continue to collaborate with CECON in the protection of the Tikal biotope adjoining Tikal Park.

Additionally, under the Project, IDAEH could expand its activities in environmental education and public awareness and could work more closely with INGUAT and with the tourism industry.

## **F. INGUAT**

**Instituto Guatemalteco de Turismo  
Guatemalan Tourism Institute**

### **1. History**

INGUAT was established in 1968 to succeed the Comisión de Turismo.

### **2. Jurisdiction**

INGUAT seeks the orderly development of tourism sites in Guatemala. It supports development of tourism oriented toward nature and culture and the reconciliation of tourism development with conservation of tourism sites.

Historically, INGUAT had legal authority to declare and manage protected areas but this authority passed to CONAP in 1989 with the passage of the Protected Areas Law. When INGUAT had primary responsibility for Guatemala's protected areas, it managed the areas under an agreement with CECON, in which CECON performed field management and conservation.

INGUAT sits on the Comisión de la Ruta Maya, along with CONAMA and other organizations. The Commission supports the Proyecto de la Ruta Maya, a project overseen by the Instituto de Cultura.

### **3. Structure**

INGUAT has one subdivision for cultural patrimony of Guatemala and another for natural patrimony.

### **4. Budget**

INGUAT oversees administration and collection of hotel and transportation taxes, a portion of which go to finance the organization.

### **5. Capacity to Perform Project Responsibilities**

INGUAT has the capacity to evaluate prospective tourism sites within the Project area and to propose development of tourist facilities, activities, and informational and promotional materials.

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In the past, INGUAT has worked with CECON and with the Peace Corps in these types of activities.

Probably the most important role related to the Project that INGUAT could play would be to increase tourism fees, especially at popular sites like Tikal, and restructure the distribution of these fees to provide greater financial resources to manage the sites.

## **G. UNEPET**

**Unidad Ejecutora del Plan de Desarrollo del Petén**  
**Executive Unit for the Peten Development Plan**

### **1. History**

UNEPET was established in 1988 as part of the reorganization of national governmental presence in the Peten which replaced FYDEP.

### **2. Jurisdiction**

UNEPET is an arm of the Ministry of Economic Planning responsible for overall development planning in the Peten. In particular, UNEPET, works with international development assistance agencies with programs in the Peten. Currently, UNEPET and the German government have begun preparing a development master plan for the region.

### **3. Structure**

As its name indicates, UNEPET has been set up as an executive unit with a small but highly qualified technical staff operating out of an office in Flores. UNEPET maintains active contacts with all the other national government agencies in the Peten, international organizations, and local government. Its main function is to keep all these entities informed and to involve them in regional development planning.

### **4. Capacity to Perform Project Responsibilities**

UNEPET will probably serve primarily as a source of information for the Maya Biosphere Project rather than in implementing specific Project activities. In collaboration with the Germans, UNEPET is coordinating preparation of basic data about the Peten, notably satellite imagery, soils maps, vegetation maps, and similar types of data. The Project should coordinate closely with UNEPET to obtain useful data and also to provide information generated by the Project to UNEPET so the agency can disseminate it.

## **H. UNIVERSITIES**

Universities should play an important role in the Project, especially with regard to research, professional training, and environmental education and public awareness. This section of the inventory of institutions briefly discusses the capacities and prospective roles of the three Guatemalan universities most likely to participate in the Project.

### 1. San Carlos University

San Carlos University carries on a significant program in research and natural resources protection and management in the Maya Biosphere Reserve through its dependency, CECON, which manages three biotopes within the Reserve. CECON's program is described in detail earlier in this inventory. In addition to the CECON activities, the university operates the San Carlos University Peten Center in Santa Elena which offers general university level education in the region.

### 2. Del Valle University

Del Valle University, a private university established in 1966, operates through a university college and a research institute. The college has three departments: sciences and humanities, social sciences, and education. The university offers technical degrees and professional degrees including degrees in studies of natural and cultural patrimony.

The university is dedicated to developing higher education through scientific research, the spread of culture, and the study and resolution of national problems. It supports focal areas in research, national problems, environmental conservation, and social, cultural and economic development.

### 3. Rafael Landivar University

Rafael Landivar University was established in 1961 as a private, non-profit institute of higher learning. The university has schools of humanities, political and social sciences, theology, engineering, agricultural sciences, legal and social sciences, architecture, and economics.

The university promotes the growth of integrated culture through scientific and humanistic research and education of professionals and technicians.

## I. ENVIRONMENTAL ORGANIZATIONS

Non-governmental organizations, especially those working in environment and conservation, should figure significantly in implementing the Maya Biosphere Project. Several NGOs currently work in the Project area, often in collaboration with international NGOs. The discussion of environmental organizations set out in this section of the inventory is not exhaustive but it does highlight the principal organizations who might play a role in the Project.

### 1. Asociación Amigos del Bosque

Asociación Amigos del Bosque was founded in 1959. The organization has chapters throughout Guatemala, with headquarters in the capital. Amigos del Bosque has a little over 1,000 members nationwide. Its annual budget of Q.24,000, which comes mostly from member fees, supports a paid permanent staff of two people.

Amigos del Bosque institutional objective is the protection and rational use of Guatemala's forests. It carries out programs in environmental education, development of protected areas, and reforestation and nursery development.

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In the Peten, Amigos del Bosque has active chapters in Poptun and Flores. The chapter in Poptun has developed nurseries, conducted reforestation, and convinced local farmers to establish a forest reserve surrounding a natural area.

Amigos del Bosque, together with Defensores de la Naturaleza, is one of two environmental NGOs with an individual seat on CONAP's board of directors.

## 2. Fundación Defensores de la Naturaleza

Defensores de la Naturaleza began work in 1983 and obtained legal status as a civil association in 1987. Defensores operates throughout Guatemala from headquarters in the capital. The organization has close to 500 members and a permanent staff of five. The annual budget, Q.200,000 for 1989 and estimated at Q.450,000 for 1990, comes from international organizations, corporate sponsors, and member contributions.

Defensores dedicates itself to conserving biodiversity in Guatemala. The organization has been particularly active in support of the Sierra de las Minas Biosphere Reserve in eastern Guatemala. It prepared the technical studies for establishing the Reserve and has raised money to purchase additional lands for inclusion in the Reserve. Defensores has also put together an impressive slide show about the Reserve for educational purposes and to raise funds for the Reserve.

The experience Defensores de la Naturaleza has gained in environmental education and in studies for biosphere reserves could apply to the Project.

As noted above, Defensores de la Naturaleza, together with Amigos del Bosque, is one of two NGOs with an individual seat on CONAP's board of directors.

## 3. Asociación Guatemalteca de Historia Natural

The Natural History Association, founded in 1960, operates out of the national zoo in Guatemala City. It has an annual budget of Q.9,000 provided from the Guatemalan government and from member fees.

The Association supports establishment of museums, educational and research institutions, parks, and protected areas.

Its activities have included:

- providing technical assistance for protected areas;
- researching parks and wildlands;
- developing nature studies;
- preparing audio-visuals for environmental education;
- studying and promoting environmental legislation;
- publishing information bulletins and a magazine.

## 4. APRODEMA, Asociación Guatemalteca Pro-Defensa del Medio Ambiente

APRODEMA is a nationwide environmental organization founded in 1974, with headquarters in Guatemala City. The organization had an annual budget for 1989 of Q.6,000 supplied from dues of its 237 members. APRODEMA operates with one paid staff member and five volunteers.

APRODEMA concentrates on conservation and restoration of the environment. Most of its activities consist of environmental education and lobbying for environmental legislation. In an effort to expand, APRODEMA has prepared a proposal for an environmental education program for which it is seeking funding of Q.270,000.

#### 5. ARCAS, Asociación de Rescate y Conservación de Animales Silvestres

ARCAS is a brand new organization currently awaiting certification as a civil association. It was founded for the express purpose of supporting CONAP to conserve Guatemalan wildlife.

ARCAS plans to engage in activities that would include:

- discovery and control of illegal traffic in wildlife;
- purchasing land for habitat preservation;
- training wildlife specialists in all facets of zoology and wildlife management with particular orientation toward rescue and care of endangered animals;
- fund raising.

By focusing on endangered wild animal species, ARCAS appears to have found an unfilled niche in Guatemalan conservation. It intends to locate a wildlife rescue center in the Peten, where illegal hunting, trapping and smuggling of wild animals is rife.

### J. COMMUNITY AND RURAL DEVELOPMENT ASSOCIATIONS

Private associations interested in community and rural development could become significantly involved in implementing the Project. There are dozens of these organizations working in Guatemala representing all levels of sophistication. This section does not attempt to cover all the organizations that might relate to the Project but it does describe a few prominent national associations and also lists a few that function exclusively in the Peten.

#### 1. Fundación para el Desarrollo de la Mujer

This organization, which was founded in 1982, had a budget for 1987 of over Q.600,000 and employs a permanent paid staff of seven people supplemented by 20 volunteers. Based in Guatemala city, the Foundation has branch offices in 15 Departments and is planning a major new effort for the northern part of the country.

The Foundation's objective is to integrate Guatemalan women into national economic development by providing technical and financial assistance to groups of women who are engaged in productive enterprises.

**Specific activities include:**

- disseminating information about productive enterprises owned and operated by women;
- training women to organize, plan, and operate small enterprises;
- evaluating credit-worthiness, markets, and sales promotions;
- providing credit for various types of small enterprises.

Traditionally, about 90 percent of the Foundation's loans have assisted urban women who have been in business for at least one year. The Foundation administers its own loans which tend to range from about Q.800 to Q.3500. It reports a default rate of roughly five percent.

**2. Fundación Dolores Bedoya de Molina**

This Foundation was established in 1983 for the purpose of promoting active participation of women in all facets of Guatemalan society. It numbers 500 to 600 women as its members and employs a technical staff of 16 plus 50 to 60 volunteers.

The Foundation operates nationwide and is especially interested in environmental education at a grassroots level. It has presented a proposal to USAID/Guatemala for conducting environmental education oriented toward women in each municipality in Guatemala.

**3. ASIES, Asociación de Investigación y Estudios Sociales**

ASIES was founded in 1979, with offices in Guatemala City, to study and propose solutions to social, economic, and political problems in Guatemala and the Central American region.

ASIES publishes a bulletin on economics a trimestral magazine. It has initiated meetings to prepare a national strategy for environmental education for Guatemala.

**4. ASINDES, Asociación de Entidades de Desarrollo y de Servicio no Gubernamentales de Guatemala**

ASINDES was founded in 1979 to provide technical assistance and management and financial intermediation services to Guatemalan private, non-profit organizations. Currently, 35 organizations, from diverse sectors and with diverse objectives, are members of ASINDES.

The annual budget of Q.3.2 million for 1989 came mainly from US and European governments and supported a permanent staff of nine people.

**5. CEMAT, Centro Mesoamericano de Estudios Sobre Tecnología Apropriada**

Since its inception in 1976, CEMAT has worked in 13 of Guatemala's 15 Departments. With its staff of 40 paid employees and eight volunteers, CEMAT works with communities to improve livelihoods through creative application of appropriate technologies.

Reputedly the most important appropriate technology group in Central America, CEMAT has specialized in developing and applying technologies for:

- improved stoves;
- biogas;
- intensive horticulture on small plots;
- dry latrines;
- herbal medicines.

#### 6. ASOPET, Asociación de Peteneros

ASOPET is an incipient association of residents of the Peten dedicated to improving social conditions in the region.

#### 7. AMAPET, Asociación del Maestros de El Peten

AMAPET generally promotes better public education in the Peten and takes particular interest in environmental education.

### K. TRADE ASSOCIATIONS

There are several trade associations that could contribute to the Project on behalf of their members. Three are noted briefly here.

1. Asociación de Madereros represents the timber industry in Guatemala and has a strong interest in the future of timber harvesting in the Peten.
2. CAMTUR, Camera Nacional de Turismo, is a tourist industry association several of whose members have large operations in the Peten.
3. INACOP, Instituto Nacional de Cooperativos, represents cooperatives. If cooperatives form in the Project area, for example among producers of xate, chicle, and allspice, or among artisans, INACOP may be in a position to provide services to these cooperatives.

### L. MINISTRY OF AGRICULTURE

The Ministry of Agriculture has a number of subdivisions and semiautonomous units that provide a variety of services to agricultural producers. At one point in the design of the Maya Biosphere Project, when it appeared that the Project would include an agroforestry component functioning in the buffer zone of the Maya Biosphere Reserve, it also appeared that the Ministry of Agriculture would have an extensive role in the Project. As currently proposed, the Project probably will only involve DIGEBOS significantly but probably not any other units of the Ministry of Agriculture. Nonetheless it seems worthwhile to note in this section of the inventory those

units of the Ministry which could eventually contribute to the Project and which, at any rate, operate in the Peten outside the Reserve.

1. COREDA, Comité Regional de Desarrollo Agropecuario, functions in each region of Guatemala. Each committee is composed of the regional directors of each Ministry of Agriculture agency operating in that region. The Committee meets monthly to exchange information, coordinate multi-institution projects, oversee application of Ministry policies.

2. COSUREDA, Comité Subregional de Desarrollo Agropecuario, composed of the regional directors of each agency of the Ministry of Agriculture, monitors field activities in research, extension, and credit.

3. DIGESA, Dirección General de Servicios Agrícolas, operates agricultural stations and provides agricultural extension services to farmers.

4. DIGESEPE, Dirección General de Servicios Pecuarios, operates livestock stations and provides extension services in animal husbandry to livestock producers.

5. INTA, Instituto Nacional de Transformación Agraria, operates Guatemala's agrarian reform and distributes public lands available for private ownership. In the Peten, INTA has taken over responsibility for land titling from FYDEP.

6. ICTA, Instituto de Ciencias y Tecnologías Agrícola, serves as the Ministry of Agriculture's research arm. Its principal function is to test, validate, and transfer new technologies through DIGESA and DIGESEPE. ICTA's programs on the productivity of basic crops and non-traditional fruits and vegetables have had positive effects on the conditions of small and medium-sized farmers.

7. INDECA, Instituto Nacional de Comercialización Agrícola, provides crop storage and marketing services to producers.

**ANNEX H**



**FINANCIAL/ECONOMIC ANALYSIS**

## FINANCIAL AND ECONOMIC ANALYSIS: MAYA BIOSPHERE RESERVE PROJECT

### 1 INTRODUCTION 1.1 Terms of Reference

This report examines the financial and economic viability of USAID/Guatemala's MAYA Biosphere Reserve Project (520-0395). The report follows the guidelines in AID Handbook, Chapter 3. The terms of reference for this component of the Project Paper are given in USAID/Guatemala's PIO/T, dated December 22, 1989.

The Project Identification Document (PID) for MAYAREMA states that "Economic analysis will be performed during the PP elaboration, and will include cost benefit calculations and least-cost analysis where appropriate. Under the supervision of USAID's Office of Economic and Policy Analysis, these analysis will be used to design the most economically efficient, and equitable alternatives to achieving MAYAREMA objectives."

### 1.2 Scope and Organization of this Report

A detailed spreadsheet of annual input financial costs comprises the organizing framework for this assessment. The spreadsheet is presented at the end of this report. The report includes a number of separate tables which are either inputs or outputs for the spreadsheet. The tables are based on the instructions given in the memorandum from Ramiro Eduardo (PDO/PDSO) through Richard Steelman (AC/PDSO) of September 19, 1989: Cost Estimate and Financial Plan for Environmental and Natural Resource Project. The purpose of these tables is to focus the reader's attention on particular details that may not be as clear when examining the large amounts of information contained in the spreadsheet.

Section 2 of this report establishes the Project context in terms useful for understanding the financial and economic analyses which follow. It discusses the relevant time horizon for assessment of Project costs and benefits; presents issues of the Project discount rate; and explains the appropriateness or more correctly the inappropriateness of traditional cost-benefit analysis.

Section 3 provides the rationale for evaluating the cost effectiveness of the Project in terms of "least cost analysis." Since often "least cost analysis" by project designers is void of numerical estimates of social costs and benefits, it leaves decision makers with the difficult decision of either accepting or rejecting a project in terms of a written argument. To abet decision making, this paper goes beyond the usual non-quantitative argument by providing a numerically based methodology for future monitoring and evaluation of the Project. The suggested methodology includes five steps: identifying the different categories of Project benefits; indicating unit amounts of Project outputs which are measurable; comparing the cash flows of Project inputs to the incremental output (net benefits) of the Project; assessing Project worth in terms of the expected incremental gain per dollar of inputs; and introducing sensitivity tests.

Section 4 presents recommendations to improve estimates of Project worth, and to assist plans for Project monitoring and evaluation.

## 2. PROJECT CONTEXT

### 2.1 Project Time Horizon

Given the long-term aims of this Project's activities and the staged implementation of certain of its components, the minimum life of the Project is six years. However, streams of costs and benefits continue well beyond the period of Project disbursements. Earnings from the Project endowment will extend into the indefinite future, since most of the pay-offs from investments in forest protection, human resource development, and regional biosphere improvement are realized only through decades. For example, timber cutting cycles alone in natural forest management are 20-40 years.

Estimating net benefits beyond the six year period, however, could result in great inaccuracies with regard to physical flows of inputs and outputs, their unit values, and institutional factors. Currently there is too little research and information on the Project area to extend the economic assessment beyond six years and into the next century. Moreover, what information is available does not allow for conclusive long term analysis. In some cases the meager research suggests that implementation of this Project will result in serious reduced economic growth where current financial return is based on "extracting" natural resources from the Project area. In other reports there is evidence that Project implementation will result in considerable social benefits from increased tourism and enhanced awareness of conservation (Refer to other Annexed reports of Project Paper.) In some cases too, there are persons who believe that the degree of future returns, as in tourism and forest product exports for example, is a function of too many world parameters, which makes a proper assessment of the MAYA Biosphere Project way beyond the scope of this Project Paper. Thus, it is argued, whatever results might be rationalized in this paper cannot be accurately estimated without macro-economic analysis.

For USAID, the standard long-term (20 year) measures of economic viability -- benefit-cost ratios, NPVs, internal rates of return -- are clearly not appropriate and will, in some cases, produce a bias in favor of short-hand gain, exactly the wrong measure for this Project.

### 2.2 Benefit-Cost Issues

The most frequently used method of establishing a measure for a project's financial value is the calculation of the "Financial Internal Rate of Return" (FIRR). Calculating an FIRR involves ascertaining the discount rate at which the sum of all annual net cash flows, positive and negative, is zero. The technique usually involves several repetitive calculations for various discount rates until the FIRR is found at which the sum of the discounted cash flows is zero or close to zero. Alternatively, the net present value (NPV) of the cost and benefit streams can be calculated using a discount rate determined in advance to represent the actual cost of capital. If the value of the discounted annual net cash flow is greater than zero, the project is financially acceptable.

The choice of a discount rate is a critical matter for project evaluation. Generally, for a long term project, the lower the discount rate, the higher the NPV of the project. Applying sensitivity analysis for the same project would show that the higher the discount rate, the lower the NPV of the project, especially if the projects' net benefits are negative in its initial years. Because MAYA Biosphere Project benefits are realized far in the future, calculation of its financial and economic returns are highly sensitive to the selection of the discount rate.

While lower discount rates and higher shadow prices are often recommended by economists in projects like this one, use of a zero discount rate and an indefinite shadow price is considered extreme. Closer examination of the environmental and natural resource stakes, however, might lead to a strong defense of a negative discount rate and/or very high shadow prices (assuming measurable relationships). The uncertainty of the outcomes further compounds the analytic problem.

Speculative analysis leading to internal rates of return are of limited use since future generations have no voice in the decision, regardless of the discount rate chosen or the willingness-to-pay technique used. By definition the discount rate assumes that something in the future is worth less than something today. The situation is even more complicated in that the use of some resources today will lead to better resource use and hence more resources in the future, compared to current patterns and projections. Resource conservation has been defined as the redistribution of rates of resource use towards the future. Depletion is the economic opposite of conservation and means the redistribution of rates of resource use towards the present. Whether individuals or groups choose to conserve resources will depend largely upon their estimates of the cost of delaying consumption and the level of uncertainty of future benefits to them or to future generations. However, using their present resource stock even though it is to their own future detriment or the detriment of future generations. They have no choice at the moment.

### 3 LEAST COST ANALYSIS

#### 3.1 Rationale

There will be little or no direct financial benefits -- revenue generation -- under the Project. Moreover, benefit-cost analysis is not well suited to an assessment of situations involving complex ecosystem behavior, cumulative impacts and diffuse spatial effects. The process of identifying and implementing sustainable economic growth and environmental quality strategies is not straight forward. Under such circumstances least-cost analysis is recommended by AID Handbook 3.

As suggested by the Project Identification Document and explained above, the MAYA Biosphere Project can be evaluated appropriately by a determination of cost effectiveness based upon review of alternatives leading to a least-cost design for each component of the project. According to the A.I.D. handbook, when it is too difficult to quantify or value the benefits of improving environmental quality in economic terms, then least cost analysis is used.

The fundamental question in this approach is whether there is an alternative project design which will yield the same magnitude of benefits for less cost. In least cost analysis, environmental quality targets such as aesthetic properties, ecosystem functions, human resource development, or levels of community participation are established, and an economically efficient solution is found by minimizing the costs of obtaining targets.

There are three fundamental issues to consider in determining the least-cost characteristics of this Project.

First, many of the problems of resource protection and sustainable natural resource use of the Peten are common to all of the countries of Central America. This is clearly shown in the Environmental and Natural Resource Management in Central America: a Strategy for A.I.D. Assistance and detailed in Leonard (1987). However, if there is any difference to be noted, it is that Guatemala's Peten is more biologically diverse than other regions. As reported by the Center for International Development and Environment World Resources Center, Biodiversity in Guatemala (Dec. 1988), "As repositories of biological diversity, Guatemala's ecosystems are among the world's richest." Thus, in comparison with other A.I.D. projects in Central America the amount spent for similar activities in the Peten will have a greater impact on biological diversity and related activities. In other words, compared to similar geographic regions of Central America, in the Peten there are many more opportunities per dollar spent for addressing issues of ecosystem diversity in Guatemala than elsewhere in Central America.

Second, many components of this Project are complementary to on-going projects with regional institutions, for example, ROCAP's RENARM Project: Regional Environmental and Natural Resources Management. Most of this Projects' components have been planned and designed to be complementarities with similar activities of several regional institutions. In some instances, the Project Papers' consultants have had direct experience in the design and development of similar projects in Central America. Hence, the incremental costs of the MAYA Biosphere Project have been compared to and estimated in line with the budgets and project plans of other regional institutions supported by A.I.D. The linkage of this Project to other project designs in the region has many economic advantages. Because of the regional commonality of many ecosystems problems, the research and policies generated from the Project will be of use in more than one area of Central America. Properly focused, regional sharing of expertise can result in economies of scale in the range of technical areas proposed for the MAYA reserve. By building a source of expertise unique to the Peten, there is an increased potential for generating income by charging for services. The initial investment or fixed costs of the Project would be high. However, once established, the marginal costs of providing information, expertise, research and services would be low given the existing high demand throughout Central America.

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 Guatemalan, 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 Project design meets the least-cost criteria as explained above. Yet, this conclusion may be unsatisfactory without an idea of the amounts and dimensions of Project benefits relative to Project costs. How much will it cost to achieve a given goal? What outputs can be expected per dollar of Project expenditure? By how much will the Project change current conditions and trends?

### 3.2 Extending Least Cost Analysis

Unlike the procedures used in the traditional benefit-cost analysis, least cost analysis is usually carried out without a monetary estimate of project benefits. Because the MAYA Biosphere Project outcomes are very difficult to quantify at this time and especially difficult to express in

monetary terms, it is tempting to conclude the financial and economic analysis part of this paper with the arguments presented above as sufficient for the Project evaluation.

Although the rationale above has shown the Project components to be least cost alternatives, decision makers involved in this Project must certainly be uneasy about not having any facts covering the magnitude of the Project's net social benefits. In short, what can be expected from the Project with the proposed level of expenditure?

In order to address this concern, this paper offers an extension of its least cost analysis. The framework below is designed to provide officials responsible for the Project (for whose benefit it has been prepared) with guidelines for improving the monitoring and evaluation of the Project's components. The guidelines stress the importance of rigor in the identification of Project priorities, targets, problems, constraints, and solutions as well as in the formulation of the strategies to achieve this improvement. It also tries to show that it is useless to simply point out problems and solutions, without seeking to identify their interrelationships and the strategies for implementing such solutions. Finally, the following draws attention to the tendency to propose constant changes in the activities of institutions without serious study of what had previously existed, thereby precluding all possibility of improvement.

Two caveats: one, this framework is the first effort to analyze systematically the socio-economic returns to a conservation, resource development and management project in Guatemala, and two, there is a limited amount of useful information which can be used to test the framework. Therefore, the framework is to be recognized as illustrative at this time. It is subject to refinements and qualifications.

### 3.3 Proposed Framework for Monitoring and Evaluation

Five steps are needed to have a quantitative assessment of the MAYA Biosphere Project: a set of indicators of Project outcomes; measures or unit amounts for each indicator; estimates of the Project's net incremental benefits; cash flows of Project inputs related to each indicator such as a ratio of the change in the indicator divided by the input cost; and sensitivity analysis. Each of these steps will be described briefly.

#### (1) Indicators of Project Outputs

Since a given developmental activity may impact many components simultaneously, it is not uncommon for that activity to positively impact one component and adversely affect others. Thus, a set of indicators or criteria must be developed for measuring changes in many factors including, for example, changes in demography, income, resources etc. Also required are techniques for measuring changes of each indicator which result from the developmental activity. In practical terms, it is not feasible or worthwhile to recommend the use of a large number of indicators or common set of criteria. Some developmental activities will be quite small, of short duration and have very limited importance to the Project. Hence, Project evaluators must be selective of the appropriate indicators to measure. The selection begins with a review and clear statement of the Project's objectives.

The Project design team has established general goals for the MAYA Biosphere Project. These goals should be consulted every time the need exists to establish the basic, relevant criteria or indicators for Project evaluation.

## (2) Unit Amounts of Project Outputs

Project outputs should be concise, specific and measurable. Identifying such outputs should involve a thorough review of the existing data related to the Project goals. If, for example, the goal is to increase family farm income, then we should determine if there are relevant data on the income of family farms and if the data are unequivocally indicative of the "family farm?"

Attempts should be made to determine the expected amounts of two different outputs; those that will arise with the proposed Project and those that will arise without the Project. Both should differ if the Project has any impact. The difference is the incremental net benefit arising from Project investments. This difference is not the same as comparing the situation "before" and "after" the Project. The before-and-after comparison fails to account for changes that would occur without the Project and thus leads to an erroneous statement of the benefit attributable to the Project. For example, a change in output without the Project can take place in two kinds of situations. The most common is when the indicator is already growing, if only slowly, and will probably continue to grow during the life of the Project. If the Project goal is to increase the rate of growth of the indicator, then the Project evaluator may erroneously attribute the total increase of the indicator to the Project; therefore resulting in an exaggerated impact.

A change in output can also occur without the Project if the indicator would actually fall in the absence of new investment. If the goal of the Project is to merely sustain or retard the decline in the output, then the evaluator may erroneously attribute no gain to the Project with a before and after comparison. This distinction is particularly important when evaluating resource conservation projects. Of course, if no change in output is expected in the Project area without the Project, then the distinction between the before-and-after comparison and the with-and-without comparison is less crucial.

## (3) Estimates of Net Incremental Projects Benefits

A simple and intuitive analysis of the expected net incremental benefits of the Project will give a sense of the magnitude of the Projects' economic value. This step of the methodology is better explained if illustrated. The table(s) below combines information from steps (1) and (2). At the top of the table is a general statement of the Project's component goal. Below the goal there is a list of Project indicators. Across each indicator's row, there is a number indicating the current magnitude of that indicator; in some cases these are guesstimates, given the paucity of information of the Peten. Next on the row is an estimate of the indicators' size that is expected in the future if the Project is not undertaken. This is an estimate of the future scenario "without" the Project component. To the right of that indicator is the Project teams' estimate of the indicator's size "with" the Project in effect. The final figure in the row is the incremental benefit expected from the Project, the difference between the "without" and "with" of the indicator. The "without" and "with" comparisons must have a predetermined future date of year. In this case the comparisons are generally stated for the early 21st Century.

**TABLE: ILLUSTRATIVE ASSESSMENTS OF NET INCREMENTAL BENEFITS**

**Goal.1 Institution Building for Protection & Management'**  
 To develop the institutional capacity to adequately protect and manage Guatemala's wildland areas and wildlife. Train and create jobs for additional conservation workers.

Indicators	Current Level	Future Level		Project Increment
		Without	With	
Area covered in 000 has.				
Park Directors	0	0	1	1
Park Guards	25	30	60	30
Forest Engineers	5	6	15	9
Biologists	10	10	30	20

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**Goal.2 Increased Environmental Education and Awareness**

Increase level of Guatemalan knowledge of and support for environmental protection and natural resource management.

Indicators	Current Level	Future Level		Project Increment
		With	Without	
National Leaders Supportive Speeches Supportive Policies Financial Backing Community People Taught Park Visitations Literature Bought Materials Books & Articles Souvenirs Sold Students Courses Taken Aptitude Score Park Visitation Graduate Study				

**Goal.3 Sustainable Resource Management for Income Generation**

To establish technically and economically viable activities that conserve natural resources while providing higher incomes than the current destructive practices being used.

Indicator	Current Level	Future Without	Level With	Project Increment
<b>A. Agroforestry:</b>				
Forrest Area (ha)	14,664 km2	less	same	
Commercial forest Standing Timber	10,000 km2			
Value \$/M3solid/ha.				
High value	\$250/ha	\$200	\$500	\$300
Low value	\$800/ha	\$800	\$1000	\$200
Lesser Species	\$225/ha	\$225	\$225	\$0
Stumpage Volume				200,000M3
\$/M3 of logs				\$1.9mil.
Utilized Mill cap.	20%	20%	90%	70%
Lumber Revenues	\$5 million	\$5 mill	\$40mill	-\$35mil.
<b>B. Ecotourism:</b>				
No.Foreign Tourists	60,000	60,000	70,000	10,000
Ave.Tourist Time	5.5days	5.5days	6.5days	1day
Ave.Daily Expend.	U.S.\$100	U.S.\$100	U.S.\$100	(1988 \$)
Tourist Expend.	\$33 mill.	\$33 mill.	\$45 mill	\$12 mill.
Park Fee	\$180,000	\$180,000	\$210,000	\$30,000

(4) Cash Flows of Unit Inputs

This step of the Projects' assessment requires calculations of the unit costs of Project outputs, as explained in the A.I.D. Handbook (Dec. 7, 1987, p.3D-13). In carrying out this step, we derive the total annual cost of each Project component. The total annual cost is the sum of the annualized investment costs (i.e., the investment cost divided by the number of years the assets are expected to be in service; in this Project six years) and the annual operating cost. This total is then divided by the number of units of output expected to be produced in a typical year. The average cost per unit methodology assumes that the average cost of various activities is distributed equally over time. However, since the average cost of the Project's activities is unequally distributed the stream of the average cost per unit is discounted to present value using the actual cost-of-capital rate which is currently averaging 18 percent in Guatemala's commercial banks.

This step of the methodology would take good judgement to determine the appropriate categories of benefits to divide into average cost per unit. For example, if we take the indicators of the incremental net benefits derived from Environmental Education and Awareness component

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of the Project, so we divide these indicators into the total average cost of the Project or just the average input cost that is allocated to certain facets of the Project. If we use partial Project costs, how specific should we be? Although these are difficult questions, most answers can be dealt with by sensitivity analysis.

#### (5) Sensitivity Analysis

Even though calculations of unit costs of output include allowances for contingencies, and even though "with" and "without" projections should be based on detailed studies, sufficient uncertainties exist in most, if not all, projections or estimates to warrant an examination of the effects of changes in some of the estimates to warrant an examination of the values of project indicators.

To test the sensitivity of a project to changes in a given factor, different values of the factor (or unit costs) are substituted in the original analysis. For example, the unit costs of producing teaching materials may include sunken costs which will not occur in later years of producing more materials. It might be more accurately determined that the average per unit costs of the materials will be cheaper at a future date. Hence, the annual costs are lowered to produce another estimate of average cost per unit of output. The same procedure can be applied to any other factor in assessing the Project components' values and benefits.

#### 4. RECOMMENDATIONS

- 4.1 The five step methodology is recommended for future monitoring and evaluation of the Project.
- 4.2 Each of the Project's component baseline studies should focus on identifying measurable indicators; i.e., the criteria by which the Project will be evaluated.
- 4.3 The time horizon should be established for each component of the Project. Some components like the "extractive reserves" will have a shorter time period to produce results than component activities for conservation and protection.
- 4.4 Indicators should be deliberately defined and selected on the basis of relevance and measurability in line with the expected performance of the component activity.
- 4.5 Project leaders of the GOG, NGO and USAID institutions should initiate analytical models assessing benefits and costs of reduced forestation, increased tourism, added education and awareness activities, etc. The analysis will prove critical for decision-making if subsequent Projects like this one are to be funded and developed in the future. The time is more than right to begin planning for the collection of hard facts and figures.
- 4.6 As the MAYA BIOSPHERE RESERVE PROJECT moves in to its first stages of implementation, it is imperative to put at the forefront of all work, the initiation of qualitatively sound baseline studies. Properly conducted, baseline data can serve as valuable benchmarks for monitoring and evaluation. At a minimum, the framework above, should be used to establish the aims of the baseline studies.

MAYAREMA Project (520-0395) All Components

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	19	124	124	123	118	117	625
Technical assistance	316	435	422	382	281	183	2,035
Travel & per diem	112	198	196	141	124	90	861
Training	127	206	180	171	70	41	795
Vehicles	0	160	60	0	0	0	220
Equipment	35	72	56	38	25	7	233
Office & furnishings	28	46	18	18	18	18	146
Supplies & op. expense	12	24	24	19	18	16	113
Special studies	155	215	114	136	94	30	744
Audits	0	0	0	0	0	0	0
Evaluations	0	0	150	0	0	150	300
SUBTOTAL	804	1,480	1,360	1,028	748	652	6,072
Contingencies	80	148	136	103	75	65	607
Inflation	40	74	68	51	37	33	304
TOTAL	925	1,702	1,564	1,182	860	750	6,983

MAYAREMA Project (520-0395) All Components

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	64	86	85	83	71	70	459
Technical assistance	49	111	128	87	70	35	480
Travel & per diem	24	37	39	31	26	18	175
Training	48	84	70	64	25	14	305
Vehicles	0	0	0	0	0	0	0
Equipment	10	22	17	16	12	6	83
Office & furnishings	55	94	35	35	35	35	289
Supplies & op. expense	21	42	44	34	32	27	200
Special studies	71	159	85	96	72	44	527
Audits	90	90	90	90	90	90	540
Evaluations	0	0	0	0	0	0	0
SUBTOTAL	432	725	593	536	433	339	3,058
Contingencies	43	73	59	54	43	34	306
Inflation	22	36	30	27	22	17	153
TOTAL	497	834	682	616	498	390	3,517

MAYAREMA Project (520-0395) All Components

*****AID TOTAL*****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	83	210	209	206	189	187	1,084
Technical assistance	365	546	566	469	351	218	2,515
Travel & per diem	136	235	235	172	150	108	1,036
Training	175	290	250	235	95	55	1,100
Vehicles	0	160	60	0	0	0	220
Equipment	45	94	73	54	37	13	316
Office & furnishings	83	140	53	53	53	53	435
Supplies & op. expense	33	66	68	53	50	43	313
Special studies	226	374	199	232	166	74	1,271
Audits	90	90	90	90	90	90	540
Evaluations	0	0	150	0	0	150	300
SUBTOTAL	1,236	2,205	1,953	1,564	1,181	991	9,130
Contingencies	124	221	195	156	118	99	913
Inflation	62	110	98	78	59	50	457
TOTAL	1,421	2,536	2,246	1,799	1,358	1,140	10,500

MAYAREMA Project (520-0395) All Components

*****NGO*****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	192	319	394	411	349	267	1,932
Technical assistance	20	120	117	43	30	10	340
Travel & per diem	51	118	117	109	91	59	545
Training	5	35	30	0	0	0	70
Vehicles	100	100	0	0	0	0	200
Equipment	20	37	24	10	9	5	105
Office & furnishings	6	19	17	17	16	15	90
Supplies & op. expense	14	42	43	41	38	35	213
Special studies	50	120	90	50	30	0	340
Audits	0	0	0	0	0	0	0
Evaluations	0	0	0	0	0	0	0
SUBTOTAL	458	910	832	681	563	391	3,835
Contingencies	46	91	83	68	56	39	384
Inflation	23	46	42	34	28	20	192
TOTAL	527	1,047	957	783	647	450	4,410

MAYAREMA Project (520-0395) All Components

Item	Year 1	Year 2	Year 3	GOG Year 4	Year 5	Year 6	TOTAL
Personnel	646	646	621	621	621	621	3,776
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	33	33	34	35	34	33	202
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	178	112	101	96	83	83	653
Office & furnishings	335	317	252	167	130	102	1,303
Supplies & op. expense	101	99	97	97	97	97	588
Special studies	0	0	0	0	0	0	0
Audits	0	0	0	0	0	0	0
Evaluations	0	0	0	0	0	0	0
SUBTOTAL	1,293	1,207	1,105	1,016	965	936	6,522
Contingencies	129	121	111	102	97	94	652
Inflation	65	60	55	51	48	47	326
TOTAL	1,487	1,388	1,271	1,168	1,110	1,076	7,500

MAYAREMA Project (520-0395) All Components

Item	Year 1	Year 2	Year 3	TOTAL Year 4	Year 5	Year 6	TOTAL
Personnel	921	1,175	1,224	1,238	1,159	1,075	6,792
Technical assistance	385	666	683	512	381	228	2,855
Travel & per diem	220	386	386	316	275	200	1,783
Training	180	325	280	235	95	55	1,170
Vehicles	100	260	60	0	0	0	420
Equipment	243	243	198	160	129	101	1,074
Office & furnishings	424	476	322	237	199	170	1,828
Supplies & op. expense	148	207	208	191	185	175	1,114
Special studies	276	494	289	282	196	74	1,611
Audits	90	90	90	90	90	90	540
Evaluations	0	0	150	0	0	150	300
SUBTOTAL	2,987	4,322	3,890	3,261	2,709	2,318	19,487
Contingencies	299	432	389	326	271	232	1,949
Inflation	149	216	195	163	135	116	974
TOTAL	3,435	4,970	4,474	3,750	3,115	2,666	22,410

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MAYAREMA Project 520-0395 - Biosphere Administration

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	4	4	4	3	3	2	20
Technical assistance	70	130	90	90	35	30	445
Travel & per diem	17	66	56	36	17	12	204
Training	23	30	23	15	0	0	91
Vehicles	0	40	40	0	0	0	80
Equipment	12	26	16	4	2	1	61
Office & furnishings	20	33	10	10	10	10	93
Supplies & op. expense	4	10	10	8	7	6	45
Special studies	6	18	6	6	0	0	36
TOTAL	156	357	255	172	74	61	1,075

MAYAREMA Project 520-0395 - Biosphere Administration

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	4	4	4	3	3	2	20
Technical assistance	0	20	25	15	5	5	70
Travel & per diem	0	3	6	4	1	1	15
Training	7	10	7	5	0	0	29
Vehicles	0	0	0	0	0	0	0
Equipment	2	7	4	2	1	1	17
Office & furnishings	40	67	20	20	20	20	187
Supplies & op. expense	7	15	15	12	10	10	69
Special studies	4	12	4	4	0	0	24
TOTAL	64	138	85	65	40	39	431

MAYAREMA Project 520-0395 - Biosphere Administration

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	8	8	8	6	6	4	40
Technical assistance	70	150	115	105	40	35	515
Travel & per diem	17	69	62	40	18	13	219
Training	30	40	30	20	0	0	120
Vehicles	0	40	40	0	0	0	80
Equipment	14	33	20	6	3	2	78
Office & furnishings	60	100	30	30	30	30	280
Supplies & op. expense	11	25	25	20	17	16	114
Special studies	10	30	10	10	0	0	60
TOTAL	220	495	340	237	114	100	1,506

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MAYAREMA Project 520-0395 - Biosphere Administration

***** NGO *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	30	72	72	72	60	20	326
Technical assistance	0	20	30	8	0	0	58
Travel & per diem	5	26	28	24	15	6	104
Training	0	15	15	0	0	0	30
Vehicles	40	40	0	0	0	0	80
Equipment	12	24	17	4	2	1	60
Office & furnishings	0	4	2	2	1	1	10
Supplies & op. expense	2	10	10	10	8	5	45
Special studies	10	20	10	0	0	0	40
TOTAL	99	231	184	120	86	33	753

MAYAREMA Project 520-0395 - Biosphere Administration

***** GOG *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	150	150	130	130	130	130	820
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	10	10	10	10	10	10	60
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	50	50	30	30	22	22	204
Office & furnishings	150	150	145	95	75	75	690
Supplies & op. expense	35	35	35	35	35	35	210
Special studies	0	0	0	0	0	0	0
TOTAL	395	395	350	300	272	272	1,984

MAYAREMA Project 520-0395 - Biosphere Administration

***** TOTAL *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	188	230	210	208	196	154	1,186
Technical assistance	70	170	145	113	40	35	573
Travel & per diem	32	105	100	74	43	29	383
Training	30	55	45	20	0	0	150
Vehicles	40	80	40	0	0	0	160
Equipment	76	107	67	40	27	25	342
Office & furnishings	210	254	177	127	106	106	980
Supplies & op. expense	48	70	70	65	60	56	369
Special studies	20	50	20	10	0	0	100
TOTAL	714	1,121	874	657	472	405	4,243

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MAYAREMA Project 520-0395 - Environmental Education, Awareness & Policy  
 \*\*\*\*\* AID 8 \*\*\*\*\*

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	15	20	20	20	15	15	105
Technical assistance	70	110	145	80	55	25	485
Travel & per diem	30	45	45	30	30	15	195
Training	27	60	60	40	20	7	214
Vehicles	0	20	0	0	0	0	20
Equipment	15	30	22	22	11	0	100
Office & furnishings	7	10	5	5	5	5	37
Supplies & op. expense	5	10	10	7	7	6	45
Special studies	30	90	35	10	0	0	165
TOTAL	199	395	342	214	143	73	1,366

MAYAREMA Project 520-0395 - Environmental Education, Awareness & Policy  
 \*\*\*\*\* AID 9 \*\*\*\*\*

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	15	20	20	20	15	15	105
Technical assistance	30	55	75	40	35	15	250
Travel & per diem	10	15	15	10	10	6	66
Training	13	30	30	20	10	3	106
Vehicles	0	0	0	0	0	0	0
Equipment	5	10	8	8	4	0	35
Office & furnishings	13	20	10	10	10	10	73
Supplies & op. expense	10	20	20	13	13	11	87
Special studies	30	90	35	10	0	0	165
TOTAL	126	260	213	131	97	60	887

MAYAREMA Project 520-0395 - Environmental Education, Awareness & Policy  
 \*\*\*\*\* AID TOTAL \*\*\*\*\*

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	30	40	40	40	30	30	210
Technical assistance	100	165	220	120	90	40	735
Travel & per diem	40	60	60	40	40	21	261
Training	40	90	90	60	30	10	320
Vehicles	0	20	0	0	0	0	20
Equipment	20	40	30	30	15	0	135
Office & furnishings	20	30	15	15	15	15	110
Supplies & op. expense	15	30	30	20	20	17	132
Special studies	60	180	70	20	0	0	330
TOTAL	325	655	555	345	240	133	2,253

MAYAREMA Project 520-0395 - Environmental Education, Awareness & Policy

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
NGO							
Personnel	40	75	150	150	100	100	615
Technical assistance	0	30	32	10	10	10	92
Travel & per diem	11	27	30	30	25	15	138
Training	0	0	0	0	0	0	0
Vehicles	20	20	0	0	0	0	40
Equipment	5	5	0	0	0	0	10
Office & furnishings	5	13	13	13	13	13	70
Supplies & op. expense	3	20	20	20	20	20	103
Special studies	20	40	50	40	30	0	180
TOTAL	104	230	295	263	198	158	1,248

MAYAREMA Project 520-0395 - Environmental Education, Awareness & Policy

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
GOG							
Personnel	10	10	10	10	10	10	60
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	2	2	3	3	3	3	16
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	8	8	10	5	10	10	51
Office & furnishings	20	20	20	10	1	1	72
Supplies & op. expense	5	5	5	5	5	5	30
Special studies	0	0	0	0	0	0	0
TOTAL	45	45	48	33	29	29	229

MAYAREMA Project 520-0395 - Environmental Education, Awareness & Policy

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
TOTAL							
Personnel	80	125	200	200	140	140	885
Technical assistance	100	195	252	130	100	50	827
Travel & per diem	53	89	93	73	68	39	415
Training	40	90	90	60	30	10	320
Vehicles	20	40	0	0	0	0	60
Equipment	33	53	40	35	25	10	196
Office & furnishings	45	63	48	38	29	29	252
Supplies & op. expense	23	55	55	45	45	42	265
Special studies	80	220	120	60	30	0	510
TOTAL	474	930	896	641	467	320	3,730

MAYAREMA Project 520-0395 - Natural Forestry

***** AID 8 *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	0	0	0	0
Technical assistance	39	47	43	55	36	27	247
Travel & per diem	20	25	25	10	15	15	110
Training	22	45	15	7	0	0	89
Vehicles	0	20	20	0	0	0	40
Equipment	3	6	6	3	3	2	23
Office & furnishings	1	1	1	1	1	1	6
Supplies & op. expense	1	2	2	1	1	1	8
Special studies	30	50	5	5	0	0	90
TOTAL	116	196	117	82	56	46	613

MAYAREMA Project 520-0395 - Natural Forestry

***** AID 9 *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	5	10	10	5	0	0	30
Technical assistance	6	13	12	10	4	2	47
Travel & per diem	4	6	6	4	2	2	24
Training	8	15	5	3	0	0	31
Vehicles	0	0	0	0	0	0	0
Equipment	1	2	2	2	2	1	10
Office & furnishings	2	3	1	1	1	1	9
Supplies & op. expense	2	2	2	2	2	2	12
Special studies	10	20	5	5	0	0	40
TOTAL	38	71	43	32	11	8	203

MAYAREMA Project 520-0395 - Natural Forestry

***** AID TOTAL *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	5	10	10	5	0	0	30
Technical assistance	45	60	55	65	40	29	294
Travel & per diem	24	31	31	14	17	17	134
Training	30	60	20	10	0	0	120
Vehicles	0	20	20	0	0	0	40
Equipment	4	8	8	5	5	3	33
Office & furnishings	3	4	2	2	2	2	15
Supplies & op. expense	3	4	4	3	3	3	20
Special studies	40	70	10	10	0	0	130
TOTAL	154	267	160	114	67	54	816

MAYAREMA Project 520-0395 - Natural Forestry

***** NGO *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	40	60	60	60	60	39	319
Technical assistance	0	40	30	10	10	0	90
Travel & per diem	10	26	23	19	17	7	102
Training	0	10	10	0	0	0	20
Vehicles	20	20	0	0	0	0	40
Equipment	2	5	4	2	1	1	15
Office & furnishings	1	1	1	1	1	0	5
Supplies & op. expense	5	6	6	5	5	5	32
Special studies	10	20	10	0	0	0	40
TOTAL	88	188	144	97	94	52	663

MAYAREMA Project 520-0395 - Natural Forestry

***** GOG *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	406	406	406	406	406	406	2,436
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	4	4	4	4	4	4	24
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	72	6	6	6	6	6	102
Office & furnishings	20	2	2	2	2	2	30
Supplies & op. expense	11	9	7	7	7	7	48
Special studies	0	0	0	0	0	0	0
TOTAL	513	427	425	425	425	425	2,640

MAYAREMA Project 520-0395 -- Natural Forestry

***** TOTAL *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	451	476	476	471	466	445	2,785
Technical assistance	45	100	85	75	50	29	384
Travel & per diem	38	61	58	37	38	28	260
Training	30	70	30	10	0	0	140
Vehicles	20	40	20	0	0	0	80
Equipment	78	19	18	13	12	10	150
Office & furnishings	24	7	5	5	5	4	50
Supplies & op. expense	19	19	17	15	15	15	100
Special studies	50	90	20	10	0	0	170
TOTAL	755	882	729	636	586	531	4,119

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MAYAREMA Project 520-0395 - Extractive Reserves

Item	Year 1	Year 2	Year 3	AID 8 Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	0	0	0	0
Technical assistance	35	27	39	30	22	20	173
Travel & per diem	15	17	16	15	14	14	91
Training	20	20	10	10	7	7	74
Vehicles	0	20	0	0	0	0	20
Equipment	1	1	1	1	1	1	6
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	1	1	1	1	1	1	6
Special studies	13	20	13	7	7	0	60
TOTAL	85	106	80	64	52	43	430

MAYAREMA Project 520-0395 - Extractive Reserves

Item	Year 1	Year 2	Year 3	AID 9 Year 4	Year 5	Year 6	TOTAL
Personnel	6	4	3	3	0	0	16
Technical assistance	5	8	6	5	3	2	29
Travel & per diem	1	3	2	2	2	1	11
Training	10	10	5	5	3	3	36
Vehicles	0	0	0	0	0	0	0
Equipment	1	1	1	1	1	1	6
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	1	2	1	1	1	1	7
Special studies	7	10	7	3	3	0	30
TOTAL	31	38	25	20	13	8	135

MAYAREMA Project 520-0395 - Extractive Reserves

Item	Year 1	Year 2	Year 3	AID TOTAL Year 4	Year 5	Year 6	TOTAL
Personnel	6	4	3	3	0	0	16
Technical assistance	40	35	45	35	25	22	202
Travel & per diem	16	20	18	17	16	15	102
Training	30	30	15	15	10	10	110
Vehicles	0	20	0	0	0	0	20
Equipment	2	2	2	2	2	2	12
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	2	3	2	2	2	2	13
Special studies	20	30	20	10	10	0	90
TOTAL	116	144	105	84	65	51	565

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MAYAREMA Project 520-0395 - Extractive Reserves

Item	Year 1	Year 2	Year 3	NGO Year 4	Year 5	Year 6	TOTAL
Personnel	42	49	49	49	49	35	273
Technical assistance	15	25	20	5	5	0	70
Travel & per diem	10	17	15	13	13	10	78
Training	5	10	5	0	0	0	20
Vehicles	20	0	0	0	0	0	20
Equipment	1	2	2	2	2	1	10
Office & furnishings	0	1	1	1	1	1	5
Supplies & op. expense	3	5	4	3	2	2	19
Special studies	10	20	20	10	0	0	60
<b>TOTAL</b>	<b>106</b>	<b>129</b>	<b>116</b>	<b>83</b>	<b>72</b>	<b>49</b>	<b>555</b>

MAYAREMA Project 520-0395 - Extractive Reserves

Item	Year 1	Year 2	Year 3	GOG Year 4	Year 5	Year 6	TOTAL
Personnel	35	35	30	30	30	30	190
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	5	5	5	5	5	5	30
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	10	10	10	10	10	10	60
Office & furnishings	50	50	30	10	2	2	144
Supplies & op. expense	20	20	20	20	20	20	120
Special studies	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>120</b>	<b>120</b>	<b>95</b>	<b>75</b>	<b>67</b>	<b>67</b>	<b>544</b>

MAYAREMA Project 520-0395 - Extractive Reserves

Item	Year 1	Year 2	Year 3	TOTAL Year 4	Year 5	Year 6	TOTAL
Personnel	83	88	82	82	79	65	479
Technical assistance	55	60	65	40	30	22	272
Travel & per diem	31	42	38	35	34	30	210
Training	35	40	20	15	10	10	130
Vehicles	20	20	0	0	0	0	40
Equipment	13	14	14	14	14	13	82
Office & furnishings	50	51	31	11	3	3	149
Supplies & op. expense	25	28	26	25	24	24	152
Special studies	30	50	40	20	10	0	150
<b>TOTAL</b>	<b>342</b>	<b>393</b>	<b>316</b>	<b>242</b>	<b>204</b>	<b>167</b>	<b>1,664</b>

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MAYAREMA Project 520-0395 - Tourism

Item	Year 1	Year 2	Year 3	AID \$ Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	0	0	0	0
Technical assistance	82	95	85	59	37	30	388
Travel & per diem	25	33	32	28	23	21	162
Training	15	22	45	67	7	7	163
Vehicles	0	20	0	0	0	0	20
Equipment	0	3	6	3	2	2	16
Office & furnishings	0	2	2	2	2	2	10
Supplies & op. expense	1	1	1	1	1	1	6
Special studies	0	7	30	50	35	15	137
TOTAL	123	183	201	210	107	78	902

MAYAREMA Project 520-0395 - Tourism

Item	Year 1	Year 2	Year 3	AID 0 Year 4	Year 5	Year 6	TOTAL
Personnel	4	4	4	4	4	4	24
Technical assistance	8	15	10	9	8	5	55
Travel & per diem	4	5	5	4	3	3	24
Training	5	8	15	23	3	3	57
Vehicles	0	0	0	0	0	0	0
Equipment	0	1	1	1	2	2	7
Office & furnishings	0	4	4	4	4	4	20
Supplies & op. expense	1	3	6	5	4	1	20
Special studies	0	3	10	40	35	15	103
TOTAL	22	43	55	90	63	37	310

MAYAREMA Project 520-0395 - Tourism

Item	Year 1	Year 2	Year 3	AID TOTAL Year 4	Year 5	Year 6	TOTAL
Personnel	4	4	4	4	4	4	24
Technical assistance	90	110	95	68	45	35	443
Travel & per diem	29	38	37	32	26	24	186
Training	20	30	60	90	10	10	220
Vehicles	0	20	0	0	0	0	20
Equipment	0	4	7	4	4	4	23
Office & furnishings	0	6	6	6	6	6	30
Supplies & op. expense	2	4	7	6	5	2	26
Special studies	0	10	40	90	70	30	240
TOTAL	145	226	256	300	170	115	1,212

MAYAREMA Project 520-0395 - Tourism

Item	Year 1	Year 2	Year 3	NGO Year 4	Year 5	Year 6	TOTAL
Personnel	40	63	63	63	63	56	348
Technical assistance	5	5	5	5	0	0	20
Travel & per diem	15	22	21	18	16	16	108
Training	0	0	0	0	0	0	0
Vehicles	0	20	0	0	0	0	20
Equipment	0	1	1	1	1	1	5
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	1	1	3	2	1	1	9
Special studies	0	0	0	0	0	0	0
TOTAL	61	112	93	89	81	74	510

MAYAREMA Project 520-0395 - Tourism

Item	Year 1	Year 2	Year 3	GOG Year 4	Year 5	Year 6	TOTAL
Personnel	5	5	5	5	5	5	30
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	2	2	2	3	2	1	12
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	3	3	5	5	5	5	26
Office & furnishings	20	20	15	10	10	10	85
Supplies & op. expense	5	5	5	5	5	5	30
Special studies	0	0	0	0	0	0	0
TOTAL	35	35	32	28	27	26	183

MAYAREMA Project 520-0395 - Tourism

Item	Year 1	Year 2	Year 3	TOTAL Year 4	Year 5	Year 6	TOTAL
Personnel	49	72	72	72	72	65	402
Technical assistance	95	115	100	73	45	35	463
Travel & per diem	46	62	60	53	44	41	306
Training	20	30	60	90	10	10	220
Vehicles	0	40	0	0	0	0	40
Equipment	3	8	13	10	10	10	54
Office & furnishings	20	26	21	16	16	16	115
Supplies & op. expense	8	10	15	13	11	8	65
Special studies	0	10	40	90	70	30	240
TOTAL	241	373	381	417	278	215	1,905

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MAYAREMA Project 520-0395 - Other ENR Commercial Activities

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	0	0	0	0
Technical assistance	0	0	0	32	60	15	107
Travel & per diem	0	0	0	10	15	8	33
Training	0	0	0	12	24	12	48
Vehicles	0	0	0	0	0	0	0
Equipment	0	0	0	4	6	1	11
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	1	1	1	3
Special studies	0	0	0	40	40	15	95
TOTAL	0	0	0	99	146	52	297

MAYAREMA Project 520-0395 - Other ENR Commercial Activities

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	4	5	5	14
Technical assistance	0	0	0	8	15	6	29
Travel & per diem	0	0	0	3	5	3	11
Training	0	0	0	3	6	3	12
Vehicles	0	0	0	0	0	0	0
Equipment	0	0	0	1	2	1	4
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	1	2	2	5
Special studies	0	0	0	10	10	5	25
TOTAL	0	0	0	30	45	25	100

MAYAREMA Project 520-0395 - Other ENR Commercial Activities

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	4	5	5	14
Technical assistance	0	0	0	40	75	21	136
Travel & per diem	0	0	0	13	20	11	44
Training	0	0	0	15	30	15	60
Vehicles	0	0	0	0	0	0	0
Equipment	0	0	0	5	8	2	15
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	2	3	3	8
Special studies	0	0	0	50	50	20	120
TOTAL	0	0	0	129	191	77	397

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MAYAREMA Project 520-0395 - Other ENR Commercial Activities							
NGO							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	17	17	17	51
Technical assistance	0	0	0	5	5	0	10
Travel & per diem	0	0	0	5	5	5	15
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	0	0	0	1	3	1	5
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	1	2	2	5
Special studies	0	20	0	0	0	0	20
TOTAL	0	20	0	29	32	25	106

MAYAREMA Project 520-0395 - Other ENR Commercial Activities							
GOG							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	0	0	0	0
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	0	0	0	0	0	0	0
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	0	0	0	0
Special studies	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0

MAYAREMA Project 520-0395 - Other ENR Commercial Activities							
TOTAL							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	21	22	22	65
Technical assistance	0	0	0	45	80	21	146
Travel & per diem	0	0	0	18	25	16	59
Training	0	0	0	15	30	15	60
Vehicles	0	0	0	0	0	0	0
Equipment	0	0	0	6	11	3	20
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	3	5	5	13
Special studies	0	20	0	50	50	20	140
TOTAL	0	20	0	158	223	102	503

MAYAREMA Project 520-0395 - Project Management & Evaluation

***** AID 8 *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	0	100	100	100	100	100	500
Technical assistance	20	26	36	36	36	36	190
Travel & per diem	5	12	22	12	10	5	66
Training	20	29	27	20	12	8	116
Vehicles	0	40	0	0	0	0	40
Equipment	4	6	5	1	0	0	16
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	0	0	0	0
Special studies	76	30	25	18	12	0	161
Audits	0	0	0	0	0	0	0
Evaluations	0	0	150	0	0	150	300
TOTAL	125	243	365	187	170	299	1,389

MAYAREMA Project 520-0395 - Project Management & Evaluation

***** AID 0 *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	30	44	44	44	44	44	250
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	5	5	5	4	3	2	24
Training	5	11	8	5	3	2	34
Vehicles	0	0	0	0	0	0	0
Equipment	1	1	1	1	0	0	4
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	0	0	0	0
Special studies	20	24	24	24	24	24	140
Audits	90	90	90	90	90	90	540
Evaluations	0	0	0	0	0	0	0
TOTAL	151	175	172	168	164	162	992

MAYAREMA Project 520-0395 - Project Management & Evaluation

***** AID TOTAL *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	30	144	144	144	144	144	750
Technical assistance	20	26	36	36	36	36	190
Travel & per diem	10	17	27	16	13	7	90
Training	25	40	35	25	15	10	150
Vehicles	0	40	0	0	0	0	40
Equipment	5	7	6	2	0	0	20
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	0	0	0	0
Special studies	96	54	49	42	36	24	301
Audits	90	90	90	90	90	90	540
Evaluations	0	0	150	0	0	150	300
TOTAL	276	418	537	355	334	461	2,381

MAYAREMA Project 520-0395 - Project Management & Evaluation

***** NGO *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	0	0	0	0	0	0	0
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	0	0	0	0	0	0	0
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	0	0	0	0	0	0	0
Office & furnishings	0	0	0	0	0	0	0
Supplies & op. expense	0	0	0	0	0	0	0
Special studies	0	0	0	0	0	0	0
Audits	0	0	0	0	0	0	0
Evaluations	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0

MAYAREMA Project 520-0395 - Project Management & Evaluation

***** GOG *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	40	40	40	40	40	40	240
Technical assistance	0	0	0	0	0	0	0
Travel & per diem	10	10	10	10	10	10	60
Training	0	0	0	0	0	0	0
Vehicles	0	0	0	0	0	0	0
Equipment	35	35	40	40	30	30	210
Office & furnishings	75	75	40	40	40	12	282
Supplies & op. expense	25	25	25	25	25	25	150
Special studies	0	0	0	0	0	0	0
Audits	0	0	0	0	0	0	0
Evaluations	0	0	0	0	0	0	0
TOTAL	185	185	155	155	145	117	942

MAYAREMA Project 520-0395 - Project Management & Evaluation

***** TOTAL *****							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	TOTAL
Personnel	70	184	184	184	184	184	990
Technical assistance	20	26	36	36	36	36	190
Travel & per diem	20	27	37	26	23	17	150
Training	25	40	35	25	15	10	150
Vehicles	0	40	0	0	0	0	40
Equipment	40	42	46	42	30	30	230
Office & furnishings	75	75	40	40	40	12	282
Supplies & op. expense	25	25	25	25	25	25	150
Special studies	96	54	49	42	36	24	301
Audits	90	90	90	90	90	90	540
Evaluations	0	0	150	0	0	150	300
TOTAL	461	603	692	510	479	578	3,323

**ANNEX I**



**SOCIAL SOUNDNESS ANALYSIS**

# SOCIAL SOUNDNESS ANALYSIS

## I. INTRODUCTION

### A. ASSUMPTIONS/GIVENS

This social soundness analysis should be prefaced by some givens and/or assumptions. These include:

1. In the design of the Maya Biosphere Project, effort was made to account for the set of key complex and interrelated biophysical, social, economic, institutional, and political factors. The commitment to this effort needs to continue and to be strengthened during project implementation.
2. Conservation, sustainable forest management and resource-based income generating activities are not just technical or economic issues. They have fundamental sociocultural and organizational aspects that must be considered as well.
3. Many projects have paid, or are paying, the price for having ignored social and cultural issues in their design and implementation. Local residents will be an important resource in addressing the challenges of integrating conservation and development in the Peten. Many of these people are both the agents and victims of resource destruction, not the fundamental causes. They have reasons for what they do, but appropriate incentives can help them move toward more sustainable practices. The general approach of the project should be "working with" local people, rather than "doing something to or for" local people.
4. The project context, both narrowly and broadly defined, must be reflected, in the Maya Biosphere Reserve Project and by other efforts, in a strategic and coordinated approach in the Peten, to meet broader conservation and economic development objectives. This, in turn, will directly and indirectly contribute to meeting the objectives of the Maya Biosphere Project.
5. Underestimating the time for any activities that yield tangible, sustainable positive results and impacts may be a constant issue for USAID/Guatemala to confront and accept.

### B. MAJOR SOCIAL CONSIDERATIONS FOR PROJECT IMPLEMENTATION

Some of the major considerations in the design and implementation of the Maya Biosphere Reserve Project include:

1. Some of the realities that the Maya Biosphere Reserve Project must address involve the nature of this rapidly growing population and the frontier mentality of the majority of residents and developers. With the creation of the Maya Biosphere

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Reserve, the boundaries of the frontier suddenly and legally have been reduced, which places still one more constraint on particularly the poorest people's ability to even survive. On the other hand, the Maya Biosphere Project cannot and should not address the underlying causes of deforestation and loss of biological diversity in the Peten. It can, however, support some research and policy dialogue on those issues that may contribute to broader political, social, and economic changes that will have positive impact, both environmentally and socioeconomically, in the area of the Maya Biosphere Reserve.

2. The actors in the region and project area include milperos, extractors, lumber interests, archeological interests, environmentalists, government agencies and more. It is important to keep in mind that in spite of the broader objectives of the project, the Reserve itself will be pretty much thought of in terms of what survival and income generating activities the project has curtailed. Free access for extraction will be regulated. Timber concessions will perhaps be more limited and activities more supervised than before. New settlement in the immediate area will be limited. These will cause more resentments to add to the previous ones of government corruption or lack of government interest and support for the Peten and its inhabitants. The project must take into account and find an appropriate balance for the many individual and competing interests. Two groups are particularly noteworthy here:
  - a) It is important to keep in mind that the majority of the actual resource managers in the Peten are and will continue to be the farmers. Agriculturalists like these have been aptly described in other parts of the world as both "shifting cultivators" and "shifted cultivators". While the Maya Biosphere Project design has tried to be sensitive to the needs of local residents and has tried to design activities that enhance some of the existing income generating activities in the region, the milpero will be the least likely to receive direct benefits from this project. Policies and economic conditions in other parts of the country will continue to push migrants to the area outside of the Reserve. USAID's intent to develop other activities in the Peten that will address some of the concerns of this portion of the population are important and will provide additional support to meet the primarily conservation objectives of the Maya Biosphere Project.
  - b) The role of women must be addressed in the project. While few data exist, some trends suggest that women in households where husbands have migrated to other areas or where men have abandoned the families may have increased responsibility for agriculture and natural resource management at the most local level. Their access to employment, credit, extension information, and general education will enhance their productive roles as well as their key role in re-enforcing the learning that children obtain in schools. This will have a long term impact on resource management by new generations of educated children.

3. Important social challenges for the project include the following.

- a) Very little information is available about resources, people, practices, etc. of the region. Research (baseline inventories and applied research) to increase understanding and enhance ability to manage resources should be a fundamental need and immediate priority of the project. As appropriate, research efforts should identify opportunities and implement research efforts that integrate biophysical and socioeconomic factors.
- b) Changing the attitudes and behavior of many local residents about the need and value of protecting biological diversity will be very difficult, more difficult even than trying to change attitudes and behavior about appropriate resource/land use practices and technologies to optimize productivity and reduce risk. They are also less apt to undertake soil conservation and other more sustainable practices that would involve "investment" in land that they do not own. Therefore, information, incentives, and income generating opportunities that complement protection activities will have to be specially geared to this challenge.
- c) Maintaining traditional access and/or rights to resources (e.g., rights for lumber companies to extract trees; rights for xateros and others to extract other products from the forest) needs to be looked at carefully in project implementation. It will not be possible in every case to maintain these rights or access to these resources when planning and decisions about the Reserve are eventually made and implemented. Project implementation efforts should acknowledge these various rights with the proviso that the practices employed in asserting the rights to resources ensure sustainable resource management to the greatest extent possible.
- d) Complementary to this is the issue of moving people from parts (e.g., biotopos) of the Reserve that are designated for strict preservation. The idea of paying people to move off of the land can have potentially adverse impacts and set some precedents that may lead to greater future conflict. As one group is moved out, another may try to move in with the thought that they will also receive money to relocate. Eventually, forced evictions may have to occur. Before making decisions about these actions, it will be important for project implementors to investigate the costs and benefits of a range of alternatives. These might include: moving the boundaries of the biotopos to avoid existing human settlements; providing jobs for current residents and rights to use certain carefully defined areas of land in certain ways with no hope of future title; providing incentives (e.g., services, jobs) to "pull" people elsewhere, rather than to "push" or "buy" them off. It is important to emphasize that each of these has costs that should not be dismissed lightly. For instance, moving lines or boundaries might set another precedent that could have adverse environmental impacts.

- e) Ecotourism or Tourism Oriented to Nature and Culture (TONC) can be an important form of income generation. However, it must be controlled or it can destroy the very base on which it depends. Also, it is potentially very vulnerable; markets often can close more quickly than they can be developed. The implications for local people employed in ecotourism can obviously be disastrous.
  - f) Many of the extractive activities also are vulnerable to international markets. This implies an emphasis on trying to diversify the economy so that extreme dependence is reduced in order to ensure a more stable local economy.
  - g) A number of policy-related issues (e.g., land and tree tenure, colonization, development opportunities and strategies in other parts of the Peten) must be included as part of USAID policy dialogue with GOG.
  - h) A particularly sensitive issue is the need to ensure that Guatemalans feel, in every sense of the word, that they are the "owners" of the project. This will continue to be difficult, especially with the limited numbers of trained people that the GOG has available and the generally low level of institutional support that currently exists.
4. A number of existing social opportunities exist that the project should take advantage of over the life of the project (LOP). These include the following.
- a) Time (not a whole lot, perhaps) exists in which to resolve some of these problems faced by the Reserve; to work with the local people to ensure adequate protection of the Reserve; and to provide income generating activities in the area. Not including local people will almost certainly ensure the failure of conservation efforts. Including them may not ensure conservation, but the likelihood is greater by doing so.
  - b) Among many of the potentially and actually competing groups in the area, a general consensus exists that conservation of the forest over the long term is important. The conservationists want an area where biodiversity can be preserved. The timber interests want a place from which they can harvest precious wood. The extractive reserve people (many of whom are also milperos) need the forest to provide other forest products for income or to meet their basic needs for food, fuel, fiber, etc.. Most everyone seems to agree that finding opportunities to provide economic benefits to rural Peteneros over the short and long term is important and advisable. Poor people who, even living in situations of poverty and great risk, seem to be interested working for a better future for their children, a future which, in great part, depends on using the natural resources of the immediate area.
  - c) Longer term residents have knowledge about the resource base that can and should be tapped in research efforts, training, environmental education, etc. These inhabitants can identify local species, and they often have deeper

knowledge of the components, structure and functions of the ecosystem on which they depend.

5. In general, the protected area management component of the project will be a "hard sell". Protection will be difficult for many to understand; little direct benefit will come to the majority of those living in the area; much development will be restricted rather than promoted; protection is a long term concept in an area that many has people with critical short term needs. Project implementors will need to be sensitive to these issues throughout the life of the project.

## **II. Compatibility of Project with Sociocultural Environment**

### **A. SUMMARY**

The vast majority of the activities promoted by the Maya Biosphere Project design are compatible with the existing social, cultural, and organizational environment. For example, extractive activities will continue, with improved practices and more controls; timber operations will continue to provide some employment in the forests, sawmills, and wood processing industries. The Protected Area Component of the project will be a new concept ("technology") in the area that will have to be addressed sensitively.

In general, the protected area component of the project will be a "hard sell" at the local level. The need for and value of protection will be difficult for many to understand; little direct benefit will come to the majority of those living in the area; much development will be restricted rather than promoted; protection is a long term concept in an area that has increasing numbers of people with critical short term needs. Project implementors will need to be sensitive to these issues throughout the life of the project. Some employment opportunities, however, will make it of interest to some local people. The training, environmental education, outreach, and public awareness activities will address some of the concerns that make this part of the project, perhaps, appear less compatible over the short term. USAID's intent to develop agroforestry and related activities with other funds will be a nice complement to the Maya Biosphere Reserve Project in the Peten.

This section is comprised of nine sub-sections: 1) history of human habitation; 2) current activities; 3) who lives where; 4) how are they organized and how do they allocate their time; 5) the role of women; 6) general motivation of the various groups; 7) general profile of project participants with implications for resource management; 8) social obstacles for the Maya Biosphere Project; and 9) communications strategies. Details on each follow.

## **B. HISTORY OF HUMAN HABITATION**

### **1. MAYA**

The early residents of the Peten were the Maya. Across Mesoamerica, from A.D. 250 until about 1500, the Maya civilization flourished in the middle of the tropical forests. The population included nobles, scribes, warriors, craftsmen, and farmers. In the Peten itself, numerous archeological sites give testimony to the nature and level of civilization that existed before its unexplained disappearance. The Maya Biosphere Reserve includes Tikal, the late Preclassic metropolis known as El Mirador, Rio Azul and other sites.

### **2. POST MAYA**

Spaniards conquered the area of the Peten in 1697. Colonial and post-colonial governments did not, however, pay much attention to the area thereafter. Thus, the encomienda system never became entrenched in the Peten as it did in other parts of the Americas. During the Colonial period, the population of the Peten included a mixture of native Indians, Indians from the Yucatan to the north and mestizos. It was only during the last quarter of the 19th century that much economic activity took place in the region. At that time, exploitation of chicle, lumber, and rubber increased.

### **3. CURRENT RESIDENTS**

The Peten can be characterized fundamentally as a frontier. The population in 1950 was approximately 15,880. In 1986, the population had grown to an estimated level of 193,933 and the projected population for the year 2000 is over 400,000. Between 1982 and 1987, the Department of the Peten had the highest rate of growth--approximately 6 percent per year. The Department has the youngest population in the country, with the average age being 14.85 years vs. the national average of 16.93. Population densities have increased rapidly from .44 inhabitants per square kilometer in 1950 to 5.37 inhabitants per square km in 1986. Immigration is currently the major source of population increase. Only the Department of Guatemala has a higher rate of immigration.

Thus, many of the current residents are recent arrivals. Estimates of migration range from 200-400/per day; the most commonly mentioned number is 250 but no census is available to confirm this. Migrants come from the southern coast, the highlands of the west, and the dry areas of the southeast. Migrants include Kekchi Indians from Alta Verapaz. Ladinos compose the majority of the migrant population.

Migration seems to follow a pattern, first of settlement in the more southerly portions of the Department by families in more southern areas of the Peten from other Departments. Then, the process of internal migration, (i.e., within the Department of the Peten itself) begins. More people are migrating into areas along the road to the south of parallel 17°10'.

some end up on land above the parallel and therefore within the area recently designated as the Maya Biosphere Reserve. Numerous families interviewed during field visits indicate they have more recently moved into this area from other areas in their progressive movement toward what is now the area of the Reserve.

The flows of migration are split between rural and urban areas. Between 1950 and 1981 the urban population of the Peten rose from 1,596 to 32,017. Some small secondary (e.g., transformation industries such as sawmills, carpentry shops, xate warehouses and distribution centers) and tertiary (e.g., local government, hotels, restaurants and other services) sector activities prevail in the towns of Flores, Santa Elena, and San Benito.

Most of economic and political power bases have been established here as well. The urban center of the Peten has, up until recently been the center for Empresa Nacional de Fomento y Desarrollo Economico del Peten--FYDEP--which basically controlled all activities in the region since 1958. FYDEP was the fundamental power structure with a mandate to regulate forest concessions, sell land, and implement development of the Department. FYDEP's policies and program have had major impact on the development of the region (e.g., migration, urbanization, concessions, deforestation)

Migration to rural areas consists of peasants seeking: 1) land and resources to plant corn, beans and other subsistence crops and to produce some surplus for market and/or 2) income generating activities such as collection of xate, chicle, and pimienta gorda. Production systems combine these primary activities with other off-farm and non-farm employment, in accordance with seasonal shifts in harvest schedules. Temporary migration associated with specific activities frequently takes men away from their households, leaving women responsible for family welfare and for agricultural production.

#### 4. ACTIVITIES

Peteneros depend on the productivity of the resource base, including its soils and forests and forest products. Basically, because of soil and other biophysical characteristics, the most appropriate land use is forestry. A great deal of forest area remains even after years of extractive use for precious woods, as well as for xate, chicle and pimienta gorda (allspice). Some evidence exists in recent satellite photos, for example, that, under appropriate conditions, selective forest extraction can provide a sustainable livelihood.

The most valuable activities are timber extraction (mahogany and cedar), milpa agriculture (corn and beans), ranching, and extraction of Chamaedorea palm. Farmers have planted milpas in the areas around population centers (e.g., Carmelita, Uaxactun) in spite of restrictions against farms in the northern part of the Peten.

Many of the new immigrants bring inappropriate technologies from other regions. Or, they do not have knowledge of the values of the forests and therefore do not know what to use, how to use it, what to manage, etc. This, along with increasing demand, potentially could undermine the future sustainability of extractive activities in the Reserve. Some of the longer

term residents complain that the new migrants do not know how to cut xate so that it will regrow for sustainable harvests.

The numbers of cattle have increased, mostly in the southern part of the Peten, but they are beginning to extend to areas north of Peten Itza Lake. Although not directly addressed by the project, the expansion of cattle ranching will affect the protection objectives of the project.

**5. LOCATION BY PRIMARY ACTIVITY**

- a. **Xateros**--Approximately 5,000 to 6,000 xateros live in the Peten. The human population is largest in areas where the highest plant density and potential for extractive activity are, i.e., in the northern part of the Department. The main centers for xate production are in Uaxactun, Dos Lagunas, El Naranjo and Paso Caballos. The richest regions are San Andreas and La Libertad municipalities because of the xate industry. Other less productive areas are: Melchor de Menchos, Yaxha, Colores and Poptun.
- b. **Chicleros**--Chicleros have collected chicle in the Peten since the 1880s. Peak production occurred in 1947. In 1981, however, only about 900 were employed in chicle production due in great part to competition from heavily subsidized gum production in Brazil. Major areas of collection are found near Flores, San Jose, San Anres, and Melchor de Mencos.
- c. **Pimenteros**--Pimenteros are located mostly near Sayache and Las Cruces. However, pimienta gorda itself occurs throughout most of the Peten.
- d. **Milperos**--The extractive people are also typically milperos. Their primary location (household) is along the major east-west road to the south of the Reserve and along the sides of the logging roads inside the area that is now designated as Reserve.

**6. SOCIAL ORGANIZATION AND TIME ALLOCATION**

Most producers are involved in complex systems of production that combine extraction of one or more forest products, other off-farm activities, and agriculture. Emphasis on different components of the systems shifts seasonally, and systems vary in different areas according to the resource.

- a. **Xate**--The xate industry is composed of collectors, contractors, transporters, sorters, and exporters. Xateros work for contractors (intermediaries) who have a licence (previously obtained from FYDEP) to organize work camps and transport the xate to exporter warehouses which receive, process, and

export the xate. The time between harvest and export is usually less than 6 days. The primary market is the U.S.

Xate camps have from 10-30 men. About 120 camps exist across the northern part of the Peten (covering an area of about 12,000-14,000 square km). Chicle and pimienta gorda collectors also use these camps. "The xatero works for a period of time that ranges from a few days to two months, entering into and exiting from the forest when his financial objectives have been met and when other activities, such as planting and harvesting of milpas, require his presence." (Heinzman and Reining, 1988:39).

"Subtracted from his wages are the costs of food and any supplies (boots, cigarettes, liquor) advanced to the xatero. The xatero's camp food, a diet of rice, beans, tortillas, coffee and sugar, is sold to the xatero at a considerable markup of 500-1000%: the xatero pays Q4.00-5.00 every day for food. ..." (Heinzman and Reining, 1988:39-40).

Women typically serve as seleccionistas (sorters) who select the exportable leaves at the bodegas or warehouses. They select for commercial quality, i.e., leaves of relatively uniform size and color that have no blemishes. From 45-65% of the leaves brought in are discarded because of poor quality. During the peak season, sorters may work as much as 44 hours per week.

Men working at the warehouses typically are the packers for exportation.

At various points in time, high unemployment exists. For example, the Prensa Libre in July 1988 stated that 2000 xateros were unemployed because of low demand on the international market. At these low points in employment, both the xateros and the contractors shift over the collection of other forest products such as allspice.

- b. Chicle--The chicle industry is divided into groups of collectors, contractors, transporters, processors and exporters. The main markets are in the U.S. and Japan.

In 1981, the chicle industry only employed about 900 men. The market for chicle is highly variable and employment rises on occasion to number perhaps from 2000 to 5000 people when demand is high. In general, the industry is in decline. Chicleros continue to participate since the periods of demand for chicle are during times when there is less demand for xate. Thus, many of the chicleros spend most of the year working as xateros.

- c. Pimienta Gorda--For pimienta gorda, collectors, contractors, transporters, warehouse owners, and exporters (to the U.S., Holland, Germany, China and Middle East) form the social organization. Collectors of Pimienta gorda also regard it as seasonal employment. They spend most of the year as xateros since allspice collection occurs from mid-July through mid-September.

- d. Milpa--Milperos typically use a large area of land with a rotation system of fallow and cultivated areas. They have mixed cropping systems with corn and perhaps beans, squash and other products for household consumption. They normally get two harvests per year (rainy season and dry season crops). Sometimes, milperos may have three harvests per year, but most do not because they participate in other non-farm extractive activities during the year, especially during the dry season. For example, during August and February, many participate in the harvest of xate. Milperos typically spend their time in preparation of some fields (slashing and burning); in planting, managing, and harvesting other fields; and waiting for fields in fallow to become available for farming once again.
- e. Timber Industry--For timber extraction, tree cutters, sawmill owners, and exporters effectively form the social organization with variations depending on sawmill capabilities (e.g., to transform into wood boards, plywood, veneer). There is also an incipient wood industry such as the production of wooden doors.

#### 7. ROLE OF WOMEN

An adequate data base does not exist to allow a good diagnosis of the gender division of labor in production systems in the Peten. The systems are complex, combining extraction of various forest products with agriculture and other off-farm activities. Women's precise participation in these systems, in different parts of the region, have yet to be studied. There are no published or systematic studies about the division of labor by gender in the Peten, nor how it might be changing.

Women do play a major role in the management of natural resources, since they are responsible for supplying water and fuelwood for their family's needs. Especially in communities oriented to forest extraction, women's detailed knowledge of fuelwood species could be an important resource for development and conservation efforts. Women also are actively involved in home garden production and in processing of agricultural and extractive products. Some women, especially those without children, also work as xate collectors or as cooks in xate camps. Women also participate in most agricultural tasks when necessary. In other parts of Guatemala, women are active in seedling production for reforestation programs. These productive activities tend to be invisible because of the prevailing cultural notions that assign women to tasks around the house, even though the reality of subsistence life may require them to be in the field or the forest.

Complex migratory patterns in the Peten affect the gender division of labor in ways that have not yet been analyzed. In unstable frontier settlements, especially those like the Peten with uncertain land tenure arrangements, men frequently migrate to work in seasonal activities in inaccessible work camps, leaving their families living on their agricultural plots or in town. Women are often left to fend for themselves for months or years with no word of their

husbands. Some men fall victim to violence, run out of money or catch ill, or take up with a new wife somewhere else, and never return.

Many women in the Peten can therefore expect to be de facto heads of household for some portion of their lifetime. It is common for Petenero men to migrate on a temporary or seasonal basis, to work as laborers on plantations or forest camps. Responsibility for agricultural production and other income-generating activities are added to the domestic duties of the women left behind. Either they themselves go to work in the forest or agricultural fields, or they must generate enough income to hire male labor.

Women have a strong stake in the long-term fate of the Peten for their children's sake, and are often left with crucial responsibilities for management of the family's resources. They are more stable regional residents, in general, than men. Women should, therefore, be considered key allies in the Maya Biosphere Project.

Despite their economic responsibilities, women in the Peten have little access to the resources they need. Literacy rates are significantly lower for women than for men. In general, men have control over productive resources. The erroneous perception that women do not participate in production or in extractive activities impedes their access to information, credit and other resources. Women are active in some local organizations such as cooperatives, parents' committees in local schools, and village committees, which might serve as a channel for providing access to the resources they need.

There are very few sources of income or paid jobs available to unskilled women. Some operate small shops or roadside restaurants that cater to truckers and other passers-by. In the town of Flores, about 200 women work as xate sorters, currently perhaps the best wage-earning alternative available. Xate sorters earn 8-10 quetzales a day. A very few women are also employed in the wood processing industries--sawmills, veneer and plywood plants, and wooden door production. Other alternatives for urban employment include jobs as domestic help and as laundresses. Women also are employed as maids, cooks, receptionists, and the like. Opportunities for women in these jobs may increase as tourism and demand for urban support services increases.

These considerations suggest the need for special project efforts to support women's productive activities and to ensure access to new sources of income and employment. Targeting some project resources to women will be essential in order to fully meet the objectives of the income-generating components of the project, and to ensure that benefits are channelled as directly as possible into the welfare of the regional population.

Women's importance as natural resource managers must also be taken into account in the introduction of new technologies and in the development of environmental education programs where they can potentially play a significant role. Because of their direct stake in family health and the long-term future of their children, women can be important allies in the effort to develop sustainable resource management activities in the Peten.

## 2. GENERAL MOTIVATIONS OF MAJOR GROUPS

- a. Extractors--Xateros, chicleros and collectors of allspice have non-farm income generation as a primary motivation. In general, "the degree to which individuals exploit xate as a wage source depends upon the contribution of other household members to maintaining milpa, finding other sources of income such as harvesting allspice, etc." (Henizman and Reining, 1988:47).
- b. Contractors--Contractors, many of whom started out as xateros, pay xateros by the quantity of leaves collected, without distinguishing their quality. There is therefore no direct incentive for xateros to distinguish higher quality leaves. Since contractors' licenses do not apply to specific areas, there is no incentive for them to preserve the future productivity of the open-access resource. Furthermore, contractors make much of their profit from selling the xateros food, coffee, sugar, cigarettes, etc. at inflated prices. The contractors want to keep the xateros in the forest camps longer so that they will buy more of these items. This contributes to the tendency to overharvest.

The contractors and exporters in extractive activities receive greater income than do the extractors themselves.

For most contractors, the fact that the land from which the resource is extracted does not have to be owned by them is a major incentive. Access to the resource provides them with income even if they do not necessarily have actual control over the resource. However, having access but no legal control leaves no one responsible for its future sustainability.

- c. Milperos--Milperos have subsistence production as their main motivation. Their plantating of corn and a few other crops serves as source of non-market food for their family and their domestic animals. The land on which the crops is grown is a capital asset when they have title to it. When they have no title, it serves at a minimum as a temporary source of food and income. In general, to obtain credit, the government requires that producers clear the forest and establish a milpa.
- d. Madereros--Madereros (lumber operators) have incentives for income produced from the high value timber coming out of the forest. Markets, primarily in developed countries, provide economic incentives for removal of the wood through concessions. They too have access to resources even though the land does not belong to them. The people working for the madereros have an interest in either seasonal income from the work in the woods or from work in the sawmills, transformation plants and other transport and associated activities.

- e. Tourism Oriented to Nature and Culture Interests and Artisans--In general, little is known about the numbers of local people who work in tourist related activities. The general nature of the work is in services. This includes individuals with more education who work for the airlines, larger hotels, and tourist and car rental agencies. Jobs for others in food preparation, transportation, guide, security (e.g., guards at Tikal), cleaning (e.g., maids, janitors), and other more menial work exist as well. Taxi drivers, local restaurants owners and workers, and others may serve both the tourists and the local population.

The numbers of artisans in the Peten is unknown. They work with the making of local wood art, textiles, furniture, and related crafts. They also work in the selling of the crafts. In El Remate, a craft production center is currently working in the training of local people to produce new crafts for sell primarily in the Peten.

### C. GENERAL PROFILE OF PARTICIPANTS AND IMPLICATIONS FOR RESOURCE MANAGEMENT

Some of the general characteristics of the rural Peteneros that have particular implications for sustainable natural resource management, protection of the Biosphere and income generation follow. In general, residents of the Peten are poorly educated. The literacy rate for men is only about 30 percent; the rate for women is lower. The vast majority of the population is composed of new migrants. Much of what is happening to them is caused by population pressures that have driven them out of other areas of the country, scarcity of resources (e.g., land), and a political and economic system that generally supports the maldistribution of those resources that are available. Peteneros have varying levels of experience in agricultural production activities on the poorer soils of the Peten and in extractive reserves of tropical forests. Those who have lived in the region for some time have developed an important source of knowledge that can and should be tapped. Those who have arrived only recently have little knowledge or experience. The poorest are the likely to be most resistant to or conservative about trying new practices or technologies. Their margins for potential error are extremely limited under subsistence and high risk conditions (e.g., land is not very productive for very long, few people have land or tree tenure). The majority of the rural population expresses desire for potable water, food to feed the family, and services such as schools and health clinics. All, however, depend on the sustainability of the natural resource base, especially of forest resource harvesting. This dependence can provide a major incentive for more sustainable practices.

Attitudes are an important part of the profile of participants, whether the attitudes of milperos, agency personnel, or others. Many locals have an attitude that might translate into: "What is this biodiversity; we need food". They also have the understandable attitude that present production is a higher priority than the sustainability of resources. Many campesinos do not believe in technical experts, in job offers, or that new laws will help their economic situation. Attitudes by most everyone (government officials, industrialists, conservationists) hold that the milperos are the "bad guys"--destroyers of the forest. Most everyone believes that women are not involved in productive activities.

The nature of many of the communities and organizations varies across the Peten. New migrants enter existing communities or establish new ones. Depending on the numbers and diversity of geographical and ethnic origins, this often leads to unstable settlements. Most groups of people have short histories of association so they have little actual cohesiveness as communities. Additionally, the temporary migration and desertion of families by men lead women to take on some unfamiliar roles in agricultural production and resource management for the whole household.

An important part of the participant profile is their access to and control over resources. It is fair to say that, in the Peten, people have little access to information and resources (e.g., credit). They have little actual control over resources, especially land. While men have varying degrees of access to and control over resources, women may have some access but rarely have any actual control over productive resources (see section 5. above on the "role of women").

#### **D. PRINCIPAL SOCIAL OBSTACLES FOR THE PROJECT**

Local people face a range of biophysical, political, institutional, social and economic obstacles. The nature of the soils, water, and other biophysical resource constraints has been described elsewhere in the Project Paper. Many social and economic constraints are identified in other parts of this Social Soundness Analysis (see especially the Participant Profile in the preceding section). Major political and institutional constraints that have important social ramifications are outlined below.

A number of political constraints exist. Now that a new political system is being established to replace FYDEP, no one, rich nor poor, really knows what the new rules of the game are. Reports persist of corruption. Many interests exist for competing and conflictual land uses in the Peten; the more powerful generally prevail. The government generally lacks commitment and/or political and institutional ability to address the issue of illegal logging, wildlife poaching and other intrusions by Mexicans from areas along the border. While some possibility for change with elections in the Fall exists, this is not necessarily a positive sign for the reserve or the local inhabitants. All the while, the guerrilla movement persists in the region which is a problem for government, military and local citizens.

Institutional constraints include lack of government agency experience in the region, inadequate policies and laws, and limited support for development activities in the Peten. Since FYDEP had responsibility for managing the Peten from 1958 until the present, other government agencies and personnel have little or no experience with the resources and people of the region. While new planning efforts are in process, they are difficult to coordinate, and implementation of plans has not yet begun. Additionally, few trained personnel are available and most have a poor understanding of technical needs and social dynamics. While much is in transition, politically and institutionally, in the Peten, much remains to be done to regularize the land tenure system. With over 29,000 titles having been requested and only approximately 4000 having been given, the process will continue for a long time to come. Many feel that the Peten will remain the unattended region by government efforts, and that it will receive little financial support from the government. This may be especially true since the area has been designated as a Biosphere

Reserve and will not have major economic development funds available particularly north of parallel 17.10.

### **E. COMMUNICATIONS STRATEGIES**

The Peten has been effectively isolated from the rest of the country in most ways - economically, geographically, and politically; however, in terms of communications, the Peten has a mixed history and potential. For those who can afford radios and televisions, information is now more readily available. Currently the radio is a primary means of general information and public awareness in the Peten. However, few materials are available for the radio stations on environmental education, agricultural extension or other issues that might be of interest to people in the region. Newspapers also provide information to the general public.

In general, information about these issues cannot be extended in any form, since almost no information exists at the moment on Peten-specific details. Teachers who might serve as direct means of communication through schools have environmental education as one of their priorities; however, they barely have books of any kind, and rarely do the children have paper and pencils. Efforts to provide environmental education also must be combined with general literacy programs so that the multiplier for both children and adult students is increased.

Other means of communications in the Peten include community meetings and word of mouth. These provide important opportunities for extending general and specific information about the protection and income generating activities of the project, about the laws and regulations of the reserve, etc.

The public avenues of communications merit attention by project implementors. A major concern is that special effort be taken to ensure the participation of women so that their contribution to meeting project objectives can be enhanced and that more of the benefits of their participation (e.g., information about programs, training in certain fields) accrue to project participants.

## **III. Spread Effect**

### **A. SUMMARY**

Most of this social soundness analysis addresses the groups of indirect project beneficiaries comprised of extractors, milperos, and children who will receive benefits from knowledge and skills to improve natural resource management; employment in project-related activities; participation to the degree possible in planning and decisionmaking related to the Reserve; income generation activities of the project; and education and awareness in school programs.

Basically, no major new technological or institutional innovations will be introduced into the project area during the 6 year LOP. Some new practices may be introduced or existing practices improved; however, the training, awareness, and environmental education components of the project have been designed to address the introduction and spread of these technologies through a range of activities including mass media; meetings with teachers, communities, and associations; training sessions for project personnel; seminars, workshops, study tours and other activities that will provide information and skills are the major means of diffusion of project innovations. Additionally, project implementors will be working closely with local, regional, and national leaders through a range of study tours, meetings, workshops, and conferences.

## **B. BENEFICIARIES**

The primary beneficiaries of this project are the institutions which receive support and their staff who receive training. The increased effectiveness of CONAP, DIGEBOS, CECON and IDAEH, because of these institutional development and training activities will have a multiplication effect over the country as their personnel participate in long-term activities in the Peten, in other regions of the country, or even at the national level at some point in their careers. Institutions will also receive benefit from technical assistance, commodities that will promote more efficient and effective programs, and new research information which will provide them with the basis for more informed decisionmaking about protected area management and sustainable resource management for income generation. Increased public sector ability to integrate the concerns of conservation and socioeconomic development will lend to the long-term stability of production systems of the country.

Other public (e.g., CONAMA, Ministry of Education) and private (e.g., NGOs) institutions and their personnel also will receive benefits from research, awareness, and environmental education activities directly available through the project.

Residents of the Peten, in most cases, will be the secondary, or indirect, beneficiaries of the Maya Biosphere Reserve Project. A number will receive direct impacts from job creation and local hiring practices. Many children and some adults in literacy programs will receive the benefits of better oriented teachers with educational materials. Individuals working in natural forest management, extractive reserves, and tourism oriented to nature and culture will benefit from the availability of new information on more sustainable resource management practices that will be provided by better trained and aware outreach personnel. In many cases, local people may be unaware of the benefits of awareness, education, and information; however, they are considered they are considered, nonetheless, to be benefits of the Maya Biosphere Reserve Project.

The global community may be considered to be an indirect beneficiary of project activities as well. Efforts to integrate conservation and development provide political, environmental, and economic stability in individual countries that can, in turn, contribute to global stability.

Basically no major new technological or institutional innovations will be introduced into the project area during the 6 year LOP. Forest management activities will continue in some form, milpa agriculture will continue in certain areas, extraction activities will continue. Some new

practices may be introduced or existing practices improved, however, the training, awareness, and environmental education components have been designed to address the introduction and spread of these technologies through a range of activities including mass media, meetings, training sessions and the like. These are described in greater detail in the Human Resource Development annex.

It must be re-emphasized that the protected area component of the project will be a "hard sell". Protection will be difficult for many to understand; little direct and early in the project benefits will come to the majority of those living in the area; much development will be restricted rather than promoted; protection is a long term concept in an area that many critical short term needs. Project implementors will need to be sensitive to these issues throughout the life of the project.

### C. ROLE OF LEADERSHIP IN DIFFUSION OF INNOVATION

To enhance the benefits to the indirect beneficiaries of the project, the project will be focusing on individuals, groups of individuals (e.g., xateros), and communities. Leaders may include long-term residents with a great deal of experience in xate extraction who can be tapped to work with researchers and who can assist in training of other xateros to improve harvest practices. Leaders, like the Soto brothers in El Remate, can provide their support for the concept of resource conservation as the basis for sustainable income generating activities in arts and crafts. Teachers will be trained and provided with materials so they can promote environmental education. Leader communities can serve as demonstrations for other communities. Locals who are hired to work in the Reserve often are able to provide more leadership than individuals who come from outside of the region to assume positions in project administration or field implementation. Political leadership from the capital can help ensure continued support to the public sector institutions working in the area. Private institutions (local, national, and international) can provide enthusiasm, assistance, and long-term commitment to meet project goals and objectives. It is important to ensure that the project itself also provides leadership in identifying and working with poorer elements of the Peten, especially women. Activities in extension/outreach should target these groups with appropriate information to enhance their productive activities, improve resource management practices, and diversify their economic base.

Specifically related to gender concerns, the project should constitute a small committee with representatives of key institutions to coordinate gender-related activities in the Project. Project executing institutions (e.g., CONAMA, CONAP, DIGEBOS, and IDAEH) can work on this committee with representatives of national and local organizations concerned with different aspects of women's issues. The committee will pursue opportunities for working together with women in the Peten (e.g., Fundacion Dolores Bdoya de Molina has a proposal for grassroots training in environmental education for women leaders, and the Fundacion para el Desarrollo de la Mujer is interested in expanding its women's credit program to the Peten).

#### **D. PREVIOUS EXPERIENCE WITH PROJECT DESIGN AND EXECUTION IN PROJECT AREA**

Little experience exists in the region. The government of Guatemala has disbanded FYDEP, the entity that previously had responsibility for managing the Peten. Most GOG agencies and personnel (except for the Military and IDAEH) have no experience in the region. USAID has not supported projects in the region before. Most of what has been done in the region has been done by the private sector (e.g., xate industry, timber industry). This suggests that it would be particularly important for project implementors to take advantage of those who have lived in the region for some time. They are a potentially valuable resource for the introduction and spread of improvements in the sustainability of existing and new practices.

#### **E. MEANS AND MESSAGES FOR INFORMATION DIFFUSION**

The majority of the audiences will generally be varied and hard to reach, since they are so dispersed. The primary information that needs to spread in the project includes:

- 1) Awareness--to increase the awareness of the general public (including Peteneros, residents of other parts of the country, and decisionmakers) about laws, regulations, the values of the Maya Biosphere Reserve for current and future generations, project objectives and activities, policy concerns, gender awareness
- 2) Environmental Education--to increase the ability of the local population (in primary and secondary schools, adult literacy programs, etc.) to understand their environment and to better manage natural resources at the most local of levels, the values and benefits of the reserve, laws, regulations, sustainable resource management practices, general literacy enhancement
- 3) Training--of personnel in public and private sector to improve their ability to address the complex issues related to planning, management, conservation, and education about the protection of the Maya Biosphere Reserve and other natural resources in the Peten.
- 4) Outreach--to provide information to local people (e.g., xateros) about improved technologies and practices for management of extractives and other products of the forest

#### **F. MEDIA, METHODS, AND MATERIALS FOR DIFFUSION**

The project will use a variety of media, methods, and materials to spread information. These include: 1) Mass media (e.g., radio); 2) Town meetings; 3) School programs; 4) Demonstration units; 5) Study tours; 6) Training sessions. These are all described in greater detail in the Annex on Human Resource Development and in the sections of the PP on training, public awareness, and environmental education.

One particular topic of concern and means for spreading information about it relates to gender. Representatives from USAID, the project implementor, and key government institutions should participate in a three-stage training program in gender analysis that draws on case study materials relevant to natural resource management and Maya Biosphere Project activities. First, a group of approximately 15-20 representatives from the groups listed above should participate in a two-day training workshop in Guatemala City. The objectives will be to sensitize project managers and decisionmakers to gender analysis, improve analytical abilities related to project goals, and provide a vehicle for inter-institutional communications. Second, a group of 4-6 participants in this training course should work with trainers in a three-day training-for-trainers workshop immediately following the course. These trainers will provide the means for multiplying the skills training provided in the course. Finally, the trainers will provide short courses, throughout the life of the project, to extensionists and teachers involved in project activities in the region. This field training is essential to improve the effectiveness of interactions with the local population.

#### **IV. Social Consequences and Equity Issues**

##### **A. ACCESS TO RESOURCES AND OPPORTUNITIES**

The general consensus is that the project will make every effort to provide real opportunities at the most local of levels (e.g., hire guards in local areas not from nearby towns), train locals, use local xateros to train other xateros, provide continued access or rights to resources such as trees for timber or xate even though land tenure inside of the reserve will continue to be restricted. With the current planned phasing of the project, the employment opportunities for Guatemalans appear to primarily exist in support of the protection of the Reserve, e.g., administrators, guards. The actual implementation of this kind of approach will provide more motivation for local people to work with the Reserve rather than against it. There should be a strong effort to ensure the spread of benefits and resources to both men and women.

##### **B. RURAL DISPLACEMENT AND MIGRATION**

This issue has been discussed in greater detail in a variety of places above (e.g., point d) on p. 3 of this Annex). Some locals, currently residing in areas now designated as part of the Reserve may be relocated. Since final decisions have not yet been made, a preliminary activity in the more concerted planning and actual management of this project will have to look at the potential costs and benefits of any action take. Alternatives may exist that avoid forced eviction; they should be identified and carefully assessed. For example, where local are without land title within the area of the Reserve, the project might consider a range of options including giving a 1-2 year "grace period" that permits current kinds and levels of use until proper consultation, study and policy can be developed, agreed to and implemented.

This project is not planned to encourage migration. As currently phased, the socioeconomic development opportunities are reasonably limited for the area during the first stage

of the project. This project will address the issue of future migration to the Peten itself through policy analysis and dialogue. Some of the research being programmed during the first few years of the project will also address the potentials for more sustainable practices as well as the carrying capacities of the various resources of the area to absorb more migrants. This information can be helpful in decisionmaking and planning of future complementary activities in the Peten. USAID will also have to address the issue more directly as it develops other activities in the region.

### **C. CHANGES IN POWER AND PARTICIPATION**

The Maya Biosphere Reserve Project will be looking at a number of issues related to changes in power in participation.

The project should undertake research to identify mechanisms and incentives to potentially modify the debt-peonage system that currently exists. While the actors in intermediary arrangements, such as contractors and collectors, are mutually dependent upon one another, the current arrangements are typically exploitative and should be modified. The project can provide information on the structure and function of these systems and provide guidance on means to modify them. The proposed 6 year project may not, however, have the time and level of resources to undertake a major effort to implement changes. This might be an important consideration for any future projects or extensions of this project.

The project will be making every effort to increase the participation of local people through employment opportunities; planning and decisionmaking that affect their farms, communities, and jobs; and improvement of their awareness of sustainable natural resource management practices that will enhance their income and long-term prospects for themselves and their families. The project will focus attention on increasing the employment opportunities for women, ensuring that they receive extension/outreach information that will enhance resource management on their farms, and education, credit and other resources insofar as possible during the life of the project.

The Protection and Management Component Technical Paper of the project design recommends that: "in coordination with CONAP and the Maya Biosphere Reserve Management Committee, define a mechanism as soon as possible to include local community representation in the design and implementation phases of the Project. Otherwise, the Project has a high possibility of being perceived as another Guatemala City governmental effort without considering the Peteneros' real needs. If the local communities do not feel a sense of propriety for the Project and the Maya Biosphere Reserve, it will be extremely difficult to achieve the ultimate goal of conserving tropical forests and protecting biological diversity" (Houseal, 1990:18)

### **D. SOCIAL IMPACT OR DISTRIBUTION OF BENEFITS AND BURDENS**

While general agreement exists that local people should participate in activities and in benefits from project activities, translation of rhetoric and desire into reality is quite something else. As designed, the project is fundamentally socioculturally feasible. Some guidelines for

ensured continued and increased feasibility include but are not limited to the following. A considerable amount of research needs to be conducted. Careful consideration of the social and organizational aspects should be given as future project activities evolve. Participation can certainly have its costs as well as its benefits. Opportunities within the Maya Biosphere Project or in other USAID activities in the Peten should expand socioeconomic opportunities and benefits to the local people. Public awareness, environmental education, and training will play a critical role in achieving project objectives insofar as they are geared to the participants' needs and abilities to take advantage of their benefits.

**E. PRELIMINARY CONSIDERATIONS AND GUIDELINES TO ENHANCE THE SOCIOCULTURAL FEASIBILITY OF PROJECT ACTIVITIES**

1. We know some things but much remains to be known in terms of how to improve people's access to sustainable resource techniques, markets, improved social organization, ways to enhance local and or regional economic development based on extractive industries. For example, there is no information currently available to assess with any precision the potential role for women, although it is apparently important.
2. It is important to recall the experience of protected area development in many other places. "Delimitation and protection of selected areas from most other land uses poses management problems and adverse socioeconomic impacts on local inhabitants. Where there are human population pressures from existing population, or they are anticipated from future colonization, these will inevitably lead to illegal encroachment, deforestation and a decline of biological diversity. Practical experience has shown that sharply defined protected areas cannot successfully be maintained intact through the use of forest guards or physical barriers" (Van Orsdol, 1987). Insofar as the broader strategy of the Maya Biosphere Project and other planning and development activities in Peten are successful, this concern of adverse socioeconomic impact because of development of a protected area may be diminished. Employment of Peteneros in Reserve activities will help to some degree. Training of personnel working with local people may help to reduce some of the inevitable conflicts that will arise over "closing" the land to traditional activities such as slash and burn agriculture. Careful research with eventual careful development of income-generating activities such as extractive activities and tourism oriented to nature and culture/ecotourism will contribute. Development of other activities further to the south by other projects may contribute. Public awareness and environmental education will contribute. Most of these activities deal only with symptoms rather than causes of the deforestation now going on, so overall development of the nation, reducing population, and distributing resources in more equitable ways through time may be the major contributors to protection of the Maya Biosphere Reserve. The Maya Biosphere Reserve Project cannot address these issues.

3. International demand for some of the products of the tropical forest is vulnerable. As always, the most vulnerable are those with least access to and control over the resources--i.e., the poorest. Other groups (e.g., contractors) can be adversely affected as well. This vulnerability may have important implications for the long-term protection of the Maya Biosphere Reserve. If these employment opportunities disappear, milpa agriculture may be the quickest and most viable alternative, particularly for the poorest. The project has been designed to identify and support opportunities to diversify the economy through support to income generating activities. It should work to leverage funds and support from other donors for development activities well outside the area of the reserve.
4. The lessons from other frontier areas, such as Amazonia, might be instructive: "In the socioeconomic and political context within which resource management projects must be carried out, the principle of private profit and expanded production far outweighs that of biophysical sustainability and environmental conservation. Hence, it is hardly surprising that the goals of ecologically sound projects premised on assumptions of sustainability are consistently subverted by the mechanics of a social system based on the laws of accumulation. ... a society's prevailing form of economic production and class structure, and the manner in which diverse economic groups battle for ideological and policy advantage within the state apparatus, are crucial considerations in the process of designing resource management projects and in formulating strategies to carry them out" (Schmink and Wood, 1987:39)
5. Security of land tenure for colonists outside of the Reserve is crucial for the success of this project. Clear title must be secured in appropriate areas. The biological, physical, political, institutional, and socio-cultural and economic carrying capacities of the Peten must be observed.
6. Cooperatives (e.g., of xateros) need to be supported so that they function rather than just exist in name only (NOTE: this is a very political issue however) are important.
7. In general, the project should attempt to identify and implement incentives for people to become better resource managers in the Peten. This can include strengthening community institutions and organizations, providing employment and training; and providing information to increase the productivity and the income generating potential of farms and their long term sustainability. The project should initiate activities (e.g., local employment, training) or encourage activities by donors that have the intent of producing some rapidly visible benefits for local people.
8. Research on social organization, household decisionmaking, the role of women, educational message transmission, are all topics that should be addressed. They have been recommended as part of the Applied Research activities of the Maya Biosphere Reserve Project.
9. It has been the generally expressed desire of GOG counterparts during this project design that to the greatest extent possible, the project should hire local Peteneros

to be employed by the project as guards, local contractors, to provide labor and materials for boundary surveys and construction of infrastructure. The project will undoubtedly want to consider contracts with local communities and individuals to perform certain tasks at certain times of the year (e.g., the repair of boundary markers, the maintenance of facilities). These activities should not just be added to the responsibilities of the guards. Providing opportunities to non-Reserve employees will help build better relations and a broader constituency for the Reserve's success.

10. The project should look at ways to structure forest management and conservation that involve locals and enhance their income generating opportunities. In the second stage of the project or perhaps in an extension of the project activities designed here, project implementors may want to experiment with the development of campesino forestry activities if appropriate communities or farmer/extractor organizations are identified and interested. Experience in a number of other countries suggest that much silvicultural/natural forest management activity rises or falls not on technological, but on motivational and organizational factors. Peasants have to know, for example, that they will own, have access or rights to harvest and benefit from the trees. The difficulties of instituting new organizations or structures to this need to be looked at very carefully, and appropriate kinds and levels of support over time must be provided in order to achieve success.
11. Project management should look at the activities that are being proposed from a long term perspective. Previous experience in other areas suggests that some of the contracted activity should be remunerated by the performance of a task, not by the amount of time that it takes. If local groups have responsibility for certain activities, the contract should be for success at performance. One useful example deals with fire. Locals should not be paid to fight fires; this builds in a potential incentive for some to start fires so that they can be paid. Instead, locals might be paid for success at fire control. The contract would thereby deduct from the pay going to the community if any fires break out. The incentive structure, in this case, thereby hopefully encourages people to perform tasks so that they will not lose income. The specific example provided here is less important than the process of identifying and establishing appropriate incentives.
12. Some of the potential social benefits of the Maya Biosphere Reserve Project include: a) self-respect because their abilities and contributions to meeting project objectives are recognized; b) more stable (effective and efficient) practices and diversified activities to provide a foundation on which to build more sustainable production; c) income generation that helps reduce household risks; d) enhancing local (individual and community) capability to deal with local problems and to resolve conflicts and to assume greater responsibility for sustainable resource management after the project ends; e) a cleaner and more healthy environment. Even more difficult are some of the longer term benefits of conserving the resources of the Maya Biosphere Reserve for future generations. The value of these is fundamentally inestimable, but shorter-term local economic benefits must be balanced

with those for broader benefits to Guatemala and to the globe. Many of the most direct costs will have to be born by the residents.

13. The project should work to: a) define roles very clearly, b) clarify everyone's expectations; and c) get specific commitments (e.g., time, labor, materials, money, infrastructure) from each participant.
14. The project should have a strong training component which integrates and promotes knowledge and skills by project implementors (e.g., administrators, guards) in listening to and learning from and engaging, encouraging and empowering people to manage their resources more sustainably and to protect part of the resource base for future generation. Training, outreach, awareness, and education activities are critical. They should be sustained efforts, not just one shot deals that serve as quick, verifiable indicators of efforts to meet project objectives.

Particularly related to gender sensitivity and analysis training, the Project should support the training described above. As support for the training program, the Maya Biosphere Project and USAID/Guatemala should develop a small collection of Women in Development materials for use in project implementation and in training. PPC/WID in Washington should be asked to help identify and provide materials, and the project budget should include funds to purchase needed materials.

A WID specialist should be contracted to work with the project's WID committee periodically throughout the project, in order to assist with adaptation of the WID strategy to changing circumstances. These and other project costs should be included in a special program of the Human Resource Development Component. USAID/Guatemala should identify ways to receive support from PPC/WID in this project.

15. Activities in addition to training to improve the gender sensitivity of the Maya Biosphere Project include: building the institutional capability to address gender issues; research, monitoring and evaluation plans; and special extension efforts. For some of these efforts, the project should seek to draw in outside organizations and funds to supplement core project resources. However, gender considerations should be considered an integral part of the overall project because of the central importance of women in achieving some of the project's objectives. Existing institutional capabilities for integrating women into the Maya Biosphere Project are weak or nonexistent. Although interest exists, the primary executing institutions have little social science expertise, no training, and no access to published materials. Nor does the USAID/Guatemala WID office have any publications or training resources to offer.

Training programs for all project components, and environmental education and awareness programs, should identify and address the specific constraints and needs of women. These typically include: long work-days; child care responsibilities; limited cash; low literacy rates; and inhibition in public settings, especially when men are present.

Ways should be explored to strengthen women's participation through local organizations such as cooperatives, communities, and parents' committees linked to local schools. The Fundacion Dolores Bedoya de Molina and the Ixchel group already have local counterpart women's groups in the Peten.

Pilot programs in association with local processing industries can provide training and employment for increased numbers of women. Entrepreneurs in the tourism and processing industries, and public sector agencies should be encouraged to experiment with hiring of women in non-traditional occupations if suitable candidates can be identified and provided with minimal training.

Women could play an important role in the production, processing and marketing of alternative or minor forest products such as ornamental and medicinal plants, fuelwood and fruit trees, and community nurseries. Project activities aimed at diversifying production and extraction systems (e.g., community forest management) should develop ways of working with groups of women to provide them with access to project resources and ensure their control over project benefits.

16. Indicators for monitoring the social aspects of this project include but are not limited to:
- o who is getting training, not just how much and in what subjects
  - o performance of certain tasks by project participants, focusing on the origins of the individuals or group(s) doing the task (i.e., are actual locals being hired or are new people coming in for jobs)
  - o who gets an extractive reserve license; who does/did not and why did they not get one
  - o who gets access to information from extension/outreach activities (men, women, young, old)
  - o are gender data collected; how they used and/or integrated into project implementation
  - o what are the nature, magnitude and long term implications of any project incentive structures, organizational efforts, etc., that promote and enable locals to change their management practices. Will locals continue practices if the incentives are no longer given or the organizations are no longer supported by external sources?
  - o what are the range and success of any conflict management methods, techniques, and results that have been used in the project.
  - o how has the project been implemented to be flexible and responsive to identify and experiment with new opportunities, emergencies, etc.
  - o how have project implementors identified and taken advantage of social opportunities, not just how have they made effort to remove constraints
  - o specific indicators for women's participation might include:
    - number of men and women trained in gender analysis
    - number of women trained by project

- number of women employed or involved in new income-generating activities
- increased access of women to credit, technical assistance and other project resources
- returns to women's unpaid labor and the impact of new technologies on their time
- linkage between income gains and improvements in nutrition and other measures of family welfare

**F. PARTICIPATORY STRATEGIES FOR ENVIRONMENTAL ASSESSMENT**

1. Project activities have been designed to be as decentralized to the Peten as possible.
2. The project design encourages local control and participation of local men and women to the greatest degree possible. The Protection and Management Component Annex of the project design recommends that: "in coordination with CONAP and the Maya Biosphere Reserve Management Committee, define a mechanism as soon as possible to include local community representation in the design and implementation phases of the Project" (Houseal, 1990:18).
3. The project promotes the distribution of benefits to participants in proportion to their participation.
4. Training, education, and awareness activities will focus on changing attitudes. Among those whose attitudes will be changed are government officials relative to their perspectives on the roles, contributions and participation of local people. Special attention in project design has been placed on providing suggestions about how the project can more appropriately integrate women, through institutional strengthening, development of a project WID committee, training and other activities.
5. The project will make every effort to ensure that Guatemalans feel "ownership" of the project.

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NOTE: Additionally, members of the Project Paper design team, staff of USAID/Guatemala and reviewers of documents presented at the Round Table in Guatemala City provided insights, ideas and comments. The author incorporated these as appropriate without attribution herein. The author, however, alone is responsible for the contents of this Social Soundness Analysis. Particular thanks, however, go to Dr. Marianne Schmink who provided the majority of the input on gender concerns as well as helpful review comments on an early draft of the Analysis.

**ANNEX J**



**ENVIRONMENTAL ASSESSMENT**

# ENVIRONMENTAL ASSESSMENT

## I. SUMMARY

### A. MAJOR CONCLUSIONS

The environmental analysis concludes that the proposed Maya Biosphere Reserve Project is environmentally sound and preferable, from an environmental standpoint, to all of the other alternative project approaches analyzed.

The proposed Project, which advocates a blend of activities focusing on protection with activities oriented toward sustainable natural resources harvesting, is superior, environmentally, to a more narrow focus on either protection, exclusively, or natural resources development, exclusively.

The Maya Biosphere Reserve includes a variety of habitats which support rich biodiversity and also contain important cultural resources in the form of extensive Mayan ruins. These resources currently receive some level of protection but this protection is unreliable. The Reserve is under threat from advancing agriculturalists who would clear the forest and also from possible over-extraction of resources, both legal and illegal. Absent some type of concentrated effort in both protection and sustainable development, the Reserve would almost certainly suffer serious deterioration in the near future. The Project proposes a strategy for dealing with this unstable and vulnerable situation consisting of three elements - protection, study, and use of the Reserve's natural and cultural resources.

The Project proposes three components to advance its strategy. The first, the biosphere administration component, will strengthen direct protection of vulnerable resources by delimiting boundaries, training resource guards and patrolling the boundaries. The environmental education, public awareness, and policy component of the Project, supports the study element of the strategy by increasing knowledge about the Reserve in general terms. Specific studies of resources and resource capacities performed under the other Project components increase the information base for this component. The use element of the strategy entails improving natural resource extraction through subcomponents to manage natural forests and extractive reserves and to enhance tourism to the Reserve.

Public perceptions of the Maya Biosphere Reserve currently vary from supportive, to uninterested, to uninformed, to hostile. Because the Reserve is so new, few people have a clear idea of what it really means for them. The long-term well being of the Reserve relies on establishing a community of interests who support the Reserve because the Reserve supports those interests. The project promotes this end by meeting the interests of scientists, the timber industry, extractors of wild products, and the tourist trade. Through its environmental education and public awareness subcomponents, the Project also explains the Reserve to a broader audience who also have interests, though less immediate ones, in maintaining the integrity of the Reserve.

The environmental analysis supports the decision to concentrate Project activities inside the Maya Biosphere Reserve. Although it is important to foster overall socio-economic

development in the Peten outside the Reserve, such development belongs more appropriately to separate development efforts from those included in this Project.

## **B. AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED**

### **1. CORE AREAS AND MULTIPLE USE AREAS**

The Maya Biosphere Reserve centers around core areas, areas dedicated primarily to strict protection of biological and cultural resources but open for scientific study, tourism, and other non-consumptive uses. The Maya Biosphere Reserve Law establishes the boundaries of the principal core areas within the Reserve. As currently designated, about half of the Reserve lies within core areas. The law also states that the Reserve will include multiple use areas and recuperation areas. The law does not, however, specifically delimit these areas nor indicate the types or locations of uses allowed within them. CONAP, as part of the biosphere administration component of the Project, will coordinate preparation of a master plan for the Reserve which will designate the multiple use and recuperation areas and the uses permitted within them. This will require resolving conflicts in the multiple use and recuperation areas among competing interests in extraction of timber, extraction of wild products, and expansion of existing agriculture based on short cycle cropping, mostly of maize and beans, interspersed with longer cycle forest fallow.

### **2. PROTECTION AND EXTRACTION TECHNOLOGIES**

The Project embodies the concepts of permanent protection of vulnerable resources and sustained yield management of other natural resources. But the precise technologies and institutional structures to achieve permanent protection and sustained yield are not currently in place in the Maya Biosphere Reserve. The Project will attempt to develop these technologies and structures. By beginning with a group of baseline studies, the Project will have a series of reference points on resource availability and condition. Sustainable technologies and institutional structures should maintain availability and condition of the resources. As implementation advances, the Project will monitor and evaluate the effectiveness of the technologies and structures it promotes at maintaining the resources it seeks to protect and use.

### **3. OIL DEVELOPMENT**

Crude oil is currently produced inside the Maya Biosphere Reserve. Oil production carries two significant negative impacts for the Reserve: spills which pollute, especially in wetlands, and roads which can provide uncontrolled access. CONAMA monitors the oil extraction in the Reserve and reports that it obtains adequate cooperation from the oil company in curtailing and cleaning up spills and controlling access to the Reserve. The situation requires continuing vigilance and continuing cooperation from the oil company.

#### **4. ROADS**

Roads, inside and outside the Reserve, produce positive and negative impacts on the Reserve. Roads provide access for appropriate activities in the Reserve and contribute to the general socio-economic development of the Peten. But roads also facilitate access to the Reserve for poaching, unlawful timber cutting, and unauthorized land clearing and settlement. The Project will not build or maintain any roads. But road building and maintenance, by public authorities and by timber companies, continues in and around the Reserve. The Project must take these roads into account as it seeks to accomplish its objectives.

## **II. PURPOSE**

The Maya Biosphere Project seeks to protect biological and cultural resources in the Maya Biosphere Reserve and to develop renewable natural resources in and around the Reserve on a sustained basis. The Project responds to the need to continue harvesting natural resources in the Reserve so as to continue to provide livelihoods to the people who rely on those resources. The Project also responds to the need to protect the biological and cultural resources in the Reserve adequately and effectively.

To attain its purpose, the Project proposes three components: one in administration of the Reserve; one in environmental education, public awareness, and policy; and one in sustainable resource management for income generation.

## **III. AFFECTED ENVIRONMENT**

### **A. THE PROJECT AREA**

The Maya Biosphere Reserve Project is located in northern Guatemala in the Department of El Peten (see map on following page). The project area includes all of the Maya Biosphere Reserve plus the buffer zone to the Reserve, a strip of land fifteen kilometers wide along its southern boundary, plus an additional populated area beyond the buffer zone. The eastern boundary of the Project area coincides with Guatemala's international boundary with Belize. The border between Guatemala and Mexico forms the northern and western boundaries of the Project area. The Reserve itself has an area of approximately 14,000 square kilometers, whereas the complete Project area totals about 20,000 square kilometers. Many Project activities, e.g. those for natural forest management and extractive reserves, occur exclusively inside the Reserve proper. Some activities, however, like those in environmental education and public awareness take place outside as well as inside the Reserve.

## **B. THE MAYA BIOSPHERE RESERVE**

The Guatemalan Government passed legislation in 1990 establishing the Maya Biosphere Reserve. As a formally declared Biosphere Reserve, the Maya Biosphere Reserve becomes part of a worldwide network of Biosphere Reserves which have been selected under criteria set up by UNESCO, the United Nations Educational Scientific and Cultural Organization. Biosphere Reserves contain significant biological wealth and often, as is true of the Maya Reserve, contain significant cultural treasures as well. Biosphere Reserves seek to protect this natural and cultural wealth in a framework that incorporates the societies that live in and around the Reserves.

Typically, Biosphere Reserves are zoned into core areas, areas whose principal function is to protect the natural and cultural richness within them, and multiple use areas, in which extraction of resources is permitted so long as the extraction is sustainable and compatible with protecting the core areas. Buffer zones, zones which support a broad range of economic activities, separate the Reserves from areas beyond them which have no formal designation for conservation. Activities in the buffer zones should support and complement the protection and multiple use objectives of the Reserves.

The Maya Biosphere Reserve exhibits the typical zoning pattern of core areas, multiple use areas, and buffer zones.

### **1. CORE AREAS**

The Maya Biosphere Reserve contains four core areas which existed prior to its establishment. These are:

- Tikal National Park;
- The San Miguel la Palotada Biotope, immediately west of Tikal;
- The Dos Lagunas Biotope in the northeast corner of the Reserve;
- The Laguna del Tigre - Rio Escondido Biotope in the wetlands near the western edge of the Reserve.

The Maya Biosphere Reserve law established three new core areas to complement the four preexisting protected areas.

- Mirador - Rio Azul National Park which expands the Dos Lagunas Biotope;
- Laguna del Tigre National Park which expands the Laguna del Tigre - Rio Escondido Biotope;
- Sierra de Lacandon National Park in the southwest corner of the Reserve.

Two additional core areas have been proposed but were not formalized in the Biosphere Reserve law - Uaxactun, directly north of Tikal, and Yaxja, directly east of Tikal, both of which contain important Mayan ruins. All of the core areas currently exhibit little disturbance from human activities. Few, if any, people live in them but they have been selectively logged and used for hunting and extraction of wild plant products. These activities continue, at a moderate level, except in the four preexisting areas which enjoy fairly strict protection, especially Tikal, where, for example, reintroduced ocellated turkeys walk freely on the roads and trails.

## **2. MULTIPLE USE AREAS**

All of the Reserve not incorporated into core areas is available for multiple use. The Biosphere Reserve law states that the boundaries of multiple use areas, cultural areas and recuperation zones will be established in the master plan for the Reserve. The areas available for these uses tend to be more disturbed than the core areas. They support a small permanent population who live from resource extraction and subsistence agriculture. Some forest clearing has occurred and is expanding gradually. A diffuse system of roads and logging trails crisscrosses the prospective multiple use areas. Most of these roads and trails are maintained by logging companies but everybody uses them. Many of the roads are impassable for much of the year when it is too wet to maintain them.

## **3. BUFFER ZONE**

The buffer zone, lying outside the Reserve proper, supports a fairly large and rapidly growing population. Most of the people live in small settlements along the principal roads which roughly parallel the southern boundary of the Reserve, right at the boundary on the extreme east and some kilometers south of the boundary elsewhere.

Small farming and low intensity cattle raising are the main economic activities in the buffer zone. Second growth forest is the predominant type of vegetation, covering a larger percentage of land than all other types of cover combined. A fair amount of cut over primary forest remains in the buffer zone but it is being cleared fairly rapidly for conversion into the cycle of short term farming followed by fallow of second growth forest.

Maize is the principal crop and the Peten produces a surplus of maize and also of beans which enter national markets. Some permanent crops are grown but these seem to be expanding slowly in the absence of reliable transportation infrastructure and markets.

## **C. PHYSICAL ENVIRONMENT OF THE MAYA BIOSPHERE RESERVE**

All of the Maya Biosphere Reserve lies in the Subtropical Moist Forest Life Zone under the Holdridge system of ecological classification. Average annual rainfall is roughly 1400 mm, slightly higher in the south and west and slightly lower in the north and east. Mean annual biotemperature is below 24 degrees. Temperatures are warm throughout the year and no frost occurs although there are occasional cool spells especially in December and January. Most of the

year is wet, starting in May and lasting through December. The rest of the year is drier, especially March and April, the season for clearing and burning forest.

The entire Project area lies on limestone. Topography ranges from flat to sharply accidented karst. Base elevation is about 100 masl and few hills, except the Sierra de Lacandon, exceed the base elevation by more than 200m. Soils vary considerably in depth, drainage and fertility. Land quality for agriculture directly reflects soil depth and drainage. Conspicuous areas of flat, but poorly drained, land support scrubby vegetation and very low intensity cattle grazing.

The porous limestone bedrock absorbs most surface water so the landscape has relatively few small streams. Subterranean water is also scarce so water from wells is in short supply both for domestic use and for irrigation and watering cattle. There are several good sized rivers, however, and quite a few lakes, some of them quite large. Lake Peten Itza is the biggest and most important lake. Flores, capital of the Peten Department with a rapidly growing population that currently exceeds 40,000 people, lies on its south shore. The lakes support goodly populations of fish and fish are important in the local diet.

A significant wetland lies along the western side of the Reserve in the area known as Laguna del Tigre. This wetland contains a number of endemic amphibians and fish and serves as an important wintering ground for northern hemisphere bird fauna. In general, the Project area exhibits high natural biodiversity, particularly in the Laguna del Tigre area and in the Sierra de Lacandon.

Probably the feature that makes the Peten best known beyond its own borders is its archeological wealth. At one time the Peten supported a dense population of Maya who apparently developed a thriving agriculture and who have left extensive architectural relics. Tikal, with its spectacular pyramids, is the most famous, but numerous sites exist across the whole Peten. Many of these sites lie within the Maya Biosphere Reserve and their protection and exploration constitute an important function of the Reserve.

#### **D. SOCIO-ECONOMIC CONTEXT SURROUNDING THE RESERVE**

The Peten is an important frontier area for Guatemala. Historically isolated from national affairs, in recent years it has become important for extraction of various forest products, for tourism, and for migration of people from other parts of Guatemala. In the 1970's the government actively promoted settlement by selling public land at attractive prices and putting in some infrastructure. Growth has far outstripped services, however. The regional road system is awful, except for the paved road to Tikal leading from the international airport near Flores that can handle up to mid-sized jets. There is no reliably clean drinking water anywhere in the Peten. The smaller towns do not have electricity and educational and health facilities are rudimentary, though apparently about equal to those in other parts of rural Guatemala.

Almost everyone in the Peten has come from somewhere else in Guatemala, usually in the last few years. It is rare to meet a person who has been in the Peten twenty years or more.

Most of the population lives from small scale, unmechanized agriculture. Nearly all the farmers live in fairly close proximity to the forest and wild game forms an important part of their diet. Other important economic activities include extraction of timber and other forest products, notably chicle, allspice, and xate palm. All these products are exported to Europe and north America - mahogany and Spanish cedar lumber, palm leaves for the floral industry, chicle to make chewing gum, and allspice as a condiment. Cattle raising occurs extensively but stocking rates are very low and the industry employs few people. General commerce employs quite a few people, as does the tourist trade.

The mixed backgrounds and mixed activities of the people of the Peten make for mixed attitudes toward the Maya Biosphere Reserve. Some recognize the Reserve as supporting their interests, others as interfering.

#### **IV. ALTERNATIVES**

##### **A. THE STATUS QUO OR NO PROJECT ALTERNATIVE**

Under the status quo or no project alternative the situation in the Peten continues to evolve as it has and most existing trends continue roughly as they are. The significant negative trends from an environmental point of view include:

- continued influx of migrants and increasing pressure from the migrants and from the longer established population to clear primary and secondary forests for shifting cultivation and unimproved pasture.
- continued inability of Guatemalan institutions to fully protect all of the areas currently designated for formal protection, thus leading to loss of biodiversity and loss of cultural resources in those areas;
- continued highgrading of the natural forest with gradual conversion to more intensive harvesting which might or might not be accompanied by practices that ensured forest regeneration;
- increased extraction of commercial wild forest products -xate, chicle and allspice - probably beyond sustainable carrying capacity, as well as increased, probably unsustainable, extraction of wild products for subsistence and increased illegal extraction of protected species;
- continued deterioration of unprotected tourism sites with both natural and cultural attractions;
- continued lack of information and trained personnel for natural resources management;

- continued low levels of public awareness of the economic and social values of protecting biodiversity and managing renewable natural resources sustainably.

Significant environmentally positive trends under the status quo include:

- slight tendency to intensify agriculture on the better soils, increase permanent crops, and improve pastures and pasture management.
- continued protection of a few key protected areas, notably Tikal and the San Miguel La Palotada Biotope;
- incipient awareness among loggers and minor products extractors that their long term economic interest coincides with protection and sustained management of the renewable natural resources they depend on;
- continued high attractiveness of the Peten for tourism oriented toward nature and culture and continued high numbers of international tourists;
- gradual increase in capacity of some institutions, especially nongovernmental organizations, to protect and manage natural resources and to influence public opinion and government action in favor of such protection and management;
- continued presence of international NGOs supporting conservation in the Peten.

If present trends continue without intervention to protect and manage natural resources, it appears the negative tendencies substantially outweigh the positive tendencies, and the Maya Biosphere Reserve and the whole Peten region are headed for rapid, large scale environmental deterioration.

## **B. THE PROPOSED PROJECT AS THE PREFERRED ALTERNATIVE**

The Maya Biosphere Project specifically confronts the status quo by reinforcing positive tendencies and counteracting negative tendencies. The Project goal unites protection with natural resources management. The Project strategy attains the goal through strategic investment to strengthen institutions, perform applied research, train resource managers and resource users, create conditions for economic expansion based on sustainable resource management practices, and increase public information and awareness about environment and natural resources. The Project will function through three components discussed below.

## **1. BIOSPHERE ADMINISTRATION**

This component provides planning and management for the entire Maya Biosphere Reserve. It entails preparing the master plan for the Reserve and allocating uses in the cultural, multiple use and recuperation areas.

The National Council for Protected Areas, CONAP, will receive substantial support from this component in the form of offices for headquarters and field stations, equipment, personnel, training, and technical assistance.

This component will mark boundaries of core areas on the ground and will employ, train, and equip park guards to secure protection of these areas.

## **2. ENVIRONMENTAL EDUCATION, PUBLIC AWARENESS, AND POLICY**

This component provides environmental education and public awareness. It also orchestrates training, applied research, and policy dialogue for the other components of the Project.

As a result of the activities performed under this component, people living inside the Reserve, in the buffer zone, and beyond the buffer zone will have more information about the Reserve. They will understand better why the Reserve is important and what its economic and other values are. This component seeks to build public support for the Reserve among residents of the Peten.

## **3. THE SUSTAINABLE RESOURCE MANAGEMENT FOR INCOME GENERATION COMPONENT**

This component has three major facets, reflected in three subcomponents: natural forest management, extractive reserves, and tourism oriented toward nature and culture.

- a) **Natural forest management:** The natural forest management subcomponent will establish a demonstration forest operated by DIGEBOS, the Guatemalan Forest Service, with participation by the timber industry. Technicians assigned to the Project will set up demonstrations of various silvicultural practices and forest harvesting techniques. The object is to demonstrate in the field those practices which optimize volumes of timber extracted while minimizing damage to the harvest site and assuring natural regeneration of the forest. Under this component, personnel from DIGEBOS and from the timber industry will learn how to prepare forest management plans and carry them out in the field.
- b) **Extractive reserves:** This subcomponent will determine optimal harvest practices and sustainable harvest volumes for the three principal non-timber products currently produced from the Reserve - xate palm, chicle, and

allspice. Working with the people who actually harvest these products, the Project will attempt to establish a feasible system of licensing and control over extraction of the products. This subcomponent will also promote development of new wild products for extraction, like honey and specialty items for artisan crafts.

- c) **Tourism oriented toward nature and culture:** This subcomponent seeks to increase the value of tourism in the Peten to Peten residents. It will establish institutional structures with combined representation from government and industry to promote tourism, increase tourism revenues, and direct more of those revenues to the local economy. The subcomponent will also make an inventory of tourism sites in the Peten and design management plans and interpretive materials for selected sites.

In sum, the combined aim of all the components of the Project as proposed is to fuse disparate interests in the Reserve into a community of interests all of which have a stake in the sustainability of the Reserve. This consortium of interests should be strong enough to assure the environmental integrity of the Reserve.

### **C. THE ALTERNATIVE OF FOCUSING EXCLUSIVELY ON PROTECTION**

This alternative would go right to the heart of the conflict between protecting biological and cultural resources and using them rationally on a sustained basis. It would focus exclusively on strict protection of a few highly valued areas, would prohibit most extractive uses in those areas, and would ignore threats to other natural resources outside the protected areas.

This isolationist approach to protection has come into disfavor in recent years and many serious conservationists now reject it as unworkable, especially in developing countries. This approach creates islands of protection but the seas which surround these islands are often hostile. The people living outside the protected areas obtain little benefit from them and often view the areas as directly antagonistic to their own needs for land and other resources. The institutions charged with protecting the areas likewise come in for public criticism for locking up resources.

This approach does work in some instances, especially in situations where pressure from surrounding populations is low and other resources are available outside the protected area. Tikal is a good example, right in the Peten, of strict protection that has functioned well and does not appear to have engendered serious resentment. But Tikal, with its spectacular Mayan ruins and 60,000 annual international tourists, is unique and probably not an effective model for the whole Maya Biosphere Reserve.

#### **D. THE ALTERNATIVE OF FOCUSING ON AGRICULTURE AND LIVESTOCK**

This alternative would approach conservation in the Maya Biosphere Reserve indirectly by developing agriculture and livestock outside the Reserve. It operates on the theory that if economic and social conditions outside the Reserve are sufficiently attractive, few people will live in the Reserve or enter it to extract resources. This approach makes some sense and there is every reason to support improved agriculture and animal husbandry outside the Reserve. But development outside the Reserve will probably not suffice to protect the Reserve. Too many people already use it and its biological and cultural resources are too precious and too fragile to last without specific attention to their protection. The Reserve requires interventions like those proposed in the Project.

A variation on this alternative would expand the instant Project to include components on agriculture and livestock. That would almost certainly overburden an already complex Project. Note also that general socio-economic development in the Peten will soon receive support from the German government under a long term arrangement that will begin with a development master plan for the region. USAID will probably also soon become involved in agricultural development in the Peten through allocation of monies under section 416. In fact, during the course of the design of the Maya Biosphere Project, a proposed Project subcomponent in agroforestry was removed from the Project in favor of funding it separately under section 416.

#### **E. THE ALTERNATIVE OF FOCUSING ON LOCAL INFRASTRUCTURE**

This alternative closely parallels the alternative discussed immediately above. It follows the same rationale and falls for the same reasons. Whereas the Peten desperately needs improved infrastructure - roads, electricity, schools, clean drinking water, etc. - these should be provided separately from this Project and their provision would not eliminate the need for this Project. Again, overall development assistance to the Peten might soon meet these development needs.

#### **F. THE ALTERNATIVE OF EMPHASIZING DEVELOPMENT ELSEWHERE IN GUATEMALA**

This alternative presents an even less direct solution to protecting the Maya Biosphere Reserve. The theory behind it would stem migration to the Peten by creating such favorable conditions elsewhere in Guatemala that people would not leave these other places. As was the case with the other two indirect alternatives, this alternative, though desirable for its own sake, does not suffice to protect or develop the Maya Biosphere Reserve.

## **V. ENVIRONMENTAL CONSEQUENCES**

### **A. DEFORESTATION; LOSS OF BIODIVERSITY; DEPLETION OF RENEWABLE NATURAL RESOURCES**

The proposed Project has been specifically designed to reverse existing trends toward renewable natural resource depletion in and around the Maya Biosphere Reserve. The several Project components all incorporate sustainable resources management practices as fundamental elements in their design.

Logging will continue under the Project, but it will be logging that aims both to maintain continuous forest cover and to maintain high levels of species diversity in the logged and regenerated forest. The same considerations apply to extraction of forest products other than timber.

The Project does not promote new settlement inside the Reserve, nor does it promote additional land clearing for agriculture and livestock raising. The Project does promote improving local incomes, both through better practices for extracting renewable natural resources and by providing additional avenues of employment, in protection of protected areas and in tourism, for example. This should reduce pressure to clear additional forest.

The Project does not deal directly with hunting but indirectly it should reduce illegal hunting by providing higher levels of patrols in core areas and increasing public awareness of illegal hunting.

The Project will not affect water availability as it does not support activities with high demand for water nor activities which would interfere significantly in natural water flows or water balances.

### **B. RESOURCE DEGRADATION**

As was true of resource availability, the Project actively seeks to maintain resource quality. None of the proposed Project activities will generate significant environmental contamination. Water quality should remain virtually completely unaffected by the Project. The Project will not build roads or permanently clear forest so it will not produce adverse impacts on soil quality from those activities. The Project does promote continued logging and extraction of other wild products which means, indirectly, that it promotes roads which others will build and maintain. The main roads are used seasonally, the extraction trails sporadically. Both roads and trails should have minimal off-road effects on soil and water quality.

As regards degradation of vegetation, and hence deterioration of animal habitat, the Project, in its natural forest management and extractive reserve subcomponents, seeks to maintain stocks and maintain diversity on a sustainable basis. The Project will produce baseline

inventories which will serve to set harvesting levels and locations. Periodic monitoring should reveal whether the Project is meeting its sustainability goals.

### **C. PESTICIDES**

The Project does not propose to use pesticides, certainly not in its initial phases. As implementation progresses, some use of pesticides may occur in the subcomponent on natural forest management, especially if it supports nurseries for forest trees. Should the Project eventually use pesticides, it is intended that they be environmentally approved and applied in environmentally unobjectionable ways.

### **D. DAMAGE TO CULTURAL RESOURCES**

The Project will not finance building or improving roads to cultural sites so it should not create any impacts directly damaging to cultural resources. In general the Project should have a positive effect on cultural resources by increasing protection to them, improving information about them, and supporting the institutions which protect and study them. One side effect of the Project might be to increase numbers of visitors to certain fragile sites. The Project will monitor pressure on cultural sites and try to avoid pressures that exceed carrying capacity.

### **E. CROSSCUTTING ISSUES**

The Maya Biosphere Project will unfold in the context of current and continuing activities and trends in the Peten Department which will influence the Project across all its components. The Project must recognize this external context and deal with it constructively. The discussion below notes some of the most prominent current issues in the Peten which will affect the Project.

#### **1. OIL DEVELOPMENT**

A few years ago oil was discovered in the vicinity of Laguna del Tigre in the western part of what has become the Maya Biosphere Reserve. Basic Petroleum Company currently extracts this oil from wells in the Laguna del Tigre wetlands. The company transports the entire production of crude petroleum by tank truck from the wellhead to a cement factory several hundred kilometers away at a point inland from Puerto Barrios on the Caribbean Coast. The cement factory uses the crude petroleum directly in its furnaces as fuel.

This form of oil exploitation has several adverse environmental consequences. Two of these that bear directly on the Project are spills that occasionally occur near the wells and sometimes contaminate the surrounding wetlands and oil exploration and extraction roads. CONAMA, the National Commission on Environment, monitors the well sites, prescribes prevention and containment measures, and oversees clean-ups when required. Though less than

ideal, the situation seems to be under control and spokespersons for CONAMA say the oil company cooperates with them adequately.

CONAMA has learned that Basic Petroleum intends to modify its current operations by building a small refinery in the Peten at a town called La Libertad about 40 km southwest of Flores and somewhat south of the buffer zone of the Reserve. This refinery would produce several refined petroleum products, notably gasoline, kerosene, and asphalt. The gasoline would enter the general national economy, the kerosene would make household fuel more readily available locally, and the asphalt would be available to pave roads.

According to CONAMA, Basic Petroleum would plan to use the asphalt initially to pave the road from the refinery westward back to the oil wells inside the Reserve. After that the asphalt could be used for other roads in the Peten, to pave streets in the larger settlements, notably Flores and its satellites, or for other uses. CONAMA believes that Basic would agree to maintaining gates and manned guard posts at the point where the paved road would enter the Reserve. Basic has an interest coincident with that of CONAMA in keeping unauthorized persons out of the Reserve and away from its wells. The danger to the Reserve is that people would use the road for improved access to the Reserve to carry on unlawful extraction of resources and also to attempt to settle in the Reserve.

## 2. IMPROVED ROADS IN THE PETEN

Beyond the possibility of direct access to the Reserve by paved road lie questions surrounding the broader impact of a network of paved roads on the region, the Reserve, and the Project. Paved roads would obviously improve general transportation in the Peten tremendously. The current trunk roads are extremely rough and difficult to travel and the side roads become impassable in wet weather. On balance better roads should boost economic development in the region. But improved transport conditions would probably make the area more attractive to new settlers, thereby swelling already high influxes of migrants. So, while on the one hand better roads would probably encourage more permanent settlement and intensification of farming and livestock raising, on the other hand they would probably increase pressure on land and resources including those that are marginal for production and those that are under formal protection.

Much of the impact of roads would have only indirect bearing on the Project but the Project need be aware of the several consequences of paved roads and prepared to deal with them should they happen.

## 3. MIGRATION INTO THE PETEN

The Peten has the lowest population density of any Department in Guatemala but the highest rate of population increase except for Guatemala City - about seven per cent per year, or more than double the national average. This rate of growth has rapidly changed the Peten from being nearly uninhabited to figuring prominently in Guatemala's demographic future. In addition to persons who migrate to the Peten with the intention of

remaining permanently, the Peten hosts seasonal migrants who come from the central highlands and the Pacific coast to plant and harvest corn but then return to their homes. The Peten also supports a stream of transients - from Guatemala and from neighboring countries, notably El Salvador - who are on their way to Mexico and thence to the United States.

The frontier nature of the Peten generates several negative tendencies for the environment. The newcomers come from different climatic zones, mostly cooler or drier ones and are not used to moist, subtropical conditions or the ecosystems they support. People mistake luxuriant vegetation as a sign of good agricultural soil whereas much of the Peten has soils too poor for sustained agriculture. People have little sense of community and little sense of traditional ties to a piece of land. Their pioneer attitude promotes clearing new land when yields drop on the farms they formerly worked. People also look to nature as a significant source of provender - for land, for timber, for other economic products to sell, and for wild game to supplement their diets. As population increases against a decreasing resource base, pressure on renewable natural resources increases and eventually exceeds carrying capacity.

The Project needs to take into account that the Peten will continue to draw large influxes of new residents and that much of the current population does not have a tradition of resource husbandry. Changing current attitudes toward a more conservationist direction will constitute an important goal and challenge for the Project.

#### **4. INCURSION FROM MEXICO**

Guatemala's border with Mexico, especially in the northern Peten, is not well patrolled. Although very few people appear to be migrating into the northern Peten from Mexico, there is significant incursion to cut and remove timber, to hunt for food, to remove animals for international trade in skins and pets, and to remove objects of archeological value. Virtually all this activity is illegal but it continues unabated and probably will increase as development in Mexico brings roads ever closer to all points on the border. The unstable border situation is another factor that the Project does not deal with directly but that it must be cognizant of.

#### **F. UNAVOIDABLE ADVERSE IMPACTS**

The Project does not appear to carry any unavoidable adverse impacts. The Project will monitor such impacts as could turn out to be adverse, like cutting trails through the forest to mark boundaries of protected areas, to make sure they promote protection and not the converse.

#### **G. RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

The Project actively seeks to maintain long-term productivity by determining resource carrying capacities and promoting extraction that does not exceed carrying capacity. The short-

term uses the Project promotes should expressly relate favorably to maintaining long-term productivity.

## **H. IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES**

The Project does not commit natural resources irreversibly or irretrievably. It does promote extraction of wild resources from natural forests, but on a sustainable basis so that the forests in question should remain fully intact and available for other uses in the future. The same statement holds for cultural resources affected by the Project.

## **I. LAND USE PLANS, POLICIES AND CONTROLS**

The Maya Biosphere Project comes at a propitious time in Guatemala. The current national government, just within the last year and a half, has embarked on a legislative program designed to foster more environmentally harmonious national development. The legislative package includes:

- the new biosphere reserve law which establishes the Maya Biosphere Reserve and designates institutional responsibility for managing the reserve;
- the new protected areas law which establishes a national system of protected areas and also establishes the National Council for Protected Areas (CONAP) to oversee the areas;
- the new forestry law and regulations which replace the former law, strengthen the General Directorate of Forests (DIGEBOS), and provide improved mechanisms for forest management and control of forest harvesting.

These laws supplement 1988 legislation which established the National Commission on Environment (CONAMA) an umbrella agency responsible for formulating national environmental policy. The new laws and the institutions responsible for applying them have not really been tested yet. Nor have they resolved all the problems associated with natural resources management. At a minimum, however, they signal changing attitudes in Guatemala which recognize the importance of conservation and sustainable development of renewable natural resources. The national policy climate appears receptive to projects like the Maya Biosphere Project.

Parallel to the national policy innovations, a number of significant international development initiatives have begun in Guatemala. These include:

- the tropical forestry action plan under auspices of FAO, the Food and Agriculture Organization of the United Nations, which will analyze the national forestry situation and recommend strategic investments in forestry;

- a development master plan for the Peten financed through the German government which will identify development opportunities in the region as well as requirements for infrastructure and basic services;
- the USAID/ROCAP RENARM Project which provides training, information, research, and technical assistance in conservation and sustainable management of renewable natural resources throughout Central America;
- the USAID APAP Project which, through a buy-in from the RENARM Project, has made an analysis of Guatemala's natural resources policies, highlighting strengths and weaknesses and recommending avenues for increasing effectiveness.

In light of the rapidly expanding policy and development framework that will surround the Maya Biosphere Project, it appears that the Project will unfold in an atmosphere that will provide it ample support and reinforcement. It would seem this could only increase the likelihood that the Project will attain its environmental goals.

## **VI. MITIGATION MEASURES FOR SPECIFIC PROJECT ACTIVITIES**

### **A. PROTECTION**

The protection element of the Project calls for cutting trails through the forest to mark boundaries of core protected areas. It also calls for building and maintaining guard posts in remote areas. The object is to use the trails and posts to increase vigilance against incursion into the protected areas. But the trails and also the guard posts, if left unmanned, could actually facilitate unlawful entry into and poaching from the protected areas. The Project will finance employment, training, and equipping resource guards who will continuously patrol the trails and use the guard posts. On balance, the environmental impact of the trails and guard posts should be decidedly positive rather than negative.

### **B. FOREST MANAGEMENT**

As noted above, the forest management element of the Project does not build any roads or logging trails although it does encourage their construction and use by others. In producing forest management plans and operating a demonstration forest, the Project should be able to promote practices for locating and constructing extraction roads and trails that minimize adverse environmental impacts.

The Project will specifically develop guidelines and practices for selecting logging sites, cutting trees, and naturally regenerating the forest. Minimizing adverse environmental impacts will be an important consideration in these guidelines and practices.

The natural forest management element of the Project does not anticipate introducing exotic species into the Project area. Nor does the Project, at least in its early stages, anticipate establishing nurseries or using pesticides in association with nurseries.

### **C. EXTRACTIVE RESERVES**

Determining sustainable harvest levels of extraction products and attaining those levels is an express objective of the extractive reserve element of the Project. Once Project baseline studies indicate appropriate harvest levels, the Project will develop field techniques, notably a harvest licensing and control system, to assure harvest does not exceed those levels.

The extractive reserve element will actively seek to improve harvest methods from the standpoint of maintaining regenerative capacity of resource stock. It will also seek to reduce loss and waste at all points in the harvest, transformation and marketing processes for each extractive product. Finally, the Project will promote expanding the array of resources harvested. The combined effect of the various measures taken under the Project should be to stabilize harvest at sustainable levels while increasing incomes through improved harvest practices.

### **D. TOURISM**

The tourism element of the Project does not entail construction of new access roads to tourism sites or any other types of infrastructure and, therefore, does not generate any adverse environmental impacts typically associated with infrastructure development.

Successful implementation of the tourism element could, however, increase numbers of visits to certain sites substantially. The baseline studies and visitor surveys the Project will undertake should establish acceptable numbers and types of tourism visits to particular sites and provide the basis for limiting visits to fragile sites.

**ANNEX K**



**INITIAL ENVIRONMENTAL  
EXAMINATION (IEE)**

Agency for International Development  
Washington, D.C. 20523

LAC-IEE-90-18

ENVIRONMENTAL THRESHOLD DECISION

Project Location : Guatemala

Project Title : Maya Resource Management  
(MAYAREMA)

Project Number : 520-0395

Funding : \$10.5 million

Life of Project : Six years

IEE Prepared by : Alfred Nakatsuma  
USAID/Guatemala

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 Scoping Exercise, including agro-forestry, natural forest management extractive reserve industries and tourism promotion.

Copy to : Anthony J. Cauterucci, Director  
USAID/Guatemala

Copy to : Gordon Straub, ORD  
USAID/Guatemala

Copy to : Alfred Nakatsuma  
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Copy to : Mark Silverman  
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Copy to : IEE File

John O. Wilson Date APR - 4 1990

John O. Wilson  
Deputy Environmental Officer  
Bureau for Latin America  
and the Caribbean

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## INITIAL ENVIRONMENTAL EXAMINATION

Project Location : Guatemala  
Project Title : Maya Resource Management  
(MAYAREMA)  
Funding : \$10,500,000

### I PROJECT DESCRIPTION

The goal of the Project is to improve the long term well-being of Guatemala's population through the management of natural resources. Its purpose is to generate sustainable economic activities for Guatemalans through the improved management of renewable natural resources and protection of biological diversity and tropical forests.

To achieve the goal and purpose, the following components will be implemented under the Project:

(1) The Protected Areas Component will provide support to the GOG and NGOs in protecting Guatemala's scientifically and economically important natural ecosystems through the establishment and strengthened management of protected areas.

(2) The Sustainable Income Generation Component will provide support to a) establish technically and economically viable activities that conserve natural resources while providing higher incomes than the current destructive practices, b) train GOG extension agents on their use, and c) perform outreach services to train target populations on their use.

(3) The Human Resource Development Component will provide support to a) environmental/natural resource education and awareness, b) applied research and investigation in natural resource management and c) natural resource policy support to the GOG.

### II POTENTIAL ENVIRONMENTAL CONSEQUENCES

As proposed, the MAYAREMA Project has potential environmental consequences that may result from the implementation of protected areas management and the promotion of sustainable income generation activities described above. It is recommended that an Environmental Impact Assessment for these activities be carried out in conjunction with the elaboration of the Project Paper for MAYAREMA. The major environmental concerns are listed below.

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III MAJOR ENVIRONMENTAL CONCERNS

The following are the identified areas of environmental concern for the MAYAREMA Project:

1. Deforestation leading to loss of natural forests and timber resources caused by illegal cutting, inadequate forest management and/or uncontrolled settlement.
2. Downstream impacts from forest harvest and logging.
3. Loss of biological diversity due to forest conversion, agroforestry and settlement.
4. Damage to and/or loss of archaeological and historical resources.
5. Impacts of extractive industries. This will vary for each type of industry, but may include solid waste disposal, road/access impacts or construction impact.

IV CONCLUSIONS AND RECOMMENDATIONS

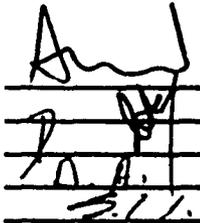
Significant environmental impacts could result from the implementation of protected areas management and the promotion of sustainable income generation activities under this Project. Therefore, the preparation of an Environmental Assessment is required per 22 CFR Section 216.3(b). USAID/Guatemala agrees to modify Project implementation plans to incorporate recommended mitigative measures, in accordance with the approved Environmental Assessment.

Concurrence:

  
 \_\_\_\_\_  
 Anthony J. Cauterucci  
 Mission Director

  
 \_\_\_\_\_  
 Date

Drafter: ORD: ANakatsuma  
 Clearance: ORD: GStraub  
 PDSO: DBoyd  
 PRM: DAdams  
 DDIR: SWingert



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**ANNEX L**

**Procurement Plan**

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ANNEX L

MAYA BIOSPHERE PROJECT

Illustrative Procurement List  
(all values in U.S. dollars)

NOTE: This list includes procurement of vehicles (10) and equipment which is expected to be undertaken by NGOs using their own (non-AID) funds.

<u>SERVICES</u>	<u>Value</u>	<u>Responsible Entity</u>	<u>Est. Date</u>
Cooperative Agreements with NGOs	6,900,000	AID	2Q/91

Other Procurement, by Project Component:

Biosphere Administration

<u>COMMODITY</u>	<u>PRICE</u>	<u>RESPONSIBLE ENTITY</u>	<u>EST. DELIVERY</u>
<b>VEHICLES</b>	354,000	AID	4Q/91
a) 4W-Drive Pick-ups/Spare Parts (10)	200,000		
b) Boats with Outboard Motors (10)	40,000		
c) Motorcycles (20)	70,000		
d) Other (animal traction, mountain bikes, etc.)	<u>44,000</u>		
<b>SUBTOTAL VEHICLES</b>	<b>354,000</b>		
<b>EQUIPMENT</b>			
a) MBR Guard Uniforms, Field Equipment & Replacements (backpacks, hammocks, boots, machetes, binoculars, compass, first aid, etc.) (150 sets)	75,000	GOG	2Q/91
b) Base Radios & Antenna (8)	40,000	AID	
c) Meteorological Stations (10)	15,000	"	
d) Computers (W/ software, supplies, uninterruptible power, etc.) (6)	37,500	AID	3Q/91
e) Laser Jet Printer (1)	2,500	"	
f) Solar-powered Electric Generators (4)	20,000	"	
g) Dot Matrix Printers (6)	4,500	"	
h) Office Furnishings	24,000	GOG	
i) Resource Management Library (1)	3,000	"	
j) Carpentry, Mechanical, & Firefighting tools	<u>15,000</u>	GOG	4Q/91
<b>SUBTOTAL EQUIPMENT</b>	<b>236,500</b>		

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## Environmental Education, Public Awareness and Policy

<u>COMMODITIES</u>	<u>PRICE</u>	<u>RESPONSIBLE ENTITY</u>	<u>EST. DELIVERY</u>
<b>VEHICLES</b>			
a) 4W-Drive Pick-ups/spare parts (3)	<u>60,000</u>	AID	4Q/91
<b>SUBTOTAL VEHICLES</b>	<b>60,000</b>		
<b>EQUIPMENT</b>			
a) Computers (W/ software, supplies, uninterruptible power, etc.) (5)	31,250	AID	
b) Dot Matrix Printers (5)	3,750	"	
c) Video Equipment (SLR, assec., projectors, screens, VCR, camcorder, (28)	98,000	AID	2Q/92
e) Resource Management Library (2)	6,000	GOG	1Q/92
f) Office Furnishings	<u>6,000</u>	"	
<b>SUBTOTAL EQUIPMENT</b>	<b>145,000</b>		

## Natural Forest Management

<u>COMMODITIES</u>	<u>PRICE</u>	<u>RESPONSIBLE ENTITY</u>	<u>EST. DELIVERY</u>
<b>VEHICLES</b>			
a) 4W-Drive Pick-ups & Spare Parts (8)	<u>160,000</u>	AID	2Q/92
<b>SUB-TOTAL VEHICLES</b>	<b>160,000</b>		
<b>EQUIPMENT</b>			
a) Video Equipment (SLR, projectors, screen, etc.) (1 set)	2,000	AID	
b) Computers (W/ software, supplies, uninterruptible power, etc.) (4)	25,000	AID	
c) Research Computer (386 mhz, 100 MB HD, color monitor, etc.)	10,000	AID	4Q/91
d) Laser Jet Printer (1)	2,500	"	
e) Dot Matrix Printer (4)	3,750	"	
f) Office Furnishings	7,700	GOG	
g) Chain Saws (2)	4,000	"	
h) Field Equipment & Replacements (backpacks, boots, machetes, binoculars, first aid, etc) (14 sets)	8,400	GOG	4Q/91
i) Research Supplies (stakes, tags, marking tape, level, nails, etc.) (20 sets)	10,000	GOG	
j) Resource Management Library (1)	3,000	"	
k) Mobile Radio (8)	<u>1,300</u>	"	
<b>SUBTOTAL EQUIPMENT</b>	<b>77,650</b>		

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## Extractive Reserves

<u>COMMODITIES</u>	<u>PRICE</u>	<u>RESPONSIBLE ENTITY</u>	<u>EST. DELIVERY</u>
<b>VEHICLES</b>			
a) 4W-Drive Pick-ups & Spare Parts (2)	<u>40,000</u>	AID	2Q/92
<b>SUBTOTAL VEHICLES</b>	<b>40,000</b>		
<b>EQUIPMENT</b>			
a) Video Equipment (VCR, camcorder, television, SLR & lenses, slide projector, screen, etc.) (1 set)	5,000	AID	2Q/92
b) Computers (W/ software, supplies, uninterruptible power, etc.) (2)	12,500	AID	
c) Laser Jet Printer (1)	2,500	"	
d) Dot Matrix Printer (1)	750	"	2Q/92
e) Field Equipment & Replacements (backpacks, hammocks, boots, machetes, binoculars, compasses, first aid) (4 sets)	2,400	GOG	
f) Research Supplies (metal stakes, tree tags, marking tape, abney level, hammer, nails, etc.) (2 sets)	1,000	GOG	
g) Mobile Radio (2)	<u>1,300</u>	"	
<b>SUBTOTAL EQUIPMENT</b>	<b>25,450</b>		

## Tourism

<u>COMMODITIES</u>	<u>PRICE</u>	<u>RESPONSIBLE ENTITY</u>	<u>EST. DELIVERY</u>
<b>VEHICLES</b>			
a) 4W-Drive Pick-ups/spare parts (1)	20,000	AID	2Q/92
<b>SUBTOTAL VEHICLES</b>	<b>20,000</b>		
<b>EQUIPMENT</b>			
a) Computer (W/software, supplies, UPS, etc.) (1)	6,250	AID	2Q/92
b) Laser Jet Printer (1)	2,500	"	
c) Dot Matrix Printer (1)	750	"	
d) Video Equipment (VCR, camcorder, TV, SLR and lenses, projector, etc.)	5,000	AID	
e) Field equipment, replacements (back-packs, hammocks, boots, machetes, binoculars, compasses, first aid kits) (5)	3,000	GOG	2Q/92
f) Mobile radio (5)	3,250	"	
g) Base Radio and antennae (1)	5,000	"	
h) Office Furnishings (1)	<u>2,250</u>	"	
<b>EQUIPMENT SUBTOTAL</b>	<b>28,000</b>		

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## Project Management and Coordination

<u>COMMODITIES</u>	<u>PRICE</u>	<u>RESPONSIBLE ENTITY</u>	<u>EST. DELIVERY</u>
<b>VEHICLES</b>			
a) 4W-Drive Pick-ups & Spare Parts(1)	<u>20,000</u>	AID	4Q/91
<b>SUBTOTAL VEHICLES</b>	20,000		
<b>EQUIPMENT</b>			
a) Mobile Radios (2)	1,300	AID	
b) Computers (W/ software, supplies, uninterruptible power, etc.) (5)	31,250	AID	
c) Laser Jet Printer (1)	2,500	"	4Q/91
d) Dot Matrix Printer (5)	3,750	"	
e) Office Furnishings	<u>5,600</u>	"	
<b>SUBTOTAL EQUIPMENT</b>	44,400		
	100.00%		

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