PD-ABA-854

APPENDIX 3A, Attachment 1
Chapter 3, Handbook 3 (TM 3:43)

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete)

Amendment Number:

DOCUMENT CODE: 3

COUNTRY/ENTITY: MADAGASCAR

3. PROJECT NUMBER: 687-0110

4. BUREAU/OFFICE: USAID/Madagascar

5. PROJECT TITLE (maximum 40 characters): Sustainable Approaches to Viable Environmental Management

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 03 DD 31 YY 96

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)

A. Initial FY 90 B. Quarter C. Final FY 94

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY 90 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	6,300	437	6,737	24,462	2,138	26,600
(Grant)	(6,300)	(437)	(6,737)	(24,462)	(2,138)	(26,600)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country					768	768
Other Donor(s)				1,060		1,060
TOTALS	6,300	437	6,737	25,522	2,906	28,428

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) DFA	290	260		0		26,600		26,600	
(2)									
(3)									
(4)									
TOTALS				0		26,600		26,600	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 250 240

11. SECONDARY PURPOSE CODE

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

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To identify and initiate systems (including institutions, methods, and behaviors) for the management of protected areas of Madagascar and the peripheral zones adjoining those areas on a sustainable basis.

14. SCHEDULED EVALUATIONS

Interim MM 11 YY 93 MM YY Final MM 04 YY 96

15. SOURCE/ORIGIN OF GOODS AND SERVICES: 000 941 Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

I have reviewed the proposed methods of implementation and financing for this project, and find them to be appropriate. Where necessary, adequate provisions have been made for detailed assessments of financial management capacities. I therefore recommend that you approve this proposed project paper.

Shirley Hunter, Mission Controller

17. APPROVED BY

Signature: Phyllis Dichter-Jones

Title: Director, USAID/Madagascar

Date Signed: MM 09 DD 26 YY 90

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

MM DD YY

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SUSTAINABLE APPROACHES
TO VIABLE ENVIRONMENTAL MANAGEMENT PROJECT
(SAVEM)

(687-0110)

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ACTION MEMORANDUM FOR THE MADAGASCAR USAID MISSION DIRECTOR

FROM: Linda Brown, Project Development Officer, USAID/Madagascar

SUBJECT: Authorization of Madagascar Sustainable Approaches to Viable Environmental Management (SAVEM, 687-0110)

PROBLEM: Your approval is required to authorize a grant of U.S. $26,600,000 from the Development Fund for Africa to the Government of the Democratic Republic of Madagascar (GDRM) for subject project.

A. DISCUSSION:

A. Project Rationale and Description

Madagascar's natural resource base, upon which the vast majority of Malagasy directly depend, is seriously threatened. The scale and intensity of deforestation, soil erosion and associated declines in overall land productivity are unparalleled. Under present agricultural practices and policies, Madagascar is physically and biologically disintegrating, thus seriously jeopardizing the continued livelihood of its increasing population.

To combat these types of problems, the GDRM has prepared a 15-year Environmental Action Plan (EAP). The EAP was developed with the assistance of a wide range of Malagasy experts and the support of a group of donors, international agencies, and nongovernmental organizations (NGOs) led by the World Bank. This group included USAID, Swiss Cooperation, UNDP, UNESCO, and the World Wide Fund for Nature (WWF).

The first five-year segment of the EAP will be the Environment Program 1 (EP-1), which was designed by a multi donor team of specialists led by the World Bank. The proposed SAVEM Project was designed within the framework of EP-1. Through SAVEM, A.I.D. will take the lead in helping the GDRM implement the biodiversity and institutional strengthening components of the EP-1.

The goal of the SAVEM Project is to establish sustainable human and natural ecosystems in areas of Madagascar where biodiversity is threatened. To move toward this goal, the purpose of SAVEM is to identify and initiate systems (including institutions, methods, and behaviors) for the management of protected areas of Madagascar and the peripheral zones adjoining those areas on a sustainable basis.

The project is to be implemented through two basic strategies. The first strategy will help develop the country's institutional, managerial, technical, and human resources. Toward these ends, SAVEM will provide technical assistance, training, and commodity support to both governmental and nongovernmental institutions active in the natural resources sector.

In particular, SAVEM will provide institutional support to the National Association for the Management of Protected Areas (ANGAP). ANGAP, the creation of which was called for in the EAP, is a recently established, semi-private association. It is intended to become a flexible organization capable of coordinating NGOs, ensuring the integration of conservation with development, and eventually replacing the foreign operators that heretofore have been designated on an ad hoc basis to manage individual protected areas.

The second approach will test the hypothesis that local populations will alter their behavior from destruction to conservation of their environment if they see a relationship between their economic and social well-being to the conserved area, and if they are empowered to make the right kinds of decisions. To do this, SAVEM will award up to six large Protected Area Development Grants (PADGs) to local and/or international NGOs for the management of interactive development and conservation efforts in priority protected areas and their peripheral zones. It will also award approximately 100 small Conservation Action Grants (CAGs) to local NGOs, governmental units, and individuals for more limited, locally initiated interventions in peripheral zones adjacent to any of Madagascar's 50 protected areas.

To carry out these strategies, A.I.D. funding will support three major project components:

1. Technical assistance, commodity procurement, and training activities to establish and empower ANGAP with sufficient authorities and capabilities to perform its management functions and fulfill its mandates.

2. An Operational Program Grant with an international NGO to develop a Biodiversity Planning Service (BPS) within ANGAP capable of tracking and communicating information on biodiversity conservation.

3. A Cooperative Agreement (or contract) with a U.S. Private Voluntary Organization or other eligible entity to act as Grant Manager responsible for making subgrants of both PADGs and CAGs to other organizations.

A.I.D. funding will also support the establishment of a Project Coordination Unit, certain costs associated with project start-up, and the costs of project evaluation and audit.

Following is a breakdown of anticipated costs by project component:

Project Coordination and Startup	$ 1,460,730
ANGAP Development	3,389,506
Biodiversity Planning Service	2,358,459
Grant Manager	4,584,169
Protected Area Development Grants	10,000,000
Conservation Action Grants	2,000,000
Evaluation and Audit	460,000
Contingencies	1,219,462
Inflation	1,127,674
Total Costs:	$26,600,000

An obligation of $6,300,000 has been planned for FY 1990.

B. Design Issues

1. ANGAP Creation:

A fundamental issue raised during AID/Washington's review of the Project Identification Document in April, 1990 (see Annex I to the Project Paper) concerned planned support for the creation of ANGAP. The ECPR questioned the rationale of supporting ANGAP as an institutional approach to the conservation of biodiversity.

USAID/Madagascar devoted considerable attention to this concern during design of the Project Paper, and concluded that support to ANGAP would be an effective means of moving toward the project's objectives. As the PP notes, the creation of ANGAP is an important element of the GDRM's Environmental Action Plan, and as such is endorsed by the group of donors that assisted the GDRM in designing the EAP. The GDRM is fully committed to this approach. Accordingly, through SAVEM, A.I.D. will help the GDRM implement this aspect of its overall sector strategy.

2. Role of the Grant Manager

During Project Paper design, the GDRM expressed its concern over the role of the Grant Manager in relation to ANGAP. Some GDRM officials were particularly worried that the Grant Manager would take over a function (i.e., the award and coordination of grants for the management of protected areas) that should eventually become the responsibility of ANGAP. The USAID discussed this issue with GDRM officials representing the founding members of ANGAP. This group decided that ANGAP's capacity to increase its initial responsibilities by assuming this function would be a subject of the joint GDRM-USAID evaluation of SAVEM planned for the end of the third project year.

3. Sustainability

Project Committees at both USAID/Madagascar and REDSO/ESA raised the issue of sustainability. It was decided that, as the first phase of a 15-year effort to conserve biodiversity in Madagascar, SAVEM would concentrate effort to conserve biodiversity in Madagascar, SAVEM would concentrate its efforts on the establishment of institutional and operational methodologies. The ability to sustain the recurrent costs of project activities would be examined through a policy dialogue with the GDRM under the auspices of the planned FY 1991 nonproject assistance initiative in the natural resources sector. Design and implementation of the NPA instrument will provide an opportunity to begin to identify ways of making the activities supported by SAVEM both financially and institutionally sustainable. Subsequent project efforts can begin to help the GDRM implement the measures identified through this dialogue.

SPECIAL CONSIDERATIONS:

A. Conditions Precedent and Covenants

As specified in Section VI of the Project Paper, the Project Grant Agreement fcr SAVEM will include Conditions Precedent and Covenants on, inter alia, the following major issues:

1. Legal Role and Responsibilities of ANGAP

The GDRM will furnish documentation acceptable in form and substance to A.I.D. demonstrating one, legal recognition of the establishment of ANGAP as a nongovernmental organization; and two, the existence of an implementation agreement between the Ministry of Livestock, Fisheries, Water and Forests (MPAEF) and ANGAP which identifies ANGAP as an autonomous organization and which delineates the responsibilities of ANGAP. This implementation agreement will include appropriate devolution of authority to ANGAP from the Department of Water and Forestry (DEF).

2. ANGAP Authority to Collect Revenues

Except as A.I.D. may otherwise agree in writing, no disbursements will be made for the ANGAP Development component of the Project after December 31, 1991, unless the Grantee has furnished to A.I.D., in form and substance satisfactory to A.I.D., evidence that ANGAP has the authority to collect revenues from parks and reserves.

3. Establishment of ANGAP

The GDRM will agree to cooperate with ANGAP to prepare bylaws, satisfactory to A.I.D., that resolve, among other things, potential conflicts of interest among members and specify internal areas of responsibility.

4. Compatibility of Data Base

The GDRM will agree to work with all participating parties in the collection and use of the biodiversity data base to ensure the use of compatible hardware and software systems.

USAID has discussed these and other conditions and covenants with the GDRM, and found that the GDRM is in substantive agreement with them.

B. Host Country Contribution Waiver

Annex IX to the Project Paper waives the requirement that the host country contribute 25 percent of total life of project costs.

C. The role of Women

Women play a vital role in all aspects of Malagasy society, and are key actors in the natural resources sector. They depend for their livelihood on many products of the protected areas, and thus will be

among SAVEM's the primary beneficiaries. Both the Social Soundness Analysis (Annex VI.D to the Project Paper) and the technical analysis of the Protected Area Development Grants component (Annex VI.A.1 to the Project Paper) address issues important to women. The training component of SAVEM will ensure the active participation of women throughout the life of project. Women will be given equal access to the Conservation Action Grants that SAVEM will fund. Planned evaluations will assess the impact of project activities in overcoming constraints faced by women, and will develop benchmarks for measuring women's involvement in the various activities supported by SAVEM. To facilitate this, all data gathered and analyzed by project grantees and by the project supported Biodiversity Planning Service will be disaggregated by gender.

D. Gray Amendment

USAID/Madagascar plans to award the $3.389 million technical assistance contract for institutional support to ANGAP through limited competition among qualified Gray Amendment firms.

E. Initial Environmental Evaluations for Grants

As suggested by the ECPR, IEEs for both the PADGs and CAGs will be considered on a case by case basis. Authority to approve these IEEs will be delegated to the USAID Mission Director, and is to be exercised with the concurrence of the Regional Legal Advisor and the Regional Environmental Advisor.

F. Justification to the Congress

Notification was sent to Congress on September 7, 1990, and expired without objection on September 21, 1990.

RECOMMENDATIONS

A. That you authorize the proposed grant for the Sustainable Approaches to Viable Environmental Management Project (SAVEM, 687-0110) by signing the attached Project Authorization.

Attachments:
1. Project Data Sheet
2. Project Authorization
3. Project Paper

Clearances:

PO: JJohnson	(DRAFT)	Date:	9/22/90
ADO:JThomas	(DRAFT)	Date:	9/23/90
CONT:SHunter	(DRAFT)	Date:	9/25/90
RLA:JBorns	(DRAFT)	Date:	9/21/90

Drafted by:LBrown:USAID/Madagascar:8/14/90

PROJECT AUTHORIZATION

Name of Country: Madagascar

Name of Project: Sutainable Approaches to Viable Environmental Management

Number of Project: 687-0110

1. Pursuant to Title II of the Foreign Operations, Export Financing, and Related Programs Appropriations Act of 1990 (Sub-Saharan Africa, Development Assistance), I hereby authorize the Sustainable Approaches to Viable Environmental Management Project for the Democratic Republic of Madagascar (GDRM) involving planned obligations of not to exceed Twenty Six Million Six Hundred Thousand U.S. Dollars ($26,600,000) in grant funds (Grant), over a five and one half year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/Allotment process, to help in financing foreign exchange and local currency costs of the project. The planned life of the project is five and one half years from the date of initial obligation.

2. The purpose of the project is to identify and initiate systems (including institutions, methods, and behaviors) for the management of protected areas of Madagascar and the peripheral zones adjoining those areas on a sustainable basis.

3. The Grant Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. Regulations and Delegations of Authority, shall be subject to the following essential terms 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

Except as A.I.D. may otherwise agree in writing:

(1) Commodities financed by A.I.D. under the Project shall have their source and origin in countries included in A.I.D. Geographic Code 935. All reasonable efforts shall be used to maximize U.S. procurement whenever practical.

(2) The suppliers of commodities or services financed by A.I.D. under the Project shall have countries included in A.I.D. Geographic Code 935 as their place of nationality.

(3) Ocean shipping financed by A.I.D. under the Project shall be financed only on flag vessels of the countries shall be financed only on flag vessels of the countries included in A.I.D. Geographic Code 935, subject to the 50/50 shipping requirements under the Cargo Preference Act and the regulations promulgated thereunder.

(B) Conditions Precedent and Grant Covenants

(1) Except as A.I.D. may otherwise agree in writing, prior to the execution of any contract for technical assistance to ANGAP, the Grantee shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D.:

(a) issuance of the "recipisse definitif" by the GDRM Provincial Office in Antananarivo which legally recognizes the establishment of ANGAP as a non-govermental organization;

(b) an implementation agreement between the Ministry of Livestock, Fisheries, Water and Forests (MPAEF) and ANGAP which identifies ANGAP as an autonomous organization and which delineates the responsibilities of ANGAP including appropriate devolution of authority from Department of Water and Forestry (DEF);

(c) a written statement which identifies the members of the Board of Directors of ANGAP.

(2) Except as A.I.D. may otherwise agree in writing, no disbursments shall be made for the ANGAP Development component of the Project after December 31, 1991, unless the Grantee has furnished to A.I.D., in form and substance satisfactory to A.I.D., evidence thta ANGAP has the authoirty to collect revenues from parks and reserves.

(3) The Grantee agrees to cooperate with ANGAP to prepare bylaws, satisfactory to A.I.D., that resolve, among other things, potential conflicts of interest among members and specify internal areas of responsiblity.

(4) The Grantee agrees to work with all participating parties in the collection and use of the biodiversity data base to ensure the use of compatible hardware and software systems.

(5) The GDRM agrees to approve entrance into Madagascar all expatriate personnel of private organizations under contract or grant agreement with A.I.D. for purposes of implementing grant funds and activities under this project.

(6) The GDRM agrees to exempt all commodities and personnel financed by A.I.D. from GDRM taxes and duties. These exemptions will be in accordance with the Economic, Technical and Related Assistance Agreement Between the United States of America and Grantee, dated June 22, 1961.

(c) GDRM Contribution

The AA/AFR has approved a waiver of the normal requirement that the host country contribute at least 25 percent of project costs pursuant to Annex IX of the Project Paper. The GDRM contribution to this Project, including in-kind costs, shall not be less than $768,000.

Approved by: _____

Phyllis Dichter-Forbes
Director, USAID/Madagascar

Date: _____

Clearances:

PO:JJohnson	(DRAFT)	Date:	9/22/90
ADO:JThomas	(DRAFT)	Date:	9/23/90
CONT:SHunter	(DRAFT)	Date:	9/25/90
RLA:JBorns	(DRAFT)	Date:	9/21/90

Drafted by:LBrown:9/14/90

LIST OF ABBREVIATIONS AND ACRONYMS

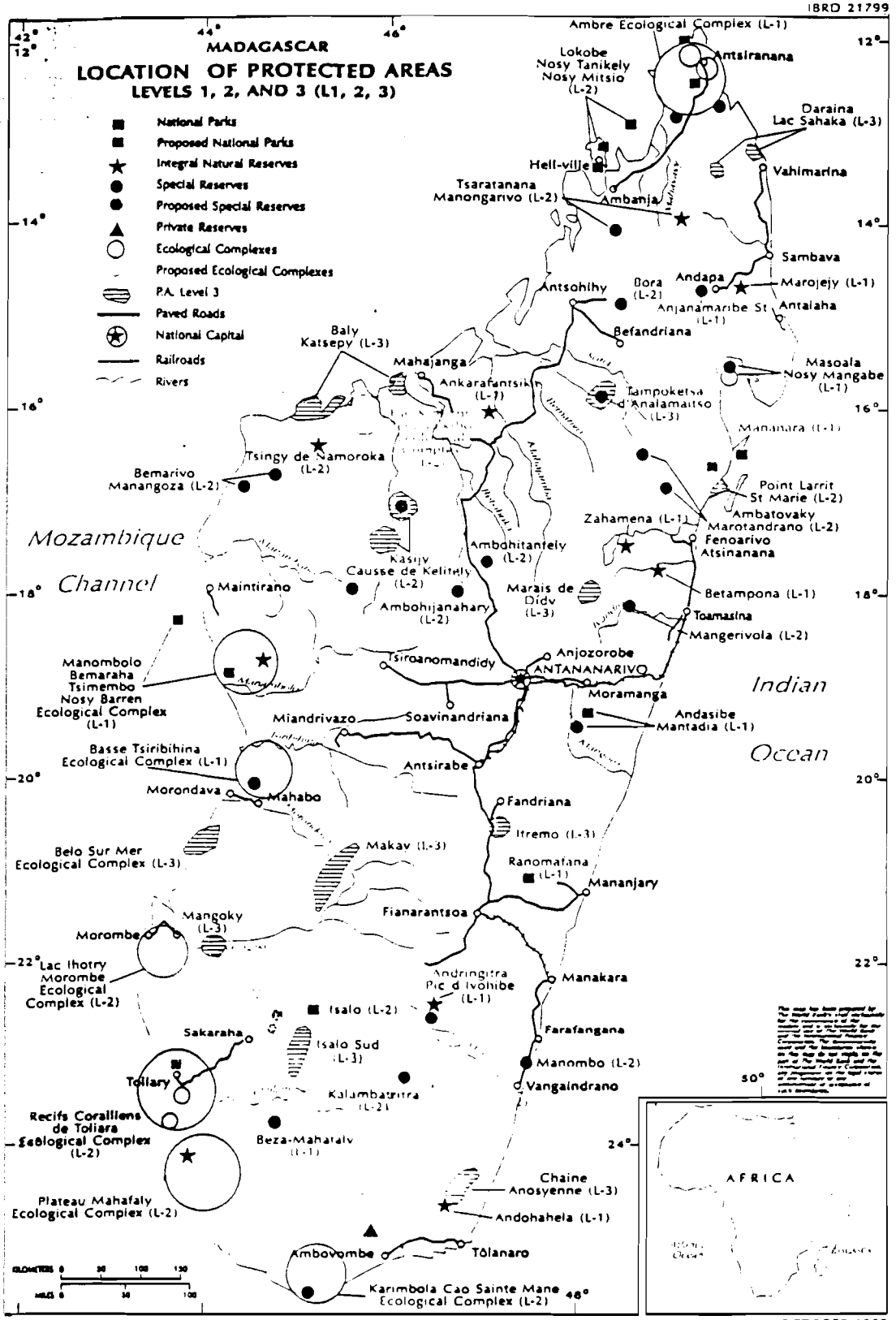
A.I.D.	Agency for International Development
A.I.D./W	A.I.D./Washington
ANAE	Association National d'Actions Environmentales National Association for Environmental Action
ANGAP	Association National pour la Gestion des Aires Protegees National Association for the Management of Protected Areas
ANRET	Agroforestry and Natural Resources Education & Training (NRMS)
ASE	Association for the Safeguard of the Environment
ATLAS	African Training for Leadership & Advanced Skills (A.I.D.)
BPS	Biodiversity Planning Service
BPSFO	Biodiversity Planning Service Front Office
BPU	Biodiversity Planning Unit
CAG	Conservation Action Grant
CAPAE	Cellule d'Appui au Plan d'Action Environnementale Support Unit for the Environmental Action Plan
CAPR	Centre Artisanal de la Promotion Rurale Rural Artisanal Development Center
CARITAS	Catholic Social Development Organization
CI	Conservation International
CNRE	Centre National de Recherche Environnementale National Center for Environmental Research
CNRO	Centre National de Recherche Oceanographique National Center for Oceanographic Research
COMODE	Conseil Malgache des ONGs pour le Developpement et l'Environnement Malagasy Council of NGOs in Development and Environment
CP	Condition Precedent
CPSP	Country Program Strategic Plan (USAID)
CRS	Catholic Relief Services
DEA	Diplome des Etudes Avancees
DEF	Direction des Eaux et Forets Department of Water and Forests (within MPAEF)
DFA	Development Fund for Africa
DP	Departement du Patrimoine Land Registry Department (Ministry of Agriculture)
EAP	Environmental Action Plan (French: PAE)
EASTA	Ecole d'Application des Sciences Techniques Agricoles
EEC	European Economic Community
EPM	Environmental Protection and Management Program
EOP	End of Project
EP I	Environment Program I
ESA	East and Southern Africa (REDSO)
ESSA	Ecole Superieure des Sciences Agronomiques Faculty of Agronomy, University of Antananarivo

FAA	Foreign Assistance Act
FAO	Food and Agriculture Organization (U.N.)
FIFAM	Anglican Church Development Office*
FIKRIFAMA	Christian Rural Development & Water Resources Program*
FOFIFA	National Agricultural Research Center*
FSU	Field Survey Unit (BPS)
FTM	National Cartography Institute* (Ministry of Public Works)
FY	Fiscal Year
GDRM	Government of the Democratic Republic of Madagascar
GIS	Geographic Information System
GM	Grant Manager
GPF	Gestion et Protection des Forets Management and Protection of Forests Project
GRO	Grass-Roots Organization
GSO	General Service Office
GTZ	German Technical Cooperation (English translation)
HRD	Human Resources Development
IBRD	International Bank for Reconstruction and Development (World Bank)
IFB	Invitation for Bids
ImATeP	Institut Malgache des Techniques de Planification
INSCAE	Institut des Science Comptables et d'Administration
IQC	Indefinite Quantity Contract
IREDEC	Institut de Recherches pour le Developpement Communautaire Institute for Research on Community Development
IRM	Information Resources Management
ISTE	Institut Superieur de Technologie en Environnement Higher Institute for Environmental Technology (planned)
LOP	Life of Project
MBG	Missouri Botanical Garden
M&E	Monitoring, Evaluation (and Audit) Plan
MPAEF	Ministere de la Production Animale et des Eaux et Forets Ministry of Livestock, Fisheries, Water and Forests
MRSTD	Ministere de la Recherche Scientifique et Technologique pour le Developpement Ministry of Scientific Research and Technology for Development
NGO	Non-Governmental Organization (French: ONG)
NORAD	Norwegian Aid and Development
NPA	Non-Project Assistance (A.I.D.)
NRMS	Natural Resources Management Support Project (A.I.D.)
ODA	Overseas Development Agency (United Kingdom)
OJT	On-the-Job Training
ONE	Office Nationale de l'Environnement National Environment Office
OPG	Operational Program Grant
ORIMPAKA	Foundation for the Development of Forestry in Madagascar*

PA	Protected Area
PAAD	Program Assistance Approval Document
PACD	Project Assistance Completion Date
PADG	Protected Area Development Grant
PAIP	Program Assistance Identification Paper
PD&S	Project Development and Support
PIO/C	Project Implementation Order/Commodities
PIO/T	Project Implementation Order/Technical Services
PP	Project Paper
PSA	Procurement Service Agency
PSC	Personal Services Contractor
PVO	Private Voluntary Agency
PZ	Peripheral Zone
RCO	Regional Contracts Office (A.I.D.)
REDSO	Regional Economic Development Support Office (A.I.D.)
RFQ	Request for Quotations
RPSO	Regional Procurement Support Office
RSU	Remote Sensing & Cartographic Unit (BPS)
SAFAFI	Department of Agriculture & Livestock/Malagasy Lutheran Church*
SAF-FJKM	Department for Development/Malagasy Reformed Church*
SAVEM	Sustainable Approaches to Viable Environmental Management
SERFA	Service de l'Enseignement du Recyclage et de la Formation Agricole
SIM	Socioeconomic Impact Monitoring Unit (BPS)
SPEF	Service Provincial des Eaux et Forets Provincial Office of Water and Forests (MPAEF)
SPN	Service de la Protection de la Nature Service for the Protection of Natural Resources
TA	Technical Assistance
TOT	Training of Trainers
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USIS	United States Information Service
WWF	World Wide Fund for Nature (International)
WWF/USA	World Wildlife Fund/USA
ZODAFARB	Zone de Defense en Faveur de l'Arbre Protected Zone for Promotion of Tree-Planting

*English translation of Malagasy name

IBRD 21799



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I. PROJECT RATIONALE AND DESCRIPTION

A. Project Rationale

1. Country Situation

Madagascar is an island mini-continent located in the South Indian Ocean off the east coast of Africa. It is noted for its extraordinary diversity of topography, climate, plants and animals. A mountain chain extends nearly the length of the island, creating a central highlands region with an average altitude of 1000 meters. A steep escarpment separates this region from a sub-tropical coastal strip in the east, where most of the country's remaining forests are located. To the west, the land descends gradually first into rolling savannas in the middle west, then to delta plains and baobab forests on the west coast. The south is a semi-desert region, marked by thorny vegetation, seasonal rivers and unusual rock formations. The highlands are drained by numerous fast-flowing rivers that empty into natural lagoons along the coasts.

This ecological diversity, and the isolation of Madagascar since its separation from the African mainland some 165 million years ago, have resulted in the evolution of a wide variety of unique flora and fauna. Eighty six percent of Madagascar's plant species, ninety-five percent of its reptiles, sixty-five percent of its birds, ninety-three percent of its primates are found no where else. New species even now are being discovered. In total, nearly seventy-five percent of Madagascar's estimated 200,000 species of living things are endemic.

Madagascar's people and culture are also unique as a result of several waves of migration from other Indian Ocean islands, Southeast Asia and East Africa beginning some 2000 years ago. For example, the peoples of the highlands tend to have features reminiscent of Indo-Malays, and have also retained similar cultural attributes such as a focus on rice cultivation and reverence for ancestors. By comparison, the cattle cultures of the Mahafaly and Antandroy in the south recall East African societies. Although divided into 18 distinct ethnic groups, all Malagasy speak dialects of one language universally comprehensible in its written form.

The population of 11 million is growing at a rate of 3 percent per year. Nearly 79 percent live in rural areas, and 8 of the 21 percent of urban dwellers live in the capital Antananarivo. Population density is low throughout much of the island, averaging 17 people per square kilometer, but is greater in the central highlands. The level of education is high in the African context, with an overall literacy rate of 61%, which is an advantage in terms of continuing to develop agriculture and diversifying the economy.

Agriculture is the mainstay of the Malagasy economy. The variety of climates permits cultivation of the full range of temperate and tropical crops. Nearly 85 percent of the population is employed in agriculture, which accounts for 43 percent of GDP and 80 percent of

export earnings. Some 70 percent of farmers are engaged in the production of the staple food - rice - which is grown on two-thirds of the cultivated land, often under irrigation. The major export crops of coffee, vanilla, and cloves are grown along the humid east and north coasts, while the cotton, tobacco, sisal, and sugar that supply the few factories are grown along the drier south and west coasts. Land reserves are still extensive, and an estimated 200,000- 300,000 hectares could be developed for irrigation. The national livestock herd includes some ten million cattle, concentrated mostly in the plains of the west and south, as well as a smaller number of poultry and pigs.

The waters along Madagascar's 5,000 kilometers of coastline include rich fisheries for lobster, shrimp, tuna, and other fish, much of which is exported to Europe and Japan. Tonnages have increased rapidly in recent years in this fastest-growing sector of the economy. In addition, Madagascar has considerable mineral and energy resources. Finally, the country has excellent potential for the development of tourism and biological research sites due to its extraordinary heritage of biological diversity.

Despite its extensive resources and development potential, Madagascar is the twelveth poorest country in the world. Its per capita income was $210 in 1988. Poor policies and investment decisions in the 1970's resulted in a heavy external debt, severe fiscal imbalances, and declining incentives for producers. Successful efforts to stabilize the economy in the 1980's have entailed necessary cuts in real public expenditures, which have resulted in declining real wages for civil servants, cuts in development expenditures, and in eroding resources for services normally provided by the Government of the Democratic Republic of Madagascar (GDRM).

Althouth the GDRM has pursued a Structural Adjustment Program since 1983, the Malagasy economy has responded only slowly. Efforts to restructure the economy have been hampered by deteriorating terms of trade for traditional exports, low utilization of productive capacity, and slow growth in investment as skepticism remains over the socialist government's commitment to free market economic policies. Although per capita income showed a real increase in 1989 for the first time in many years, it is today about 20 percent lower than in 1975. Living standards have continued to decline.

2. The Crisis in the Natural Resource Sector*

Madagascar's natural resource base, upon which the vast majority of Malagasy depend directly, is seriously threatened. The scale and intensity of deforestation, loss of biological diversity, soil erosion and associated declines in overall land productivity are unparalleled. Under present agricultural practices and policies, Madagascar is biologically and physically disintegrating, seriously jeopardizing the continued livelihood of its increasing population.

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* This section draws heavily on the Madagascar Environmental Action Plan (July 1988) and the working papers developed in conjunction with the EAP process and subsequent Environment Program I.

This alarming advance of environmental degradation is being pushed by economic and population growth that are increasing demands on the natural resource base. Over 80 percent of Malagasy depend on agriculture for their primary means of livelihood. Farmers and pastoralists continue to rely on land extensive production practices which destroy vegetative cover and exacerbate soil erosion. Government administrators have applied policies and regulations which distort incentives towards over-exploitation rather than in favor of conservation of valuable resources. Development projects are often approved without due attention to their potential negative impacts on the environment. Even when appropriate policies and procedures exist, the government frequently lacks the resources and institutional capacity to enforce them.

The negative impact of environmental degradation on the economy is very high. The economic cost of lower agricultural productivity due to soil loss, damaged infrastructure, and the need to build new infrastructure to higher standards is estimated to equal between 5 and 15 percent of Madagascar's GNP annually.* Some attempts to institute sustainable management of the renewable resource base have been made, but not on a significant scale. A more broadly based effort is needed to protect natural resources and at the same time foster ecologically and economically sustainable development.

The following sections discuss the nature and extent of Madagascar's most serious environmental problems: loss of biological diversity, deforestation and soil erosion, weak institutional capacity, a shortage of trained personnel, and insufficient data for policy planning and programming.

a. Loss of Biological Diversity

Madagascar has been singled out by the international conservation community as one of the ecologically richest countries in the world, one in which the heritage of biological diversity is most at risk. Biodiversity refers to the variety and complexity of biological systems at all levels, from the genetics of individual species to the species composition and structure of ecosystems. Madagascar's high endemism, high number of species, and small size make it an extremely important global reservoir for biological diversity, and thus a high priority for conservation.

The diverse systems of Madagascar contain numerous plants and animals that provide many useful products and services to local human populations. Such products include food, medicinal plants, forage for livestock, fibers, and firewood. Some of the newly discovered palms and other plants could be of great agricultural potential, and important new commercial pharmaceutical products might be derived from plants found only in the remaining forests. A full 40 percent of all prescription drugs contain active ingredients originally derived from wild plants and animals. Madagascar's rosy periwinkle, for example, yields powerful antileukemic agents.

* See Annex 6.C., "Economic Analysis", for a more detailed discussion of these costs.

According to available information, nearly 80 percent of Madagascar's original forest cover has disappeared or has been severely degraded since man's arrival some 2000 years ago. The attendant plant and animal extinctions include a wide variety of endemic families and genuses, including 14 species of lemurs and a number of species of "Aepyornis," the largest known bird. Within the next 20-40 years, almost all of Madagascar's remaining rain forests will be damaged or destroyed unless current trends are reversed. This massive and complete deforestation threatens not only biological diversity, but also watershed and soil stability vital to the local agrarian economy.

A.I.D.'s Sustainable Approaches to Viable Environmental Management Project (SAVEM, 687-0110) will assist Madagascar in its attempt to conserve the vast irreplaceable range of natural biological resources. A key aspect of this attempt is the recognition that natural complexity and diversity have direct benefits for human health and development. Sustainable development is not feasible without the maintenance of a healthy, diverse environment. Similarly, it will not be possible to maintain Madagascar's natural resources without developing sustainable, non-traditional income generating activities for the country's human population. Thus, conservation of biological diversity in Madagascar must integrate rural development goals by focusing on programs that enhance the ability of the Malagasy people to meet their development needs through sustainable use of available resources.

b. Deforestation and Soil Erosion

Loss of forest cover is the principal factor in the severe soil erosion problems affecting Madagascar. Severe erosion decreases agricultural productivity and threatens major infrastructure. Because of the lack of conservation practices, as much as 200 tons of topsoil per hectare are annually washed away, and soil fertility as well as agricultural productivity are declining. By comparison, the maximum sustainable soil loss on the best of soils is estimated by agronomists to be 11/tons/ha/year. The most serious erosion occurs on agricultural land cultivated for upland crops and rainfed rice, as well as on vast areas of rangeland. Thousands of acres of irrigated land are lost every year due to excessive siltation.

Madagascar's soils are also highly susceptible to one of the world's most dramatic types of gully erosion. Lavaka, which took its name from the Madagascar phenomenon, is rarely found elsewhere. Lavaka erosion rapidly extends both up and down slopes, as well as laterally. A recent study by the World Bank estimates the soil erosion and other environmental degradation costs the country between $100 - $300 million a year, roughly one tenth of its gross national product. Most of these costs arise from the effects of deforestation and soil erosion on maintenance of irrigation, transport, and hydroelectric infrastructure. Deforestation also imposes severe hardships on the poor who are totally dependent on fuelwood and charcoal as their primary source of energy.

c. Weak Institutional Capacity

Madagascar lacks a coherent institutional structure for managing its environment, and the institutions that do exist are largely incapable of carrying out their mandates. Responsibility for the environment is fragmented among several ministries which all suffer from inadequate funding, insufficient numbers and poorly trained staff at all levels, lack of information, a history of agricultural policies which have worked as disincentives to conservation, and weak capacity for policy analysis and planning.

This is particularly the case for the Ministry of Livestock, Fisheries and Forestry (MPAEF) and its Department of Water and Forests (DEF). DEF is technically responsible for the rural environment, including biodiversity and forestry policies, forest management, reforestation, soil conservation and the management of protected areas. Recognizing its limited capacity, DEF is concentrating its efforts on policy and the forestry sector. It presently is receiving institution-building assistance under a World Bank and Swiss financed project, Forestry Protection and Management. For the management of protected areas, DEF has pragmatically contracted with NGO's, universities and international agencies to assist in managing the parks and reserves.

For these institutions to function effectively, a concerted effort will have to be made to address the current scarcity of qualified personnel at all levels. A recent survey of human resource needs and availabilities for the forestry sector conducted by Cooperation Suisse revealed that not only will there be an acute shortage of qualified field level technicians in coming years, but also that local training institutions will be unable to meet the anticipated demand. It also highlighted the considerable need for in-service training of existing staff.

d. Insufficient Data for Policy Planning and Programming

Although environmental management requires good research and data collection, not enough environmental research is being carried out in soil conservation, agroforestry, and the management of natural forests. The knowledge of terrestrial biodiversity and its dynamics is still very limited. Soil conservation and watershed management technologies need to be better defined for the various economic regions of the country. The management of vast western pasture lands needs to be extensively researched to provide keys to controlling the huge annual fires and to establish more sustainable grazing systems.

In 1988, the GDRM created a new environmental research center (Centre National pour la Recherche Environnementale, CNRE). Yet a more comprehensive approach is needed to link strategically targeted local projects with policy reform, human resource development, research and analysis, and knowledge dissemination. It will also be important to link socio-ecological surveys to natural resources management and ecological surveys. Diagnostic studies, follow-on

monitoring, and data furnished through conservation/development activities in peripheral areas will identify the policy, technical and socioeconomic interventions needed to conserve biodiversity while simultaneously promoting economic development.

The ultimate success of these efforts will depend, in part, on the integration of data generated by these projects in the following areas: biodiversity conservation, fundamental ecological research, forestry, soil conservation, social ecology, and cultural anthropology, cartography, and institutional support activities. A biodiversity information system will allow for information to be assembled, systematically organized, and disseminated for evaluation and application.

3. The GDRM Strategy

In recognition of the types of problems described above, the GDRM first enunciated a strategy for the conservation of natural resources in December 1984 with the adoption of a "Malagasy Strategy for Conservation and Sustainable Development". The GDRM took the first steps in making this strategy operational in 1988/89 with the preparation of an "Environmental Action Plan" (EAP). The EAP was prepared with the assistance of a wide range of Malagasy experts and the support of a group of donors, international agencies, and non-governmental organizations (NGO's) led by the World Bank. This group included USAID, Cooperation Suisse, UNDP, UNESCO, and the World Wide Fund for Nature (WWF). The EAP, which sets forth the Government's policy in the environmental sector, has identified key programs to be implemented in the long term.

The overall goal of the EAP over the next fifteen years is to assist the Malagasy population in protecting and improving its environment while working for sustainable development. Its four specific objectives are:

(a) To conserve and manage the patrimony of biological diversity.

(b) To promote sustainable development by better managing natural resources.

(c) To improve rural and urban living conditions.

(d) To develop human resources and institutional capacity.

EAP's strategy calls on NGO's and the private sector to play major roles in environmental protection by participating in coordinated development activities, training and education, environmentally sensitive industrial expansion, "ecological" tourism, fuel production, and wood product processing.

To carry out this strategy, the EAP will undertake six long-term programs:

(a) Protecting and managing the national heritage of biodiversity, with special emphasis on parks, reserves, and gazetted forests. This effort will include the sustainable development of surrounding areas.

(b) Improving the living conditions of the population. This will be done in rural areas, in part by improving the protection and management of natural resources. EAP will pay particular attention to watershed protection, reforestation, and agroforestry. In urban areas, this will involve improving water supply and sanitation, waste management and pollution control in general.

(c) Promoting environmental education, training, and communication.

(d) Developing mapping and remote sensing tools to meet the demand for natural resources and land management.

(e) Developing environmental research on terrestrial, coastal, and marine ecosystems.

(f) Establishing appropriate mechanisms for managing and monitoring the environment.

The Environment Program 1 (EP-1), designed by a multi-donor team of environmental specialists led by the World Bank, is the first five year segment of the Environmental Action Plan. EP-1 will begin or expand implementation of the six priority programs. As this is the first phase of a complex, long term process, the program will be implemented incrementally to allow for the development of local experience and capacity. The designers of EAP used the following criteria to identify priorities for this first segment:

(a) Developing operations of an urgent nature. This is to include: (i) protecting the heritage of biodiversity in the parks, reserves and gazetted forests currently at risk, in conjunction with the development of the surrounding communities; and (ii), fighting deforestation and erosion in priority watersheds where the negative economic impact is currently the highest.

(b) Establishing a foundation for environmental management through institution building, studies, and human resource development.

To move toward the objectives described above, EP-1 will carry out actions in seven areas:

(a) Protection and management of biological diversity in 50 targeted threatened areas, together with the development of the surrounding areas.

(b) Soil conservation, agroforestry, reforestation and other rural development activities in priority areas.

(c) Mapping and progressive establishment of a geographic information system (GIS).

(d) Establishing clear boundaries for protected areas and improving land security through titling.

(e) Environmental training, education, and awareness.

(f) Environmental research on land, coastal and marine systems.

(g) Institutional strengthening, i.e., coordination, establishment of environmental assessment procedures, strengthening the environmental data base, monitoring and evaluation, and studies.

One of the first major institutional initiatives taken by the GDRM under the auspices of EP-1 was the planning for a National Association for the Management of Protected Areas (ANGAP). ANGAP was planned partly in response to the Department of Water and Forests' accurate perception that the ad hoc designation of various international NGO's to manage Protected Areas could not continue indefinitely. Recognizing that it lacked a strong managerial capability of its own, DEF proposed the creation of a flexible agency capable of coordinating these NGO's, ensuring the integration of conservation with development, and eventually replacing foreign operators. Accordingly, ANGAP was established as a private association, with a board of directors balancing public and private sector representation. The GDRM intends that ANGAP gradually take over responsibility for the coordination of both protected area management and development activities in their peripheral zones.

Two other institutions also have been created under the EP-1:

(a) a National Office for the Environment (ONE) to coordinate environmental policy, environmental impact assessments of investments, and environmental training and consciousness raising; and

(b) a non-governmental National Association for Environmental Action, (ANAE) to expand community level initiatives in soil conservation and sustainable resource management.

Several existing institutions also will be strengthened: DEF, the Malagasy mapping agency (FTM), Direction du Patrimoine (DP) and the environment research centers CNRO and CNRE.

The proposed SAVEM project ensues directly from the GDRM efforts. Through SAVEM, USAID will take the lead in helping the GDRM implement the biodiversity and institutional strengthening components of the EAP. Other donors also plan to provide assistance under the framework and priorities of the EAP. The Norwegian Aid

and Development Agency (NORAD), for example, plans to provide, through the World Bank, $1.06 million over five years to support ANGAP's local operating expenses. While the U.S., Switzerland and other donors have long been active in supporting improved management of Madagascar's natural resource base, the EAP offers an opportunity for improving the scale and coordination of interventions. It also has launched policy discussions and established natural resource policy and administrative reform as important elements of GDRM programs in this sector.

4. Relationship to A.I.D. Strategy

A.I.D.'s environmental and natural resource policy is based on the premise that environmental protection and conservation of natural resources are essential to sustained economic and social development. The central objective of this policy is to help developing countries conserve and protect their environment and natural resources, and to promote long-term economic growth by managing exploited resources for sustainable yields.

This strategy also reflects a priority concern of the United States Congress as expressed in the revised Foreign Assistance Act of 1989. Section 119 of that Act contains a special provision on endangered species. This provision reads in part:

> "Special efforts should be made to establish and maintain wildlife sanctuaries, reserves and parks, to enact and enforce anti-poaching measures; and to identify, study, and catalog animal and plant species, especially in tropical environments."

In Madagascar, A.I.D. has responded to this mandate by making resources available for the planning and execution of conservation projects under the centrally funded Natural Resources Management Support Project (NRMS), centrally-funded biodiversity grants, and bilateral conservation and development projects implemented jointly by the GDRM and NGO's. These efforts have been based on the premise that conservation is inextricably linked to the improvement of the lives of the rural poor who utilize forested lands.

The proposed SAVEM Project reflects both this Agency-wide strategy and the high priority accorded to the conservation of biodiversity in Madagascar. As detailed in other sections of this Project Paper, SAVEM will seek to carry out the Agency's mandate by improving the management of Madagascar's priority protected areas while simultaneously assisting surrounding communities to identify and implement more sustainable ways of using the natural resources on which they depend. Through technical assistance, training, and grants to local and international NGO's, SAVEM will assist ANGAP and NGO's in promoting the interactive management of Madagascar's protected areas and the development of adjacent communities. SAVEM will seek to do this through, among other things, the development of sustainable agricultural practices, the improvement of living conditions in local communities, and the identification of sustainable ways in which those communities can continue to benefit from their proximity to these protected areas. The local

communities around the protected areas will thus be both partners in conservation and beneficiaries of rural development programs. They also will benefit from new jobs created in park and reserve infrastructure, operation and maintenance, policing, and tourism. Additionally, SAVEM will support efforts to undertake ecological inventory, species-level research, and environmental education and training. Through all these activities, SAVEM will test the assumption that the biological diversity and ecosystems can be conserved through a program involving both interactive management of protected areas and economic development of the surrounding areas.

USAID/Madagascar also will be undertaking a policy reform-related non-project assistance (NPA) activity in the natural resources sector in FY 1991. This activity will come under the mandate of the Environmental Action Plan, and will support and parallel the SAVEM Project. The planned program will attempt to identify and support the reform of economic, institutional, and administrative policies that inhibit effective natural resource management. The precise content of the NPA will be defined as the program is developed. A series of studies will be undertaken within the NPA, or with the use of PD&S funds. These studies will analyze the constraints to, assess the impact of, and identify policy and administrative solutions to current land-use practices and policies regarding land tenure, share- cropping and forest-products pricing.

B. Project Objectives

1. Project Goal and Purpose

In response to the problems described above, the goal of the SAVEM Project is to establish sustainable human and natural ecosystems in areas of Madagascar where biodiversity is threatened. This is consistent with the overall sector goal that USAID/Madagascar expects to include in its upcoming Country Program Strategic Plan (CPSP). It is also consistent with the 15-year sector goal of the GDRM's Environmental Action Plan.

To move toward this goal, the purpose of SAVEM is to identify and initiate systems (including institutions, methods, and behaviors) for the management of protected areas of Madagascar and the peripheral zones adjoining those areas on a sustainable basis. This purpose will have been entirely achieved if, by the Project Assistance Completion Date (PACD) of March 31, 1996:

(a) SAVEM, its grantees, and the GDRM agencies with which they will collaborate have identified and begun to test various hypotheses concerning the management of sustainable, interactive development and conservation efforts in up to six protected areas. In this context, the phrase "protected areas" refers not only to the parks and reserves, the management of which SAVEM will seek to improve, but also to the human communities living in the peripheral zones adjacent to those parks and reserves.

(b) The populations of these peripheral zones are using improved production adaptations that decrease their need to rely on continued, non-sustainable use of resources located in those protected areas.

(c) The same local communities, including both governmental and non-governmental representatives, are involved in the interactive management of the resources of the protected areas adjacent to their homes.

(d) Public awareness of the prospects for interactive management of protected areas has increased.

As with any project, it is unlikely that SAVEM will have achieved all these objectives by the PACD. Nonetheless, the critical importance of the environmental problems described above mandates that USAID and the GDRM proceed now to identify and test various approaches to those problems.

Accordingly, SAVEM should be viewed not as a solution to the crisis that threatens Madagascar's ecosystem, but rather as a means of testing and validating such solutions. Project observers should assess SAVEM's success or failure not by whether environmental degradation in Madagascar has been halted by the end of the project, but rather by the extent to which SAVEM has identified and tested alternate approaches to the problems.

2. Planned Inputs and Expected Outputs

SAVEM is to be implemented through two basic strategies. The first, or traditional, approach, will help develop the country's institutional, managerial, technical, and human resources. Toward this end, SAVEM will provide technical assistance, training, and commodity support to both governmental and non-governmental institutions active in the natural resources sector. Section I.C. of this Project Paper describes this support in greater detail.

The second, or non-traditional, approach will test the hypothesis that local populations will alter their behavior from destruction to conservation of their environment if they see a relationship between their economic and social well-being to the conserved area and if they are empowered to make the right kinds of decisons. To do this, SAVEM will award up to six large "Protected Area Development Grants" (PADG's) to local and/or international NGO's. It will also award approximately 100 small "Conservation Action Grants" to local NGO's, governmental units, and individuals for more limited, locally-initiated interventions in peripheral zones adjacent to any of Madagascar's 50 Protected Areas.

By the end of the project, these two types of efforts should have resulted in the following outputs:

(a) Establishment and empowerment of a National Association for the Management of Protected Areas (ANGAP) with sufficient authorities and capabilities to perform its management functions and fulfill its mandates.

(b) Development of a Biodiversity Planning Service (BPS) managed within ANGAP capable of tracking and communicating information on biodiversity conservation.

(c) Implementation of interactive management plans in five to six protected areas of Madagascar and the adjacent peripheral zones.

(d) Demand by Malagasy individuals and communities interested in community activities aimed at sustainable conservation biodiversity in 50 priority areas.

(e) The enhancement of the managerial and technical capacity of GDRM and NGO personnel active in the conservation of natural resources.

If the central hypothesis proves valid; i.e., if local populations prove willing to alter their behavior toward their environment in response to economic and social incentives, SAVEM will not only help conserve biodiversity and promote economic development in its target areas, but perhaps more importantly, it will also significantly expand understanding of how to influence human behavior in favor of improved utilization of natural resources.

3. Sustainability

As part of the Environmental Action Plan, SAVEM is the first phase of a 15 year effort to conserve biodiversity in Madagascar. During this phase, SAVEM will attempt to establish institutional and operational methodologies for viable natural resource use.

During the SAVEM Project, sustainability issues related to ANGAP will be introduced, to be expanded upon during implementation of the related FY 1991 NPA initiative. NPA designers will look into potential solutions such as local currency endowments funded under debt for nature swaps. Such endowments might be used, for example, to continue interactive management efforts launched by SAVEM. NPA designers also will examine the possibility of establishing systems whereby local communities could retain for their own use a portion of the revenues generated by Madagascar's protected areas.

SAVEM procedures for grant review, monitoring and evaluation will also consider sustainability of grant activities. In successive phases, it is expected that subsequent project efforts can begin implementing sustainability measures based on NPA results.

C. Project Elements

1. ANGAP Development

a. Creation of ANGAP

A major objective of the first five year phase of the Environmental Action Plan, the Environment Program I, (EP-I) is to establish solid foundations for environmental management through institution building and human resources development. Part of a major reform initiated by this program, and agreed to by donors contributing to the EP-I, has been the establishment of the National Association for the Management of Protected Areas (ANGAP) to coordinate implementation of government policy for the management of protected areas and the development of peripheral zones. The Ministry of Livestock, Fisheries, Water and Forests (MPAEF), from which ANGAP will derive its authority, will maintain overall responsibility for biodiversity policy.

In accordance with the EP-I, ANGAP was created in June 1990 as a small agency under private law. The founding members, who compose the present General Assembly, represent a balance of the public and private sectors. These include representatives of the Ministry of Livestock, Fisheries, Water, and Forests; Ministry of Economy and Plan; Ministry of Scientific Research, Technology and Development; Ministry of Interior; Ministry of Higher Education; National Office for the Environment (CAPAE/ONE); 3 international and 3 national non-governmental organizations; and one representative from the private touism industry.

The statutes have been ratified, but the legal recognition of ANGAP as an institution will be forthcoming only after the designation of the members of the Board of Directors and submission of the statutes to GDRM. Thus, while ANGAP has been established on paper, it is not yet a legally recognized organization. ANGAP will be able to begin functioning as an institution after obtaining the "recipisse provisoire" issued by the Provincial office in Antananarivo which is expected by the end of September 1990. ANGAP will not, however, be legally recognized until the receipt of the "recepisse definitif," issued after concurrence by the Ministry of Interior. As stipulated in the conditions precedent, this will be received by the end of 1990 (ref. Section IV) The delegation of responsibility to ANGAP will be made through an agreement to be signed between MPAEF and ANGAP. Definition of the structure and functions required to fulfill its mandate will be a gradual process over the life of SAVEM.

b. Purpose and Role of ANGAP

The creation of ANGAP represents an important step in the process of increasing Madagascar's ability to manage and protect biodiversity resources, and to assist Malagasy communities in becoming less dependent on non-sustainable exploitation of protected areas. Madagascar has identified forty-five priority biodiversity zones; ultimately, 50 areas will be so designated. The principal purpose

of ANGAP is to coordinate activities in these protected areas and the surrounding peripheral zones, which require particular and technically focused approaches. This purpose may be expanded to management of the protected areas based on demonstrated capabilities of ANGAP.

As stated in the Environmental Program I and according to the objectives outlined in its statutes, ANGAP will be progressively responsible for, but not restricted to, the following functions:

- helping the Department of Water and Forests (DEF) refine the national policy on biodiversity in collaboration with the National Office for the Environment (ONE);
- negotiating and contracting with field operators;
- mobilizing additional funds for biodiversity;
- coordinating staff training;
- monitoring and evaluating field operations; disseminating information and organizing meetings and workshops with field operators;
- establishing a national biodiversity data system and planning service.

All of these functions will not be integrated into the overall operations of the organization from the outset. Rather, they will be assumed gradually as ANGAP's capacity increases over the life of the project. As described in Section I.C.3 below, the execution of protected areas management plans integrating conservation with sustainable development activities are to be delegated to competent field operators, such as international and national NGOs, universities, or other appropriate entities. ANGAP's possible future capacity to manage protected areas directly will be reviewed during a joint AID/GDRM mid-term evaluation of the SAVEM project at the end of FY 1993.

c. Institutional Development of ANGAP

USAID is the lead funding agency for the biodiversity component of the Environmental Program I of which ANGAP is the major institution. The SAVEM project is the principal vehicle for assisting the institutional development of ANGAP. SAVEM will provide long term and short term technical assistance to ANGAP, commodity support, and will fund 20% of ANGAP's operating costs over a five year period. However, because of budget arrangements made with the World Bank, AID will apply this 20% funding all to the first year of operation. SAVEM will thus fund all recurrent costs of ANGAP, including salaries of national staff during FY 1991. Beginning in FY 1992, the GDRM will

assume these recurrent costs. Additional support will be allocated to the establishment of the Biodiversity Planning Service within ANGAP. (see section I.C.2 below)

The SAVEM project will assist ANGAP through an institutional support contractor who will provide 72 months of long-term and 30 months of short-term technical assistance. The two long-term specialists, a Management Advisor and a Natural Resource Advisor, will play a crucial role in transferring important skills. Short-term technical assistance in financial and administrative management, agroforestry, zoology, natural resource economics, monitoring and evaluation, computer technology, and museum technology/public education will be provided at critical periods throughout the life of the project. The timing of this assistance will be determined during project implementation. Short-term assistance prior to the arrival of the instituional contractor will be provided through the project coordination office. A limited quantity of computers, vehicles, audio-visual equipment, and other office equipment will also be provided by SAVEM for use by the TA team and ANGAP staff.

This long term and short term technical assistance will assist ANGAP in:

- establishing itself by focusing on policy and planning issues in biodiversity;
- developing effective mechanisms for coordinating the activities of independent protected area managers;
- the development of an institutional capacity in administration and finance;
- the establishment of an education, training and communication network to enhance understanding of biodiversity conservation and rural development in Madagascar;
- the development within ANGAP of the capability to monitor and evaluate activities of field operators working in protected areas and their peripheral zones; and the establishment and operation of a biodiversity data base.

Draft Scopes of Work for the long-term positions are set forth in Annex VIII of this Project Paper. The following sections describe these types of assistance in more detail.

1) Policy and Planning

One of the primary responsibilities of the two long term technical advisors will be to assist ANGAP in examining short and long term policy and planning issues. ANGAP's efforts will be directed toward assisting the GRDM in refining national

policy on biodiversity, in collaboration with the National Office of the Environment. Senior staff at ANGAP, in collaboration with the Natural Resources Advisor, will analyze information from the planned Biodiversity Planning Service (BPS) to develop long range plans for the improved management of protected areas and policy recommendations. Based on these analyses, ANGAP will then make recommendations to the GRDM regarding the status and direction of biodiversity conservation activities and the prioritization of zones and of activities in those protected areas These recommendations will be transmitted to the Direction of Water and Forests(DEF), which has overall responsibility for refining national biodiversity policy.

2) Coordination

ANGAP is charged with coordinating the implementation of government policy for the management of identified priority protected areas and the development of their peripheral zones, Accordingly, ANGAP is to be designated by the GRDM as the organization responsible for establishing contracts with field operators working in these protected areas and peripheral zones. One of the primary responsibilities of the technical assistance provided under the SAVEM project will be to assist ANGAP in establishing effective procedures for reviewing protected areas management plans and coordinating these activities.

To do this, ANGAP will first seek to develop a capacity for conducting preliminary site reconnaissances to obtain required information needed to evaluate eventual project proposals for protected areas. These will be carried out initially in collaboration with the Natural Resources Advisor and the Protected Area Grant Manager (GM). As described in section I.C.3 below, the GM will be responsible for awarding and monitoring grants to field operators in six protected areas under the SAVEM project. Criteria for viable protected areas interactive management plans will be developed by the Grant Manager for appropriate interventions in the targeted areas. These criteria will be reviewed and approved by ANGAP and USAID; and then, applied in the review of the proposed park management and development activities.

At the end of the third year of the project, the capacity of ANGAP to increase its responsibilities will be assessed during a joint AID/GDRM evaluation of SAVEM. Based on the outcome of this evaluation, ANGAP may take on increasing responsibilities either in grants administration and/or direct management of protected areas. There are at least two possible approaches which could be introduced following that evaluation to enable ANGAP to increase its institutional capacity. First, to allow ANGAP to demonstrate its capability to administer grants, the Protected Areas Grant Manager, with consultation of the

Management Advisor, could provide funds to ANGAP. ANGAP would subsequently allocate these funds to a field operator in a specific protected area. Alternatively, the Grant Manager could provide funding to ANGAP for the direct management of one protected area. This would provide ANGAP with the opportunity to demonstrate its capacity to function as a grant administrator and/or protected areas manager while receiving guidance and technical assistance from the Grant Manager over the remaining two years of the project.

3) Administration and Financial Management

One of the first types of technical assistance to be provided by SAVEM will be to assist the Board of Directors and the Director General in defining staffing patterns and job descriptions for all professional and support staff. An illustrative national staff could include a Senior Social Scientist, Senior Ecologist, Director of Administration and Finance, two Junior Social Scientists, Public Education Specialist, Librarian, and bookkeeper and four support staff. In order to effectively collect data related to the joint management of protected areas and development activities in the peripheral zones, ANGAP may also consider placing a field monitor in each of the six provinces. (Illustrative job descriptions for these staff positions are set forth in Annex VI.E.)

During FY 1991, a short term administration/financial advisor will also be provided to assist ANGAP in setting up financial management and accounting systems, personnel system and procedures, and short and long term financial planning. This person will be responsible for training the national staff in the use of appropriate computer software.

In FY 1992 and 1993, further technical assistance will be provided to assist ANGAP in establishing a system for the receipt and programming of park fees and other revenues to be allocated to ANGAP by the government. Several options for financing recurrent costs of ANGAP must be explored as the park fees are unlikely to cover all these costs. Long term options, such as the creation of an endowment through Debt for Nature Swap, need to be considered and explored by the ANGAP senior staff in collaboration with the long term technical assistance team. It is recommended that a project cost analysis of recurrent costs be conducted and recommendations be developed for these costs to be funded from other than external donor sources.

4) Education, Training and Communication

Education strategies and approaches will be established by ANGAP's national staff in conjunction with short term technical assistance provided under the SAVEM project. These will be aimed at enhancing national public awareness, sensitivity, and participation in activities which support the conservation of Madagascar's natural resources. Training needs for ANGAP staff will be assessed by the Director General in collaboration with the long term technical advisors after the structure of the organization is finalized, and positions defined and staffed. SAVEM will fund in-country and overseas training for ANGAP staff. This training will be coordinated by the technical assistance contract team. The specific types of training that SAVEM will support are set forth in Section I.C.4 below.

An effective communication network will be established through several means. Regular meetings will be held with government ministries and organizations active in biodiversity conservation and related development activities. Through short term technical assistance, ANGAP will develop a capacity in desk top publishing to produce quality newsletters on issues concerning the conservation of biodiversity. Other short-term advisors to ANGAP will assist the librarian in setting up a library for public use, as well as archives and computer indexes of publications available; and, will assist the educational specialist in audio-visual material development.

ANGAP's responsibility for coordinating training activities needs to be further defined. It may be an appropriate role for ANGAP to function as a coordinating body in organizing seminars and workshops of particular use to government agencies and the principal international and national NGOs involved in management of protected areas. However, this must be determined during the course of the project based on specific needs and the capabilities of other institutions with training mandates.

5) Monitoring and Evaluation

A Monitoring and Evaluation specialist will provide short term technical assistance to ANGAP staff in designing an effective computerized tracking system for maintaining up-to-date status reports on activities in the protected areas and peripheral zones. This will be developed on an incremental basis beginning with those protected areas where integrated conservation and development projects are already being implemented by field operators.

TA will be used to train ANGAP staff in using the planned Biodiversity Planning Service (BPS) computerized system for retrieving information regarding NGO activities, number of projects in each zone, number of Malagasy trained in each project, level of input per project, etc. Regular reports

subsequently will be established on the status of the various protected areas management and development activities. These data will be integrated into the Biodiversity Planning Service described below, to assist in evaluating the impact of the project in the protected areas.

6) Biodiversity Planning Service

A major responsibility of ANGAP will be to coordinate data collection. This will be accomplished through the establishment of a national conservation data bank or Biodiversity Planning Service (BPS) as a separate component under the SAVEM project. The BPS is to be housed in ANGAP, but will be managed through a separate grant to an international organization with experience in conservation data banks. This grantee will be responsible for providing the management and technical services required to establish and operate the BPS, and will assure integration of this information into the other functions of ANGAP.

The BPS will consist primarily of a Geographical Information System (GIS) data base; a computer-based on-going documentation of species of plant and animal life, topography, climate and soils in the protected sites; and socio-economic data gathered from diverse sources pertaining to human communities in the protected sites and peripheral zones. A field survey team will be responsible for the collection of zoological and botanical data and the field monitoring and evaluation data from ANGAP. This collection and analysis of biological and socio-economic data will develop the capacity of ANGAP over the life of the project to monitor the impact of project interventions on the effective protection of parks and reserves. At the end of project, the BPS should be an integral service of ANGAP. More information on the establishment of this conservation data base is contained in Section I.2.C.

d. Other Inputs

1) GDRM Contribution

In the financial plan for the Environment Program I established by the GDRM in collaboration with the World Bank, the projected financial resources required for ANGAP's operational costs total $5,919,000 over five years. This amount includes establishment of the BPS as well as ANGAP. The GDRM's contribution will consist of a total input of $768,000 either in cash or through tax exemption benefits to ANGAP. This will represent a total contribution of 13% of ANGAP's operating expenses. The government's cash contribution will be provided either by the Ministry of Economy and Plan or by MPAEF.

2) Other Donor Assistance

To date, NORAD has been the only other donor which has made a financial commitment to ANGAP. NORAD has agreed to finance a total of $1,060,000 for up to 80% of recurrent operational costs during the five year Environment Program I. These monies are to be administered by the World Bank for disbursement to ANGAP. It was agreed with the GRDM during negotiations with the World Bank that, as a condition of disbursement of funds to ANGAP, the GDRM would enable ANGAP directly to collect park revenues including entrance fees, concession sales, and other fees from the tourism industry. These revenues are currently collected by MPAEF and transferred to the Public Treasury. Representatives of the National Office of the Environment (CAPAE) have told USAID that the government will not be able to ensure the modification of this procedure prior to mid-1991 due to the complexity of the task. Consequently, the contribution to ANGAP by the World Bank, which includes the funds committed by NORAD, will not begin until the second year of the SAVEM project (FY 1992).

e. Planned Outputs

USAID expects that by 1996, the principal output of this component of SAVEM, will be the establishment of a National Association for the Management of Protected Areas (ANGAP) with sufficient authorities and capabilities to perform its management function. This means that by the end of SAVEM, ANGAP will have become a viable institution with an increased capacity to manage protected areas in Madagascar. Through its field monitoring system, evaluation system, and Biodiversity Planning Service, ANGAP will have identified management approaches most effective in conserving biodiversity and achieving a balance between human societies and plant and animal life in protected areas. Indications that this has been achieved will include:

(1) Demonstrated ANGAP organizational capacity in administrative and financial management;

(2) Development of ANGAP institutional capacity, national standards, and site-specific procedures for the effective coordination of interactive conservation and development activities in protected areas and peripheral zones;

(3) Establishment and operation by ANGAP of an effective system for tracking on the ground activities relevant to the conservation of biodiversity; expanded knowledge of other organizations' activities in the NGO community; provision of accurate and timely data on NGO activities;

(4) The development by ANGAP of proposed policies and procedures that will encourage and promote communication with non-governmental organizations active in the field, the national government and, in turn, communication between such entities;

(5) Establishment by ANGAP of an effective information network among and between organizations working in protected areas and their peripheral zones; and

(6) Application of information from data generated by ANGAP towards improved planning of biodiversity conservation and rural development activities in Madagascar.

The FY 1993 mid-term evaluation will assess ANGAP's progress toward all these measures. If by that date ANGAP has already achieved some or all of these objectives, the evaluators will propose a new set of objectives and activities for ANGAP over the remainder of the life of the project. USAID and GDRM will, in that case, review these proposals and, if necessary, amend this component of SAVEM accordingly.

2. Biodiversity Planning Service (BPS)

In an attempt to find a more comprehensive approach linking socio-ecological surveys to natural resources management and ecological surveys, SAVEM will fund the establishment of a Biodiversity Planning Service (BPS) as part of ANGAP. The BPS will be responsible for diagnostic studies, follow-on monitoring, and collecting data furnished through conservation/development activities in an attempt to identify interventions needed to conserve biodiversity while simultaneously promoting economic development.

As part of ANGAP, the BPS will have the major responsibility of establishing a national biodiversity data system. In order to perform this function, the BPS will be responsible for coordinating and standardizing the collection of all data pertaining to biodiversity in protected areas so that information collected from different locations and by different sources can be readily located and cross-referenced.

The BPS will be an integral part of ANGAP from the beginning, but will be managed as a separate project component. USAID will award an Operational Program Grant (OPG) to an internationally-based organization with experience in managing data banks. This grantee will provide the management and technical services required to establish the BPS and to ensure the integration of BPS activities into the other functions of ANGAP. USAID should assure that any potential grantee has the expertise and experience required to implement the socio-economic data collection component of the BPS. As the range of skills necessary to implement this component may exceed that available to any one organization, potential grantees may wish to consider a corsortium arrangement.

a. Nature of the Problem

Biological conservation policy in Madagascar has been initiated on a national scale by development of the Environmental Action Plan (EAP) by the Malagasy Government, with the support of international donors and NGOs. To help implement its biodiversity component, the EAP proposes that a national biodiversity planning system be established (funded initially by NGOs and bilateral donors) to coordinate the collection, storage, analysis and application of biological, socioeconomic, and demographic information.

While many existing flora and fauna distribution records are available in museums, reports, and publications, this information has little utility for biodiversity conservation at either the local or national levels for the following reasons:

- Most existing records are not accurately geocoded and hence cannot be used to provide management information on habitat requirements or response to cultural disturbance.

- Habitat type and patterns of land use will in most cases have changed at the location of historic records since they were made.

- There are major gaps in the sampling distribution of existing records which consequently do not reflect true patterns of species distribution and biodiversity.

- The reliability of records previously collected by untrained personnel is unknown.

- A small but important percentage (5%) of specimen locality records are recorded incorrectly and cannot be used at all.

- Most previous collection has been carried out with non-standardized methodologies obviating the possibility of cross-regional analysis and comparison.

- Almost no effort has been made to document ongoing patterns of natural resource use and management strategies among neighboring human populations and the influence this may have on biodiversity.

The solution to these problems lies in the use of rapid standardized biological survey methods. When coupled with recent advances in Geographic Information System-based computer database management, rapid standardized survey methods can provide baseline biodiversity planning and management information quickly and at relatively low cost. By adding to this approach rapid standardized surveys of socioeconomic, demographic, and land use patterns, it is also possible to enhance the evaluation and prediction of threats to protected areas. Improved management strategies can be developed that conserve biodiversity while taking into account important features of the livelihood systems of adjacent human populations. The Biodiversity Planning Service (BPS) will undertake this important set of multidisciplinary resource management investigations.

b. Structure of the BPS

The BPS will be organized into four service units and an office for coordination and management. The service units include a Remote Sensing and Cartographic Unit (RSU), a Field Survey Unit (FSU), a unit for Socioeconomic Impact Monitoring (SIM), and a Biodiversity Planning Unit (BPU). The functions of each are outlined below.

1) Remote Sensing and Cartographic Unit

The functions of the Remote Sensing and Cartographic Unit will be:

- Compilation of existing maps;
- Provision of cartography and photogrammetry services;
- Acquisition of aerial photos;
- Interpretation of aerial and satellite photos;
- Processing of satellite digital images; and
- Ground truthing.

Fulfillment of these functions will require modest investments in equipment, training, and short-term technical assistance, as well as initial salary support for trained Malagasy technical personnel. Some of the more specialized technical tasks may be contracted out during the initial stages of project implementation.

2) Field Support Unit

The functions of the Field Support Unit will encompass:

- Compilation and evaluation of the utility of existing records of flora and fauna distribution, and habitat type and condition.

- Implementation of standardized procedures for recording on-going opportunistic sightings of flora and fauna by field personnel.

- Development of standardized procedures for survey and monitoring of flora, fauna, habitats, and threats to habitats.

- Implementation of a national survey of flora, fauna, habitats, and threats to habitats using rapid standardized survey methods.

- Coordination of the identification and storage of voucher specimens of flora and fauna obtained during field surveys.

- Training in flora and fauna identification and standardized survey methods.

Fulfillment of these tasks will require substantial investments in field and survey equipment, and focused investments in training and short-term technical assistance. Salary support for trained Malagasy technical personnel will also be required initially. The implementation plan indicates that the Field Survey Unit will be organized in FY 1992. This delay will allow BPS to begin operations of the other technical units before tackling the major task of establishing the FSU.

3) Socio-Economic Impact Monitoring Unit

The functions of the Socioeconomic Impact Monitoring Unit will be to provide data on local populations in proteced areas, primarily through:

- A 180-community baseline survey to document the full range of ongoing ecological interactions between protected areas and adjacent rural populations.

- Annual 60-community survey updates to track project progress, generate management information for resource management policy-makers, and to document the results and impact of mitigating rural and economic development efforts.

- Annual tracking of 120 sample households within the 60-community survey update, to analyze farmer decision-making, gender roles as related to natural resource access and management, and the causal linkages underlying resource management decision-making at the household level. This will allow a progressive refining of national resource management policies to evolve relatistic and balanced approaches to biodiversity conservation.

The FSU will also review changes in migration patterns and other variables over time, consider their impacts on park areas and project interventions and revise if necessary the monitoring program. The FSU will also interact with the Grant Management Unit in exchange of data impact and monitoring information as appropriate.

Implementation of these activities will require modest investments in equipment, training, and short-term technical assistance in the first two years of SAVEM, as well as initial salary support for trained Malagasy technical personnel. The budget provides for additional short-term technical assistance in FY 1996, at which time a summary report of progress, impact, and lessons learned will be prepared. As noted above, some of the more specialized technical tasks associated with designing and analyzing rural surveys may be devoted to a subgrantee or consortium partner.

4) Biodiversity Planning Unit

The function of the Biodiversity Planning Unit will be, in general, to support the three substantive technical units in accomplishing these objectives:

- Evaluation of the effectiveness of existing protected areas management schemes;

- Assessment of individual species status;

- Design and location of new protected areas;
- Facilitate preparation of improved, experience-based management plans;
- Provide an information database for biodiversity research;
- Integration of socioeconomic, demographic, and land use information into the biodiversity database; and
- Monitor trends in vegetation change and other processes affecting biodiversity.

To fulfill these functions, SAVEM will support the installation of a biodiversity database management system, a cartographic information digitizing system, and a socioeconomic database management system. A Geographic Information System (GIS) will integrate these components into a single computer-based analytic tool to support biodiversity planning and management of Protected Areas. Trained Malagasy personnel will undertake much of this work (with initial salary support), although short-term technical assistance and training will be required to establish these computer-based data management tools.

5) Biodiversity Planning Service Front Office

In addition to these four technical units, ANGAP's Biodiversity Planning Service will have a front office (BPSFO) consisting of a Malagasy Director and support staff with appropriate equipment and supplies. Two years of long-term technical assistance are considered appropriate for a biodiversity database management advisor to assist the Director in establishing this complex set of technical activities. The detailed project budget tables (Annex X) provide more detail on the support to be provided to the ANGAP BPS.

d. EOP Output

The collection and analysis of biological and socio-economic data provided by the BPS will help develop the capacity of ANGAP to monitor the impact of project interventions on the effective management for conservation of protected areas. By the end of the project, ANGAP will be able to assemble, systematically organize, and disseminate information on biodiversity conservation for evaluation and application. The biophysical data collected will include socio-economic, cultural, institional, and political variables which can be used to identify conservation interventions while simultaneously promoting economic development.

3. Grant Management Unit

a. Guiding Scenario

This component of SAVEM will test the hypothesis that local populations will alter their behavior from destruction to conservation of their environment if they see a relationship between their economic and social well-being to the conserved area, and if they are empowered to make the right kinds of decisions. To do this, SAVEM will provide $12 million for two types of grants. $10 million will be used to award up to six large Protected Area Development Grants (PADG's) to local and/or international NGO's, while $2 million will be devoted to approximately 100 small Conservation Action Grants (CAG's) to local NGO's, governmental units, and individuals for more limited, locally-initiated interventions in peripheral zones adjacent to any of Madagascar's 50 protected areas.

PADG grant recipients will develop and implement plans for the joint, interactive management of development and conservation efforts in six selected protected areas, and in the communities surrounding those areas (which often are referred to as "peripheral zones"). These plans will include not only measures to protect endangered species and virgin forest, but also more effective local community involvement in resource management. Field activities financed by these grants thus will link two major domains of action traditionally carried on separately: one cluster of activities conventionally associated with forest protection and another conventionally associated with economic development. The direction of each PADG will emerge in response to the demands of its particular region. SAVEM will thus treat each protected area as a somewhat autonomous operational unit. The smaller, more numerous CAG's will complement the work of the PADG's.

b. The Umbrella Grant

1) The Concept of the "Umbrella Grant"

Using a mechanism that has been successful elsewhere, SAVEM will implement both types of grants described above through an arrangement frequently referred to as an "umbrella grant". Under this arrangement, USAID will award a $16.49 million Cooperative Agreement to a U.S. Private Voluntary Organization (PVO) or other eligible entity. (N.B. During the early implementation period, USAID, in conjunction with the Regional Legal Advisor and Regional Contracting Officer, will also consider the option of using a direct A.I.D. contract and including for-profit U.S. entities as potential grant managers.) The major obligation of this umbrella grantee, which will be known as the Grant Management Unit (GMU), will be to make subsequent subgrants to other organizations to carry out the actual field operations of the project in direct contact with local beneficiary groups. USAID will select the GMU through limited competitive procurement among eligible U.S. PVO's. (See Section III.A "Procurement of Technical Assistance", for details of the

selection process.) The GMU will then solicit proposals for PADG's and CAG's.

2) Start-up Activities

The GMU will receive a Letter of Credit to cover operational expenses and to make subgrants to the implementing NGO's. To maintain a flexible evolutionary stance toward project management, the GMU will have three expatriate staff. The first will be a Chief of Party, who will arrive in April 1991 and serve for the entire five-year LOP. The second will be a Financial Administrator, who will also arrive in April 1991 and will serve for the first three years of project implementation. The third will be a Conservation Action Grant specialist who will arrive at the same time and serve for three years. The GMU office, housed in Antananarivo, will also have, at start-up, two four-wheel drive vehicles, a chauffeur, and other secretarial and ancillary staff.

3) Encouragement of International and National NGO's

Because there is a serious shortage of qualified personnel to work in conservation, one of the objectives of the GMU will be to encourage additional international and national NGO's to expand their activities in integrated conservation and development in Madagascar. The GMU will meet this objective through two promotional initiatives. One will be aimed at U.S. PVO's active in development, environment or wildlife management in other countries, to encourage them to become involved in Madagascar. The other will be directed at national NGOs or indigenious groups, to increase their interest and capacity to work in protected areas. Actions to implement these initiatives will be incorporated into the first year's work plan.

Also, prior to the award of any grants, the GMU will announce to the NGO community its presence, its purpose and its intended granting activities. The different types of grants available, provisional ceiling amounts and criteria for selection also should be made known.

c. Selection of Protected Areas for Assistance

USAID anticipates that SAVEM will begin to work in three "new" protected area in FY 1992. In this context, the phrase "new" means protected areas in which donor-funded interactive conservation and development efforts are not yet underway. The GMU, in collaboration with ANGAP and with USAID approval, will assess the potential sites according to the following basic criteria which may be refined during implementation.

- Are there potential long-term economic benefits for the population in the peripheral zones and outlying areas?

- Has the area been defined as high priority by the GDRM?

- Is there at least one experienced potential grantee capable of and interested in supervising interactive conservation and

development work in the area? USAID expects that in most cases, these potential grantees will be consortia of international NGO's, with one partner having extensive expertise in conservation and the other extensive expertise
in rural development. USAID does not, however, wish to discount the possibility that a Malagasy institution capable of managing a protected area may emerge.

- Has there been a local precedent, or at least an expression of interest by surrounding villages in collaborating with projects?

- Are there local institutions in the area which could implement SAVEM-funded activities?

- Is the site accessible?

- Are there serious social problems in the area (e.g. cattle banditry, serious inter-village conflict) that would make the project unworkable for extrinsic reasons?

d. Preliminary Site Reconnaissance

Once USAID and ANGAP have approved the sites proposed by the GMU, it will be the responsibility of the GMU to develop the information base needed to evaluate proposals from potential recipients of PADG's. This will be done by fielding a multidisciplinary technical team to visit the chosen protected areas and the surrounding peripheral zones. During these visits, the team should become familiar with local economic and social organization and learn about development activities in that area. The purpose of this visit will not be to design specific projects, but rather to ascertain what are the most likely types of development activities in peripheral villages, and who are the most likely collaborators. USAID envisions that the most likely activities will be in areas such as improved irrigation, upgraded road access, and agroforestry.

This short-term reconnaissance team should include the following technical expertise:

- environmental impact assessment
- small scale irrigation systems
- secondary road upgrading, reparation, and maintenance
- reforestation and agroforestry
- rapid rural social assessment

These specialists will survey the periphery of each selected PA and prepare for the Grant Manager a menu of possible interventions in that region. This preliminary technical analysis should specify the financial, technical, and timeframe requirements of each type of project and the requirements for the subsequent maintenance by the local communities of these interventions. Simultaneously, a social scientist/rapid rural assessment specialist will conduct a rapid village-by-village survey to elicit local perceived priorities.

The work of this reconnaissance will serve as a prelude to the GMU's entry into direct negotiations with individual NGO's and villages on the award of grants. This reconnaissance should equip the GMU with sufficient knowledge about local conditions to assess the feasibility of project action in the area and to evaluate subsequent proposals to carry out Protected Area Development Grants in the chosen regions.

e. Protected Area Development Grants (PADG's)

Upon completion of the above reconnaissance, the GMU will invite local and international NGO's to submit proposals to design and carry out interactive conservation and development efforts in the chosen areas. As Annex VI.A., "Technical Analyses," documents, there are many potential grantees interested in and capable of carrying out the types of activities SAVEM envisages. One of the major criteria for evaluating proposals will be the presence of a clear statement by the potential grantees as to how they propose to ensure a linkage between the enhanced economic activities made possible by the developmental component and the enhanced protection/management activities required by the conservation component.

PADG's will be made in two stages: the start-up phase (Phase I) and the operational phase (Phase II).

1) Phase I Grants

a) Description

Phase I grants will be made by the GMU (with the concurrence of ANGAP and USAID) for a period of up to one year on the basis of a start-up proposal. The money from this Phase I grant, which is not expected to total more than $100,000, will be used by the grantee to identify and design specific activities in the selected protected area and the surrounding communities, and to develop a detailed and precisely budgeted action plan for the remainder of the life of project. Within six months of receiving the startup grant, the grantee will be required to submit its operational proposal.

The startup grants will contain resources for the recipient NGO's to design and budget specific types of protected area infrastructure and management activities and various types of economic activities in specific villages. As opposed to the more general reconnaissance made earlier by the GMU, the NGO soliciting an operational grant would have to give evidence of its ability to identify, design, and schedule specific types of conservation and development activities to be carried out in a given time frame in accordance with an approved budget.

b) Criteria for Awarding Phase I Grants

In collaboration with USAID and ANGAP and with final approval of criteria by USAID, the GMU will develop a list of criteria for making these awards. These criteria should include variables such

as the following.

i) Institutional Variables

- Institutional history. It will be better, especially in the beginning, to work with NGO's that have been in existence and functioning for some time.

- Domain-specific track record. A history of working either in rural development or in protected area management (or preferably both) will be a positive factor in favor of an applicant.

- Administrative capacity. An NGO with a history of adequate fund administration will be in an advantageous position.

- Local roots. The presence of ongoing ties between an NGO and the local population will be a positive factor, particularly if the NGO has a history of development activities in the area.

ii) Proposal Content Variables

- Relating conservation and development. Though the startup proposal need not propose specific implementation activities, it should offer a clear and convincing statement of how development and conservation can be dynamically related.

- Awareness of the importance of economic motivations. A successful proposal will clearly indicate awareness of the economic nature of the forest destruction dilemma. People destroy the forest for economic reasons; attempts to change this behavior have to open up other economic alternatives.

- Linking costs and benefits of the protected area. Proposals should address the problem of ensuring that those who suffer from the constraints imposed by the designation of an area as "protected" are included among those who benefit from the interactive conservation and development activities of the PADG.

2) Phase II (Operational) Protected Area Development Grants

a) Description

Upon completion of the design efforts funded by Phase I grants, USAID, ANGAP, and the GNU will then consider the grantees' proposal for long term, operational PADG's. As described in more detail in Annex 6.A.1, these Phase II grants will be for the implementation and management of interactive conservation and development efforts in the selected protected areas and the surrounding communities. Each operational grant will run for a period of at least three years at a total cost of between $300,000 and $500,000 per year.

b) Criteria for Awarding Phase II Grants

Proposals for long term PADG's will specify precisely which tasks will be accomplished within the target area, anticipated time frames, and required financial and human resources. As with the Phase I grants, the GMU will collaborate with USAID and ANGAP to develop a list of criteria for making these awards. These criteria will be similar to the following:

i) Budgetary Criteria for All Grants

The GMU will require budgets that reflect the objective financial requirements of economic development. This means at least two things:

- Budgets in which a substantial portion of the total is allocated for material and capital inputs into protected areas and communities, while only the necessary minimum is allocated to delivery costs.

- Budgets in which there is a proper balance between activities inside the protected areas and activities in the villages. Experience suggests that the costs of managing a protected area internally are substantially lower than the costs of economic development in the villages of the periphery.

ii) Technical Criteria for Activities within Protected Areas

The proposals must show solid technical grasp of the steps needed to carry out management and economic activities within the protected area and alternative economic development activities in the adjacent human communities. Evidence of such a grasp might include:

- Identification of sustainable forest uses. All proposals should demonstrate that the applicant has gathered basic information on the local flora and fauna, and on the entire gamut of current resource use patterns by locals (or outsiders). Proposals should state which, if any, traditional economic activities can safely continue inside the protected area itself, and should identify the basis for this judgment. Serious consideration should be given to the establishment of "core areas" in which no resource use would be permitted, and of "buffer zones" in which limited, sustainable resource use would be allowed to continue.

- Infrastructural installation. Successful proposals must provide for at least the minimal infrastructural elements of boundary delimitation, trail construction and upkeep, and lodgings for protected area personnel. Where a road is present, its maintenance must be included. Accommodations and lookout sites may also be required.

- Ranger selection, training, and supervision. Proposals should include plans for monitoring of the protected area. The key element in this system will be a corps of locally chosen civilian "rangers" who will not have police power,

but who will be charged with monitoring and reporting violations of PA's boundaries. Grant proposals should discuss selection criteria and procedures for the rangers, as well as their job descriptions, training needs, salary levels, working schedules, and supervisory mechanisms. It is anticipated that there can be up to twenty full time ranger slots in each protected area, and that each of these slots could be filled on a part-time basis by more than one individual. (See Annex VI.A.1 for a fuller discussion of this time-sharing concept.)

- Protected Area Manager. Each proposal should provide for a Protected Area Manager to whom the rangers will report. This PA Manager would be responsible for the delineation of job responsibilities and the establishment of regular workplans.

- Responding to violations. Proposals should show enough familiarity with the local situation to address the following questions:

  - What violations are most likely to occur? Slash and burn agriculture ("tavy"), logging, inappropriate cattle grazing, etc.?

  - Who is most likely to be behind these violations: local inhabitants or people from outside the area? (Much ecologically inappropriate lumber extraction is done by itinerant sawyers in the employ of local townspeople.)

  - What measures will be taken when violations are detected?

  - What provisions will be made for dealing with the conflict-of-interest situation generated by the hiring of local rangers who may be forced to report violations by their own kin?

iii) **Technical Criteria for Economic Development Activities**

USAID anticipates that the major types of economic interventions to be funded in the communities adjacent to the protected areas will fall into several categories: repair and upgrading of small scale irrigation systems, repair and upgrading of secondary roads, reforestation and agroforestry, market- oriented vegetable gardening, and fertilizer supply. With respect to these activities, successful grant proposals will have to meet the following criteria:

- Environmental soundness. The proposal has to be in a region where a development reconnaissance team has determined that that general type of activity proposed is environmentally sound. Prior to award of the grant, the USAID Environmental Officer must concur in this determination, and further certify that the requirements of A.I.D. Regulation 16 have been met.

- Technical soundness. The proposal must document that the proposed activities are technically feasible. As part of this determination of technical soundness, the proposal should have a step-by-step description of the tasks, materials, and labor required to complete planned activities. To illustrate: a proposal for irrigation projects should be made after an engineer has certified that the volume of water is sufficient, that the topography permits the construction of the required canals, and that the task can be done within project budgetary guidelines. Reforestation and agroforestry proposals should specify the species to be planted, seed sources, nursery systems, projected planting distances, etc.

- Economic soundness. The proposal must give evidence that the investment required by the activity will result in higher levels of output that justify the investment. In the case of irrigation for subsistence rice growing, for example, the output should be monetized for analytic purposes. In the case of proposals that would support production for a market -- e.g. vegetable gardening -- the proposal must demonstrate awareness of the location and demand of the market, and give evidence that returns to producers will outweigh costs by a reasonable margin.

iv) Social Soundness Criteria

- Community involvement in decisions. Grantees must demonstrate that the communities on the periphery of the protected area have been contacted. Information should be provided on the number of contacts, the content of the interactions, and the general response of the community to the NGO and to the protected area.

  SAVEM will give preference to those proposals that include measures to endow the surrounding population with enhanced quasi-proprietary access to the protected area. Conventional policy often eliminates the traditional proprietary rights which surrounding populations claim. In contrast, SAVEM will look favorably on proposals that recognize the special relationship between the protected area and the inhabitants of surrounding villages. Final authority in carrying out these measures will continue to reside with the GDRM.

- Local decision making on specific subprojects. Proposals must document that the participating community has declared its interest in this project, that a reasonably large percentage of the community will benefit from it, and that no unintended intracommunity or intercommunity conflict is likely to occur as a result of the project. In the case of irrigation proposals, evidence must be presented that a reasonable percentage of the community will have access to irrigated land after the project, and that there is no reason for predicting post- project land conflicts, land concentration, or other socially problematic dynamics as a

result of irrigation.

- Community based project selection and design. Villager involvement will be crucial to the success of the planned activities. Therefore, proposals must demonstrate that villagers have been involved in the identification and design of proposed activities.

- Anticipation of unintended consequences. Successful proposals will discuss possible negative impacts that might result from grant activities. For example, raising local prosperity could attract more immigrants to the region, thus exerting more pressure on the protected area. Similarly, improved roads, besides easing market access for farmers, also eases access for those who would convert the forest into charcoal and lumber, while irrigation projects can be directed toward the land of a local wealthy elite, or trigger land concentration processes. Successful proposals provide recommendations for dealing with these problems.

- Use of local extension agents ("animateurs"). Following procedures that have played a critical role in project success elsewhere, SAVEM will make funds available for implementing NGO's to select one or more members of each community to be "animateurs." Proposals should envision some type of extension agent in every project village. Annex VI.A.1 sets forth USAID's recommendations on the role of these agents in more detail.

- Participation by women. Each potential grantee must specify the impact that the activities it proposes will have on women in the project area, and must detail how women have been or will be involved in the design and implementation of the proposed activities. For example, women should be considered for area management or ranger positions. If this proves inappropriate for cultural reasons, all grantees will be required to explain those reasons.

v) Sustainability Criteria

USAID will expect both the GMU and the PADG recipients to understand that their ultimate obligation is to to work themselves out of a job. This means that a proposal by an international NGO to carry out both conservation and development activities by itself will be less attractive than one formulated in a manner that involves local NGO's. The latter will have a permanent presence; the former presumably will not. Further, the ideal proposal will need little follow-up by the intervening NGO, and should be easily replicable by villagers themselves. (See Annex VI.A.1 for a further discussion of issues related to the problem of sustainability.)

f. Conservation Action Grants (CAG's)

1) Description

Throughout the life of SAVEM, the GMU will also award and oversee a series of small Conservation Action Grants (CAG's). These grants, which are not expected to exceed $25,000, will be for locally-initiated conservation and development-related actions in any part of Madagascar within or in proximity to one of the 50 areas that have been identified as ecologically vulnerable and worthy of protection. Whereas the focus of the PADG is on park management including peripheral zones activity, the Conservation Action Grant will support activities by indigenous groups or individuals that demonstrate a concern for conservation and will be used to encourage this interest. Thus educational and social activities as well as conservation and economic development activities could be financed through these grants.

2) Criteria for Award

Award of these CAG's will be made by the GMU upon the concurrence of USAID and ANGAP. As with the PADG's, the GMU will collaborate with USAID and ANGAP in developing specific criteria for these awards and submit these criteria for approval by USAID and ANGAP. To assist the GMU in preparing this list, Annex XI to this Project Paper provides suggests examples of such criteria.

g. Ongoing Responsibilities of the Grant Manager.

By the end of Fiscal Year 1992, all large PADG's for "new" areas will have been awarded. The GMU's principal role will then change. Rather than devoting the majority its efforts to assessing proposed new activities, the GMU will instead carry out the following ongoing functions, all of which will continue through the PACD.

1) Monitoring Ongoing PADG's and CAG's

Just as the subgrantees will report on a quarterly basis to the GMU, the GMU will in turn be required to submit quarterly activity and financial reports to USAID and ANGAP. USAID will expect the GMU to monitor, assess, and report critically on the activities of grantees. The SAVEM budget presented in Annex X includes funds for short-term technical assistance under the umbrella grant for this function.

2) Assessing Proposed Phase II Grants in "Old" Areas

USAID is presently funding conservation and development activities in five protected areas. The mission expects to support follow-on, or "Phase II", grants in at least three of these areas. When current grants begin to expire, SAVEM will assume responsibility for financing, if preliminary results warrant, Phase II efforts.

The GMU will critically review proposals for Phase II activities by these grantees. Based upon this review, the GMU will award the

grants subject to USAID and ANGAP approval. Although no preliminary reconnaissance efforts such as those that the GMU will undertake for "new" areas will be required, the GMU will nonetheless be expected to review these proposals and to apply to them the same stringent criteria used for assessing activities in "new" areas.

3) Training

As detailed in Section I.C.4 below, the GMU will be involved in carrying out several types of training activities throughout the life of SAVEM. These will include workshops for local NGO's on project planning and management, in-country technical training and training of trainers courses, and research grants to students from the Ecole Superieure des Sciences Agronomiques. To help implement these various training activities, the GMU's staff will include a full-time, local-hire Training Coordinator.

4) Transfer of Functions to ANGAP

USAID expects that ANGAP will eventually assume the responsibilities of the GMU. Accordingly, one of the GMU's principal objectives throughout the project will be to transfer to ANGAP the analytical skills and technical expertise needed to carry out these responsibilities. ANGAP's capacity to assume the GMU's role will be assessed during a joint A.I.D./GDRM mid-term evaluation in FY 1993.

4. Training.

a. Introduction/Summary.

Training should not be considered a discrete component of the SAVEM Project, since extension, staff training and conservation education programs will be an integral part of all Protected Area Development Grants. These, plus a multitude of training activities related to ANGAP and its Biodiversity Planning Service, will contribute a considerable emphasis on human resources development to the project. This section of the Project Paper identifies actions to meet needs for skills transfer and information exchange that will promote institutional development of ANGAP and NGO's working in protected areas: U.S., third-country and in-country training through short-term programs, workshops and technical assistance in curriculum/materials development. About 530 participants will benefit from these interventions, including nearly 55 participants in study tours and courses outside the country, and 475 through classes, workshops and research grants provided in Madagascar.

b. Project Training Strategy.

The training activities described in this section focus on selected project components, rather than on diffused attempts to meet the wide range of needs identified through donor-funded human resources assessments, reviews in the course of project design and the EP I Education-Training component. The SAVEM strategy emphasizes filling gaps in hard skills or general approaches for existing protected-areas management and NGO staff, rather than expanding an employment pool for which there is no guaranteed salary support. Programs have been kept short--under three months--to avoid prolonged absence from jobs during critical start-up activities. Although it may be more costly to send a large number of people out of the country for brief periods, value is recovered in increased time for on-the-job application of training, and wider diffusion of acquired knowledge. Third-country study tours are favored over U.S. trips, to allow observation of activities in conditions similar to Madagascar. For short-term training, however, U.S. seminars and programs will be used to introduce innovative integrated natural resources management approaches. Development of in-country programs, concentrating on basic skills, will rely primarily on the expatriate and Malagasy expertise mobilized by the project, supplemented by specialized short-term assistance as needed. Wherever possible, SAVEM will pursue opportunities created through other A.I.D.-funded natural resources management projects.

c. Training Activities

The SAVEM Project will not have a separate training unit, advisor or budget. Instead, responsibility for program planning and delivery will reside with the concerned Contractor or Grantee for each of the components described in the following sections. Coherence of activities within an overall project training strategy can be effected through critical-point review meetings. Consistency of training in meeting overall project objectives will be monitored by

the long-term Project Coordinator, in collaboration with ANGAP and the GMU.

1) ANGAP

ANGAP exists primarily on paper. Definition of its training mandate will depend on final negotiation of its structure and functions. Staff training needs will be determined once positions are defined and filled. Consequently, the first planning exercises undertaken by technical assistance personnel and the ANGAP director will have to include a staff training needs assessment and development of an organizational training strategy and plan, to further define the activities described in the following sections.

a) Staff Training

The technical assistance contractor should make an assessment of competence- based training needs for ANGAP within the first three months of arrival. Based on the organization's objectives, job descriptions and qualifications reviews for staffed positions, the Chief of Party and ANGAP Director should prepare a staff development plan that targets types, location and timing of training over the life of project. While most training will be on-the-job through work with long- and short-term advisors, key staff may need further exposure to innovative management and programming techniques that will enable ANGAP to fulfill its mandate. On the basis of the organization defined in this Project Paper, selected and illustrative training needs are described in the following sections. These will be verified and amended during the assessment exercise.

i) Short-term U.S. and Third-Country Training

SAVEM will not fund long-term degree programs for ANGAP staff. Given the educational criteria for staff recruitment, the heavy infusion of on-site technical assistance, and the need for staff involvement during start-up, mid- career training programs of less than three months should be sufficient for senior managers and technical specialists. Therefore, 18-person-months have been allotted for U.S. and third-country programs, assuming two-month programs for four senior staff positions and 10 one-month programs for junior staff and technicians as needed. Decisions on external or in-country training will depend on identification of local institutions that may be able to meet training needs. The following examples illustrate the types and sources of external training that <u>might</u> be targeted for selected positions:

- ANGAP Director: strategic planning and social research (University of Maryland, New School of Social Research, Atlanta Management Institute Francophone program); U.S. or African study tour of national parks and conservation agencies (recommended FY 1992).

- Senior Ecologist: socio-ecological survey techniques, wildlands management, integrated conservation-development (University of Michigan, Dehra Dhun [Indonesia]; recommended FY 1991 or 1992).
- Public Education Specialist: exhibit design, outreach program development, audio-visual materials development to promote conservation awareness (Maryland Institute of Art, Philadelphia Museum, Smithsonian Institution; FY 1992 or 1993).

If such external training needs are verified, they should be timed to avoid pressure on staff resources during start-up and evaluation.

ii) In-Country Short-Term Training

SAVEM will support in-country training through tuition payments to local institutions, or through development of special courses for ANGAP staff. This assistance will enable design/instruction time and materials for two special courses, and payment for 40 course placements (10-week terms) per year.

In-country training will cover a wide range of subjects. Based on the Grantee's assessment, these might include: secretarial courses, GIS seminars sponsored through other projects and a study placement in a special-purpose documentation center for the archivist/librarian. English-language training (ELT) will be included, since requirements for U.S. study and the volume of documentation generated from Anglophone countries indicate a need for basic proficiency. Although the level of most candidates would enable participation in existing programs, SAVEM will consider the possibility of contracting with USIS to provide an instructor to design and deliver a special course. Special courses for ANGAP might be opened to the staff of DEF, ANAE and other collaborating agencies.

iii) Biodiversity Planning Service

All training related to the establishment of the BPS is internal to that project component, which is described in Section I.C.2. During the first months in-country, the Grantee's personnel should assess training needs and prepare a staff development plan, as described for ANGAP. One activity is already well- defined: in-country training of 60 local socioeconomic experts with field experience in Madagascar-specific methods of data collection, for the Socio-Economic Impact Monitoring Unit (SIM). A one-month course, combining classroom and field training, will enable them to contribute effectively to the information base needed for project planning, monitoring and evaluation.

In FY 1991 and 1992, training will be done by an expatriate senior social scientist working with two Malagasy social scientists (one from the target area, or with research experience there). An expatriate graduate student will attend the training sessions and spend two months in the field with the trainees. The Malagasy social scientists will assume responsibility for the training

beginning in FY 1993. Twenty local socioeconomic experts (SIM enumerators) will be trained per year in FY's 1991-1993, ten for each protected area. Five repeaters will be invited to the second- and third-year training sessions as facilitators, to share their experience with new trainees. A manual on data collection techniques will be developed on the basis of field-testing during the first training cycle, which will provide a valuable resource to researchers in Madagascar, as well as to SAVEM.

b) Training Coordination

ANGAP's training mandate is ambiguous, but seems limited to coordination as opposed to training design, management or delivery. According to the World Bank Staff Appraisal Report, the organization is to include a "training and communication" section, but its role is not defined beyond "coordinating staff training" (5.09.iv). Until this mandate is better-defined, ANGAP will not be providing training directly. Consequently, no support for course-delivery activities has been programmed through SAVEM. One of the first tasks of the ANGAP technical assistance team will be to work with the Director to define ANGAP's role in organizing or sponsoring workshops and seminars. An active role may argue for shifting responsibility and resources for management of project training activities to ANGAP over time. A more passive role might suggest activities such as developing a directory of training institutions and resources in fields related to conservation and development.

c) Study Tours

According to its statutes, ANGAP is to coordinate training programs other than those executed by implementing agencies. To foster this role, one SAVEM training activity will be housed within ANGAP: organization of third-country study tours that will include ANGAP personnel, representatives from DEF (central, regional), ANAE, ONE and other related agencies. These also will include University professors involved in developing integrated natural resources management programs, and private-sector tour operators. ANGAP will have responsibility for 20 short-term (4-6-week) study tour placements over the life of project. These tours will include visits to parks and protected areas in Africa--many supported through A.I.D. projects--to enable observation of operational approaches to interactive park management under conditions similar to Madagascar. Tours might include one or more of the following:

- the Development through Conservation, Impenetrable Forest Conservation and the Rwenzori Mountain Services projects in Uganda;

- game and wildlife management areas covered by the the SARP Regional Natural Resources Management Project in Zimbabwe, Zambia and Botswana;

- the IUCN-sponsored Serengeti Project in Tanzania;

- selected sites in Rwanda, Burundi and Kenya.

The Project Coordinator and contractor TA personnel will assist ANGAP staff in selecting sites, recruiting participants and organizing delegations or individual study tours.

d) ANGAP Training Outputs

- Up to fourteen senior staff or specialists trained in short U.S. or third-country programs that provide exposure to new management and technical skills.
- Approximately 50 members of ANGAP staff and related agencies trained in-country through local institutions and special courses.
- 60 local socio-economic experts trained in Madagascar-specific methods of data collection, and a manual on data-collection techniques produced.
- Up to 20 members of ANGAP, DEF, ANAE, ONE and related agencies exposed to natural resources management programs through Africa study tours.

2) Protected Area Development Grants

This section addresses training for both NGO and public-sector personnel involved in management and development of protected areas and the adjacent peripheral zones, as well as strengthening of local NGO's to be funded under the umbrella grant. It does not cover training activities that will be carried out under individual PADGs (these will be included in the training plan of each grant proposal). The programs will be managed by the GMU, with the assistance of a Malagasy Training Coordinator whose primary responsibility will be design, delivery and management of training for local NGO's.

At the community level, success in linking conservation and development activities will depend on the ability of local NGO's to plan and manage sub- project grants awarded under the umbrella. Reflecting identified needs in management, extension and environmentally-related technical skills, project training activities will focus on selected efforts to strengthen sub-project activities. These will include project planning/design and project management workshops. Agroforestry and other technical skills will be provided through workshops with a training-of-trainers (TOT) component.

The target groups and programs described in the following sections will be verified through an initial needs assessment undertaken by the GMU's personnel, as the basis for developing a protected-areas training plan. This plan can be expected to change over the life of SAVEM, as the GMU and the grantees themselves define new needs, and sub-project implementation reveals performance gaps that can be filled through training.

a) Third-Country and U.S. Training

Problems faced by senior and mid-level managers in the protected areas (planning, personnel, etc.) would be addressed more effectively through direct observation of interactive park management programs than through theoretical MSc. training. Consequently, SAVEM will provide short-term (4-6-week) study tours in Africa, as described for ANGAP, to sites where the successes and failures of community-based conservation-development activities provide living case studies and on-the-job training opportunities.

A total of 10 placements will be available through the GM for protected area managers in FY's 1992- 1994. In addition, participation in U.S. or third-country seminars is budgeted for 10 participants over the LOP. These might include events such as the annual USDA/University of Michigan Seminar on Forest Administration and Management, which addresses issues including biodiversity conservation, public and private institutional cooperation, extension and technology transfer. Other institutions suggested for training in natural resources management during project design include Louisiana and Michigan State Universities, and the Universities of Wisconsin, Montana, Maryland and Florida.

No long-term third-country training for mid-level park managers is planned. Conservationists working in Madagascar have raised questions about the appropriateness of programs in Cameroun (Garua) and Tanzania, and have suggested that similarities in emphasis and environment may argue more strongly for training in Asia (eg: Dehra Dhun in Indonesia). The issue of longer-term training needs and appropriate institutions should be reviewed by the GMU and international NGO advisors as part of the initial training needs survey (eg: during preliminary site reconnaissance). Grant applicants might be asked to include in their proposals identification of staff training needs that will not be met through project activities, to enable the GMU to develop its training plan.

b) **In-Country Training**

i) **Project Planning and Management**

Needs for project planning and financial management skills have been identified through preliminary program activities undertaken by COMODE, a national consortium of development and conservation NGO's recently created with support from the A.I.D. NRMS Project. These needs suggest that donors providing funds to local NGO's have a responsibility to help grantees develop the capacity to plan and manage funded activities. At present, no in-country training in these areas is being provided to NGO's. To help fill this gap, SAVEM resources will be invested in training for sound project design and implementation, a logical priority given the project's commitment to the success of community-based economic development and conservation activities.

Three sets of events will be developed by the GMU to reach local NGO's and enable them to design and manage sub-projects:

- A series of one-day, on-site informational meetings or orientations in each region during the outreach phase. The objectives of the meetings are to recruit participation of local NGO's, explain project selection criteria and discuss preliminary project ideas (four times over FY 1991-93).
- A week-long project planning/design workshop. Provisionally conceived as a centralized course, it will bring together officers and planners of NGO's from around the country, and will cover elements of economic, social, technical and environmental feasibility. Training will focus on practical exercises that require participants to review initial project ideas in terms of financial, manpower and other needs. At the end of the workshop, participants will be able to work with other members of their organizations to develop a simple plan that meets general criteria for project soundness, as well as project-specific requirements (six times during FY's 1992-1994).

- A shorter project management workshop that will cover accounting, record-keeping, monitoring and evaluation. A basic training package of short presentations and review exercises will be developed for on-site delivery to individual NGO's or groups during TA visits by the training coordinator (FY's 1992-1995; once/year/region).

Although planning and management training will be tailored to SAVEM's criteria, the basic principles and approaches will be relevant to the wider NGO community. To enable continuation of workshops past the PACD, SAVEM will gradually shift responsibility for training management and delivery from the GMU to a Malagasy institution over the LOP (see "Sustainability of NGO Training").

ii. Technical Training and Training of Trainers (TOT)

The GMU will organize 12 two-week workshops over FY's 1992-1996, for mid-level protected area managers, extension agents and NGO staff. Funds could support a lead NGO that would organize training in subjects and themes common to all protected areas, or development of project-driven events by short-term experts. These may include applied technologies (eg: hydrology), or extension and community development techniques, but all technical workshops should integrate adult education and communications skills in a training-of- trainers (TOT) component that ensures on-the-job skills transfer to lower-level staff (thereby increasing the impact of the initial training investment). Subject areas for NGO technical training will depend to a large extent on the types of activities

proposed for Protected Area Development Grants, but may be expected to include:

- agroforestry
- terracing and bunding
- vegetable gardening
- soil conservation
- natural forest management

Wherever possible, these workshops will build upon existing projects that transfer training and extension skills in the context of technical subjects, such as the NRMS Agroforestry and Natural Resources Education and Training (ANRET) program. Also, active efforts will be made to encourage the participation of women in all of these workshops.

iii) Research Grants to ESSA Students

In order to help integrate research and program implementation, the GMU will award five grants per year to students from the Ecole Superieure des Sciences Agronomiques (ESSA) from FY 1993 through FY 1995. These grants will support research in protected areas or peripheral zones that will contribute to development of interactive management plans with rural communities. They are distinct from "piggyback" grants to researchers collecting project-specific information in the course of their own work. The grants should support fieldwork at the D.E.A. level and above, encouraging research in integrated natural resources management. The GMU will establish the grant program in consultation with ESSA faculty and protected area managers, including setting criteria for grant awards and developing procedures for linking ESSA students with U.S. graduate students and research programs.

c. Sustainability of NGO Training

Technical assistance for design of planning, management and technical training for NGO's is expected to be provided primarily through the GMU's long- and short-term staff resources. The volume of design and delivery activity during project start-up requires a considerable level of effort. Therefore, a Malagasy Training Coordinator will be employed for the LOP, to take responsibility for planning, management and technical/TOT training.

Given its mandate to provide institutional support through training and management assistance to member NGO's involved in development and conservation, COMODE may emerge as a promising partner if given time to develop service-delivery capacity. COMODE will take at least a year to become fully operational. With continued support from the NRMS Project, COMODE plans to survey members' needs and attempt to design training responses in the areas identified. If the COMODE program is sufficiently developed by the time the GMU is in place, a contract for training design, delivery and/or management might be considered. It is more likely, however, that COMODE's own institutional development will require a gradual shift of responsibility over the life of the project.

It is also possible that ANGAP or a local training institute may receive a mandate to house NGO training activities. The GMU's initial training survey should include an assessment of local training institutions and support agencies, to enable preliminary identification of potential partner agencies. Development and implementation of project training events in collaboration with local institutions will help assess their potential for taking full responsibility for coordination, design, delivery and/or management of programs.

d) Summary of Protected Areas Training Outputs

- 10 protected area managers exposed to alternative, interactive management practices through third-country study tours.

- 10 protected area managers having taken part in U.S. and third- country seminars and workshops on conservation and development issues.

- Up to 150 members of NGO's trained in project planning and management techniques.

- Up to 200 protected area managers, extension agents and NGO staff members trained in technical subjects related to conservation, and in training skills needed to transfer subject matter.

- 15 grants awarded for research in protected areas that will contribute to the development of interactive management plans.

3) Needs Assessment/Educational Institution Strengthening

There are a number of valid areas for training support related to biodiversity--especially support to educational institutions developing new curricula and certification tracks to improve training of natural resources management professionals. Programs targeted for donor support in the EP I education-training component include:

- Addition of an environmental-awareness module to the first-year University program.

- Development of University forestry, agriculture and science programs into comprehensive environment/natural resources management degree programs, at the D.E.A. (baccalaureate plus five years), "doctorat de troisieme cycle" (baccalaureate plus seven years) and "doctorat d'etat" (post-doctorate) levels.

- Creation of an "Institut Superieur de Technologie en Environnement" to train mid-level operations managers (baccalaureate plus two years).

Further investigation into the relative merits of different programs

and the level of effort required to create them is needed before making final decisions on USAID involvement. Also, creation of new degree programs should not be removed from the larger issue of how to structure education to effectively meet development needs and employment demands. This issue falls under the broad policy questions that will be addressed through USAID's planned FY 1991 non-project assistance (NPA) initiative. If the GDRM commits resources to hire and retain the numbers and kinds of qualified professionals called for in the Environmental Action Plan (EAP), then efforts should be made to ensure that secondary school and university training effectively prepares graduates to fill these positions.

While it is premature to commit SAVEM resources to creation of a new degree program, it is appropriate for SAVEM to support an assessment of needs for higher-level training related to project activities. This study will help inform USAID program planners of options that might be pursued through NPA to help develop the University's capacity to provide relevant training. At the same time, it will provide information for planning SAVEM training. Consequently, SAVEM will fund a three-month study in the second quarter of FY 1991, to review higher-education curricula as a basis for proposing actions under NPA to strengthen educational institutions. Options might include varying levels of investment in EP I programs in the form of:

- Addition of core courses and an expanded research component to the existing ESSA undergraduate curriculum, to create an integrated natural resources management track (low investment).

- Institutional and curriculum-development support to create ESSA- based, inter-faculty (ESSA/Sciences/ Letters) graduate degree programs (high investment).

- Curriculum development support to Institute Superieur de Technologie en Environnement (ISTE) (medium-high investment).

In addition, actions not targeted in the EAP could be explored with the GDRM. These might include decentralized integrated natural resources management programs in the regional University system, or creation of a non-degree, mid- career program in integrated park management based on existing U.S. programs and the ESSA requalification curriculum. ESSA already has begun curriculum reform, adding a 30-hour park management course to its curriculum, and a pilot forestry/ecology "doctorat de troisieme cycle" to its forestry department. Further development of interdepartmental, higher-level degree programs will require a significant infusion of resources to support faculty expansion, curriculum design, expanded research programs and perhaps new facilities.

The contractor conducting the assessment will review existing curricula and methodologies to determine the type of degree needed, subjects for curriculum development and teacher training, program development costs, and a feasible timetable for developing the program within the parameters of current ESSA resources. If a valid

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need for a degree program is determined, the contractor will recommend ways that USAID can support its creation. These might include:

- Long-term technical assistance for institutional development.

- Development of linkages with U.S. universities to allow teaching exchanges, and support for long-term visiting professorships for U.S. faculty to assist in curriculum development, train teachers, replace ESSA faculty studying in the U.S., supervise research and help coordinate studies and protected-areas planning activities.

- U.S. graduate study in park and wildlife management for ESSA faculty or graduate students who will return to teach, with emphasis on areas not covered in Madagascar (natural resources economics, ecological anthropology, interactive park planning).

- Coordination of U.S. and Malagasy research programs, through expansion of the research grant program contained in this project (eg: larger grants to joint research teams).

d. Personnel

To implement the training plan described, SAVEM budgets funds for:

- A local-hire (Malagasy) Training Coordinator in the GMU office, to take responsibility for design and delivery of NGO planning, management and technical training until the program is shifted to another agency (FY 1991-1996).

- Nine months of short-term technical assistance for specialized training design needs, including three months for the educational instutution support needs assessment (FY 1991-1995, as needed).

Proposed Scopes of Work for the Training Coordinator and certain short-term, training-related technical assistance positions are included in Annex VIII.

e. Logistical and Administrative Arrangements

Training funds for ANGAP will be handled by the ANGAP TA Contractor. ANGAP will coordinate in-country training for its staff in cooperation with the Contractor' TA personnel and long-term PSC Project Coordinator. Training for BPS staff will be the responsibility of the Grantee for the BPS component. Training related to protected areas will be the responsibility of the GMU Grantee.

All third-country and U.S. training will be coordinated by the long-term PSC Project Coordinator, or by a HRD Coordinator if one is hired, in collaboration with the Contractor's or Grantees' personnel. Tasks will include review and screening of participants,

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identification of existing programs and visit sites, pre-departure formalities and back- stopping. If possible, mid-career study programs will be funded through buy- ins to the ATLAS program; however, given the stringent requirements needed to obtain tuition scholarships under the program, full tuition costs have been budgeted for all U.S. training events.

II. COST ESTIMATE AND EXPENDITURE PROJECTIONS

A. Total Life of Project Contribution from All Sources

The total life of project cost of SAVEM from all sources known to date will be $28,428,000. The A.I.D. contribution will be $26,600,000, or 93.6 percent of that total. The GDRM will contribute the local currency equivalent of $768,000, or 2.7 percent of the total. The GDRM will make this contribution in the form of payments for certain local expenses of the National Association for the Management of Protected Areas (ANGAP) and the waiver of that organization's normal tax burden. Another donor, Norway, will contribute the equivalent of $1,060,000, or 3.7 percent of total costs, toward ANGAP's recurrent costs. This contribution, which Norway will channel through the World Bank, will begin in FY 1992 upon the GDRM's enactment of a law allocating to ANGAP revenues generated by fees from Madagascar's protected areas. (See Annex V, "Legislative Action Requirements", for a discussion of the status of the GDRM's efforts to fulfill this condition.)

The above figures are misleading, however, for the GDRM's contribution, and commitment, to the objectives of SAVEM should be measured not only by the limited budgetary support it will provide to the activities of this project. Instead, it must be remembered that SAVEM is only one part of the overall Environmental Action Plan (EAP). The World Bank estimates that total cost of the first five-year phase of EAP, from all sources, will be $85,534,000. The GDRM plans to contribute the equivalent of $17,248,000, or 20.17 percent, of this total.

Given this GDRM commitment to the overall EAP, Annex IX sets forth a justification for approval by A.I.D.'s Assistant Administrator for Africa of a waiver of the normal requirement that the host country contribute at least 25% of project costs. This justification is based both on Madagascar's status as a relatively less developed country, and on the commitment to the objectives of SAVEM that the GDRM has demonstrated by its approval of and planned participation in an overall Environmental Action Plan.

Additionally, many recipients of Protected Area Development Grants and Conservation Action Grants from SAVEM will contribute a portion of the cost of their activities from their own resources. Normally, A.I.D. requires that all grantees contribute 25% of the costs of a given activity from such resources. SAVEM will adhere to this requirement to the extent possible. It may, however, be necessary for USAID/Madagascar to waive the requirement in some cases. For example, many of the possible local recipients of CAG's lack the resources necessary to make such a contribution. Therefore, on a case-by-case basis, USAID will determine if waivers are necessary. The following discussion of project costs, and the Financial Analysis set forth in Annex VI.B, exclude such contributions, though it is understood that USAID will require some inputs from project grantees.

Table II.A.1 on the following page summarizes the anticipated contributions to SAVEM from all sources other than grantees.

TABLE II.A.1: Summary Cost Estimate by Input Category.
(U.S. $ '000 or equivalent)

Input Category:	A.I.D.:	GDRM:	NORAD:	Total:
Technical Assistance	7,769	0	0	7,769
Commodity Procurement	1,084	0	0	1,084
Training	801	0	0	801
Grants	12,000	0	0	12,000
Local Costs	2,138	768	1,060	3,966
Evaluation and Audit	460	0	0	460
Sub-Total	24,253	768	1,060	26,081
Contingency	1,219	0	0	1,219
Inflation (5%)	1,128	0	0	1,128
Total Costs:	26,600	768	1,060	28,428

(Note: Totals differ slightly due to rounding.)

Table II.A.2 makes the same comparison by project element:

TABLE II.A.2: Summary Cost Estimate by Project Element.
(U.S. $ '000 or equivalent)

Project Element:	A.I.D.:	GDRM:	NORAD:	Total:
Coordination & Start.	1,461	0	0	1,461
ANGAP Development	3,390	768	1,060	5,218
Biodiversity Pl. Ser.	2,358	0	0	2,358
Grant Manager	4,584	0	0	4,584
Protected Area Grants	10,000	0	0	10,000
Cons. Action Grants	2,000	0	0	2,000
Evaluation and Audit	460	0	0	460
Sub-Total	24,253	768	1,060	26,081
Contingency	1,219	0	0	1,219
Inflation (5%)	1,128	0	0	1,128
Total Costs:	26,600	768	1,060	28,428

(Note: Totals differ slightly due to rounding.)

Annex X, "Detailed Budget Estimates and Expenditure Projections", provides further information on planned expenditures. N.B. The reader should view this budget as illustrative rather than final as final costs may vary according to the costs borne by grantees. Annex VI.B, "Financial Analysis," discusses the manner in which these budget projections were made and the assumptions that underlie them.

B. Expenditure Projections

Table II.A.3 on the following page provides annual expenditure projections for the A.I.D. contribution to SAVEM by project element.

TABLE II.A.3: Expenditure Projections by Fiscal Year.

(U.S. $ '000 or equivalent)

Project Element:	1991:	1992:	1993:	1994:	1995:	1996:	Total:
Coordination & Start.	483	229	214	214	214	107	1,461
ANGAP Development	933	925	772	534	183	43	3,390
Biodiversity Pl. Ser.	320	744	427	330	244	295	2,358
Grant Manager	638	1,136	1,156	878	547	229	4,584
Protected Area Grants	200	700	2,200	2,700	2,550	1,650	10,000
Cons. Action Grants	200	400	400	400	400	200	2,000
Evaluation and Audit	0	0	100	240	0	120	460
Total, All Components	2,773	4,134	5,269	5,295	4,137	2,644	24,253
Contingencies	145	207	263	265	206	132	1,219
Inflation (5%)	0	217	277	278	217	139	1,128
TOTAL, ALL COSTS	2,919	4,558	5,810	5,838	4,561	2,915	26,600

(Note: Totals disagree slightly due to rounding.)

C. A.I.D. Obligation Schedule

USAID/Madagascar plans to obligate the funds required to make this contribution as per the schedule summarized below in Table II.A.4:

TABLE II.A.4: A.I.D. Obligation Schedule vs. Planned Expenditures.

(U.S. $ '000)

Fiscal Year:	Planned Obligation:	Estimated Expenditures:	Anticipated Pipeline:
1990	6,300	0	6,300
1991	8,000	2,919	11,381
1992	8,000	4,558	14,823
1993	2,000	5,810	11,013
1994	2,300	5,838	7,475
1995	0	4,561	2,914
1996	0	2,914	0
TOTAL:	26,600	26,600	0

(Note: Totals disagree slightly due to rounding.)

It is clear from the above that planned obligations should be sufficiently timely to meet the project's expenditure requirements.

I. IMPLEMENTATION PLAN

A. Procurement of Technical Assistance

The REDSO/ESA Regional Contracts Office (RCO) will assist in the procurement of contracts and grants/cooperative agreements for the following project components. Activities within the USAID's delegation of authority may be executed at the mission with the RCO assistance.

1. Institutionalization of ANGAP

A long term technical assistance contract will be awarded to a Gray Amendment entity if it is determined that there are at least three Gray Amendment entities with the required expertise. No matter what procurement scenario is chosen, USAID/Madagascar will assure compliance with the mandatory 10 percent subcontracting requirement of the Gray Amendment. Competition among Gray Amendment entities will be encouraged to the maximum extent possible to enable the mission to have a greater selection of technically qualified firms at competitive prices. In the institutionalization of ANGAP, the contractor will provide long and short-term technical assistance and procurement of commodities in support of ANGAP. Training activities identified for ANGAP will also be funded from the contract. Activities for the institutionalization of ANGAP will commence prior to award of the institutional contract. Therefore, interim short-term contracting mechanisms, (i.e. short-term personal services contracts, purchase orders, and IQC Delivery Orders) will also be used.

When Needed: April 1991
Procurement Time: 6-9 months

2. Grant Manager for NGO Conservation and Development Grants

A cooperative agreement will be awarded to a U.S. Private Voluntary Organization to act as the umbrella grant manager. Potential U.S. PVOs who have had experience in managing umbrella funds will be located through AID/W technical offices. USAID will ask these organizations to submit proposals. After award of the Cooperative Agreement, this PVO, who will be known as the "Grant Manager" or "GM", will work with USAID and ANGAP to establish criteria for the award of subgrants to U.S. and /or local PVOs for the management of up to six protected areas. The Grant Manager will then invite proposals and make awards based on these criteria. Concurrence by ANGAP and USAID will be required prior to the award of any grant. The GM will also award approximately 100 small grants not expected to exceed $25,000 in support of locally initiated conservation and development efforts. As stated in Section I.C.3., USAID, in conjunction with the Regional Legal Advisor and Regional Contracting Officer will also consider the option of using a direct A.I.D. contract and including for-profit U.S. entities as potential grant managers.

When Needed: April 1991
Procurement Time: 4-6 Months

3. Biodiversity Planning Service

An Operational Program Grant will be awarded to a U.S. PVO conservation organization with the experience needed to develop a Biodiversity Planning Service within ANGAP. The availability of these types of organizations will be identified by technical offices in AID/W and REDSO/ESA. The identified PVOs will be requested to submit proposals. At least three potential offerors should be sought. If it is determined that there is only one organization with this capability and expertise justification for a sole source grant award could be made pursuant to Handbook 13, Section 2.B.3.(a)(2), exception to competition because of unique capability.

When Needed: April 1991
Procurement Time: 4-6 Months

4. Project Coordinator

A U.S. Personal Services Contract will be awarded for an initial two year period with an option for renewal. The PSC will work under the supervision of the USAID project officer and will assist in the management and coordination of all the project elements. The position will be advertised in the Commerce Business Daily and the SF 171s received will be reviewed by a mission technical committee. REDSO/ESA Regional Contracts Office will negotiate and award the contract to the most technically qualified individual.

When Needed: April 1991
Procurement Time: 6 Months

5. Short-Term Contracting Mechanisms

To meet the mission's project needs prior to arrival of the contractors and grantees described above, various short-term activities will be initiated.

a. Local-Hire Short-Term Personal Services Contract
A PSC will be advertised and awarded locally to assist the mission with the project until a contract with the long-term U.S. PSC has been executed. Security and medical clearances can be carried out locally.

When Needed: October 1990
Procurement Time: 6 weeks

b. Short-Term Consultancies
PIO/Ts will be used to earmark money for short-term consultancies, to meet TA needs identified by the Mission.

When Needed: As identified
Procurement Time: Few weeks to a month

c. IQC Delivery Orders for TA
REDSO/ESA and AID/W IQCs can be accessed to provide technical assistance for periods up to 120 days.

When Needed: As identified
Procurement Time: Few weeks to a month

B. Procurement of Commodities

1. Responsible Agencies

Because of the multidisciplinary nature of the SAVEM Project, overall responsibility for its implementation is divided among various entities. USAID will assume overall responsibility for the procurement of commodities necessary to ensure the start-up of ANGAP. USAID will carry out this responsibility by engaging a local hire Personal Services Contractor (PSC) during the first six months of FY 1991 and setting up a Project Coordination Office. This PSC, who will report to the USAID Environmental Officer, will ultimately be replaced by a long-term, U.S. hire PSC who will serve through the PACD. In the case of ANGAP equipment funded by the Project, ANGAP's Director will have responsibility for authorizing expenditure of project funds, for approving and signing Project Implementation Orders, Project Implementation Letters and other forms of obligating documents, and for acknowledging receipt of goods to USAID by issuance of receiving reports.

At the same time, through the Project Coordination and Startup Office, USAID will initiate procurement of commodities (vehicles, computers, office supplies, etc.) for the Protected Area Development Grants (PADG) component of SAVEM prior to the execution of a Cooperative Agreement for technical assistance to that component.

Overall procurement responsibility for the other component, the Biodiversity Planning Service (BPS), will reside with the grantee selected to implement this component. Procurement of commodities for the BPS will be carried out in accordance with procedures set forth in A.I.D. Handbook 13.

2. Purchasing Entities

Purchases of SAVEM commodities will be undertaken by a variety of entities. USAID, through the Project Coordination and Startup Office, will act as purchasing entity as follows:

a. Vehicles

Initially four vehicles as well as a few motorcycles will be required by ANGAP and the Grant Manager. To obtain these vehicles, USAID will employ the services of the Central Procurement Office of the U.S. Embassy in Tokyo and order directly from Japan. This option has been selected because of the substantial savings (e.g. $5-6,000 per 4WD vehicle) over purchasing locally.

b. Computers, office equipment

Because of the similarity of the remaining equipment for ANGAP and the GM, the PSC may choose, for purposes of simplifying the procurement process, to combine its equipment needs into one procurement action. In so doing, different options will be considered. Either one PIO/C designating REDSO/ESA/PSA/IQC as the authorized procurement agent will be issued or, alternatively, USAID may request that AID/W IRM procure all hardware and software directly on behalf of the Project. USAID will seek guidance from REDSO/IRM before finalizing the computer/software equipment list.

When employing the services of REDSO's PSA IQC (either for all or part of this remaining equipment), USAID will prepare the PIO/C along with detailed specifications. At the time of budget preparation, approximately 6-8% of the commodity value of the PIO/C will be included to cover the PSA's procurement fee. The finalized PIO/C will be forwarded to REDSO/ESA/CO for contract action. RCMO assistance in the preparation of the PIO/C will be provided as needed.

The bulk of the office furnishings and supplies could be part of the larger PIO/C assigned to the PSA or, alternatively, could be obtained through RPSO Bonn. If the RPSO option is chosen, the USAID Executive Officer will be the primary officer responsible for the ordering; the PSC will prepare the detailed equipment list.

Some items may be purchased locally, notably photocopiers and certain small value office supplies. These purchases will be valued under $25,000. The appropriate solicitation documents (IFB/RFQ) will be employed when soliciting quotations from local vendors.

c. Equipment/supplies for other components of SAVEM

USAID will have no direct responsibility for the procurement of commodities for the Biodiversity Planning Service (BPS) component of SAVEM. Rather, the grantees selected to undertake this activity will procure all commodities in accordance with procurement procedures set forth in A.I.D. Handbook 13. Because of the significant amounts of commodities proposed for the BPS component of SAVEM, USAID will review the equipment list before authorizing procurement to proceed.

3.. Equipment List

Item	Qty.	Prob s/o	Proc. Agent	Amount
I. Project Coordination and Startup				
Computer	1	000	USAID:PSA/IRM	4,500
Printer	1	935	USAID:PSA/IRM	1,500
Software		000	USAID:PSA/IRM	1,000
Typewriter	1	935	USAID:PSA	1,500
UPS (1,000 KVA)	1	935	USAID:PSA	1,500
Office Furnishings		935	USAID:PSA	4,100
Photocopier		935	USAID:PSA	4,000
Subtotal commodities group Project Coordination				18,100
II. ANGAP				
6-passenger 4WD vehicle	3	935	USAID	66,000
Motorcycles, 125-185 cc	6	935	USAID	16,200
Computers (2 flop)	6	000	USAID:PSA/IRM	20,000
Laptops	6	935	USAID:PSA/IRM	15,000
Printers	4	935	USAID:PSA/IRM	6,400
Software	-	000	USAID:PSA/IRM	14,350
Typewriter	1	935	USAID/PSA	1,500
Fax machine	1	935	USAID/PSA	900
UPS (1,000 kva)	6	935	USAID/PSA	9,000
Photocopier	2	935	USAID/PSA	11,500
Audio visual equipment	-	935	USAID/PSA	2,500
Office furnishings	-	935	USAID/PSA	25,000
Subtotal commodities ANGAP				188,350
III. Biodiversity Planning Service				
A. Remote Sensing Unit (RSU)				
Cartography/Photogrametry		935	Grantee	6,000
Image processing equipment		935	Grantee	120,000
Ground truthing equipment		935	Grantee	9,950
Photo Interpretation Facility		935	Grantee	60,200
Subtotal commodities group RSU				196,150
B. Field Support Unit (FSU)				
Survey Equipment		935	Contractor	339,750
4-wheel drive vehicle		935	Contractor	22,000
Subtotal commodities group FSU				361,750

Item	Qty.	Prob s/o	Proc. Agent	Amount
C. Socioeconomic Impact Monitoring Unit (SIM)				
Computer Hardware/Software	2	935	Contractor	10,000
D. Biodiversity Planning Unit (BPS)				
GIS Hardware/Software	2		Contractor	90,150
E. Biodiversity Planning Service Front Office				
Vehicle	1	935	Contractor	18,000
Computer Hardware/Software			Contractor	20,000
Office Furnishings		935	Contractor	30,000
Subtotal commodities BPSFO				68,000
Total commodities, groups A-E				726,050
IV. Grant Manager				
6 passenger 4wd vehicle	1	935	USAID	22,000
Computers (2 flop)	2	000	USAID:PSA/IRM	12,000
Laptops	1	935	USAID:PSA/IRM	2,500
Printers	2	935	USAID:PSA/IRM	1,000
Software	-	000	USAID:PSA/IRM	2,100
Typewriter	1	935	USAID/PSA	1,500
Fax machine	1	935	USAID/PSA	900
UPS (1,000 kva)	2	935	USAID/PSA	3,000
Photocopier	2	935	USAID/PSA	11,500
Audio visual equipment	-	935	USAID/PSA	2,300
Office furnishings	-	935	USAID/PSA	10,150
Subtotal commodities Grant Manager group				68,950
Total Commodities, PCU, ANGAP, Grant Manager:				275,400
30% Freight, Insurance, PSA Fees				82,620
Total Commodities, PCU, ANGAP, Grant Manager:				358,020
Total Commodities, BPS				726,050
GRAND TOTAL, COMMODITIES				1,084,070

4. Development Fund for Africa Certification

This Project will be funded by resources provided under the Development Fund for Africa (DFA). Per Congressional guidelines set forth in the legislation authorizing DFA, all reasonable efforts will be made to maximize U.S. source/origin commodities to the maximum extent practicable. The above list was reviewed by the REDSO/ESA Regional Commodity Management Officer. Only those items which are not currently made in the U.S. or which because of the very nature of the item(s) cannot be purchased and shipped to Madagascar from the U.S. at a

reasonable cost, have been designated as eligible for purchase from code 935 source/origin.

The authorized source for procurement of motor vehicles and motorcycles is AID code 935 (Special Free World), and no "Special Circumstances" waiver is required to be executed by the Project Officer to purchase such items from non-U.S. sources. Because service and parts for U.S.-manufactured vehicles/motorcycles are unavailable in Madagascar the Project intends to purchase these items from code 935 sources.

Based on the above, the REDSO/ESA/RCMO has concluded that USAID/Madagascar is in accordance with Agency Africa Bureau guidelines of maximizing U.S. procurement whenever practicable. However, to ensure that the grantee complies with this guideline, the USAID Project Officer assigned to monitor this Project will keep records of all commodities purchased by geographic code and will report this information to AID/W, AFR/DR on a yearly basis.
Consonant with DFA procurement guidelines under Grants and Cooperative Agreements, the grantee will follow an order of preference for procurement as follows: (a) U.S. only, (b) host country, (c) code 941 (Selected Free World), and (d) code 935 (Special Free World).

5. Commodity Marking

Commodities purchased by the Project will be appropriately marked with the AID handclasp emblem. It is the responsibility of USAID to assure compliance with AID marking requirements. When marking requirements have not been complied with, the USAID should initiate corrective action which could simply entail informing the grantee of the non-compliance and request corrective action, or may necessitate the submittal of AID Form 1450-1 ("Reporting of Violation - Marking Requirements") to AID/W. AID policy on marking requirements for AID-financed commodities is contained in HB 1B, Chapter 22.

6. Procurement Schedule

Realistic advance planning for the procurement of all equipment listed above is essential for project success. Because of ANGAP's as yet unknown administrative/management capabilities, USAID, will take the lead in implementing the pertinent sections of this procurement plan. Commodity arrival will be governed in large measure by the timeliness with which the following procurement actions (as appropriate) are implemented:

- Specification and solicitation document preparation;
- Advertisement issuance for procurements over $25,000;
- Receipt and evaluation of bids/offers;
- Negotiation and issuance of contracts to suppliers;

- Establishment of payment documents;

- Manufacture, inspection and packing of contracted equipment;

- Transportation (by sea, min. 3 months; by air, 3 weeks) and receipt of equipment, including processing and clearance through customs.

In those instances where the PSA/IQC will be employed, approximately nine months should be allowed to permit all of the above steps to be completed. Realistically, all procurements will take 3-4 months longer than anticipated, therefore sufficient advance planning should be done to ensure that project success is not handicapped by the late arrival of commodities.

C. Administrative and Logistical Arrangements

1. Administrative Responsibilities

To manage the SAVEM project effectively, three separate contractor/grant mechanisms will be responsible for the administrative and logistical arrangements of the different project components. The details of these contractual arrangements are explained above. ANGAP, BPS and the Grant Manager will all be housed in one office building to facilitate collaboration and information exchange, but each entity will maintain its own administrative and financial structure.

The technical advisors under the direct A.I.D. contract for technical assistance to ANGAP will work directly with the ANGAP Director General. All administrative and logistical support will be provided by the permanent national staff. Similarly, the Biodiversity Planning Service within ANGAP will have a front office with a BPS technical advisor and national staff composed of a Director and two support staff. This front office, in cooperation with the SAVEM-funded grantee providing technical assistance to the BPS, will be responsible for all administrative and logistical arrangements concerning the BPS. Likewise, the international "umbrella" NGO which will function as the Grant Manager also will have its own small administrative support staff. USAID/Madagascar will not be responsible for providing any administrative or logistical support to any of these SAVEM grantees or contractors.

2. Project Coordination and Start-Up

A.I.D. will oversee and monitor project activities through a separate project coordinating office. This office will be staffed by a Project Coordinator and two support positions: a procurement/logistics assistant and a secretary. For the first six months of FY 1991, the Project Coordinator's position will

be filled on an interim basis by a local-hire Personal Services Contractor. Beginning in April 1991 and continuing through the PACD, the slot will be filled by a long-term U.S.-hire PSC. For the first year of project operations, the procurement/logistics slot will be filled by a GSO clerk, to be replaced by an administrative assistant when most procurement activities have been completed. The secretary will be a five year position, filled by a local hire PSC.

The project coordinating office will be responsible for:

- Assisting USAID in procuring project commodities as described in Section III.B above.

- Start-up assistance to USAID, in procurement of office space and technical assistance for preliminary studies and support to ANGAP, prior to the arrival of contractor and grantee personnel.

- Liaising with the GDRM on behalf of SAVEM contractors and grantees, as required, to smooth project implementation.

- Ensuring coordination of activities between the institutional contractor to ANGAP, the BPS, and the Grant Manager.

- Ongoing monitoring of all SAVEM activities.

The Project Coordinator will report to USAID/Madagascar's Environmental Officer. USAID will be responsible for providing administrative and logistical support for this project coordinating office.

3. Project Support Services.

Contractor and grantee agencies will be responsible for housing and maintenance, and other services related to office and personnel support. If USAID establishes a Project Support Unit as planned, contracts will be adjusted to enable access to the services of that unit. Additionally, the grantee for the BPS will be responsible for procuring, under the auspices of the Operational Program Grant, all commodities required for this sub-component. USAID's Project Coordinator, in collaboration with REDSO/ESA and the Project Officer, will assist in the procurement of commodities for the ANGAP and Grant Manager components.

D. Implementation Schedule

The following summarizes major actions and benchmarks set to take place under each of the major project components. Actions are listed by the quarter of the Fiscal Year in which they are scheduled.

1. ANGAP Development.

Action:	Action Agent:	Scheduled:
SAVEM Project authorized and funds obligated	USAID	4th Q 90
Identification of TA contractor	REDSO/USAID	1st Q 91
Selection and nomination of ANGAP D.G.	ANGAP	1st Q 91
Implementation agreement between MPAEF & ANGAP	MPAEF/ANGAP	1st Q 91
ANGAP legally recognized by isssuance of récépissé definitif	GDRM	1st Q 91
ANGAP Director and Board start staff search	ANGAP	1st Q 91
Hiring of ANGAP staff	ANGAP	1st Q 91
Commodity specifications developed	REDSO/USAID	1st Q 91
Technical Assistance contract executed	USAID	2nd Q 91
Staffing patterns, job descriptions, personnel procedures defined	TA/ANGAP	2nd Q 91
ANGAP office set up	ANGAP	2nd Q 91
Commodity orders placed	USAID	2nd Q 91
Arrival of TA/contractors	TA	3rd Q 91
Establish financial mgmt and accounting	TA/ANGAP	
system established	TA/ANGAP	3rd Q 91
Training in computer use	TA	3rd Q 91
Field Reconnaissance begins	ANGAP/GM	3rd Q 91
Commodities arrive	PSA	4th Q 91
CP's for NORAD contribution fulfilled	GDRM	1st Q 92
System established for receipt and programming of park fees & other revenues	TA/ANGAP	2nd Q 92
Tracking system set up	TA/ANGAP	2nd Q 92
Library & computer indices of publications established	TA/ANGAP	2nd Q 92
Capacity in desk-top publishing for quarterly publication of newsletter	TA/ANGAP	2nd Q 92
Computerized tracking system established	TA/ANGAP	2nd Q 92
Newsletter begins to appear	TA/ANGAP	3rd Q 92
Audio visual material developed	TA/ANGAP	3rd Q 92
Forum on biodiversity mgt systems	TA/ANGAP	1st Q 93
Mid-Term Evaluation	USAID/REDSO	1st Q 94
Departure of TA team	TA	3rd Q 94
Transfer of responsibility for BPS to ANGAP	ANGAP/BPS	1st Q 95
Final Evaluation	USAID/REDSO	1st Q 96

Project Assistance Completion Date 2nd Q 96

2. Biodiversity Planning Service.

Action	Action Agent	Scheduled
Commodity specifications developed	REDSO/USAID	1st Q 91
OPG granted to PVO	REDSO/USAID	2nd Q 91
Commodity Orders Placed	USAID	2nd Q 91
Training in computer based data management tools begins	TA	4th Q 91
Cartographic information digitalizing established	TA/PVO	1st Q 92
Training for collection of socio-economic data begins	TA/PVO	1st Q 92
Socio-economic data base management system installed (SIM)	TA/PVO	2nd Q 92
Biodiversity database management system established	TA/PVO	4th Q 92
Installation of GIS	TA/PVO	4th Q 92
Transfer of responsibility for BPS to ANGAP	PVO	1st Q 95

3. Grant Manager

Action:	Action Agent:	Scheduled:
Potential Grantees solicited	REDSO/RCO	1st Q 91
Cooperative Agreement awarded	REDSO/RCO	2nd Q 91
Proposal for one "old" area received	GM	2nd Q 91
TA team arrives in Madagascar	GM	3rd Q 91
Field reconnaissance begins	GM	3rd Q 91
Grant for first "old" area awarded	GM	3rd Q 91
USAID and ANGAP approve 3 proposed PAs	USAID/ANGAP	4th Q 91
Potential Grantees solicited	GM	4th Q 91
Award of CAG's begins	GM	4th Q 91
Grant in 1st "old" area begins	GM	4th Q 91
Three Phase I Grants awarded	GM	1st Q 92
Criteria for Phase II Grants approved	USAID/ANGAP	2nd Q 92
Proposals for Phase II Grants received	GM	3rd Q 92
Proposal for 2nd "old" area received	GM	3rd Q 92

Phase II Grants awarded	GM	4th Q 92
Grant for 2nd "old" area awarded	GM	4th Q 92
Phase II Grants begin	GM	1st Q 93
Grant in 2nd "old" area begins	GM	1st Q 93
Proposal for 3rd "old" area received	GM	3rd Q 93
Grant for 3rd "old" area awarded	GM	4th Q 93
Mid-Term Evaluation	USAID/REDSO	1st Q 94
Grant in 3rd "old" area begins	GM	1st Q 94
Admin/Finance Specialist completes contract	GM	2nd Q 94
CAG Manager completes contract	GM	2nd Q 94
Final Evaluation	USAID/REDSO	1st Q 96
Chief of Party completes contract	GM	2nd Q 96
Project Assistance Completion Date		2nd Q 96

4. Training

.Action	Action Agent	Scheduled
NPA Needs assessment conducted	PSC	2nd Q 91
LH training coord. recruited	GM	2nd Q 91
ANGAP staff tr. needs assessed	ANGAP/TA	3rd Q 91
NGO training needs assessed	GM	3rd Q 91
Protected areas mgrs. U.S./3rd country seminars begin	GM/USAID	4th Q 91
ANGAP staff & organizational training plans developed	ANGAP/TA	4th Q 91
NGO training plan developed	GM	4th Q 91
NGO orientation cycle begins	GM	4th Q 91
1st BPS/SIM enumerator training held	BPS	4th Q 91
NGO project planning tr.cycle begins	GM	1st Q 92
ANGAP in-country tr. begins	ANGAP/ TA	1st Q 92
Africa study tour program begins	ANGAP/TA/USAID	2nd Q 92
NGO technical tr./TOT cycle begins	GM/NGOs	3rd Q 92
ANGAP U.S. staff training begins	ANGAP/TA/USAID	3rd Q 92

Africa study tour cycle for PA's begins	GM/USAID	4th Q 92
NGO project mgmt. tr. cycle begins	GM	4th Q 92
2nd BPS/SIM enumerator training held	BPS	4th Q 92
1st ESSA research grants awarded	GM	4th Q 93
3rd BPS/SIM enumerator training held	BPS	4th Q 93
NGO project planning tr. cycle ends	GM	3rd Q 94
NGO project mgmt. tr. cycle ends	GM	4th Q 95
last ESSA research grants awarded	GM	4th Q 95
NGO technical training/TOT ends	GM/NGOs	1st Q 96
U.S./3rd country seminars end	GM/USAID	1st Q 96
PACD		2nd Q 96

5. Project Coordination and Start-Up

Action	Action Agent	Scheduled
Project Coordination Office staff organized	PC	1st Q 91
Commodities procured for PC/ANGAP/GM offices	PC/GSO Clerk	1st Q 91
Assistance to ANGAP in staff recruitment and hiring provided	PC	1st Q 91
Coordination for NPA/PAIP team provided	PC	1st Q 91
Rental office space and housing for ANGAP/ BPS/GM staff identified	PC	1/2 Q 91
Commodities arrive; customs clearance completed	PC/GSO Clerk	2nd Q 91
Short-term TA for ANGAP in Fin/Admin office operation management procedures provided	TA	2nd Q 91
TA for assessment of educational institutions for NPA	TA	2nd Q 91
Short term TA for preparing equipment/computer specification for all computer equipment for conservation data bases	TA	3rd Q 91
Arrival of long term PSC Project Coordinator	PC	3rd Q 91
Review of bi-annual workplans from ANGAP/BPS/GM begins	PC	3rd Q 91

Submission of bi-annual reports begins	PC	3rd Q 91
Procedures for communication between implementing agencies of three components instituted	PC	3rd Q 91
Monitoring system of project components set up	PC	4th Q 91
Coordination of third country training begins	PC	1st Q 92
Options/mechanisms to establish endowment funds for recurrent costs reviewed	PC/TA	3rd Q 93
Preparation of SOW and coordination of mid-term evaluation completed	PC	2nd Q 93

E. Section 611(a) Assessment

It is believed that the financial and other plans necessary to carry out the planned assistance, as well as a reasonably firm estimate of the costs to the U.S. Government of providing this assistance, have been completed.

It is believed that upon execution of the FY 1992 disbursement for the project such legislative action as may be necessary to meet the objectives of this project may reasonably be anticipated to be completed in time to permit the orderly accomplishment of those objectives (See Annex V).

IV. MONITORING, EVALUATION, AND AUDIT PLAN

This monitoring, evaluation, and audit (M&E) plan is divided into four sections: (a) a discussion of overall M&E objectives; (b) an outline of the four programmatic levels encompassed in the M&E plan; (c) a discussion of the socio-economic impact component of the M&E plan, and (d) a summary of the evaluation and audit plans. Section E outlines the main assumptions and ideas underlying the project which will be validated and refined as the monitoring and evaluation program is implemented.

A. Monitoring and Evaluation Objectives

This monitoring and evaluation program is designed to meet three objectives. The first is to generate management information that can be used to assess the progress and impact of the SAVEM project. A second and more important objective is to strengthen empirical understanding of key socio-economic and ecological processes which have shaped Madagascar's natural resource management problems in the past, and which will continue to influence the effectiveness of formal natural resource management strategies. The third objective is to establish Malagasy institutional capacity to generate and analyze empirical information needed to strengthen national policy-making and development planning on natural resource and ecosystem management.

B. Levels of Monitoring and Evaluation Activity

To meet the objectives outlined above, the SAVEM monitoring and evaluation plan covers four levels of project implementation and progress:

- Project Inputs. The first step in implementing the M&E plan is monitoring the disposition of technical assistance, training, commodity support and financial assistance made available through the SAVEM project.

- Project Outputs. The next step, which begins measuring impact as well, establishes whether the resources provided as inputs have accomplished anything. Judgements will have to be made on two output-level indicators in particular: whether ANGAP is carrying out defined responsibilities in monitoring and improving interactive natural resource management strategies; and, whether NGOs are implementing socially and ecologically-sound resource management strategies in protected areas.

- Indicators of Purpose-Level Achievements. The third step is to determine whether project outputs have led to any progress at the purpose level. That is, have project-funded activities helped establish sustainable systems (including institutions, methods and behaviors) for the management of protected areas of Madagascar and their peripheral zones?

- Indicators of Goal-Level Accomplishment. The last step is to determine the effect that intermediate outcomes may have had on the conservation of biodiversity in Madagascar, which entails an assessment of goal-level indicators.

As with all monitoring and evaluation activities, implementation of this plan will require a long-term perspective, good baseline data, a comprehensive monitoring system which is embedded in the implementation process, and willingness to accept that many causal linkages might be difficult or even impossible to prove. The indicators chosen and the means for monitoring them are discussed in turn below. Input monitoring is probably the most straightforward, and monitoring of goal-level impacts is the most complex.

1. Input Monitoring

Input monitoring is a routine but essential element in the overall M&E plan. It will help determine how the specific resources A.I.D. has provided might conceivably influence the preservation of biodiversity in Madagascar. The SAVEM project encompasses the following inputs:

- 240 person-months of long-term technical assistance;
- 152 person-months of short-term technical assistance;
- 547 person-months of training;
- $10,000,000 to implement six interactive protected area development grants;
- $2,000,000 for Conservation Action Grants; and
- $1,084,070 for commodity support.

The USAID PSC Project Coordinator will be responsible for monitoring and reporting on the disposition of project inputs, which will be adequately documented through normal correspondence associated with project implementation. This includes memoranda of understanding with the Government of Madagascar, grant agreements, project implementation letters, Project Implementation Orders for technical assistance, training and commodities, financial reports, and project implementation reports.

2. Output Monitoring

Output monitoring will answer the key question of what specific, concrete changes or activities have occurred as a consequence of A.I.D.'s decision to provide resources in support of improved natural resource management in Madagascar. The project anticipates the following outputs during five years of activity:

- Establishment of a National Association for the

Management of Protected Areas (ANGAP) with sufficient authority and capabilities to perform its mangement function.

- Establishment of a Biodiversity Planning Service (BPS) within ANGAP capable of tracking and communicating information on biodiversity conservation.

- Implementation by NGOs of interactive natural resource management plans in six protected areas and the adjuacent peripheral zones.

- Enhancement of managerial and technical capability of GDRM and NGO personnel active in the conservation of natural resources.

- Support for self-help community activities aimed at conserving biodiversity in 50 priority protected areas.

The USAID PSC project coordinator will be responsible for monitoring and reporting the achievement of these project outputs, which will be documented in workplan reviews, quarterly and annual progress reports, activity site visit reports, and other reviews as needed. Many of these outputs also will be documented through the normal correspondence associated with project implementation. All of these outputs will be further documented and assessed in a series of evaluations, as indicated in Section D. below.

3. Purpose-Level Monitoring

The purpose of the SAVEM project is to identify and establish sustainable systems (including institutions, methods, and behaviors) for the management of Madagascar's protected areas and their peripheral zones. Achievement of this purpose will be associated with the following empirical indicators of change:

- Up to six hypotheses about management of sustainable, interactive development efforts in protected areas and adjacent peripheral zones developed and in process of being tested;

- Populations of up to six peripheral zones using improved production adaptations that decrease need to rely on non-sustainable use of resources located within adjacent protected areas;

- Populations of same peripheral zones involved in interactive management of resources of adjacent protected areas;

- Increased public awareness of prospects for interactive management of protected areas and adjacent peripheral zones.

Unlike the monitoring arrangements for inputs and outputs, it is not feasible to expect purpose-level monitoring to be done exclusively

by the A.I.D. PSC project coordinator within the context of routine project implementation actions. A special effort will be required for effective purpose-level monitoring. However, the SAVEM project is unusual in that a major component of project activity--the creation of ANGAP--is aimed primarily at monitoring the effectiveness of protected area natural resource management strategies. ANGAP will have, inter alia, the following responsibilities:

- Coordination of activities which influence the conservation of biodiversity in Madagascar;

- Establishment and operation by ANGAP of an effective system for tracking on the ground activities relevant to the conservation of biodiversity

- Management of a database on the status of biodiversity and factors influencing biodiversity in Madagascar.

To enable ANGAP to carry out these monitoring and assessment responsibilities, SAVEM will provide a substantial volume of technical assistance, training, and equipment which will establish ANGAP's Biodiversity Planning Service (BPS) and support a range of assessment and analytic activities. The BPS Remote Sensing/Cartographic Unit (RCU), Field Survey Unit (FSU), unit for Socio-Economic Impact Monitoring (SIM), and Biodiversity Planning Unit (BPU), described in section I.C. of the project paper, all will provide critical data for purpose and goal-level monitoring.

It will be difficult, and may turn out to be impossible, to disaggregate out the effects of A.I.D.'s particular interventions on empirical measures of natural resource change, but this is not a flaw in the monitoring system proposed here. This monitoring system is designed to collect information on key indicators which will shed useful light on the performance of Madagascar's Environmental Action Plan, and which will provide a basis for adjusting SAVEM project implementation in accordance with empirical circumstances. This also will provide a basis for making careful judgments about the progress of the project at the purpose level. The A.I.D. PSC project coordinator will be responsible for incorporating the results of ANGAP monitoring activities into appropriate project implementation reports. A series of evaluations will review the results and implications of the monitoring exercise at key times during project implementation as described in part E of this section.

Effective purpose-level monitoring cannot be done without an expenditure of time and money to generate the information required. The complexity of ecological and socio-economic interactions in Madagascar, and the importance of succeeding in biodiversity conservation, result in an M&E investment which is substantial. However, this is the only way A.I.D. and the GDRM will be in a position to make judgments regarding the efficacy of the program outlined here, or about needed adjustments as

the project evolves. The project will be designed and implemented through and with relevant Malagasy institutions, so that the information generated makes a full contribution to policy decision-making. At the same time the monitoring and research effort itself will be institutionalized, strengthening the capacity of government and non-government organizations effectively to manage Madagascar's natural resources.

4. Goal-Level Monitoring

The goal of the project is to establish or maintain sustainable human and natural ecosystems in areas of Madagascar where biodiversity is threatened. It must be anticipated at the outset that efforts to monitor the achievement of this goal will be complex and inconclusive to a degree. To the extent the SAVEM project contributes to this goal, empirical change should be observed in these areas:

- No deterioration in biodiversity as measured by the appropriate indices;
- Better understanding of the nature of biodiversity in Madagascar;
- Better understanding of the interactions between humans and other memebers of Madagascar's ecosystems; and,
- Size of Madagascar's 50 Protected Areas stabilized at sustainable rates.

ANGAP's Biodiversity Planning Service will generate all the information required to make a judgment on the extent to which progress has been made in conserving biodiversity in Madagascar.

The results of goal-level monitoring will be subject to debate, especially regarding the specific impact of A.I.D.'s assistance. This is an inevitable outcome which no conceivable expenditure on data and research would alter. This monitoring plan is not designed to resolve all foreseeable issues associated with implementation of this resource management activity; rather, it is designed to keep A.I.D. management in close touch with the evolution of key indicators of effective resource management in the country at large. This, and the associated institutional strengthening, are the most important reasons for undertaking a comprehensive monitoring effort.

C. Socio-Economic Impact Monitoring

The SAVEM project is designed to respond flexibly to site-specific circumstances. This "learning process" approach will maximize the likelihood of generating interactive park management strategies that accomodate the needs of local populations in ways that foster biodiversity. An important element of this flexible implementation strategy will be a

socio-economic impact monitoring (SIM) program integrated into the BPS (the strategy and SIM methodology are described in Annex VI.A.). Illustrative features of the SIM program are:

- A socio-ecological baseline survey in 180 communities (30 in each of six protected areas), which will establish current resource management relationships in these areas and begin the identification of alternative biodiversity-conserving resource management approaches. The relatively large number of survey communities is a consequence of the high level of social and economic variation observed in rural Madagascar.

- Annual socio-ecological updates in 60 communities (10 in each of six protected areas), which will reveal trends over time in the socio-economic dimension of natural resource management as the SAVEM project is implemented. These annual updates also will document the effectiveness of or the need to adjust project implementation strategies, and will also help to identify policy and institutional issues of broader significance.

- Annual in-depth household studies of 120 families (two families in each of 10 communities in each protected area). These studies will focus on differential impact by gender and other socio-economic variables, and will shed light on the individual decision-making which underlies resource management outcomes at the household and community level. This causal analysis will in turn allow resource management policy-makers at regional and national levels to better understand the structure of incentives that influence rural people's approaches to resource management, and will lead to project implementation approaches that effectively balance biodiversity objectives with the livelihoods of neighboring populations.

D. Evaluation and Audit

A comprehensive monitoring plan reduces but does not eliminate the need for project evaluations. Accordingly, the following evaluations will be conducted during the life of the project:

(1) A mid-term evaluation, approximately in October 1993 after implementation begins. It will focus on progress made in institutionalizing ANGAP as a biodiversity monitoring/management institution and address critical issues that will shape the balance of project implementation:

- Has ANGAP effectively conceived and set in place a coherent interactive park management philosophy that conserves biodiversity while improving the lives of surrounding populations?

- Has ANGAP as an institution grown to the point that it can be expected to adopt a broader role in managing the conservation of biodiversity in Madagascar?

(2) A final evaluation at the close of the activity, to provide a comprehensive assessment of results which will, if appropriate, feed into the design of follow-on or second-generation efforts. Finally, provision is made for an audit to ensure that project funds have been appropriately utilized.

(3) Provision has been made for two types of audits: a certification of financial capability prior to the grantees disbursing project funds and a non-federal audit to ensure that project funds have been appropriately used.

E. Project Ideas and Assumptions

The SAVEM project breaks new ground in several areas, primarily because it revolves around the idea that conservation and economic development can be mutually supportive. This idea implies several assumptions about the character of community-level socio-economic and ecological processes in Madagascar. The M&E plan is designed to validate these assumptions, and, in doing so, generate knowledge that can be used to refine the project implementation approach and improve the balance between conservation of biodiversity and rural livelihoods in Madagascar. Some of the most important questions raised during project design will be addressed through SAVEM's research and evaluative efforts:

(1) What amount of human forest use (harvesting wild plants, grazing, and so forth) can be sustained while conserving biodiversity at acceptable levels?

(2) Does intensification of agricultural land use and infrastructural investment exacerbate or alleviate human pressure on adjacent biodiversity reserves?

(3) Under what circumstances is an explicit, negotiated quid pro quo--community support of forest protection in return for rural development investments--either possible or appropriate?

(4) Can implicit community "stewardship" of forest resources serve as a viable management model in places where community organization is strong? What

management models are appropriate in places where community organization is fragmented or undergoing rapid change?

(5) Can informal, community-based "rangering" substitute for or complement traditional forest ranger regulatory approaches?

(6) Can aspects of social organization and tradition be channelled toward effective conservation and land-use practices?

The M&E system will develop answers to these key questions, thereby strengthening the project as implementation moves forward, and helping to find a balanced approach to natural resource management in Madagascar.

V. SUMMARIES OF ANALYSES

A. Protected Area Development Grants

This analysis describes the types of activities that USAID expects grantees will carry out under PADGs. It demonstrates that there are institutions with the technical and managerial capacity required to carry out the activities proposed, and describes the institutional linkages required between the various organizations that will implement these grants.

The importance of developing interactive plans for the management of protected areas is stressed. Interactive management is defined as the integration of conservation activities in the protected areas with developmental activities in the peripheral zones. Such management would emphasize local involvement in the development of resource use plans, and on allowing, when possible, local populations to continue to use the resources of protected areas, albeit in a more sustainable manner. The philosophy of the PADG's will be to promote conservation by affording villagers in the peripheral zones the necessary economic motivation to change, but not necessarily abandon, traditional resource use patterns, and to encourage alternate revenue-producing activities in the peripheral zones.

To save Madagascar's threatened resources, rural communities must see an economic worth in conserving those resources. Thus, as part of their interactive management plans, grantees and local communities may seek to develop non-extractive income generating mechanisms through the sustainable use of resources both within and adjacent to the protected areas. Tourism may be explored as one of these options.

Many of the interventions necessary for community and economic development may be obvious, but it is not evident that these interventions will lead to decreased pressure on the protected areas. The identification of interventions that link development to conservation will require in depth surveys and studies in the areas of socio-ecological, natural resource management, and ecological inventory. This information will provide a basis for development interventions that either help local communities manage forest resources on a sustainable basis or find viable on-farm alternatives to in-forest use.

Good community relations will be an important part of any management scheme. This entails acceptance by the community of the management program, and the perception that it exists to protect resources for the benefit of the community, not to prevent the community from using them.

There is a reasonably strong international and national NGO presence in Madagascar that renders implementation of the PADG's feasible. There are already three international NGO and two national NGO's involved in the management of protected areas in Madagascar. Numerous other NGO's have expressed an interest in becoming more

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involved in the natural resources sector. As activities in this sector increase and more demands are placed upon both international and national NGO's, these organizations will require training and institutional support to expand their absorptive capacity and enlarge their project portfolios.

D. Training Analysis

The SAVEM training component has been designed to ensure that the project's target group can be effectively trained within the LOP and resources budgeted. The target group is focused on ANGAP/BPS staff, members of ANGAP, international and national NGOs receiving grants, and protected area managers. Recipients of both training and technical assistance provided by the project from these target groups totals approximately 1,500 people.

Skill areas have been chosen for their direct relationship to project activities, based on preliminary training surveys. They will focus on: (1) planning and management; (2) technical knowledge and skills, from scientific areas related to watershed and wildlands management, to locally-adoptable agroforestry and soil conservation techniques, and (3) communications, social research and adult education for extension and community development. Competence-based training will ensure selection of subject areas directly related to job (ANGAP) and project (NGO) functions.

Training has been structured to minimize trainees' absence from job sites and the managerial burden on contractor or grantee personnel. There is no long- term training. U.S. and third-country training is limited to study tours, courses or seminars less than three months long. In-country training for ANGAP staff will be done through special courses or tuition payments to existing institutions, for courses that do not conflict with work hours. NGO workshops will be presented in a combination of on-site and residential formats that do not exceed two weeks. These short formats have been used effectively to provide training in similar skills areas for Malagasy target groups. With the hiring of a long-term local-hire training coordinator for NGO activities, training management resources internal to the project are adequate to handle activities during the LOP.

C. Social Soundness Analysis

SAVEM is socially feasible and will benefit Madagascar if two issues are considered carefully and handled flexibly during implementation. The first is the potential overlap of responsibility between ANGAP and other agencies. The second, which affects the 60,000-120,000 estimated direct beneficiaries in the peripheral zones, is the need to help communities find appropriate alternatives to the resources being placed off-limits through conservation. A gradual, sensitive, site-specific approach has been built into project design, to involve affected populations and try to minimize possible short-term negative socioeconomic effects of

ultimately-beneficial biodiversity preservation.

A number of factors must be taken into consideration during project implementation. Project implementors must distinguish between formal (state) and informal (traditional social) structures; in many cases the latter will be more useful in achieving project goals. The size and characteristics of SAVEM's direct beneficiary groups vary widely from region to region, and within protected areas, as reflected in analyses of four areas. Consequently, the project's design for social change will be site-specific, founded in the traditional social forms of each area. The goal of maximizing equity will not be clear-cut; an initial uneven distribution of resources may widen disparities in wealth. Landless people, who are usually migrants, will probably be most hurt by a ban on forest activity. Differential impact of project activities by socioeconomic strata, ranked groups and gender must be monitored carefully during implementation.

The SAVEM Project has been designed using a flexible "learning process" model which involves prospective beneficiaries in a project they help plan, that evolves through experience. The umbrella grant process and monitoring system have been designed to continuously inform project implementors of the social as well as ecological soundness of project activities. The primary source of information will be the baseline survey of 180 villages, and in-depth socio-economic impact monitoring of 60 villages over the LOP. This information will help test selected hypotheses regarding models for integrating conservation and development, types of new organizations that can be built, steps for enhancing the equity impact of the project.

Observations during site visits raised issues considered in project design. These include interfamily jealousy related to cash employment of guards (Ranomafana), resistance to eviction from reserve fields in absence of flexible negotiation and compensation strategies (Andohahela), culturally- appropriate project implementation strategies enlisting traditional spiritual and political leaders (Amber Mountain).

D. Economic and Financial Analyses

These analyses, taken together, demonstrate (1), that the stream of project expenses can be financed with the means available; and (2) that there are reasonable grounds for concluding that the proposed activities can be made financially viable and have monetary value to the direct participants.

The financial analysis demonstrates that USAID plans to obligate funds to SAVEM on a schedule that will be sufficient to meet planned expenditures. It points out, though, that it is difficult to assess the financial sustainability of the proposed protected area management plans, and thus the financial sustainability of ANGAP and its Biodiversity Planning Service, given that the nature of these plans will depend to a large extent on grantee proposals and

subsequent experience. Nonetheless, as the economic analysis shows, revenue from park fees over the next five years could, under a set of relatively conservative assumptions, reach $2.75 million. The GDRM plans to devote these revenues to the operational expenses of ANGAP. This total would be more than sufficient to cover ANGAP's projected operating expenses of approximately $200,000/year over that period. Whether park revenues can expand to meet the larger expenses ANGAP is expected to incur when and if it begins to manage protected areas itself remains problematic, and depends in part on the success of the interactive management efforts supported by SAVEM in developing economic alternatives that reduce pressure on these areas.

The economic analysis also notes that it is not possible to conduct a standard cost-benefit analysis of this project, given that one of its major objectives is to conserve biological resources "the value of which also cannot be quantified and analyzed with the tools available". It further notes that the development activities SAVEM will support will be site-specific, and will emerge only during the course of project design. These conceptual obstacles notwithstanding, the analysis demonstrates that the annual loss to Madagascar from such non-sustainable agriculture practices as brushfires and slash and burn farming ranges, depending on the set of assumptions chosen, from $104 million to $293 million. It points out further that the annual production value of the timber resources alone in six protected areas is approximately $38.4 million. Finally, the analysis demonstrates the long-term economic viability of the sort of alternative economic activities that SAVEM will promote (e.g., agroforestry). It acknowledges, though, that there will be substantial short-term costs to local farmers that may have to be made up through subsidies. Finally, the analysis emphasizes that the extent to which SAVEM-funded interventions will be able to raise local incomes will depend to a large degree on the budget structure of project grantees. If delivery costs form the predominant part of those budgets, the amount devoted to development efforts, and thus potentially to raising incomes, will be correspondingly lower.

E. Institutional/Administrative Analysis.

The institutional/administrative analysis of ANGAP demonstrates the feasibility of supporting and strengthening the newly created National Association for the Management of Protected Areas. ANGAP is ultimately to be responsible for coordinating the implementation of government policy for the management of protected areas and the development of peripheral zones. Supporting such a new and unproven institution does entail some risk. Moreover, coordination is a difficult task, particularly as many areas of ANGAP's nominal responsibility overlap with those of other existing environmental agencies, including DEF, ONE, ANAE, COMODE, FTM, and CNRE. Areas of responsibility and action must be defined and redefined if the ANGAP component of the project is to be successful.

In terms of ANGAP's internal management, delegations of authority

and the clarification of decision making roles will be critical to the organization's success. The roles of ANGAP's two governing bodies, the General Assembly and the Board of Directors, are defined by its statutes. The relationship between ANGAP's management office (Direction General) and these governing bodies will be defined in the by-laws of the association. Due to the special mandate of ANGAP, an implementation agreement will be established between ANGAP and MPAEF which delineates the responsibilities of ANGAP, including appropriate devolution of authority from the Department of Water and Forests (DEF).

The proposed organizational structure of ANGAP is based on an inventory of services needed and how they might be provided. Over the five-year life of SAVEM, ANGAP will be expected to develop organizational capabilities in administrative and financial management, socioeconomic research and analysis, ecology or natural resource management, archival and library design and management, audio-visual and public education capacity, data base design and management, short and long term planning capacity, and evaluation and monitoring capacity. The capability of ANGAP to assume additional functions in grants administration and protected areas management will be evaluated by AID and the GDRM in the third year of its operation.

The analysis concludes that the creation of ANGAP is an important step in the process of increasing Madagascar's ability to manage and protect biodiversity resources, and in assisting Malagasy communities to become less dependent on non-sustainable exploitation of protected areas. The GDRM and NGO's active in the sector are aware that time is a critical element in resolving the problems of Madagascar's diminishing natural resource base. They expect that ANGAP, a specialized non-governmental agency will be able to work on this problem and manage the diverse activities, which require particular and technically focused approaches.

VI. CONDITIONS AND COVENANTS

The conditions precedent for disbursement of project funds and special covenants required from the GDRM as presented in the Project Agreement are presented below:

A. Conditions Precedent

1. Conditions Precedent to First Disbursement

Except as A.I.D. may otherwise agree in writing, prior to any disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D. a written statement setting forth the names and titles of persons holding or acting in the Office of the Grantee and of any additional representatives, and representing that the named person or persons have the authority to act as the representative or representatives of the Grantee, together with a specimen signature of each such person certified as to its authenticity.

2. Conditions Precedent to Award of Contract for Technical Assistance to the National Association for the Management of Protected Areas (ANGAP)

Except as A.I.D. may otherwise agree in writing, prior to the execution of any contract for technical assistance to ANGAP, the Grantee shall furnish or have furnished to A.I.D., in form and substance satisfactory to A.I.D.:

(a) issuance of the "recipisse definitif" by the GDRM Provincial Office in Antananarivo which legally recognizes the establishment of ANGAP as a nongovernmental organization;

(b) an implementation agreement between the Ministry of Livestock, Fisheries, Water and Forests (MPAEF) and ANGAP which identifies ANGAP as an autonomous organization and which delineates the responsibilities of ANGAP including appropriate devolution of authority from Department of Water and Forestry (DEF);

(c) a written statement which identifies the members of the Board of Directors of ANGAP;

3. Conditions Precedent to Disburusement to ANGAP Development Component after December 31,1991

Except as A.I.D. may otherwise agree in writing, no disbursement shall be made for the ANGAP Development component of the Project

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after December 31,1991, unless the Grantee has furnished to A.I.D., in form and substance satisfactory to A.I.D., evidence that ANGAP has the authority to collect revenues from parks and revenues.

B. Special Covenants

1. Project Evaluation

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 thereafter:

(a) evaluation of progress towards attainment of the objectives of the Project;

(b) identification and evaluation of problem areas or constraints which may inhibit such attainment;

(c) assessment of how such information may be used to help overcome such problems; and,

(d) evaluation, to the degree feasible, of the overall development impact of the Project.

2. Long Term Training

(a) From each participant who receives long-term training, the Grantee agrees to obtain and enforce an individual bond in order to guarantee his return.

(b) The Grantee agrees to place returning participants in jobs appropriate to their training for specified periods of time as agreed to by A.I.D.

3. Establishment of ANGAP

The Grantee agrees to cooperate with ANGAP to prepare bylaws, satisfactory to A.I.D., that resolve, among other things, potential conflicts of interest among members and specify internal areas of responsibility.

4. Compatability of Data Base

The Grantee agrees to work with all participating parties in the collection and use of the biodiversity data base to ensure the use of compatible hardware and software systems.

5. Entrance of Project Personnel and Exemption of GDRM taxes and duties

(a) The GDRM agrees to approve entrance into Madagascar of all expatriate personnel of private organizations under contract or grant agreement with A.I.D. for purposes of implementing grant funds and activities under this project.

(b) The GDRM agrees to exempt all commodities and personnel financed by A.I.D. from GDRM taxes and duties. These exemptions will be in accordance with the Economic, Technical and Related Assistance Agreement Between the United States of America and Grantee, dated June 22, 1961.

ANNEXES

ANNEX I : PID Approval Message

ANNEX II : Logical Framework

ANNEX III : Statutory Checklist

ANNEX IV : GDRM Request for Assistance

ANNEX V : Legislative Action Requirements

ANNEX VI : Project Analysis

A. Technical Analysis

1. Protected Areas Development Grants
2. Training
3. Biodiversity Planning Service

B. Financial Analysis

C. Economic Analysis

D. Social Soundness Analysis

E. Institutional/Administrative Analysis

ANNEX VII : Other Donor Assistance

ANNNEX VIII : SOW's for Long-Term TA and Selected Short-Term Personnel

ANNEX IX : Request for Host Country Contribution Waiver

ANNEX X : Detailed Budget Estimates

ANNEX XI : Suggest Criteria for Conservation Action Grants

ANNEX XII : Initial Environmental Examination

I. Project Data
II. Project Goal and Purpose
III. Project Problem
IV. Project Outline and Strategy
V. Environmental Action Recommendation

ANNEX 1 - PID APPROVAL MESSAGE

AID 05/10/90
FM SECSTATE WASHDC
TO RUFHAN/AMEMBASSY ANTANANARIVO PRIORITY 6310
INFO RUFHNR/AMEMBASSY NAIROBI PRIORITY 9109
BT
UNCLAS SECTION 01 OF 04 STATE 148897

AIDAC NAIROBI FOR REDSO

SUBJECT: MASAGASCAR ENVIRONMENTAL PROTECTION AND MANAGEMENT PID (687-0110)

REFERENCE: A) STATE 000853, B) STATE 110664

1. SUMMARY: ECPR APPROVED SUBJECT PID ON APRIL 18 FOR UP TO DOLS 15,950,000 OVER THE LIFE OF PROJECT. MISSION SHOULD PROCEED WITH PP DESIGN IN COLLABORATION WITH REDSO/ESA. PP WILL BE SUBMITTED TO AID/W FOR REVIEW. SUBMITTAL OF PP TO AID/W SHOULD BE NOT LATER THAN AUGUST 1 TO MAKE AUGUST 31 OBLIGATION DATE. END SUMMARY.

2. ECPR MET ON APRIL 18 TO REVIEW MADAGASCAR ENVIRONMENTAL PROTECTION AND MANAGEMENT PID. THE REVIEW WAS CHAIRED BY TIM BORK, AFR/PD, AND ATTENDED BY AFR/ PD, AFR/TR/ANR, GC/AFR, AFR/DP/PAB, AFR/DP/PAP, AFR/EA, USAID/M AGRICULTURE DEVELOPMENT OFFICER J. THOMAS, AND FORMER MISSION DIRECTOR B. DE MARCKEN. THE ECPR APPROVED THE PID FOR UP TO DOLS. °5,950,000 OVER THE LIFE OF THE PROJECT. THE MISSION IS CONGRATULATED FOR A WELL-WRITTEN PID.

3. IN PREPARING THE PP, USAID/M IN COLLABORATION WITH REDSO/ESA SHOULD TAKE INTO ACCOUNT THE FOLLOWING GUIDANCE AND SUGGESTIONS:

A. PROJECT PURPOSE. THE PURPOSE OF THE PROJECT AS STATED IN THE PID IS TO IMPROVE THE MANAGEMENT OF MADAGASCAR'S PRIORITY PROTECTED AREAS AND THE INCOMES OF PEOPLE WHO LIVE ON THE PERIPHERY OF THESE AREAS. THE SECOND PART OF THIS PURPOSE, IMPROVING INCOMES, WOULD NOT APPEAR TO BE IN THE QUOTE MANAGEABLE INTEREST UNQUOTE OF THE MISSION TO ACHIEVE GIVEN THAT LIFE OF PROJECT IS ONLY 5 YEARS AND THE FUNDING FOR PERIPHERAL AREA DEVELOPMENT ACTIVITIES IS RELATIVELY MODEST. IT IS APPARENT FROM THE PID THAT THE ECONOMIC DEVELOPMENT ACTIVITIES TO IS UNDERTAKEN IN PERIPHERAL AREAS ARE MORE IN THE NATURE OF PILOT ACTIVITIES, AND WILL BE BASED ON THE FIRST 1-2 YEARS OF THE PROJECT. A SECOND FACTOR TO CONSIDER WITH RESPECT TO PROJECT PURPOSE IS THAT SELECTED CASE STUDIES EXAMINED JOINTLY BY AID/WWF/WORLD BANK DO NOT UNANIMOUSLY SUPPORT A THEORY THAT INCREASED INCOME IN PERIPHERAL AREAS NECESSARILY LEADS TO A REDUCTION IN THE THREAT TO THE PROTECTED AREAS. ACTIVITIES UNDERTAKEN TO INCREASE INCOMES MAY HAVE NO OR EVEN A NEGATIVE EFFECT ON PROTECTION OF NATURAL RESOURCES. THE MISSION SHOULD RECONSIDER THE INCOME GENERATION PURPOSE OF THE PROJECT. AN ALTERNATIVE WOULD BE AN ANALYTICAL PURPOSE, SUCH AS TO DETERMINE THE TYPES OF ECONOMIC AND SOCIAL INVESTMENTS OR INTERVENTIONS THAT LEAD TO A REDUCED THREAT TO ADJOINING PROTECTED AREAS.

B. RELATIONSHIP TO POSSIBLE NPA. THE ECPR VIEWS THIS PROJECT AS PART OF A LONGER TERM SECTORAL PROGRAM TO ACHIEVE POLICY,

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INSTITUTIONAL, LEGISLATIVE, AND ATTITUDINAL CHANGE. THIS PID IS THEREFORE APPROVED BASED ON AN ASSUMPTION THAT AID WILL SUPPORT A NATURAL RESOURCES NPA (SECTOR SUPPORT PROGRAM) IN FY91 IF ANALYSIS INDICATES THAT THE POLICY AND INSTITUTIONAL REFORM AGENDA OF THE GDRM ARE WORTHY OF SUCH SUPPORT AND IF FUNDING IS AVAILABLE. IN ORDER TO BE IN A STRONG POSITION TO DEVELOP AN NPA, THE MISSION SHOULD REVIEW THE SPECIAL STUDIES COMPONENT OF THIS PROJECT AND ENSURE THAT IN ADDITION TO LONGER TERM STUDIES (E.G. LAND TENURE/USE), ADEQUATE SHORT-TERM ANALYSIS IS INCLUDED IN THE PROJECT TO ADDRESS THE BROADER ENVIRONMENTAL POLICY AND INSTITUTIONAL ISSUES THAT COULD BE THE BASIS FOR AN FY 91 SECTOR SUPPORT PROGRAM. IT IS RECOMMENDED THAT THIS INCLUDE ANALYSIS OF THE STRUCTURE, FUNCTION, AND RECURRENT COST REQUIREMENTS OF THE DEF. IN ORDER TO REVIEW THE PROJECT IN THIS BROADER AND LONGER TERM CONTEXT, THE PP SHOULD INCLUDE A FULL DISCUSSION OF THE RELATIONSHIP OF THE PROJECT TO THE ENVIRONMENTAL ACTION PLAN AND DONOR/GDRM/AID STRATEGIES FOR POPULATION CONTROL AND ENERGY, DUE TO THEIR EFFORT ON THE ENVIRONMENT OVER THE LONGER TERM.

C. INSTITUTIONAL ARRANGEMENTS. THE ECPR RAISED A VERY BASIC CONCERN ABOUT THE PROJECT WHICH WE ARE SURE YOU ALSO HAVE BEEN STRUGGLING WITH. CREATION OF ANGAP WILL FACILITATE IMPLEMENTATION OVER THE SHORT RUN OF SOME OF THE ACTIVITIES AID AND OTHER DONORS WILL WANT TO SUPPORT. IT WILL ALSO BE A USEFUL FOCAL POINT FOR INTERNATIONAL AND NGO SUPPORT. AT THE SAME TIME, ANGAP WILL SIGNAL AN UNUSUAL TRANSFER OF GOVERNMENT POLICY MAKING AND CERTAIN PLANNING AND MANAGEMENT ASPECTS OF A PUBLIC RESOURCES TO A PUBLIC/PRIVATE BODY, WHICH LIKELY WILL HAVE PREFERENTIAL SUPPORT FROM AND COLLABORATIVE TIES WITH DONORS AND INTERNATIONAL NGOS IN THE NATURAL RESOURCES FIELD. WILL THIS RESULT IN PERCEPTION OF THE ANGAP IN THE EYES OF THE GDRM AS A DONOR/NGO-FINANCED AND ORIENTED BODY, AND LEAD TO THE OPPOSITE OF THE DESIRED EFFECT OF THE PROJECT: INTERNALIZING ENVIRONMENTAL CONCERNS WITHIN THE GDRM? THE PP DESIGN SHOULD CLEARLY ADDRESS THE LONG-TERM PROS AND CONS OF THE INSTITUTIONAL APPROACH CHOSEN. (WE UNDERSTAND THERE ARE SOME EXAMPLES OF SIMILAR PUBLIC/PRIVATE NATURAL RESOURCE ORGANIZATIONS BEING SET UP WITH IBRD SUPPORT, WHICH MAY BE USEFUL IN PP DEVELOPMENT. AFR/TR/ANR CAN PROVIDE FURTHER INFORMATION).

D. COMPLEMENTARITY OF RESOURCE MANAGEMENT, ECONOMIC DEVELOPMENT, AND ENFORCEMENT. ECPR DISCUSSED THE IMPORTANCE OF COMPLEMENTARITY AMONG THESE THREE AREAS FOR A SUCCESSFUL INTERVENTION TO FOSTER ENVIRONMENTAL PROTECTION. EVIDENCE FROM CASE STUDIES GENERALLY SUPPORTS A CONCLUSION THAT ECONOMIC DEVELOPMENT MAY BE A NECESSARY BUT IS NOT A SUFFICIENT CONDITION FOR REDUCING THE THREAT TO PROTECTED AREAS. THE PP SHOULD INCLUDE AN ASSESSMENT OF THE LEGAL ENFORCEMENT OF PROTECTED AREAS AND THE CAPACITY OF THE DEF TO SUPPORT PROJECT OBJECTIVES. THE ASSESSMENT SHOULD ADDRESS THE DEF ENFORCEMENT ROLE IN RELATION TO ANGAP AND THE IMPORTANCE OF DEF ENFORCEMENT IN GAZETTED AND OTHER FORESTS IN REDUCING FUTURE PRESSURE ON PROTECTED AREAS. WE UNDERSTAND THAT PROJECT SUPPORT TO DEF HAS BEEN REDUCED TO A MODEST AMOUNT OF TRAINING, BUT THAT MISSION PLANS TO CONSIDER AN ENFORCEMENT COMPONENT UNDER A PLANNED FOLLOW-ON NPA. IF YOUR ASSESSMENT OF THE ENFORCEMENT ISSUE DURING PP PREPARATION LEADS TO A CONCLUSION THAT MORE SUBSTANTIAL PROJECT

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SUPPORT FOR ENFORCEMENT SHOULD BE STARTED SOONER, MISSION MAY EXPAND ITS ACTIVITIES WITH DEF UNDER THIS PROJECT. FYI: ANY PROPOSAL TO PROVIDE ASSISTANCE TO THE DEF (OR ANY OTHER BODY THAT COULD BE VIEWED AS A LAW ENFORCEMENT ENTITY) WOULD BE REVIEWED IN AID/W AS DISCUSSED IN REFTEL A. END FYI.

E. PROJECT EOPS. THE ECPR WAS CONCERNED THAT THE EOPS OF THE PROJECT WERE TOO AMBITIOUS. FOR INSTANCE, GIVEN THE TIME FRAME OF THE PROJECT IT MAY NOT BE POSSIBLE TO HAVE SUSTAINABLE PROTECTION MECHANISMS IN PLACE FOR EACH OF THE 10 PROTECTED AREAS, OR TO HAVE 10 PERCENT OF PERIPHERAL FARMERS USING IMPROVED TECHNOLOGIES. WE WOULD CAUTION YOU TO CONSIDER SCALING THESE OUTPUTS DOWN WHERE APPROPRIATE, SINCE THE PROJECT IS THE FIRST PHASE OF A °5 YEAR PROGRAM AND IS FOCUSSED ON INSTITUTIONAL DEVELOPMENT AND STRENGTHENING, BOTH AT HEADQUARTERS AND IN THE FIELD. THE ECPR WAS ALSO CONCERNED ABOUT THE COMPOSITION OF THE TECHNICAL ASSISTANCE TEAM TO ANGAP. DEVELOPMENT SKILLS SEEM UNDER-REPRESENTED. A RURAL DEVELOPMENT SPECIALIST MAY BE MORE RELEVANT TO NGO NEEDS THAN A RESOURCE ECONOMIST, PARTICULARLY GIVEN THE SUGGESTED REVISION OF PROJECT PURPOSE AS DISCUSSED IN PARA. 3A.

F) PROJECT ASSISTANCE MECHANISMS. THE ECPR REVIEWED THE VARIOUS POSSIBLE ASSISTANCE MECHANISMS FOR IMPLEMENTING THE PROJECT. THE PID PROPOSES THAT THE SPECIFIC DEVELOPMENTAL ACTIVITIES UNDERTAKEN BY AN NGO IN A PERIPHERAL AREA BE DESIGNED AND UNDERTAKEN DURING THE LIFE OF THE NGO GRANT. THE DEVELOPMENT ACTIVITY MAY BE A PRODUCT OF A YEAR OR MORE OF SITE-SPECIFIC ANALYSIS. IN ORDER TO ACHIEVE YOUR OBJECTIVES, IT IS RECOMMENDED THAT YOU CONSIDER TWO ASSISTANCE MECHANISMS AS ALTERNATIVES TO THE ONE-TIME GRANT TO EACH NGO FOR THE FULL LOP: (1) A TWO STAGE GRANT CONSISTING OF A PLANNING GRANT AND AN IMPLEMENTATION GRANT, OR (2) A COOPERATIVE AGREEMENT USING THE COLLABORATIVE ASSISTANCE METHOD (HANDBOOK 13, APPENDIX 6B).

IN EITHER CASE, THE INSTITUTIONAL CONTRACTOR ASSOCIATED WITH ANGAP COULD PROVIDE CRITICAL TECHNICAL SUPPORT TO THE MISSION IN ADMINISTRATION OF THE NGO GRANTS OR COOPERATIVE AGREEMENTS, WHILE LEAVING WITH THE MISSION FULL AUTHORITY AND FINANCIAL CONTROLS WITH RESPECT TO THE GRANTEES. IN USING AN INSTITUTIONAL CONTRACTOR (VERSUS A PSC) FOR THESE PURPOSES, THE MISSION WOULD NEED TO ENSURE THAT IT DOES NOT TREAT THE CONTRACTOR'S EMPLOYEES IN A MANNER THAT DEEMS HIM/HER A DE FACTO PSC, (F.G. A HIGH DEGREE OF SUPERVISION RATHER THAN GIVING TECHNICAL DIRECTIONS, PROVIDING MISSION OFFICE SPACE, ETC.). IT IS SUGGESTED THAT MISSION REVIEW THE PROPOSED ARRANGEMENT WITH THE RLA TO ENSURE PROPER USE OF AN INSTITUTIONAL CONTRACTOR. FYI: AID HAS RECENTLY HAD TO RESPOND TO AN IRS AUDIT ON THIS ISSUE. END FYI.

RECOGNIZING THE NECESSITY FOR AID TO RETAIN CERTAIN ASPECTS OF PROJECT OVERSIGHT IT IS NONETHELESS IMPORTANT, GIVEN STAFF CONSTRAINTS, THAT THE MANAGEMENT BURDEN ON THE MISSION BE NO MORE INTENSIVE THAN NECESSARY. IT MAY BE POSSIBLE FOR AN INSTITUTIONAL CONTRACTOR TO HANDLE MOST TECHNICAL ASPECTS OF AN NGO GRANT SHORT OF FORMAL ACTIONS, SUCH AS APPROVING PAYMENTS. OVERALL CRITERIA FOR THE AWARD OF THE NGO GRANTS OR COOP AGREEMENTS SHOULD BE INCLUDED IN THE PP.

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A SUB-GRANT MECHANISM IS NOT RECOMMENDED DUE TO SIZE OF THE VARIOUS NGO GRANTS (OR COOP AGREEMENTS) AND TO AVOID POTENTIAL CONFLICTS BETWEEN A PRIME GRANTEE AND THE NGOS, PARTICULARLY SINCE THEY ARE LIKELY TO BE DRAWN FROM THE SAME RELATIVELY SMALL FAMILY OF ORGANIZATIONS SPECIALIZING IN RESOURCE MANAGEMENT.

G. RECURRENT COSTS. THE ECPR SHARES YOUR CONCERNS ABOUT THE RECURRENT COSTS OF ANGAP (AS WELL AS DEF). IT WOULD APPEAR THAT IN ANYTHING OTHER THAN PERHAPS THE VERY LONG TERM, PARK FEES AND OTHER REVENUES GENERATED BY THE PROTECTED AREAS WILL BE SUFFICIENT TO COVER THE COSTS INCURRED BY ANGAP. PP SHOULD INCLUDE A FULL ANALYSIS OF RECURRENT COST ISSUES. INCLUDED HERE WOULD BE YOUR INITIAL ANALYSIS OF THE COST OF ESTABLISHING A SUSTAINABLE ENDOWMENT AND THE PROSPECTS FOR THIS COST BEING COVERED BY THE GDRM, DONORS, AND DEBT SWAP.
H. HOST COUNTRY CONTRIBUTION. ECPR REVIEWED WHETHER OR NOT TO WAIVE THE HOST COUNTRY CONTRIBUTION. WE ARE COGNIZANT OF THE FACT THAT, ALTHOUGH THIS PROJECT CAN BE WELL-JUSTIFIED ON LONG TERM DEVELOPMENT GROUNDS, IT ALSO IS THE PRODUCT OF EXTRAORDINARY DONOR, NGO, AND CONGRESSIONAL INTEREST. GIVEN THE RESOURCE CONSTRAINTS AND LOW INCOMES IN MADAGASCAR, A LACK OF GDRM FINANCIAL SUPPORT FOR THE PROJECT SHOULD NOT NECESSARY BE INTERESTED AS A LACK OF COMMITMENT TO THE PROJECT. BALANCED AGAINST THIS ARE THE CONCERNS NOTED IN PARA. 3C THAT THIS ACTIVITY AND ANGAP NOT BE ALIENATED FROM GDRM SENSE OF INTEREST, CONTROL, AND RESPONSIBILITY. THE THE ECPR WOULD BE WILLING TO SUPPORT A WAIVER OF THE 25 PERCENT COST HOST COUNTRY CONTRIBUTION REQUIREMENT IF REQUESTED IN THE PP AND IF BACKED UP BY ANALYSIS OF WHAT THE GDRM CAN AFFORD TO CONTRIBUTE (INCLUDING IN-KIND CONTRIBUTIONS) AND WHY THE GDRM CANNOT CONTRIBUTE THE FULL 25 PERCENT, AND EVIDENCE THAT DESPITE THE LESS THAN USUAL FINANCIAL SUPPORT THE GDRM IS COMMITTED TO THE PROJECT.

I. WID. THE PP SHOULD ADDRESS HOW YOU PROPOSE TO INCORPORATE WID CONCERNS IN THE PROJECT, PARTICULARLY WITH RESPECT TO PARTICIPANT TRAINING AND PERIPHERAL AREA DEVELOPMENT ACTIVITIES.

J. GRAY AMENDMENT. IT WAS POINTED OUT AT THE ECPR THAT THE PID DOES NOT CONTAIN THE REQUIRED DISCUSSION ON THE EXTENT TO WHICH DISADVANTAGED ENTERPRISES HAVE BEEN CONSIDERED FOR INVOLVEMENT IN THE DESIGN AND, IF PRACTICAL, IMPLEMENTATION OF THE PROJECT (SEE REFTEL B ON ADDRESSING GRAY AMENDMENT ISSUES IN PIDS AND PPS). WITH REGARD TO THE DESIGN OF THE PROJECT, IF MISSION IS PLANNING TO CONTRACT FOR SKILLS REQUIRED VIA THE IQC ROUTE, MISSION IS STRONGLY ENCOURAGED TO USE A GRAY AMENDMENT IQC. MISSION IS ALSO REMINDED THAT THE PP MUST CONTAIN A DISCUSSION CONCERNING THE EXTENT TO WHICH DISADVANTAGED ENTERPRISES WILL BE INVOLVED IN THE IMPLEMENTATION OF THE PROJECT. IF MISSION DETERMINES THAT FULL AND OPEN COMPETITION IS THE MOST APPROPRIATE MECHANISM FOR IMPLEMENTATION, MISSION IS ALSO REMINDED THAT FOE ALL FULL AND COMPETITIVE CONTRACTS OVER DOLS. 500,000 THERE IS A REQUIREMENT THAT AT LEAST 10 PERCENT OF THE TOTAL VALUE OF THE PROCUREMENT BE SUBCONTRACTED TO DISADVANTAGED ENTERPRISES. FINALLY, MISSION SHOULD BE AWARE THAT THERE ARE DISADVANTAGED ENTERPRISES WITH THE NECESSARY EXPERIENCE AND CAPABLE OF IMPLEMENTING THIS ACTIVITY. THESE ENTITIES SHOULD BE ENCOURAGED

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TO PARTICIPATE AS PRIME CONTRACTORS. AFR BUREAU MINORITY/SMALL BUSINESS ADVISOR WILL BE HAPPY TO PROVIDE A LIST OF DISADVANTAGED ENTERPRISES CAPABLE OF IMPLEMENTING THIS ACTIVITY, IF MISSION DESIRES, VIA SEPTEL.

K. IEE. THE CATEGORICAL EXCLUSION HAS BEEN APPROVED BY THE BUREAU ENVIRONMENTAL OFFICER FOR ALL PROJECT COMPONENTS EXCEPT THE NGO GRANTS FOR ACTIVITIES IN SPECIFIC PROTECTED AREAS AND THEIR PERIPHERIES. FOR THESE GRANTS, THRESHOLD DECISIONS WILL NEED TO BE DEFERRED UNTIL SPECIFICS OF THE GRANTS ARE KNOWN. THE USAID/M MISSION DIRECTOR WILL BE DELEGATED AUTHORITY TO APPROVE THESE GRANT-SPECIFIC IEES WITH THE CONCURRENCE OF THE RLA AND REGIONAL ENVIRONMENTAL OFFICER.

I. COMPOSITION OF PP TEAM. RURAL DEVELOPMENT ACTIVITIES ARE AN INTEGRAL PART OF THIS PROJECT. ECPR IS CONCERNED THAT DURING THE COURSE OF PROJECT DESIGN, RURAL DEVELOPMENT ISSUES ARE ADEQUATELY ANALYZED. PP SHOULD INCLUDE PERSONNEL WHO CAN GIVE ADEQUATE ATTENTION TO RURAL SOCIO-CULTURAL ISSUES, RURAL ECONOMIC DEVELOPMENT ISSUES, AND ECONOMIC ANALYSIS OF POSSIBLE PERIPHERAL AREA DEVELOPMENT ACTIVITIES, AND CAN ASSIST MISSION IN REFINING THE PROJECT PURPOSE WITH RESPECT TO NECESSARY PERIPHERAL AREAS. AID/W STANDS READY TO ASSIST AS NECESSARY.

4. IT WAS DECIDED THAT DUE TO THE COMPLEXITY OF THE PROJECT AND SPECIAL AID/W AND CONGRESSIONAL INTEREST, THE PP WILL BE REVIEWED IN AID/W. THE PP SHOULD BE SUBMITTED NOT LATER THAN AUGUST °. CLOSE COLLABORATION WITH REDSO ON PROJECT DESIGN IS ENCOURAGED. TO EXPEDITE DEVELOPMENT OF PROJECT AND COMPLY WITH DEADLINE, WE SUGGEST THAT REDSO REVIEW BE HELD IN MADAGASCAR.

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ANNEX 2 - LOGICAL FRAMEWORK

ANNEX II: LOGICAL FRAMEWORK Sustainable Approaches to Viable Environmental Management Project
Page 1 (SAVEM, 687-0110) August 12, 1990

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS:
Goal:			(Goal to Supergoal)
To establish sustainable human and natural ecosystems in areas of Madagascar where biodiversity is threatened.	1. No deterioration in the biodiversity of Madagascar as measured by approprite indicies. 2. Better understanding of nature of biodiversity in Madagascar. 3. Better understanding of the interactions between humans & other members of Madagascar's ecosystems. 4. Size of Madagascar's 50 protected areas (PA's) stabilized at sustainable level.	1. Comparison of baseline & endline census dat on numbers of species in ecosystem and genetic variation within species. 2. Dissemination of research findings on nature of biodiversity. 3. Dissemination of research findings. 4. Agreement between GDRM & populations of peripheral zones (PZ's) on size of all PA's.	Maintenance of sustainable ecosystems will lead to stabilized or increased availability of the resources on which Malagasy peopld depend for their livelihood.
Project Purpose:			(Purpose to Goal)
To identify and initiate systems (including institutions, methods, and behaviors) for the management of protected areas of Madagascar and the peripheral zones adjoining those areas on a sustainable basis.	1. Up to six hypotheses concerning the management of sustainable, interactive development efforts developed & in process of being tested in 6 PA's & adjacent PZ's. 2. Populations of six PZ's using improved production adaptations that decrease need to rely on non-sustainable use of resources located within adjacent PZ's. 3. Populations of six PZ's involved in sustainable, controlled use of resource in adjacent PA's. 4. Increased public awareness of prospects for interactive management of PA's & PZ's.	1. Review and approval of up to 6 NGO proposals for interactive development efforts in PA's & PZ's; mid-term and final evaluations to verify implementation and validity of hypotheses. 2. Comparison of baseline & endline data on agricultural practices and PA resource use; grantee records. 3. Site visits to PA's & PZ's; interviews with NGO, GDRM, & private individuals in PZ's. 4. Sample of public opinion/awareness.	Identification and testing of various hypotheses concerning the management of sustainable, interactive development efforts in PA's & PZ's will lead to development of proven methodologies for sustaining threatened ecosystems.

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ANNEX II: LOGICAL FRAMEWORK Sustainable Approaches to Viable Environmental Management Project
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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS:
Outputs:			(Outputs to Purpose)
1. Establishment of a National Association for Management of Protected Areas (ANGAP) with sufficient authorities & capabilities to perform its management function.	1.1 Responsibilities of ANGAP & other organizations working in NR sector clarified. 1.2 Demonstrated ANGAP organizational capacity in administrative and financial management. 1.3 National standards and site-specific procedures established for effective coordination of conservation & development activities in PA's & PZ's. 1.4 ANGAP on-the-ground tracking system established and providing information on NGO activities. 1.5 ANGAP has developed & proposed policies for promoting communication among & between NGO's & entities active in sector. 1.6 Data generated by BPS being used in ANGAP planning efforts.	1.1 Issuance of GDRM decrees or institutional by-laws clarifying respective responsibilities. 1.2 Evaluation of ANGAP internal procedures; non-Federal audit. decree. 1.3 Review of ANGAP reports & policy recommendations; site visits. 1.4 Review of ANGAP reports; interviews with local NGO's. 1.5 Review of ANGAP policy recommendations. 1.6 Review of BPS & ANGAP reports & publications.	ANGAP will be capable of participating, and willing to participate, in design & testing of hypotheses re the management of sustainable interactive development effors in PA's and PZ's.
2. Establishment of a Biodiversity Planning Service within ANGAP capable of tracking & communicating information on biodiversity conservation.	2.1 BPS receiving data from field monitors, NGOs, and other sources. 2.2 Unified protocol in place on data collection & management. 2.3 GIS compatible with other GIS systems in Madagascar in-place. 2.4 BPS using data gathered to monitor activities in PA's & PZ's throughout Madagascar.	2.1 Examination of sources of BPS data. 2.2 GDRM issuance of protocol on data collection & management. 2.3 Comparison of BPS GIS with other similar systems in Madagascar. 2.4 Analysis of BPS reports & publications.	2. BPS will provide a convenient, uniform source of information for those seeking to identify sustainable systems for natural resource management.
3. Management plans being implemented in up to 6 PA's & PZ's	3.1 Up to six PA's formally registered with boundaries marked & core & buffer zones designated. 3.2 Infrastructure of up to six PA's improved. 3.3 Local populations participating in definition and implementation of plans for controlled, sustainable use of resources of six PA's. 3.4 Systems for registering plant & animal species in place in up to six PA's. 3.5 Decrease in frequency of non-sustainable resources use in six PA's & adjacent PZ's. 3.6 Information flow established between management of PA's & ANGAP BPS.	3.1 Park records & patrol reports; inspection of boundaries. 3.2 Site visits to verify marked trails, adequate huts & roads, etc. 3.3 Presence of buffer & core zones; park records; interviews with GDRM & NGO representatives & other members of local communities. 3.4 Grantee records. 3.5 Site inspections in sample portions of PA's & PZ's; grantee records. 3.6 Examination of grantee & BPS reports; interviews with grantee & BPS staff.	3.1 Local populations willing to adopt alternate activities to compensate for decreased access to resources of PA's. 3.2 Alternate activities can quickly replace traditional income sources.

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ANNEX II: LOGICAL FRAMEWORK Sustainable Approaches to Viable Environmental Management Project
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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS:
Outputs (cont.):			(Outputs to Purpose)
4. Support for Malagasy individuals and communities interested in conserving biodiversity in 50 priority areas.	4. Issuance by Grant Manager (GM) of up to 100 Conservation Action Grants of less than $25,000 each.	4. GM records; interviews with CAG recipients.	4. Support to locally initiated conservation efforts will generate important lessons re the development of techniques for sustainable, interactive management of threatened natural resources.
5. Enhanced managerial & technical capacity of GDRM & local NGO personnel active in natural resource management.	5.1 ANGAP Staff: a. 18 PM's short-term U.S. & 3rd country training. b. 175 PM's in-country short-term training. c. 30 PM's 3rd-country study tours. 5.2 NGO Training: a. 15 PM's 3rd-country study tours. b. 10 PM's 3rd-country seminar training. c. 24 PM's of NGO orientation training. d. 40 PM's NGO planning & design training. e. 25 PM's NGO Management training. f. 150 PM's technical training. 5.3 60 PM's in-country training in SIM for BPS employees.	5. GM and ANGAP records.	5. Improved staff skills will contribute to the development & testing of methods for sustainable management of threatened natural resources.

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ANNEX II: LOGICAL FRAMEWORK Sustainable Approaches to Viable Environmental Management Project
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NARRATIVE SUMMARY	IMPLEMENTATION TARGETS:	MEANS OF VERIFICATION	ASSUMPTIONS:
Inputs:			(Inputs to Outputs)
1. ANGAP Development a. Long-Term TA i) Mgt. Advisor ii) RR Advisor b. Short-term TA c. Commodity Support d. Local Operating Costs: e. Training	1. ANGAP Development a. 72 PM's i) 36 PM's ii) 36 PM's b. 33 PM's c. $244,955 d. $366,600 e. See Above	1. Contractor billings; contractor reports; site visits.	1.1 GDRM willing to delegate effective responsibilities to ANGAP. 1.2 ANGAP will prove willing and able to coordinate effectively with other NGO's.
2. Biodiversity Planning Service a. Long-Term TA b. Short-Term TA c. Commodity Support d. Training	2. Biodiversity Planning Service a. 24 PM's b. 75 PM's c. $726,050 d. See Above	2. Grantee billings; grantee reports; site visits.	2. Malagasy trainees capable of learning GIS and other techniques required to operate BPS.
3. Grant Management a. Long-Term TA i) Chief of Party ii) CAS Specialist iii) Admin/Finance Spec. b. Short-Term TA c. Commodity Support d. Local Operating Costs e. Training	3. Grant Management a. 84 PM's i) 60 PM's ii) 36 PM's iii) 36 PM's b. 27 PM's c. $89,635 d. $460,500 e. See Above	3. Grantee billings; grantee reports; site visits.	
4. Protected Area Development Grants	4. Up to 8 grants totalling $10 million.	4. Grantee billings; grantee reports; site visits.	4. GDRM & local populations willing to allow & participat in controlled, sustainable use of resources of PA's.
5. Conservation Action Grants	5. Up to 100 grants totalling $2 million.	5. Grantee billings; grantee reports; site visits.	
6. Project Coordination & Startup a. Long-Term TA b. Short-Term TA c. Commodity Support d. Local Operating Costs	6. Project Coordination & Startup a. 60 PM's b. 17 PM's c. $23,530 d. $242,000	6. Contractor billings; contractor reports.	

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ANNEX III - STATUTORY CHECKLIST

5C(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.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE?	Yes
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?	Yes

A. GENERAL CRITERIA FOR PROJECT

1. FY 1990 Appropriations Act Sec. 523; FAA Sec. 634A. If money is to be 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 was submitted on September 7, 1990 and tn 15 day workshop period expired without objection on September 21.
2. FAA Sec. 611(a). 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?	N/A
3. FAA Sec. 611(a)(2). If legislative action is required within recipient country with respect to an obligation in excess of $500,000, what is the basis for a reasonable expectation that such action will be completed in time to permit orderly accomplishment of the purpose of the assistance?	Change in fiscal law to provide ANGAP with authoriz ation to collect revenues directly from protected areas is a CP for disburs- ment of FY 1992 project funds as well as a conditio of disbursement of FY 1992 project funds as well as a condition of disbursement of WB funds to ANGAP. The legislature has previously approved similar measures.

4.	FAA Sec. 611(b); FY 1990 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.)	N/A
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?	N/A
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.	No
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.	(a) Project will encourage efforts of the country to increase tourism through improved infrastructure in protected areas and as a means to conserve these areas.
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 encourage U.S. private trade and investment particularly these companies which promote agro industry by demonstrating the GDRM's interest in preserving biodiversity.

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.	GDRM will provide 20% of the total value of EAP overall program.
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 1990 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?	N/A
12. FY 1990 Appropriations Act Sec. 547. 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, the manufacture 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 (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel?	No
13. FAA Sec. 119(g)(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;	Yes
(b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other	Yes

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?	Yes No
14. FAA Sec. 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)?	N/A
15. FY 1990 Appropriations Act, Title II, under heading "Agency for International Development." If assistance is to be made to a United States 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?	U.S. PVO not yet identified
16. FY 1990 Appropriations Act Sec. 537. 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.?	PVO not yet identified
17. FY 1990 Appropriations Act Sec. 514. If funds are being obligated under an appropriation account to which they were not appropriated, has the President consulted with and provided a written justification to the House and Senate Appropriations Committees and has such obligation been subject to regular notification procedures?	N/A

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).	Agreement date not yet set.
19. Trade Act Sec. 5164 (as interpreted by conference report), amending Metric Conversion Act of 1975 Sec. 2 (and as implemented through A.I.D. policy). Does the assistance activity use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms? Are bulk purchases usually to be made in metric, and are components, subassemblies, and semi-fabricated materials to be specified in metric units when economically available and technically adequate? Will A.I.D. specifications use metric units of measure from the earliest programmatic stages, and from the earliest documentation of the assistance processes (for example, project papers) involving quantifiable measurements (length, area, volume, capacity, mass and weight), through the implementation stage?	Yes
20. FY 1990 Appropriations Act, Title II, under heading "Women in Development." Will assistance be designed so that the percentage of women participants will be demonstrably increased?	Yes

21. FY 1990 Appropriations Act Sec. 592(a). If assistance is furnished to a foreign government under arrangements which result in the generation of local currencies, has A.I.D. (a) required that local currencies be deposited in a separate account established by the recipient government, (b) entered into an agreement with that government providing the amount of local currencies to be generated and the terms and conditions under which the currencies so deposited may be utilized, and (c) established by agreement the responsibilities of A.I.D. and that government to monitor and account for deposits into and disbursements from the separate account? N/A

Will such local currencies, or an equivalent amount of local currencies, be used only to carry out the purposes of the DA or ESF chapters of the FAA (depending on which chapter is the source of the assistance) or for the administrative requirements of the United States Government? N/A

Has A.I.D. taken all appropriate steps to ensure that the equivalent of local currencies disbursed from the separate account are used for the agreed purposes? N/A

If assistance is terminated to a country, will any unencumbered balances of funds remaining in a separate account be disposed of for purposes agreed to by the recipient government and the United States Government? N/A

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FY 1990 Appropriations Act Sec. 546 (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: (1) 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 (2) in support of research that is intended primarily to benefit U.S. producers?	N/A
b. FAA Sec. 107. Is special emphasis placed on use of appropriate technology (defined as relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?	Yes
c. FAA Sec. 281(b). Describe extent to which the activity 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 civic education and training in skills required for effective participation in governmental and political processes essential to self-government.	SAVEM **supports** institutional development of ANGAP, established as a private association, with a board of directors balancing public and private sector. Creation of this more flexible agency capable of coordinating activities in protected area was the initiation of the GDRM.

d. FAA Sec. 101(a). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	Yes
e. FAA Secs. 102(b), 111, 113, 281(a). Describe extent to which activity will: (1) 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; (2) 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; (3) support the self-help efforts of developing countries; (4) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (5) utilize and encourage regional cooperation by developing countries.	Activities in peripheral zone to protected areas to be fund must adhere to following criteria: - community involvement in decisions - project selection and design was community based - participation of women - support self help activities of communitie
f. FAA Secs. 103, 103A, 104, 105, 106, 120-21; FY 1990 Appropriations Act, Title II, under heading "Sub-Saharan Africa DA." Does the project fit the criteria for the source of funds (functional account) being used?	Yes
g. FY 1990 Appropriations Act, Title II, under heading "Sub-Saharan Africa, DA." Have local currencies generated by the sale of imports or foreign exchange by the government of a country in Sub-Saharan Africa from funds appropriated under Sub-Saharan Africa, DA been deposited in a special account established by that government, and are these local currencies available only for	N/A

use, in accordance with an agreement with the United States, for development activities which are consistent with the policy directions of Section 102 of the FAA and for necessary administrative requirements of the U. S. Government?	
h. 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)?	Yes
i. 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)?	Cost sharing requirement is being waived as Madagascar is RLD country.
j. 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 stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority?	Yes
k. 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.	Same as BIC.
l. FY 1990 Appropriations Act, under heading "Population, DA," and Sec. 535. 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 sterilizations?	No
Are any of the funds to be made available to any organization or program which, as determined by the President, supports or participates in the management of a program of coercive abortion or involuntary sterilization?	No
Will funds be made available only to voluntary family planning projects which offer, either directly or through referral to, or information about access to, a broad range of family planning methods and services?	No
In awarding grants for natural family planning, will any applicant be discriminated against because of such applicant's religious or conscientious commitment to offer only natural family planning?	N/A
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
m. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes
n. FY 1990 Appropriations Act Sec. 579. What portion of the funds will be available only for activities of economically and socially disadvantaged 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	Institutional contract for technical support to AWGAP will be competed among Gray Amendment entities.

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)?

o. 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: (1) stress the importance of conserving and sustainably managing forest resources; (2) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (3) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (4) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices; (5) help conserve forests which have not yet been degraded by helping to increase production on lands already cleared or degraded; (6) conserve forested watersheds and rehabilitate those which have been deforested; (7) support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (8) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (9) conserve biological diversity in forest areas by supporting 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

Yes

(1) Yes

(2) Yes

(3) Yes

(4) Yes

(5) Yes

(6) Yes

(7) Yes

(8) Yes

(9) Yes

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; (10) seek to increase the awareness of U.S. Government agencies and other donors of the immediate and long-term value of tropical forests; and (11)/utilize the resources and abilities of all relevant U.S. government agencies?

(10) Yes

(11) Yes

p. 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: (1) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and (2)/take full account of the environmental impacts of the proposed activities on biological diversity?

Yes

Yes

q. FAA Sec. 118(c)(14). Will assistance be used for: (1) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; or (2) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas?

No

No

r. FAA Sec. 118(c)(15). Will assistance be used for: (1) activities which would result in the conversion of forest lands to the rearing of livestock; (2) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undergraded forest lands; (3) the

No

No

colonization of forest lands; or (4) the construction of dams or other water control structures which flood relatively undergraded 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?

No

No

s. FY 1990 Appropriations Act Sec. 534(a). If assistance relates to tropical forests, will project assist countries in developing a systematic analysis of the appropriate use of their total tropical forest resources, with the goal of developing a national program for sustainable forestry?

Yes

t. FY 1990 Appropriations Act Sec. 534(b). If assistance relates to energy, will such assistance focus on improved energy efficiency, increased use of renewable energy resources, and national energy plans (such as least-cost energy plans) which include investment in end-use efficiency and renewable energy resources?

N/A

Describe and give conclusions as to how such assistance will: (1) increase the energy expertise of A.I.D. staff, (2) help to develop analyses of energy-sector actions to minimize emissions of greenhouse gases at least cost, (3) develop energy-sector plans that employ end-use analysis and other techniques to identify cost-effective actions to minimize reliance on fossil fuels, (4) help to analyze fully environmental impacts (including impact on global warming), (5) improve efficiency in production, transmission, distribution, and use of energy, (6) assist in exploiting nonconventional renewable energy resources, including wind, solar, small-hydro, geo-thermal, and advanced

N/A

biomass systems, (7) expand efforts to meet the energy needs of the rural poor, (8) encourage host countries to sponsor meetings with United States energy efficiency experts to discuss the use of least-cost planning techniques, (9) help to develop a cadre of United States experts capable of providing technical assistance to developing countries on energy issues, and (10) strengthen cooperation on energy issues with the Department of Energy, EPA, World Bank, and Development Assistance Committee of the OECD. N/A

u. <u>FY 1990 Appropriations Act, Title II, under heading "Sub-Saharan Africa, DA"</u> (as interpreted by conference report upon original enactment). If assistance will come from the Sub-Saharan Africa DA account, is it: (1) 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; (2) being provided in accordance with the policies contained in section 102 of the FAA; (3) being provided, when consistent with the objectives of such assistance, through African, United States and other PVOs that have demonstrated effectiveness in the promotion of local grassroots activities on behalf of long-term development in Sub-Saharan Africa; (4) 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

(1) Yes

(2) Yes

(3) Yes

(4) Yes

into account, in assisted policy reforms, the need to protect vulnerable groups; (5) 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 networks, to maintain and restore the renewable 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 especially to those outside the formal educational system and to improve primary education, and to develop income-generating opportunities for the unemployed and underemployed in urban and rural areas? (5) Yes

v. International Development Act Sec. 711, FAA Sec. 463. If project will finance a debt-for-nature exchange, describe how the exchange will support protection of: (1) the world's oceans and atmosphere, (2) animal and plant species, and (3) parks and reserves; or describe how the exchange will promote: (4) natural resource management, (5) local conservation programs, (6) conservation training programs, (7) public commitment to conservation, (8) land and ecosystem management, and (9) regenerative approaches in farming, forestry, fishing, and watershed management. N/A

w. FY 1990 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 region as originally obligated, and have the House and Senate Appropriations Committees been properly notified? N/A

ANNEX IV - GDRM REQUEST FOR ASSISTANCE

ADO

"Tanindrazana-Tolom-piavotana-Fahafahana
MINISTERE DES AFFAIRES ETRANGERES
Direction des Relations Bilatérales

N° 10499 -AE/DRB/2b/Am.241

LE MINISTERE DES AFFAIRES ETRANGERES DE LA REPUBLIQUE DEMOCRATIQUE DE MADAGASCAR présente Ses compliments à l'AMBASSADE DES ETATS-UNIS D'AMERIQUE et a l'honneur de recourir à Son obligeante entremise en vue de solliciter une assistance de l'USAID pour un montant d'environ 28,1 Millions de dollars destinés à financer les approches durables pour une gestion rationnelle de l'Environnement (Sustainable Approches to Viable Environment Management SAVEM).

LE MINISTERE DES AFFAIRES ETRANGERES DE LA REPUBLIQUE DEMOCRATIQUE DE MADAGASCAR remercie l'AMBASSADE DES ETATS-UNIS D'AMERIQUE de la suite qu'elle jugera pouvoir réserver à la présente Note et saisit cette occasion pour Lui renouveler les assurances de sa haute considération.

AMBASSADE DES ETATS-UNIS
D'AMERIQUE
=ANTANANARIVO=

Antananarivo, le 22 AUG 1990

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ANNEX V - LEGISLATIVE ACTION REQUIREMENTS

Annex V: Legislative Action Requirements: FAA 611 (a)

Analysis of legislative requirements and the political and administrative environment for the success of the SAVEM project strongly indicates that legislative actions required to accomplish the project's objectives can be expected to be achieved in a timely manner following execution of the Project Grant Agreement.

The only legislative action requirement in the context of the SAVEM project is a new fiscal law that would provide ANGAP with the authority to collect revenues directly from protected areas. These would include entrance fees, concession sales, and other fees generated from the tourism industry. Currently, these revenues are collected by MPAEF and transferred to the Public Treasury.

During negotiations with the World Bank concerning funding of the Environment Program I (EP-I), the GDRM agreed that as a condition of disbursement of funds to ANGAP, legislative actions would be taken to enable ANGAP to collect park revenues directly. Therefore, the NORAD financial commitment to ANGAP of $1,060,000 will not be released until the government fulfills this condition.

In order to activate the process, the Ministry of Livestock, Fisheries, Water and Forests (MPAEF) is required to make a request to the Ministry of Finance for a change in the fiscal law governing the collection and disbursement of park revenues. The Ministry of Finance then prepares the fiscal law which is submitted to the National Assembly during the month of June. The National Assembly then votes on the proposed fiscal law during its session in October/November. After approval, a proclamation of the law is made by the President and the law goes into effect.

Since ANGAP was not yet legally established in June 1990, MPAEF and the Ministry of Finance were unable to submit the request to the National Assembly for the 1990 session. Consequently, the GDRM will not be able to make a request for this change in the fiscal law until the 1991 session. Execution of this legislative action serves as a condition precedent for disbursement of FY 1992 project funds. (See Section VI of the Project Paper.) The legislature has previously approved similar measures.

ANNEX VI - PROJECT ANALYSES

ANNEX VI: PROJECT ANALYSES

A. Technical Analyses

1. Protected Area Development Grants

This portion of the technical analysis has several objectives. First, it seeks to describe in more detail the types of activities that USAID expects grantees will carry out under this component of SAVEM. Second, it addresses the question of whether there are institutions with the technical and managerial capacity required to carry out the activities proposed in the project description. Finally, it describes some of the necessary institutional linkages that will be formed between the various actors involved in carrying out this component.

a. The Philosophy of the PADG's

1) Conservation through the Economic Motivation of Peripheral Villages

The theme of protection through the economic motivation of peripheral villages is not unique to this project. It has in fact long been well entrenched in both host country and expatriate dialogue about the environment in Madagascar. Nonetheless, on the basis of several field visits to ongoing project sites and of conversations with farmers, livestock raisers, and project personnel during PP design, USAID has concluded the following.

-- Few if any examples of successful economic interventions in peripheral zones in Madagascar can be found.

-- The principal cause is not lack of information, as occasionally stated. The menu of potential economic program alternatives available is limited. Thus, a pre-project needs assessment for any particular village or cluster of villages could be carried out in less than a month using rapid rural assessment techniques.

-- The absence of significant project-supported economic contributions in peripheral areas can be attributed to the priorities of the organizations currently functioning in those areas. Most active projects in this sector emphasize conservation efforts within protected areas, rather than economic development efforts outside them.

SAVEM therefore will break with current practice and launch a large-scale attempt to deal with the issue of economic change in the communities surrounding protected areas. In conformity with the biodiversity objectives underlying the project, the project scenario set forth in Section I.C of this Project Paper gives explicit attention to park management and protection issues. But it also seeks to link these conservation activities to economic change in the periphery. Indeed, the design of the Protected Area Development Grant (PADG) component of SAVEM is based on the proposition that there is a potential causal link between economic development and conservation.

Grants made under SAVEM are expected to trigger a heterogeneous cluster of forest-contiguous developmental activities, taking precautions against negative ecological impacts, by grantees endowed with operational autonomy. Once the different activities are underway, a research hypothesis may be expressed: are there some types of developmental interventions which appear more effective than others in leading to conservation? Before SAVEM, there were no significant forest-related development activities to be observed in Madagascar and the hypothesis remained untested. By the completion of SAVEM, however, researchers will have available a large number of communities engaged in activities that permit some empirical assessment of the differential ecological impact of different types of developmental activities.

2) Sustainable Revenue Generation from Activities Within Protected Areas

SAVEM will support both activities within protected areas and village-based activities in the peripheral zones adjacent to them. Activities within the protected areas must entail not only systematic monitoring and protection efforts, but also the diversion of as many forest-generated income streams as possible directly to the villages. These revenue streams can themselves be divided into:

-- Those that are intrinsically generated (appropriate foraging and wood-extraction activities by humans and appropriate grazing by livestock or animals); and

-- Those that are extrinsically generated (ranger salaries, tourist fees, and other tourism-derived cash flows).

Certain reserves, by virtue of their small size, special vulnerability, or other factors, can be protected only by total exclusion of all traditional economic activities. The same may hold true for certain "core areas" within larger reserves. There are, however, two countervailing considerations that make it unwise to assume that the grant component of SAVEM need necessarily entail total cessation of traditional activities.

-- The scientific jury is still out with respect to the potential for sustainable, non-destructive traditional uses of the forest. This must be examined on a site by site basis.

-- Even if a technical judgment is made that a given reserve can be protected only if all human use is excluded, experiences both in Madagascar and elsewhere do not lead to optimism about the feasibility of that objective.

For these scientific and pragmatic considerations, SAVEM will opt for a gradual, evolutionary model of shifting resource-procurement behavior within the protected areas. The project will attempt to create the economic and institutional incentives whereby peripheral populations modify their behavior toward the resources of those areas. There is little precedent for keeping villagers out of the forest; there are good reasons, however, derived from both anthropological theory and case studies, for supposing that they can be motivated to modify what they do when there.

3) Alternate Revenue-Producing Activities in the Peripheral Zones

These considerations notwithstanding, the volume of short term revenue streams from traditional forest uses will almost always decrease with the creation of a protected area. The likely restriction of ranger salaries and tourist-derived income to a small number of households will prevent these extrinsically derived revenue streams from compensating most households for the loss. For this reason SAVEM will support a second component of special economic development activities on the periphery of the forest. The overwhelming consensus of villagers interviewed during PP design was that the installation, repair, or upgrading of small local gravity fed irrigation systems is the highest priority need. In addition, SAVEM will support support road building, tree planting, vegetable gardening, and other credible economic activities proposed by local communities.

b. The Concept of Interactive Management

There has been a tendency to discuss the types of interventions SAVEM will undertake along a strict dichotomy between those activities within and those activities outside protected areas. The unique nature of SAVEM lies in its potential for breaking down this distinction by supporting the interactive, sustainable use of resources within those areas to help foster and maintain the economic well-being of the communities outside those areas. The interactive management plans that SAVEM will fund will seek to integrate conservation activities in the protected areas with developmental activities in the peripheral zones, realizing the linkage between these two areas that classical forestry and park management have failed to acknowledge.

In most of the developing world, the failure to integrate these two components has cut off local communities from much of their traditional resource base (trees, wildlife and in some cases traditional grazing lands). In most cases it has put local communities at odds with the government natural resource managers, and has resulted in poaching and mining of the resources of the reserved areas by the local community. The local community perceives a need to use the protected resources, but does not perceive a need to conserve those resources. Those resources do not belong to them, and are of little value other than for use today.

In most instances, as is the case in Madagascar, natural resource agencies are understaffed and are required to cover large geographical areas relative to their staffing patterns. Given these limited staffing patterns, it is recognized today, that the only way for a natural resource manager to have a chance of assuring the long term sustainability of the natural resource base is through collaboration with (and not opposition from) the traditional resource users living in the vicinity of the forest or ecological zone to be managed.

The old ways of policing and guns do not provide a long term solution, only a stop gap, and are not a viable management tool except in extreme cases. The best long term solution is involvement of the rural community in participatory development of park management plans. This will imply compromise by all parties. It may very well be found that certain natural resources in the parks are a necessity for the very survival of the surrounding human populations. These might include the need to collect medicinal plants, produce honey or harvest crawfish. Depending on the protected area, certain activities as pit sawing might even be considered under a managed situation, this being a low impact activity and a major income generator. The exact natural resource management activities permissible will be area-specific, and must be worked out between the local community and the protected area managers.

Limited access in a collaborative effort to manage certain of the natural resources within protected areas may prove more fruitful in the long term and than would a complete ban on using those resources. In most of the world, banning access to a resource has always failed in the long term unless local communities perceive a need or benefit from the ban (e.g., giving a resource the opportunity to recover from over exploitation). Enforcement is possible when local people agree with the resource management plan and for the most part stay within the law. Then enforcement is only necessary against the minority who do not obey the law. Where there is a perceived need to use a resource, it is better to help people manage what they have, permitting rather than cutting off access. The latter course often will result in poaching and continual confrontation between the protected area manager, who really becomes a policeman, and the resource users. Furthermore, it is not evident to what degree resource use is of sociocultural importance versus a necessity. In either case it may be difficult to completely stop.

c. Implementing Interactive Management Plans

As noted above, many of the interventions necessary to help in community development may be obvious (e.g. irrigation expansion and improvement, soil conservation and agroforestry to stabilize hillside agriculture). However, it is not evident that there will be a causal relationship between these interventions (e.g. irrigation and roads) and decreased pressure on the forest. The identification of interventions that link development to forest conservation will require in depth studies in the areas of social ecology and cultural anthropology, as well as fundamental ecological research. This information will be required to provide a basis for development interventions which will either help the rural community manage forest resources on a controlled and sustainable basis or find viable on-farm alternatives to in-forest use.

It is assumed that park planning will be reiterative in nature. To devise these plans, the recipients of Protected Area Development Grants under SAVEM will have to conduct rapid surveys of various types. These surveys, which are described briefly below, should be carried out in collaboration with the rural community. Results should be used to draw up preliminary interactive management plans.

As results from longer term, in depth surveys become available, the decision making process will improve. As understanding improves on what (if any) peripheral zone development and on-farm activities help displace the need to use the forest, the community and the park managers can make changes in the management plan.

1) Required Socio-Ecological Surveys

Both rapid rural appraisals and long-term detailed knowledge, attitude and practice studies will be required to determine on-farm needs (e.g. improved water systems, bunding and terracing, agroforestry, improved seed varieties, integrated pest management) and in-forest use (e.g. medicinal plants, pit sawing, vines and marsh grasses handicrafts, building materials, charcoal and firewood, grazing, hunting and gathering). This information will help to better understand the linkages and dependencies between the peripheral zone communities and the natural resources which they extract from the protected areas. Managers of these areas will better be able to determine where there may be possible on farm alternatives to the continued use of in-forest resources. They will also help them devise ways to manage the in forest resources for sustainable extraction where no viable alternative is evident.

2) Ecological Surveys

Ecological surveys will be required to determine the diversity of each protected area in a quantitative manner (e.g. Shannon-Weaver Index), and to identify critical habitats that may need complete protection in order to preserve rare and endangered or unique endemic flora and fauna such as the lemurs. The diversity indices will be used for long term monitoring to determine the ecological health of the area and to observe the evolutionary changes that may occur from global climate change, local anthropomorphic activities or other unforeseen factors. This information will become an important part of the ecological data base that will be used by the protected area manager to make management decisions and to determine research priorities.

Ecological surveys will be used to identify critical habitat within the protected area that should be cut off from human interaction other than for observation by tourists or study by scientists. This protected zone would in essence be the classical Core Zone. Depending on the particular protected area and its size relative to the critical habitat, the core zone could include the entire protected area. Ultimately, the Area manager and the local communities will have to work together to reach agreement on the boundaries of this zone. The remaining portion of the protected area between the core zone and the peripheral zone (The Buffer Zone) would be managed for sustainable use in collaboration with the local community.

3) Natural Resource Management Surveys

This is a relatively new concept. However, this approach is being used increasingly in the developing world as it is realized that the subsistence lifestyles of most rural communities rely very heavily on some use of forest resources. Natural resource inventories will determine sustainable yields of forest products that the socioecologic surveys have identified as economically valuable or as necessary for subsistence by the peripheral zone community (e.g. sustainable yields of lumber, charcoal/firewood, crawfish, orchids, fern trees, medicinal plants, vines and reeds for handicrafts, etc.).

During these inventories, resources will be identified that are not currently used, but which have potential for sustainable, income-generating exploitation. Once the buffer zone is delineated, this information could be be used to establish a management plan for the sustainable extractive use of natural resources in the buffer zone which the peripheral communities can use to generate income and/or for subsistence needs.

Through this process, interactive protected area management plans will evolve which take into account both ecological issues and the needs of the local community to benefit from these areas on a managed and sustainable basis.

4) Ecological Inventory Methods

At an early stage in the project, standard methodologies for ecological, natural resources and socioeconomic surveys will be developed, to which all recipients of PADG's will be required to adhere. Any deviation from these standard methods must be justified. The purpose of having standardized data will be to permit comparison of results (e.g. ecological diversity indices) between protected areas. Two types of surveys should be carried out by the grantees. A rapid reconnaissance survey could be undertaken in each selected area in about 10 days to give the ecologists a quick overview about wildlife and vegetational types within a forest. This information would be used to develop preliminary management plans and work plans to study the flora and fauna of the forest in a detailed scientific design. At the same time, socioecologic surveys should also be undertaken.

Strong consideration should be given to providing scholarships to students from the University of Madagascar to undertake these studies in collaboration with short term technical assistance (expatriate scientists and natural resource managers). This will help train future upper level park and natural resource managers and provide the needed information to develop interactive park management plans. Consideration should also be given to providing summer internships in protected/peripheral areas to students from the Lycee Agricole who will likely play an important role as extension agents and field technicians on future park management teams. Likewise, this should be considered for the socioecological studies. Such a program is proving quite successful in the Impenetrable Forest/Development Through Conservation Projects in Uganda, site of half the world's mountain gorilla population (300 gorillas).

At a minimum standard methods should be developed for the following areas:

-- Vegetation and Forestry. Transects and random block designs should be considered that provide a detailed list of vegetation by numbers and species that can be applied to standardized diversity indices (such as the Shannon Weaver Index) that will be used as part of a long term management program.

-- In each transect, all trees should be identified by species and quantified, including number, and diameter breast height (DBH). All trees should be categorized by species into DBH classes such as: 5-50 cm, 51-100 cm and greater than 100 cm. This information will be used for developing a sustainable forest exploitation plan once critical habitat is identified for lemurs and other endangered, threatened or unique species that should be set aside and not disturbed. Other plants of economic or subsistence value to the rural community should be noted. Likewise, trees and plants which may have potential for cultivation on-farm for agroforestry, medicine, construction and other uses should be noted. Some of this information can be gained from local people who act as guides. Once the formal survey is completed, the botanist should consider random cruises about the study plot looking for new, rare or endemic species of plants that were missed.

  Representative species of all plants should be collected, cataloged and put in plant presses for further verification. Possible consideration should be given by the grantees to establishing an in-country herbarium for future reference.

-- Estimates of Lemur Populations. Primate ecologists should select an appropriate sampling methodology. This will likely be done through locating organized groups of lemurs, obtaining numbers, age, gender and dietary habits of each group, observing behavior and determining the group's territorial range in order to delineate habitat critical to their survival.

-- Ornithology. Consideration should be given to using mist nets where appropriate to collect representative birds from the forest understory. These birds can then be identified, representative species photographed, and possibly banded. A tag and recapture technique should be considered to obtain relative abundances. Additionally, a standard walking census method should be considered based upon site and hearing to further qualitatively identify birds. Tape recordings may also made.

-- Small Mammals. Live traps can be considered along transects to determine relative abundances based upon hours of trap time.

-- Herpefauna, Butterflies, Insects and other fauna should also be assessed through appropriate methodologies by specialists in their field.

This fundamental research should be used to identify the critical habitat within a protected area that needs protection. It should be overlaid with the forest inventories and the needs of the people to extract certain forest products to develop an interactive management plan which integrates protection of endemic flora and fauna into sustainable natural resources management.

4) Environmental And Socioeconomic Monitoring

Key indicator parameters should be selected from this applied and fundamental research. These might include diversity indices or DBH for tree species. The selected parameters should be easy to measure and indicative of the ecological diversity and sustainability of natural resources in the protected area. The regular collection of these parameters (frequency of sampling to be determined) should be combined with selected on-farm monitoring data as an indication of whether such development interventions are improving, deteriorating or having no impact on the protected area and the peripheral zones with regard to biological diversity and economic development. This information should be used in a reiterative mode to develop interactive and evolutionary management plans which will place greater emphasis on those actions that prove most beneficial to the human and environmental health of the area.

d. The Need For On-Farm Activities As Alternatives To In-Forest Use

The survival of many of the protected areas will ultimately depend on finding viable alternatives to in-forest use. This is especially true for the destructive practice of "tavy" (slash and burn agriculture) which is not extraction, but rather elimination of forest habitat through cutting and burning. Alternatives which might be considered to diminish pressure on the forest ecosystems include:

-- Improved irrigation schemes to increase agricultural Production.

-- Bunding and terracing to diminish soil erosion and to stabilize hillside agriculture.

-- Agroforestry to control erosion and to improve soil fertility, and as a source of firewood/charcoal, fodder, poles, timber and fruit.

-- Tree plantations as a source of income/food in the form of fruit trees, coffee, fodder, poles, housing and timber.

-- Cultivation of indigenous tree species from the forest on the farm to diminish the pressures on the forest.

-- Small animal husbandry such as chickens and rabbits as an alternative to hunting as a source of protein.

-- Crawfish culture/fish culture in rice paddies as a source of income and protein.

-- Low technology inputs such as fuel efficient wood stoves.

-- Integrated Pest Management to improve agricultural yields.

These are only ideas, and are not definitive. The inhabitants in each area will have their own interests and ideas on how they need help. Interventions may be suggested but, as much as possible, the people should be allowed to be creative in what they wish to accomplish. Extension agents working with the grantees may sensitize them to possibilities and make certain suggestions. However, nothing should be forced on them. Experience has shown that with traditional societies this usually results in failure. Once the community has decided what it wishes to accomplish, attempts can be made to facilitate their undertaking these development alternatives.

No one should be naive enough to think that traditional people will immediately walk away from use of the forest. Tradition dies slowly among subsistence societies, and is passed on through generations of experience in order to assure survival of a society under what are often harsh and unforgiving conditions. This implies a certain resistance to sudden change. Unfortunately, what may have been appropriate for a society with low population densities (e.g. "tavy" with 20-year rotational cycles) may no longer be viable under high population densities (e.g. "tavy" with three-year fallow periods, which results in encroachment upon the very forest on which the community depends for in-forest products and for water supplies).

It is certain that communities will have to directly experience the benefits from these alternatives prior to freely giving up traditional sources of forest products or traditional practices that are considered destructive. If there is any attempt to cut the people off from these natural resources prior to finding viable alternatives that the community believes in, there will be "war" between them and the managers, poaching will be widespread, and the protected areas will continue to deteriorate under increasing population pressures. For this reason, compromises must be reached immediately between the community and the protected area managers. It is also very possible that, for sociocultural reasons, communities may refuse to give up completely use of the forest resources even if viable alternatives exist. The socioecologic surveys should help to better understand such issues.

e. The Importance Of Enforcement and Licensing.

The success or failure of any natural resource management scheme depends on a viable enforcement program. This must involve good community relations, acceptance by the community of the management program, and the perception that the enforcers are there to protect the resources for the benefit of the community, not to prevent them from accessing resources they feel are rightfully theirs. Once core zones that need complete protection are identified, once the needs of the community are understood through socioecologic studies, once natural resource inventories are undertaken, and in some cases life history studies carried out (e.g. of the crawfish), then for those resources and in the delineated buffer zones, interactive management plans should be developed for the sustainable exploitation of each individual resource. This may include:

- Limitations on the minimum diameter breast height (DBH) in order to log certain tree species.

-- Control over what trees or over whether live/dead trees may be harvested for firewood or charcoal.

-- Control over harvesting vines, grasses or other traditional materials used in making handicrafts.

-- Controls over harvesting economically valuable species of flowers, plants or animals such as tree ferns and orchids.

-- The time of the year and the number of cattle that can be grazed.

-- Seasons on harvesting wild stocks of crawfish.

-- Seasons, limitations on weapons, numbers and species that may be hunted.

This is just a preliminary list. There are likely other resources that will require management. There is no attempt here to say which, if any, of these activities should be permitted. Ultimately, these decisions should be site specific and should depend on the outcomes of the socioecological, the ecological and the natural resource survey recommendations being developed into acceptable management plans. Whatever is used should be tightly controlled; permits or licenses should be required, seasons, and size/bag limits established. Once the community agrees to these rules, those who refuse to obey them must be stopped. Project grantees should be cautioned against coming down with heavy handed enforcement prior to the successful attainment of the above events.

f. Park Guards and Rangers: the Success or Failure of the Protected Areas

The success or failure of the protected areas will depend on the park rangers. In most developing countries, these lower level people are trained as policemen and not managers. Placing

uneducated people in the field trained purely as enforcers has traditionally resulted in deteriorated relationships between the management agency and the resource user, with the end product being mismanagement of the natural resource base.

Great care must be given to designing the curriculum to be used in training these rangers. They must first see themselves as collaborators and extension agents who must have a collegial rapport with the local communities. They must be trained in the philosophy of sustainable natural resources management, and lastly trained as enforcers. Enforcement must be looked upon as the last resort when all else has failed. Hopefully, it will be used against the minority of the community who are law breakers.

It is anticipated that there will be up to twenty full time ranger sl ots in each protected area, and that each of these slots could be filled on a part-time basis by more than one individual. The concept of the "full time slot" is important. Though guards currently employed by DEF and NGO's throughout the country are full time, there are solid reasons for entertaining the possibility of splitting each full time ranger slot into three part time jobs (e.g. two days a week). Splitting the ranger slot would have several positive functions:

-- It would avoid the dilemma of artificially shifting villagers from their role as cultivators and herders into full-time project employers. Villagers would earn only part-time salaries as supplements to, not replacements of, their traditional activities.

-- The smaller average per-ranger remuneration would reduce the intensity of the jealousy quotient that frequently occurs when some villagers are selected for employment, even when the community ostensibly participates in the process.

-- The number of villagers trained in protected area protection and benefitting from the modest salaries would treble. Experience already shows that income-generating jobs are a major advantage of protected area establishment. The satisfaction level of those employed would be less than if they were full time; but the number of satisfied households would, if the selection is done correctly, nearly triple.

The merits of such a rotating arrangement should be examined. Though the Grant Manager should not impose such an unusual arrangement, USAID and the Grant Manager should view with interest proposals suggesting an arrangement of this sort.

The possibility that some of these rangers might be female also bears discussion. Though Malagasy women often occupy high level managerial posts, as in the Amber Mountain Project, current practice excludes women from ranger or guard roles. It is not yet known whether this is in adherence to local customs or is rather a product

of male chauvinism in the project design process. Potential grantees should present information on whether local custom is in fact compatible with the allocation of ranger roles to females. If so, the proposal should explicitly indicate that women will be included. If local factors make this inappropriate, the proposal should show creativity in identifying alternative income-generating roles which could be reserved for the females excluded from ranger roles. The resolution of this issue should be done and dealt with in a culturally sensitive manner on a site specific basis at the proposal stage.

g. Role of Extension Agents ("Animateurs")

As noted in the body of this Project Paper, SAVEM will make make funds available for the recipients of Protected Area Development Grants to select one or more members of each local community to be extension agents, or "animateurs." Proposals for such grants will be required to place some type of animateur, or their functional equivalent, in every project village. Though each NGO will follow its own judgment on these matters, USAID recommends that:

-- Animateurs should be resident community members, not outsiders.

-- Animateurs should be contracted only after specific projects have been agreed on by the community, and they should be contracted with the explicit task of spending whatever time it takes to push those activities forward. (e.g. nursery preparation, tree planting, organizing canal digging schedules and crews).

-- They should be paid at a reasonable local rate, but only for time spent on task and for tasks actually completed. Their remuneration should thus be part time and according to output (e.g. when seedlings are produced, or when so much canal is dug).

-- It should be understood that their status reverts to that of ordinary citizen when the task for which they were contracted is finished.

If different projects are going on simultaneously, each can have its own animateur(s).

h. Tourism As Means Of Conserving The Protected Areas

There is a growing realization that, in order to save the unique natural resources in the developing world, the rural communities must see an economic worth in conserving them. Perhaps the best alternative to conserving the protected areas and to traditional use of the areas would be to turn them into non-extractive income generating devices for the rural communities. This implies not only community benefits, but sufficiently large benefits felt by individuals or individual families to make it economically worth their while to reduce or eliminate natural resource extraction in the protected area. Tourism should be explored as one of these options.

In many cases it is likely that the expected low volume tourism can be compatible with managed low impact natural resources extraction, and in fact could provide a tourist attraction (for example, observing traditional pit sawyers at work). Regardless of how tourism is undertaken, the community must be actively involved. The exact method for organizing this will depend on the sociocultural make-up of the communities around each protected area.

USAID has had success with local community involvement in nature tourism in the Rwenzori Mountains (Mountains Of The Moon) of Uganda. In this instance, the local community has formed an NGO that provides guide services (Rwenzori Mountain Services) to backpackers and mountain climbers. Young men from the village are hired as guides directly benefitting individual families. In addition to other fees, all entrants into the park must pay a development fee. This fee is being used for community activities. The villagers are in the process of building a hostel/restaurant that will employ more people from the area and will buy produce from local farmers. At the end of the year the NGO committee, made entirely of villagers, decides whether profits should go into village development or back into the business. The entire village receives direct and indirect benefits, and supports this area becoming a park. Plans exist to permit forest product extraction in the lower sections of the forest that are not touristically important. This program will be expanded to other villages located in different sections of the mountain range.

i. Other Approaches to Sustainability

The possibility of expanding or introducing environmentally sensitive tourism to Madagascar's protected areas represents one potential solution to the problem of continuing the interactive conservation and development activities that SAVEM will help begin, beyond the PACD. USAID attaches great importance to this issue, and plans to require that all proposals for Protected Area Development Grants include strategies for grantees to gradually phase themselves out of the activities they have launched.

This requirement, however, must be interpreted judiciously. The effective channeling of resources to local citizens must remain the prime objective. SAVEM should not allow cumbersome institutional linkages to jeopardize that output. Nonetheless, potential grantees should provide a clear description of their eventual phaseout strategy. The most likely route to such phaseout lies in the involvement of local NGO's.

In pursuing this, it would be a mistake to impose an immediate, up-front consortium arrangement on international NGO's. Such rules have been found, in some cases, to lead to artificial and superficial partnerships in which neither partner has genuine roots in the communities. The international NGO should be given time to forge genuine local links. Nonetheless, all proposals should manifest commitment at least to some general gameplan for eventually involving local NGO's.

j. The Availability of Potential Grantees

There are numerous institutions, in Madagascar and abroad, with both the interest in and capacity for carrying out the conservation and development activities described in this PP. Nonetheless it must also be said that there are several weaknesses in current conservation and development approaches that must be attended to, and several potential problems of which project managers should be aware.

It is important to clarify one point from the outset. In the course of this discussion, several NGO institutions will be mentioned by name. Such citation, however, is purely illustrative in purpose and constitutes no commitment on the part of the project to support any particular NGO. One can predict that certain institutions already carrying out conservation/development efforts in country are quite likely to receive support from this project. Nonetheless, this analysis is written generically with respect to the NGO participants. Only ANGAP as an institution is structured into the project as a predetermined major recipient of project support. Other NGO's will have to compete for project support by submitting proposals that show promise of achieving project goals, purposes and outputs.

1) Grant Manager Prerequisites

A major institutional feature of the SAVEM project will be its use of an umbrella grantee to expedite the channelling of resources to protected areas and local populations via intervening NGO organizations. In the Project Paper, this institution is referred to as the Grant Manager. Desired institutional capacities include:

- -- Familiarity with USAID financial procedures.
- -- Experience in working with, mobilizing, and coordinating other NGO's.
- -- Experience in contracting technical tasks.
- -- Status as a registered U.S. Private Voluntary Organization (PVO).

Numerous PVO's which meet these criteria exist in the United States. These need not be enumerated here. Although there might be NGO institutions already in Madagascar which meet some or all of these criteria, the choice of one of them as the Grant Manager might provoke jealousies among other institutions. It would be better, therefore, for the GM to be a U.S. organization that meets the criteria enumerated above but will be new to Madagascar.

2) Potential Institutional Resources for Protected Area Development Grants

There has been an increased openness towards the creation of national NGO's and the installation of international NGO's on the part of the GDRM over the last few years. In 1985, Catholic Relief Services (CRS) and World Wide Fund for Nature (WWF) were the only international NGO's operating in Madagascar. Since that time, a total of 7 international NGO's have established a representational office in Madagascar. Of the 30 members of the NGO coordinating body, Conseil Malagache des Organisations Non-Governmental pour le Developpement et l'Environnement (COMODE), 22 of the member NGO's have come into existence over the last five years. An active NGO presence in Madagascar is therefore relatively recent.

There are currently three international NGO's involved in the management of protected areas in Madagascar: World Wide Fund for Nature/International (WWF), Missouri Botanical Garden (MBG), and Duke University. Conservation International recently signed a country agreement and will be establishing a representational office in Madagascar with planned activities in conservation/development and conservation education.

The activities of WWF are by far the most diverse including: public awareness and conservation education programs; integrated conservation and development projects in five protected areas; training of rangers; and small research projects and student support. Although there is one Representation of WWF/International in Madagascar, there are two offices which function somewhat independently. The Representation office is principally responsible for relations with the government and the environmental education program in schools. The Protected Areas Project office is uniquely responsible for all activities pertaining to the management of protected areas. This latter office is housed in the Department of Water and Forests (DEF), which facilitates a close working relationship between DEF and WWF. In terms of USAID funding, the Protected Areas Projects has received and is implementing an OPG, PL 480 Title II counterpart funds, and Debt for Nature funds.

Missouri Botanical Garden in collaboration with a national NGO, SAFAFI, also has received an OPG from USAID for an integrated conservation/development project on the Masoala Peninsula. Duke University just recently received AID funding through a cooperative agreement for the development of the newly created Ranaomanfana National Park. Even though the programs of these conservation NGO's have not yet reached full fruition, their presence in Madagascar indicates that there are already national and international NGO's in country, interested in implementing protected areas development projects to be supported under SAVEM.

While the majority of NGO's working in the conservation field in Madagascar are international, there is an increasing interest by national NGO's in becoming more involved in the natural resources sector. There are currently two national NGO's involved in development activities related to the management of protected areas, SAFAFI (Agriculture and Development office of the Malagasy Lutheran Church) and SAF-FJKM (Development office the Malagasy Reformed church. It should be noted, however, that there is not yet a national NGO has a capability of becoming the prime manager of a Protected Areas Management Grant.

3) Existing Institutional Resources for Economic Development Activities in Peripheral Zones

a) Community Development Expertise

As previously indicated, there has been increasing interest over the last few years by the government and donors in working through NGO's in the delivery of development services to the Malagasy population. They recognize that NGO's are more in touch with field-level realities. NGOs have a better knowledge of the project areas and a long term commitment towards development; and, they are more cost effective. The Environmental Action Plan (EAP) foresees providing support to NGO's and community groups primarily through the National Association for Environmental Action (ANAE). ANAE will basically function as an umbrella organization to dispense funds through sub-grants to local development agencies and community groups for activities in soil conservation, agroforestry, reforestation and other development activities. This is similar to SAVEM's approach of funding Conservation Action Grants, except that CAGs will be limited to activities in the peripheral zones.

A recent survey of NGO's was carried out under the auspices of the Environmental Action Plan to assess the scope of activities implemented by NGO's in the environmental sector. A total of 141 national and international NGO's were surveyed. Many of these NGO's are community-based groups or newly created NGO's with a weak organizational structure and limited absorptive capacity. While they could become very effective vehicles for carrying out development activities in the peripheral zones, various measures would need to be taken to increase their project design and management capabilities.

The national NGO's with the most extensive experience in community development activities are the church based development organizations such as SAFAFI (Lutheran), CARITAS (Catholic), SAF-FJKM (Reformed), FIFAM (Anglican), CAPR (Catholic), FIKRIFAMA (Protestant), AVEAMM (Ecumenical), and IREDEC (Catholic). In addition to these Catholic and Protestant NGO's which were created expressly for development purposes, there are numerous individual priests and pastors who raise money to implement a variety of development activities.

An example of potential collaboration with these national NGO's to carry out economic development activities in the peripheral zones is the Diocesan Development Committee in Antsiranana. With support of CRS (an international development organization), they carried out socioeconomic survey research in numerous villagers near the Amber Mountain National Park, and are currently preparing training in village organization techniques. The Protected Areas Manager of the WWF project has indicated an interest in collaborating more closely with these kinds of local development groups in the implementation of activities in the peripheral zones.

b) Reforestation and Agroforestry Expertise

In the area of tree planting there are promising in-country precedents in both private sector and public sector institutions.

i) Public Sector Initiatives

The Department of Water and Forests (DEF) began tree planting efforts with conventional state-owned plantations in different parts of the country. But in recent years a new approach has been tried which is promising and unusual (if not unique). Public land is subdivided into lots of 2 or 3 hectares. Individuals are then invited to plant and care for trees on this land. After a specified time both the trees and the land itself become the property of the individual (see Annex VI.C. re: ZODAFARB).

The idea is still in its toddler stage, and the concept behind it is more impressive than the realizations achieved. Nonetheless it is a potentially spectacular solution to the dilemma of the commons. Around the globe, land held under communal tenure is rarely planted with trees because of insecure tree tenure arrangements. "Social forestry" programs and communal woodlot schemes are known to run into serious problem precisely because of the tree tenure issue. The GDRM's unusual willingness to turn public land over to individual tree-planting families seems, at least to USAID's current knowledge, to be a uniquely enlightened policy with respect to trees.

ii) NGO Initiatives

For several years, Cooperation Suisses has been supporting creative tree-planting efforts south of Antananarivo. These efforts led to the emergence, about two years ago, of ORIMPAKA, a Malagasy NGO that has specialized in village reforestation and agroforestry. The model used is similar to that used by DEF. Villagers are given lots of approximately three hectares. Both trees and land will become theirs after a stipulated period of time.

ORIMPAKA has developed the expertise to become a potential collaborator with USAID in its tree planting efforts. Its director currently is writing a book on how to involve villagers in development activities.

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c) Irrigation Systems and Roads

The potentially most important technical domain in the Protected Area Development Grants component of SAVEM is that of the construction of local irrigation systems and improved roads. Fortunately, there are in-country institutions with abundant experience in these matter.

One of the more promising is FIKRIFAMA, a Malagasy Christian NGO whose primary sphere of activity has been the installation of small-scale local gravity irrigation systems and potable water systems. FIKRIFAMA has also been involved in the organization of villages for various agricultural and sanitation projects. It has already received support from eight international funding agencies to carry out its work, principally water-related, in six provinces. Its involvement with international donors has led to the emergence of what appears to be a competent accounting system, including annual audits.

In addition to this NGO, there are also numerous small and medium Malagasy engineering firms with which the GDRM regularly contracts to construct publicly financed irrigation systems. The irrigation system under construction in the Beza Mahafaly area is being constructed by Genie Rural using precisely such a private contracting system.

When one considers in addition that the Betsileo rice growers of the central and south highlands have what may be the most sophisticated terracing and irrigation systems in the Indian Ocean region, it becomes clear that there is an abundant supply of in-country technical capacity for carrying out irrigation tasks.

There is also evidence of in-country capacity with respect to secondary road improvement. These tasks are routinely contracted out by the GDRM to private sector firms that specialize in these matters.

4) Linking Conservation and Development

There are institutional precedents in Madagascar for linking conservation to development activities. One approach has been to create a consortium by which a conservation organization links up with a development organization in the design and inplementation of an interactive protected areas management plan. This arrangement underlies the consortia that involves SAFAFI (a national development NGO) with Missouri Botanical Garden (an international conservation NGO) in Masoala. In the case of the Amber Mountain integrated conservation and development project, CRS was instrumental in assisting WWF with the design of the development component of the project. However, CRS is not operational at the field level, so WWF was required to take responsibility for the implementation of both the conservation and development component in close collaboration with the Department of Water and Forests.

In each case, the lead has been taken by the international conservation partner due to its stronger institutional capacity. It should be noted, though, the three projects are receiving funding through grants directly from USAID which require the lead organization be a registered U.S. PVO. By establishing an umbrella mechanism, sub-grants can be made directly to organizations who are not registered with AID. This will facilitate greater participation by all international and national NGO's.

There is no strong rationale for the lead agency always to be a conservation rather than a development organization. An active international or national development agency working in the periphery of a protected area could be lead agency for the Protected Area Development Grant (PADG), with responsibility for the park management component delegated to the conservation organization. As stated earlier, though, there are presently no national NGO's with the capacity to take on such a role. The only U.S. development organization working in Madagascar is CRS, and it does not have a mandate for project implementation in the field. An alternative would be to encourage other international development organizations with experience in the environmental sector, such as CARE, to become involved in Madagascar through SAVEM. At the same time, efforts should be taken to improve the institutional and operational capacity of national NGO's to take on increasing responsibility in the management of protected areas.

5) Research Resources

An anthropology program recently started in the University of Antananarivo already is fielding Malagasy researchers to carry out precisely the type of village-level fieldwork SAVEM will need. Students are sent out in groups for village fieldwork experience. Masters-level students working all over the country spend several months doing field research in one or another village. Conversations with these students and their professors indicate that they have already, on their own initiative, begun to move toward applied research, and that they would be very interested in linking up to projects such as SAVEM.

6) Potential Recipients of Conservation Action Grants

Throughout the country the education project of WWF has formed ASE -- Associations to Safeguard the Environment. The one in Antsiranana consists largely of educators who have banded into an association to promote environmental awareness. There was an impressive level of goodwill among these individuals. But they lacked resources and concrete program ideas. Such groups would be excellent candidates for receipt of Conservation Action Grants. Moreover, virtually any of the local institutions discussed above would be capable of and interested in carrying out one or several of these small grants.

k. Potential Institutional Problems

The preceding analysis indicates that there is a reasonably strong

NGO institutional presence in Madagascar that renders the proposals in this Project Paper institutionally feasible. The analysis will conclude, however, by briefly listing several potential problem areas of which project managers should remain aware.

1) Expectations from DEF

DEF on several occasions has pointedly reminded USAID that it has only 400 agents to cover the entire country, and that it needs heavy infusions of support. Though DEF agents will receive SAVEM-funded training, DEF may have expected to receive more direct support from this project.

2) Expectations from ANGAP

During PP design, ANGAP's founding members expressed a concern that ANGAP may not be directly awarded Protected Area Development Grants during the life of SAVEM. They perceive that one of ANGAP's eventual roles will be to administer grants to field operators working in protected areas, and/or direct management of protected areas. USAID has discussed at length with ANGAP and DEF. It was decided that ANGAP's capacity to take on increased responsibilities would be assessed during the GDRM/AID mid-term evaluation. Based on the outcome of this evaluation, USAID might consider amending the project to allow the Grant Manager to provide funding and subsequent technical assistance to ANGAP to administer grants to field operators or to manage a protected area itself.

3) International vs. National NGO's

The management of most protected areas in Madagascar is presently the responsibility of international NGO's or international agencies, such as UNESCO. This could foster some feeling of resentment from the national NGO's and government agencies such as DEF, since protected areas represent a national patrimony. While international NGO's will probably receive the majority of the funding for the Protected Development Area Grants, there should be a concerted effort both on the part of the Grant Manager and the international NGO's to increase the institutional capacity of national NGO's and government institutions through the implementation of the interactive protected area projects to ensure long term sustainability.

1. Institutional Linkages

1) The Grant Manager and the Protected Area Managers

The Grant Manager will be a major institutional actor in selecting not only the areas in which SAVEM will work, but also the recipients of Protected Area Development Grants themselves. These grants will be awarded by the Grant Manager rather than by USAID directly, although the concurrence of both USAID and ANGAP will be required prior to the issuance of any such grant. The Grant Manager will be the primary representative of the interests of USAID in ensuring that grantees remain committed to the developmentally oriented

approach to conservation envisioned in the project. The GM must therefore continually monitor both budgets and activities after the Protected Area Development Grants have been made. This will necessarily involve the Grant Manager in ongoing assessment of the progress of these grants.

Because most conservation/development funds will be allocated to five or six large grantees who themselves will have operational autonomy, the GM's role will not be as active as in the case of a "pure" umbrella arrangement -- i.e. one in which the fund manager itself has relatively direct involvement in the planning of specific, limited subprojects with other NGO's. The GM can and should therefore take on a heavier commitment to institution building, in particular to ensuring that all grantees, both large and small, are dealing with the issue of long-term sustainability in addition to their immediate output objectives.

2) USAID's Role

USAID/Madagascar will play several major, direct roles in project implementation. It must approve the selection of the protected areas in which to work, as well as the selection of protected area Development grantees. It will also have prime responsibility for a formal evaluation of the project in midterm, and for ongoing monitoring of all project activities, and for working with the GDRM and project grantees to avoid or overcome roadblocks to project implementation.

3) The role of ANGAP

Althoug the ultimate role of ANGAP will not be determined at the earliest after a mid-term evaluation, ANGAP should play several important roles from the beginning of this project. Like USAID, ANGAP will be responsible for reviewing and concurring in the selection of the protected areas in which SAVEM will work and in the award of Protected Area Development Grants.

In addition to its role in these decisions, ANGAP should also participate in the development of project criteria, should participate in the design of criteria for the rapid rural assessment that will be carried out first by the GM and then by Phase I grantees. It should participate in the formulation of hypotheses, of criteria for ensuring that the benefits of project interventions go to those who bear the costs, and in designing strategies for the interactive model of protected area management being proposed here (i.e. one involving popular participation rather than strictly police activities.) In addition, ANGAP should play a major role in establishing and maintaining links between the numerous institutions involved in Madagascar's natural resource sector.

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2 Training

The training component of SAVEM has been designed in response to a specific set of needs and resources that define the project context. Target groups have been narrowed from a wide field of natural resources practitioners in the public and private sectors, to key individuals within ANGAP and related agencies, international and local NGOs who will be working directly with SAVEM in conservation and community development. Skills areas in each component are focused on basic process and technical needs which are not presently met through local training resources. Training events have been structured to minimize absence from job sites, and to take advantage of the concentration of TA advisors who will provide on-the-job training. Local training has been designed with a TOT component to enable continuation of training activities after the PACD. Training functions have been shared among Contractor and Grantee TA personnel, to avoid pressure on a single entity as the number and frequency of training events increases. These considerations, and others discussed in the following sections, ensure a training program that can be implemented within the LOP and resources budgeted.

a. Target Groups

The potential target population for SAVEM training is extensive: existing DEF personnel (central, provincial and circonscription levels), protected areas staff, government and NGO community development agents--as well as trainees to meet EAP staffing projections for the biodiversity component. These include 500 conservation agents, 14 parks/reserves directors, 50 rural development advisors, 20 rural development directors (for 14 protected areas). If SAVEM is to use training resources effectively, a narrow focus is necessary in deciding who will be trained by the project. Therefore, this population has been reduced to a viable target group on the basis of several considerations:

- direct project involvement: organizations which will be working directly with SAVEM whose members need defined skills to implement project activities (ANGAP functions, PADGs, CAGs). Members of other organizations who receive project training (eg: ONE and ANAE staff participating in study tours) will be considered part of the ANGAP training group. On the basis of this consideration, involvement in valid indirect activities such as strengthening of educational institutions has been limited to assessment for action under other projects.

- actual vs. projected staffing positions: SAVEM training is focused on existing government, NGO or protected areas staff or supported new personnel (ie: ANGAP). Trainee targets over LOP are not based on meeting EAP projections

for new staff needs. Until resources for salary support and retention incentives can guarantee new employment, it is irresponsible to train people for new jobs. As debt-swap and counterpart funds are mobilized for salary support, the project might revise targets, and begin training for expanded staffing.

- training not included in PADGs: since individual park management grants are expected to have staff training and conservation education components, overall SAVEM training does not address these areas. This eliminates needs to channel potentially- considerable resources to a large sub-target: guards, or rangers, whose role is primarily one of protection and enforcement but needs to be shifted to community development. PADG funds will cover training of these agents; training design/delivery (as well as salary) support will be provided through the WWF debt-for-nature Protected Areas Training/Support Program, which is in the start-up phase. If post-training performance indicates a need for further community development training, SAVEM could provide curriculum development assistance for appropriate modules. At this point, however, there is no need to duplicate WWF training efforts when other needs are not being addressed at all.

These considerations for a focused trainee group generated the conservatively- estimated target population covered in the following sections. Design of the SAVEM training component concentrates on groups and needs rather than numbers of participants and trainee-days. Inflated training targets are impressive but unrealistic. They are counterproductive during implementation, orienting TA personnel toward meeting quantitative rather than qualitative training- delivery goals. The definition of this group ensures that SAVEM can train its target within the time-frame of the project.

1) ANGAP

All positions will be considered provisional training slots pending a needs assessment by the Director and TA personnel assisting the organization. Assuming a maximum staff of 20 for ANGAP and 20 for the BPU, up to 40 participants will benefit from staff training. In addition, 60 socio-economic data collectors- -10 per protected area--will be trained for the BPU/SIM unit. The training output for ANGAP is likely to exceed staff totals, since special courses designed for ANGAP staff will be open to member agencies (DEF, ONE, ANAE). Assuming that ANGAP develops two special courses per year in two different areas, with an average size of 15 participants this activity could generate up to 150 trainees over LOP (in fact, the number will be far lower, since one person will take several courses, as in a sequenced English program). A flexible strategy that combines tuition payments to local institutions and development of special courses as needed will enable SAVEM to respond to the diverse training needs of ANGAP staff in a way that minimizes loss of job time (eg: night courses).

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U.S. training will be limited to senior staff and technicians. If there are four two-month programs, and ten months used for one- or two-month programs, a minimum of nine and maximum of fourteen ANGAP staff members will benefit from this intervention. Given the need for staff presence in the formative years of the organization, no U.S. training of over three months is targeted. The utility of U.S. training will be reviewed on a case-by-case basis, to ensure to the extent possible that the investment in money and time away from the job is justified for a short program. Criteria for review will include the candidate's English proficiency, the relevance of the program to the Malagasy context and the innovative advantage of content.

A mixed group of DEF, ANAE, ONE, CNRE, FOFIFA and other agencies connected to ANGAP is targeted for short-term study tours. This group will include directors and department heads who may not all be available at the same time. A flexible system of budgetting placements (20) rather than groups over the LOP will allow ANGAP to send two-person teams or large delegations, as events and availability dictate. The decision to limit training for this group to short-term study tours also is based on an attempt to reduce the amount of time away from the job.

The following participation rates are expected for ANGAP-related training:

	# Trainees	
	Maximum	Anticipated
U.S. training: 4 x 2 months + 10 x 1 month	14	12-14
ANGAP special courses: 2 courses/year x 15 students/course x 5 years	150	50*
ANGAP tuition payments: 40 placements/yr. x 5 years	200	40*
SIM enumerators 10 x 6 protected areas	60	60
study tours 20 placements	20	20

*from the same trainee pool

NB: maximum participation rates assume no repeaters (they are used for calculating person-months of training rather than total trainee population).

2) Protected Areas

The decision to concentrate on training activities other than PADG-supported programs allows for a more focused target group within a large population. The first sub-category of this group encompasses senior and mid-level managers working in protected areas with NGOs carrying out integrated conservation and development projects (planning, technical, training staff; tourism and community development directors; affiliated SPEF coordinators). SAVEM training for this group will focus on integration of conservation and development through exposure to programs that combine both in integrated park management approaches. As discussed in Section 1.c.4., operations-oriented study tours have been chosen over U.S. degree programs, or even long-term training in third-country environmental institutes.

SAVEM will work in six out of the 14 Level-1 Priority Protected Areas targeted for conservation and development activities. An average of three Malagasy senior and mid-level managers will be chosen for training per protected area. A total of 20 placements are reserved: 10 in study tours and 10 in U.S. and third-country conferences and seminars. This also allows for participation by members from areas not assisted by the project. By limiting the number of participants in this sub-group, it is economically feasible to send all members out of the country for training. The Grant Manager's preliminary needs assessment will verify types and numbers of protected areas managers and buffer-zone development planners that should be included in this training.

The other sub-group is targeted for the majority of in-country training: planners, managers, administrators, trainers and community development agents working in and/or with local NGOs in the peripheral zones. This choice is based on the assumption that conservation cannot succeed in the absence of community-based development. In order for development to succeed, community action agents need the skills to plan, manage and execute projects. The community action agents involved with SAVEM are primarily local NGOs which will undertake projects through the PADGs and smaller CAGs.

There are an estimated 260 local NGOs in the country (most small, charitable organizations). In the protected areas, SAVEM may work with 10% or less of this population. Up to 10 members of each NGO will be trained in planning, management, TOT or technical skills; this will include 3-6 participants in planning and management, and up to 10 in technical or TOT skills (overlap is expected). Assuming a target of 25 NGOs, this will yield a 250-person trainee population. The total target group will be 300, including local staff of international NGOs and government extension agents working in the buffer zones; a 20% government/other participation rate is built into courses, based on workshops that have been held in-country. The following maximum participation rates are expected for NGO training:

- orientations: 6 sessions x 25 participants/session x 4 times over LOP 600
- planning/design: 6 workshops x 25 participants 150
- management: 6 sessions x 25 participants/session (NB: for repeaters over LOP) 150
- technical/TOT: 12 workshops x 25 participants 300

Of all sub-targets, this group is likely to be the most educationally heterogeneus. Project training will address this diversity by keeping training and materials basic, functional and in Malagasy.

b) Skills Areas

Preliminary training surveys conducted prior to project design revealed three broad areas of needs, cross-cutting all levels of public- and private-sector entities (forestry services, Universities, NGOs) involved in integrated conservation-development activities: (1) planning and management; (2) technical knowledge and skills, ranging from scientific studies related to watershed and wildlands management, to agroforestry and soil conservation techniques for community adoption, and; (3) communications, social research and adult education techniques for extension and community development.

Training in these broad areas, defined to the extent possible at the project design stage, is focused on skills, knowledge and practices needed to implement interactive management plans. Several strategies have been built into the training plan to promote absorption and application of training content. In the case of ANGAP and other job-related training, programs will be preceded by a period of time on the job to provide a practical context for theoretical presentations; they will be followed by on-the-job application under the guidance of on-site TA personnel. NGO project management workshops will be designed as a series of on-site training modules that will allow the local-hire training cordinator and TA personnel to work with participants on their actual financial and administrative record-keeping. Inclusion of a TOT component in technical workshops will create a cadre of trainers who can provide follow-up assistance to participants.

The skills areas described below reflect guidance provided through preliminary surveys, and by the design team through direct observation and interviews with GDRM and NGO representatives.

1) ANGAP

Competence-based training will ensure that selection of subject areas is directly related to job functions and assessed performance gaps. The needs assessment targeted for the first quarter of TA activities will initiate a process that should become a permanent part of ANGAP staff review, as a means to identify new needs as they

arise. In addition to the subjects proposed in Section 1.c.4., the following areas have been suggested for senior management and specialists: park planning and management; park administration and finance; Geographical Information Systems (GIS) and data management; tropical forestry ecology; natural resources economics; social ecology/cultural anthropology; economic anthropology/survey techniques. All of these can be covered effectively through U.S. institutions targeted for short-term training, or through special courses developed for ANGAP staff by TA personnel working with the project. In-country training in existing institutions is likely to focus on mid-level management, accounting, language, secretarial/computer training. Training in collection of socio-economic baseline data will be provided to a specific group of field researchers (i.e.: SIM enumerators).

2) Protected Areas

Interactive park management encompasses all of the subject areas targeted for protected-areas managers: wildlife management, extension methods, ecological inventorying, park administration and finance, social ecology/cultural anthropology, economic anthropology/survey technology. While training will depend on specific job functions, the overall objective will be to improve the ability to plan and execute sustainable natural resources management programs that engage and assist communities negatively affected by conservation as well as environmental degradation. In order to meet this objective, training will be job-related, and presented in programs that stress direct observation over theory.

Training for local NGOs focuses on project planning and management skills. The choice is based on observed and stated needs in the NGO community, discussions among NGOs during two NRMS-supported workshops, and early results of a survey conducted by COMODE, a recently-formed consortium of 33 development-environment NGOs nationwide. Assessments by COMODE estimate needs for planning/management skills in over 75% of the member organizations. COMODE is planning a seminar (fall, 1990), to define ways to transfer skills in project identification and feasibility assessment. The results of this forum will provide valuable insights to SAVEM in designing its training in this area, as well as possibilities for joint design and delivery with COMODE. In order to keep training practical, and ensure effective application, planning and management workshops will be based on participants' actual project ideas and operations, rather than hypothetical studies (see Annex VI.B.7. for suggested topics in financial management training).

Training in technical skills areas will be directly related to sub-project activities. Topics considered by design-team ecologists as necessary to help rural communities utilize available resources on a sustainable basis include: soil conservation, integrated pest management, natural forest management, agroforestry, nursery management, hydrology and aquaculture. Based on the experience of the NRMS agroforestry workshop and similar training events held in Madagascar, there are strong grounds to expect that technical

material can be presented effectively to the targeted population in short workshops (two weeks or less). At least one field trip has been built into preliminary workshop design, to ensure that theory and hands-on practice is supplemented by direct observation of operational projects.

Repeated identification of needs for communication and extension skills led to inclusion of TOT skills in technical workshops. An alternative approach would be separate, generic TOT courses that cover principles of adult learning, training methodologies and communications techniques. The design of the SAVEM training component expressly avoids this approach, based on experience that shows theory and method divorced from content to be of little value. The functional TOT built into technical training events follows the NRMS agroforestry model, and ensures better integration of message and medium. The relatively high level of formal education in Madagascar creates a pool of qualified people who can be trained as trainers with a basic exposure to non- formal education techniques.

c. Structure, Duration and Timing of Training Events

Training events for SAVEM have been designed on the basis of two principal considerations: minimizing time away from the job, and emphasis on practice and observation over theory. Project training emphasizes short-term infusions of knowledge through seminar, workshop or study-tour exposure, followed by longer periods of time for on-the-job application in a supervised or counterpart work content. In most cases, more than one training option or format is used within a program, to allow the most effective response to each group's learning needs.

1) ANGAP

For ANGAP, a flexible strategy has been developed to meet diverse needs for in-country training, while reducing the training management burden on the organization. This strategy consists of a combination of tuition payments for participation in existing courses, and resources for developing special courses. This split strategy will enable the organization to respond quickly to training needs, and to provide access to night courses (eg: English at USIS, accounting at INSCAE), minimizing loss of job time. At the same time, it will permit development of courses that can be scheduled to fit the needs of the project, the organization, and individual staff. Equal flexibility is built into the third-country and U.S. training and study-tour components, by keeping programs short and allowing individual placements to be used over LOP as needed (single placements, teams, large groups).

The number and kind of training events targeted for ANGAP will not put undue pressure on the organization, in terms of staff absence or management time. Over LOP, the following events are projected:

- 9-14 external, short-term programs for staff. Assuming that 18 person-months of training is broken into 4 x

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2-months and 10 x 1- months, and that travel does not begin until the fourth quarter of FY 91, there is enough time for all programs without overlap of staff absences. Training for senior staff is recommended in FY 1992, after some time on the job but prior to evaluation; other slots can be timed as needed. The planning and management responsibility will be shared by the TA Contractor and USAID, but processing approximately four people/year is not an unreasonable management burden.

- 2 ten-week (60-hour) courses per year, which entail hiring a designer/instructor and securing classroom space. In many cases, instructors will be TA personnel working with the project, which will minimize logistical difficulties in planning and delivery. These courses allow flexibility in delivery and management, as they can be scheduled to fit the demands of project activities and timed to avoid job absences (nights, weekends, lunch hours). Also, hours can be compressed to create courses of varying length, especially if training needs justify the use of job time.

- tuition payments for up to 40 placements per year in 10-week courses. This entails setting up a system for reviewing requests and making payments, which represents a minimal management burden. Most events will be night courses and special short seminars, which will minimize job absences.

- study tour placements for 20 people, which are likely to be grouped into yearly events. Participants could be processed concurrently with ANGAP staff going overseas for training, to avoid duplicating planning efforts. If placements are grouped into a maximum of two events per year, the management burden on ANGAP TA personnel and USAID will not increase significantly.

2) Protected Areas

Short-term study tours and seminars or conferences appear to be the most effective structures for providing protected-areas managers an integrated approach to conservation, development and management. A combination of 20 placements, split equally between study tours and seminars, will allow learning without undue loss of job time. The alternative approach is longer- term training, which might enable better absorption of material. If a long- term program has unquestionable advantages, it justifies the loss of time on the job. However, questions raised about long-term training have led to the more OJT-oriented approach. The relevance of training in institutions usually targeted for third-country programs (Mweka Wildllife College in Tanzania or Garua Training Center in Cameroun) has been called into question, not only for content, but for similarity of environmental conditions. Asian institutions have been suggested, such as Dhera Dun in Indonesia, but will need further investigation. As discussed in Section 1.c.4,, the theoretical framework of a U.S. degree program does not seem best-suited to the training needs of the target group.

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The subject areas defined for local NGOs have been structured into two types of training events: residential courses in a central location (Antananarivo or a provinicial capital), and on-site workshops. In choosing formats, an attempt has been made to identify subject areas which benefit from an exchange of ideas and experiences (eg: project planning), and those which may need a more organization-specific focus (eg: project management, with time built in for review of individual NGOs' financial records). Relative advantages of each format have been considered in the context of Madagascar--especially the logistical pressures created by travel constraints--and argue for both types of training. Ultimately, it will be up to the Grant Manager to verify the choices made during design, and choose the most appropriate format for each training event.

Until a cadre of local trainers is in place in the provinces, it will be impossible for the local-hire training coordinator to do all training on- site, in the regions. Consequently, the expense of paying participant travel to a central location for at least some portion of LOP training events is amply justified. Also, residential courses remove distractions of family and job, enabling participants to concentrate on training content. In order to minimize long absences from home and work, however, residential courses will be limited to two weeks. Residential courses have been run successfully in Madagascar, and there is an adequate network of institutions to provide training sites.

The combined efforts of programming study tour and seminar placements, developing and running planning/management and technical workshops, and adminstering a small grant program, creates a considerable training management task for the Grant Manager. The level of effort is sufficient to justify hiring a local-hire training coordinator, who will be responsible for the local NGO training program. This will include planning and management of all training events, and design and delivery of the planning and management workshops. With a large pool of University-trained Malagasys, no difficulties are anticipated in recruiting a training coordinator (tasks and qualifications are outlined in the Scope of Work in Annex VIII).

In developing the training plan, an attempt has been made to balance the planning, management and delivery work load, recognizing that intensive training design efforts will be required at the beginning of the project. The last two quarters of FY 1991 are devoted primarily to assessment and design. The first event--a one-day informational orientation--will require relatively little design effort, and delivery will be shared among team members. This allows time for development of the project planning/design program. No more than two training events are planned per quarter, assuming the following time commitments for delivery and/or management:

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- orientation: 6 provinces x 3 days/province (includes travel time)
- project planning: 12 days/course (including planning & follow-up)
- technical training/TOT: 20 days/course (including planning & close-out)
- project management: 30 days/cycle.

Commitments of the training coordinator's time will be reduced as the local trainer pool is developed, and project training functions are shifted to Malagasy agencies.

d. Training Resources

1) In-country

Two types of training-delivery resources are needed for implementation of this plan: trainers for project-driven courses, and training institutions for existing courses. The project will draw on several resources for trainers. First, long- and short-term TA advisors working with the project will provide OJT and as much workshop or course training as possible, in areas of expertise not available through local resources. The backgrounds for planned TA positions cover most of the skills targeted in this plan, in the broad areas of management, biological sciences, social sciences and rural development. It will be important for the Grant Manager's training coordinator to know the schedule for short-term TA missions, to plan technical workshops that take advantage of their expertise. In addition, specialists may be recruited on a short-term basis, specifically for training design and delivery. Also, experts in a number of fields come to Madagascar repeatedly to work with on- going projects, which can facilitate advance workshop planning.

The local pool of potential senior technical trainers is concentrated in the University (faculties of agronomy, sciences and letters) and in lead NGOs working in natural resources management and community development (SAFAFI, ORINPAKA, SAF-FJKM). As needed, they will be given an intensive TOT to adapt teaching techniques to a more participatory, experience-based context. The NGO training coordinator will be the lead local trainer. S/he will be responsible for delivery of the planning/design and management workshops. Present plans target the cycle to be run twice/year for three years; this is the maximum capacity for the coordinator, given other job responsibilities. In order to increase the number of cycles, a trainer pool will have to be developed. This can be done over time, recruiting candidates from the trainee pool, giving them a short TOT and having them slowly assume responsibility for full training delivery.

On the basis of information gathered during project design, there is an adequate base of Malagasy educational institutions, consulting

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firms, private organizations and other resources to provide training facilities, support, and in many areas, direct training services. ANGAP will send staff to local language schools or embassy cultural centers, the University and other institutes (eg: IMaTeP and INSCAE for planning, management and accounting). These entities are also likely sources of course design and delivery. Technical training centers such as the "Centre de Formation Professionnelle Forestier" and the SAF-FJKM center at Isoavina may provide training sites, and possibly training delivery for NGO technical courses (with adaptation of their existing curricula). It will be incumbent upon the project personnel responsible for training to further explore the range and potential of such institutions.

Training-management resources internal to the project are adequate to handle the activities planned during LOP. However, if there is a commitment to the sustainability of training activities, it is necessary to identify organizations which can take responsibility for management and delivery of training services offered by SAVEM, preferably during the LOP. Efforts will be made to work with partner organizations which share SAVEM's development-conservation orientation, and are committed to providing training services to their client population. There is good reason to expect to find such partners among training or NGO-support organizations. As the level of EAP activity increases, existing training facilities will be strengthened and new organizations will be formed.

This already has begun with the creation of ANGAP and COMODE. COMODE's beginning augurs well for its development: in less than a half-year, the organization has developed a plan of action, initiated a survey of member organizations, and is planning a workshop on project identification and management in the coming months. COMODE is developing slowly, prudently; if it is operational by project start-up, a partnership relationship with SAVEM that targets gradual transfer of responsibility for training management would help build its capacity as a service-delivery organization. Eventually, SAVEM project planning/management training program could become the COMODE program, and continue past the PACD.

2) U.S. and Third Country

Several U.S. universities are recognized as lead institutions in interdisciplinary conservation-development programs, which would expose mid- and senior- level Malagasy professionals to innovative approaches to interactive park management. A preliminary training assessment identified the Universities of Montana, Minnesota, Michigan, Wisconsin, Maryland and Florida as strong resources that offer coursework in at least four broad areas: (1) management of biological resources (wildlife, wildlands, freshwater systems); (2) land use planning; (3) natural resources economics, and (4) environmental policy and analysis. Courses also are offered in the social sciences, a fifth area critical to this project, omitted from the assessment. Additional recommendations during project design included Louisiana State University (freshwater fish farming), Yale University (forestry, forestry curriculum development) and Michigan State University.

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In addition to degree programs, most of these institutions also offer short courses and seminars, especially for practitioners from developing countries. The USDA Forest Service/University of Michigan annual seminar on forest administration and management is typical of the type of short-term training the project will access. The three-week seminar provides an opportunity for mid-career and senior-level managers to "identify, analyze and compare forest policies, planning programs and administrative systems which provide for the integrated management of forest lands" (the Project Director for integrated conservation and development at Amber Mountain will attend the seminar this year).

In addition to providing short-term training opportunities, these events can help strengthen linkages between U.S. universities and Malagasy academic and development institutions. A.I.D. has cooperative agreements with most of the universities noted above (eg: ACCESS II with the University of Wisconsin Land Tenure Center), which facilitate research and education exchanges. Training events for this project could be structured to allow additional time for tutorials in areas related to seminar issues, or to coordinate research and training plans with faculty members working in Madagascar.

The two primary considerations in sending participants to the U.S. for training are academic qualifications and language. Since there are no degree- program candidates, competitive admissions standards are not a constraint to acceptance for training. The project has addressed needs for English language training by funding tuition grants and special courses at ANGAP. Although basic English proficiency will be required for participation in U.S. courses, candidates will be able to apply for refresher or specialized training.

While the U.S. has been targeted for training, Africa is considered most appropriate for study tours, to provide exposure to interactive park management that would not be as relevant in the context of a visit to U.S. national parks. Study-tour sites proposed in Section 1.c.4. are based on the design team's knowledge of projects which provide local communities access to alternative resources and income streams in protected areas. One example is in the Rwenzori Mountains in Uganda, where entrance fees have been structured to include a portion for village-driven community development projects, and the local community has formed an NGO to provide guide services. A.I.D. involvement in integrated conservation-development projects around the world should provide site possibilities in regions other than Africa, as well.

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ANNEX IVA

3. Biodiversity Planning Service Feasibility Study

The following feasibility study comes from a report entitled "Draft Report on the Feasibility of Establishing a National System for Biodiversity Conservation in Madagascar". The report was prepared by A.P. Smith of the University of New England, New South Wales, Australia; N.Horning of NASA Goddard Space Flight Center, Greenbelt, Maryland; S. Olivieri of Conservation International; and L. Andrianifahnana of World Wildlife Fund.

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DRAFT REPORT ON THE FEASIBILITY OF ESTABLISHING A NATIONAL SYSTEM FOR BIODIVERSITY CONSERVATION IN MADAGASCAR

by

A.P. Smith[1], N. Horning[2], S. Olivieri[3], & L. Andrianifahnana[4]

1. Department of Ecosystem Management, University of New England, Armidale, New South Wales, Australia. 2351.

2. NASA Goddard Space Flight Center, Greenbelt, MD 20771 USA

3. Science and Technical Support, Conservation International, 1015 18th Street N.W., Suite 1000. Washington, DC. 20036 USA

4. World Wildlife Fund Aires Protégées B.P. 738, Antananarivo, Madagascar.

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1. GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ANGAP	Association Nationale pour la Gestion des Aires Protégées National Association for the Management of Protected Areas
BPS	Biodiversity Planning System
BPU	Biodiversity Planning Unit
CI	Conservation International
CNRE	Centre National de Recherche Environnementale National center for Environmental Research
CNRT	Centre National de Recherche de Tsimbazaza National Research Centre at Tsimbazaza
DEF	Direction des Eaux et Forets Forestry Department
DGBDE	Direction Générale de la Banque de Données de L'Etat. State Data Bank
DM	Direction de la Météorologie Meteorology Department
DP	Direction du Patrimoine National Cadastral Agency
EAP	Environmental Action Plan
EP1	Environment Program - 1
FOFIFA	Foibem-Pirenena Momba ny Fikarohana Ampiharina amin'ny Fambolena Agricultural Research Center
FSU	Field Survey Unit
FTM	Foiben-Taotsarintanin'i Madagascar National Cartography Institute
GIS	Geographic Information System
GO	Government Organization
GPS	Geographic Positioning System
ICDP	Integrated Conservation and Development Project
IRNT	Inventaire des Ressources Naturelles Terrestres Inventory of Terrestrial Natural Resources
IUNC	International Union for the Conservation of Nature
LNT	Laboratoire National de Télédétection National Remote Sensing Laboratory
MBG	Missouri Botanical Gardens
MINESUP	Ministere de l'Education Superieure Ministry of Higher Education
MRSTD	Ministère de la Recherche Scientifique et Technologique pour le Développement Ministry for Scientific and Technological Research for Development
NGO	Non-government Organization
ORSTOM	Office de Recherche Scientifique et Technique d'Outre Mer Office of Overseas Scientific and Technical Research (France)
SPN	Service de la Protection de la Nature Nature Protection Service
PAE	Plan d'Action Environnementale
RSSM	Rapid Standardized Survey Methods
RSU	Remote Sensing and Cartographic Unit
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WWF	World Wildlife Fund for Nature

2. BIODIVERSITY CONSERVATION IN MADAGASCAR

2.1. THE NEED FOR BIODIVERSITY CONSERVATION

The need for biodiversity conservation in Madagascar is not in dispute. Approximately 75% of Madagascar's estimated 200,000 species of living organisms are found nowhere else, and the species richness of its forests may be unequalled in the world.

Already an estimated 80% of Madagascar's natural vegetation cover has been cleared or degraded by agriculture, burning, grazing, timber harvesting, and other cultural practices. The remaining 20% continues to be cleared and degraded in the face of population growth, poverty and declining productivity in previously cleared land. Madagascar has a population of approximately 11 million and a doubling time of approximately 21 years. The majority (80%) of the population is rural, deriving a minimum wage or subsistence income from grazing and/or agriculture. The quality and quantity of productive land is diminishing as a result of weed invasion, loss of fertility and erosion. The entire central western region of Madagascar is massively eroded, representing one of the most significant examples of badlands development in the world.

It has been estimated that during the period 1950 to 1985 3.8 million ha of rainforest was cleared in Madagascar at an average annual rate of 110,000 ha per annum. Slash and burn cultivation of natural vegetation is illegal without a permit. However it continues because of poor enforcement resulting from inadequate staffing, low government salaries and lack of support and extension facilities. Clearing of natural vegetation is generally preferred to fixed cultivation by peasant farmers because it is it easier and cheaper to slash and burn virgin forest than to control weeds, or increase fertility and control erosion on previously cleared land. There appears to be little or no forest recovery after slash burn cultivation because invasion and completion by weeds, and fire incursion suppresses natural regeneration. For all practical purposes the process of deforestation can be regarded as irreversible in the foreseeable future. The threat of clearing and degradation to Madagascar's unique biodiversity has led this country to be referred to as "the single highest conservation priority in the world.

2.2. CURRENT APPROACHES TO BIODIVERSITY PLANNING AND MANAGEMENT

Biodiversity conservation in Madagascar is currently practised by dedication and very limited management of a network of so called "Protected Areas". There are five categories of protected areas (see table 1). There are 5 National Parks covering, in which harvest of certain forest products is permitted to neighbouring villages. There are 11 Strict Nature Reserves totalling 570,000 ha, in which access is strictly forbidden except for scientific research. There are 23 Special Reserves, totalling 365,000 ha, in which pastoralism, agriculture and use of forest products is forbidden but public access is free. There are 158 Classified forests, covering 2,671,000 ha, in which forest exploitation is

forbidden but protection is not necessarily permanent and traditional rights of usage of minor products is permitted. There are 77 reforestation areas, covering 824,000 ha, in which the principal management aim is stabilization and protection of watersheds, and in which land use is regulated but can include pasture development. Excluding classified forests and reforestation areas the total area of protected forest is 1.05 million ha or 1.8% of the land surface. When classified forests are included the total protected area increases to 3.72 million ha or 6.4% of the land surface.

While the total area of forests classified as protected is relatively high the actual area effectively managed is extremely limited. Protected area management is the responsibility of The Direction des Eaux et Forêts (DEF), which also has responsibility for reforestation, timber production and watershed management, but it lacks the resources to complete its protected area tasks effectively. Intensive biodiversity planning and management appears to be confined to a small number of local "integrated conservation and development projects" (ICDPs) funded and coordinated by NGOS. These projects combine direct protection practices with development and management of land on the periphery of protected areas to stabilize land use and to provide inhabitants with alternative sources of income and forest products. The ICDP approach has greatly increased the scope and magnitude of demand for resources planning and management information and expertise. It requires socio-economic, demographic and physical as well as biological resource information, and can require expertise in agricultural, pastoral, social, and forest as well as biodiversity, management. The ICDP approach has grown in popularity recent years, increasing in Africa for example from 1 project in 1980 to 4 in 1985 and 20 in 1988, but it has yet to be comprehensively evaluated. At present there are 8 major ICDP projects, and 10 other major conservation projects in operation in Madagascar funded by 11 major NGOs and aid agencies. Seventy five percent of NGOs in Madagascar invest in ICDPs, 44% invest in education, 38% invest in training and 38% invest in research and or inventory (table 2). Average annual expenditure for 12 of these projects for which figures were available was $400,000 per annum, giving a total annual expenditure of more than US$ 4.8 million (table 2) on localized projects. This expenditure on biodiversity conservation at the project level is out of all proportion to the almost complete lack of expenditure on information collection and analysis for biodiversity planning and policy development at the national level. A major constraint limiting coordinated biodiversity planning and management is the inadequacy of biophysical and socio-economic resource information. Even at the level of local ICDPs lack of information is a significant problem, with protected area management progressing in ignorance of the type magnitude and importance of major threats, and without the collection of baseline survey data with which to monitor the success of management programs. This suggests an urgent need to establish a biodiversity planning facility for coordination the collection, storage, and analysis of biophysical, socio-economic and demographic information for application to biodiversity planning and management at both national and local levels.

2.3. A BIODIVERSITY PLANNING SYSTEM FOR MADAGASCAR

Biological conservation policy in Madagascar has been initiated at the national scale by development of an Environmental Action Plan (EAP) by the

World Bank and the Malagasy Government with the support of international donors, agencies, and NGOs. The EAP proposes a 15-20 year program of activities to protect the environment including a major component on biodiversity planning and management. To implement the biodiversity component of the EAP it has been proposed that a national biodiversity planning system (BPS) be established and funded initially by NGOs and/or bilateral aid donors to coordinate the collection, storage, analysis, and application of biological socio-economic, and demographic information. For successful operation the BPS would need to provide all the information necessary for a) evaluating patterns of biodiversity; and b) evaluating threats to biodiversity. Emphasis would need to be placed on the former at the national scale and the latter at the local scale.

Patterns of biodiversity are generally evaluated at two different but complementary levels: 1) the ecosystem level; and 2) the species level. Ecosystem approaches attempt to conserve and protect the bulk of common and widespread species by recognizing and protecting representative ecosystems, while species approaches attempt to conserve individual species by mapping their distributions and identifying their habitat and management requirements. Ecosystem approaches are the cheapest and simplest to implement. They identify and classify the natural environment into a series of biomes and ecosystems which can, for example, be overlaid with reserve boundaries to evaluate the effectiveness of current reserve networks. In Madagascar ecosystem classification and mapping is only possible at the national level, because vegetation mapping is incomplete at scales of greater than 1: million. Species level approaches to biodiversity conservation are necessary to protect rare and threatened species with restricted distributions and/or specialized habitat requirements, and to identify regions of high diversity and endemism. The species level approach requires information on individual species distribution patterns, habitat and management requirements. This level of information is not available for most rare and threatened species in Madagascar, indeed so little information is available about most species that it is uncertain which species are rare and /or threatened. Current evaluations of species conservation status are highly subjective, so one of the first analytical tasks of the BPS would be to review the conservation status of flora and fauna to establish management priorities. While many existing flora and fauna distribution records are available in museums, reports and publications this information can be expected to have little utility for biodiversity conservation at either the local or national levels for the following reasons:

1) few records appear to be accurately geocoded (tied to latitude and longitude coordinates) and hence cannot be used for predictive distribution modelling or to provide management information on species habitat requirements and response to cultural disturbance.
2) habitat type and patterns of land use may have changed at the location of historic records since they were made.
3) there are major gaps in the sampling distribution of existing records, reflecting patterns of concentration of previous surveys rather than true patterns of species distribution and biodiversity.
4) the reliability of records previously collected by untrained personnel is not known and can rarely be retrospectively determined.
5) a percentage (approximately 5%) of specimen locality records are always recorded incorrectly (at nonsense locations). This is a particular problem

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when specimen localities are only stored on cards or in relational data bases and not routinely mapped and checked (as would be the case with the BPS).
6) most previous collecting has been carried out using variable non standardized techniques so that results cannot be used to compare biodiversity between regions.

The solution to these problems lies in the use of rapid standardized survey methods (RSSM). When coupled with recent advances in computer data base management, modelling and mapping using GIS, RSSMs can provide baseline biodiversity planning and management information quickly and at relatively low cost. This approach has recently been adopted by CI for its biodiversity conservation programs in Latin America. By coupling RSSM with rapid standardized census of socio-economic, demographic and land use and condition surveys it is also possible to enhance the evaluation and prediction of threats to protected areas. Most of the major threats to species and ecosystems have been identified (table 3) but the location, magnitude and relative importance of most threats has not been determined at either national or regional scales. Deforestation can be measured relatively simply (but at cost) by remote sensing, and some preliminary national and regional assessments of clearing have already been carried out in Madagascar. The extent and importance of other threats, which cause degradation but not complete loss of vegetation cover, are not well understood and await the collection and analysis of biophysical and land use data.

2.4. OBJECTIVES AND CONDUCT OF THE BIODIVERSITY EVALUATION MISSION

A biodiversity evaluation mission funded by WWF and USAID was planned in 1989 and implemented in 1990 with the principal purpose of evaluating the technical feasibility of establishing a biodiversity planning system in Madagascar, and advising on the expertise, equipment and training requirements, functions, costing and administrative location of such a facility. Further details of the objectives of the mission, as modified during the course of the enquiry, are given in the terms of reference in Appendix 1. The sequence of actions adopted by the evaluation team to meet these objectives may be summarized as follows;

1) Completion of field inspections of ICDP projects and consultation with representatives of all government and non government agencies, foreign universities and research institutions involved in biodiversity conservation in Madagascar, to identify and list the potential objectives and functions of the BPS at regional and national levels.

2) Proposal of a structure for the BPS based on identification of the most appropriate and cost effective methods, facilities and expertise required to gather and utilize the information required to meet BPS objectives.

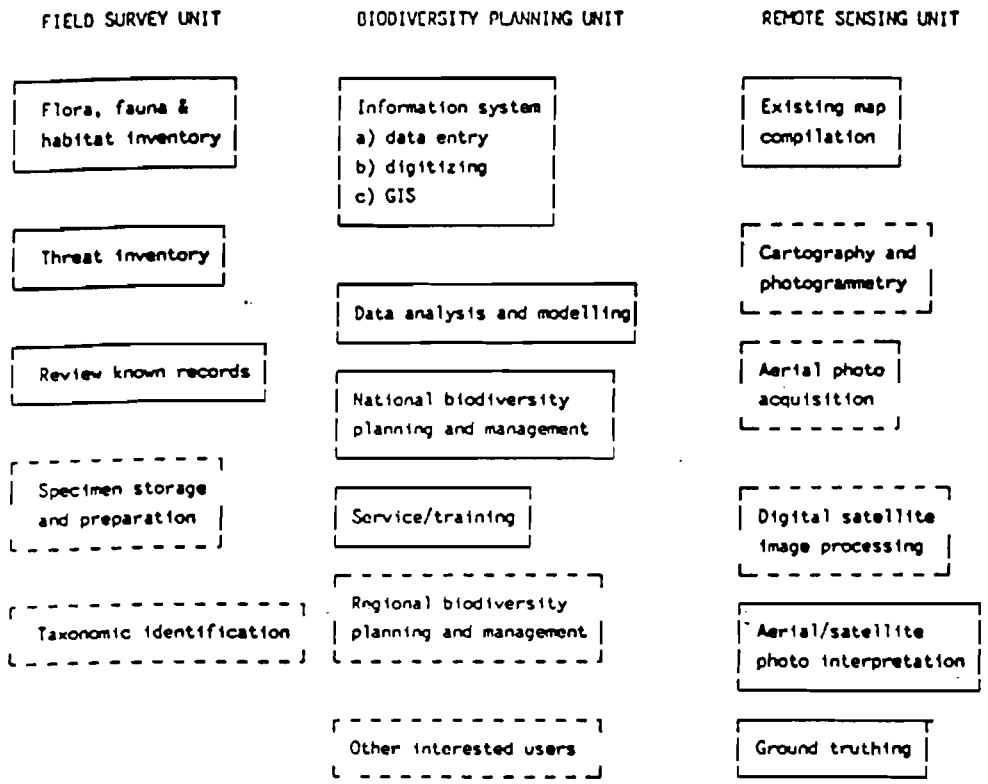
3) Evaluation of the technical feasibility of establishing the BPS, by reviewing the availability of existing relevant information, facilities, and expertise in Malagasy GOs and identifying and costing requirements for additional facilities, expertise and training.

4) Evaluation of the long term options for government administration of the BPS by review of the current and proposed responsibilities , facilities, expertise and practices of GOs involved in biodiversity planning and management.

5) Outline of a phased implementation plan and budget for the first five years of operation of the BPS.

BIODIVERSITY PLANNING SERVICE

PROPOSED STRUCTURE



3. STRUCTURE, SERVICES AND TECHNICAL FEASIBILITY OF THE BPS

3.1. OVERALL STRUCTURE OF THE BPS

The minimum facilities and expertise required for functional operation of the BPS have been organized into three service units each with a number of specialized components (fig 1). Some of these components already exist and are wholly or partially funded by existing government and/or nongovernment organizations, while others are new and would need to be wholly supported by the BPS, at least in its initial phases. Details of each unit of the BPS, including: functions; existing information, facilities and expertise; additional information, facilities, expertise and training requirements for operation of the BPS; and recommendations are given in the following sections.

3.2. FIELD SURVEY UNIT

The functions of the field survey unit will be as follows:

1) Compilation and evaluation of the utility of existing records of flora and fauna distribution, and habitat type and condition.
2) Implementation of standardized procedures for recording on-going opportunistic sightings of flora and fauna by field personnel.
3) Development of standardized procedures for survey and monitoring of flora, fauna, habitats, and threats to habitats.
4) Implementaion of a national survey of flora, fauna, habitats and threats to habitats using RSSMs.
5) Coordinate the identification and storage of voucher specimens of flora and fauna obtained during field surveys.
6) Provide training in flora and fauna identification, and standardized survey methods.

3.2.1. Flora Survey Group

Existing Knowledge. There are approximately 7,000 described species of plants and and estimated 3000 species of undiscribed plants in Madagascar. Approximately 50-75% of these species are known from less than 5 records. Normally all such species would be regarded as rare, implying the need for conservation of nearly all of Madagascar's remaining natural vegetation. It is likely, but not known however, that this rarity is more apparent than real and simply reflects inadequate past collecting. During the past 10 years MBG and affiliated scientists (table 4) have collected an estimated 10,000 flora specimens. Approximately 5000 of these records collected over the last 2-3 years have retrievable label data stored on the MBG computer data base system. These records have associated lat-long coordinates recorded with a variable accuracy of between one and ten minutes (500m -10 km). This accuracy is inadequate for regional planning and may be of limited value for national planning depending on the habitat heterogeneity and steepness of ecological gradients within the survey region. Retrospectively there maybe no way of distinguishing accurate from inaccurate records. In order to gain some advantage from this existing information it will be necessary to design a data base storage and mapping system with at least several levels of locational accuracy (eg biogeographic region, local region, individual protected area

or forest region, 10min grid, 2km grid, 200m grid). Sampling has been uneven throughout Madagascar with limited survey or individual species collection at many sites (eg 150 sites in the South) and intensive collection at few sites.

Identification. For most specimens flora identification is presently only possible to the generic level. No key to the genera of Malagasy plants is available and training in plant identification to generic level takes about 3 months full time. Identification to the species level is currently achieved either by comparison of plant specimens with material in the Musee Nationale d'Histoire Naturelle in Paris or by sending specimens to taxonomic specialists in a range of overseas institutions. Identification of plant species for a national flora survey in Madagascar would require secondment of a qualified Malagasy botanist and employment of a half time local assistant to work six months of the year on specimen identification in Paris.

Expertise. Three highly qualified local government botanists and their assistants are currently active in specimen collection, identification and storage (table 4) at the Parc de Tsimbazaza, DEF and CNRE. One higher degree student is currently undergoing overseas and local training under the guidance of MBG, and over the course of the next two years from 4-6 students with qualifications in biological or agricultural sciences are expected to be available for training and employment in flora survey and identification. It is anticipated that only one expatriate botanist would be required for two years to supervise a national flora survey. This individual would also be responsible for training at least two Malagasy assistants in plant identification, and for preparing a key to the families and genera of Malagasy plants, in the first year of survey.

Facilities. There are currently two major herbaria in Madagascar, one at the Parc de Tsimbazaza (MHE) with approximately 30,000 specimens and one at FOFIFA (MRSTD) with approximately 50,000 specimens. Neither herbarium is air conditioned or adequately housed and maintained to justify current or increased investment in specimen storage within Madagascar. However, MBG are seeking funding from the MacArthur Foundation to construct a single new herbarium. Since aid funding would be required to maintain this facility, at least into the foreseeable future, it would make considerable sense to physically combine both herbarium collections at one location, certainly the BPS should only support one herbarium. Amalgamation of the collections should be possible without amalgamating existing staff or staff functions. Field vehicles and minor survey equipment will be required for field survey and freight costs would be required for sending specimens to Paris.

3.2.2. Fauna and Habitat Survey Group

Existing Knowledge. Existing knowledge of fauna distribution in Madagascar is based primarily on the results of localized research, scientific expeditions, and non systematic surveys of protected areas. Localized research is currently in progress at Morondava, Montagne d'Ambre, Ranomafana, and other locations. Semi-systematic surveys of herpetofauna have been carried out annually since 1985, at a range of locations by C. Raxworthy and associates. Other unpublished reptile survey data are held by Q. Bloxam and D. Reid. There have been four major expeditionary fauna

surveys in Madagascar during the past 10 years, at Andasibe, Manongarivo, Rantabe, and Fort Dauphin (QIT). Copies of available reports for these surveys are housed at WWF Madagascar. Semi-systematic mammal and bird survey records have been carried out at 35 sites, mainly in protected areas, by WWF personnel during the past several years. A fauna and flora inventory group exists within SPN (DEF) but emphasis appears to be on inventory of commercial timber species. Fauna and flora records made by protected area guards are submitted to SPN on proformas and rare of unusual sightings may be followed up for validation. Guards only report sightings of species they are able to identify and locations are recorded by village sector names. Village sectors vary in size between regions and no map of sector boundaries is currently available. Distribution records of some vertebrates and commercially important plant species have been compiled by DEF personnel at the Firaisana level of government administration in the Antsiranana province. An example of the type of data being compiled was made available to the mission team by the Chef de Service des Eaux et Forets (B.Rajaonson). Fauna and commercially important flora records were compiled by Eaux et Foret guards on the basis of either direct observation or interviews with local inhabitants. The reliability of these records needs to be evaluated and the procedure for recording them needs to be standardized as far as possible, by training in survey and recording methods, before they can be expected to have utility in biodiversity planning and management.

Distribution records collected to date have been useful for compiling species lists for protected areas, but little is known about fauna distribution outside reserves, and within reserves most records are too inaccurately located to permit distribution modelling and mapping, and habitat evaluation and management. WWF survey data are, however, considered accurate to within 200m. It is recommended that the utility of these particular records be evaluated in a pilot study prior to initiation of national field surveys.

Studies of fauna habitat are in progress at Morondava and Andasibe but their has been no general survey of fauna habitats and only minimal evaluation of the effects of land use and cultural develpment on native fauna.

Identification. A field guide to the identification of birds by sight and call is in press and expected to be available by 1991. A field guide to the mammals of Madagascar is in preparation and could be expected to be available by 1992. During the interim a field key to species identification may need to be prepared by expatriate staff supervising national mammal field surveys. A field guide to the reptiles of Madagascar is not currently available, but the total fauna is relatively small (257 species) and expatriate expertise required to produce a field guide is available (table 4). It may be necessary to commission a provisional field guide, comprising sets of photographs with an accompanying a set of species descriptions, key diagnostic characters, and line diagrams, prior to initiation of national surveys.

Expertise. DEF staff record some opportunistic sightings of well known species in local management regions, but further training in identification, standardized survey and recording is necessary to improve

the utility of this source. At least on Ph.D student (table 4) and 4-6 graduates with qualifications in biological or agricultural sciences are expected to be available for training in fauna survey and identification in 1991. Training in all aspects of fauna survey should be possible within a period of 3 months. Initial training would be required by three part time (6 months per year) expatriates with expertise in mammal, bird, and herpetofaunal survey and identification respectively. After an initial training year it is envisaged that only one part time expatriate would be required to supervise national fauna surveys, while in the third year this responsibility could be taken over by trained Malagasy.

Facilites. The museum at the Parc de Tsimbazaza has space for storage of the large amount of voucher specimen material, especially of reptiles, amphibians and invertebrates, which could be expected to be generated by a national fauna survey. The museum houses 1400 bird specimens, a modest number of mammals specimens, 11000 insect specimens, but no herpetological specimens or invertebrate material other than insects. Expertise is available in wet specimen preparation, storage and registration, but no materials or facilities are available for specimen preparation or maintenance. The entomological group for example relies on visiting scientists to supply pins and has no cards on which to maintain its bibliographic index. No vehicles are available for making field excursions. Despite these difficulties the entomology group, which is one of the strengths of the museum, has assembled a reference collection which includes 80% of Madagascars described insect species. Although emphasis in the field unit of the BPS will be on vertebrate survey it would be desirable to fund some level of insect survey to support and maintain the entomology group. A certain amount of insect material will be generated indirectly (by pitfall trapping) during mammal and herpetofaunal surveys. The BPS will need to meet maintenance costs (chemicals, storage bottles, labels, and cabinets) associated with preservation, storage and registration of survey material. Little exists in the way of fauna survey equipment, but with the exception vehicle expenses, field fauna survey costs of the BPS are relatively minor (table 5a).

3.2.3. Rapid Standardized Survey Methods

Rationale. Rapid standardized survey methods are characterized by:

1) the use of presence or presence absence measures rather than abundance or density estimates of fauna abundance.
2) short duration of survey effort (> 2 sites per day).
3) no or minimal collection of voucher material.
4) many small rather than few large survey sample sites.
5) a high degree of precision.
6) independence from extraneous factors affecting species detection (eg season, climate, observer skill).

These methods are intended to provide a lot of information over a wide area, as quickly and cheaply as possible. They measure relative rather than absolute biodiversity as a basis for planning and management. The use of standardized methods ensures that results from widely separated regions are comparable, and the broad geographic spacing of survey sites maximizes opportunity for mapping species distributions. RSSMs could be expected to identify approximately 80% of bird species, 20-30% of small mammals, 100%

of arboreal mammals, 40% of reptiles, and 20% of plant species within 48 hours on sites of less than 1 ha.A potential constraint on the development of rapid flora surveys is the need to collect voucher specimens. At present approximately 10 duplicates of fertile material and 2 of sterile material are collected of each species in a region, but only one duplicate is retained in Madagascar. The rest go to other museums and specialists. Preparation and freight of this material is time consuming and expensive, so means will need to be examined for cutting down on this commitment. It would be desirable in the long term to ensure that at least 50% of this material, especially type specimens, is returned to Madagascar in due course. This could be achieved by a system of long term loans (eg 50 years) with specimens and types recallable once Madagascar has adequate housing and staffing for its own botanical facility.

A complete review of the options for selection of rapid standardized survey methods is beyond the scope of this evaluation. A list of key survey methods and equipment requirements and a summary of the effects of season, climate, observer skills, and habitat structure on the precision of these methods is given in table 5.

Location and Stratification. Madagascar has a surface area of 587000 square km.and a rainforest cover of 3.8 million ha. If a total of 400 rainforest sites, each of less than 1 ha, were covered during a national survey less than 0.01% of the total rainforest area would actually be censused. It is therefore of considerable importance to locate survey sites in a way which provides optimal opportunity for extrapolation of findings to the remaining 99.99% of the forest. This is generally done in either of two ways, by locating sites in a course grid and extrapolating results within each grid square to produce broad distribution patterns, or by stratifying surveys on the basis of habitat or ecosystem type and extrapolating results within habitats in which a species is found to occur. The latter procedure is generally preferable because it provides information about habitat requirements rather than simply national distribution patterns, and if designed appropriately it can also be used to predict regional as well as national distribution patterns.

Design of stratified surveys is greatly facilitated by the use of GIS to identify and map sample strata. Key mapped attributes used for survey stratification include: topography (elevation, aspect, slope and position on slope), geology and soils, and climate and vegetation. Maps of vegetation (1973), geology, soils, and topography, are available at a scale of 1:million. Climate maps are not available but could possibly be derived using climatic data from meteorological stations. Bioclimate surfaces modelled from latitude longitude, elevation and average climatic values at meteorological stations have previously been shown to be good predictors of fauna and flora distribution patterns at a national scale.

Access. Poor access is a potentially significant obstacle to a well designed stratified sampling program. Since road and trail development is often poor in Madagascar it is suggested that most sampling be done along major transect lines located to pass through desired strata. Trapping could be carried out intervals along transect lines at appropriate sites, while the entire transect line could be used for census of conspicuous but widely dispersed species (eg lemurs). The relatively low cost of portage (approximately 3000 MGF per man day) should facilitate the transport of

heavy survey and camping equipment over long distances.

Season. Season has a very pronounced effect on the detectability of most species of fauna, and it also effects the flowering time of plants, and hence their ease of identification. Plants flower throughout the year but at any one time the proportion of species in flower may be less than 10%. Animal species are generally more active or call more frequently during the period late spring, summer and early autumn, but at least some bird species may call for less than one month each year. Season is such a significant determinant of species detectability that it can mask the effects of environment and habitat type on patterns of biodiversity unless these effects are recorded during field surveys and taken into account during data analysis. It is therefore recommended that fauna surveys be confined to the 6 month period Sept.-March, while flora surveys could be conducted all year. Field survey teams would be responsible for specimen preparation, registration and storage between field excursions.

Climate. Just as season has a pronounced effect on the activity and detectability of many species of fauna so also does the weather conditions on the day of survey. These effects need to be controlled by sampling in appropriate conditions, by recording weather conditions during surveys and by correcting biodiversity estimates for the effects of weather condition during data analysis.

Habitat Structure. The detectability of animals by sight is strongly influenced by the density, height and structure of vegetation. Experience elsewhere has shown that the zone of 100% detectability along a rainforest track may be as little as 2m either side of the transect while that in an open woodland may be up to 100m. This effect also varies between species according to size and behaviour. Capture success in traps, mist nets and other capture devices can also vary strongly with vegetation structure at the survey site. The former effect has to be controlled by recording distances to individuals detected and modelling the data to determine effective sampling areas. The latter effect has to be taken into account by recording habitat structure at survey sites and identifying its effects during data analysis.

3.2.4. Conservation Threat Survey Group

The broad functions of the conservation threat survey group will be will be:

1) to develop and implement RSSM procedures for measuring and monitoring the extent and relative condition (level of degradation) of protected areas, particularly along roads and trails and boundaries with developed land;
2) to develop and implement RSSM procedures for measuring the magnitude and extent of utilization of protected areas for natural products (eg. firewood, timber, medicines);
3) to develop and implement RSSM methods for evaluating demograhic and economic (income, expenditure, wealth) pressures on the periphery of protected areas;
4) to identify associations between land use and protected area condition as a basis for management and prediction.

It is envisaged that the condition of natural areas in close proximity to

developed lands will be evaluated by sampling vegetation structure, floristic dominance, successional stage, occurence of pioneer species, wood invasion, and levels of land use disturbance (eg cattle tracks, stumps, trails, charcoal). Sampling could occur in the same local regions as national flora and fauna surveys but would be stratified to measure vegetation condition and land use at a range of distance intervals from boundaries and zones of different demographic and/or economic pressure. Social surveys could be based on group interviews or family head interviews, with a percentage repeat survey by a different follow up group to give some assessment of response reliability. Threat evaluation and prediction would be based on proximity analysis of associations between land use, social and demographic pressure and vegetation condition.

Existing knowledge of the relative magnitude, extent and importance of threats to protected areas is poor. The rate and effects of clearing have received most attention with some long term averages now available at the national level. A major, and to date irreversible, problem is the failure of natural vegetation to regenerate after abandonment of lands temporarily cleared for shifting agriculture. Abandoned agricultural lands are generally dominated by exotic shrubs or fire maintained grasslands. In regions where clearing has slowed, habitat degradation and economic use of specific taxa are the overriding threats to protected areas. There is some concern that horticultural collection, timber harvesting, fodder harvesting and collection of medicines are threatening specific plant taxa. A major problem in southern dry forests is the possibility of widespread biodiversity loss through woody weed development (rise to dominance of unpalatable native and introduced shrubs) as a result of excessive grazing by cattle and goats. This problem was evident several kilometres beyond the reserve boundary of parcel 2 at Andohahela. Madagascar had an estimated 7.3 million head of zebu in 1981. Most of these stock are retained for social purposes or as banks on hooves, making impact mitigation a complex social problem.

WWF personnel have completed some preliminary methodological development and training in forest use assessment through their ethnobotanical project. Proformas for interviews with family heads have been developed and evaluated for assessing the use of forests for medicinal plants. This project also involves measurement of vegetation condition, using 25 variables, in 30m by 20m plots completed at a rate of 3-5 hours by two persons. Student trainees from this and related projects should be available for employment on the conservation threat evaluation team over the next 2 years.

3.3. REMOTE SENSING AND CARTOGRAPHIC UNIT

Functions

Remote sensing data (satellite imagery and aerial photography) and cartographic information will be one of the primary sources of data input to the GIS. Mapped data is a necessary component for management and biodiversity modelling. By analysing and interpreting mapped information it is possible to predict future trends from past trends as a basis for making sensible development decisions.

The function of this unit is to service the BPS needs for remote sensing and cartographic information. It is the aim of this unit to utilize the services of existing government organizations when appropriate and perform its own data processing and compilation only when it is not available through existing organizations.

The remote sensing and cartographic unit requirements can be broken up into the following components:
1) existing map compilation
2) cartography and photogrammetry
3) aerial photo acquisition
4) aerial/satellite photo interpretation
5) satellite digital image processing
6) ground truthing

3.3.1. Existing Map Compilation

The evaluation mission has briefly reviewed the available map data and the results are summarized below:

THEME	SCALE	SOURCE	DATE	COMMENTS
Vegetation	1:1000000	Faramalala (CNRE)	1988	3
Biogeographic regions	1:1000000	IRNT	1989	Compiled from old data.
Climatology	1:4000000	ORSTOM	????	
Geology	1:100000	Service Geologie	1960	
	1:1000000		1973	
Hydrology	1:200000	IRNT	????	2
	1:1000000	ORSTOM	1960	
Infrastructure	1:50000	FTM	1950	1
	1:1000000			
Topography	1:50000	FTM	1950	1
	1:1000000			
Soil	1:200000	IRNT	1990	2
	1:1000000	ORSTOM	1960	
Meteorological	--------	DM	historic & current	Data is from point source stations, not mapped.
Population	--------	DGRDE	1975	Data is stored in a digital database.
Land use				Available for some regions only.

Comments:
1 - FTM wishes to compile maps at a scale of 1:25000 for protected areas subject to funding
2 - IRNT is currently mapping hydrology and soils at a scale of 1:200000 but plans are for only partial coverage (the agriculturally important regions), and to date only 3 out of 24 regions have been completed
3 - Faramalala's forest cover map was compiled largely from data acquire in 1972 and 1973. Also, there are areas in the northwest that have not been mapped due to cloud cover.

The adequacy of existing mapped data for biodiversity is marginal on the national, and inadequate on the local (protected area) level. It is envisaged that many of the existing maps, particularly the climatology, hydrology, topography, vegetation, soil, and protected area boundary maps will be entered into the national level GIS at a scale of 1:1000000. The accuracy of many of these existing maps is low and should be improved. Currently there is an effort to revise many of the existing thematic maps. As these revised maps become available they will replace the existing maps.

On a local level, detailed thematic maps will have to be produced at a moderate scale (eg 1:100000) for entry into the GIS. Thematic maps exist for a limited number of protected areas. The mission recommends that the necessary thematic maps be created at a moderate scale for each protected area using satellite imagery and aerial photography when necessary. Creation of these larger scale thematic maps should be the responsibility of local protected area managers.

In order to get an idea of how well the existing network of protected areas covers biodiversity in Madagascar a map illustrating the location of all existing protected areas will have to be created. Maps containing the boundaries of the existing protected areas are held by DEF. These maps have varied scales (1:10000 - 1:100000). The boundaries will have to be transfered to a base map at a scale of 1:1000000 before being entered into the GIS. This will be one of the initial tasks of the BPS.

The existing protected boundary mapping data exists in four forms; 1)physical boundary markers, 2) mapped boundaries, 3) local perceptions, and 4) legal documents. Unfortunately these different forms are not coincident, therefore, it will be necessary to review existing protected boundary information and make recommendations for a legally accepted boundary. It is envisaged that the BPS will work closely with DEF and DP to define legal protected area boundaries. It is proposed in the EP-1 that DP will receive approximately 7 million dollars in funding.

3.3.2. Cartography and Photogrammetry

On the local level, larger scale (eg 1:25000) topographic maps will have to be produced. These larger scale maps will be used to record opportunistic flora and fauna sightings, and to map natural ecosystems and land use at a scale necessary for local management. Production of 1:25000 topographic maps by FTM of selected protected areas is scheduled to begin this year (1990). Special requests for map generation (eg larger scale maps, finer contour line interval) will be forwarded to FTM.

Costs for cartography and photogrammetry at the national level is expected to be minimal. Approximately $1000/year will be needed to purchase existing maps and aerial photographs. It is envisaged that each protected area will be responsible for its own cartographic and photogrametric needs.

FTM wishes to incorporate a digital stereo plotter in their map production facility subject to funding. If this is accomplished, digitized terrain data will be available without the need for independently digitizing contour lines, the single most time consuming step in entering data into the GIS. It is expected that FTM will have digital terrain capabilities by 1993.

3.3.3. Aerial Photo Acquisition

For protected areas it will be necessary to acquire aerial data at a finer resolution then that currently available from satellite data. This finer resolution data is necessary to classify various land use/land cover types in areas where cultural practices (eg agriculture, burning, forest clearing) are occuring on a small scale (less then one hectare).

It is envisaged that aerial photography at a scale adequate for detailed land cover/land use classification will be available from FTM as a by-product from their aerial photo acquisitions for mapping purposes. If the aerial photography from FTM is not adequate (because of scale, type of film used, quality of the photographs...) then it will be necessary to acquire additional aerial photography. The cost of this additional aerial photography is approximately $US 10,000 for 1000 Km^2. The acquisition of additional aerial photography over protected areas should be considered the responsibility of the organization in charge of the area.

3.3.4. Aerial/Satellite Photo Interpretation

In order to utilize the information from photographs (aerial or satellite) land use/land cover areas will be manually classified and delineated. The method used to delineate areas on aerial and satellite photographs is similar. A simple but adequate method for most instances is to overlay the photograph with a sheet of clear plastic or tracing paper and draw lines around land use/land cover classes. If the areas being delineated are small it is useful to magnify the area being worked on. Once the areas of interest have been delineated they must be transfered to a base map.

There are two acceptable methods used to transfer data from photographs to a base map; the first is used if the photograph has been geometrically corrected (eg geocoded (map registered) satellite photograph), and the other if using aerial photographs or satellite photographs not geocoded to a map. When using geocoded satellite photographs the delineations can be directly transfered simply by tracing the delineations directly onto the base map. If there is a difference in scale between the photograph and the base map the delineations may have to be magnified or reduced before transfering them to the basemap. A transfer projector can be used for magnifying or reducing delineations. A pantograph can also be used to transfer mapped information at different scales. In the other case, when the photograph is not geocoded, it will be necessary to use a simple transfer instrument such as a zoom transfer scope to adequately transfer deliniations from a photograph to a base map. Transfer instruments allow

distortions to be compensated for optically. See table six for material requirements for photo interpretation and their associated costs. It is envisioned that the photo interpretation will be done by the BPS.

3.3.5. Ground Truthing

Aerial photo and satellite image classification decisions must always be verified by ground observations. Ground truthing involves setting up and executing a methodology for verifying delineations of land use/land cover.

At a regional scale the ground truthing should be done by personnel associated with the particular protected area (eg DEF) and could be arranged at little cost to the BPS. Using personnel familiar with the area being field checked eliminates many of the logistical problems associated with bringing new people to an area (eg transportation, familiarity of area being classified, and finding ones location on the photograph or map). The role of the BPS will be to offer assistance to the protected area staff in the form of training and limited equipment support. See table seven for a list of materials needed for ground truthing training and support.

3.3.6. Satellite Digital Image Processing

Satellite imagery is an important data source for geographic information systems. Using satellite imagery it becomes possible to get quick natural resource assessments on a regional or national scale. In order to economically utilize remote sensing imagery it is important to choose the correct type of imagery, particularly with respect to ground resolution. Below is a table with a list of data types and their appropriate map scales for interpretation:

DATA TYPE	GROUND RESOLUTION	APPROPRIATE MAPPING SCALES
NOAA AVHRR GAC	4 km^2	1:8000000 and smaller
NOAA AVHRR LAC	1 km^2	1:2000000 and smaller
Landsat MSS	80 m^2	1:200000 and smaller
Landsat TM	30 m^2	1:75000 and smaller
SPOT XS	20 m^2	1:50000 and smaller
SPOT Pan	10 m^2	1:25000 and smaller
Aerial photo	0.1m^2- 10m^2	1:400 and smaller

With respect to satellite imagery, the finer the ground resolution the more expensive the data. For this reason it is important that the end use of the satellite data is known before it is purchased.

On the national scale it is recommended that low resolution satellite data (eg NOAA AVHRR LAC) be processed to determine; 1) seasonal variations in vegetation, 2) define broad vegetation classes, 3) monitor long term changes in vegetation cover, and 4) monitor fire activity on a national scale.

For protected areas it is recommended that medium (eg Landsat MSS) or high (Landsat TM, SPOT) resolution satellite imagery be processed to; 1) produce enhanced geo-referenced photographs for manual interpretation, 2) produce land use/land cover images classified for particular themes (eg

forest classification, ecological zones, human disturbance) for direct entry into the GIS, and 3) to monitor changes in land use and land cover over time at a regional scale.

It is envisaged that satellite imagery and digital image processing costs for the national level will cost $20,000/year. Satellite data for protected area use will be purchased by the administrating organization in the protected area of interest.

As part of the Environment Program 1 it is envisaged that a new department of FTM will be formed to process satellite imagery (LNT). Unfortunately, the remote sensing facilities in FTM will not be available until 1994 at the earliest. It is therefore recommended that the image processing work be either contracted out or that the purchase a satellite image processing system suitable for providing regional and national image processing services (it is not in the scope of this mission to evaluate an image processing system for the BPS). The Goddard Space Flight Center\NASA has already expressed an interest to provide satellite image processing support for the BPS until FTM has an operational image processing system. For training purposes it is recommended that Malagasy personnel accompany personnel providing the digital image processing support. Using this training scheme, there will be Malagasy expertise in digital image processing when LNT is formed.

Preliminary investigations have revealed that the technical expertise for all of the tasks listed above with the exception of digital image processing and use of simple photogrammetric instruments for photo interpretation presently exists in various organizations within Madagascar. It is recommended that a more comprehensive survey of available qualified personnel be conducted to identify gaps in areas or levels of expertise. The mission recommends that selected Malagasy individuals be trained either by sending them to institutions specializing in remote sensing and photo interpretation training (eg ITC in the Netherlands) or hire a contractor to do in-house training.

3.4. BIODIVERSITY PLANNING UNIT

3.4.1. Function

The biodiversity planning unit (BPU) is core of the BPS. As the core unit, it will be the receptacle for storage of biophysical resources information acquired from review of existing information, field surveys, remote sensing and maps. Once the data is stored, it is the function of the BPU to analyze the data and, from the analysis, allow sensible biodiversity planning decisions to be made on both the national and local levels. This will be most effectively achieved using a geographic information system (GIS) in concert with a data base management system and data analysis and modelling system, as a tool for capture, storage, mapping, overlay and modelling of natural resource, land use and biodiversity data.

The function of the BPU is not to offer management solutions, but to organize and present available information in a format most useful for planners and managers. Examples of general planning and management problems to be addressed by the BPU at national and local levels are listed below:

On the national level the biodiversity planning and management functions are:

1) evaluation of the effectiveness of existing protected areas for conservation of representative ecosystems,
2) assessment of individual species conservation status,
3) evaluation of the effectiveness of existing protected areas for conservation of rare and threatened species,
4) design and location of new protected areas,
5) facilitate preparation of rare and threatened species management plans,
6) stratify country to assist in national survey design,
7) provide an information database for biodiversity research,
8) monitor the rates of vegetation clearing and alienation on a national scale (including past trends),
9) help define protected area boundaries.

3.4.2. Regional biodiversity planning and management

On the regional level, biodiversity planning and management functions are:

1) evaluation of the magnitude and importance of cultural activities on fauna and their habitats,
2) assessment of individual species conservation status,
3) facilitate preparation of rare and threatened species management plans,
4) facilitate formulation of protected area peripheral zone development plans,
5) evaluation of the protected areas for conservation of representative ecosystems of a regional scale,
6) evaluation of the effectiveness of the protected areas for conserving rare and threatened and endemic flora and fauna at a regional level,
7) assessing species population sizes,
8) monitoring and predicting vegetation clearing and disturbance at a regional scale,

3.4.3. Data Base Management System

All reliable existing distribution records derived from previous flora and fauna surveys, museum specimens, published and unpublished reports and existing data bases will be geocoded and stored in a relational database. The data base will allow queries (eg updating, editing, and analysis) to made in a simple fashion. The information stored in the data base should include as a minimum, geographic location, species names, collector, date and, in the case of fauna records, climate and habitat information if available. Because of the great variability in accuracy and reliability of existing records the data base should include a capability for recording geographic locations at several or more scales of accuracy (eg biogegraphic region, province, protected area, 2km grid, 200m grid). Malagasy personnel skilled in use of relational databases are available. It is envisioned that one person would be sufficient for data entry on the national level.

Key functions of the data base management personnel will be: 1) to ensure that as far as possible a standard format is adopted for collection, recording, and storage of biological inventory information throughout

Madagascar, 2) to supervise the encoding and reliability assessment of existing biological distribution records, 3) to ensure that the BPS data base is compatible with other biodiversity data bases, and 4) to develope additional non-geographic data bases (eg bibliographic, systematic) necessary to assist biodiversity planning and management.

3.4.4. Digitizing System

The functions of the digitizing system will be to manually digitize all existing relevant hardcopy map information, and new mapped information as it becomes available. On a national scale this will involve digitizing the following existing 1:1,000,000 scale maps:

1) vegetation,
2) biogeographic regions,
3) geology,
4) soil,
5) hydrology,
6) topography,
7) infrastructure, and
8) climatology.

At the local level the same themes will be digitized but at larger scales, when maps are available. Some regions have additional mapped information (eg forest productivity, forest change, and demographic information) which would also be digitized for entry into the GIS.

It is envisioned that a large format central digitizing unit will be located in the BPU and small format digitizing units will accompany GIS units which will be located in the various regional centers and other interested organizations (see Table 8). Digitizing on the national level and large digitizing tasks on the regional level will be done by the BPU. Small digitizing tasks for local projects will be done by local management personnel, after training by the BPU. Digitizing is labor-intensive and time consuming but requires little training with appropriate hardware and software.

3.4.5. Geographic Information System (GIS)

A GIS is a computer based system for the storage, retrieval and analysis of geographically referenced (eg tied to specific coordinates of latitude and longitude) environmental data (fig. 2, Table 8). Geographic data comes in three forms: points, lines and areas. Most biological survey data consists of points (distribution records), while roads, rivers, power lines are examples of lines, and soil type and vegetation cover are examples of areas.

The GIS constitutes the center piece that ties together the different types of information (cartographic, satellite images, biological surveys, socioeconomic data, etc.) and analysis that must be performed for the planning and management of protected areas, both at the national and the regional level (figure 3).

On the national level it is envisioned that a GIS would be created to store information in a grid with a ground resolution of 1-2 km^2 (depending on the capacity of the GIS) and on the regional level a grid with a ground

resolution of 1 ha would be used.

The scale at which biodiversity information is required for management depends on the minimum habitat patch size which can be occupied by a species and on the scale of habitat heterogeneity in the natural environment. The former may be as small as $1m^2$ for invertebrates or as large as $10km^2$ for the larger vertebrate carnivores. As a general rule we recommend a scale of 1 ha for regional studies because this is the approximate minimum patch size recognized by most vertebrate species.

At the national scale the grid size is limited to the accuracy of mapped data and the storage capacity of the GIS. A 1-2 km^2 grid is recommended as being less than the scale of heterogeneity recognizable on existing maps at a scale of 1:1,000,000.

Malagasy personnel with limited GIS experience are located in FTM. It is envisaged that additional training will need to be provided by the BPU at both the national and local levels.

3.4.6. Data Analysis and Modelling

Functions of the data analysis and modelling system will include:
1) correcting biodiversity estimates for the the effects of season, climate,vegetation structure and other extraneous factors;
2) modelling species distribution patterns;
3) classification of natural ecosystems;
4) associating species distribution patterns with vegetation and habitat variables to evaluate their habitat and management requirements;
5) associating patterns of land use and habitat condition to identify the magnitude and importance of conservation threats;
6) evaluation of customized national and local management tasks.
7) providing summary reports of species occurrence and land use data by region, protected area etc.

In order to adequately utilize the BPU for modelling and data analysis a statistical package will have to be used in concert with the GIS to allow customized modelling and analysis using statistical procedures not built into the GIS. At a minimum the GIS should have an inbuilt capacity to producing summary statistics, area statements, proximity analyses, and rapid (near instantaneous) overlays.

Biological point survey data (eg rare and threatened species records) have to be converted into distribution maps (areas) using the modelling capabilities of the GIS before they can be used in biodiversity planning and management. Distribution maps are generated by correlating the frequency of occurrence of a species, with the values for existing mapped variables (eg soils, vegetation, climate, elevation) at those same sites. The resulting correlations or associations can be used to develop models that predict the distribution and abundance of the species in regions that were not surveyed. Individual species distribution maps can be overlaid to map centres of biodiversity and endemism, or point biodiversity measures can be modelled and mapped directly.

Malagasy personnel with limited experience in statistical data analysis and modelling are available, however, it is expected that the persons

conducting the data analysis and modelling will need to train Malagasy personnel in advanced statistical analysis and GIS applications to fully utilize the capacity of the GIS.

3.4.7. Service and Training

A major function of the BPU will be to provide training and various services to regional centers and other interested organizations. It is envisaged that the BPU should support a variety of services to the regional centers and other users which would be too expensive for the individual center to do themselves. Support activities in GIS methods should also be made available to other institutions interested in using this approach to other problems where geographic and spatial analysis is of importance. Having a large number of institutions use a common tool applied to different issues will facilitate training, enhance the development of applications and reduce technical dependency. Among these institutions, CNRE has already expressed their need for such a system. Services which should be offered by the BPS are listed below:

1) simple photogrammetric services (eg transfer of information from photographs to maps)
2) photo interpretation
3) large format digitizing
4) network referal (referal of appropriate government or non-government services to aid regional projects)

It is recommended that training programs be offered in:

1) concept and use of a GIS,
2) data entry and digitizing,
3) analysis and modelling of data in a GIS,
4) field survey methodology and technique, and
5) protected area management applications.

specimens. In the event the specimens are inadequately housed or maintained, duplicate material will need to be freighted to overseas museums. The BPS will supply the Parc de Tsimbazaza with materials and cabinets for storage and registration of voucher material, and training in specimen preparation and maintenance.

Relations with the Direction de la Météorologie.

The BPS will rely on DM for historic und current meteorologic data. DM is currently receiving data from 147 stations (some stations report rainfall data only). The BPS will provide the DM with copies of any national climatic models and maps generated by the BPU.

Relations with the D.E.F./S.P.N.

The BPS will rely on DEF/SPN for:

1) providing maps of protected area boundaries

2) providing copies of biophysical and land use inventory records accumulated by protected area guards and provincial management personnel.

The BPS will provide DEF/SPN with information for management of protected areas.

Relations with FOFIFA.

The BPS will provide services and training to FOFIFA personnel interested in using GIS.

Relations with the Direction du Patrimoine.

The BPS will provide a global view of existing protected areas to DP to aid them designating boundaries. As protected area boundaries become defined, the DP will provide the BPS with their precise location.

Relations with the MINESUP/Université d'Antananarivo.

The BPS will liaise with MINESUP and relevant departments of the University in seeking personnel for training and employment at the BPS.

Relations with DGBDE.

DGBDE will provide the BPS with demographic and socio-economic data. The population prediction information provided by DGBDE will also be used by the BPS.

Location of the BPS.

Location of the BPS is a critical issue. At present, there is no single GO with primary responsibility for Protected Area planning and management at both the national and local levels. An association of GOs (ANGAP) has been proposed to coordinate and develop protected area policy and planning at the national level. However, location of the BPS within such an association may be inadvisable if it has no power or authority to implement planning and policy recommendations at a local level.

The evaluation mission considers that the BPS should be located within a single GO which has the power and responsibility for Protected Area

4. ADMINISTRATION AND LOCATION OF THE BPS

Appropriate location and administration of the BPS is necessary to ensure that:
1) the services, findings and recommendations of the BPS are utilized and implemented at the local management level;
2) the BPS continues to operate effectively under Malagasy control once expatriate training services and advisors have been withdrawn;
3) information generated by the BPS is made available to all interested and relevant GOs and NGOs concerned with aspects of biodiversity conservation and management.
4) the BPS can continue to fonction effectively in the event the collaborating GOs are unable to continue providing current services.

The evaluation mission has given a great deal of consideration to options for design of an administrative structure for the BPS which will enable it to meet the above objectives. The results of the review of existing expertise and facilities within GOs are summarized in table 9. Explicit relations of the BPS with GOs and options for location of the BPS are outlined in the following sections.

Relations with F.T.M.

The BPU will rely upon the FTM FOR:
1) cartographic and photogrammetric services;
2) aerial photo acquisition (including aerial surveys at a scale of 1:40,000 of the protected areas and their zones of influence, and the production of annotated ortho-photos maps at a scale of 1.25,000 for these areas, as included elsewhere in the PAE).
3) digital satellite image processing by 1994
4) production of digital terrain models for the protected areas and zones of influence (produced as a by-product of the ortho-photo production)

In the event that FTM is unable to provide these services, they would have to be provided by the BPS itself, or by outside contract. This would not increase the operational costs of the BPS substantially because it is anticipated that most of these costs will be met by local management projects. If it proves necessary or desirable for the BPS to acquire a satellite digital image processing system, it would require an additional capital investment of approximately $200,000.

Relations with C.N.R.E./I.R.N.T.

The BPS will rely upon CNRE for production of updated vegetation maps, and on IRNT for the supply of updated biogeographic, hydrology and soil maps, for entry into the GIS. In the event that these GOs are unable to continue upgrading these mapped data bases, the BPS would either utilize existing information or provide contract vegetation, soil and hydrological survey services to local management projects on request. The BPS will offer service and training to CNRE in use of GIS.

Relations with the Parc de Tsimbazaza.

The BPS will rely upon Tsimbazaza for storage and registration of voucher-

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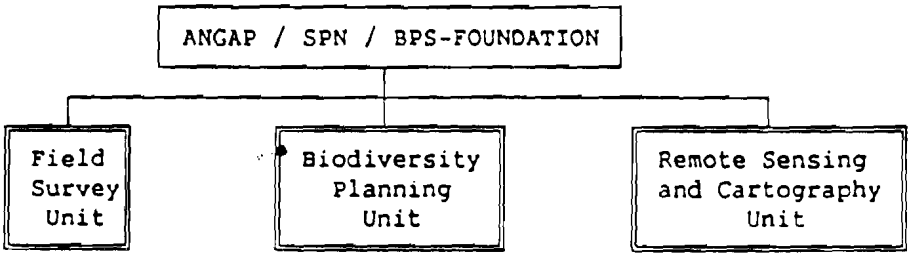
planning and management at both national and local level. Local protected area management is currently the responsibility of SPN. A national Protected Area policy and planning facility could be created within SPN for housing the BPS.

SPN has the advantage of providing an existing structure for administering protected area guards and personnel, but the disadvantage that a conflict of interest may arise between the park management functions of SPN and the Forest and Water management functions of its parent organization DEF. While SPN remains a part of DEF, it is also possible that resources allocated for Protected Area management could be displayed for other uses. As possible solution to this problem would be the development of greater autonomy by SPN by supporting its transition to a Protected Area department with equivalent status to DEF.

A third solution would be development of an independent foundation with the power to influence Protected Area policy, planning and management by allocation of funds directly to existing GOs and NGOs. This solution is not recommended however, because it would not promote autonomy and independent control of the BPS functions by the Malagasy Government, after the first five years of operation of the BPS as currently planned.



5. BPS IMPLEMENTATION TIMETABLE

The following phased approach to implementation of the BPS is recommended to spread establishment costs across the first several years and maximize opportunity for gradual training and transfer of BPS functional responsibilities to Malagasy personnel (see table 10).

YEAR 1

Staffing and Qualifications
BPS Advisor: Expatriate with qualifications in GIS, computer data base management, and biological survey

Malagasy Director: Qualifications as above

Malagasy Secretary: Five years secretarial experience

Malagasy Digitizing Personnel: Undergraduate student with basic computer skills

Equipment
GIS hardware/software, digitizing hardware/software, data base software, and statistical analysis software(see table 8), one vehicle and office equipment (ie, computer, printer, fax, phone, photocopier, furniture...).

Responsibilities

1) Formulation of National Biodiversity Planning policy
2) Evaluate, select, and install computer data base and GIS software
3) Commence compilation and reliability assessment of existing flora and fauna distribution data (museums, publications etc.)
4) Development of standardized procedures for recording and storage of ongoing biophysical inventory data.
5) Supervise contracts for formulation of a rapid standardized flora, fauna, habitat, and threat survey.
6) Evaluate rapid field survey methods and prepare pro-formas
7) Complete National biophysical resource digitizing and upgrade topographic data base.
8) Identify major biogeographic provinces and design a stratified sampling program for a three year national field survey.
9) Evaluate facilities currently offering satellite digital image processing services. Order satellite data for entry into GIS to aid in identification of biogeographic provinces.
10)Review and evaluate national and regional pilot study results.
11)Establish a library with relevent books and journals.Year 2

YEAR 2

Staffing and Qualifications

All personnel carried over from year one

Secretary Assistant: Secretarial skills

BPU Data Base Advisor: Expatriate with qualifications in data base management and computer programming

Malagasy Data Base Manager: Undergraduate or post graduate degree with experience in data base management and/or computer programming

BSU Flora Survey Advisor: Expatriate with plant survey and identification skills

2 Malagasy Flora Survey Supervisors: Undergraduate or post graduate skills in biological or agricultural sciences

2 Malagasy Field Assistants: Undergraduate qualifications in biological or agricultural sciences

3 BSU Fauna and Habitat Advisors (six months each): Expatriates with bird, mammal, and reptile survey and identification experience respectively

3 Malagasy Fauna Survey Supervisors (six months): Undergraduate or postgraduate skills in biological sciences

3 Malagasy Fauna Field Assistants (six months): Undergraduate qualifications in biological sciences

RSU Advisor (six months): Expatriate with expertise in setting up and operating a photo interpretation facility. Familiarity with digital image processing and satellite interpretation

Malagasy RSU Supervisor: Experience in photo interpretation and use of simple photogrametric instruments

Malagasy RSU Assistant: Undergraduate with basic experience in photo interpretation

Equipment
Vehicles, field survey equipment (see table 5b), and simple photogrammetric instruments (see table 6)

Responsibilities
The BPS will be organized into three units (FSU, BPU,and RSU)

BPU Personnel:
1) Storage and management of field survey records and ongoing opportunistic biophysical inventory data.
2) Commence trainning regional personnel in the use of GIS
3) Commence offering services to regional GIS users
4) Train Malagasy data base management assistint in data base management and computer programming
5) Commence data analysis and modelling using simple models

BSU Personnel:
1) Commence national flora survey
2) Commence national fauna, and habitat surveys (six months)

RSU Personnel:
1) Create in-house photo interpretation facility
2) Train malagasy to supervise RSU
3) Train personnel in use of simple photogrammetric instruments
4) Acquire recent satellite imagery for national GIS
5) Acquire satellite photos and aerial photos for training purposes

YEAR 3

Staffing and Qualifications
All personnel carried over from year two less one expatriate fauna survey supervisor.

BSU Threat Survey Advisor: Expatriate with experience in sociology and rural development

Malagasy Threat Survey Supervisor: Undergraduate or postgraduate with skills in sociology.

Malagasy Threat Survey Assistant: Undergraduate with skill in sociology.

Malagasy in Paris for Plant Identification (six months): Undergraduate or postgraduate skills in biological sciences

French Technician in Paris for Plant Identification (three months): Undergraduate skills in biological sciences

Malagasy Field (ground truthing) Technician: Basic experience in field work

Equipment
Equipment and parts for replacement and repair of existing equipment. Equipment for ground truth survey (see table 7).

Responsibilities

BPU personnel:
1) Storage and management of field survey records.
2) Continue regional training in GIS use
3) Continue services to regional GIS users
4) Continue data analysis and modelling
5) Review data base software/hardware for possible upgrading

BSU personnel:
1) Commence threat analysis and determine appropriate techniques for measureing human threat on protected areas for a national and regional scale
2) Commence plant identification in Paris (six months)
3) Continue national flora survey
4) Continue national fauna, and habitat survey (six months/year)
5) Train Malagasy personnel to supervise flora, fauna, and habitat surveys

RSU personnel:
1) Commence photo interpretation/ground truthing services for national survey and regional projects
2) Acquire recent satellite imagery for national GIS
3) Acquire high resolution satellite imagery if needed

YEAR 4

Staffing and Qualifications

All personnel carried over from year three less two expatriate fauna survey supervisors

Responsibilities
BPU personnel:
1) Storage and management of field survey records.
2) Continue regional training in GIS use
3) Continue services to regional GIS users
4) Continue data analysis and modelling
BSU personnel:
1) Flora survey supervisor will oversee flora, fauna, and habitat survey
2) Continue threat analysis
3) Continue national flora survey
4) Continue national fauna, and habitat survey (six months/year)
RSU personnel:
1) Continue photo interpretation/ground truthing services
2) Define satellite image processing requirements and integrate digital satellite image processing products from LNT into the GIS
3) Acquire recent satellite imagery for national GIS
4) Acquire high resolution satellite imagery if needed

YEAR 5

Staffing and Qualifications
All personnel carried over from year four less the expatriate flora survey supervisor, the expatriate threat survey supervisor, and the expatriate data base manager

Responsibilities
BPU personnel:
1) Review results of national survey and data analysis and begin policy decision making process
2) Storage and management of field survey records.
3) Continue regional training in GIS use
4) Continue services to regional GIS users
5) Continue data analysis and modelling
BSU personnel:
1) Transfer field survey staff to regional projects
2) Malasasy data base manager becomes data base supervisor
RSU personnel:
1) Continue photo interpretation/ground truthing services
2) Acquire recent satellite imagery for national GIS
3) Acquire high resolution satellite imagery if needed

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TABLE 11: Costs/year for opperation of the BPS

DESCRIPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
BPS						
Vehicle	$ 18,000					$ 18,000
Vehicle maintainence and fuel	$ 6,200	$ 6,200	$ 6,200	$ 6,200	$ 6,200	$ 31,000
BPS Advisor	$ 65,000	$ 68,250	$ 71,660	$ 75,245	$ 79,000	$ 359,155
Malagasy BPS Director	$ 6,000	$ 6,600	$ 7,260	$ 8,000	$ 8,800	$ 36,660
Secratary	$ 3,500	$ 3,850	$ 4,235	$ 4,470	$ 4,920	$ 20,975
Secratary Assistant		$ 3,300	$ 3,630	$ 4,000	$ 4,400	$ 15,330
Office equipment and Maintanance	$ 20,000	$ 6,000	$ 6,000	$ 6,000	$ 6,000	$ 44,000
Office supplies	$ 3,000	$ 3,300	$ 3,630	$ 4,000	$ 4,400	$ 18,330
RSU						
Cartography and Photogrammetry Costs	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 5,000
Digital image processing Costs	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 100,000
Photo Interpretation Facility		$ 44,200	$ 4,000	$ 4,000	$ 4,000	$ 56,200
Ground Truthing Equipment			$ 6,750	$ 1,000	$ 1,000	$ 8,750
Malagasy digitizing personnel	$ 3,000	$ 3,300	$ 3,630	$ 4,000	$ 4,400	$ 18,330
RSU Advisor		$ 32,500				$ 32,500
Malagasy RSU Supervisor		$ 4,400	$ 4,840	$ 5,350	$ 5,885	$ 20,475
Malagasy Field Assistant			$ 3,630	$ 4,000	$ 4,400	$ 12,030
FSU						
Survey Equipment and overhead		$ 142,300	$ 75,325	$ 75,325	$ 23,500	$ 316,750
Flora Survey Advisor		$ 68,250	$ 71,660	$ 75,245		$ 215,155
2 Malagasy Flora Survey Supervisors		$ 8,800	$ 9,680	$ 10,700		$ 29,180
2 Malagasy Flora Survey Assistants		$ 6,600	$ 7,260	$ 8,000		$ 21,860
Mammal Survey Advisor		$ 34,125	$ 35,830			$ 69,955
Reptile Survey Advisor		$ 34,125				$ 34,125
Bird Survey Advisor		$ 34,125	$ 35,830			$ 69,955
3 Malagasy Fauna Survey Supervisors		$ 13,200	$ 14,520	$ 16,050		$ 43,770
3 Malagasy Fauna Survey Assistants		$ 9,900	$ 10,890	$ 12,000		$ 32,790
Threat Survey Advisor			$ 71,600	$ 75,245		$ 146,845
Malagasy Threat Survey Supervisor			$ 4,840	$ 5,350		$ 10,190
Malagasy Threat Survey Assistant			$ 3,630	$ 4,000		$ 7,630
Malagasy in Paris for Plant ID			$ 2,420	$ 2,675		$ 5,095
French personnel in Paris for Plant ID			$ 3,500	$ 3,850		$ 7,350
BPU						
Hardware/Software	$ 32,900	$ 11,450	$ 11,450	$ 11,450	$ 11,450	$ 78,700
Data Base Advisor		$ 68,250	$ 71,660	$ 75,245	$	$ 215,155
Malagasy Data Base Supervisor		$ 4,400	$ 4,840	$ 5,350	$ 5,885	$ 20,475
SUBTOTAL	$ 178,600	$ 633,425	$ 581,600	$ 527,750	$ 195,140	$ 2,111,515
10% inflation and contingency	$ 17,860	$ 63,342	$ 58,160	$ 52,775	$ 19,514	$ 211,151
TOTAL	$ 196,460	$ 702,267	$ 639,760	$ 580,525	$ 214,654	$ 2,322,666

Note: These cost do not include a building to house the BPS. If a building must be rented or purchased, (pending on a decission a decission on the location of the BPS) these cost would have to added to the above figures.

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6. PILOT SURVEY

Objectives

1) To evaluate the utility of the best existing fauna distribution information (lemurs, birds) for biodiversity planning at a national scale as a guide in the need for collection of additional biological inventory data at a national level.
2) To evaluate the utility of the best-known existing biophysical and socio-economic resource information for biodiversity planning at a local scale, as a guide to the need for collection of additional biological and socio-economic inventory data at a local level.
3) To conduct pilot surveys of plant, bird, mammal and reptile biodiversity as a guide to the cost-effectiveness of rapid standardized biological surveys.
4) To conduct a preliminary gap analysis, to evaluate the extent to which major vegetation communities are represented in the current Protected Area network in Madagascar.
5) To conduct a preliminary gap analysis to evaluate the extent to which key rare and endangered lemur and bird species are represented in the current protected area network in Madagascar.
6) To compare the utility of available GIS systems and identify appropriate hardware and sotware for use in Madagascar.
7) To set up a pilot, GIS based, biodiversity information system, as a facility for training and demonstrating the techniques of biodiversity planning and management in Madagascar.

6.1. Methods

6.1.1. National Pilot Study

1) Set up a national GIS data base and digitize existing mapped information (vegetation, topography, geology, bioclimate) at a scale of 1:1000000 into a GIS (AS and NH)
2) Classify recent NOAA AVHRR LAC (1km2 resolution) satellite images to produce a map of current vegetation cover and enter it into the GIS (NH)
3) Collect and geocode all available climatic average rainfall and temperature data for meteorological stations in Madagascar, enter into a data base (MN, FR) and model using statistical trend surface modelling procedures to produce a climatic surface for the whole of Madagascar (MN, AS) (This step may not be necessary if existing data is found to be adequate, AS to report later).
4) Transfer mapped protected area boundaries to a set of 1:1,000,000 maps, digitize, and send to AS/NH for entry into a GIS (MN, FR).
5) Overlay protected area boundaries with vegetation communities and modelled biogeographic provinces to evaluate the effectiveness of the current protected area network for representative ecosystem conservation (AS, NH, SO, FH).

6) Compile and geocode (UIM grid net, plus index of locational accuracy) all existing systematically collected lemur and bird species, distribution records and enter into a data base (DBase 3+ ?)(MN, FR) and send to AS for transfer to the GIS.
7) Model fauna distribution patterns using GIS overlay and standard multivariate statistical modelling procedures. Overlay species distributions using GIS and produce fauna biodiversity maps. Overlay biodiversity maps with the existing protected area network to evaluate the effectiveness of protected areas for conserving lemur and bird species (AS, JG, MN).

8) Consolidate and model data from national and regional pilot surveys at CI in Washington (two weeks) following field surveys in Madagascar, and compare the utility of different available PC-GIS systems, to identify appropriate hardware and software for use in Madagascar (SO, AS, NH).

6.1.2. Regional Pilot Study Methods

1) Digitize existing available mapped biophysical information and establish a raster GIS data base for the Morondava region. Define boundaries of region and circulate map to participants (suggested boundary, NH).

2) Compile a map, from hardcopy satellite imagery, showing patterns of recent annual vegetation clearing at Morondava and mail to NH (SAF/CFPF representatives).
3) Compile a listing of all flora and fauna records, including location and accuraca, in the study region and enter into DBase 3+ relational data base (FR to coordinate data collection from MN, OL, AS, NH and other sources including publications and reports).
4) Provide a listing of available dbh, height, species, abundance data for timber producing plants at geocoded (lat long) locations in the study area (SAF/CFPF representatives) and send to FR for entry into DBase 3+, then forward to NH.
5) Compile available rainfall and temperature data (SAF/CFPF representative), incorporate into the relational data base (MN,FR) and model the data to produce a climate surface map of the region (NH, AS).
6) Develop and evaluate (cost, effects of climate, collector, habitat access, time of day, etc.) stratified, rapid, systematic biological surveys (plants, birds, reptiles, lemurs and small mammals) of the Morondava region (two weeks, GS, FR, MN, OL, AS, NH and others) and code for enty into the GIS. Conduct and evaluate similar surveys in wetter, eastern rainforests (in the vicinity of Antananananarivo, eg. Andasibe ?) (one week, GS, FR, MN, OL, AS, NH and others). Prepare data collection proformas for each flora/faune group and for each survey method and mais to AS for drafting into coordinated survey program. FR to review availability of camping equipment and survey equipment and advise AS of any necessary purchases.
7) Classify high resolution satellite imagery (SPOT or Landsat TM) into vegetation cover types for entry into the GIS using georeferenced hard copy imagery, and digitize into the data base (NH).
8) Ground truth satellite classification to identify cover types (NH, SAF/CFPF representative).

9) Data entry into GIS and data base (FR and others) and analysis (to be conducted in Washington for two weeks in first instance and subsequently at individual institutions. Copies of data to be circulated to all participants once data base completed. Final analysis to be completed by 31 August 1991.

6.2. Budget

- Satellite image classification/storage (NH)		
	National	$ 2000
	Regional	$12000
- Digitizing and storage of mapped data (NH,AS)		
	National	$12000
	Regional	$ 6000
- GIS software (AS to send to NH and others)		$ 3000
- Compilation and geocoding existing bird/lemur record storage 1.5 months (FR)		$ 300
- Compilation and storage of meteorological data 1.5 months (FR)		$ 300
- Mapping protected area boundaries (FR)		$ 500
- Project administrator salary for 1.5 months @$270/month (LA)		$ 400
- Field survey coordinator for 1.5 months @ $340/month (FR)		$ 500
- perdiem USA 7 days @ $150/day		$ 1050
- Two roundtrip airfares from USA @ $3500/person (NH,SO)		$ 7000
- Roundtrip airfare from Australia (AS)		$ 3500
- Perdiem in Madagascar for three expats for four weeks @ $50/person/day for ten days		$ 5250
- Camping expenses all personnel 20 days field survey		$ 2500
- Two 4WD vehicles for three weeks @ $750/vehicle/week		$ 4500
- Five cooks/guides/guards for 3 weeks @$15/person/week		$ 250
- 1 camp coordinator for 4 weeks (inc. prep.)@ $30/week		$ 125
- Field Survey Equipment (nets, traps, batteries, portable PC for data base and GIS, polaroid for producing identification keys on site)		$ 3000+
- Other costs (air freight, phone calls, office supplies printing...)		$ 2705
TOTAL		$66,675

Note - This budget does not include the institutional commitment of the institutions of the respective investigators. This commitment includes equipment costs, salaries and other services.

6.3. Participants

(AS) Andrew Smith (project leader) - University of New England, Australia
(NH) Ned Horning (remote sensing specialist) - NASA Goddard Space Flight Center, USA
(SO) Silvio Olivieri (GIS specialist) - Conservation International, USA
(MN) Martin Nicoll (mammal specialist) - WWF, Madagascar
(OL) Olivier Langrand (bird specialist) - WWF, Madagascar
(GS) George Schatz (botanist)-MBG, Madagascar.
(FR) Felix Rakotondraparany (survey coordinator)- Malagasy student
(LA) Lalao Andrianifahanana - (project administrator) - WWF, Madagascar
(FH) Faramalala Harisoa - CNRE

TABLE 1

List of protected areas in Madagascar

NATIONAL PARKS		HECTARES
Isalo (PN2)		81 540
Montagne d'Ambre (PN1)		18 200
Mantady		10 000
Ranomafana		40 000
Mananara-Nord		24 000
	Total	173 740

RESERVES NATURELLES INTEGRALES		
Tsingy de Bemaraha (RNI 9)		152 000
Andohahela (RNI 11)		76 020
Zahamena (RNI 3)		73 160
Ankarafantsika (RNI 7)		60 520
Marojejy (RNI 12)		60 150
Tsaratanana (RNI 4)		48 622
Tsimanampetsotsa (RNI 10)		43 200
Andringitra (RNI 5)		31 160
Tsingy de Namoroka (RNI 8)		21 742
Betampona (RNI 1)		2 228
Lokobe (RNI 6)		740
	Total	569 542

SPECIAL RESERVES		
Ambatovaky (Province de Toamasina)		60 050
Marotandrano (Mahajanga)		42 200
Manongarivo (Antsiranana)		35 250
Analamera (Antsiranana)		34 700
Anjanaharibe sud (Antsiranana)		32 100
Kalambatritra (Fianarantsoa)		28 250
Ambohijanahary (Mahajanga)		24 750
Kasijy (Mahajanga)		18 800
Ankarana (Antsiranana)		18 220
Tampoketsa d'Analamaitso (Mahajanga)		17 150
Mangerivola (Toamasina)		11 900
Bemarivo (Mahajanga)		11 570
Maningozo (Antsiranana)		7 900
Andranomena (Toliara)		6 420
Ambohitantely (Antananarivo)		5 600
Manombo (Fianarantsoa)		5 020
Forêt d'Ambre (Antsiranana)		4 810
Bora (Mahajanga)		4 780
Pic d'Ivohibe (Fianarantsoa)		3 450
Cap Sainte Marie (Toliara)		1 750
Périnet-Analamazaotra (Toamasina)		810
Beza Mahafaly (Toliara)		580
Nosy Mangabe (Toamasina)		520
	Total	376 580

RESERVES DE CHASSE

Lac Kinkony (Mahajanga)	Not determined
Lacs Masama et Bemamba (Mahajanga)	Not determined
Lac Ihotry (Toliara)	Not determined
Lac Kasanga (Antananarivo)	Not determined

FORETS CLASSEES

158 localities	approx. 2 671 000 ha

ZONES DE REBOISEMENT

77 localities	approx. 823 978 ha

TABLE 2

Summary of NGO biological conservation policies and integrated conservation/development projects and expenditures in Madagascar: A (Integrated conservation/development), B (Education and/or Public Awareness), C (Research), D (Inventory), E (Training)

NGO	PROTECTED AREA	FUNDING	DURATION/ AVERAGE	GENERAL POLICY ON BIOLOGICAL CONSERVATION	STRATEGIES FOR ACHIEVING BIOLOGICAL CONSERVATION				
					A	B	C	D	E
	Marojejy, Anjanaharibe-S, Andringitra Pic Ivohibe, Manongarivo, Nosy Mangabe, Masoala, Zahamena, Bemaraha	USAID/WWF: Fmg 3,451,000,000	1990-93 $ 625,000/yr	'Debt for Nature Swap' Recruitment and training of 400 guards for protected areas.		X			X
WWF	Mont. d'Ambre	WWF :$152.000 USAID:$320.000 PL480:$364.000	1990-91 $400,000/yr	Integrated conservation/ development Public awareness	X	X		X	X
WWF	Andohahela	WWF :$96.660 USAID:$82.560 PL480:$295.620	1990-91 $237,420/yr	Integrated conservation/ development Public awareness	X	X		X	X
WWF	Beza Mahafaly	WWF/USAID/ESSA/ Yale University/ Washington Univ.: $ 100,000	$ 100,000/yr	In field training + Integrated conservation/ development	X	X			X
WWF	Andringitra/ Pic Ivohibe	WWF: $ 35,000	$ 35,000/yr	Public awareness + Integrated conservation/development	X	X			
WWF	Marojejy/ Anjanaharibe-S	WWF/USAID/Kfw		Integrated conservation/ development	X				
WWF	Manongarivo	WWF: SFR 74,700/y	$ 47,000/yr	Ethnobotanical research			X	X	X

NGO	PROTECTED AREA	FUNDING	DURATION/ AVERAGE	GENERAL POLICY ON BIOLOGICAL CONSERVATION	STRATEGIES FOR ACHIEVING BIOLOGICAL CONSERVATION					
					A	B	C	D	E	
MBG	Masoala/Mangabe	MBG/USAID $ 737,850 Fmg 777,877,000	1990-91 $ 612,000/yr	Integrated conservation/ development + Botanical research		X	X	X	X	X
UNESCO/Mus. Paris	Mananara-Nord	UNDP/UNESCO/ Muséum Paris/ Min.Fr.Environmnt: $ 1,678,650 Fmg 88,320,000	1989-91 $ 577,950/yr	Man and Biosphere	X	X		X		
UNESCO/Mus. Paris	Ankarafantsika	UNDP/UNESCO+Kfw (Kfw:DM 1 million)		Integrated conservation/ development	X	X				
UNESCO/Mus.Paris	Andasibe	UNDP/GPF(WB)		Eco-development	X	X				
DEF	Ft Dauphin	UNICEF Fmg 482,000,000	1990-95 $ 60,250/yr	Management of watersheds	X					
Duke University	Ranomafana	Duke University/ USAID: $ 1,200,000/yr Fmg 606,432,000	1990-93 $ 526,340/yr	Integrated conservation/ development	X	X	X	X		
SAF	Morondava	Coop. Suisse: SFR 235.000 FMG 170.000.000	1990-91 $ 126,600/yr	Safeguard and management of forests	X	X				
DEF	Vakinankaratra	GTZ: DM 7,500,000	1989-91 $ 1,471,000/yr	Refforestation + natural resources conservation	X					
JWPT	Ampijoroa	JWPT: WWF:SFR 32,000/yr		Protection of rare species Experimental captive breeding of 2 rare Tortoises			X			
FAO		FAO:		Projet Crocodile (ranching)			X	X		
ORIMPAKA	Andramasina	Swiss Coop. : SFR 617.000	1990-92 $ 193,000/yr	Village reforestation	X	X				

75 % of NGOs invest in Integrated Conservation/development
43,7 % of NGOs invest in Education and/or Public Awareness
37,5 % of NGOs invest in Training
37,5 % invest in Research and/or Inventory

Participation in Biological Conservation

WWF	:	2,7 %
USAID	:	57,9 %
MBG	:	
UNESCO/UNDP	:	13,1 %
UNICEF	:	
KFW	:	4,1 %
Swiss Coop.	:	4,5 %
PL 480	:	11,5 %
FAO	:	0,2 %

Average expenditure per year = $ 399,797

TABLE 3

List of threats to protected areas showing the percentage of each type of threat occurring in 18 major protected areas and their occurence in six protected areas visited by the evaluation team:
A = Andohahela, MA = Montagne d'Ambre, AK = Ankarana
MO = Morondava, B = Berenty, CM = Cap Sainte Marie

THREAT	% of reserves	Project inspection site
Burning	66	A MA
Hunting/poaching	55	A CM
Grazing	50	A AK MO CM
Roads/trails	74	MO
Slash and burn cultivation	33	A MA MO
Firewood harvest	27	A MO
Permanent cultivation	22	A MA MO
Honey collection	11	
Timber harvesting	11	MA AK MO
Altered hydrology	11	MO B
Weed invasion	6	A MA B
Tree dieback	6	B
Erosion	?	A MA
Feral pigs	?	MA
Horticultural trade	?	CM

Table 4 List of personnel with skills and expertise of relevance to biodiversity planning and management currently active in Madagascar (list not intended to be exhaustive).

Name	Institution	Expertise
Malagasy		
R. Rakotozafy	FTM	GIS
J. Amade	FTM	Aerial Photography
J. Alibay	IRNT	Soil/hydrology Mapping
M. Andrianirina	IRNT	Hydrology Mapping
J. Rakotomiraho	IRNT	Soil Mapping
A. Rakotozafy	Tsimbazaza	Plant Survey/Id.
R. Rabevohitra	FOFIFA	Plant Survey/Id.
J. Abraham	MPAEF	Plant Survey/Id.
J. Brunnel	Lab.de Phyto.	Plant Survey/Id.
F. Harisoa	CNRE	Remote Veg. Classif.
R. Randrianasolo	Postgrad.Uni. Missouri	Plant Survey/Id.
J. Rahantamalala	Postgrad.Uni.Mad.	Veg./Soil/Topo.Realations
F. Rakotondraparany	Postgrad.Uni.Mad.	Mammal Survey/Id.
E. Randrianasolo	Parc de Tsimbazaza	Entolological Survey/Id.
Resident Expatriates		
G. Schatz	MBG	Plant Survey/Id.
O. Langrand	WWF	Bird Survey/Id.
M. Nicoll	WWF	Mammal/Habitat Survey/Id.
N. Quansat	WWF	Veg. Struc. Survey
H. Ducerne	SAF	Remote Image Interp.
Visiting Expatriates		
D. Dupuy	Kew Gardens	Plant Survey/Id
P. Lowry	MBG	Plant Survey/Id.
P. Phillipson	c/- MBG	Plant Survey/Id.
M. Putman	Postgrad. Uni.Wisc.	Bird Density Est.
J. Graetz	Postgrad. Uni.Wisc.	Bird Density Est.
J. Ganzhorn	Abt.Verhaltensphys.	Mammal/Hab. Survey/Mod.
D. Myers	Postgrad. Duke Uni.	Mammal Biogeog.
Q. Bloxam	JWPT	Herp. Survey/Id.
C. Raxworthy	?	Herp. Survey Id
O. Behra	FAO	Crocodile Survey

TABLE 5

Summary of rapid vertebrate survey methods showing availability of identification guides, equipment requirements, relative duration and sensitivity to extraneous factors

TAXA	SURVEY METHODS	IDENTIFICATION GUIDES	EQUIPMENT REQUIREMENTS	SURVEY DURATION	FACTORS AFFECTING PRECISION
BIRDS	Transect counts	A	Binoculars	R	S T O W
	Standing counts	A	Binoculars	R	S T O W P
	Mist netting	A	Mist nets	M	S T W P
	Call playback	A	Tape recorder	R M	S T W
	Area searches	A	Binoculars	S	S T O W
	Territory mapping	A	Binoculars	S	S T O W
MAMMALS	Transect sight counts	P	Binoculars, Spotlight, Chargers, Batteries	R	S T O W
	Transect call counts	NA	Tape recorder	R	S T O W
	Call playback	NA	Tape recorder	R	S T W
	Snap trapping	P	Snap traps, Preservatives	R	S W P
	Live cage trapping	P	Cage traps	M S	S W P
	Pitfall trapping	P	Pitfall buckets, Post hole digger	M S	S W P
	Scat/sign counts	NA	-	R	S W
	Mist netting (Bats)	NA	Mist nets	M S	S T W P
	Harp trapping (Bats)	NA	Harp traps	R	S W P
	Bat detectors (Bats)	NA	Bat detector	R M	S W P T O

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TABLE 5b: Equipment and overhead costs for the Biodiversity Survey Unit

quantity	equipment description	cost/item	total cost
2	portable refrigerators	$ 750	$ 1,500
2	generators or solar chargers	$ 850	$ 1,700
12	tents	$ 150	$ 1,800
12	sets of cooking equipment and acces.	$ 100	$ 1,200
	other camping equipment		$ 600
3	annual maintenance of camping equipment	$ 500	$ 1,500
2	GPS units	$ 5,000	$ 10,000
	traps and nets		$ 4,000
8	binoculars	$ 100	$ 800
10	spotlights	$ 50	$ 500
15	inexpensive tape recorders	$ 100	$ 1,500
1	quality tape recorder	$ 3,000	$ 3,000
3	annual survey accessories and consummables	$ 2,000	$ 6,000
4	annual supply of fauna specimen storage equipment and material	$ 5,000	$ 20,000
2	survey vehicles	$27,800	$ 55,600
4	maintenance and fuel for 2 - four wheel drive vehicles	$18,400	$ 73,600
3	Fauna survey per diem @ $15/person/ day for six persons 120 days/year	$10,800	$ 32,400
3	Flora survey per diem @ $15/person/ day for four persons 240 days/year	$14,400	$ 43,200
3	porters/guards @ $2.50/person/day for for 10 persons 180 days/year	$ 4,500	$ 13,500
3	food for guards @ $2.50/person/day for for ten persons 180 days/year	$ 4,500	$ 13,500
2	Roundtrip to Paris from Madagascar	$ 1,500	$ 3,000
2	Per diem for six months in Paris @ $75/day	$13,725	$ 27,450
TOTAL			$316,350

TABLE 6: Material requirements for the photo interpretation group:

quantity	equipment description	cost/item	total cost
2	stereo scopes with magnification	$ 1,500	$ 3,000
2	parallax bar	$ 300	$ 600
1	transfer instrument	$25,000	$25,000
1	pantograph	$ 50	$ 50
1	light table	$ 250	$ 250
1	drafting table	$ 500	$ 500
1	transfer projector	$ 800	$ 800
*	miscellaneous supplies	$ 5,000	$ 5,000
1	** training	$ 5,000	$ 5,000
4	yearly maintenance and supplies	$ 4,000	$16,000
TOTAL			$56,200

* miscellaneous supplies include: chairs, tables, map files, mylar, paper sheets, pens, colored pencils, drafting tools, pin prickers, straight edge, triangles, lettering templates...

** The mission recommends that one Malagasy personnel be trained in the use of the aforementioned equipment either by sending them to an institution specializing in the use of simple photogrammetric instruments or hire a consultant to do in-house training.

TABLE 7: Material requirements for ground truthing:

quantity	equipment description	cost/item	total cost
1	GPS unit	$5000	$5000
2	compasses	$ 25	$ 50
2	clinometers	$ 60	$ 120
2	50M measuring tapes	$ 50	$ 100
2	field stereoscopes	$ 90	$ 180
*	miscellaneous supplies	$ 500	$ 550
3	yearly maintenance and supplies	$1000	$3000
TOTAL			$8950

* miscellaneous supplies include: drafting tools, pencils, paper supplies, clipboards, calculator, etc.

TABLE 8: Criteria for selecting required hardware and software, examples of alternatives with approximate costs:

Large format digitizing hardware/software - approximate cost $ 8,550
1) user friendly
2) compatible with the GIS
3) large format digitizing tablet (A0/E)
4) dependable
5) able to run on a PC or compatible

Hardware: Digitizing Tablet (Summagraphics, Calcomp, Kurta, or similar), approximate US cost: $ 5,300. Dedicated PC-XT, with VGA interfase & monitor, 40 MB hard disk, mouse, cost US$ 2,700.
Software: ROOTS (Harvard University), or similar software, cost US$ 150. Map projection conversion program, cost US$ 400.

Small format digitizing hardware/software - approximate cost $ 1,000
1) user friendly
2) relatively inexpensive
3) compatible with the GIS (including flexibility in output formats to different systems)
4) digitizing tablet small enough for desk top work
5) able to run on an IBM PC or compatible

Hardware: 11"x17" digitizing tablet (Kurta IS-One, or similar), US$ 700.
Software: same.

Geographic information system hardware/software - approximate cost $ 9,300
1) user friendly
2) able to run on an IBM PC or compatible
3) relatively inexpensive
4) capable of instantaneous overlay
5) good analytical capabilities

Hardware: 386SX or 386/20 PC computer, 2 MB memory, 80 MB hard disk, mouse, VGA video interface & monitor, cost US$ 5,300. Color printer (Hewlett-Packard PaintJet printer), cost US$ 1,700.
Dot matrix quality printer, cost US$ 1,000
Software: GIS package(s) following evaluation through pilot project (E-RMS, CI/SIG, IDRISI, etc.), estimated cost US$ 400 to 1,300.

Statistics software - approximate cost $ 1,300
Relational data base software - approximate cost $ 1,300
1) user friendly
2) able to run on an IBM PC or compatible
3) relatively inexpensive
4) compatible with the GIS (input/output)

Maintenance/service of hardware and software - approximate cost
$ 4,300/year for five years = $21,500
Obselescence/Replacement/Upgrade of hardware/software $7,150/year for five years = 35,750
Total hardware/software costs - $78,700

TABLE 10 SUMMARY OF STAFFING REQUIREMENTS FOR IMPLEMENTATION OF BPS FOR 5 YEARS

POSITION	YEAR 1	2	3	4	5
BPS Advisor	▒	▒	▒	▒	▒
Malagasy Director	▒	▒	▒	▒	▒
Malagasy Secretary	▒	▒	▒	▒	▒
Malagasy Secretary assistant		▒	▒	▒	▒
Malagasy Digitizing Personnel	▒	▒	▒	▒	▒
BPU Data Base Advisor		▒	▒	▒	
Malagasy Data Base Manager		▒	▒	▒	
BSU Flora Survey Advisor		▒	▒	▒	
2 Malagasy Flora Survey Supervisors		▒	▒	▒	
2 Malagasy Flora Field Assistants		▒	▒		
Mammal Survey Advisor		▒	▒	▒	
Reptile Survey Advisor		▒			
Bird Survey Advisor		▒	▒		
3 Malagasy Fauna Survey Supervisors		▒	▒	▒	
3 Malagasy Fauna Field Assistants		▒	▒	▒	
RSU Advisor		▒			
Malagasy RSU	▒	▒			
Malagasy RSU Assistant					
BSU Threat Survey Advisor			▒	▒	
Malagasy Threat Survey Supervisor					
Malagasy Threat Survey Assistant					
Malagasy in Paris for plant ID					
French Technician in Paris			▒	▒	
Malagasy Ground Truthing Assistant					
▒ # of Expatriate personnel	1	5	5.25	4.75	1
# of Malagasy personnel	3.0	12	15.50	15.50	7

TABLE 9

Existing government services and facilities in Madagascar

COMPONENT	GO	EXISTING SERVICES AND FACILITIES	PROPOSED SERVICES AND FACILITIES
Analysis and modelling	MINESUP	none	
Digitizing	FTM	none	Digitizing software /hardware
GIS	FTM	none	Cartographic GIS
National planning/policy	DEF	none	
National management	SPN	none	
Local planning/policy	DEF	limited	
Local management	SPN	limited	
Boundary allocation	SPN	Limited	
Cartography + photogrammetry	FTM	Full service analytic	Digital
Aerial photo acquisition	FTM	Full service	
Photo interpretation	FTM	Stereo equipment	
	IRNT	Full service	
	DEF	None	
Digital image processing	FTM/LNT	None	Full service
Ground truthing	IRNT	Full service	
	DEF	Full service	
Flora and fauna survey	SPN	Opportunistically	
Threat inventory		none	
Habitat inventory		none	

TAXA	SURVEY METHODS	IDENTIFICATION GUIDES	EQUIPMENT REQUIREMENTS	SURVEY DURATION	FACTORS AFFECTING PRECISION
REPTILES AND AMPHIBIANS					
	Habitat searches	P	Axes, I	R	S T O W
	Transect sight counts	P	Binoculars, Spotlights, charger, batteries	R	S T O W
	Transect call counts	NA	Tape recorder	R	S T W
	Wet pitfall trapping	P	Pitfall buckets, Preservatives	M S	S W P
	Dry pitfall trapping	P	Pitfall buckets	M S	S W P

KEY TO ACRONYMS

Identification guides:
A = Available or soon to be
P = Proposed or partially completed
NA = Not available

Survey duration:
R = Rapid: 3-6 sites of 1 ha or less
M = Medium: 1-3 sites of < 1 ha per day
S = Slow: < 1 site of < 1 ha per day

Factors affecting precision:
S = Season
T = Time of day
O = Observer skill
W = Weather conditions on day
P = Placement of trap

B. Financial Analysis

1. Cost Estimate

The total life of project cost of SAVEM from all sources known to date will be $28,428,000. The A.I.D. contribution will be $26,600,000, or 93.6 percent of that total. The GDRM will contribute the local currency equivalent of $768,000, or 2.7 percent of the total. The GDRM will make this contribution in the form of payments for certain local expenses of the National Association for the Management of Protected Areas (ANGAP) and the waiver of that organization's normal tax burden. Another donor, Norway, will contribute the equivalent of $1,060,000, or 3.7 percent of total costs, toward ANGAP's recurrent costs. This contribution, which Norway will channel through the World Bank, will begin in FY 1992 upon the GDRM's enactment of a law allocating to ANGAP revenues generated by fees from Madagascar's protected areas. (See Annex V, "Legislative Action Requirements", for a discussion of the status of the GDRM's efforts to fulfill this condition.)

The above figures are misleading, however, for the GDRM's contribution, and commitment, to the objectives of SAVEM should be measured not only by the limited budgetary support it will provide to the activities of this project. Instead, it must be remembered that SAVEM is only one part of the overall Environmental Action Plan (EAP). The World Bank estimates that total cost of the first five-year phase of EAP, from all sources, will be $85,534,000. The GDRM plans to contribute the equivalent of $17,248,000, or 20.17 percent, of this total.

Given this GDRM commitment to the overall EAP, Annex IX sets forth a justification for approval by A.I.D.'s Assistant Administrator for Africa of a waiver of the normal requirement that the host country contribute at least 25% of project costs. This justification is based both on Madagascar's status as a relatively less developed country, and on the commitment to the objectives of SAVEM that the GDRM has demonstrated by its approval of and planned participation in an overall Environmental Action Plan.

2. Breakdown of A.I.D. Contribution

a. By Type of Input

Table VI.B.1 on the following page illustrates how the A.I.D. contribution will be divided among the various types of inputs:

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TABLE VI.B.1: A.I.D. Contribution by Input.

(U.S. $ '000)

Input:	Total Estimated Cost:	% of A.I.D. Total:
Technical Assistance:	7,769	29.21%
Commodity Procurement:	1,084	4.08%
Training:	801	3.01%
Grants:	12,000	45.11%
Local Costs:	2,138	8.04%
Other Costs:	460	1.73%
Sub-Total	24,253	91.18%
Contingency:	1,219	4.58%
Inflation (5%):	1,128	4.24%
GRAND TOTAL:	26,600	100.00%

(Note: Totals do not agree completely due to rounding.)

b. By Project Element

Table VI.B.2 below illustrates the A.I.D. contribution to each of the seven major project elements.

TABLE VI.B.2: A.I.D. Contribution by Project Element

(U.S. $ '000)

Project Element:	Total Estimated Cost:	% of A.I.D. Total:
Project Coordination:	1,461	5.49%
ANGAP Development:	3,390	12.74%
BPS:	2,358	8.86%
Grant Manager:	4,584	17.23%
PA Development Grants:	10,000	37.59%
Cons. Action Grants"	2,000	7.52%
Other Costs:	460	1.73%
Sub-Total	24,253	91.18%
Contingency:	1,219	4.58%
Inflation (5%):	1,128	4.24%
GRAND TOTAL:	26,600	100.00%

(Note: Totals do not agree completely due to rounding.)

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3. Expenditure Projections

USAID expects to disburse funds from SAVEM on the following schedule:

TABLE VI.B.3: Expenditure Projections by Fiscal Year.
(U.S. $ '000 or equivalent)

Project Element:	1991:	1992:	1993:	1994:	1995:	1996:	Total:
Coordination & Start.	483	229	214	214	214	107	1,461
ANGAP Development	933	925	772	534	183	43	3,390
Biodiversity Pl. Ser.	320	744	427	330	244	295	2,358
Grant Manager	638	1,136	1,156	878	546	229	4,484
Protected Area Grants	200	700	2,200	2,700	2,550	1,650	10,000
Cons. Action Grants	200	400	400	400	400	200	2,000
Evaluation and Audit	0	0	100	240	0	120	460
Total, All Components	2,773	4,134	5,269	5,295	4,137	2,644	24,253
Contingencies	145	207	263	265	207	132	1,219
Inflation (5%)	0	217	277	278	217	139	1,128
TOTAL, ALL COSTS	2,919	4,558	5,810	5,838	4,561	2,915	26,600

(Note: Totals disagree slightly due to rounding.)

4. A.I.D. Obligation Schedule

USAID/Madagascar plans to obligate the funds required to make this contribution as per the schedule summarized below:

TABLE VI.A.4: A.I.D. Obligation Schedule vs. Planned Expenditures.

(U.S. $ '000)

Fiscal Year:	Planned Obligation:	Estimated Expenditures:	Anticipated Pipeline:
1990	8,300	0	8,300
1991	6,000	2,919	11,371
1992	8,000	4,558	14,823
1993	2,000	5,810	11,013
1994	2,300	5,838	7,475
1995	0	4,561	2,915
1996	0	2,915	0
TOTAL:	26,600	26,600	0

(Note: Totals disagree slightly due to rounding.)

It is clear from the above that planned obligations should be sufficiently timely to meet the project's expenditure requirements.

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5. Methods of Implementation and Financing

Implementation of SAVEM will adhere to the A.I.D. Payment Verification Policy Guidance dated December 30, 1983, as reiterated in A.I.D. Handbook 3, Chapter 3, Section 3.E. Specifically, A.I.D. will use direct reimbursement procedures for all project contractors, and will pay project grantees through a Letter of Credit. The only exception to this policy will be the procurement of commodities (other than vehicles and computer hardware and software) through REDSO/ESA's Indefinite Quantity Contract with a U.S. Procurement Services Agent (PSA). A.I.D. will reimburse this PSA through a Bank Letter of Commitment (Bank L/Com), a method of funding that has proved effective in many other A.I.D.-funded activities in East and Southern Africa. Table VI.B.5 below summarizes the contracting and payment mechanisms that SAVEM will use:

TABLE VI.B.5: Methods of Implementation and Financing
(U.S. $ '000)

Method of Implementation	Method of Financing	Approximate Amount
TA - Direct AID Contract	Direct L/Com	3,145
TA & Subgrants- Coop. Agr.	Letter of Credit	16,494
TA & BPS Commodities- OPG	Letter of Credit	2,358
TA - PSC's	Direct Pay	1,145
Audit - HC Contract	Direct Pay	100
Certification of Financial Capability - HC Contract	Direct Pay	50
Commodities:		
Vehicles - Tokyo CPO	Direct Pay	114
Computers - AID/W/IRM	Direct Pay	110
Other non-BPS Commodities - IQC PSA	Bank L/Com	134
Evaluations -- IQC's	Direct Pay	360
Proj. Coord. Staff - Local Contracts	Direct Pay	32
Proj. Coord. Supplies/Services - Local P.O.'s	Direct Pay	210
Total:		24,253

Annex X, "Detailed Budget Estimates and Expenditure Projections," provides further detail on all the above cost estimates.

6. Assumptions Underlying Cost Estimates

The above tables are based in part on several sets of assumptions. The most important of these are explained below.

a. Contingency and Inflation

These budgets include a five percent allowance for inflation beginning in FY 1992, plus a contingency line item of approximately 5% of base expenditures in every Fiscal Year. The FY 1991 contingency provision is slightly higher, thus allowing the total LOP cost to be expressed in an even number.

b. Technical Assistance Costs

The cost estimates for long- and short-term personal service contractors, institutional contractors and grantee personnel are derived from cost models provided by the USAID/Madagascar Controller's Office. The per month figures cited in the budget table in Annex X for long-term personnel include base salaries, cost of living allowances, post differential, fringe benefits (insurance, education allowances, etc.), international and local transportation, housing and furniture costs, and payment for guard services. They also allow for participation in, and payment to, a Project Support Unit that USAID/Madagascar is planning to establish. A larger base but lower rate (25%) was applied to burden the estimates with an overhead calculation. This methodology should realistically accommodate a variety of contractual options (PVOs, universities and profit seeking enterprises) that may participate in various components of this complex project.

c. Grants

The estimated annual cost of Protected Area Development Grants (PADG's) is based on USAID's experience with several similar activities in Madagascar. The present annual cost of these activities ranges between approximately $100,000 to $800,000 per year. The actual cost of each SAVEM grant is expected to vary depending upon local circumstances and the nature of the proposals received. USAID expects that with a life-of-project budget of $10 million, this component of SAVEM will be able to support interactive resource management activities in up to six protected areas and their peripheral zones. See Annex VI.C., "Economic Analysis," for one presentation of an estimated annual budget for protected area management.

The full-scale, operational PADG's will be preceded by year-long Phase I grants for rapid rural appraisal and hypothesis development. The project budget allows $100,000 for each of these Phase I grants. Again, though these seems a reasonable estimate based upon informed professional opinion, the actual cost of these grants will vary depending upon local circumstances and the nature of the proposals received.

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d. Project Coordination

The budget and financial plan for Project Coordination represents the estimated expense, over the life of the project, for an individual with a small local support staff to provide on the ground support and coordination to the various agencies and organizations implementing the technical assistance effort. Annex VIII presents a preliminary scope of work for such an individual. His/her tasks will include logistical support relating to the arrival of commodities and arranging for rentals of housing and office space. Funds have been projected to cover the cost of an independent office (a short-term local hire PSC, office rental, the salary of a procurement assistant, a secretary, and office furnishings and supplies) for six months prior to the teams' arrivals. This budget category also includes funds for up to eight months of short-term TDY as required to assist the GDRM in establishing ANGAP, and for a three month PSC to assess possible University training opportunities in this sector in the context of both SAVEM and USAID's planned non-project assistance activity.

e. ANGAP

As a new institution, ANGAP is expected to experience the greatest budgetary demands in the initial years of the project as it seeks to establish itself. The SAVEM budget, for example, includes funds for support to ANGAP's operating expenses from October 1990 through March 1992; i.e., the first one and one-half years of the project. Costs will begin to drop in the second half of FY 1992 once the expected contribution from NORAD begins to assume a portion of ANGAP's local operating expenses. With the development of operational systems and the training of qualified Malagasy personnel, USAID expects that the expatriate long-term technical assistance team will be able to depart in mid-FY 1994. The costs of ANGAP to SAVEM will then drop precipitously.

f. Biodiversity Planning Service

All estimated costs of this component are based upon a feasibility study submitted to USAID by the World Wildlife Fund and Conservation International. Certain portions of that study are included as Annex VI.A.2 to this Project Paper.

g. Commodities

The above estimates assume that SAVEM's Project Coordination and Startup Office will initiate procurement of commodities for the ANGAP and Grant Manager components of the project in early FY 1991. A 30% allowance for freight, insurance, and the fees of any procurement services agents that may be used has been added to the expected base cost of these commodities. In contrast, the OPG recipient for implementation of the Biodiversity Planning component will procure all required commodities in accordance with procedures set forth in A.I.D. Handbook 13.

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7. Institutional, Financial, and Management Capability of Participating Organizations

SAVEM is designed to encourage the participation of locally based institutions that can contribute to the project's objectives. Many organizations with which the project will relate are relatively new and emerging. Yet to a degree the project must depend upon their capacity to absorb, manage and leverage funds, if the project is to have a sufficient impact in achieving its objectives.

Since only ANGAP, among local institutions, has been specifically designated a major role in the project, it was necessary to undertake a review of the management capability of a sampling of locally based NGO's which are also active in development interventions similar to those contemplated by the project. A large percentage of those interviewed were involved in:

- Potable water
- Technical assistance in agriculture
- Conservation of forest resources
- Agricultural Credit
- Education
- Livestock
- Sanitation

A number of the NGO's contacted carry out their operations in a wide range of geographic areas throughout Madagascar. Some were either subsidiaries to or affiliated with overseas NGO's and have been recipients of grants, financial, management or technical assistance. A few of these organizations themselves administered small grants, loans or donations in kind to other organizations and individuals. A review of the type of records or documentation used by these organizations in order to account for grants and donations indicated very rudimentary bookkeeping practices. Some, especially the larger and more established ones, kept complete sets of financial and cost accounting records and had their books audited at least annually by certified accountants. Those who felt that they could manage funds (without having to add new staff), if they were to be channeled through their organization, indicated that their capacity to do so ranges from $140,000 to $2,500,000. Those which do not now have the capacity to handle additional funds or would like to handle additional funds indicated an interest in receiving training and management assistance in the areas of bookkeeping, accounting, and the use of computers. The NGO proposal design and management workshops that will be included in the Grant Manager component of SAVEM derive from this expression of interest. These will offer training in practices such as:

- Maintaining multiple bank accounts
- Performing monthly bank reconciliations
- Maintaining accurate, current, and complete accounting records for expenditures and disbursement of grant funds
- Preparing monthly financial reports to account for cash receipts and disbursements activities

3. Management of ANGAP

Given the pivotal role ascribed to ANGAP and the international interest in supporting it, ANGAP's success will depend largely on how well it manages its affairs. As a new organization it must face the challenge of quickly instituting appropriate and workable procedures in every sphere of operations. USAID participation in the establishment of ANGAP will help anticipate some of the potential challenges and institute the means to handle them. The speed with which ANGAP demonstrates a solid management capacity, especially in the areas of financial probity, contract and grant management, will be the barometer by which the interested international donor community will measure the organization. If the organization is to acquire the capacity to play an effective role as a recipient of grants and in turn as a grant manager, it must put the appropriate procedures in place. The development of an effective accounting system will be fundamental to the establishment of this capacity.

To help ANGAP develop the necessary skills, SAVEM will fund the services of a Management Advisor for the first three years of project implementation. Annex VIII presents a draft Scope of Work for this position. The efforts of this individual should be supplemented by more specialized, short-term technical assistance. For example, early in the project, a Finance and Accounting Specialist could train local staff in the operation of an integrated accounting system that would enable ANGAP to account for costs and expenses for multiple projects or jobs separately.

The cost estimates included in this Project Paper suggest that ANGAP's local recurrent operating expenditures will approximate $300,000. These estimates, however, do not include the assumption of management responsibilities for protected areas. The recurrent costs of actually managing these areas will emerge based on the experience of the recipients of PADG's and the management systems that they develop. If it is decided that ANGAP should eventually assume the responsibility for managing one or more protected area development grants, then it will have to establish collaborative or monitoring relationship with the grantees carrying out field operations.

One important objective of SAVEM's technical assistance to ANGAP will be to help it establish financial and accounting systems appropriate to its management responsibilities. One primary tool in so doing should be the establishment of a monthly Performance-to-Budget Reporting System to monitor operations from a financial perspective and to assist in financial planning and the development of cost consciousness within the organization. The financial and accounting system established should also anticipate ANGAP's possible involvement in future revenue-generating activities.

Some of the macroeconomic factors discussed in Annex VI.C, "Economic Analysis," directly affect the cost burden that ANGAP may one day bear. To the extent that the PADG's are successful in stimulating

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self-sustaining economic activities as viable alternatives to the present unsustainable use of forest products and other resources of Madagascar's protected areas, the costs associated with the management of those protected areas are likely to be diminished.

If SAVEM the PADG's serve not merely to provide one-shot infusions of jobs and infrastructure, but instead give rise to economic activity by expanding and creating markets for local goods and services, then the potential economic multiplier effects (new skill development and increased entrepreneurial activity) could potentially make a significant contribution towards project sustainability. This type of economic sustainability, which could help ease pressure on the protected areas, would contribute toward lowering park management costs and, as a consequence, ANGAP's ultimate recurrent costs.

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C. Economic Analysis

1. Introduction

One of the SAVEM's project's fundamental hypothesis is that conservation of biodiversity in Madagascar's protected areas must be compatible with the economic interests of the human population whose livelihood depends on forest resources. Economic development is therefore a necessary component of the project, and economic analysis should be able to evaluate the likelihood of project success. Yet it is not possible to conduct a standard economic analysis of the project, complete with calculation of an overall internal rate of return, for several reasons.

-- A major objective of the project is the conservation of biological diversity resources, the value of which cannot be quantified and analyzed with the current tools available to natural resource economics.

-- The development activities to be supported by the project are to be site-specific, but varied, and to be determined only after assessing the needs of given villages.

-- The institutional strengthening, data collection and analysis and training components of the project will generate external as well as internal benefits to the project. Therefore the costs of these components should not have to be covered by project-specific benefits.

This analysis will attempt to demonstrate both the need for the SAVEM Project and the economic problems that the project must address to succeed. Section 2 synthesizes the macroeconomic impact of current nonsustainable farming and livestock practices. Section 3 is a nonstandard attempt to estimate the value of the forest resources to be protected by the Environmental Action Plan (EAP). Section 4 evaluates the economic activities in which the populations living on the periphery of the parks and reserves currently engage. Section 5 explores the potential for alternative income-generation activities for the people who currently need access to forest resources. Section 6 considers the questions of overall economic viability of the SAVEM project.

2. Aggregate Economic Costs of Environmental Degradation in Madagascar

Accoding to Environmental Action Plan (EAP) estimates, the economic cost of environmental degradation from the deliberate burning of pastures, farmland and forests amounts to between US$ 100 million and US$ 300 million per year, or 5-15% of GNP (EAP 1988). This can be viewed as equivalent to a disinvestment in natural resource capital. Direct investment to compensate for the loss of productive capacity would be necessary to reverse the negative effects on incomes.

MAP's estimate of the annual costs of brushfires and tavy clearing are based on the following assumptions:

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Assumptions on pastures

Carrying capacity	1 livestock unit per 5 ha.
Meat yield	40 kg./livestock unit/year
Thus meat yield per ha.	8 kg./ha./yr.
Capitalized at 10%	80 kg. meat per ha.
Land Value at US$ 1.30/kg.	approximately US$ 100 per ha.
5% productivity loss	approximately US$ 0.50 per ha. per year

Assumptions on Tanety (hillside cultivation)

Yield (paddy equivalent)	500 kg./ha./yr.
Capitalized at 10%	5000 kg./ha.
Land Value at US$ 0.08/kg.	US$ 400/ha.*
10% productivity loss	approximately US$ 4/ha./yr.

Assumptions on Natural Forests

Sustainable yield	
good quality	2 m3/ha./yr.
degraded	1 m3/ha./yr.
Capitalized at 10%	
good quality	20 m3/ha.
degraded	10 m3/ha.
Land value at US$ 80/m3	
good quality	$1,600
degraded	800
Value of Tavy land	400 (same as Tanety)

* More recently the producer price of rice has risen to 336 FMG/kg., or US$ 0.22 per kg. at the current exchange rate. This implies that land values in rice equivalent would be US$ 1,100 (assuming the rice price is the only change).

An estimated 1,000,000 to 3,000,000 are burned annual. Based on the above asusuptions, the following estimates of economic losses from burning are obtained:

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Table VI.C.1:
Annual Economic Costs of Burning of Farmland and Natural Forests

Type of land burned	Hypothesis Low Area (ha./yr.)	Hypothesis Low Value (US$'000)	Hypothesis High Area (ha./yr.)	Hypothesis High Value (US$'000)
Pasture	600,000		1,800,000	
unrecoverable	30,000	$3,000	90,000	$9,000
productivity loss of 5%	570,000	250	1,710,000	750
Tanety	300,000		900,000	
unrecoverable	15,000	6,000	45,000	18,000
productivity loss of 10%	285,000	1,000	855,000	3,000
Natural forest	100,000		300,000	
good quality	50,000		150,000	
unrecoverable	5,000	3,000	15,000	24,000
tavy	45,000	54,000	135,000	162,000
degraded	50,000		150,000	
unrecoverable	5,000	4,000	15,000	12,000
tavy	45,000	18,000	135,000	54,000
TOTAL	1,000,000	$94,250	3,000,000	$282,750

Approximately US$ 10 million in downstream effects should be added to this range of US$ 94-283 million as erosion causes siltation of rice paddies and ports, and undermining of roadbeds; and thereby, increases investments to maintain productivity EAP's estimate of total costs of burning are between US$ 104 million and US$ 293 million. Of this, US$ 72 million to US$ 216 million, or nearly 70 per cent, is attributable to tavy cultivation with the higher value of tavy land which has accompanied recent increases in the producer price of rice, the annual losses would be much lower.

3. The Economic Value of Protected Areas

A wide range of resources in the natural forests within protected areas actually or potentially serve a variety of economic functions. The most obvious resource in natural forests is wood. Water is another resource of importance in many of the reserves. Many of the protected areas are important watersheds which supply water for irrigation and village consumption, and current or potential hydroelectric power. The unique nonwood flora and fauna in all the protected areas are the object of hunting and gathering activities of the population surrounding the reserves, and could be the object of touristic and scientific interest. The land in the reserves has potential for agriculture; cleared slopes can support tavy cultivation of rice, manioc, bananas and other crops, and forest cover can support intensive cultivation of bananas, coffee, lychees, vanilla, plus safe and virtually costless grazing of livestock.

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Some of these activities may be sustainable (e.g. water supply, gathering of medicinal plants, even some forms of logging and hunting), but most are not. Most are likely to have negative effects on the biological diversity of the forest.

What is the value of the natural forest contained in protected areas? The economic answer to this question is the opportunity cost of maintaining woodlands as protected areas, in other words their value in their best alternative use. The only truly quantifiable alternative use for natural forests is the productive value of its wood. As shown in Section 1, above, the AEP (1988, p. 2-4) estimates the sustainable yield of the Eastern coastal natural forest at 2 cubic meters (m3) per hectare per year, with a net standing value of 200,000 FMG in 1988 (US$ 160). Capitalized at 10%, the value of a hectare of such natural forest would be US$ 1600. Some zones of protected areas are now considered virtually inaccessible, where high transport costs lower the value of wood. However, anyone who has been to Haiti or Burundi will recognize that apparent inaccessibility of land has never prevented poor people from contributing to its deforestation. EAP's average value (in wood equivalent) of one hectare of natural forest thus remains valid..

A protected area of the size of Ranomafana National Park (40,000 ha.) would therefore be "worth" US$ 64 million for its wood alone, counting neither its fauna and other flora nor its utility as a watershed. Assuming similar sustainable yields for natural forests in other ecological zones, the 1.1 million hectares of protected areas would be "worth" US$ 1.76 billion, with an annual sustainable productivity of 2.2 million m3 of wood valued at US$ 176 million. If SAVEM support is given to six protected areas averaging 40,000 ha. in size, the economic value of the resources being protected would be US$ 384 million, and its annual production value would be US$ 38.4 million.

4. The Economics of Current Forest Uses by Peripheral-Zone Populations

Residents of the areas surrounding the parks and reserves derive a significant part of their cash and in-kind income from a wide variety of natural resources. Classic park management procedures in Madagascar have been directed at enforcing restrictions on park access; successful restriction deprives local residents of income. Even the more recent conservation/development management plans have begun by limiting access, then proceeded to socioeconomic studies of the peripheral zones, and finally -- possibly -- to development interventions to provide alternative sources of income.

By adopting this sequence of operations -- restrictions, studies, development -- area managers impose substantial costs on the residents; making them victims of the protected area rather than its beneficiaries. Also, it makes the economic challenge of the project that much harder as incomes must be restored to their former levels

before they can be raised. This section attempts to describe the most important current uses of forest resources in order to make the challenge of restricting these uses clear to the implementors of the project.

a. "Tavy" (Slash and burn cultivations)

The destruction of one hectare of natural forest causes a loss of national income potential of US$ 160 per year. In the case of tavy cultivation, however, this is more than compensated in the short run by rice and other crops. At an optimistic estimated yield of one ton of rice per harvest for rainfed rice on newly cleared tavy fields, the value of output is 336,000 FMG at recent September 1989 producer prices, or US$ 224. In addition, there is the value of whatever wood is obtained before burning. On the other hand, the tavy fields are only productive for three years at most, and must then undergo a fallow cycle which has decreased from up to 25 years traditionally (when it was probably not inconsistent with maintenance of biodiversity), to as few as five years in many areas at present. If a one-hectare tavy field can sustainably support three years of cropping out of eight, the annual value of its output over the swidden cycle is about US$ 84 (3/8 times US$ 224), or approximately one-half its value for sustainable wood production.*

Furthermore, there is much qualitative evidence that tavy cultivation is not sustainable with such short fallow periods. In addition, erosion of bare slopes between crops and before the fallow becomes established will create significant downstream external effects: loss of water-holding ability leading to alternating flooding and drying out of watercourses, siltation of rice fields, hydroelectric systems and harbors, destruction of roadbeds.

The tavy cultivator is not personally concerned with the downstream effects of the removal of forest cover, unless she or he has rice paddies directly below the tavy field. Neither is she or he concerned by the fact that the land must rest after two or three years of cultivation, assuming that there is more land to which to move. If the latter is true, the tavy cultivator only perceives the value of the land for the time it is farmed, which as shown above may be higher than its value in sustainable wood production. Tavy is therefore economically rational for the individual farmer, and the wider effects are borne by the rest of the nation.

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* As seen in Section 1, the EAP estimates are based on rice yields on tavy fields only one-half as high as those adopted here, and on lower prices, but do not factor fallow period into calculations. With tavy land valued at half of the above estimate, the economic costs of conversion from natural forest to tavy are higher in the EAP estimates than they would be with the parameters used in this section.

b. Hunting and Gathering in Natural Forests

Resources in the natural forests are vital to the well-being of many residents of the peripheral zones. In some cases, such as Ambatolahy in the middle of Ranomafana National Park, the forests are the source of most cash income, as well as a good part of subsistence. Most of the residents migrated to the area from the 1930's on to serve as laborers on logging operations in what is now the park. This source of income has been stopped. Currently, Ambatolahy residents have three principal cash sources, from:

-- cutting tree ferns to make flower pots (men: average income 1500 FMG per day worked);
-- harvesting pandanus leaves to weave into mats (women: average income 750-1000 FMG per day worked);
-- gathering freshwater shrimp for sale at the roadside (women and children: average income 500-1000 FMG per day worked).

This cash is crucial to village survival. Because of the steep topography and the fact that the village is surrounded by the park, no family has enough land (tavy or irrigated bottomland) to be self-sufficient in rice; the average family grows four months' worth of rice per year and must purchase the balance. At the current rice price of 650 FMG/kg. and average consumption of one kg/day/person, it is clear from the above figures that a significant proportion of family labor is needed to generate cash to buy rice.

Residents of most villages in the peripheral zones also hunt and gather for subsistence. The principal activities are gathering wood for fuel and construction, honey, medicinal plants, and -- in some areas where they are not fady (taboo) -- hunting or trapping lemurs and tenrecs.

c. Cultivation Under Natural Forest Cover

It is not necessary to clear natural forests in order to use them for agriculture. Much of Madagascar's agricultural export production consists of crops which benefit from shade and the relatively rich, undisturbed soils under forest cover: robusta coffee, cloves, and vanilla. Yet even if the area is not deforested, it is clear that biodiversity suffers. In the very long run, the large trees will not necessarily be replaced as they die naturally.

Farmers living in peripheral zones of protected areas also make use of forest cover to cultivate crops for subsistence and sales to the local market. In Joffreville next to Amber Mountain National Park, for example, over forty per cent of the families have plots averaging one hectare in the neighboring Amber Special Reserve, where they grow bananas, lychees, coffee, and citrus (WWF 1990). Many of them have no other farmland. This is a very profitable activity: WWF estimates that household income derived from cultivation in the Reserve averages 200,000-250,000 FMG per month, or US$ 1600-2000 per year (around $250 per capita given an average

household size of seven). This compares favorably to the crop income of a "typical" Malagasy farm household: about 550,000 FMG per year (US$ 367, or US$ 67 per capita given national-average household size of 5.5. (René Rabezandrina in Devres 1990).

d. Keeping Livestock Within Natural Forests

Madagascar's livestock sector is experiencing an insecurity problem of enormous significance. In 1987, cattle owners lost an estimated 116,100 head of cattle to cattle rustlers; this represents 12% of national cattle herd offtake in that year (SEDES 1988). The aggregate annual cost can be estimated at about 12 billion FMG (12% of cattle's contribution to GDP in 1987), or about US$ 10 million at the 1987 exchange rate. If anything, current figures are likely to be higher, as the "dahalo", or cattle rustlers, have become well-organized and armed. Government attempts to control rustling have been only sporadically effective.

The problem is not uniform across the island; it is more intense in the dry pastoral zones of the South and West (up to 40% of some herds are lost to rustling in some areas: SEDES 1988). Herders have few defenses against rustlers; one of the most frequent is to hide their cattle in forests at night. This occurs, notably, in the Integral Reserves of Andohahela near Tolognaro and Andringitra south of Fianarantsoa. While this practice does not lead to immediate deforestation, it does prevent regeneration of some palatable species of plants and therefore is a long-term threat to biodiversity.

In other reserves, such as Ranomafana, herders release their cattle into the forest, not for protection against rustlers, but simply for grazing. The Tanala residents of several villages near Ranomafana town depend on occasional cattle sales for large cash needs, but otherwise let the cattle roam unattended and semi-wild for long periods of time. The practice deprives them of the benefits of milk, but also reduces labor input to practically zero. The quantitative and qualitative effects of this practice on biodiversity are unknown, but surely cannot be positive.

e. Logging

The Department of Water and Forests (DEF) grants logging permits to individuals and corporations to conduct selective cutting of valuable tree species. DEF does not, of course, permit such operations in parks and reserves. However, some reserves, such as Ranomafana, were created after extensive logging had already taken place. Permit-holders test the boundaries of parks and reserves, a fairly safe risk because the boundaries are poorly marked and DEF enforcement capacity is very limited.

The economics of logging enterprises are well described in ANGOVO 1989. It appears that permit holders obtain substantial margins on their operations. They hire local or immigrant labor to go into the forest, cut the useful trees and saw them into the desired shapes before bringing the wood out of the forest. Lumber workers

generally work on a piece-rate basis, and for valuable woods like palissandra a two-person crew can earn FMG 4500 in one day, substantially more than returns in agriculture or in exploiting other forest products. In areas such as Amber Mountain where the only forests left are within reserves, the temptation for illicit logging by both workers and entrepreneurs is great.

5. The Economics of Alternative Income-Generating Activities

a. Agricultural Intensification

Nearly every village visited during preparation of this Project Paper expressed the desire to increase its irrigated rice area; most have sufficient sources of water to do so by gravity-fed methods. There are social (see Annex VI.D, "Social Soundness Analysis") as well as economic problems associated with irrigation which make it one of the riskiest forms of agricultural development, but the potential payoff is large. PL 480 funding has supported many microprojects involving irrigation in Madagascar. Some of these have been very successful, with rice yields increasing by 30-100% and exhibiting lower interannual variability, but some have failed completely for technical or social reasons (USAID 1988).

The PL 480 projects spent from US$ 100 to 650 per additional metric ton of rice, a huge range. The bottom end of the range compares favorably to the recent producer price of US$ 224, but since many beneficiaries of the microprojects had been net purchasers of rice at US$ 433 per ton (FMG 650/kg), financial viability of the projects could arguably be achieved at the retail price. Still, the experience of the PL 480 projects demonstrate that the cost per marginal ton must be carefully monitored if irrigation is to be an economically profitable activity.

b. Agroforestry

The following sections illustrate some of the agroforestry interventions which might be supported by SAVEM in different climatic zones. The lack of data based on Madagascar experiences necessitates a good deal of guessing in the scenarios outlined here. They are based on the methodology developed in Anderson (1987).

1) On-farm tree-planting on dry "tanety" land (e.g. Andohahela)

This scenario, based on experience in Northern Nigeria modified to reflect Malagasy prices, is that in-field planting of leguminous trees, fruit trees and eucalyptus can reduce soil fertility loss, and eventually increase fertility, provide fodder for livestock, and provide wood and fruit as well. The assumptions used here are at least as conservative as those Anderson uses, except that Anderson assumes that on-farm production costs equal 85% of gross income. Anderson's farmland reaches zero net income, and hence is abandoned, after 15 years. Here, assume:

-- at the beginning, land yields 500 kg. rice equivalent @ $0.22/kg. (see sec. 2)
-- soil fertility (thus yield) diminishes at a rate of 2% per year
-- trees planted take up 5% of land
-- production costs are 50% of gross income in year 0 every year except when gross income exceeds that in year 0
-- the ecological impact of trees is to:
   a) stop fertility decline in year 8
   b) begin to raise fertility (thus yield) by 5%/year in year 9.
-- income from tree products is $7/ha/yr once trees are mature.
-- investment cost of tree-planting is $40/hectare

The results are shown in Table VI.C.2 on the following page. This modest investment yields a high economic rate of return to the farmer, even if he or she has to bear the full costs of tree-planting. There is a serious problem with such a scenario, however: the farmer has a lower net income, even excluding the $40 investment cost, until year 7, and does not return to a net income equal to that of year 0 without AF until year 14 (Anderson's Northern Nigerian farmer achieves these one year earlier). One does not need sociological or institutional explanations to understand why a farmer close to the subsistence level would not be interested in such an AF program. The moral of the story is that there will need to be some sort of subsidy to farmers in dryland areas to enable them to participate in something that is clearly in their long-term interest (perhaps to be recovered in some way out of increased incomes in later years).

2) Intensification of tavy through alley-cropping in a high-rainfall area

This scenario is based on less Madagascar specific data. Anderson's parameters are based on dry West African conditions; in the Eastern forests, rainfall may be three times higher, trees grow faster, and soil fertility declines can be recovered through bush fallow. The assumptions of the preceding scenerio are significantly modified here, based on the little agronomic and economic information available.

-- at the beginning, land yields crops valued at $200 (see section 3.a)
-- soil fertility (thus yield) diminishes over 3-year tavy cycle
-- without AF, tavy is sustainable (original yields return after 5 years)
-- trees planted take up 25% of land
-- production costs are 50% of gross income in year 0 every year except when gross income exceeds that in year 0
-- for two years after first three, only wood products can be grown (two years' fallow needed before trees mature)
-- the ecological impact of trees is:
   a) stop fertility decline in year 4
   b) begin to raise fertility (thus yield) by 5%/year in year 4
-- income from tree products is $15/ha/yr once trees are mature.
-- investment cost of tree-planting is $200/hectare

TABLE VI.C.2:
Impact of Agroforestry (AF) on Farm Income
(One-hectare Dryland "tanety" Farm)

	without AF		Phase-in rate of:		with AF		
Year	Gross Income	Net Income	Fertility increase	Wood Val.	Gross Income	Net Income	Impact on Net Y of AF
0	110.0	55.0	0	0	104.5	52.3	-42.8
1	107.8	52.8	0	0	102.4	50.2	-2.6
2	105.6	50.6	0	0	100.4	48.1	-2.5
3	103.5	48.5	0	0	98.4	46.1	-2.4
4	101.5	46.5	0	0	96.4	44.1	-2.3
5	99.4	44.4	0	0.1	94.5	42.9	-1.5
6	97.4	42.4	0	0.2	92.6	41.7	-0.7
7	95.5	40.5	0	0.3	90.7	40.6	0.1
8	93.6	38.6	0.1	0.4	90.7	41.3	2.7
9	91.7	36.7	0.2	0.5	91.2	42.4	5.7
10	89.9	34.9	0.3	0.6	92.1	44.0	9.2
11	88.1	33.1	0.4	0.8	93.5	46.8	13.7
12	86.3	31.3	0.5	1	95.3	50.1	18.8
13	84.6	29.6	0.7	1	97.7	52.5	22.9
14	82.9	27.9	1	1	101.1	55.9	28.0
15	81.2	26.2	1	1	106.2	60.1	33.9
16	79.6	24.6	1	1	111.5	62.8	38.1
17	78.0	23.0	1	1	117.1	65.5	42.5
18	76.5	21.5	1	1	122.9	68.5	47.0
19	74.9	19.9	1	1	129.1	71.5	51.6
20	73.4	18.4	1	1	135.5	74.8	56.3
21	72.0	17.0	1	1	142.3	78.2	61.2
22	70.5	15.5	1	1	149.4	81.7	66.2
23	69.1	14.1	1	1	156.9	85.4	71.3
24	67.7	12.7	1	1	164.7	89.4	76.6
25	66.4	11.4	1	1	173.0	93.5	82.1
26	65.1	10.1	1	1	181.6	97.8	87.8
27	63.8	8.8	1	1	190.7	102.4	93.6
28	62.5	7.5	1	1	200.2	107.1	99.6
29	61.2	6.2	1	1	210.3	112.1	105.9
30	60.0	5.0	1	1	220.8	117.4	112.4

Net Present Value (NPV) @ 10% discount rate -- 30-year horizon 104.4
Internal rate of return -- 30-year horizon 16.7%
Internal rate of return -- 20-year horizon 13.5%

The results are shown in Table VI.C.3 below. Even though tavy is assumed to be more productive than the tanety of the previous scenario -- in the years in which the field is in use -- and even though trees take up more land and greater investment costs are required, intensification of tavy is a more economically profitable investment. There are only three years in which farmers get less out of the land with the AF investment than without it (plus another year in year 9), and therefore only three years in which subsidies would be required to persuade farmers to adopt these AF practices.

TABLE VI.C.3:
Impact of Agroforestry (AF) on Farm Income
(One-hectare Tavy Farm)

	without AF		Phase-in rate of:		with AF		Impact
Year	Gross Income	Net Income	Fertility increase	Wood Val.	Gross Income	Net Income	on Net Y of AF
0	200.0	100.0	0.0	0.0	150.0	75.0	-225.0
1	180.0	80.0	0.0	0.0	135.0	60.0	-20.0
2	150.0	50.0	0.0	0.1	114.0	39.0	-11.0
3	0.0	0.0	0.0	0.2	3.0	1.5	1.5
4	0.0	0.0	0.1	0.3	7.5	3.8	3.8
5	0.0	0.0	0.2	0.4	121.1	46.1	46.1
6	0.0	0.0	0.3	0.5	130.5	55.5	55.5
7	0.0	0.0	0.4	0.6	142.1	71.0	71.0
8	200.0	100.0	0.5	0.8	157.6	78.8	-21.2
9	180.0	80.0	0.7	1.0	178.1	89.1	9.1
10	150.0	50.0	1.0	1.0	202.0	101.0	51.0
11	0.0	0.0	1.0	1.0	227.1	113.6	113.6
12	0.0	0.0	1.0	1.0	253.5	126.8	126.8
13	0.0	0.0	1.0	1.0	281.2	140.6	140.6
14	0.0	0.0	1.0	1.0	310.2	155.1	155.1
15	0.0	0.0	1.0	1.0	340.7	170.4	170.4
16	200.0	100.0	1.0	1.0	372.8	186.4	86.4
17	180.0	80.0	1.0	1.0	406.4	203.2	123.2
18	150.0	50.0	1.0	1.0	441.7	220.9	170.9
19	0.0	0.0	1.0	1.0	478.8	239.4	239.4
20	0.0	0.0	1.0	1.0	517.8	258.9	258.9
21	0.0	0.0	1.0	1.0	558.7	279.3	279.3
22	0.0	0.0	1.0	1.0	601.6	300.8	300.8
23	0.0	0.0	1.0	1.0	646.7	323.3	323.3
24	200.0	100.0	1.0	1.0	694.0	347.0	247.0
25	180.0	80.0	1.0	1.0	743.7	371.9	291.9
26	150.0	50.0	1.0	1.0	795.9	397.9	347.9
27	0.0	0.0	1.0	1.0	850.7	425.3	425.3
28	0.0	0.0	1.0	1.0	908.2	454.1	454.1
29	0.0	0.0	1.0	1.0	968.6	484.3	484.3
30	0.0	0.0	1.0	1.0	1032.1	516.0	516.0

Net Present Value at 10% discount rate -- 30-year horizon	531.6
Internal rate of return -- 30-year horizon	18.0%
Internal rate of return -- 20-year horizon	15.6%

3) Tree-planting on government domain land -- ZODAFARB

The ZODAFARB (Zones de Défense en Faveur de l'Arbre) program is an innovative type of land reform which DEF, with World Bank and Swiss funding, has begun to implement over the past two years. Under the program, peasants are given the right to plant trees on land they do not own; after five years they receive title to the land and to the trees. DEF establishes village-level nurseries and provides seeds, but requires village participation in managing the nurseries. The land for the program is considered by DEF to be part of the national domain, for which clear rules for cession to individuals exist.

In the early stages, most ZODAFARBs have been planted in pure stands of eucalyptus, aiming at production of charcoal and/or poles. More recently, mixed stands of eucalyptus and leguminous trees such as leucaena are being tried, with the goal of accelerating the beginning of economic returns to farmers. The economics of this program are very straightforward. The land used has zero or very low opportunity cost since it is generally either abandoned or low-grade pasture. Growth rates of trees and costs of planting, maintenance and logging are known; and market prices are easily ascertained. Cost-benefit calculations are not presented here because it is unlikely that the economics of the program are problematic (little or no need for subsidies because the land is not diverted from other uses; beneficiaries are usually landless or land-poor farmers with surplus labor).

What may be problematic is the land tenure situation. ZODAFARBs are ostensibly established on national domain land, but apparently many of them are in fact located on land which used to be owned by French colons, the so-called "concessions" Therefore, the land is not legally the property of the state. This means that the titles which the government will issue will not be secure, and -- if farmers are as aware of this problem as they appear to be in some places -- their participation might be desultory at best and productivity would suffer.

c. Livestock

Very little is known about the potential for intensification of livestock production. Currently, the vast majority of herders use low-input techniques of transhumance or, as discussed above, free grazing in forests. Agroforestry techniques employing leucaena or perennial grasses planted on the contour appear promising, but they are unlikely to be as profitable to herders as the current system. It will probably require major ecological catastrophes such as a Sahel-type drought in the South and West or strong enforcement to exclude cattle from the forests in the East, before the conditions will be right for alternative systems of livestock production.

d. Aquaculture

One technique to reduce peasants' needs to use the forest as a source of protein (small mammals and lemurs) or cash (crayfish; birds, mammals and reptiles for pets) is to conduct aquaculture in village bottomlands. Shrimp or crayfish can be raised in modified

streambeds and fish in rice fields, assuming the year-round availability of water. USAID has been unable to obtain data on Madagascar's experience with small-scale freshwater aquaculture, but is convinced that it bears thorough investigation in certain situations, especially in protein-deficiency areas and those near sites of tourist potential.

e. Tourism

The World Bank report on the EAP (1990, Annex 9) contains the following paragraph, quoted here in full:

> Madagascar has the potential to become a significant tourist destination, with two strands, the first being beach and coastal resort oriented, the second being focussed on the visiting and interpretation of the country's unique flora and fauna. It is estimated that in 1987, 28,000 visitors came to Madagascar, of whom about 8,000 (up from 4,000 two years earlier) came specifically to enjoy nature. Since the average annual cost of the biodiversity program is estimated at $4.5 million, and assuming a net contribution by visitors of $500, 9,000 ecotourists per annum would add value to the economy sufficient to just exceed the capital and operating costs of maintaining that which they are coming to enjoy. Given the recent growth, this appears to be achievable in the long term. Under the Program, it is projected that ecotourists will number 25,000 during the fifth year, adding $12.5 million annually to the economy.

Assuming on the basis of the above analysis that ecotourists number about 10,000 in 1990, the following linear time path of ecotourist visits can be projected:

TABLE VI.C.4: Ecotourism
(Number of Visits, Net Economic Value and Park Revenue)

	1990	1991	1992	1993	1994	1995
Number of visits	10,000	13,000	16,000	19,000	22,000	25,000
Value @$500('000)	5,000	6,500	8,000	9,500	11,000	12,500
Park revenues " (see below)	300	350	450	550	650	750

Under this very optimistic scenario, ecotourism would contribute $47.5 million to GNP over the five years 1991-95, or about twice the cost of the biodiversity component of EP-1. It is unclear how much of these revenues should be attributed to the investments in parks and reserves EP-1 is financing, and even less certain how the parks, reserves and surrounding populations will be able to capture a substantial portion of these revenues.

Park entrance fees have been established, and are now being collected by DEF or by NGO's in charge of park management, according to the following schedule (established in 1989):

Category	Fee (FMG)
Researchers and film groups	50,000
Tourists	20,000
Resident foreigners	15,000
Students (external/foreign)	15,000
Madagascar citizens	1,000
Students accompanied by teacher	100
Children	150
University of Madagascar personnel and invited specialists	free

If tourists enter an average of two parks during their stay (an assumption with no data behind it), direct revenue collection from tourists alone by park management would rise from 400 million FMG in 1990 (10,000 x 2 x 20,000, or US$ 267,000) to 1 billion FMG (US$ 667,000) in 1995. This is likely to be the largest revenue category, but not the only one. In the absence of any way of estimating the other categories of visitors, the figures are round up to US$ 300,000 in 1990 and US$ 750,000 in 1995, and a coarse interpolation is made between the two years. The five-year total of park revenues would then be US$ 2.75 million, or 5.8% of total national revenues from ecotourism and roughly 10% of the cost of SAVEM.

At their present rates, park fees will therefore not contribute significantly to the sustainability of the biodiversity program. The rates are low by some standards -- Rwanda has recently raised the fees for viewing mountain gorillas at Volcanoes National Park to US$ 200 per person (Wells et al. 1990). Although they do not seem unreasonably low, it might be appropriate to charge higher fees for tourists in parks where tourism potential is high, and for researchers where biological interest is high.

The six protected areas (of 45 in the three priority classes) to be supported by the SAVEM project in the first five years include several (Amber Mountain, Andohahela) of exceptional interest for tourists. It would, however, be unrealistic to expect that they will attract a greatly disproportionate share of park revenues -- or that they can claim credit for a disproportionate share of overall revenues from tourism. If the SAVEM protected areas capture approximately 15% of both kinds of revenue, their share of park revenues would total only about US$ 400,000 over five years, and their share of overall tourism revenues about US$ 7 million.

Other tourism income will be generated in and around the parks and reserves. Local people will be hired as park rangers, guides (as they already are in Ranomafana) and maintenance/construction workers. They will work in and perhaps own, businesses serving tourists; and they will be encouraged to produce food and crafts for the tourist trade. Nearly all of these activities will have high local value added and thus high local multiplier effects. They will also provide revenue to the" fokontany" and "faraisana" levels of local government through the existing set of taxes and market fees.

One problem to anticipate, especially in remote areas with small local markets, is the low elasticity of supply of food products, land, and perhaps also of labor. Ranomafana experienced a sudden boom during the construction of the hydroelectric dam on the Namorona River in the late 1970's; food prices more than doubled within a year and the area has since suffered from a relatively high cost of living. Vacant construction sites in the town of Ranomafana are apparently so scarce that potential hotel, restaurant and service industry construction possibilities are limited (Peters 1989). Land prices may rise and people renting their residences may lose them due to tourism development.

If local inflation occurs due to an increase in demand without compensating increases in supply, it will reduce the real benefits to communities surrounding the protected areas. The Amber Mountain Complex project has had difficulty in hiring and retaining day laborers for road repair at the minimum wage rate, because the opportunity cost of labor appears to be very high (or perhaps because the project has not achieved villagers' trust). If the project offers higher wages, local food production may fall as labor is drawn away from agriculture. The lesson from this is that the supply side of both product and labor markets should not be neglected when planning to capture local benefits from tourism.

The other side of the coin is that there is reportedly a high incidence of in-migration into the peripheral zones of many reserves. If true, (there is no evidence to document large recent migratory flows) this would ease the labor constraint but would aggravate land and product-market problems.

f. Road Building

Many of the peripheral zones surrounding the protected areas are very poorly served by road networks. This has both costs and benefits. The costs are:

- The population has difficulty competitively producing marketable products for sale to meet cash needs such as the elemental demand for rice and other basic necessities (whose costs are therefore also higher).
- The tourism potential of the protected areas is reduced by their inaccessibility.

The benefits are:

- The protected areas, or at least parts of them, remain inaccessible to loggers, charcoal producers and other agents whose use of the forests is not likely to be sustainable.
- The ambiguous influence of the cash economy on self-sufficient forest communities is discouraged.

There are some cases where the benefits of road improvement will surely outweigh the costs. For example, the reconstruction of the national highway from Fianarantsoa to Ranomafana will not only permit greater access for tourists, but also reduce the market isolation of the nearby villages. It should not run the risks

discussed above because logging is easily monitored and villagers are already firmly secured by the cash economy. Similarly, improvement of the access road to Amber Mountain National Park from Joffreville will permit tourists to arrive without 4-wheel-drive vehicles, and will not increase access by illicit users of protected area resources. In all cases, wages paid to local residents for road construction and maintenance could be an important source of cash income.

There are other cases where the picture is not as clear. The long-promised improvement of the road from Beza Mahafaly to Betioky will ease the way for tourism but will do the same for charcoal producers whose output is destined for Betioky and even Toliary. Access roads to the eastern side of Ranomafana National Park will facilitate logging. The road constructed by the Italian contractor for the JIRAMA water conduit for Antsiranana has aggravated erosion problems in the watershed it was built to tap. It is evident from these examples (which probably represent the more frequent cases) that feasibility studies for road construction and improvement must take the possible unintended negative environmental effects into account.

Road construction, like all labor-intensive activities in Madagascar, is quite inexpensive. NGO's with experience in the field suggest that rehabilitation and construction costs average FMG 10-15 million per kilometer (US$ 6700-10,000) for rural access roads. The unintended costs discussed above have to be added to the financial costs, however, before the equally difficult task of estimating benefits should be undertaken.

6. Economic Viability of the SAVEM Project

Of the four principal components of the project -- Protected Area Development Grants, institutional strengthening of ANGAP, creation of a Biodiversity Planning Service, and training -- only the first lends itself to conventional economic analysis. Conservation interventions can be analyzed using the opportunity cost approach discussed in Section 3, and development interventions using cost-benefit methods similar to those sketched out in Section 5, but only on a case-by-case basis once specific actions have been determined.

One unconventional but instructive method of illustrating the economics of the project is to determine the amount by which beneficiaries' future income would have to increase for SAVEM to be justified entirely on this basis. The simulation in Table VI.C.5 shows that under reasonable assumptions about the number of potential beneficiaries, i.e. residents of the peripheral zones surrounding the parks and reserves funded by the project, the required increase in per capita income would be about US$ 40-50, or 20-25% of current per capita GDP and an unknown, but surely larger, percentage of per capita incomes of peripheral zone residents. Since the benefits will not be equally distributed among residents, some incomes would have to rise by substantially more than that.

Given the multipurpose character of the project, however, it is not necessary that its entire cost be covered by economic benefits accruing to peripheral zone residents. Institutional support to ANGAP, the BPS, and training can easily be considered to be a separate project. Thus, only the cost of conservation/development grants and the Grant Manager should be included (assumed to be US$ 12 million). In this case, as shown in Table VI.C.6, an increase in sustainable per capita income of only about $30 is required.

TABLE VI.C.5:
Increase in Per Capita Income
Needed for Economic Profitability of SAVEM Project
If all Benefits are Incomes to Beneficiaries
(figures in US$ '000)

a. 50,000 beneficiaries: incomes must rise by $50/year.

Assumptions: Beneficiary population: 50000
Project Cost $26 million
Incomes rise over 5 years beginning in year 2

Year	Cost	Returns	Net cash flow over: 30 years	20 years
1	4000		-4000	-4000
2	5000	500	-4500	-4500
3	5000	1000	-4000	-4000
4	5000	1500	-3500	-3500
5	4000	2000	-2000	-2000
6		2500	2500	2500
7		2500	2500	2500
8		2500	2500	2500
9		2500	2500	2500
10		2500	2500	2500
11		2500	2500	2500
12		2500	2500	2500
13		2500	2500	2500
14		2500	2500	2500
15		2500	2500	2500
16		2500	2500	2500
17		2500	2500	2500
18		2500	2500	2500
19		2500	2500	2500
20		2500	2500	2500
21		2500	2500	
22		2500	2500	
23		2500	2500	
24		2500	2500	
25		2500	2500	
26		2500	2500	
27		2500	2500	
28		2500	2500	
29		2500	2500	
30		2500	2500	
	IRR		10.1%	7.9%
	NPV@10%		107.03	-2404.68

TABLE VI.C.5 (cont):

b. 60,000 beneficiaries: incomes must rise by $40/year

Assumptions: Beneficiary population: 60000
Project Cost $26 million
Incomes rise over 4 years beginning in year 2

Year	Cost	Returns	Net cash flow over: 30 years	20 years
1	4000		-4000	-4000
2	5000	600	-4400	-4400
3	5000	1200	-3800	-3800
4	5000	1800	-3200	-3200
5	4000	2400	-1600	-1600
6		2400	2400	2400
7		2400	2400	2400
8		2400	2400	2400
9		2400	2400	2400
10		2400	2400	2400
11		2400	2400	2400
12		2400	2400	2400
13		2400	2400	2400
14		2400	2400	2400
15		2400	2400	2400
16		2400	2400	2400
17		2400	2400	2400
18		2400	2400	2400
19		2400	2400	2400
20		2400	2400	2400
21		2400	2400	
22		2400	2400	
23		2400	2400	
24		2400	2400	
25		2400	2400	
26		2400	2400	
27		2400	2400	
28		2400	2400	
29		2400	2400	
30		2400	2400	
	IRR		10.1%	8.0%
	NPV@10%		241.85	-2169.39

Note: The calculations in Table VI.A.5 were derived by experimentation with alternative scenarios. Any number of simulations are possible. The premise was to ask the question "by how much would annual incomes have to rise for the project to be economically profitable (IRR equal to or greater than 10%, the conventionally-used shadow price of capital)?"

TABLE VI.C.6:
Increase in Per Capita Income
Needed for Economic Profitability of Grants Component of SAVEM Project

If all Benefits are Incomes to Beneficiaries

(figures in US$ '000)

50,000 beneficiaries: incomes must rise by $30/year.

Assumptions: Beneficiary population: 50000
Incomes rise over 6 years beginning in year 2
Cost of grants component: $12 million

			Net cash flow over:	
Year	Cost	Returns	30 years	20 years
1	2000		-2000	-2000
2	3000	250	-2750	-2750
3	3000	500	-2500	-2500
4	3000	750	-2250	-2250
5	2000	1000	-1000	-1000
6		1250	1250	1250
7		1500	1500	1500
8		1500	1500	1500
9		1500	1500	1500
10		1500	1500	1500
11		1500	1500	1500
12		1500	1500	1500
13		1500	1500	1500
14		1500	1500	1500
15		1500	1500	1500
16		1500	1500	1500
17		1500	1500	1500
18		1500	1500	1500
19		1500	1500	1500
20		1500	1500	1500
21		1500	1500	
22		1500	1500	
23		1500	1500	
24		1500	1500	
25		1500	1500	
26		1500	1500	
27		1500	1500	
28		1500	1500	
29		1500	1500	
30		1500	1500	
		IRR	10.2%	8.1%
		NPV@10%	204.79	-1302.23

How much productive investment is required to raise incomes by $30 per capita per year? This depends very much on the type of investment. Few are easily quantified given the type of data available; following is an example of the calculations needed using a well-known technology: irrigated rice.

In most places, irrigation technology is very expensive, running as high as many thousands of dollars per hectare. Under Malagasy conditions, however, with gravity-fed earthen canals and labor contributed by the beneficiaries, a typical irrigation project can provide full water control for US$ 167 (FMG 250,000) in direct investment costs per hectare (USAID 1988, also personal communication from local NGO's). The irrigated hectare will produce a sustainable yield, depending on soil and climatic conditions, of between one and two tons of rice without modern inputs, for a value between US$ 224 and US$ 446 at recent producer prices. If production costs plus opportunity costs (previous land use) are assumed to be 50% of gross output, a conservative assumption, then the net value of the crop is between US$ 112 and US$ 224 per hectare. This yields a capital/net output ratio of between 0.75 and 1.5. Consequently, to raise income by US$ 30 via irrigation alone, it would be necessary to invest between US$ 22 and US$ 45 per capita, or a total of between US$ 1.12 million and US$ 2.25 million for the estimated 50,000 beneficiaries.

Some other investments, such as agroforestry, may have lower capital/net output ratios (but higher labor demand). Others, such as roads and tourism infrastructure, are sure to have higher ratios. In addition, it should be recalled that the project has the task not only of increasing incomes, but of replacing incomes currently obtained from nonsustainable use of the resources of the parks and reserves. All things considered, the estimate of capital requirements derived from the irrigation example may be close to the average of all the activities the project is likely to undertake.

How likely is it that the SAVEM project will be able to deliver, US$ 2 million in direct investment to the beneficiary population? This depends crucially on the budget structure of the conservation/development grants. The total amount of funds allocated to conservation/development grants, including those for the Grant Manager (GM), is $15.46 million. Approximately $3.46 million will be for operation of the GM, leaving $12 million to go to grantees.

Two million dollars of this will be earmarked for small, individual grants to local NGO's and village organizations for site-specific development activities in any of the 50 protected areas. Economic analysis of these grants will have to be done on a case-by-case basis; this will be straightforward given the fact that most of them will be single-purpose.

The remaining $10 million is to be devoted to thorough conservation/development activities in and around six protected areas. The average allocation per protected area is thus likely to be about $400,000 per year, which would permit 25 "park-years" of management. The budget of a park management grant is likely to have something like the following structure:

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TABLE VI.C.7:
Hypothetical Annual Budget
of a Typical Park Management Grantee

TOTAL ANNUAL BUDGET	$400,000
Expatriate salary & benefits	100,000
Salaries of local staff (office, technicians, rangers)	100,000
Commodities and supplies (for operation of grantee)	100,000
Remainder for investment in and around protected area	100,000

In other words, delivery costs, excluding the GM, are likely to be 75% of the grantees' budgets. The remainder must be divided between park infrastructure -- roads, trails, buildings, lookout points -- and economic development interventions in the peripheral zones. If half is used for each, the result is that there will be $50,000 per year available for economic development interventions, or about $5 per capita per year if our assumption that 10,000 people inhabit the peripheral zone of a typical protected area. Over 25 "park-years", this would amount to $1.25 million, less than the $2 million figure adopted above and considered necessary for economic development benefits to justify the conservation/development component of the project, but at least it is the right order of magnitude.

The lesson to be learned from this illustrative exercise is that the success of the SAVEM project is crucially dependent on limiting delivery costs. In screening potential park management grantees, the GM should ensure that sufficient resources are committed to activities that will promote sustainable economic development.

The SAVEM project is an ambitious attempt to achieve an environmental purpose through (at least in part) socioeconomic actions. There are no obviously more cost-effective delivery systems for achieving the same purpose. SAVEM has the potential to succeed. To do so, it must:

1) Recognize and take into account the current uses of the forest on which residents of the peripheral zones depend for survival.

2) Identify and implement sustainable economic development actions which both compensate residents for loss of unsustainable current uses of the forest and increase their incomes.

3) Provide sufficient monitoring of conservation/development field operators to ensure that sustainable economic development is not sacrificed to the interests of conservation- and research-oriented park management grantees.

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ANNEX D

SOCIAL SOUNDNESS ANALYSIS

1. Introduction.

The goal of the SAVEM Project is conservation--specifically the preservation of biodiversity in Madagascar, with an initial focus on six protected areas. The project responds to the growing international concern with preserving biodiversity and conserving finite global resources--particularly tropical forests. But it is intended to primarily benefit Madagascar, where rapidly- growing (over 3% annually) human population threatens natural-resource availability and biodiversity, especially through deforestation. Forests, particularly those in some of the protected areas, are vital watersheds. As such they supply electricity and water for surrounding towns and cities, such as Diego Suarez (Amber Mountain) and Fianarantsoa (Ranomafana). Forest watersheds also nourish the small canals that irrigate peasant fields in the peripheral zones around many of the protected areas.

There is a general need to inform and educate the Malagasy people about the relationship between the preservation of the forests and the survival of traditional agriculture. If watersheds disappear, the productivity of many rice fields will decline. The devastating effects of deforestation on rice production are already obvious in many areas of the central highlands, where increasing runoff is threatening rice production through siltation in canals and erosion of low-lying rice fields near increasingly swollen rivers.

In the long run millions of Malagasy people stand to benefit from the conservation goals of the project. This includes the urbanites who depend on the protected areas for water and electricity and the rural people whose rice cultivation will decline if the watersheds are destroyed. More immediately, some 60,000 to 120,000 people who live in peripheral zones of the protected areas will be directly affected. Some of the short-term effects may be negative, as people are made to give up customary sources of livelihood. A gradual, sensitive, site-specific approach has been built into project design, to involve affected populations and try to minimize damage to them. A flexible implementation strategy, experimentation, community-level action grants and careful monitoring and evaluation are designed to continuously inform the project of options and alternatives that may work best at each site. These aspects of project design are intended to provide satisfactory alternatives to traditional resources, that will be the only incentives for communities to help meet the goal of preserving biodiversity.

The project is socially feasible and will benefit Madagascar if two problems- -the potential overlap of ANGAP and other agencies, and the difficulty of replacing traditional resources with appropriate alternatives--are considered carefully and handled flexibly during implementation. This analysis raises issues for consideration, and illustrates how project design has attempted to anticipate them. The following section addresses social-soundness issues including potential institutional and local-level obstacles, economic and political factors working for or against project success, variations in target populations, and equity issues. It is followed by a discussion of selected project elements that ensure socio-economic appropriateness of project activities: a flexible, "learning-process" model and on-going, in-depth collection of data on groups affected by project implementation. Recommended grantee strategies and hypotheses to be tested by the SAVEM Project are followed by social analyses of potential project areas visited by the project design team.

2. Social Soundness Issues.

a. Potential National, Institutional and Local Obstacles.

The project's conservation goals are socially sound. If successful, the project will be good for the globe and good for Madagascar as a nation. However, there are two potential problems involving the social soundness of the project:

- First, the project is committed to support and work to strengthen ANGAP, an organization whose areas of responsibility potentially overlap with those of several existing agencies, including DEF, ANAE, ONE, COMODE and CNRE. Areas of responsibility and action must be defined, redefined, and disentangled as the project is implemented if the ANGAP component of the project is to be successful.

- The second problem is at the local level. The project, if successful, will be good for Madagascar in the long run. However, SAVEM must be implemented in the short run and in local communities, where there are obvious obstacles. People who have relied on a broad spectrum of resources in the protected areas are being asked to give up many of their traditional economic and cultural activities without immediately obvious alternatives, substitutes, or incentives. They are being asked or forced to make these sacrifices in order to satisfy long-term, national and global, rather than immediate and local, goals and interests.

An institutional problem also may also arise with the Protected Area Development Grant component of SAVEM. A strategy that channels most benefits to NGO's, PVO's, communities and GRO's (grass-roots organizations) will maximize immediate benefits to community residents. However, it will not be surprising to encounter resistance to this strategy. A majority of well-educated and intellectual Malagasy work for the government (whether in universities or administration). Some of them will perceive a strategy that removes them from decisions about the benefit stream as neo-colonial. Special sensitivity to these issues is needed before and during implementation.

b. Economic and Political Factors Working For/Against Project Success

Economic and political factors will affect the project. Population pressure on the land (a doubling per generation) is fueling agricultural intensification and rural-urban migration. Poverty and unemployment produce many forms of informal redistribution including begging, urban crime and rural cattle rustling. Various political and economic constraints beyond the project's control threaten biodiversity in Madagascar. Near the Andohahela reserve, a Canadian firm (Qitfer) has received government permission to destroy large segments of the tropical forest above and below Fort Dauphin. Reforestation is planned. However, the pollution that is likely to follow titanium extraction by Qitfer and its Malagasy counterparts can be expected to have harmful effects on the local and regional ecology, and reduce the tourist appeal of one of Madagascar's otherwise most promising and attractive beach resorts. Near at least one of the other protected areas, farmers have been forced to relinquish land they have traditionally cultivated (without legal title), to state-authorized concessionaires who have brought no clear local benefits.

There are also political-governmental considerations. In implementing this project (or any other community-level project in Madagascar), personnel must understand the contrast between formal and informal structures--between structures and offices of the state and those of traditional social organization. The latter will often be more useful than the former to achieve project goals. The president of the "fokontany,"* for example, is an elected official and administrator. His--or rarely, her--authority varies, however, from place to place; traditional authority figures often are more important that the "fokontany" president. In those "fokontany" where one cohesive group predominates, the person chosen to stand for election is someone with little real authority. He is an agent for the real powers--the descent group elders- -and is expected to be their expediter and intermediary in encounters with the state.

Many areas of Madagascar are insecure. In recent years parts of the central highlands and south have experienced an outbreak of cattle rustling and banditry. This problem is severe around Fianarantsoa, one of Madagascar's traditional rice baskets, where peasants even worry about the theft of their rice harvest. Two protected areas (Ranomafana and Andringitra) are located in the "faritany" of Fianarantsoa. Historically Madagascar has witnessed several such periods of lawlessness, interspersed with stronger governments offering more security to peasants. Lack of effective law enforcement will affect the project, which includes enforced conservation and prohibition of traditional activities in order to meet the goal of preserving biodiversity. There is little reason to believe that people asked to modify their traditional practices (cutting the forest, letting cattle graze there) will do so without adequate enforcement or incentives.

On the other hand, certain unifying political and cultural factors may aid project implementation. Madagascar has years of experience with political centralization (under the Merina, the French, and the Malagasy Republic). Most Malagasy descend from the same ancestral ethnic group, the Proto- Malagasy, who began to settle the island around 500 A.D. Madagascar has less linguistic and cultural diversity than do most African countries; there is a single national language with closely related dialects. A fairly uniform educational system is another national commonality. There are, however, significant contrasts in economy and in the scale of traditional political organization.

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*In the early 1970's, local government was reorganized into units building on traditional institutions:

"fokontany" :	township (at least 500 people)
"firaisampolontany:	municipality
"fivondronampolontany:	district
"faritany":	region headed by an elected official.

The units are headed by elected officials. There is universal suffrage of people over 18. Consequently, leaders are elected on the demographic weight of their kin ties and other social factors.

c. Variations within Target Populations.

The size and characteristics of SAVEM's direct beneficiary groups vary widely with level (national, regional or local) and with type of human ecological adaptation, from region to region, and even within the protected areas. Variations among groups are reflected in the discussion of the protected areas visited by the design team, covered in Section 6 (the Amber Mountain complex, Ranomafana, Andringitra, and Andohahela). Recognizing that affected groups exist at various levels and in different regions, the project's social design for change will be site-specific, founded in the traditional social forms of each target area.

At the local level, beneficiary groups vary depending on traditional economy and region. In "tavy" areas (of swidden or shifting cultivation), such as Ranomafana and Masoala in Betsimisaraka country, traditional organizations will be fewer, and groups smaller and less formal. Implementation may prove easiest in areas of greatest population density. However, in some of these areas people will be destroying the forest (because of increasing population pressure). Other farmers already will have made the transition to irrigation and intensive agriculture. Reforestation may occur most easily in irrigated areas; people will plant eucalyptus for firewood and other local use.

The people to be most directly and immediately affected by the project--and among whom its potential negative effects on livelihood must be minimized-- are the 60,000 to 120,000 inhabitants of the villages and hamlets peripheral to--and in at least one case within--the protected areas. There are people living within the physical limits of the Andohahela reserve (although, through a legal fiction, some of them are apparently not classified as living within the reserve). In many of the reserves, people from nearby villages cultivate productive, sometimes long-established fields. This is true in Andohahela, Amber Mountain, and Ranomafana.

The protected areas have supplied firewood, wood for houses, granaries, fences and technologies (ox carts, mortars and pestles). Forests are used to graze cattle and hide them from rustlers (and as retreats and hideaways for the rustlers themselves). Mica has been collected and sold from the Andohahela reserve. The protected areas have also been used for food and cash crop production. Most of the protected areas have been used for "tavy." Some have irrigated rice fields (Andohahela). Others have fields where tree crops (bananas, fruits, coffee) are cultivated.

Hunting and gathering also takes place within the protected areas. The women of Ranomafana gather pandanus to make mats and catch crayfish to eat and sell. Men hunt and cut down trees for tree fern pots, which women sell along the main road. The forests also contain vital cultural products (including medicinal plants and unguents considered essential for the proper growth of children). At Ranomafana "tavy" rice is part of the ceremony needed for a successful and fertile marriage. Tanosy have tombs ("kibory") in the forests. Such areas are "fady," tabooed for burning and wood-cutting traditionally-- and thus are part of the native conservation system.

Potential project beneficiaries are being asked or forced to give up their customary sources of livelihood. If traditional resources and products are to be placed off limits they must be replaced by appropriate and satisfactory alternatives. A gradual and sensitive approach--one that listens to the affected peasants and tries to minimize damage to them--seems most likely to succeed. SAVEM's flexible implementation strategy, experimental grant-making process, and careful monitoring and evaluation are designed to suggest and evaluate the kinds of options and alternatives that may be used at each site.

d. Equity Issues.

1) Stratification.

The nature and extent of social stratification varies among ethnic groups in Madagascar. The wealth contrasts associated with stratification are most obvious among the Merina and Betsileo of the highlands, where the contrast between nobles, commoners and slave descendants is still important as a socioeconomic marker. The Merina have more intricate distinctions involving degree of nobility (based on recentness of descent from particular "mpanjaka," kings and queens). Among Betsileo commoners there is an important distinction in the traditional authority of senior and junior commoners. The former would have more clout as project supporters. Merina and Betsileo royalty retain almost no significance today.

However, among certain coastal groups such as the Sakalava and Tankarana, the "ampanjaka" (prince) and nobles retain ritual and ceremonial importance. This might seem a paradox, since the pre-colonial power of the coastal rulers was generally less than that of the highlands "mpanjaka." However, the coastal royal families became symbols of autonomy and resistance against various conquerors. They remain important figures who should be tapped for project implementation in the relevant areas (e.g. the Amber Mountain complex).

The distribution of land in Madagascar is not equitable; some households have more than enough land for their needs, while others are land-poor or even landless. This pattern of inequality is the result not only of twentieth- century social, demographic, and economic change (including colonial concessions of land to European settlers) but also of the very hierarchical organization of pre-colonial societies in the central highland areas of the country. Nobles and high-ranking commoners controlled large areas of land, while slaves were not permitted to own land. Although slavery itself has long been abolished, the land-holding patterns associated with it remain. Many who have no land of their own are descendants of slaves and dependent on the families of their former masters for access to land, being permitted only use rights. Other slave descendants have migrated from the highlands to other parts of Madagascar (such as the Amber Mountain and Ranomafana areas) in search of land and/or employment.

Effects of stratification will vary among the protected areas. Near Ranomafana, for example, there is both stratification and ethnic diversity (the latter receives special attention in Section 6). Some Ranomafana villages are populated mainly by Tanala--living in their homeland with a traditional culture based on "tavy" cultivation. Ranomafana also has many Merina and Betsileo immigrants and their descendants. Many of the Merina came as merchants; others were slave descendants, who make up a large proportion of migrants in Madagascar because they lack land at home (particularly in Imerina, except as sharecroppers). Many of the people "from Antananarivo" in the Ranomafana and Amber Mountain areas are slave descendants. Betsileo slave descendants and junior commoners have also migrated to these areas.

Whether descended from slave or free people, migrants tend to be land-poor. They leave home because land is inadequate. One village near Ranomafana founded by recent immigrants (Ambatolahy) is land-poor and socially disorganized. It is mainly Betsileo, but there are seven extended families with 120 people living in 20 houses (there are also 7-8 tombs). The economy of the village is mixed. Some people have "tavy"--mainly banana, but a few have "tavy" with maize, potatoes, and rice. Some have irrigated rice fields. More would cultivate irrigated fields, they say, if they had land and "micro- barrages" (small dams).

Dams, canals, and other improvements in irrigation systems tended to head villagers' lists of desired projects in all the affected areas. However, cross-national comparison (Kottak 1985) shows that irrigation schemes are more likely than other types of projects to widen wealth disparities. Without

particularly sensitive implementation and monitoring, an initial uneven distribution of resources (particularly land) can become the basis for even greater socioeconomic skewing after the project. The project can also anticipate some land tenure problems associated with the expansion of irrigation systems, some of which will be addressed in a special land-tenure study to be undertaken by USAID/Madagascar.

The goal of maximizing equity--and of keeping wealth disparities from widening--will not be clear-cut. Inequality in Madagascar takes different forms; social ranking is not the same as socioeconomic stratification. Systems of ranking based on slight, or age-based, contrasts in status, wealth or power are common in Madagascar. Fundamental units of social organization include clans, lineages, and other descent groups. Often, descent branches are ranked above others, perhaps being considered "noble," although the actual differences in wealth and power between branches are slight. Furthermore, with descent group structure, elders often control their juniors' labor and access to resources. However, because young people will eventually become elders, the situation contrasts with socioeconomic stratification, in which differences in wealth and power are substantial and lifelong. It is not enough to know in whose name land happens to be legally registered, because descent group members often benefit from what is, on closer analysis, a joint or communal estate.

The project's equity evaluation strategy must take care to distinguish between ranking and social stratification. The contribution to project cooperation made possible by building on traditional ranked groups (e.g., at Andohahela and the Amber Mountain complex) will probably outweigh a slight negative equity result. However, in the context of stratification and limited resources, equity will be more of a problem (e.g., at Ranomafana). Landless people will probably be hurt most by a ban on forest activity. Without fields or forests, there is a serious question of how they will subsist. At Ranomafana, for example, several current activities in the forest will be banned: collection of pandanus for mats, crayfishing, tavy, cattle grazing, tree fern pot cutting. One replacement for these forest activities will be salaried work as guides. But as discussed in Annex A.1.f., apportionment of salaried employment can cause inequities (eg: by gender, when jobs are given only to men).

2) Women in Development.

There are few obvious cultural constraints to involving women in development in most parts of Madagascar, particularly in the central highlands, where women are prominent in the public domain. Highland Malagasy women play prominent traditional roles in agriculture, marketing, and politics. They attend meetings of the "fokontany" (the basic unit of local government). The elders are called fathers and mothers ("ray amindreny"). Female status is lower in the south and is discussed under Andohahela in Section 6.

Malagasy women--particularly in the highlands--have relatively easier access to land under the customary systems of land tenure than in many African societies. Both sons and daughters may inherit land, although the eldest son is likely to receive the largest share. Daughters are usually given fields only if they do not have land through their husbands; moreover, these portions tend to be smaller than those of their brothers. Among the Merina and Betsileo, children often inherit land from both parents. Women may also buy and sell land on their own, although, once again, their holdings are likely to be smaller. Nor does agricultural production rest as exclusively on women as it does elsewhere in East and Central Africa. The labor seems to be more equally shared. It is possible, however, that in recent years women's farming responsibilities have been increasing as men seek income outside the household.

Malagasy women have been active development project beneficiaries. In the late sixties women were systematically involved in development. Female as well as male animators were chosen from each village, to introduce improved agricultural practices. Women of the highlands were the focus of the successful transition to planting rice seedlings in rows. Therefore, in the SAVEM project, it is reasonable to expect that women will be involved in education, animation, and at the local level in discussions of plans, ideas and monitoring. For example, the design team suggested that in each project village, a man and a woman be chosen as environmental animators. They will visit the regional project centers to discuss experiences and problems with other animators and project personnel.

As mentioned above, salaried work as guides (or rangers) is a possible replacement for forest activities. At present, all guides are men (although the reason for this is not known). Women sell forest and manufactured products, and benefit from rice cultivation. Requirement of a plan for inclusion of women in all PADG proposals, as discussed in Annex A, will ensure women access to income opportunities in culturally-appropriate ways. Differential impact by gender should be monitored carefully during project implementation.

3. Social Soundness of the SAVEM Design.

a. The "Learning-Process" Model

The need to provide adequate and appropriate replacements, alternatives, opportunities, and incentives to change at the local level necessitates an especially sensitive and responsive implementation strategy for all components of the project. The SAVEM Project has been designed using a flexible "learning process" model (rather than a rigid "blueprint" strategy, as

distinguished by Korten). This allows the project to be site-specific, and to evolve through experience. The learning-process model involves prospective beneficiaries in a project they help plan. It is suggested by the fact that projects are most likely to succeed when they:

- are directed toward the target population's proven expertise
- address locally recognized needs
- make proper use of existing social structures.

The following aspects of SAVEM illustrate how this learning-process model has been integrated into project design:

- The umbrella-grant process is structured to encourage, develop, evaluate and administer activities to enhance conservation efforts, generate development alternatives, or increase environmental awareness in areas both near and beyond the parks and protected areas. Such grants could include community efforts in the protected areas or small-scale initiatives in other parts of Madagascar.

- GM personnel, including experienced social scientists and their assistants (local conservation and socioeconomic experts) will evaluate grant applications for social sensitivity. Criteria for social impact monitoring, evaluation and impact assessment will be built into individual grants. Grant-supported activities will be expected to change as the learning process dictates. Data resulting from grant activity will be passed onto the databank.

- Continuous, systematic monitoring and evaluation procedures will suggest changes in project specifics as part of the learning process. The BPS, and especially the Socio-Economic Impact Monitoring (SIM) Unit, will play a play a central role in the monitoring and evaluation process.

The numerous types of data to be collected through SAVEM--by the BPS, through grant activities, and in socio-economic monitoring--will contribute continuous input to the learning process. The socio-economic data to be collected by the SIM, described in the following section, will provide the basis for on-going assessment of the social soundness of conservation and development activities.

b. Socio-Economic Impact Monitoring as a Basis for Social-Soundness.

The commitment to maintaining both the social and ecological soundness of SAVEM activities is reflected in creation of a unit within the BPS for the collection of socioeconomic data. If existing groups are to be used in implementation, their social

characteristics, numbers, effectiveness, and location should be thoroughly known and the manner of their use clearly charted. The socioeconomic data-collection activities described in Sections I.C.2. and IV.C. of this Project Paper are based on the methodology described below. Its development constituted a critical part of the project design process, to ensure an information flow over the LOP that will enable informed decisions on socially-sound interventions.

Assuming an average of 30 villages affected in each of the six protected areas, a total of 180 villages will be covered by a baseline survey over the LOP. Data from the survey will be used to construct a typology of villages based on organizational features that might be effectively harnessed to achieve project goals. Samples from each village type will be chosen for in-depth monitoring, evaluation and socio-economic impact assessment.

Data will be collected using a village checklist, a questionnaire and eventually a manual that will be developed on the basis of training and field experience during the first two years of survey activity. Collection will be carried out primarily by local socioeconomic experts (ideally, natives or long-term residents of the general project area with at least a baccalaureate), who will be attached to the BPS/SIM. They will be recruited locally and trained on-site, using field and classroom techniques. As described in Section 1.c.4 of the Project Paper, 20 local experts will be trained per year in FYs 1991-1993, enabling coverage of two areas annually.

Following training, two-person teams of enumerators will spend an average of three weeks in each village gathering baseline socioeconomic information. A typology of villages in each protected area will emerge from this process. In constructing the typology, the focus will be on organizational features--local or regional groups (e.g., lineages or clans) that might be harnessed to achieve project goals and channel benefits. Eventual comparison of types of villages and organizations found in the different protected areas may suggest general procedures and strategies to enhance the implementation of this and future projects.

Assuming that an average of five types of village will be defined from each 30-village survey, ten villages per protected area (2 representing each type) will be chosen as foci for monitoring and evaluation and socioeconomic impact assessment for that protected area. These 60 villages will be studied across the life of the project. The villages will be visited annually by the local socioeconomic experts.

Checklist assessment, consultation of "fokontany" records (for economic and demographic shifts) and qualitative evaluation will done each year. For quantitative study a sample of 20 families will be monitored in each protected area, using a detailed questionnaire.

During the initial survey wave, two diagnostic families will be chosen for this longitudinal study in each of two villages per village type. Assuming five types (numbers may be modified depending on the degree of variation in types across the protected areas), a total of 120 families will be studied over the life of the project for careful monitoring, evaluation, and assessment of social impact (following procedures developed for an AID project in Sri Lanka). Such regular and systematic socioeconomic monitoring should uncover project problems and serve as a basis for flexible response using the learning process model.

In addition to SIM enumerators, SAVEM can make cost-effective use of existing researchers throughout the island. They can be asked to "piggyback" the collection of socioeconomic information for the project onto their own ongoing research. In recompense, they will receive small grants to supplement their research funds. The project also might assemble local researchers who have done socioeconomic studies commissioned by NGOs active in rural development and environmental projects in Madagascar, to discuss their methods, results and problems. These relatively low-cost interventions could make considerable contributions to the content and methods of SAVEM's data-collection component.

4. Specific Recommendations on Grantee Strategies.

On the basis of the preceding sections, certain strategic recommendations to the Grant Manager and PADG grantees can be made. Overall, the project will need to adopt a three-pronged strategy: enforcement, information-education, and negotiation-social work. Some people will be forced to abandon many of their traditional activities. The project should strive to minimize damage to local people, providing appropriate and satisfying alternatives. Several such alternatives are discussed in the context of interactive park management plans in Annex VI.A.1. of this Project Paper. They are based on strategies for helping rural communities manage forest resources on a controlled and sustainable basis, and helping them find viable on-farm alternatives to forest use.

The wishes of the rural communities need to be taken into account. What do the people want? Peasants suggested a few common ideas for alternatives at all or most of the sites. Small-scale dams to permit more productive sedentary cultivation; schools to enhance job options, technical skills and environmental consciousness, and health care were among the projects that villagers suggested as in their own best interests. In one village near Ranomafana the design team talked to a Tanala man who was especially concerned about the prohibition on cattle grazing in the forest, and suggested that grazing be allowed to continue in certain areas. Options permitting people to make continued but sustainable use of the forest are suggested in Annex VI.A.1., and should certainly be heeded by the project.

Possible alternatives for fodder may be suggested by livestock specialists. Solar cooking could be tried to relieve firewood pressure. Project planning of alternatives and compensatory measures should take population pressure into account. As the Malagasy population doubles in a generation, pressure on strategic resources may force people to clear new "tavy" land, even if their current lands become more productive.

Most generally, the project should aim at enhancing environmental awareness, action, pride, and responsibility among the Malagasy people. A national- level strategy to increase environmental awareness is beyond the scope of this project, although aspects of such an effort will be addressed through conservation education activities supported by individual PADGs. Any such national strategy should harness existing structures, such as the educational system and mass communications. Regionally the project will affect environmental awareness and action through education, training, and animation supported through grants and data collection training.

The project may well end up focusing on young people rather than trying to convert the old. However, the social design for change should be founded in the traditional social forms of each target area. This means that the project must first obtain the agreement and support of the older people, particularly traditional leaders, on goals and strategies. Once leaders and authorities agree, technical and practical matters should be worked out with the younger generation, which tends to be better-educated.

Conservation awareness and action also can be increased through museums built at the entrance to each reserve. These will provide information about local flora and fauna, and on cultural traditions of the ethnic groups in the area. The museums will help preserve the traditions of the "tompotany" (original settlers) of the protected areas--such as the Tankarana around Diego, the Tanala around Ranomafana, the Mahafaly at Beza, and the Tanosy in Andohahela. Since these groups are generally small and non-migratory, local people may value museums in which "endangered cultures" (relative to the more expansive ethnic groups in Madagascar) have their traditional ways preserved and displayed. Local populations should be involved in planning and related museum activities (eg: selling artisanal products). The museum area also can serve as a community education ("animation") center, where conservation programs can be explained and discussed (and displays of the sort shown at the Tsimbazaza zoo in Antananarivo can be included).

5. Hypotheses to be Tested by the Project.

Some of the assumptions underlying the project necessitate special attention and careful monitoring during implementation. Hypotheses to be tested during the project, and methods to be used, are discussed below.

- Various models have been proposed for conserving resources and biodiversity in the protected areas: enforcement, education- information, and negotiation-social work. Testing of various combinations provides an exciting research dimension to the project. Government agencies and NGO's already have experimented with these strategies in some of the protected areas. Results so far should be described in NGO grant applications, and continuing lessons from experience should be incorporated in implementation strategy. An important part of the flexibility built into project design is local-level, site-specific experimentation with different kinds of community action and negotiation--to be determined on the basis of community type, traditional and current use of resources, and the nature of existing groups available for project implementation. Once baseline information is gathered through rapid appraisal and community typologies are established, various strategies can be tested in communities of the same and different types. A few control communities can also be designated randomly after baseline reconnaissance. These will receive no interventions. At the end of the project they will be compared with communities where various strategies (enforcement, information, negotiation) were tried.

- The project will innovate by testing the value of using Third World models (traditional descent groups and other pre-existing social institutions) for Third World development--rather than imposing western sociocultural models. One strongly recommended implementation strategy is to locate and use traditional descent groups and leaders as conduits for benefit and information flows and to gain cooperation, wherever possible. This strategy will permit us to compare project success in communities with descent groups versus those with less cohesive social organization.

- The project's site-specific and experimental strategy also will test the extent to which it is possible to build new organizations in Malagasy communities. What kinds of organizations are easiest to build? What kinds work best? One hypothesis is that schools can be used to foster multi-ethnic cooperation and action within communities. In what types of communities is it easiest to build new organizations. In some cases (e.g., for nontraditional goals) do new organizations (perhaps when based on latent but previously not actualized ties) work better than pre-existing ones? For what purposes are new organizations created and how well do they work compared with traditional ones?

- What steps can be taken to enhance the equity impact of the project? Will landless people especially be hurt by curtailment of traditional activities? Will provision of inputs for irrigation systems (high on many villagers' wish lists) increase stratification by disproportionately raising the incomes of landowners? To what extent--if any--will the strategy of building on traditional organizations and leaders increase stratification? There should be careful attention to stratification effects during implementation.

- What will be the relative effects of the project on men and women? Will new employment opportunities (e.g., as rangers and guides) disproportionately benefit men? What effects will the project have on traditional gender roles? Will project inputs raise female status in some regions (e.g., the south) while perhaps lowering them in others (e.g., the highlands). These hypotheses and questions deserve careful attestablished, various strategies can be tested in communities of the same and different types. A few control communities can also be designated randomly after baseline reconnaissance. These will receive no interventions. At the end of the project they will be compared with communities where various strategies (enforcement, information, negotiation) were tried.

6. Social Analysis of Protected Areas Visited during Project Design

The following sections indicate the kinds of groups to be encountered and tapped by the project, in developing integrated conservation-development activities. Descriptions are based on field visits conducted during project design, and reflect characteristics, variations and issues that will influence appropriate, site-specific interventions.

a. **Ranomafana**

The park is located in the "firaisana" of Ifanadiana, a 19th-century Merina outpost in Tanala country. It lies within the "faritany" of Fianarantsoa, which extends from the southern highlands--where Betsileo is the dominant ethnic group--to the southeast coast, homeland of various ethnic groups (e.g., Tambahoaka, Taimoro, Taisaka, Zafisoro). Much of the protected area seems to lie in the Tanala homeland. However, the Tanala are not populous and thriving ethnic group, and this is a sparsely populated transitional zone with considerable ethnic diversity. Descendants of 19th-century conquering armies from Imerina still live in the area, along with more recent Merina migrants, including merchants and slave descendants from the Antananarivo area. The Betsileo, whose homeland lies just west, in the southern central highlands, have also been expanding and migrating to the Ranomafana area. There are also Tambahoaka migrants form the southeast coast.

Social issues are especially problematic at Ranomafana because of continuing immigration, ethnic diversity, land poverty, and stratification patterns. Most of the immigrants came as land-poor people--slave-descended or free. The villages near the road are socially fragmentary and disorganized, wiht ethnic diversity, multiple unrelated families, and a percetnage of female-headed households (one third) higher that usual in Madagascar.

In the village of Ambatolahy, where Duke University employs several guides, there are interfamily jealousies related to this cash employment. Land tenure and cropping issues are also problematic at Ambatolahy. Most households have small "tavy" fields where bananas, at a minimum, are cultivated. The "fokontany" president controls the most land--both irrigated rice fields and "tavy" plots--where he grows several crops.

There was comparable ethnic diversity, poverty, and social fragmentation in a second roadside village visited by the design team. Duke researchers report that some of the villages that are more distant from the road appear to be more ethnically homogeneous (they probably include some Tanala villages where traditional authority figures, such as descent group heads, might be approached). These communities may offer more cohesive structures and organizations potentially useful to project implementation, for gaining local support, raising environmental awareness, and channeling benefits.

Given the extent of poverty, stratification, ethnic diversity, and social fragmentation around Ranomafana, project implementation must be especially sensitive here. The potential for noncompliance and resistance (likely to be passive resistance here) is great. Tanala and other "tavy" cultivators will be hurt by the prohibition on using the forest for slash-and-burn cultivation. Land-poor people who use the forest to hunt and gather for subsistence and sale also will be hurt. Those who rely on the forest to graze their cattle and hide them from rustlers will suffer. More likely to benefit are people with clear land claims whose fields may be improved by small dams, better irrigation, and other agricultural inputs. Economic alternatives suggested for the area include tourism-generated employment (enlist local businessmen and businesswomen to create tourist attractions), crayfish farming, planting pandanus, replacing tree ferns with pottery, and land grants.

b. Andringitra.

This is a long-established reserve in the extreme south of the Betsileo homeland. There is ethnic diversity around Andringitra, but of a different and less problematic sort than that at Ranomafana. Three ethnic groups (Betsileo, Bara, and Bara Harongona) have villages near Andringitra. However, each village tends to be ethnically homogeneous. Nor are issues of stratification and land poverty as troubling as in Ranomafana.

Surrounding Andringitra are at least 13 "fokontany," encompassing a minimum of 6500-10,000 people. Each "fokontany" includes smaller villages and hamlets, although there is a tendency toward settlement centralization in the area because of the fear of "dahalo" (cattle rustlers). Rustlers are said to use the forests to hide and dismember the cattle they steal, and peasants are said to use the forests to hide their cattle from rustlers (similar comments were made at Andohahela).

Around Andringitra, the Betsileo villages lie to the north, the Bara to the south, and the Bara Harongona (a mixture of Taisaka and Bara) to the southeast. The traditional social organization and economy of the Betsileo villages around Andringitra is known from a previous survey by a member of the design team. This is a relatively recently settled (19th-century) addition to the Betsileo homeland. The local economy combines irrigated rice cultivation with cattle pastoralism. Agriculture is less diversified here, more focused on rice than in the eastern, central, and northern parts of Betsileo territory.

The typical Betsileo village near Andringitra contains branches of several (3- 5) different clans. The village founders in this sparsely-populated and land- rich area were small-family migrants from more densely populated parts of the Betsileo heartland. They came in search of land for their herds and rice cultivation. After the French conquest of Madagascar, they were joined by freed slaves and their descendants from Betsileo country and Imerina. All now consider themselves Betsileo, but maintain their different clan ("foko") affiliations and names.

Project implementation should be easier around Andringitra than in Ranomafana. There are existing solidary, uniethnic kin and descent groups. Some of these are arranged in larger associations (phratries). Ties of marriage and blood siblinghood link people in different villages and ethnic groups. Because irrigation is traditional and widespread, inputs will be appreciated. There is room for agricultural diversification, and extension activities seem appropriate for this area. The WWF engineer who works in Antanifotsy, one of the Betsileo villages near Andringitra, commented that it was hard to get the villagers to cooperate. However, there has been no recent socioeconomic research in connection with the conservation efforts. The local social experts to be trained by the project should have better luck because there is more to build on here than at Ranomafana. Descent group lines can also be used to enlist support and channel benefits among the Bara around Andringitra. However, the Bara are more problematic because pastoralists are harder to reach than the more sedentary agriculturalists.

c. Andohahela.

Andohahela is located near Fort Dauphin. Most of the reserve lies in the traditional homeland of the Tanosy people (Anosy). The reserve has two main ethnic groups--Tanosy (the numerically predominant group) in the east and Tandroy in the west. Besides

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the Tanosy and Tandroy, two intermediate or transitional ethnic groups also live near the reserve. The Tatsimo are transitional between the Tanosy and the Tandroy, the Tavaratra between the Tanosy and other southeast coast agricultural populations (Taifasy and Taisaka). Tanosy culture tends to absorb its immigrants, who "become Tanosy" after a few generations.

The reserve has three parts. The mammoth eastern part--by far the largest at 63,100 ha.--is separated from the western part (12,240 ha.) by non-reserve lands where the Tanosy farm productive irrigated rice fields. These fields rely on the Andohahela forests for their water supply. The third part of the reserve is minuscule--only 500 hectares. It appears to have been defined because of an endemic palm.

Unlike Androy (Tandroy land) and the rest of the southeast coast, Anosy is not an area of strong emigration. Despite some deforestation near Fort Dauphin, population pressure on available resources was less obvious here than at Ranomafana or Amber Mountain.

The traditional Tanosy economy is diverse, with "tavy" and irrigated rice fields (called "horaka" on the east coast, versus "tanimbary" in the highlands). Roots and tubers (sweet potato, taro, manioc) are also cultivated. Cattle is another focus of the traditional Tanosy economy and a matter of great cultural interest, as it is among the Tandroy and southern and western Malagasy generally.

Both Tanosy and Tandroy, like the Mahafaly at Beza, retain powerful descent groups. Tanosy and Tandroy plant sacred trees ("hazomanga," sometimes a real tree, accompanied by a wooden post that can be moved from village to village as the locus of authority shifts after a leader's death). The "hazomanga" is the focus of traditional ceremonies. Among the Tandroy, the descent group head, or "mpisoro," (not the same as the "mpijoro" described below for Amber Mountain) is the guardian of and master of ceremonies at the "hazomanga." A Tandroy "mpisoro" presides over a lineage of between 500 and 2,000 people. There are probably more than 100 Tandroy "mpisoro," but their number appears to be declining. They are not being replaced in the younger generations. However, they still exist in villages near the western edge of the Andohahela reserve, which is the eastern limit of Tandroy country. The comparable Tanosy descent group leader--usually confined to a single village--is the "lonaka."

Identification of descent group heads is vital in implementing this project in Andohahela (as in Beza Mahafaly, where Mahafaly social organization is similar to that of the Tandroy). Descent group heads must give the project their blessing, thus maximizing the cooperation of the entire group. Descent group structure can be used to channel benefits and spread information. All the ethnic groups abutting on Andohahela have these kind of structures and leaders. DEF has used them to distribute seedlings and gain cooperation in its tree-planting programs.

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Tanosy, Tandroy, Mahafaly in Beza, and Bara in Andringitra are patrilineal and polygynous. Female status appears to be lower among these ethnic groups than in the highlands, where women have traditionally been more active and obvious in the public domain. Although active in markets and women's groups, women are excluded from the main public discussions of political and economic issues and disputes within the village. Men may initiate divorce, but a woman may not divorce her husband without his consent. Divorced Tandroy women may live on in their former husband's village with their sons, to whom the social tie is calculated after the marriage ends.

In one Tatsimo village visited by the design team there were 70 men over 17, but more than 80 adult women. Five of the men were polygynous; two with three wives and three with two wives. Some Tandroy villages have five or more current or former wives of the same man. Some are divorced and living with their sons; some are polygynous wives living in different houses in the same compound. The size of the wife's house increases with her seniority; junior wives live in hovels.

There are significant wealth contrasts in the Andohahela area, but stratification is less developed here than in the highlands. It will be less of a problem in project implementation than at Ranomafana or Amber Mountain. One of the people living in the Andohahela reserve--with productive rice fields and grazing land there--is a wealthy "ombiasa" (traditional sorcerer-healer) with four wives and twenty head of fat castrated cattle. This is an ambitious, hard-working and productive peasant with ties through marriage to four villages. With money, social support, and supernatural authority, he is mounting effective resistance against the lone and lonely protective service agent who has been trying to get him to move (he claims to have abandoned some of his rice fields within the reserve already. The recent death of the protective service agent's son was attributed to the "ombiasa"'s power.

The "ombiasa" wants land to replace his losses. Reserve personnel should attempt to satisfy the "ombiasa" and similar affected people through boundary adjustments, negotiation and provision of obvious benefits. The project can expect various forms of resistance if suitable alternatives are not provided. Care must be taken in seizing the land that people have been using for years.

d. Amber Mountain.

Four forested areas are included in the project area; members of the design team visited two of these: Ambohitra (Amber Mountain proper) and Ankarana.

The area around Diego Suarez is the traditional homeland of the Tankarana (Antankarana). Like the Tanosy near Andohahela and the Tanala near Ranomafana, the Tankarana have not expanded. The area is one of immigration rather than emigration. Indeed

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the Tankarana seem to have retracted to their mountain homeland at Ankarana, where their prince still lives, holds court, and heads ceremonies at his capital, Ambilobe (he is also employed as a gendarme).

In a country where many foreigners have been deceived by the claims of false princes, this is a real and effective prince. The project must pay attention to him, to his assistants, their customs and their ceremonies. Fortunately the Amber Mountain WWF staff has taken care to do so in ways that are culturally appropriate, as described below. Because of this, the implementation strategy being tried at Amber Mountain may serve as a model for SAVEM. To build on this promising model, training of the first group of local social experts should take place there.

All areas of Madagascar have traditional owners, called "tompotany" (masters of the land). The Tankarana are the "tompotany" for the Diego Suarez area. Also important are the Anjoatsy, a mobile, seagoing group of spiritual-ritual specialists, with traditional ties to an informal version of Islam and ports on the east coast. The Anjoatsy have spiritual authority at Ambohitra (Amber Mountain proper). The WWF staff has arranged for an Anjoatsy "mpijoro" (priest) to bless the park in a traditional ceremony. Similarly, at Ankarana, WWF plans to enlist the aid of the prince and the power of traditional Ankarana ritual to enhance cooperation with project agents.

Because the Tankarana are still important at Ankarana, the approval and cooperation of their leaders are needed for project success. A likely implementation strategy would be to channel benefits through the Tankarana social structure. However, the Tankarana have never been studied anthropologically. Tankarana social structure is incompletely understood--particularly the relationship between the king and nobility and the commoner clans. The nature of Tankarana stratification should be investigated and monitored during implementation to maximize equity in the distribution of benefits.

There are immigrants throughout the Amber Mountain complex area. They include Merina (still hated in the area because of their 19th-century conquest of the Tankarana), Betsileo (including wood cutters working for a commercial firm that is said to be a particular threat to the forest) and people from the southeast coast (Taimoro, Taisaka, Zafisoro and others). There are also Sakalava from the west and northern coast, Tsimihety from further south, and Comorians. For generations this has been an area of coastal trade--extending to the Comoros and the East African coast--interethnic contacts, and mixture.

The assembly of people from the highlands (called "borizano," derived from the French word bourgeois) started arriving with Merina rule. However, immigration from the densely-populated and socially-stratified highlands by Merina and Betsileo

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increased substantially after the French abolished internal slavery in 1896. Immigrants also came to be caretakers for the French, particularly in the ethnically mixed town of Joffreville, near Amber Mountain. This was a weekend retreat for the French colonialists, and the descendants of their Malagasy caretakers have remained. The major immigration to Joffreville was in the colonial period, and appears to have slowed to a trickle.

Joffreville is a microcosm of the ethnic diversity that exists in this region. Although it lacks descent groups, there are some ethnic, religious, and school associations that might be used in project implementation. People still seem to respect the ancestral ritual authority of the "tompotany" and their priests. Not all villages near Amber Mountain are as ethnically mixed as Joffreville. The design team also visited Antsilaka, an ethnically diverse "fokontany", but with component villages that are ethnically homogeneous. One such subdivision was a prosperous Betsileo hamlet with 18-20 houses, varied crops, and a carefully managed irrigation system originating in the forests of Ambohitra.

Half of the families in Joffreville have planted trees and crops in the reserve. The project design team was informed that people had planted after being told that the land was not within the reserve, since the boundary was on the other side of the Creole River. Later, when the boundaries were redrawn, the farmers learned that their fields were now in the reserve. They are understandably worried that they will have to abandon land they have cultivated for years. A suggested response to this dilemma is a flexible plan for redrawing the boundaries, to permit as many people as possible to go on cultivating their traditional fields (with assurances that the fields will not be enlarged).

The project design team discovered a growing but still incomplete awareness of the relationship between preservation of the protected forest and the productivity of local agriculture, which is dependent on irrigation. The people of Joffreville realize that continuing destruction of the forest will reduce their water supply. The water table and supply have already started to diminish noticeably. People in Antsilaka have been warned about this relationship, but some of them don't believe it yet. They need to be convinced.

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SOCIOCULTURAL FEASIBILITY--SUMMARY JUDGMENT: The project is feasible and will benefit Madagascar if two obvious problems are considered carefully and handled flexibly during implementation. First, at the national level, the potentially overlapping areas of responsibility between ANGAP and other agencies (e.g. ANAE, SPN, DEF) must be defined, redefined, and disentangled. Second, at the local level, if traditional resources and products are placed off limits they must be replaced by appropriate alternatives. A gradual and sensitive approach--one that listens to the affected people in and around the protected areas and minimizes the disruption of their lives--is most likely to succeed. The flexible implementation strategy, experimentation, community- level grants, and careful monitoring and evaluation that have been built into the design of SAVEM should help suggest, test, and evaluate options at each site that are socio-economically as well as environmentally appropriate.

E. Institutional/Administrative Analysis

1. Scope of Analysis

A detailed and systematic examination of ANGAP's management, staffing and organizational experience must be limited as ANGAP is not yet functional as an institution. As such, ANGAP's institutional character has been reviewed based on the parameters of the organizational structure defined in the statutes, the notional functions previously defined in the project paper, and an illustrative staffing pattern.

From the stated expressed in its statutes, ANGAP's organizational capabilities are expected to include: administrative and financial management, socio-economic research and analysis, ecology or natural resource management, archival and library design and management, audio visual and public education capacity, data base design and management, short and long term planning capacity, and evaluation and monitoring capacity. The institutional capability of ANGAP to assume additional functions will be evaluated by AID/GDRM in the third year of its operation. In particular, there should be an assessment of the advisability of adding the functions of grants administration and park management.

This analysis also discusses the institutional relations between ANGAP and other agencies active in the natural resources sector in Madagascar. It examines the likely relationships between them, ANGAP and other components of SAVEM.

2. Analysis of ANGAP's Organizational Elements

a. Legal Status

ANGAP was created in June 1990 by fifteen founding members, with balanced public and private sector representation. The statues have been ratified by the founding members, but there are several steps which still need to be completed for ANGAP to be legally recognized as an institution. As per public ordanance no. 60-133, governing the creation of associations in Madagascar, the statutes with a list of the founding members and the denomination of the Board of Directors must be submitted to the provincial office in Antananarivo. A "récépissé provisoire" will be issued by the President of the Faritany. After a review and approval of the statutes by the Ministry of Interior, a "récépissé definitif" is subsequently issued by the provincial office. In practical terms, ANGAP can begin functioning as an institution after obtaining the "récépissé provisoire". This should be received by the end of September 1990. ANGAP will not, however, be legally recognized until the receipt of the "récépisse definitif".

As a private organization, ANGAP will have the flexibility and autonomy in financial and staff management, including staff recruitment. It will have the capacity to receive grant proceeds directly from donors without the funds having to be disbursed through the Ministry of Finance or referring to the parent ministry. ANGAP will have the authority to determine how the tasks of monitoring, evaluation, information collection, analysis, storage and dissemination, public education and others should be carried out. It eventually will be recognized by the government as a public interest organization which could entitle ANGAP to tax exempt status.

Due to its special mandate, an implementation agreement will be established between ANGAP and the Ministry of Livestock, Fisheries, Water and Forests (MPAEF) which identifies ANGAP as an autonomous organization and delineates its responsibilities , including appropriate devolution of authority from the Department of Water and Forests (DEF). However, DEF will maintain clearance authority regarding the appropriateness of ANGAP activities in the context of policy for protected areas since these are government lands. This should be facilitated by DEF's representation on the Board of Directors, which retains authority to review ANGAP programmatic and financial plans.

b. Financial Status

As discussed in Annex VI B, "Financial Analysis", ANGAP will be financed mostly by donor grants. It will manage its own investment and operating costs and monitor funds allocated under the donor contracts to field operators for conservation and development activities in the peripheral zones. As a condition of disbursement of funds for this component, which will partly supported by Norwegian Aid and Development, the GDRM must enable ANGAP to collect revenues directly from the protected areas (entrance fees, concession sales, other fees from the tourism industry). These revenues are currently collected by MPAEF and transferred to the Public Treasury. A fiscal law must be approved by the National Assembly delegating collection responsibility to ANGAP. These revenues will be used for some recurrent costs and for priority activities in the protected areas not yet covered.

Based on a mid-term evaluation of their institutional capacities, ANGAP may begin to mobilize funds from donors and allocate them to field operators. At the same time, field operators also may continue to be financed directly by donors, with ANGAP maintaining its responsibility to monitor these activities.

c. Organizational Governing Structures

The organizational structures governing ANGAP were clearly defined in the statutes approved in June 1990. There are two main governing bodies, the General Assembly and the Board of

Directors, which provide overall guidance to the management office for the operational aspects of ANGAP. To this extent, they have a consultative, rather than decision making, or administrative role in the day to day operations of ANGAP. A brief description of these two structures and composition of their responsibilities follows:

1) General Assembly

The General Assembly is the supreme governing body of ANGAP. It defines the overall orientation of the association, resolves all issues which are not within the authority of the Board of Directors, and reviews and approves financial reports. The General Assembly will, through the Board of Directors, express its interests and concerns regarding ANGAP operations and responsibilities.

The General Assembly of ANGAP is presently comprised of the fifteen founding members. It is open for additional membership through requests seconded by two members of ANGAP and submitted to the Board of Directors. The founding membership is composed of representatives from the following public and private entities:

Ministry of Livestock, Fisheries, Water and Forestry
- Department of Water and Forests
- Department of Programming and Planning

Ministry of Economy and Plan

Ministry of Scientific Research, Technology and Development

Ministry of the Interior

Ministry of Transportation, Meteorology, and Tourism

Ministry of Higher Education

National Office for the Environment (ONE)

Sampn'Asa Fampandrosoana/SAF-FJKM (NGO)

Sampana Famolena sy Fiompiana/SAFAFI-FLM (NGO)

World Wide Fund for Nature/International (NGO)

Conservation International (NGO)

Missouri Botanical Garden (NGO)

National Association for Environmental Action/ANAE (NGO)

Syndicat Hotelerie (private)

2) Board of Directors

ANGAP is administered by a Board of Directors (Conseil d'Administration) composed of 13 members: the Minister of Water and Forests (Eaux et Forets) or his representative, as President; six representatives of the GDRM whom the President will name; and six representatives elected by the non-governmental members of the General Assembly from national and international NGOs and the tourism industry. The Board of Directors has not yet been appointed, but will be chosen during the next General Assembly from the fifteen founding members of ANGAP. They will represent a diverse field of experience in biodiversity conservation and rural development.

The responsibilities of the Board of Directors are: to establish and apply the by-laws of the association; define the orientation of the organization; approve annual program plans submitted by the Director General; define the modalities for the utilization of resources allocated to ANGAP; approve narrative and financial reports submitted by the Director General; prepare budgets and financial reports to be submitted to the General Assembly; establish personnel procedures and staffing patterns taking into consideration the functions and activities of the association; and select the Director General.

The Board will hold bi-annual formal meetings, and meet with senior management staff at regularly appointed intervals. An annual work plan will be submitted by ANGAP staff to the Board for review within the first six months of operation. Since seven out of the thirteen members on the Board of Directors will be representatives of government ministries, the opportunity to obtain government clearance is provided within the structure of ANGAP itself.

d. Management Structure (Direction General)

ANGAP's statutes specify that the Direction General (Management Office) should be comprised of a Department of Administration and Finance and other departments needed to accomplish ANGAP's tasks. Establishment of these offices requires approval by the Board of Directors. The only staff member specified in the statutes is the Director General. ANGAP is presently recruiting for this position. The Director General will be a Malagasy professional with experience in natural resource management and biodiversity conservation in Madagascar, and should be in place by the end of 1990.

Although the purpose of ANGAP is defined as responding to and making recommendations on GDRM policy for biodiversity conservation, the Director General will have full responsibility for decision-making regarding day to day operations as well as short-term and long-term objectives. The Director General will

be responsible for reporting directly to the Board on all policy matters requiring government clearance or initiation of new programs requiring unusual expenditures. Through quarterly reports and bi-annual meetings, the Director General will be responsible for keeping the Board up to date on ANGAP activities and financial status.

Other senior staff may include a Senior Ecologist, Senior Sociologist, and Director of Administration and Finance. Suggested mid-level management positions could include: two junior social scientists, one archivist/librarian, one public education specialist, one bookkeeper/accountant, and one computer program specialist. These positions should provide ANGAP with adequate staff for the first three years. Staff levels then may increase pending an evaluation by USAID and the GDRM. This evaluation may recommend expansion of ANGAP responsibilities and thus, its staff resources in park management and grants administration. For example, it may be advisable to add one ecologist on the staff who would be parallel to the junior social scientists.

The institutional growth of ANGAP to a great extent will be a function of the demand for the services it offers. A measure of its success will be in communicating its mission to both the general public and the development community. It is anticipated that the first two years will be the most crucial period of institutional development as staff are both in the process of learning new roles and receiving specific training in various skills, i.e. computer literacy and English.

In the Environment Program I, an illustrative organizational chart of ANGAP was presented which divided the organization into five departments or teams: (1) coordination; (2) finance and administration; (3) education, training and communication; (4) monitoring and evaluation; and (5) conservation data base. All of the departments would be directly responsible to the Director General. Based on this structure, an illustrative breakdown of staffing for ANGAP, their responsibilities and qualifications is presented below. (The possible staffing pattern of ANGAP's conservation data base, Biodiversity Planning Service, is discussed in Annex V.A.2.)

1) **Direction General**

Director General

<u>Responsibilities</u>:

- Coordinate the staff activities and activities to meet staff training needs

- Oversee the operation of the Biodiversity Planning Service

- Organize seminars, meetings, and colloquia with NGOs, appropriate ministries of the GDRM, and donors regarding biodiversity conservation and rural development issues as they pertain to protected areas

- Assure the operation of ANGAP's monitoring and evaluation activities

- Assure efficient financial management of ANGAP

- Assure that all necessary inputs are in place for ANGAP operations

- Oversee the planning and coordination of activities in the targeted zones

- Promote public understanding of biodiversity conservation and peripheral-zone development issues

- Assist DEF in the conception of national policies as they relate to the management of protected areas and economic development activities in their surrounding communities

Qualifications:

Ten years experience in general administration and management or in the direction of a project in the area of agroforestry, rural development, or natural resource conservation; good personnel management capabilities ; strong experience in the design, programming, implementation and monitoring/evaluation of projects; familiarity with the rural sector and forestry in Madagascar; good understanding of socio-economic issues in Madagascar; good organizational aptitude; public relations skills; availability for frequent travel for site visits; familiarity with the participatory and multidisciplinary approach to development; computer literacy; working knowledge of English

2) Coordination of Protected Areas Activities

Senior Ecologist

Responsibilities:

- Design of monitoring and evaluation instruments which can be used by the two junior social scientists and the 6 field monitors for making general on-the-ground assessments of community understanding of ecological issues, conditions, and progress towards biodiversity conservation.

- Make field trips to the protected sites in order to assess the nature and quality of conservation activities in those areas, and make recommendations regarding future actions in those areas

- Prepare periodic reports on observations and analyses of activities in the field to facilitate understanding of ecological issues by diverse audiences such as the Public Education Specialist, government decision-makers, and NGOs working in the field.

- Collaborate closely with the Senior Social Scientist in assessing the success, problem issues, or failures of activities in the field

- Collaborate in the organization and coding of data to be entered into the Biodiversity Planning Service

- Contribute to the design and implementation of short training seminars for other staff and possible NGOs, as well as participation in various seminars, meetings, and colloquia of actors involved in biodiversity conservation

Qualifications:

Minimum Masters level education in Natural Resource Management, Ecology, or a combined curriculum and/or work experience that provides expertise in forestry, soil conservation, land-use systems and crop or animal production; a doctorate of 3me cycle is preferable; five to three years working experience in rural development activities; one to two years management experience; pas experience working with extension systems would be a plus.

3) **Administration and Finance**

a) Director of Administration and Finance

Responsibilities:

- Establish financial and accounting systems

- Establish a personnel system and oversee the creation of a procedures manual for staff use

- Work closely with the short term Technical Advisor for Financial Management to set up the ANGAP financial management system, as well as set up appropriate computer systems to facilitate these functions

- Supervise bookkeeper/accountant; assist other ANGAP staff in preparation and use of their budgets; and assist the Director General in short and long term planning tasks

Qualifications:

Masters level education in Administration and Management or a related field; 4 years working experience of comparable nature including personnel management, long term and short term financial planning, preparation of budgets, and contracting.

b) Administrative Assistant

Responsibilities:

- Maintain files, records, and calendars to support the administrative duties of the Director General

- Maintain a schedule of all staff activities, as well as professional activities particular to the Director General of ANGAP

- Establish and maintain a directory of all pertinent professionals and agencies working in biodiversity conservation in Madagascar

- Oversee the utilization and maintenance of all office equipment,

- Responsible for all correspondence emanating from the Director's office; maintain an institution-wide correspondence file (incoming and outgoing) and files of ANGAP staff, General Assembly, and Board of Director reports

- Supervise on the job training of two secretary-typists, chauffeur/messenger, and janitor

Qualifications:

Masters level education with emphasis on administration and management with two years work experience, or Bachelors level education with 4 years experience in administration and management; familiarity with office management procedures

4) Education, Training and Communication

a) Public Education Specialist/Photographer

Responsibilities:

- Develop a public awareness campaign that will enhance public understanding of issues related to biodiversity conservation and rural development in Madagascar

- Establish and maintain contacts with the press and educational institutions around the country through effective documentation and coverage of biodiversity conservation and related activities taking place in the field

- Develop the public image of ANGAP in collaboration with the Field Monitors

- Select video and still coverage of field activities at the request of NGOs working in protected areas and the peripheral zones

- Establish and maintain communication and contact with national communications networks

Qualifications:

Minimum Bacheiors education with a liberal arts major; preferred areas of educational concentration should be Literature, Communications, or Education; understanding and interest in the subject of biodiversity, conservation and rural development; Minimum of two years journalistic experience; experience in public education and outreach in another institution; photography experience; training abroad in museum education and related audio-visual materials development/use; good verbal and written skills

b) Archivist/Librarian

Responsibilities:

- Maintain a library and archives system which will be the repositories for reports, research documents, journals, etc. that have particular import on biodiversity conservation in Madagascar

- Keep an up-to-date file on relevant periodicals and journals, and recommend the suitability of materials to be obtained

- Assure an index of all data is included in the Biodiversity Planning Service

- Develop materials for increasing public awareness of biodiversity conservation awareness and understanding

- Prepare monthly newsletters on ANGAP and other agency activities relative to biodiversity conservation and rural development

- Maintain a file on donors for biodiversity and environmental action

- Collaborate with other ANGAP staff for the development of materials for ANGAP sponsored workshops and seminars

- Produce a quarterly listing of recent acquisitions that should be sent to all biodiversity conservation organizations and other interested parties in the country

- Establish a mailing list based on educational institutions in the country

- Establish links with universities in country in order to arrange access to copies of memoirs and other documents relevant to biodiversity conservation

Qualifications :

Minimum Bachelor's education in Library Science (or a related field); fluent French and some knowledge of English ; good writing skills

5) Monitoring and Evaluation

It should be noted that all ANGAP staff responsible for monitoring and evaluation will work closely with the Biodiversity Planning Service (BPS) national staff and technical advisors. These two departments within ANGAP will operate as complementary units of one another.

a) Senior Social Scientist

Responsibilities:

- Design of a monitoring and evaluation plan for the collection and analysis of data regarding field activities in the protected areas and their peripheral zones to include observation of activities carried out by local and international NGOs as well as relevant government ministries

- Supervise two Junior Social Scientists and six field monitors; conduct in-service training of Junior Social Scientists including assistance in preparing questionnaires for field use, etc.

- Collaborate with Senior Ecologist, and complete short and long term planning of activities which are complimentary to his/her responsibilities and tasks

- Prepare periodic assessments of socio-economic conditions in the peripheral zones; work directly with the short term technical assistance consultant for social science research in preparing M&E plans as well as coding and analysis of data to be entered into the Biodiversity Planning Center

- Interact with the Chief of Party for the Protected Areas Grants Component, including two field trips per year to visit on-site activities

- Prepare reports to facilitate and justify recommendations made to the Board and SPN concerning ANGAP plans and programming

Qualifications:

Minimum of Masters level education in the social sciences; preferably rural sociology or anthropology; a doctorate of 3me cycle is preferable; minimum five years working experience combining field research and a role in execution of rural development activities; fluency in French and a working knowledge of English; one to two years of management experience; previous experience working with extension systems.

b) Junior Social Scientist (2)

Responsibilities:

- Monitor biodiversity conservation activities in protected sites and their peripheral communities in three administrative regions of Madagascar

- Track the discrete and combined impact of biodiversity conservation activities in these areas in collaboration with field monitors

- Train field monitors in observation and interview techniques in order to collect socio-economic data and data on the level of public awareness of biodiversity conservation issues and activities in the targeted areas

- Supervise six field monitors and analyze their reports

- Enter data from field reports with assistance and on-the-job training from the ANGAP computer specialist and the Data Base Technical Assistant

- Maintain effective working relationships with counterparts in the NGO organizations with which ANGAP interacts

- Make quarterly visits to the protected areas in respective regions and submit reports on those site visits to the Senior Social Scientist

- Participate in seminars and workshops sponsored by ANGAP, as well as collaboration with the Public Education Specialist/Photographer in the development of materials for the public use

- Collaborate with the archivist/librarian in the review of periodicals, reports, etc. suitable for ANGAP

Qualifications:

Bachelors (or comparable) degree in sociology or anthropology with 2 years work experience, or a Masters degree and one year work experience should make up the minimum requirements; experience working in the field carrying out field research or participating in rural development activities

c) Field Monitors

Responsibilities:

- Monitor activities of NGOs and relevant government ministries in the protected areas and peripheral zones in collaboration with the two Junior Scientists responsible for monitoring biodiversity conservation activities

- Submit quarterly reports to the ANGAP office in Antananarivo to be reviewed by the Junior Social Scientists

- Provide field presence for ANGAP and use observation and interview techniques to follow community development activities and conservation programs in targeted zones

- Report on observed activities and make recommendations through the Junior Social Scientists regarding the combined impact of various agencies on the targeted areas

Qualifications:

Minimum of two years university experience; bachelors degree is preferable in sociology or anthropology; fluency in French and Malagasy; one year's working experience or comparable time engaged in field research

3. Institutional Relationships: ANGAP and other Agencies Working in Biodiversity Conservation

One of the primary functions of ANGAP will be to serve as an information resource for agencies working in biodiversity conservation. This information will fall into five specific categories: 1) updates on the level of activities of NGOs in the protected sites and peripheral zones, including levels of investment, character of activities, project implementation calendars, numbers and short descriptions of personnel, current training activities, distribution of inputs, and projected activities for the upcoming year; 2) updates on the level and character of activities currently being managed by DEF/SNP in protected areas and the peripheral zones; 3) quarterly impact assessments, by region, protected area, and peripheral zone of biodiversity conservation and rural development activities; 4) periodicals, journals, research

reports and other data housed in the ANGAP library and archives; and 5) brief descriptions of current activities focused on public education on biodiversity conservation in Madagascar.

Definitions of key agencies working in environmental protection and management are presented below to better illustrate the significant working links that will effect the performance of ANGAP.

a. DEF/SNP

The Department of Water and Forests (DEF) plays a central role in the conception and implementation of national forestry policy. It is technically responsible for the rural environment including biodiversity and forestry policies, forest management, reforestation, soil conservation, and the management of protected areas.

SPN is the Service for Protection of Natural Resources which is one of four sections of DEF. The Service for the Protection of Natural Resources is divided into three departments: 1) division of flora, fauna and the environment; 2) soil conservation, and 3) forestry division. Other departments within DEF are the Service for Inventory and Exploitation of Forest resources; the Reforestation Service (including Forest Station oversight); and the Operation Savoka IGPF, which concentrates on managing small development projects in areas identified as critical to general environmental well-being, around the country.

Relationship with ANGAP: ANGAP will collaborate with DEF/SNP in refining of national biodiversity policy and in coordination of activities in the protected areas with those in the adjacent gazetted forests. As a member of ANGAP's Board of Directors, DEF/SNP will maintain an official direct link with ANGAP and will participate in the review of its long and short term plans, as well as its various reports, publications, and other activities. It is expected that any matters requiring clearance or authorization from DEF for action can thus be submitted by the Director General of ANGAP directly to the DEF Board of Directors representative; thereby reducing the number of administrative levels normally required by such authorizations or policy clearances.

b. CAPAE/ONE (Office National pour l'Environnement)

The CAPAE (Cellule d'Appui du Plan d'Action Environnementale) was established in 1987 under the Ministry of Economy and Plan to coordinate work of the numerous ministries and donors involved in the preparation of the Environmental Action Plan, and to plan and undertake a number of studies and pilot projects for the environment. This unit is staffed by consultants and was created on a temporary basis. Over time its role expanded as it assumed responsibility for preparing the multi-donor Environment Program

I, and for initiating an environmental awareness program. It was increasingly recognized that a central office to coordinate environmental policies and activities in Madagascar was needed.

This new office, to be called the National Office for the Environment (ONE), should be legally ratified through government legislation by fall 1990. Its major responsibilities will be: 1) to launch and coordinate implementation of the Environmental Action Program; and 2) to provide leadership for developing Environmental policy and establishing the tools and procedures for its implementation, monitoring, and evaluation. This latter activity would therefore include: a) policy analysis, planning and environmental legislation; b) monitoring of environmental conservation activities, and assistance to Environmental Action studies throughout Madagascar, c) education and public awareness of environmental issues, and data management reflecting the tasks stated above.

Relationship with ANGAP: As the agency responsible for oversight of the environmental activities throughout Madagascar, ONE will benefit greatly from the specialized, targeted information that ANGAP will gather regarding selected protected sites and rural development activities in their peripheral zones. ANGAP and ONE will also maintain a close working relationship as concerns general coordination, data management, training, education and awareness, and monitoring and evaluation. With its primary task of evaluation, ONE might be a candidate to participate in evaluations of ANGAP at the request of the GDRM. As a member of ANGAP, ONE will have a direct link by which it can communicate with ANGAP management. ONE should ensure not to expand its data gathering and monitoring tasks to overlap with ANGAP's functions in this area.

c. ANAE (Association National de l'Action Environnementale)

ANAE is a small, non-governmental agency comprised of natural resource professionals. It has already been established as a private association under Malagasy law, and will receive the majority of its funding and institutional support from Swiss Cooperation. Unlike ANGAP, ANAE has only two government representatives on its Board. Other ANAE founding members include representative national and international NGOs, religious groups,and private businesses and consultants.

ANAE's primary objective is to fund the preparation, appraisal, and implementation of community level small projects for watershed management, reforestation, and other rural development activities in 5 priority regions as well as in the peripheral zones of the protected areas. Rural communities will be assisted by field operators, financed by ANAE, to identify, prepare, submit, and implement their projects. ANAE is expected to become a grant recipient for the implementation of some development projects in the peripheral zones.

ANAE has yet to become fully operational. It needs appropriate training in rural development, project development and grants administration. It also needs to determine the structure most effective for intervening directly at the grassroots level.

Relationship with ANGAP: As two organizations with overlapping responsibilities for the implementation of development activities in the peripheral zones, a close working relationship will be established between ANGAP and ANAE. They will collaborate in developing criteria and procedures for identifying and selecting viable small projects in the peripheral zones. ANGAP will share information regarding these activities gathered as part of their own monitoring system. The receptive role of each organization in the review and approval of activities in the peripheral zones needs to be determined to ensure coordination and consistency in protected areas management plans.

d. COMODE (Conseil Malagache des Organisations Non-Governementales pour le Developpement et l'Environnement)

COMODE is an association of thirty-three national NGOs, created in February 1990. It is to function on a national level as a coordinating body for NGOs active in the development and environment sectors in order to enhance and promote communication and exchange between NGOs. Member organizations are small, rural development organizations with grass-roots experience. The creation of COMODE represents an initiation and expressed desire of the national NGO community in Madagascar.

COMODE's specific objectives are to: 1) provide a forum for exchange and facilitate coordination between NGOs; 2) support activities related to the protection, conservation; and rational management of natural resources ; 3) assist various member organizations to establish links between themselves at local, regional, and national levels; 4) create or support resources which facilitate directed action and collaboration among members; 5) provide assistance to member organizations in the areas of information, training, funding, technical assistance, and management (administrative and financial); and 6) facilitate the establishment of new forms of national and international cooperation between public and private actors in biodiversity conservation in Madagascar.

COMODE is presently serving as the Country Lead Agency for the implementation of the AID centrally funded NGO-NRMS (Natural Resource Management Support Project) in Madagascar. The goal of this project is to strengthen the operational and organizational capabilities of national and international NGOs in natural resources management through training, technical assistance, and information support services. Types of activities which will be organized and supported by COMODE include seminars to share information on appropriate approaches to development activities in Madagascar and training workshops on project identification and management.

Relationship with ANGAP: ANGAP can serve as a resource of information for COMODE in order to enhance collaboration between NGOs in natural resources management. COMODE could serve as a vehicle to provide training to small, Malagasy NGOs that require assistance in preparing proposals. ANGAP would then review these proposals for ecological, geographic, and socio-economic viability. Funding could be accorded either through ANGAP or ANAE, with ANGAP continuing their role in monitoring the combined impact of these activities in the targeted areas.

e. FTM (Foiben - Taosarintanin'i Madagasikara)
(National Cartography Institute)

FTM, under the Ministry of Public Works, is the national mapping and remote sensing agency. FTM is a public enterprise with more than 30 years of experience in mapping. FTM is in charge of producing maps and geographic information. This includes: (1) maintenance of the geodetic network, digital files, base map archives and nautical charts and (2) management of the Laboratoire de Télédétection (LNT) - National Laboratory for Remote Sensing, a national facility that is being set up for remote sensing and the Geographical International System (GIS).

FTM has just signed a partnership agreement with IGN/FI (the private branch of Institut National Géographique, the French national mapping agency). Under this agreement, IGN/FI will help FTM launch its program, train its staff and hire equipment that FTM does not need to buy (e.g. for establishing the geodetic network). IGN/FI will provide adapted software and technical assistance.

Relationship with ANGAP : The Biodiversity Planning Service being created within ANGAP will rely upon the FTM for: 1) cartographic and photogrammetric services; 2) aerial photo acquisition; 3) digital satellite image processing by 1994; and 4) production of digital terrain models for the protection area and zones of influence (produced as a by-product of the ortho photo-production).

f. CNRE (Centre National de Recherche Environnementale)

CNRE, attached to the Ministry of Scientific and Technological Research for Development, is involved in environmental research in association with the national universities. Various foreign research agencies provide external support for this research. It has the same legal status as public enterprises. CNRE recently initiated (i) a study to review its current program and organization; (ii) the preparation of a master plan for environmental research in association with the national universities; and (iii) the preparation of its own priority research programs in accordance with its existing capacity and comparative advantage. These studies are expected to be completed by the end of 1990, and will be the basis for financing research by CNRE under Environment Program I.

Relationship with ANGAP: The BPS will rely upon CNRE for production of updated vegetation maps. In the event that CNRE is unable to continue upgrading these mapped data bases, the BPS would either utilize existing information or provide contract vegetation survey services to local management project on request. The BPS will offer service and training to CNRE in the use of the Geographical Information Service.

4. Conclusion

The creation of ANGAP is an important step in the process of increasing Madagascar's ability to manage and protect biodiversity resources, and in assisting Malagasy communities to become less dependent on non-sustainable exploitation of protected areas. Many of Madagascar's priority biodiversity zones have not received consistent monitoring or inventory of resources. The Department of Water and Forests has repeatedly emphasized its desire that a specialized, non-governmental agency be created with the responsibility of managing these areas, which require particular and technically focused approaches. The proposed organizational structure of ANGAP has been based on an inventory of what services are needed and how they can be provided by ANGAP.

ANGAP is a new institution and some risk can be acknowledged in the creation and support of such an institution. Coordination is a difficult task, and considerable skill building will have to take place in order for this responsibility to be successfully carried out. In terms of the management responsibilities of ANGAP, delegations of authority and the clarification of decision-making roles are critical elements in assuring ANGAP's success. ANGAP is in fact a private institution that has the responsibility of management of government lands. This is something entirely new for Madagascar. On the other hand, the conditions of both protected areas and their peripheral zones attest to the fact that an innovation is needed.

The GDRM and NGOs active in the sector are aware that time is a critical element in resolving the problems of Madagascar's diminishing natural resource base, and that a specialized task force is needed to work on this problem and manage the diverse activities underway or planned. SAVEM's support of ANGAP will increase institutional capacity in Madagascar for the management of biodiversity and development activities, and therefore will create lasting skills in Madagascar that will continue beyond the life of the project.

ANNEX VII - OTHER DONOR ASSISTANCE

OTHER DONOR ASSISTANCE
ENVIRONMENTAL ACTION/MADAGASCAR

CONSERVATION INTERNATIONAL:

Preparing a program of action; establishing an office in Madagascar. Signed an Accord de Siège for a $5 million Debt Swap (yet to be funded). May work in parks and reserves.

DEUTSCHER VOLKSHOCMSHUL - VERBAND:

Adult literacy/conservation education. Production of brochure on erosion prevention measures.

DUKE UNIVERSITY:

Ranomafana National Park Project with USAID, University, and other donor funding. ($4.43 million total for Phase I, 1990-1993). Support to Ivoloina Lemur Rehabilitation Center/Zoological Park north of Tamatave which includes 2 expatriate advisors.

E.E.C.: Signed Lome IV Agreement to provide $150 million to Madagascar 1991-5. Unspecified portion will go towards environmental activities.

F.A.O.: Implementing $1.56 million (1990-93) soil conservation and protection of watersheds (bassins versants) program near Antananarivo with UNDP funding.

Nationwide crocodile survey and breeding project - will also provide training to raise and breed crocodiles.

Coordination of Tropical Forestry Action Plan. Funded study (by Bureau Jureco) on

Funded study (by Bureau Jureco) on tenure, access to land titled Paysans sans Terre, Terre sans Paysans; report never released by Prime Minister's Office. Attempting to establish interministerial committee on tenure issues, under chairmanship of DPRA.

FRANCE: Does not have a focused environmental program but rather incorporates environmentally related training, soil conservation (Lac Alaotra) and forestry activities into on-going rural development projects. Also supports research related to forestry management in Matsiatra; and strengthening of the Center for Technical Information (CIDST) of MRSTD.

FTM has recently signed a partnership agreement with ING/FI (the private branch of Institut National Géographique, the French national mapping agency). Under this agreement, IGN/FI will help FTM launch its program, train its staff and hire equipment that FTM does not need to buy (e.g. for establishing the geodetic network). IGN/FI will provide adapted software and technical assistance.

G.T.Z. (German Technical Cooperation):

Supporting 3 projects involving 6-8 German expatriates: (1) Forestry project at Ampahibato (70 kms. south of Antananarivo) involving reforestation, economic uses of the forest, wood harvesting and a socioeconomic study. Funded at DM 7.5 million, 5/89-7/92. Includes 2 German forestry engineers and 1 forestry instructor. Collaboration with DEF. (2) Agriculture project at Port Bergé (near Majunga) involving 3 expatriates working in soil conservation and agroforestry. Collaboration with MPARA. (3) Energy project in collaboration with Ministry of Energy and Mines.

JAPAN: Japanese Embassy has submitted environmentally - related proposals. None have been approved by Tokyo to date.

K.F.W. (Kreditansfalt fur Wiederaubau): German

Supporting reserve peripheral zone development activities in Andrigitra, Marojejy and eventually Manongarivo through W.W.F./International - DM 7 million (1991-1994). Has reserved DM 5.0 million for co-financing with IDA for cartographic equipment for FTM (estimated disbursment-1992). Also DM 5.0 million will be given to UNESCO for activities in the Bemaraha strict Nature Reserve.

MISSOURI BOTANICAL GARDEN:

Implementing Masoala Peninsula Project with USAID ($425,000) and WWF ($ 105,000) funding. Collaboration with MPAEF and SAFAFI.

NORWAY:

Will provide operational costs ($1.06 million) for ANGAP through the World Bank. Also support for: environmental mini projects ($1,580,000) ANAE ($520,000), and WWF for environmental projects in the south for 5 years ($350,000). Provides funds to the World Bank GPF (forestry) Project.

ODA: Providing Stg Pound 85,000/yr. through WWF/U.K. for environmental programs in Madagascar. Soon to support a Sterling Pound 15,000/year program of student training abroad. Support (through Jersey Wildlife Preservation Trust and DEF) to tortoise reserve in NW Majunga region in late 1990.

RUSSIA: Planning reforestation activities in 2 reserves: Betampona (near Tamatave) and Sombitsy/Vohibasia (near Tuléar). Will involve 8 Russian reforestation specialists/advisors and $5 million in start-up costs. Dates and availability of funding uncertain at this time.

SMITHSONIAN INSTITUTION:

Signed a 5 yr. M.O.U. in 1988 with GDRM, part of which agrees to promote and support cooperation in environmental biology and conservation. Nothing funded to date, but planned within next 6 months.

SWISS (Cooperation Suisse): Program 1990-1994

Partner Institution	General theme	Projects
MEP / ONE	PAE / Structural Support	Support to ONE (ex CAPA
ANAE	Anti-erosion/Soil Conservation	Support to ANAE
WWF	Sensibilization / Information	Magazine "WWF"
MPAEF / DEF	Village reforestation / Social forestry / Tanety Management	FAFIALA ALTAFA
ORIMPAKA		PSFP Andriamasina
	Silo, forest seeds	PASN
	West Coast Forest (protection + Management)	CFPF SAFCO
	Strengthening DEF	GPF (COFIDA)
MPAEF / SERFA	Forest Technician Training	Support to SERFA /EAST
MINSUP	Forest Engineer Training	Support to ESSA
MINAGRI / DVA	Agriculture on tanety (conservation and management)	LOVA SOA Fianarantsoa
DVA / SPV	Phytosanitary Protection	PLI Lac Alaotra
DVA / SPV		Pesticide Testing
SIC	Rural Press	Support to SIC
MRSTD / FOFIFA	Soil conservation / Agroforestry Rural areas management	Soil - Tany
	Phytosanitary Protection	PLI Lac Alaotra

UNDP: $3,330,000 (1982-92) to UNESCO to implement biosphere (conservation and integrated development) projects: Mananara Nord; also Andasibe, Ankarafantsika and Bemahara planned. Projects look at: 1) issues concerning creation of protected areas, 2) management plans of protected areas, 3) peripheral zone development, and 4) supporting research to allow for better management and protection of protected areas.

Bassins Versants: '90-'93; $1.56 million; implemented by FAO; watershed management (reforestation through ZODAFARB, agroforestry, soil conservation) for increased rice production.

Lac Itasy: '88 prep study; '90 accord agreement; $3 million, integrated RD (agriculture, livestock, forestry, fishculture, marketing).

Global 2000: '90; part of Africa wide UNDP environmental program; establish network, generate information on different interventions.

Collaboration with Conservation International on Debt-Swap.

Tourism sector: funding training, establishment of hotel school; funding studies (impact of tourism and resulting GDRM policies; and infrastructure needs).

WORLD BANK:

Will support entire cadastral component of EAP with 5,200,000 DTS loan [(1) cadastral, (2) mapping, geographic information system and remote sensing, (3) research on environment both terrestrial and marine, (4) institution building and training]. On-going $15 million GPF project with Cooperation Suisse.

WORLD WIDE FUND FOR NATURE:

Public awareness and conservation education program, $160,000/yr., will double 1990-91. $60,000/yr. to small research projects and student support. Implementing: Madagascar Debt-for-Nature Swap (USAID & WWF/U.S. funded); Amber Mtn., Andohahela & Beza Mahafaly Grants (USAID and WWF funded); NORAD funded southern reserves and Forêts Classées; and KFW funded Andringitra/Pic d'Ivohibe, Marojejy/Anjanaharibe Sud, and Manongarivo/Lokobe.

ANNEX VIII - SCOPES OF WORK FOR LONG TERM TECHNICAL ASSISTANCE AND SELECTED SHORT-TERM PERSONNEL

ANNEX VIII

A. ANGAP Long-Term Technical Assistance

Management Advisor:

1. Establish a schedule and mechanism to assist the Director General (DG) of ANGAP to periodically review and refine the role, purpose and objectives of ANGAP in the implementation of a national policy on biodiversity. Facilitate the collaboration of this self-analysis with the National Office of the Environment (ONE), the Department of Water and Forests (DEF), and the National Association for Environmental Action (ANAE). Assist the DG to establish a work plan and schedule to implement any recommended changes in the role of ANGAP over time, including the possibility of increased coordination and/or possible fund management or management of protected areas.

2. In collaboration with the Natural Resources Advisor, assist the DG of ANGAP to examine short and long-term policy and planning issues in biological diversity and for sustainable management of protected areas. Create and sustain a forum for dialogue of needed policy and administrative changes based on an analysis of the constraints to current land use practices and existing laws and procedures, and the impact of recommended changes. Assure the coordination of this dialogue with the ONE, DEF, other relevant GDRM Ministries, and NGO and local community operators in the environment sector.

3. Introduce innovative management and programming techniques which will allow ANGAP to fulfill its mandate, and to assume added responsibilities over time.

4. Institute information systems to enable donors, NGOs and the Government of the Democratic Republic of Madagascar (GDRM) to keep abreast of each other's activities in protected areas. Create and put into practice procedures to allow a regular exchange of ideas and lessons learned on the effectiveness and impact of various strategies to manage protected areas through conservation and development.

5. In collaboration with the Natural Resources Advisor, and with the help of short-term consultants if needed, undertake a training needs assessment for ANGAP. Coordinate on-the-job and technical training for the professional staff of ANGAP by identifying appropriate courses and activities in Madagascar and third countries, and develop a schedule, in consultation with the Director General of ANGAP, for a relevant training plan.

6. Explore options, identify sources, and institute mechanisms for ANGAP to mobilize additional funds for the provision of recurrent costs, and to finance biodiversity conservation and interactive development activities in protected areas and peripheral zones. Conduct an analysis of recurrent costs and develop recommendations for funding these costs from other than external donors.

7. In coordination with the DG of ANGAP and the long-term Natural

Resource Advisor, identify the need for short-term technical assistance to assist ANGAP to fulfill its mandate, develop scopes of work for, fix the timing of and devise in-country work plans for this assistance.

8. In coordination with the DG of ANGAP and the Long-Term Senior Ecologist, identify equipment and materials requirements to be financed by the SAVEM project, and initiate and carry out the necessary procurement in compliance with the procedures in place under the contract.

9. Participate in a joint GDRM, NGO and multi-donor evaluation of ANGAP after the third year of project implementation to assess its present and future role in the Environmental Action Program, and its ability to take on further coordination responsibilities, including the capability to act as a financier and manager of protected areas.

10. In consultation with the Protected Areas Grants Manager (GM), set up procedures to test the hypothesis that economic development in the peripheral areas will lead to forest and biological diversity protection. Work with the long-term Management Specialist under the GM to make sure that NGO grants in protected areas have a monitoring and evaluation plan to test and measure the impact of strategies for effective protected areas management.

11. Prepare annual work plans and targets for accomplishing the objectives and mandate of ANGAP. Submit semi-annual activity and financial reports to USAID which identify the purpose and outputs of the institutional strengthening element of the SAVEM Project, the progress toward achieving these purposes and outputs, any problems which are being encountered, and the results of any testable hypotheses on the most appropriate strategies for protected areas management. Include in the report an assessment of ANGAP's potential to take on increased coordination and management responsibilities.

12. Through short-term technical assistance as may be required, assist ANGAP to create a functioning organizational structure with financial and administrative procedures in place to collect and administer park fees and revenues, and to set up procedures in long and short-term financial planning. Assist with the establishment of an office, recruitment and selection of a national staff, and the setting up of financial management and accounting systems, and personnel and communication procedures.

13. Establish, evaluate and strengthen procedures to assure effective communication and coordination of activities between ANGAP and other policy and monitoring bodies created under the Environmental Action Plan. Assist in setting up collaborative working relationships with the ONE, ANAE, DEF, and COMODE.

14. Identify and train a Malagasy member of ANGAP's staff to assure the above responsibilities upon completion of his/her contract.

Qualifications:

Minimum of a Masters Degree in Natural Resource Management or related discipline, with a concentration on policies and steps to enhance the relationship between the preservation of biological diversity and economic development. A minor in the study of Anthropology or Rural Sociology would be highly desireable. A minimum 5 years professional working experience in a developing country in a managerial role in the execution of rural development projects is required. The Specialist must have demonstrated experience with the design and analysis of natural resources policies, and the application of methods to promote inter-institutional interaction and communication. Knowledge of, and the ability to apply innovative institutional management and evaluation techniques are required. The specialist must be fluent in French at the FSI level three at a minimum.

Natural Resource Advisor:

1. Establish procedures, schedules, and criteria for ANGAP staff to monitor and evaluate the programs of field operators working in protected areas and their peripheral zones. Train and organize the staff of ANGAP to apply these procedures in consonance with ANGAP's evolving role, including the installation of a computerized tracking system in collaboration with ANGAP's Biodiversity Planning Service.

2. Assist in the establishment of an effective communications network with NGOs active in the field of biodiversity conservation and related development activities. Assist in the identification and planning of seminars and workshops to be sponsored by ANGAP which could be of importance to ANAE, COMODE and the principal international and national NGOs involved in development activities in and around the protected areas.

3. In collaboration with the Chief of Party (COP) of the Grant Manager, participate in the review of NGO proposals for protected area management. From observations of NGO grantee activities in the field during regular visits to various protected areas, bring to the attention of the COP of the GM, any grantee or local project problems which may need resolution.

4. Assess the training plans and programs undertaken by various NGOs for park and reserve staff to make sure that they are consistent with national policies and training needs for protected area management.

5. Assist ANGAP to develop the capacity to conduct Rapid Rural Assessments in collaboration with the GM.

6. Assist in the establishment of procedures for identifying and evaluating various systems used to manage protected areas. Set up a monitoring and information system to make this knowledge and experience available to all operators in protected areas, as well as potential conservation NGOs or field operators wishing to initiate activities in new protected areas. Disseminate information and organize meetings and workshops with current and potential field operators to assist them to

better design conservation/development activities and operations to protect areas of environmental and economic importance.

7. In collaboration with the BPS contractor, organize training for the staff of ANGAP to be able to operate the BPS, and to facilitate its transfer into ANGAP. Monitor biological and socio-economic data collection from protected areas and surrounding buffer zones to assure eventual integration into ANGAP's BPS. Based on regular analysis of this data, promote scientific follow-up of the biodiversity situation in protected areas, and advise the DG of ANGAP on needed policy recommendation for the long-term direction of biodiversity conservation activities.

8. Develop a capacity in ANGAP, through training and field orientations for its staff, to create an awareness among the people living in peripheral areas of the need to better manage protected areas and their surrounding forests and natural resources. Establish public education strategies and approaches to strengthen their understanding of the relationship of their economic well-being to and dependence of people living around protected areas on better management of these areas. Establish an education and communication network to enhance public understanding of issues related to biodiversity conservation and rural development.

9. Establish procedures and capabilities among ANGAP staff to coordinate the implementation of field activities by field operators. As appropriate, organize meetings and seminars with field operators, representatives from Government ministries, and funding agencies. Review and refine, if necessary, established criteria for interventions in the targeted protected areas, and assist ANGAP to apply these criteria in the review of proposed protected area management and development activities.

10. Schedule and organize regular monitoring and site visits, accompanied by ANGAP senior staff, to protected areas and their peripheral communities.

11. Participate in a joint GDRM, NGO and multi-donor evaluation of ANGAP after the third year of project implementation to assess its present and future role in the Environmental Action Program, and its ability to take on further coordination responsibilities, including the capability to act as a financier and manager of protected areas.

12. Identify and train a Malagasy member of the GM's staff to assure the above responsibilities upon conclusion of her/her contract.

Qualifications:

Minimum of a Masters Degree in Environmental Sciences or Natural Resources Management required. Academic training and previous professional work experience must have stressed the application of methodologies for enhanced interaction between people and their environment for the wise management of natural resources. The Senior Ecologist must have demonstrated experience in developing monitoring and evaluation plans and procedures for assessing the impact of conservation

and environmental activities, as well as previous work experience promoting effective communication among and within rural community groups in developing countries. At least 5 years professional experience working in a developing country in natural resources management is required. Also required are demonstrated effective training skills. Combined Asian and African experience would be preferable. Fluency in French at the FSI level 3.5 at a minimum is required.

B. Grant Manager Long-Term Technical Assistance

Chief of Party:

1. Based on visits to various existing and proposed protected areas, and in consultation with USAID, potential NGO collaborators, the Department of Water and Forests (DEF), ANGAP, and the National Office for the Environment (ONE), select up to six priority parks and reserves for NGO and local community group interventions to be financed by USAID under the SAVEM Project. Establish protected area selection and prioritization procedures based on a list of selection criteria consistent with SAVEM Project objectives.

2. Establish procedures for the solicitation of Protected Area Development Grants (PADGs) by national and international NGOs, and small activity Conservation Action Fund grants by local community groups. Present to all potential grantees the purpose and types of grants available, procedures for application, the provisional ceiling amounts, and the criteria for acceptability.

3. Establish procedures and criteria, consistent with the objectives of the SAVEM Project and in consultation with ANGAP, for evaluating grant proposals and selecting NGOs for protected areas management grants. Selection should be based on clear statements by the NGOs as to how a linkage between enhanced economic activities and enhanced protection/management activities will be ensured, and what is technically, socially, and economically feasible for a particular area.

4. In coordination with the Financial Manager, identify the need for short-term technical assistance to be able to review and approve PADGs, and to provide training to field operators of a common need. Develop specific scopes of work for, fix the timing of, and draw-up in-country work plans for this assistance.

5. Identify the planning, management and technical training needs of mid-level and senior staff of NGOs, community-based conservation action groups, and members of related agencies involved in conservation/development in Madagascar. Organize in-country and third-country study tours, training, and workshops tailored to the objectives of the SAVEM Project.

6. Prepare annual work plans and targets for accomplishing the objectives of the GM component of the SAVEM Project. Submit semi-annual activity, and quarterly financial reports to USAID which identify the purpose and outputs of each PADG, the progress toward achieving the purposes and outputs, any problems which are being encountered, and the results of any testable hypotheses on the most appropriate strategies for protected area management.

7. Assure effective coordination and communication between the Grants Manager and ANGAP. Involve ANGAP in all aspects of the selection of priority protected areas, training, development of NGO grant acceptance criteria, and the selection of grantees.

8. In consultation with ANGAP, set up procedures to test the hypothesis that economic development in the peripheral areas will lead to forest and biological diversity protection. Work with the Director General of ANGAP to set up a monitoring and evaluation plan to identify strategies for effective protected area management.

9. Review and assure the coordination among NGO grantees of consistent biological and socio-economic data collection procedures and types of data collected in accordance with the guidelines established by ANGAP.

10. In coordination with the Financial Administrator, identify equipment and materials requirements to be financed under the GM Umbrella grant, and initiate and carry out the necessary procurement.

Qualifications:

Must have had at least 10 years professional experience in designing, managing, and/or evaluating Third-World rural development projects. Must have a minimum of a graduate level degree in Rural Sociology, Anthropology, International Development, or some other relevant behavioral science. Must have demonstrated knowledge and experience dealing with programs to promote conservation/development linkages, and the balance of the relationship between rural populations and their economic needs, and the need to protect their surrounding natural environment. Must have demonstrated community development, communication and training skills. The COP should be at the FSI level 3.0 (or above) in French. Firsthand knowledge of Madagascar and fluency in Malagasy would be highly desirable.

Conservation Action Grants Manager:

1. Establish procedures for the solicitation, review, and awarding of Conservation Action Grant (CAG) proposals by community groups, Government organizations, and individuals. Present to all potential grantees, the purpose and types of grants available, procedures for application, the provisional ceiling amounts, and the criteria for acceptability.

2. Based on consultations with USAID, the Protected Areas Grants Manager Chief of Party, the Department of Water and Forests (DEF), the Director General of ANGAP, and the National Office for the Environment (ONE), establish CAG selection criteria consistent with SAVEM Project objectives.

3. Develop criteria and procedures for the review and analysis of the financial, managerial, and technical capabilities of CAG recipients to carry out their programs funded under the SAVEM Project. Recommend needed training and/or technical assistance for the grantees in order to make sure USAID funds are properly accounted for.

4. Coordinate the awarding of CAG grants to selected recipients, and prepare all necessary documentation to authorize the disbursement of funds. Set up accounting and financial tracking procedures to monitor the use of funds.

5. Review all required activity and financial reports submitted by CAG grantees on the progress of their grants. Prepare quarterly financial and semi-annual activity reports on CAG activities for submission to USAID.

6. Prepare and implement a monitoring and evaluation program of CAG financed activities to allow USAID and ANGAP to assess the impact of the grants program on the end of project status. Advise USAID of any problems with grant administration or progress in completing the grant objectives.

7. Assure the coordination of CAG activities and selection procedures with the National Association for Environmental Action (ANAE). Establish procedures for effective communication and the sharing of lessons learned regarding effective interventions.

8. In coordination with the Protected Areas Grants Manager Chief of Party, identify the need for short-term technical assistance to be able to review and approve CAG proposals. Develop specific scopes of work for this assistance, and schedule the timing and in-country work plans.

Qualifications:

Must have had at least 5 years professional experience in designing, managing, and evaluating rural development projects in developing countries. Must have a minimum of a graduate level degree in Rural Sociology, Anthropology, International Development, or some other relevant behavioral science with a strong emphasis on natural resources

management. Must have demonstrated community development, communication and training skills. The CAG Manager must be at the FSI level three in French. Firsthand knowledge of Madagascar and fluency in Malagasy would be highly desirable.

Financial Manager

1. Organize the renting and equipping of the Grants Manager (GM) administrative office in Antananarivo, establish local bank accounts, and work out the logistics of regular dollar and local currency cash flows with the US-based office of the GM, and local field operators.

2. Design and establish a functioning organizational structure for the GM, complete with financial and administrative procedures in place. Coordinate the recruitment, selection and training of a national staff, and the setting up of management and communication systems.

3. Establish procedures to continually monitor, reassess, and modify, if necessary, both budgets and activities of PADGs and Conservation Action Grants (CAGs). Implement these procedures to assure that implementation is having the desired outputs.

4. Evaluate PADGs and community based CAGs for their financial and economic viability. Establish clear criteria and guidelines, and apply them in the review and acceptance of all NGO grant proposals.

5. Review and make recommendations on the administrative and financial mechanisms set up by NGO grantees for their PADGs. Undertake a thorough review and analysis of each NGO grantee's financial and accounting systems to ensure that funds will be disbursed and accounted for in accordance with sound financial practices.

6. Organize training programs for NGO financial and administrative staff, as needed, to make sure all grantees are using common financial reporting and tracking systems.

7. Train NGO grant managers to set up proper financial record keeping procedures for audit purposes.

8. Identify and train a Malagasy member of the GM's staff to assume the above responsibilities upon completion of his/her contract.

Qualifications:

An MBA, CPA or some equivalent degree is required. At least 5 years professional working experience in a developing country as a financial controller on rural development or natural resources management projects is required. The Specialist should have demonstrated a willingness to apply flexibility in seeking appropriate ways to mobilize the flow of funds to NGO grantees, while at the same time ensuring proper accounting and financial practices. Experience in the design, implementation, and evaluation of rural development or natural resources management projects is necessary. Fluency in speaking French at the FSI level three or greater is required.

C. Project Coordinator:

1.* Organize and staff a Project Coordination Office, including the development of scopes of work for a Malagasy Administrative Assistant and GSO Clerk. Carry out in collaboration with and upon the approval of USAID, the recruitment, selection, and hiring of the local staff. Set up office operations, including communications and management procedures, and assist USAID in completing the procurement of all required office supplies and equipment.

2.* Coordinate the ANGAP and Protected Areas Grant Manager (GM) administrative start-up activities before the technical assistance teams arrive. This will include assisting USAID in ordering of vehicles and office equipment, and arranging for the rental of housing and office space.

3.* Prepare Scopes of Work, and arrange for the contracting, as necessary, prior to the arrival of the long-term technical assistance team, of short-term technical assistance for ANGAP activities. Such activities would include: the setting up of operational policies, procedures, and financial systems; recruitment and training of local staff; coordinating the data collection and analysis by NGOs already involved in conservation/development activities in protected areas; and preparing equipment specifications.

4. Assure effective coordination of all major activities of the project, i.e., ANGAP development, PADGs and CAGs, training, and the development of a Biodiversity Planning Service. Institute procedures and opportunities for communication and exchange of ideas between the implementing agencies of the various components.

5. Attend all multi-donor and Government of Madagascar coordination meetings on the implementation of the Environmental Action Plan (EAP). Ensure that the activities of the SAVEM project are linked to and coordinated with the EAP. In this capacity, the Project Coordinator will represent USAID/Madagascar, and report to the Mission on all relevant discussion and recommendations needing USAID/Madagascar action, or matters having an impact on the SAVEM Project.

6. Assure the coordination and exchange of information and ideas on needed policy and administrative reforms to be promoted under the USAID financed Environmental Non-Project Assistance Program. Develop and strengthen this exchange between SAVEM Project technical advisors, USAID, other donors, and GDRM Ministries dealing with implementation of the Environmental Action Plan. This would include the options and mechanisms to establish endowment funds for paying recurrent costs of the EAP.

7. In coordination with the ANGAP and the GM technical assistance teams, develop a monitoring and evaluation plan which measures progress toward the achievement of the project purpose. Provide recommendations, based on discussions with implementing contractors, grantees, and the Government, on the efficacy of the project, or about needed adjustments as the project evolves.

8. Assure the timely monitoring and reporting on the disposition of all project financed inputs, and the planned achievement of project outputs. The necessary project reporting shall be completed by the Project Coordinator through regular workplan reviews, annual progress reports, and periodic site visits. Included in these reports will be: progress on the timely provision of inputs in the form and amounts planned for; progress toward achieving targeted outputs; the identification of any implementation problems; and the steps being taken to resolve them.

9. Coordinate all third-country and U.S. training which does not fall under the responsibility of the ANGAP and GM technical assistance teams, to include: review and screening of participants; identification of existing programs and visit sites; and pre-departure formalities and backstopping.

10. Schedule and organize planned project evaluations over the life of the project. These would include a first evaluation after 18-24 months of implementation, a second after 36 months, and the third at the end of the project. The Project Coordinator will prepare scopes of work for the evaluations, coordinate the selection of multi-disciplinary evaluation teams consisting of international and national experts, and arrange for the contracting of the teams. The Coordinator will follow-up on evaluation recommendations and initiate any actions needed.

11. Review and make recommendations with respect to work plans submitted by the various participating institutions.

12. Prepare contractor performance reports as necessary at the end of the contract period for review and administrative approval by the USAID Project Officer. Make sure that contractors are providing the required inputs as stipulated in their contracts, and that defined targets are being achieved.

* These are tasks that can be performed by an interim Project Coordinator to start-up key implementation activities. The interim Project Coordinator will be hired as soon as possible after project authorization, and will work until the permanent Project Coordinator can be selected and hired.

Qualifications:

Must have a minimum of a Masters Degree in Business Administration or International Development, with course work related to economics, natural resources and/or rural development. At least 5 years professional experience working in a developing country as manager of a rural development program with responsibilities for program and financial planning, project development, budget preparation and analysis, and commodity procurement. At least 5 years professional experience in a developing country training and organizing host country and international NGOs to develop activities in the environment/natural resources sector, and facilitating the coordination of these activities with host government ministries and international donor organizations. Some

knowledge of AID project management, procurement, and contracting procedures is necessary. Must have demonstrated experience in project monitoring and evaluation. Must be fluent in French at the FSI level three or greater. Some knowledge of Malagasy and an understanding of Madagascar culture and private sector, public sector and university organizations and individuals involved in the environmental sector would be desireable.

D. Local Hire Training Coordinator

1. The local-hire training coordinator will be responsible for the planning and management of the SAVEM Project's local NGO training program. S/he will work with the staff of the PAGM in the following areas:

2. Program Planning: identify NGO training needs and local support or training institutions as the basis for preparing a NGO training plan.

- accompany PAGM staff on site reconnaissance visits to interview administrators, planners and "animateurs" of local NGOs concerning experience with planning and managing community development projects, problems faced in overall operations and special projects, types of training needed by members and clients

- assist PAGM in interviews of park management staff to determine training needs

- survey national organizations (eg: COMODE) and training entities to determine current or future capabilities for managing and/or delivering training

- conduct other training needs assessments in the NGO community as needed

- develop a provisional plan for NGO training, targeting the type, number and timing of training events over the project; sources of trainers and training support; material and personnel requirements.

3. Training Design: develop NGO planning/design and management workshops; assist technical specialists in design of technical/TOT workshops. Products/tasks include:

- a one-day orientation program to familiarize NGOs with PADG criteria and stimulate discussion of local development priorities/project ideas

- training design (course outline, session plans, manuals, materials, administration and evaluation plans) for a project planning/design workshop (5-10 days, possibly residential) that will enable members of NGOs to choose a project idea, assess its technical, economic, environmental and social feasibility, present findings in a simple project plan format, and develop a plan for start-up and implementation

- project management modules for use in workshops and on-site training, covering organization, financial management (simple

accounting), monitoring and evaluation, that will enable members of NGOs to implement conservation/community development projects

- assistance to specialists in involved in technical workshops in developing presentations and training materials.

4. Training delivery: serve as lead trainer for project planning/design and management workshops; provide TOT for facilitators and trainers.

- take part in orientation sessions as needed

- serve as lead trainer for at least the first cycle of courses (delivery of core sessions)

- recruit and orient/train as necessary special presentors, co-trainers and special trainers for technical workshops

5. Training management: responsible for logistics, recruitment, planning training events, budget and contracting arrangements, monitoring and evaluation.

- arrange rental of facilities, recruitment of support staff, transport for training events

- notify participants, develop travel plans/reimbursement procedures, track participants

- develop budget for training events, contracting and payment procedures, keep training funds and books

- develop trainee and trainer evaluation system

- assess local training and support institutions, and make recommendations to COP on actions and timetable for transferring project activities.

Qualifications

At least five years' experience in training or education, preferably in the areas of community development/natural resources:

training/teaching (preferably adult non-formal education), including materials and curriculum development

administration/training management

project planning and management (preferably with an NGO)

community development (related to natural resources if possible).

fluent French at the FS three level

E. Selected Short-Term Personnel

NPA Training Needs Assessment Specialist

1. The Contractor will review present and planned curricula for training natural resources management professionals at the secondary levels and above. Considering job needs targeted in the EAP, long-term GDRM plans and resources for assuring staffed positions, and effectiveness of the current curricula in preparing graduates for integrated conservation-development work, the Contractor will recommend to USAID/Madagascar actions to be taken under its NPA program to support development of revised or new degree programs.

1. Review of NPA concept paper (8/90) and other planning documents to determine the relationship between planned policy reforms and needed educational reforms. This should include review of host-country policies on long-term staffing (especially DEF) and employment incentives.

2. Field interviews with graduates of ESSA ("ingenieur" level working in DEF and protected areas with NGOs) to determine gaps between formal training and job needs, and assess needs for mid-career or higher- degree study.

3. Assessment of curricula (review of syllabi, observation of courses, faculty and student interviews) at ESSA, EESS and other faculties of the University of Antananarivo with course offerings related to integrated natural resources management, to determine adequacy of coverage, integration of conservation and development, emphasis on fieldwork in protected areas. Subject areas should include: sylviculture, range management, agroforestry/soil conservation, park management and planning, ecological anthropology, rural sociology, natural resources economics, primate ecology and management, botany, zoology, agronomy, animal husbandry, veterinary science, adult/non-formal education, community development. Studies should include:

a. A status review with ESSA, EESS and other University administrators, on the status of curriculum-reform activities, with special focus on: (i) decisions to create ISTE and/or EASTA II, to train mid-level (baccalaureat + two years) operations managers and teachers, which might be attached to ESSA (decisions to be made during a 10/90 World Bank mission, and (ii) Conservation International's proposal to create a U.S. Master's-level program, and other curriculum-reform propsitions.

b. An in-depth review of ESSA's DEA program, with special focus on the subject areas listed above. This should include an assessment of practica and fieldwork (in yearly "stages") as research and pre-professional training exercises; review of "memoire" (thesis) topics over past five years to assess relevance of research to interactive park management; faculty qualifications review and training needs assessment; asessment of requalification track added to upgrade "metrise"-level "ingenieurs" to DEA-level (as the

basis for developing a mid-career training program).

c. Assessment of the experimental "doctorat de troisieme cycle" in forestry ecology, to determine degree of conservation-development integration (including interviews with Swiss advisors working on curriculum development).

d. Assessment of the need/feasiblity for creating a new DEA track, ESSA graduate track or inter-faculty degree program. This should inlude projections of staffing needs, faculty training needs, level of effort for program and curriculum development, additional infrastructure needs. The study should assess impact of creating ISTE and/or EASTA II on ESSA resource availability, and the institutional complexity of creating inter-faculty programs (changes in statutes, resource-sharing arrangements, etc.). For USAID consideration, the study should address:

- needs for long-term, U.S. degree training for faculty (number, subjects, target institutions, timing, impact of absence on existing program and strategies for compensation);

- number, kind and duration of U.S. visiting professorships to enable curriculum development, teacher training, fill-in teaching, research supervision;

- use of A.I.D. cooperative agreements and other agreements with U.S. universities in program development

- possibility of investing in support to ISTE or EASTA II instead of/in addition to higher-degree programs (in terms of costs, need for filling jobs at mid- vs. upper-level).

(NB: if possible, the Contractor should discuss the feasibility of creating new degree programs with Yale and University of Wisconsin faculty members who are familiar with ESSA and/or the process of setting up programs).

3. Assessment of the regional university system (areas of study,curricula), with special attention to subjects not offered currently that could be decentralized from ESSA and/or EESS.

5. Review of EASTA ("lycee agricole") curricula with Swiss TA team to determine the need for biodiversity and agroforestry modules (and interest in assistance for curriculum development).

Qualifications

Involvement in higher-education integrated natural resources management programs, preferably with experience in setting up new degree programs

Institutional analysis/training needs assessment experience

Fluent French at the FS three level.

Socio-Economic Data Collection Specialist

1. The expatriate senior social scientist will be responsible for the design, delivery and supervision of a month-long training program that will enable participants to collect socio-economic data needed for monitoring, evaluation and impact assessment. Tasks will include:

- recruitment and necessary training of Malagasy counterparts (two social scientists)
- development of a life-of-project training plan that targets materials development, workshop design, delivery (by year, location, # participants)
- guidance to counterparts on development of participant recruitment criteria, administrative procedures, tracking systems
- coordination and lead design effort in course and materials development (including production of field manual)
- providing needed training-of-trainers (TOT) to Malagasy staff, and serving as lead trainer at least during the first cycle of course delivery
- development and monitoring of an evaluation plan for assessing training and post-training performance
- participation in revision of course and materials based on first- and second-cycle experience.

Qualifications

The candidate should have as many of the following qualifications as possible:

1) good to excellent knowledge of French and English.

2) research experience in Madagascar.

3) development experience, preferably related to baseline data collection analysis, monitoring and evaluation activities.

4) experience planning and conducting large-scale, comparative multi-site research project.

5) teaching experience at the University level, as well as ability to adapt material for audiences at lower education levels.

6) familiarity with educational materials development.

ANNEX IX - REQUEST FOR HOST COUNTRY CONTRIBUTION WAIVER

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

ACTION MEMORANDUM FOR THE ACTING ASSISTANT ADMINISTRATOR FOR AFRICA

From: AFR/PD, Timothy J. Bork

Subject: Madagascar Sustainable Approaches to Viable Environmental Management (SAVEM) Project (687-0110) - Waiver of the Full 25 Percent Host Country Contribution Requirement

Problem: Your approval is needed to waive the requirement that the Government of the Democratic Republic of Madagascar (GDRM) contribute at least 25 percent of project costs as specified in Section 110 of the Foreign Assistance Act of 1961, as amended.

Cooperating Entity:	Government of the Democratic Republic of Madagascar (GDRM)
Project Name:	Sustainable Approaches to Viable Environmental Management Project (SAVEM)
Project Number:	687-0110
Life of Project Funding:	$26,600,000
Source of Funding:	Development Fund for Africa

Discussion: Section 110 of the Foreign Assistance Act of 1961, as amended (FAA), provides that: "No assistance shall be furnished by the United States Government to a country under Section 103 through 106 of this Act until the country provides assurances to the President, and the President is satisfied, that such country will provide at least 25 percentum of the costs of the entire program, project, or activity with respect to which such assistance is to be furnished, except that such costs borne by such country may be provided on an 'in-kind' basis."

FAA Section 124(d) authorizes a waiver, on a case-by-case basis, of the requirements of FAA Section 110 for projects in relatively least developed countries (RLDCs). Handbook 3, Appendix 2G, section E2b states that this includes countries on the Development Assistance Committee (DAC) list of low income countries and Madagascar is on this list.

Appendix 2G also states that the relevant considerations which should be taken into account in determining when a waiver of FAA Section 110 is appropriate are financial constraints, country commitment and the nature of the project. These constraints are addressed below.

Financial Constraints: As defined by the United Nations, Madagascar is one of the "least developed countries" in the world. Least developed countries are defined as those countries with per capita income in 1987 of less than $700. Madagascar's per capita GNP in 1987 was $200. According to the World Bank Development Report 1990, Madagascar's per capita GNP for 1988 declined to $190 and Madagascar is listed as the twelfth poorest country in the world. In addition, Madagascar is on the Development Assistance Committee (DAC) list of low income countries.

Another reason for giving Madagascar special consideration is that the Malagasy economy is undergoing structural adjustment, including strict limits on government expenditures. The United States supports their efforts and wants them to continue. The GDRM has continuously followed the International Monetary Fund/World Bank (IMF/IBRD) guidelines of a Structural Adjustment Program since 1983. IBRD countries following a structural adjustment program are often negatively impacted in the short term. As demonstrated by the the comparison of the GNPs for 1987 and 1988, Madagascar has been so affected. In order to support continued adherence to the IMF/IBRD Agreement, a lesser contribution from the GDRM should be accepted.

Country Commitment: The GDRM has demonstrated strong support for the SAVEM project and its objectives by its acceptance of and contribution to the Environmental Action Plan (EAP). SAVEM is one component of this plan. The EAP was collaboratively designed by the GDRM, the World Bank and participating donors. This project supports biodiversity, which is one of six components addressed in the EAP. In the credit agreement for the EAP, the GDRM has agreed to furnish 20 percent or $17,248,000 of the total $85,534,000 program costs. Of this GDRM contribution, $768,000 will be allocated to funding the local operational expenses of the National Association for Management of Protected Areas (ANGAP). Establishment of ANGAP is one of the principal objectives of SAVEM. This amount, which will completely fund ANGAP's local operating costs between FY 1992 and FY 1996, is equal to 2.7 percent of total project costs.

Given the extensive GDRM contribution to the EAP, USAID/Madagascar believes that to require an additional contribution of over $7,000,000 to SAVEM to comply with the 25 percent requirement would jeopardize implementation of the EAP.

The ECPR guidance cable, STATE 148897, stated that AID/W would be willing to support a 25 percent waiver if fully justified in the Project Paper. The evidence presented above supports and justifies the waiver request.

Madagascar is a relatively least developed country in the midst of a long-running Structural Adjustment Program. It has demonstrated strong support for the objectives of SAVEM through its approval of and planned contribution to the Environmental Action Program. A GDRM contribution to SAVEM is not critical to project success; indeed, such a requirement would likely handicap the prospects for timely and successful implementation of this critical activity because continuing budget stringencies would make a 25 percent contribution very difficult. Accordingly, the SAVEM project fits the criteria outlined in Appendix 2G for waiver of the full 25 percent host country contribution requirement.

Nature of the Project: The primary purpose of the project is to establish systems, institutions, methods, and behaviors for the management on a sustainable basis of protected areas of Madagascar and their peripheral zones. Since technical assistance and grants to non-governmental organizations will be the main inputs, the success of the project is not dependent on a contribution by the GDRM.

As noted above, the GDRM will contribute the local currency equivalent of $768,000, or 2.7 percent, of the total cost of the project. The GDRM will make this contribution in the form of payments for certain local expenses of ANGAP and waiver of ANGAP's normal tax burden. In addition, the ECPR recommended that the Mission revisit the issue of the host country contribution to determine the full extent of in-kind contributions to the project, e.g., training, transportation, contributions to ANGAP and from ANGAP operations.

In addition, it should be noted that the host country contribution will actually be higher than the amount contributed by the GDRM inasmuch as the Mission intends to seek a 25 percent contribution from each of the grantees under the grants component of the project. Though the Mission will seek to maximize contributions from grantees, the exact amount of the contribution cannot be quantified at this time since proposals from potential grantees have not yet been received.

Recommendation: That you waive the FAA Section 110 requirement that Madagascar contribute 25 percent or more of the project

costs for the Sustainable Approaches to Viable Environmental Management Project on the condition that it make the contributions described above.

Approved: Walter Bollen

Disapproved: _____

Date: 9/17/90

Clearances:

AFR/PD/EAP:DMackell		Date 9-11-90
AFR/EA:SPulaski		Date 9-11-90
PPC/PB:RMaushammer		Date 9-11-90
GC/AFR:MAKleinjan	MAK	Date 9-11-90
DAA/AFR:ELSaiers		Date 9/14/90
AFR/DP:RDwivedy/SGrossman (info)		Date

Drafted: USAID/Tana (rev AFR/PD/EAP:SMeyer, 9/05)(0309J)

ANNEX X - DETAILED BUDGET ESTIMATES

ANNEX I: Detailed Budget Estimates and Expenditure Projections. August 12, 1990

TABLE I: A.I.D. CONTRIBUTION

Description:	Unit Price	Unit	FY 91 (12 Mo)	FY 92 (12 Mo)	FY 93 (12 Mo)	FY 94 (12 Mo)	FY 95 (12 Mo)	FY 96 (6 mo)	LOP Total
I. PROJECT COORDINATION AND STARTUP									
A. Technical Assistance									
PSC Project Coordinator	(1)		100,000	185,000	170,000	170,000	170,000	85,000	880,000
Short-Term Startup TA	15,600	Mo	124,800						124,800
Local-Hire PSC Proj. Coord.	15,600	Mo	93,600						93,600
Certification of Fin. Cap.	50,000		50,000						50,000
Initial Training Assessment	15,600	Mo	46,800						46,800
Sub-Total. Tech. Asst.			415,200	185,000	170,000	170,000	170,000	85,000	1,195,200
B. Local Staff									
Procurement Assistant	3,400	Yr	3,400						3,400
Administrative Assistant	3,400	Yr		3,400	3,400	3,400	3,400	1,700	15,300
Secretary-Typist	2,500	Yr	2,500	2,500	2,500	2,500	2,500	1,250	13,750
Sub-Total. Local Staff			5,900	5,900	5,900	5,900	5,900	2,950	32,450
C. Commodities (Table IV)			23,530						23,530
D. Other Local Costs:									
Communications	4,000	Yr	4,000	4,000	4,000	4,000	4,000	2,000	22,000
Office Supplies	6,000	Yr	6,000	6,000	6,000	6,000	6,000	3,000	33,000
Local Transport	1,000	Yr	1,000	1,000	1,000	1,000	1,000	500	5,500
Miscellaneous	500	Yr	500	500	500	500	500	250	2,750
Guard Service for Office	5,000	Yr	5,000	5,000	5,000	5,000	5,000	2,500	27,500
Office Rental	1,800	Mo	21,600	21,600	21,600	21,600	21,600	10,800	118,800
Sub-Total. Other Local Costs			38,100	38,100	38,100	38,100	38,100	19,050	209,550
TOTAL. COORD. & STARTUP			482,730	229,000	214,000	214,000	214,000	107,000	1,460,730
II. PROJECT DEVELOPMENT									
A. Long-Term Tech. Asst.									
Management Advisor (GS-14)	17,500	Mo.	105,000	210,000	210,000	105,000			630,000
Nat. Resource Adv. (GS-13)	16,500	Mo.	99,000	198,000	198,000	99,000			594,000
Sub-Total. Long-Term TA			204,000	408,000	408,000	204,000			1,224,000
B. Short-Term Tech. Asst.	15,600	Mo.	78,000	109,200	109,200	93,600	93,600	31,200	514,800
C. Commodities (Table IV)			216,255			28,600			244,855
D. Local Admin. Costs									
Executive Director	20,000	Yr	20,000	10,000					30,000
Senior Social Scientist	10,000	Yr	10,000	5,000					15,000
Senior Biologist	10,000	Yr	10,000	5,000					15,000
Junior Scientists (2)	4,000	Yr	4,000	2,000					6,000
Project Evaluators (3)	3,000	Yr	3,000	1,500					4,500
Project Librarian	6,000	Yr	6,000	3,000					9,000
Photo Lab Photographer	4,000	Yr	4,000	2,000					6,000
Administration/Finance	6,000	Yr	6,000	3,000					9,000
Administrative Assistant	3,000	Yr	3,000	1,500					4,500
Computer Data Entry	3,000	Yr	3,000	1,500					4,500
Secretary Typists (2)	5,000	Yr	5,000	2,500					7,500
Driver Messenger	2,500	Yr	2,500	1,250					3,750
Janitor	1,100	Yr	1,100	550					1,650
Sub-Total. Loc. Admin. Costs			77,600	38,800	0	0	0	0	116,400

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TABLE I: A.I.D. CONTRIBUTION (CONT.)

Description:	Unit Price	Unit	FY 91 (12 Mo)	FY 92 (12 Mo)	FY 93 (12 Mo)	FY 94 (12 Mo)	FY 95 (12 Mo)	FY 96 (6 Mo)	LOP Total
II. ANGAP (cont.)									
E. Other Local Costs									
Local Travel and Perdiem (2)	50	Day	48,000	24,000					72,000
Office Rental/Rehabilitation	48,000	Yr	48,000	24,000					72,000
Utilities	4,800	Yr	4,800	2,400					7,200
Communications	25,000	Yr	25,000	12,500					37,500
Vehicle Maintenance	5,000	Yr	5,000	2,500					7,500
Office Supplies	30,000	Yr	30,000	15,000					45,000
Office Guard Service	5,000	Yr	5,000	2,500					7,500
Miscellaneous	1,000	Yr	1,000	500					1,500
Sub-Total, Other Local Costs:			166,800	83,400	0	0	0	0	250,200
F. ANGAP Training Costs									
U.S. Study (3)	2,000	Wk		48,000	48,000	48,000			144,000
In-Country Training	1,755	Crs	1,755	3,510	3,510	3,510	3,510	1,755	17,550
In-Country Tuition (4)	85	t/s	1,700	3,400	3,400	3,400	3,400	1,700	17,000
3rd Country Study Tours (5)	9,140	ea	.	45,700	45,700	45,700	45,700		182,800
Sub-Total, ANGAP Training:			3,455	100,610	100,610	100,610	52,610	3,455	361,350
Sub-Total, All ANGAP Costs			746,110	740,010	617,810	426,810	146,210	34,655	2,711,605
Overhead @ 25% of All Costs			186,528	185,003	154,453	106,703	36,553	8,664	677,901
TOTAL COSTS, ANGAP			932,638	925,013	772,263	533,513	182,763	43,319	3,389,506

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TABLE I: A.I.D. CONTRIBUTION (CONT.)

Description:	FY 91 (12 Mo)	FY 92 (12 Mo)	FY 93 (12 Mo)	FY 94 (12 Mo)	FY 95 (12 Mo)	FY 96 (6 mo)	LOP Total
III. BIODIVERSITY PLANNING SERVICE							
A. Remote Sensing and Cartographic Unit (RSU)							
1. Personnel Costs							
Malagasy RSU Supervisor	2,000	4,000	4,000	4,000	4,000	4,000	22,000
Malagasy Digitizing Personnel	1,500	3,000	3,000	3,000	3,000	3,000	16,500
Malagasy Field Assistant	0	0	3,000	3,000	3,000	3,000	12,000
Expat RSU Advisor (ST TA)	17,063	17,063	0	0	0		34,125
2. Equipment Costs							
Cartography/Photogrammetry	1,000	1,000	1,000	1,000	1,000	1,000	6,000
Digital Image Processing	20,000	20,000	20,000	20,000	20,000	20,000	120,000
Photo Interpretation Facility	0	44,200	4,000	4,000	4,000	4,000	60,200
Ground Truthing Equipment	0	0	6,950	1,000	1,000	1,000	9,950
Subtotal, RSU:	41,563	99,263	41,950	36,000	36,000	36,000	290,775
B. Field Survey Unit (FSU)							
1. Personnel Costs							
Malagasy Flora Survey Superv. (2)	0	8,000	8,000	8,000	8,000	8,000	40,000
Malagasy Flora Survey Asst. (2)	0	6,000	6,000	6,000	6,000	6,000	30,000
Malagasy Fauna Survey Superv. (3)	0	12,000	12,000	12,000	12,000	12,000	60,000
Malagasy Fauna Survey Asst. (3)	0	9,000	9,000	9,000	9,000	9,000	45,000
Malagasy Threat Survey Superv.(1)	0	0	4,000	4,000	4,000	4,000	16,000
Malagasy Threat Survey Asst. (1)	0	0	3,000	3,000	3,000	3,000	12,000
Expat Flora Survey Advisor (ST TA)	0	34,125	34,125	0	0	0	68,250
Expat Mammal Survey Advisor (ST TA)	0	34,125	0	0	0	0	34,125
Expat Reptile Survey Advisor (ST TA)	0	34,125	0	0	0	0	34,125
Expat Bird Survey Advisor (ST TA)	0	34,125	0	0	0	0	34,125
Expat Threat Survey Advisor (ST TA)	0	0	34,125	34,125	0	0	68,250
2. Equipment Costs							
Survey Equipment/Maintenance	0	142,300	75,325	75,325	23,400	23,400	339,750
4-wheel drive vehicle	0	22,000	0	0	0	0	22,000
Plant Identification	0	5,920	5,920	0	0	0	11,840
Subtotal, FSU:	0	341,720	191,495	151,450	65,400	65,400	815,465

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TABLE I: A.I.D. CONTRIBUTION (CONT.)

Description:	FY 91 (12 Mo)	FY 92 (12 Mo)	FY 93 (12 Mo)	FY 94 (12 Mo)	FY 95 (12 Mo)	FY 96 (6 mo)	LOP Total
III. BIODIVERSITY PLANNING SERVICE (CONT))							
C. Socio-Economic Impact Monitoring (SIM)							
1. Personnel Costs							
Malagasy Senior Social Scientist	3,000	6,000	6,000	6,000	6,000	6,000	33,000
Malagasy Junior Social Scientist (two)	3,500	7,000	7,000	7,000	7,000	7,000	38,500
Malagasy Social Science Adv. (ST TA)	8,531	17,063	0	0	0	17,063	42,256
Expat Social Science Advisor (ST TA)	17,063	34,125	0	0	0	34,125	85,313
Enumerators (Temporary Hire)	13,500	27,000	18,000	18,000	18,000	18,000	112,500
2. Equipment Costs							
Hardware/Software	10,000	0	0	0	0	0	10,000
Supplies	2,000	4,000	2,000	2,000	2,000	2,000	14,000
Field Costs/Interviewing	6,000	12,000	6,000	6,000	6,000	6,000	42,000
Mid-term Research	2,500	5,000	5,000	5,000	5,000	5,000	27,500
In-country Travel	1,500	3,000	3,000	3,000	3,000	3,000	16,500
Subtotal, SIM:	67,594	115,189	47,000	47,000	47,000	98,189	421,969
D. Biodiversity Planning Unit (BPU)							
1. Personnel Costs							
Malagasy Database Supervisor	2,000	4,000	4,000	4,000	4,000	4,000	22,000
Expat Database Advisor (ST TA)	17,063	34,125	17,063	0	0	0	68,250
2. Equipment Costs							
Hardware/Software	32,900	11,450	11,450	11,450	11,450	11,450	90,150
Subtotal, BPU:	51,963	49,575	32,513	15,450	15,450	15,450	180,400
E. Biodiversity Planning Service Front Office (BPSFO)							
1. Personnel Costs							
Malagasy BPS Director	3,000	6,000	6,000	6,000	6,000	6,000	33,000
Malagasy Secretary	1,750	3,500	3,500	3,500	3,500	3,500	19,250
Malagasy Clerk	1,500	3,000	3,000	3,000	3,000	3,000	16,500
Expat BPS Advisor (LT TA)	34,125	68,250	34,125	0	0	0	136,500
2. Operating Expenses							
Office Equipment/Maintenance	20,000	6,000	6,000	6,000	6,000	6,000	50,000
Office Supplies	15,000	30,000	30,000	30,000	30,000	30,000	165,000
Communications	12,500	25,000	25,000	25,000	25,000	25,000	137,500
Vehicle	16,000	0	0	0	0	0	12,000
Computer Hardware/Software	20,000	0	0	0	0	0	20,000
Office Furnishings	30,000	0	0	0	0	0	30,000
Vehicle Maintenance/Fuel	3,100	6,200	6,200	6,200	6,200	6,200	34,100
Subtotal, BPSFO:	159,975	147,950	113,825	79,700	79,700	79,700	654,850
TOTAL COSTS, BIODIVERSITY PLANNING SERVICE (BPS):	320,094	742,195	426,783	329,600	243,550	294,739	3,388,459

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ANNEX X: Detailed Budget Estimates and Expenditure Projections.

TABLE I: A.I.D. CONTRIBUTION (CONT.)

Description:	Unit Price	Unit	FY 91 (12 Mo)	FY 92 (12 Mo)	FY 93 (12 Mo)	FY 94 (12 Mo)	FY 95 (12 Mo)	FY 96 (6 mo)	LOP Total
IV. GRANT MANAGER									
A. Long-Term Tech. Asst.									
Chief of Party @ GS-15	19,000	Mo	114,000	228,000	228,000	228,000	228,000	114,000	1,140,00
CAB Manager @ GS-13	15,500	Mo	93,000	186,000	186,000	93,000			
Admin/Finance Spec. @ GS-12	15,500	Mo	93,000	186,000	186,000	93,000			558,00
Sub-Total, Long-Term TA			300,000	600,000	600,000	414,000	228,000	114,000	2,256,00
B. Short-Term Tech. Asst.	15,600	Mo.	62,400	109,200	109,200	93,600	46,800		421,20
C. Commodities (Table V)			89,635						89,63
D. Local Salaries									
Assistant Grants Manager	13,000	Yr	6,500	13,000	13,000	13,000	13,000	6,500	65,0
Training Coordinator	8,000	Yr	4,000	8,000	8,000	8,000	8,000	4,000	40,0
Bookkeeper	2,800	Yr	1,400	2,800	2,800	2,800	2,800	1,400	14,0
Administrative Assistant	2,800	Yr	1,400	2,800	2,800	2,800	2,800	1,400	14,0
Secretary/Typist	2,500	Yr	1,250	2,500	2,500	2,500	2,500	1,250	12,5
Driver	1,100	Yr	550	1,100	1,100	1,100	1,100	550	5,5
Sub-Total, Local Salaries			15,100	30,200	30,200	30,200	30,200	15,100	151,0
E. Other Local Costs									
Office Rental	24,000	Yr	12,000	24,000	24,000	24,000	24,000	12,000	120,0
Utilities	2,400	Yr	1,200	2,400	2,400	2,400	2,400	1,200	12,0
Communications	10,000	Yr	5,000	10,000	10,000	10,000	10,000	5,000	50,0
Vehicle Maintenance	5,000	Yr	2,500	5,000	5,000	5,000	5,000	2,500	25,0
Office Supplies	15,000	Yr	7,500	15,000	15,000	15,000	15,000	7,500	75,0
Guard Service for Office	5,000	Yr	2,500	5,000	5,000	5,000	5,000	2,500	25,0
Miscellaneous	500	Yr	250	500	500	500	500	250	2,5
Sub-Total, Other Local Costs			30,950	61,900	61,900	61,900	61,900	30,950	309,5
F. Grant Manager Training									
Ind Country Study Tours (5)	9,140	ea		36,560	36,560	18,280			91,4
US Ind Country Seminars (6)	9,240	ea	9,240	18,480	18,480	18,480	18,480	9,240	92,4
NGO Orientation Meetings	500	ea	3,000	6,000	3,000				12,0
NGO Planning Workshops	7,000	ea		14,000	14,000	14,000			42,0
NGO Management Workshops	4,800	ea		4,800	4,800	4,800	4,800		19,2
Technical Trg. Workshops	14,000	ea		28,000	42,000	42,000	42,000	14,000	168,0
SSSA Grants	1,000	ea			5,000	5,000	5,000		15,0
Sub-Total, GM Training:			12,240	107,840	123,840	102,560	70,280	23,240	440,0
Sub-Total, Grant Mgr. Costs:			510,325	909,140	925,140	702,260	427,180	182,290	3,657,37
Overhead @ 25% of All Costs			127,581	227,285	231,285	175,565	106,795	45,573	914,3
TOTAL, GRANT MANAGER			637,906	1,136,425	1,156,425	877,825	534,475	227,863	4,571,7

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TABLE I: A.I.D. CONTRIBUTION (CONT.)

Description:	Unit Price	Unit	FY 91 (12 Mo)	FY 92 (12 Mo)	FY 93 (12 Mo)	FY 94 (12 Mo)	FY 95 (12 Mo)	FY 96 (6 mo)	LOP Total
V. PROTECTED AREA DEVELOPMENT GRANTS (PADG):									
A. Grants for Rapid Rural Appraisal and Hypothesis Development:	100,000	Per		300,000					300,000
B. Grants for Proposal Implementation:									
1. First New Area	500,000	Yr			500,000	500,000	500,000	250,000	1,750,000
2. Second New Area	500,000	Yr			500,000	500,000	500,000	250,000	1,750,000
3. Third New Area	500,000	Yr			500,000	500,000	500,000	250,000	1,750,000
4. First "Old" Area	Variable		200,000	400,000	300,000	300,000	200,000	100,000	1,500,000
5. Second "Old" Area	Variable				400,000	400,000	350,000	300,000	1,450,000
6. Third "Old" Area	Variable					500,000	500,000	500,000	1,500,000
Sub-Total, Implementation			200,000	400,000	2,200,000	2,700,000	2,550,000	1,650,000	9,700,000
TOTAL PADG'S:			200,000	700,000	2,200,000	2,700,000	2,550,000	1,650,000	10,000,000
VI. CONSERVATION ACTION GRANTS (CAG'S):	400,000	Yr	200,000	400,000	400,000	400,000	400,000	200,000	2,000,000
VII. EVALUATION AND AUDIT									
A. Mid-Term Evaluation	240,000	Per				240,000			240,000
B. Final Evaluation	120,000	Per						120,000	120,000
C. Non-Federal Audit	100,000	Per			100,000				100,000
TOTAL, OTHER COSTS:			0	0	100,000	240,000	0	120,000	460,000
TOTAL PROJECT COSTS:			2,773,368	4,134,133	5,269,470	5,294,938	4,136,789	2,644,169	24,252,864
Contingencies:			145,488	206,707	263,474	264,747	206,839	132,208	1,219,457
Inflation (5%):			0	217,042	276,647	277,984	217,181	138,819	1,127,674
GRAND TOTAL, ALL COSTS:			2,919,856	4,557,881	5,809,591	5,837,669	4,560,808	2,915,196	26,599,[illegible]

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ANNEX I: Detailed Budget Estimates and Expenditure Projections.

TABLE II: A.I.D. CONTRIBUTION BY TYPE OF INPUT

Type of Input:	FY 91 (12 Mo)	FY 92 (12 Mo)	FY 93 (12 Mo)	FY 94 (12 Mo)	FY 95 (12 Mo)	FY 96 (6 mo)	LOP Total
I. Technical Assistance:	1,459,021	2,113,750	1,901,575	1,291,593	684,248	318,811	7,768,998
II. Commodities:	461,320	240,950	116,725	141,375	60,850	60,850	1,084,070
III. Training:	15,695	208,450	224,450	203,170	122,890	26,695	801,350
IV. Grants:	400,000	1,100,000	2,600,000	3,100,000	2,950,000	1,850,000	12,000,000
V. Local Costs	437,331	470,983	324,720	318,800	318,800	267,313	2,138,446
VI. Evaluation and Audit	0	0	100,000	240,000	0	120,000	460,000
TOTAL PROJECT COSTS:	2,773,368	4,134,133	5,269,470	5,294,938	4,136,788	2,644,169	24,252,864
Contingencies	145,488	206,707	263,474	264,747	206,839	132,208	1,219,463
Inflation (5%):	0	217,042	276,647	277,994	217,181	138,819	1,127,674
GRAND TOTAL, ALL COSTS:	2,918,856	4,557,881	5,809,591	5,837,669	4,560,808	2,915,196	26,600,000

TABLE III: A.I.D. CONTRIBUTION BY PROJECT COMPONENT

Component:	FY 91 (12 Mo)	FY 92 (12 Mo)	FY 93 (12 Mo)	FY 94 (12 Mo)	FY 95 (12 Mo)	FY 96 (6 mo)	LOP Total
I. Project Coordination and Startup	483,720	339,000	214,000	214,000	214,000	107,000	1,460,720
II. ANGWF Development	932,638	925,013	772,263	533,513	182,763	43,319	3,389,506
III. Biodiversity Planning Service	320,094	743,695	426,763	329,600	243,550	294,738	2,358,455
IV. Grant Manager	637,906	1,136,425	1,156,425	877,625	546,475	226,113	4,584,159
.. Protected Area Development Grants	200,000	700,000	2,200,000	2,700,000	2,550,000	1,650,000	10,000,000
... Conservation Action Grants	200,000	400,000	400,000	400,000	400,000	200,000	2,000,000
VII. Evaluation and Audit	0	0	100,000	240,000	0	120,000	460,000
TOTAL, ALL COMPONENTS:	2,773,368	4,134,133	5,269,470	5,294,938	4,136,788	2,644,169	24,252,864
Contingencies:	145,488	206,707	263,474	264,747	206,839	132,208	1,219,463
Inflation (5%):	0	217,042	276,647	277,994	217,181	138,819	1,127,674
GRAND TOTAL, ALL COSTS:	2,918,856	4,557,881	5,809,591	5,837,669	4,560,808	2,915,196	26,600,000

008,016,024,032,040,048,056,064,072.

TABLE IV: BUDGET NOTES

(1) Assumes yearly cost of $200,000 during first year in-country and $170,000 for all succeeding years. Figures provided by USAID/Controller.
(2) Assumes two days travel per month by senior staff, 5 days per month by junior staff, and 10 days per by Monitoring and Evaluation personnel.
(3) At $ 4,500 per plane ticket, $140 for visa and travel expenses, $120/day per diem, $200 for books and materials, and $100 for travel within U.S. Average length of stay six weeks.
(4) $65/term/student.
(5) Six-week African study tour assuming $2500 for plane ticket, $140 for visa and travel expenses, $200 for books and materials, $90/day per diem, and $2250 for internal African travel (air and ground).
(6) Based on USDA/University of Michigan Forest Management Seminar ($4600) + $4640 overseas travel and expenses.

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ANNEX I: Detailed Budget Estimates and Expenditure Projections.

Table V: Estimated Commodity Costs

Description:	Unit Cost	Qty	Total Cost
I. PROJECT COORDINATION			
Desk, Chair, Bookcase	1,000	2	2,000
Secretarial Desk	500	1	500
Computer Table	500	1	500
IBM PC 230 or equiv. w/printer	6,000	1	6,000
Space Heaters/Office	50	2	100
Air Conditioner	500	1	500
Filing Cabinet	500	1	500
UPS (1,000 KVA)	1,500	1	1,500
Typewriter - IBM or equiv.	1,500	1	1,500
Word Processing Software	500	1	500
Other Software	500	1	500
Photocopier	4,000	1	4,000
Sub-Total, Project Coordination:			18,100
Insurance and Freight (30%):			5,430
TOTAL, PROJECT COORDINATION:			23,530

Description:	Cost	Qty	Cost
III. GRANT MANAGEMENT			
Toyota 4X4 or equivalent	22,000	1	22,000
Desks, Chairs, Bookcases	1,000	5	5,000
Secretarial Desks/Tables	500	2	1,000
Computer Table	500	2	1,000
Photocopier MD	10,000	1	10,000
Photocopier SM	1,500	1	1,500
IBM PC 230 or equiv. w/printer	6,000	2	12,000
Laptop PC/20MB/HD/BL	2,500	1	2,500
Printers	500	2	1,000
Space heaters	50	3	150
Air Conditioner	500	3	1,500
Filing Cabinet	500	3	1,500
UPS (1,000 KVA)	1,500	2	3,000
IBM Typewriter or equiv.	1,500	1	1,500
Word Processing Software	500	2	1,000
Peachtree Acctg. or equiv.	500	1	500
Other Software	600	1	600
FAX Machine	900	1	900
Video Camera	1,200	1	1,200
VCR multisystem	500	1	500
Monitor 21" color	600	1	600
Sub-Total, Grant Manager			68,950
Insurance and Freight (30%):			20,685
TOTAL COMMODITIES, GRANT MANAGER:			89,635

II. ANGAP DEVELOPMENT			
Six-Passenger Vehicles, 1991	22,000	2	44,000
Motorcycles	2,700	6	16,200
PC 386SX/80MB/VGA/2 floppies	5,000	1	5,000
AT/80MB/2 Floppies	3,000	5	15,000
Laptop PC/20MB/HD/BL	2,500	6	15,000
Laser Printer HP III or equiv	1,800	2	3,600
Dot Matrix Printer/Wide Carr.	1,400	2	2,800
Flatbed Scanner	1,500	1	1,500
Modems 2400 Baud	200	4	800
Math Coprocessors	300	6	1,800
Word Processing Software	500	12	6,000
SPSS or equivalent	1,000	1	1,000
Paradox or equivalent	1,000	1	1,000
Peachtree Acctg. or equiv.	500	2	1,000
Procom or equivalent	50	6	300
Harvard Project Mgr. or equiv.	400	1	400
FormTool or equivalent	150	1	150
CDSS/IS	400	1	400
Typewriter, IBM or equiv.	1,500	1	1,500
FAX Machine	900	1	900
Photocopier MD	10,000	1	10,000
Photocopier SM	1,500	1	1,500
UPS (1,000 KVA)	1,500	6	9,000
Video Recorder/multi-system	500	1	500
Video Camera	350	1	350
Still Camera	350	1	350
Overhead Projector	500	1	500
Slide Projector	300	1	300
Drafting Table	300	1	300
Blackboard	100	2	200
Office Furnishings	25,000	1	25,000
Sub-Total, ANGAP 1991			166,350
Six-Passenger Vehicle, 1994	22,000	1	22,000
Sub-Total, ANGAP			188,350
Insurance and Freight (30%):			56,505
TOTAL COMMODITIES, ANGAP			244,855

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ANNEX XI - SUGGESTED CRITERIA FOR CONSERVATION ACTION GRANTS

ANNEX XI: Suggested Criteria for Conservation Action Grants.

As noted in the body of this Project Paper, the Grant Manager will be responsible for developing, in collaboration with USAID and ANGAP, criteria for the award of small, locally-initiated Conservation Action Grants (CAG's). The average size of these grants will be approximately $20,000; the criteria for the awards will have to be approved by both ANGAP and USAID before any awards are issued.

To assist the Grant Manager in this process, the following illustrative criteria were developed by REDSO/ESA and USAID/Madagascar during the design of SAVEM. The Grant Manager will, of course, modify this list as appropriate in light of changing circumstances and expanding information.

A. General Criteria for All CAG's

-- Proximity to a Protected Area. The proposed activities should take place in a peripheral zone adjacent to one of Madagascar's 50 protected areas, or, if appropriate in the context of an approved Protected Area Development Plan, within a PA itself.

-- Local origin. The proposals must have been initiated by members of the local community.

-- Presence of a reliable implementer. Given the nature of these grants, it will not be possible to insist that, as with the PADG's, each potential grantee have a proven track record of managing funds and carrying out successful development and/or conservation activities. Nonetheless, grantees should provide some acceptable indication of their trustworthiness and capacity to manage resources.

-- Simplicity and avoidance of risk. The proposed activities should not only be simple, they should also entail low risk to farmers. That is, while some risk taking is inevitable in development projects, proposals should not involve more vulnerable groups of farmers or herders in ventures which could prove catastrophic should they fail.

-- Low input requirements. Successful proposals should entail a low input of materials and labor. The activity should avoid high labor demands, particularly during local planting seasons or other traditional periods of peak labor demand. The planned activities should require a low and simplified, rather than a high and complicated, level of village organization.

-- Rapid realization of benefits. The benefits from proposed activities should come sooner than later. Since villagers all over Madagascar tend to be involved in the cash economy and eager to better their position in that economy, projects that generate cash income will highly desirable.

B. Questions to be Answered

In addition to meeting the above standards, potential grantees should, depending on the type of activity proposed, provide satisfactory answers to the following questions:

1. For Soil Erosion/Soil Fertility Proposals:

   Will farming take place on steep slopes? If so are terracing, bunding or agroforestry practices being used to control erosion?

   Is agroforestry an option to using high cost input fertilizer that also can pollute streams and lakes?

2. For Agroforestry Proposals:

   1. Will this project expand onto currently forested land or marginal forested savannah land that could also be important wildlife/livestock rangeland?

   2. Are there plans to harvest firewood/charcoal from the area? Is there a management plan to allow this to occur on a sustainable basis?

   3. Does the type of tree, shrub, etc. to be planted have any local taboos associated with it?

   4. If exotic trees/plants are proposed do they pose any danger of escaping into the natural system and in becoming a pest/weed, and/or displacing indigenous vegetation?

   5. Has a selection of an indigenous species been given first priority over the use of an exotic?

3. For Fisheries Proposals:

   Are the fishermen conferring with the Department of Fisheries with regard to:

   - Gear Limitations (gill nets, seines, trawls, etc.)?
   - Mesh Limitations of gear?
   - Fishing Seasons?
   - Limitations of Fishing Effort?
   - Limitations of Size of Fish by Species?
   - Areas Off Limit For Fishing (e.g. breeding or nursery grounds)?
   - Providing catch statistics to Fisheries Department for management purposes?

4. For Small Enterprise Proposals:

a. Will liquid wastes be discharged?

b. Will solid wastes be produced (e.g. by a food processing

facility, or by a slaughter house)?

c. Is air pollution a potential problem, especially in the worker's environment?

5. For Construction Activities (e.g. roads and irrigation systems).

a. Are there archeological or historical sites in the vicinity, or on the site that could be impacted?

b. Is there environmentally sensitive habitat of rare or endangered species that could be impacted?

c. Is the site near a surface water body (e.g. marsh, lake or river) or in the vicinity of a high ground water table that could be impacted during the construction phase, or from permanent sighting of certain activities (e.g. soil erosion, solid waste or sewage)?

d. Is the site on or near a taboo area (sacred or power site or burial ground)?

e. Has the site and site plan been approved by local religious authorities?

6. For Ecotourism Projects:

a. Is this culturally acceptable to the local community?

b. What will be the impact on the natural system .(e.g possible erosion from backpackers on trails, disturbance of natural formations such as stalactites/stalagmites or archeological materials in caves, destruction of coral reefs from boat anchors, diver contact or sewage)?

c. What will be the social impact (e.g. the possibility of unequal distribution of income, increased commodity prices to the local community)?

d. Is solid and human waste generation being properly dealt with .(e.g avoidance of dumping of garbage into surface waters, placing pit latrines at least 500 feet from surface waters)?

C. Proposals Excluded from Receipt of CAG's.

The following types of activities should not be eligible for Conservation Action Grant funding:

1. Any activity using pesticides in any manner.
2. Formal and informal education programs.
3. Health and nutrition programs.
4. Programs requiring long-term expatriate technical assistance.
5. Studies and surveys.

ANNEX XII - INITIAL ENVIRONMENTAL EXAMINATION

INITIAL ENVIRONMENTAL EXAMINATION

I. PROJECT DATA

Project Location	:	Madagascar
Project Title and Number	:	Environmental Protection and Management (687-0110)
Funding (A.I.D. LOP)	:	11,852,500
(Total LOP)	:	15,950,000
Life Of Project	:	Five Years
IEE Prepared By	:	Robert G. Rose REDSO Environmental Officer
Environmental Action	:	Negative Determination For Conservation And Development Grants
	:	Categorical Exclusion For Institutional Strengthening, Training, Special Studies and Conservation Data Base
Concurrence	:	Satesh P. Shah, Director, REDSO/ESA
Date	:	March 22, 1990

Clearances:

John Thomas, ADO/Madagascar	(Cleared)	Date: 3/23/90
Steven J. Spielman, Chief/RLA/REDSO	(Cleared)	Date: 3/23/90
Paul Andre DeGeorges, REO/REDSO	(Cleared)	Date: 3/23/90

II. PROJECT GOAL AND PURPOSE:

The goal of the Environmental Protection and Management Project is to conserve Madagascar's natural resource base. The purpose is to improve the management of Madagascar's priority protected areas and the incomes of people in their peripheral economic zones. This goal and purpose are fully consistent with the Mission's strategy statement for Madagascar which is to increase rural incomes in ways that are consistent with the conservation of the natural resource base.

III. PROJECT PROBLEM:

Madagascar, because of its insular nature and evolutionary history, is considered one of the most biologically diverse countries on the planet Earth. Madagascar's high endemism and high number of species make it a high priority for conservation, not only for the Government of Madagascar but for the global environmental community. At the same time, its rapidly growing population, is placing increasing pressures on the natural resource base, through such destructive practices as slash and burn agriculture, uncontrolled felling of forests for charcoal and fuelwood, and overgrazing. The net result of this human encroachment is the loss of habitat to support Madagascar's endangered and threatened species, decreased agricultural production on hillsides, and massive erosion which is threatening downstream hydroelectric dams, irrigation projects and the fragile coastal zone.

IV. PROJECT OUTLINE AND STRATEGY:

This project will undertake a series of actions, in a coordinated effort with the Government of Madagascar and other donor agencies to establish and manage a series of national parks and reserves in ecologically sensitive areas. They will be operated in the spirit of a biosphere reserve. Surveys will be undertaken to better understand how the rural community uses and traditionally manages the natural resources in the peripheral zones and in the parks/reserves (protected areas). Additionally, zoological and botanical inventories will be made of selected protected areas. This will be followed by developing a series of remedial actions, specific to each protected area, which will

attempt to help the rural community better manage its natural resources, improve its standard of living and decrease its encroachment on these parks and reserves. The project can be dissected into a series of interrelated components:

a. Institutional Strengthening of the Government Department of Forestry and NGO's, and the creation of a semiautonomous organization, ANGAP (National Association For The Management of Protected Areas), which will ultimately be responsible for the management of national parks and reserves.

b. Training of personnel associated with ANGAP, host country development NGO's, or training institutions in natural resources management, including but not limited to conservation, protected area administration and management, soil conservation, forest management and agronomy.

c. Special Studies will be undertaken to help A.I.D. and other donors determine how non-project assistance can be used to influence policy changes that will improve the sustainability of natural resources management. This includes but is not limited to land tenure as it relates to conservation of protected areas and sustainable land use, the socioeconomics of tavy cultivation, sharecropping, migration patterns, and the feasibility of establishing a local currency endowment for ANGAP and ANAE (National Association For Environmental Action).

d. Conservation Data Base development as the result of scientific surveys in the national parks and reserves, diagnostic surveys conducted in the peripheral areas, and special studies.

e. Conservation and Development Grants will team local and international NGO's to carry out botanical and zoological inventories of protected areas, to develop protected area management plans and ecotourism schemes involving the local community, to develop formal and non-formal environmental education programs, and to study traditional natural resources practices by inhabitants of the peripheral zone in order to work with them in sustainable natural resources management activities that will improve their quality of life and decrease encroachment on the protected areas.

V. ENVIRONMENTAL ACTION RECOMMENDED

If this project is successful it could have a major long term beneficial impact towards the preservation of biological diversity, and sustainable natural resources management in Madagascar. If it can be replicated on a large enough scale it could help to stimulate Madagascar's economy and to improve the quality of life of its rural inhabitants. Based upon the review of A.I.D environmental procedures, 22CFR Part 216, the following threshhold decision is recommended for the project components:

Categorical Exclusion:

a. Institutional Strengthening based upon section 216.2 (c) (2) (i).

b. Training based upon section 216.2 (c) (2) (i).

c. Special Studies based upon section 216.2 (c) (2) (iii).

d. Conservation Data Base based upon section 216.2 (c) (2) (iii).

Negative Determination

Conservation and Development Grants. A negative determination is recommended for these NGO grants pursuant to section 216.3 (a) (3) (iii), "The Agency has designed criteria for such an action, which if applied in the design of the action, will avoid a significant effect on the environment."

The PID states that the PP design will establish a formal system, including AID and ANGAP participation, to review and approve each PVO proposal and specifically address compliance with Reg. 16.

No disbursement of funds to PVO's under this component will be allowed other than for, or in support of staff recruitment, diagnostic and other studies, and training until USAID/Madagascar is satisfied, after consultancy with REDSO/ESA, and determines in writing that the PVO activity complies with Reg. 16.