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The Broken Forest:

Applying the Integrated Conservation and Development Paradigm to Madagascar's Protected Areas

Volume One: Synthesis Report

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This synthesis was written by Russell Barbour, the team leader and Professor Rene Rabezandria, the team agronomist using information gathered by the Assessments Team, as well as the Project Paper and other sources. The other SAVEM Assessments Team members included: Ray Daviesson, forester; William Guyton, agricultural economist, Dr. Nivo Rakotobe, physician; Pepe Andrianomanana, economist; Lala Ranajanhery, anthropologist; and Paula Williams, social forester. The individual consultants' reports are in the appendices to this document. Additional material was provided by the SAVEM/GMU staff, SAVEM/ANGAP staff, Chris Seubert of DAI, and the U.S.A.I.D. Mission in Madagascar.

The authors wish to express their appreciation to all who helped support this effort, and especially to the farmers and rural dwellers that we met.

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EXECUTIVE SUMMARY

This report synthesizes and expands on the work of a multi-disciplinary team - the SAVEM Assessments Team - that visited protected areas in Madagascar to see how Integrated Conservation and Development Projects could be best promoted by the Grants Management Unit of the SAVEM project.

The objectives of the assessment team mission were to review the integrated conservation and development concept and develop criteria and guidelines for funding small grants - Community Action Grants (CAGs) and large projects - Protected Area Development Grants (PADGs). The team visited a wide variety of sites in northern Madagascar where most SAVEM activity will take place. We looked at projects outside of the USAID funding framework and even went to forested sites where no project was ongoing or planned to provide a comparative analysis.

This report summarizes the major findings of the SAVEM Assessments Team and cover the following topics in seven sections: 1) understanding the protected areas peripheral zones, 2) developing guidelines for integrated conservation and development projects, 3) identifying sustainable development activities in peripheral zones, 4) developing criteria for CAG proposals and Phase II PADG proposals, 5) identifying implementing organizations for PADGs and CAGs, 6) establishing baseline data, and 7) sector priorities.

Main Findings

While the team does not agree with all elements of the SAVEM project design, we found the ICDP concept to be basically sound. The ICDP framework is a useful conceptual model that helps to focus the long-term goals of SAVEM projects towards conservation; yet it provides enough flexibility to allow the project to address the near-term needs of people living near Madagascar's protected areas.

Although the dramatic loss of biodiversity continues in Madagascar, even preliminary efforts at ICDP's seem to be holding off further destruction in some places. Nonetheless, the macro-economic situation in Madagascar, calls into question the possibility of sustained economic development in the peripheral areas at the present time. The team members, most of whom are very familiar with rural Madagascar, were shocked at the exceptionally low standard of living in these isolated areas. The present bleak macro-economic picture in Madagascar make it unlikely that SAVEM, or any other project, will be able to make rapid and large improvements in the economic conditions of those living in the protected areas periphery.

Implementing current ICDP projects has been complicated. Attempting to respond to the many needs in the communities near the reserves runs the risk of recreating the largely unsuccessful integrated rural development projects of the late seventies and early eighties. To avoid this, the team recommends using small grants to respond to needs in the areas of health, education, and other activities only indirectly linked to conservation. The larger grant program, the phase two Protected Area Development Grants (PADG), should focus on income generation.

The suggestions in the SAVEM project document and the comments in the 1991 evaluation of World Wildlife Fund activities that strict protection of core areas be abandoned, are not consistent with scientific evidence concerning Madagascar's ecology. There are many unique features of Madagascar which make the ecosystems less resilient than those found elsewhere in Africa and other parts of the

world. The team recommends that exploitation of the protected areas, except for carefully controlled ecotourism, be restricted.

Major Recommendations

This paper outlines how we believe the CAG and PADG grant programs can operate effectively. By simplifying the activities as we recommend, we believe that the SAVEM project can indeed protect biodiversity and improve the lives of people in the peripheral areas. To accomplish the goals of the SAVEM project, the team recommends certain action and policy changes for the GMU. The recommendations, which are discussed in detail in the sections that follow, are:

- Divide participants into primary grantees and local implementing organizations with strict criteria in terms of experience, administration and field work for the first category and a more liberal approach for the local implementing organizations.
- Instead of complete sustainability, consider activities that will delay loss of biodiversity and increase incomes for fixed periods of time.
- Use the CAG grants to address basic needs and allow the PADG grants to concentrate on preservation of biodiversity and income generating activities that will compete with activities that threaten biodiversity.
- Abandon the policy of building new rice irrigation schemes as an alternative to tavy.
- Focus agricultural programs on activities that improve labor efficiency and make food production more sustainable by maintaining soil fertility and preventing erosion.
- Promote commercial forestry to improve income.
- Empower villagers so that they have clear land use rights.
- Assist villagers to eliminate exploitative marketing practices.
- Focus health activities more narrowly than called for in the project paper.
- Establish a new and more realistic system of social and biological monitoring.

Major Criteria for Assessing Grant Proposals

Both CAG and PADG proposals submitted to the GMU should be judged primarily on the following factors:

- PADG grants should demonstrate that an alternative to a current or potential destructive practice is being offered to the population. No PADG grants should be considered that do not do this.
- CAG grants should address some element of basic community needs or involve the community in the conservation effort.

- The alternative activity should reduce labor, reduce inputs or significantly increase income.
- Individual benefits for participants in both types of grants must be demonstrated.
- The field experience of the proposing organization should be a major selection factor.
- Evidence that there will be a local cash contribution to the activity should be part of the selection criteria. The team found that this a common practice for village projects and that SAVEM should continue this.
- Social analysis in the PADG proposal should demonstrate that groups that most directly impact conservation are included. At most locations this would be young people and young couples. Thoroughness and site specificity of social analysis should be a selection criteria.
- The number and qualifications of university trained Malagasy technical assistance should be a requirement for any PADG grant. No grants with only expatriate technical assistance should be considered.

This report was used to help the staff of the SAVEM/GMU and ANGAP to develop a set of criteria or guidelines for the implementation of the Conservation Action Grants program. This set of criteria is included with this document as Attachment 1. However, it should be pointed out that these represent a late draft and not the final version of the CAG criteria.

INTRODUCTION

Ny ala simba, literally the broken forest in official Malagasy, describes the transformed primary forest that has been modified for human use, usually by clearing for agriculture. The creation of these zones of secondary vegetation is what the SAVEM project hopes to either halt or slow down. According to most observers this loss of habitat is the greatest threat to the island's biodiversity; more so than hunting or logging.

The local people do not see this transformation as quite the calamity that outsiders do. The zones of secondary vegetation, often referred to as *sovoaka*[1], form the bases of subsistence. In most areas the assessment team visited most fuelwood, medicinal plants, building material and even *tavy* the local, highly variable form of slash and burn agriculture, is in areas of secondary vegetation. Thus, the view that villagers take is that they are taming a wilderness, making it more fit and accommodating to their own lives, and not that they are destroying a valuable resource.

The central issue, or question, for the SAVEM/GMU is: How can the villagers' necessity of clearing the forest, be reconciled with the need to conserve of biodiversity by halting the destruction of primary forests? The Integrated Conservation and Development Project (ICDP) paradigm posits that conservation related activities can generate income and improve people's lives, thus making primary forest preservation of direct benefit to villagers.

What are the fundamental problems that ICDPs should address? During our field visits the team found rural societies that demonstrated unambiguous decline as a result of losses of natural resources. In some cases village organization has broken down and traditional limits on resource use are being ignored. The falling value of cash crops that formerly stabilized agricultural production has lowered living standards and increased pressure on the protected area. Health conditions are appalling; but this is hardly new information. These statements can be generalized for much of Madagascar. The question is how ICDP's can go beyond the current truce.

The increased presence of conservation personnel and the modicum of support for Malagasy government forestry service field agents offered by the debt for nature program has increased the level of protection for the protected areas which had been seriously threaten. The zones of secondary vegetation, *ny ala simba*, appear to be more important for subsistence than products from the primary forest. The primary forest is seen as more a reservoir of fertile land and more remotely as a watershed for irrigation by the local populations. The question remains as to how long watchfulness of the forest service personnel will be able to withstand pressure for new land.

Land Under Pressure

Human pressures on protected areas can be manifested in many different ways. By far the most serious threat is the conversion of forest lands to agriculture or pasture, because this involves a near total destruction of the natural ecosystem and its biodiversity. Furthermore, unlike many other areas in the world, Madagascar's forests have a remarkably low capacity to recolonize fallow and pasture land.

[1]The term *sovoaka* is a general term which refers to any area which is in the bush fallow portion of a system of shifting cultivation.

In addition to the principal threat - conversion of forests to agriculture - there are other pressures on protected areas. They include the following:

- Harvest of wood products for noncommercial use; for local or urban markets. Of particular import is the commercial harvest of fuelwood, charcoal and sawtimber;
- Harvest of non-woody or secondary products from the forest for a wide variety of uses;
- Pasturing livestock within reserves, often associated with the use of fire to maintain or regenerate pasture grasses;
- Partial or complete destruction of forests, especially dry forests, by wildfires set for various reasons and coming from outside of the forest;
- Hunting of animals for meat, skins and other products for commercial and non-commercial use.
- Commercial harvest of plants and animals for urban or International markets.
- Invasion of natural areas and replacement of native species by exotic plants and animals not generally found in those areas.

The Integrated Conservation and Development Concept

The SAVEM documentation states that the project will test the hypothesis that local populations will alter their behavior from destruction to conservation of their environment if they see are empowered to make decisions, and if they see that there is a link between conservation and their economic and social well being. The SAVEM project documentation further suggests that testing this hypothesis will in itself generate benefits and protect biodiversity. Also, a major assumption throughout the SAVEM papers, and supported by a number of authors[2], is that the preservationist model of conservation previously practiced in Madagascar is no longer possible or desirable. Thus, the ICDP approach being taken under SAVEM should be seen as a paradigm shift.

The ICDP Guidelines[3] provided a concise explanation of the integrated conservation and development concept for the team. The Guidelines state that the main purpose of integrated conservation and development projects (ICDPs) is to diminish or eliminate the human threats to protected areas through appropriately conceived development activities. Development is a means to achieving the goal of preserving the natural areas. Development is, arguably, an indispensable means, but not the main goal. If development was the goal, then these projects would not be located around protected areas.

However, every development activity near a protected area is not necessarily integrated conservation and development. Some of the project activities the team saw do neither, yet they are unavoidable if the local population's wishes are to taken into consideration. A community grocery store sponsored by a project is just such an example. In developing these guidelines and criteria, answering

[2]Brown and Wyckoff-Baird, 1991; Mckinnon et. al, 1990.

[3]Taken from ICDP Guidelines by Roy Hagen.

the question of what constitutes an ICDP became a important objective. Through the process of narrowing the ICDP concept the team has been able to distinguish ICDP from previous development model, such as integrated rural development.

ICDP Strategies

In designing an ICDP, strategies should be developed to address each threat to the protected area in question. As most of the threats are directly related to poverty and subsistence food production, development strategies which have activities that are directed toward farming, basic food production and income generation will contribute to reducing the threat to protected areas[4]. For a given threat, there are a variety of strategies that can be implemented, and the ICDP design may actually employ multiple strategies for the same threat. For example, the following three, very different types of strategies may be employed to address the problem of unsustainable slash and burn agriculture:

- Develop or intensify irrigated rice production in those limited areas where this is possible. This has been the principle strategy employed in Madagascar over the past 30 years, but there has been minimal success.

- Develop and disseminate sustainable production practices. This involves using improved agroforestry and soil and water conservation practices to maintain soil fertility and control erosion. This strategy is new to Madagascar and requires a substantial applied research component, especially to identify agroforestry species adapted to local conditions and suited to local farming systems and farm labor patterns.

- Develop alternative economic activities so that farmers in the peripheral zones have an alternative to *tavy* production systems for subsistence and commercial food production.

The Assessment Team's Objectives

With the above mentioned points in mind, the objectives of the SAVEM assessment team's mission were as follows:

- Understand the protected areas peripheral zones, their development needs and potential;

- Develop general guidelines for Integrated Conservation and Development Projects in Madagascar

- Identify potential sustainable development activities in peripheral zones;

- Develop criteria for assessing CAG proposals and Phase II PADG proposals;

- Identify the most likely collaborators for PADGs and CAGs;

- Establish baseline data for the areas visited and to determine key elements to guide baseline studies in other target zones.

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[4]Adapted from ICDP Guidelines by Roy Hagen.

The Team's Methodology

The team used the multi-disciplinary approach given in the terms of reference, with some modification. There has been an emphasis on individual observation and analysis, and individual team members have engaged in-depth interviews with local villagers, NGO field staff and malagasy government technical offices to accomplish these tasks. Since the local civil administration has been abolished, the team most often met with traditional rulers or authorities who have taken over civil administration.

The large size of the team provided the opportunity to interview a good-sized cross section of the population. Our field interviews focused on individual, household, and key informant interviews, although we conducted a few group interviews. In nearly all cases, interviews were followed by farm and forest visits to confirm what had been talked about with farmers and villagers. The team also tried one Rapid Rural Assessment technique. This consisted of a joint survey. At three locations, several team members worked together to perform a household survey. This information was useful in team discussions. Other information gathering methods used by the team included village mapping, walking transects, an over flight of the protected biosphere area, as well as examination of aerial photos and other secondary data.

The team augmented the field visits to include ICDP's that presented a wider, and in some ways conflicting, definition of the ICDP concept. The three additional field sites: Ankany ny nofy, Beforana and Mananara are vastly different in scope and approach than the activities at the three sites originally proposed. At each of these sites, aspects of ICDP activities that predate the SAVEM project, are being implemented with private and international financing. For the most part, they are run with Malagasy technical assistance. Comparative analysis was greatly enhanced by these additional visits. For example, the team was able to visit not only national parks and official protected areas, but we were able to visit unprotected forests that are being exploited by various communities.

The criteria for participation in the SAVEM/GMU ICDP grants is presented in the next section. In presenting the guidelines and criteria, we recommend ways in which they might be met by the grant applicants. It bears mentioned here that the in-depth, extensive, multi-disciplinary field work undertaken by this team has generated information and recommendations that avoids generalities and goes beyond the information presented in the SAVEM project paper. Further, these recommendations are based on field observations and known successes. The team has avoided "development theory" and has presented realistic options.

Our field work, following the list of priority areas given in our scope of work, focuses on forested sites. However, this team has concluded that a number of ecosystems are under represented in the system of Malagasy protected areas and the priorities for SAVEM activity. There are few marine sites, lakes and particularly wetlands among the them. It is important to note that one of the few models for protection, empowerment and income generation was at the newly created marine park at the Man and the Biosphere project that the team visited.

The information gathered by the SAVEM Assessments team and used to formulate the recommendations given in this report was gathered by the individual team members. While some of the information from the individual reports is contained in this main report, to understand the full context within which the team has made recommendations, it is necessary to read the reports in the appendixes.

GENERAL GUIDELINES FOR GRANTS

To accomplish the goals of the SAVEM project the team recommends certain action and policy changes for the GMU. As discussed in the detailed discussion sections they can be summarized as follows:

- Divide participants into primary grantees and local implementing organizations with strict criteria in terms of experience, administration and field work for the first category and a more liberal approach for the local implementing organizations.
- Instead of complete sustainability, consider activities that will delay loss of biodiversity and increase incomes for fixed periods of time.
- Use the CAG grants to address basic needs and allow the PADG grants to concentrate on preservation of biodiversity and income generating activities that will compete with activities that threaten biodiversity.
- Abandon the policy of building new rice irrigation schemes as an alternative to tavy.
- Focus agricultural programs on activities that improve labor efficiency and make food production more sustainable by maintaining soil fertility and preventing erosion.
- Promote commercial forestry to improve income.
- Empower villagers so that they have clear land use rights.
- Assist villagers to eliminate exploitative marketing practices.
- Focus health activities more narrowly than called for in the project paper.
- Establish a new and more realistic system of social and biological monitoring.

Geographical Criteria

In spite of familiar models of concentric circles of core protected areas and adjacent peripheral zones, the team believes that a strict geographical definition would not very useful. In fact, the "buffer zone" concept - at least in terms of a specific geographic location - doesn't exist adjacent to the protected areas. Identifying pressure against the protected area, whatever the source, is more important. A functional definition of a peripheral zone which identifies the source of the threat to the protected area should be part SAVEM's implementation of the ICDP concept. Thus an ICDP activity that relieves pressure on the protected area and preserves habitat would be considered as being in a peripheral zone. To be considered as a peripheral zone activity an ICDP activity should achieve one of the following:

- Develop a substitute for a resource being extracted from a protected area (assuming that its extraction threatens biodiversity).

- Develop an economic activity that does not threaten the biodiversity of a protected area and provides an alternative income that competes successfully with one that is destructive to protected area.

- Increase the value of a resource in a way that would lead to its conservation and sustainable use.

Using a functional definition, a fuelwood plantation near a city that reduces cutting in primary forests; a successful cash crop program that competes with tavy; or a commercial hardwood operation, are all examples of peripheral zone activities.

CRITERIA FOR PARTICIPATION IN SAVEM

To establish criteria for organizations to participate in the SAVEM project the team has outlined two levels of participation: primary grantees and local implementing organizations. We recommend fairly strict criteria for primary grantees, while local implementing organizations have criteria which are easier to meet. The criteria proposed for primary grantees are the same for both the CAG and PADG programs.

We believe that the GMU should avoid direct grants to new and unproven groups. However, to help strengthen the capacity of local groups to take on projects, we recommend that SAVEM promote a number of community organizations in ICDP areas by using existing groups as umbrella organizations. These more experienced, existing organizations will provide administrative and some technical support to less experienced organizations.

The team believes that following these recommendations will help the GMU avoid creating GMU-dependent organizations. This is an important point, given the sustainability goals of the project. Already the GMU has relieved grant requests from organizations without prior experience or self managed resources. While institution building can be a part of the SAVEM project, the team feels that creating and financing new organizations as primary grantees would divert significant human resources from its primary goals.

Main Criteria for Assessing CAG and PADG Grant Proposals

Both CAG and PADG proposals submitted to the GMU should be judged primarily on the following factors:

- PADG grants should demonstrate that an alternative to a current or potential destructive practice is being offered to the population. No PADG grants should be considered that do not do this.

- CAG grants should address some element of basic community needs or involve the community in the conservation effort.

- The alternative activity should reduce labor, reduce inputs or significantly increase income.

- Individual benefits for participants in both types of grants must be demonstrated.
- The field experience of the proposing organization should be a major selection factor.
- Evidence that there will be a local cash contribution to the activity should be part of the selection criteria. The team found that this a common practice for village projects and that SAVEM should continue this.
- Social analysis in the PADG proposal should demonstrate that groups that most directly impact conservation are included. At most locations this would be young people and young couples. Thoroughness and site specificity of social analysis should be a selection criteria.
- The number and qualifications of university trained Malagasy technical assistance should be a requirement for any PADG grant. No grants with only expatriate technical assistance should be considered.

Participating Organizations

The team, especially its Malagasy members, believes that the number of organizations that can successfully administer GMU grants is limited. The team feels strongly that, outside of the large international conservation organizations and church sponsored groups, there are few, if any, organizations that can operate as primary grantees. Primary Grantees and Local Implementing Organizations are the two main categories of grantees in SAVEM. However, individuals and private enterprises should also receive small amounts of funding.

Qualifications for Primary Grantees

In order to be considered as a primary grantee there should be five prerequisites for the organization. These prerequisites are listed and explained below:

- Field experience in project implementation;
- Technical personal on staff;
- Ability to organize local people to accomplish tasks;
- Administrative and logistical capabilities;
- Access to resources outside of GMU/SAVEM.

The team believes that the existing church sponsored groups such as SAFAFI, SAF-FJKM, FIKRIFAMA and the Diocesan Development Committee have set a standard in terms of administration, field experience and technical competence that the SAVEM project should follow. Selecting less qualified organizations as primary grantees is not recommended.

Field experience is the most important selection criteria for primary GMU grantees. The difficulty and logistical challenges of working in Madagascar's countryside, and the challenge of finding people to work in remote areas, make this an issue of great importance.

For primary grantees, we recommend a minimum of two years field experience in Madagascar or another developing country. The grant applicant must present clear evidence of success in previous development work. The SAF-FJKM program in Betampona is a model for the type of experience the GMU should be looking for.

Field experience should be evaluated by the number of the organization's staff that are actually living at a site and the type of activity they are carrying out. Short visits to disperse funds or to do occasional field activities should not be accepted as field experience.

Primary grantees should have University trained, Malagasy, technical personal. The team was impressed with the work of the Malagasy technical assistance at existing projects. The assessment team believes that many technical positions could be filled with recent graduates from the University. Such individuals should be part of a team that includes more experienced expatriates, but in key fields such as agriculture and village-level forestry, preference should be given to organizations that propose a largely Malagasy technical assistance team.

The complex agricultural and environmental issues at virtually every site the team visited indicates that a high level of technical training and experience is needed to address these problems. Organizations staffed entirely with generalists should not be considered for these grants.

If such individuals are not on staff, recruitment and identification of the technical personal should be done by the organization prior to the award of the grant. In some cases, the GMU should interview technical personal as part of the pre-award process for grants.

The ability to organize local people to accomplish tasks is an important criteria for assessing primary grantees. As noted in the team's observations, this factor has been overlooked at some locations. For example, at the Biosphere project in Mananara the project did not organize the farmers into a maintenance group for the project-built irrigation system until it had to begin repairs. In contrast the SAF- FJKM program at Betampona started their maintenance activities right along with community organization. The GMU criteria for this factor should include the ability to identify community organizations or form special purpose task oriented groups.

The GMU should not set an arbitrary percentage of outside finding as a criteria for grantees. However, the organization should provide some indication of having other funding sources before they can become a primary grantee.

Local Implementing Organizations

As was mentioned previously, the prerequisites for local implementing organizations are not as difficult to achieve as for primary grantees. Guidelines for local implementing organizations include:

- Non-discriminatory membership practices;
- Prior experience in task completion;

- Demonstrated capacity for group to organize;

- Preference should given to organizations that include young people and young families;

Local organizations that implement GMU funded activities should be community-based. At the local level, the team's rural sociologist found that a number of groups have potential for participation in SAVEM activities. In some cases the church sponsored groups, such as the SAF-FJKM, SAFAFI, FIKRIFAMA, and the Diocesan Development Committee may qualify for ICDP grants. Another example of organizations which should be considered for grants are the long-established sports associations that have been involved in self help in the past. An example of one such group is the Association Sportives des Professseurs (ASPRO) at Joffreville.

A lack of youth groups in the peripheral areas poses a problem. Young people at most locations have few opportunities for employment, and young couples are often the ones who clear land for *tavy* on steep slopes near the protected areas. The team recommends that the GMU give preference to grant applicants which make a special effort to include young people and young families in their organizations. Also, project grantees should consider forming youth groups to offer opportunities for work in conservation or on road repair and other activities.

Another problem in local organizations is the disintegration of the men's groups related to natural resource use. At Betampoona several traditional groups of this type existed. For example, the findramana grouped men for clearing and agricultural work, while the tambiroho grouped men for a variety of building tasks including gathering wood from the primary and secondary forests. Whenever possible, the GMU should give preference to using these types of groups traditional groups as grantees.

There are two other groups that are frequently active in Malagasy villages. In nearly all villages that have a school there are parents groups, and they often have the capacity to organize themselves for group activities. Also, the women's groups in many villages are well organized and active. These groups are likely to be local organizations to receive grants.

Individual As Grantees

For the most part the volume of grant funds disbursed to individuals by the GMU is expected to be small. However the team feels that there are some instances when grants to individuals are appropriate. The guidelines for these grants are:

- Persons negatively affected by conservation activities, especially young people and young families;

- Farmers adopting or testing new sustainable technologies.

Current ICDP's at Mananara and Betampona have made resources available to farmers on an individual basis. The team recommends that the GMU consider funding individual efforts under the CAG joint small grants program described later in this report. We further recommend that grants to individuals be targeted to young families, a group who the team found to be the most disadvantaged, and often who exerted the most pressure on protected areas.

Individuals directly and negatively effected by either PADG or CAG conservation activities should also qualify for grants. These should include young people who want an alternative to tavy. The

adoption of land use systems that enhance soil fertility, reduce erosion and reduce labor requirements are recommended activities for individual funding.

Grants to Private Enterprises

While the SAVEM grants are primarily for groups, there are some instances when businesses should be considered as grant recipients. The guidelines are:

- Businesses that generate income for villages using natural resources in a sustainable way;
- Businesses organized by groups of villagers who offer alternatives to destructive practices (preference given to business groups which include a significant number of young people and families);
- Business that offer an alternative to unfair market practices.

We believe grants, or more appropriately credit to private businesses should be considered exceptional and handled directly by the GMU. These grants should be given only if a clear benefit to the community is evident. Examples of this would include providing jobs for young people as an alternative to tavy, ending unfair market practices, providing lower cost transportation or activities that increase the value of natural resources and encourage their use in a sustainable way.

Inappropriate Groups to Receive Grants

The team feels that it is necessary to exclude some groups from receiving grants, even though they may meet most of the above mentioned criteria and guidelines.

- Groups with an ethnic base which exclude members of the community;
- Groups with political affiliation;
- Malagasy government cooperatives.

In communities with a large number of immigrants or a mixed ethnic composition some self-help organizations have an ethnic bases that exclude other members of the community. Working with such groups could alienate other members of the community and it is recommended that they be avoided.

Groups with political affiliation is another category that the team recommends should not be eligible for SAVEM funding. Included in category are the many Malagasy government organized cooperatives. The SAVEM project paper suggests that government sponsored groups at the local level could be financed, but the team disagrees with this idea. Most government cooperatives are no longer active, and were highly unpopular.

It should be pointed out that oftentimes ethnic-based and politically-based groups have a functional base in the community and their ethnic and/or political nature is not apparent to outsiders. This situation emphasizes the importance of the team's recommendation that PADG projects have Malagasy social scientists as part of the early study, identification and negotiation process.

GUIDELINES AND CRITERIA FOR THE CAG PROGRAM

CAG's Response to Basic Needs

The Conservation Action Grant (CAG) program was originally conceived to "support activities by indigenous groups or individuals that demonstrate a concern for conservation". however, educational and social activities were recommended in the project paper without being specific. The team recommends that the CAG program be used in a more focused way to meet some of the pressing basic needs in health and education in concerned communities. From the ongoing projects and the assessment team's interviews it is apparent that responding to basic needs will have to take place in any community where an ICDP project is proposed. Some of these activities will not necessarily be linked to conservation.

We believe that the CAG program can be used to respond to these needs and to free the larger PADG grants from administration of small activities. The team found that most of the basic needs expressed by local people could be met with relatively small sums. Administration of these small requests within a large PADG Phase II grant would detract from the conservation and income generation focus of the larger grants. We have observed at three different ICDP projects, senior administrators who are bogged down in handling small requests.

Priority for the CAG program should be given to local organizations. The participation of local NGO's in ICDP projects is one of the most positive factors in the SAVEM project. Organizations such as SAF-FJKM and SAFAFI have their own resources and their activities predate the SAVEM project. The experience in a number of developed and developing countries has demonstrated that long term conservation is dependent on strong advocacy by locally based groups. The administration of CAG grants could help generate a long term presence and commitment to the ICDP concept.

Summary of Criteria for CAG Grants

- CAG grants should either address basic needs as defined by the communities themselves or involve communities in conservation
- Most CAG grant categories should be reserved for Malagasy organizations
- Budgets for CAG grants should be between $1000 and $50,000
- CAG grants to private enterprises should be considered exceptional and decided on a case by case bases by the GMU staff itself.
- CAG grants to individuals should be reserved for target groups such as young families or those negatively impacted by conservation groups

Types of CAG Grants

The team recommends four types of CAG grants:

- A small grants program to address basic needs that would be administered jointly by GMU and one of the larger church sponsored organizations or any other local organization with similar experience and administrative capabilities.

- A matching fund program that would encourage local NGO's to diversify funding sources for ICDP activity.

- A mid-size grant program that would include qualified organizations without matching funds. Another type of mid-size grant would emphasize infrastructure such as road repair and the maintenance of water projects, but should be directly administered by the GMU. Some international NGO's may participate in these programs.

- A university / NGO internship program that would allow for travel and field work for students from institutions such as ESSA and regional universities that train NGO technical staff.

Small Grant Program

The church sponsored groups (SAF-FJKM, SAFAFI, Fi-KRI-FA-Ma, Diocesan Development Committees) are the most suitable for the joint administration of CAG very small grants program. Any other organization that meets the same level of field experience, administrative procedures and community support should also be considered. We recommend that this program be limited to Malagasy organizations, and that the GMU tie these grants to conservation activities.

In the first category of grants the project would be able to respond to the very small scale activities that are often among the most pressing felt needs in a community. At Ambanytoaka, near the Betampona reserve, only three hundred dollars is needed to complete the school building which has been mostly built with local materials by the parents association. We envision a joint grants board to review small requests that would include an NGO, and perhaps one or two members of the GMU staff. The team identified a number of health organizations that would seem appropriate for this type of funding.

The small grants program should be used to support the activities of organizations that have little or no prior experience. A review of the current CAG requests received by the GMU found that many of the organizations submitting proposals have no prior project experience. It is doubtful that they could meet GMU's administrative requirements. Using well established organizations with good accounting and implementation procedures will help reduce the administrative problem for the GMU and is likely to result in a more effective use of GMU funds.

Matching grants

The CAG matching grant program should be open to any local organization that meets the requirements that are set out in the general criteria for organizations participating in SAVEM and that have successfully raised funds from other sources. Priority should be given to those organizations that

have received private funding or raised money in the local community. In-kind participation by the community should not be allowed in the matching grants program.

Diversified funding will ensure the continued presence of local NGO's at ICDP sites after the SAVEM project ends. It would also provide evidence of long-term commitment to the communities involved. Presently the SAVEM project can offer only short-term support to local communities while asking the villagers in return for a long-term loss of resources in the protected areas.

A certain amount of matching funding should be made available to NGO's submitting proposals for private funding or attempting community fund raising. It is recommended that training be offered by the GMU to familiarize local organizations with private funding sources and the proper format for proposal submission. The GMU's permanent staff and director have considerable personal experience in this area, and international NGO's may also help to train local NGO's in how to apply for grants.

Mid-size grant programs

These grants are targeted towards organizations that did not have matching funds and an infrastructure improvement program directly administered by the GMU.

Infrastructure problems such as road and canal repair are important needs in the communities that surround the protected areas. The complexity of such activities, as proven by past ICDP experience, will require a high level of management from the GMU. Probably any infrastructure activity over $50,000 should be placed in this category. It is envisioned that these activities would include: small bridge repair, training and technical assistance in for rice irrigation system maintenance, terracing of crop land, and other activities where the management of contractors and engineering expertise is beyond the scope of NGO staffs.

The infrastructure programs will undoubtedly be the most difficult to administer and here the team recommends fairly strict criteria. First, the GMU should set an upper limit on the cost per project. This would include a maximum cost per hectare for irrigation projects, the minimum number of people in a community that would be served by a bridge, etc.

From the beginning it should be clear that cost overruns are not possible and the local community should be made aware that the project will abandon an activity if the budget cannot be meet. In several places members of the team know of ICDP's that have resulted in open ended commitments for expenditures for water projects that will be difficult to justify in economic terms. Obviously some flexibility will be necessary, but we believe that the GMU will be better able to withstand community pressure than local organizations and will have to keep management control of such projects.

The GMU should have a core staff of locally recruited technicians to supervise infrastructure improvement grants. This will not be difficult to do as there are many qualified people with degrees in hydraulic engineering and other technical fields that are having difficulty finding work. Other specialties would include agronomist, foresters and others who could examine questions of opportunity costs of such projects. We recommend that the GMU identify qualified individuals and establish a rooster of local consultants for this program.

University / NGO Internship program

The university - NGO link is an important element in ICDP implementation in Madagascar. At virtually every site the team visited, graduates from the Ecole Superieur des Sciences Agronomiques (ESSA) of the University of Antananarivo were employed as technicians. Further, at a recent conference held at Yale University (Zack, 1991), a group of Malagasy researchers emphasized the importance of providing careers in conservation for Malagasy university graduates. The team recommends that the SAVEM project support the employment of Madagascar trained university technicians.

The SAVEM project paper suggested that five Malagasy researchers be supported directly by GMU. The team believes that reorienting this program towards NGO's and expanding it would promote the ICDP concept. WWF already has such a program and it has worked very successfully. Recruiting talented graduates in fields related to conservation has been helped.

We recommend that both local and international NGO's be eligible for this type of funding. Student travel and field support should be included. In additional to ESSA, regional universities such as Tulear and Tamatave could be included in ICDP field work. Students in health related fields should also be included.

The major criteria for the intern program would be that students work on problems facing an NGO implementing an ICDP. The NGO would identify a problem request proposals for research through the universities. Only students in their last two years of study should be allowed to apply. At ESSA most of the students would participate as part of their *memoire de fin d'etude*. Acceptable expenses for this activity include: transportation, library and literature review costs, and lodging and subsistence while at the field site. In is expected that the amount of money needed for each student in this program is small, only 1500 to 2500 dollars.

Geographical priorities for CAG grants should be established based on the following criteria:

- How much project activity is already in place? Generally CAG grants should be used for areas that do not receive PADG's, but this should not be applied inflexibly.
- What is the population density and is that population stable? The GMU should set a minimum number of beneficiaries per dollar per grant.
- Will the activity draw more people to the region and increase pressure on the reserve? In some cases such as road building, this is likely to happen, but the more important question is: can the impact of the activity be geographically restricted?

RECOMMENDATIONS AND CRITERIA FOR PADG FINANCING

Linking the PADG Grants to Conservation

To fulfill the SAVEM mission we believe that the PADG phase II grants should focus their activity on income generating activities that relieve pressure on protected areas. Conservation activities that increased protection should also be included in this program. The idea is to avoid the current pattern of ICDP's which consist of a conservation program with a development component that includes unrelated activities.

Key Features of PADG Phase II Grant Proposal

In addition to the above mentioned administrative and experience qualifications, organizations who submit a proposal for a PADG phase II grant should be required to demonstrate that the activity has a conservation link. The proposal should include the following features:

- Identify current or anticipated threats to biodiversity in the area;
- Describe how the proposed activity will address this threat or pressure;
- Show what benefits will accrue to the community from participation in the proposed activity;
- Illustrate how are villagers to become stakeholders - given a share of the resources in the peripheral area;
- Demonstrate how the organization will monitor the effects on biodiversity during the project period, either on its own or with the proposed Biodiversity Planning Service.

Activities and Priorities for PADG Projects

Based on the sectorial analysis that each team member completed, it will be necessary for phase II PADG grants to distinguish between those activities that generate income and those that respond to more general community needs. As discussed in the CAG section of the report, the time based strategy the team recommends means that activities not directly related to income generation will be included in the smaller CAG program. A model for income generation and empowerment of the local population has been presented by the team's forester and is contained in the appendix.

POTENTIAL ACTIVITIES IN THE PERIPHERAL ZONES

Recommended Activities in the Agricultural Sector

The team recommends that ICDP agricultural activities proposed for GMU funding should address the following priorities:

- Alleviating labor constraints in the *tavy* cultivation system, especially for weed control, should be the focus of agricultural improvement projects;
- Sustainable agricultural practices, especially those employing agroforestry techniques;
- Soil fertility improvement and soil erosion control;
- If reforms continue, SAVEM should explore legal services and advocacy as a means of improving the land tenure situation.

- New rice irrigation projects should be limited to areas with less than a six month growing season. In wetter areas, priority should be given to maintenance and yield improvements of existing projects.

- Renewal of perennial cash crops, especially those which have high returns to labor, should be adopted as a long-range strategy for income improvement.

We recommend that ICDP programs in the eastern forests focus on labor constraints. From reviewing current project activity and former extension efforts, the team agronomist concluded that there has been insufficient attention given to labor constraints in agriculture. He found that labor constraints are the most important factors limiting agricultural productivity at most of the sites that the team visited. Labor constraints also directly effect efforts to maintain soil fertility.

It should be mentioned that the team agronomist found that many of improved practices that were supposed to stabilize or improve the tavy system of agriculture, increased labor requirements. The continued attractiveness of traditional *tavy* is its competitiveness it terms of labor. Since *tavy* is considered the most serious threat to biodiversity in Madagascar's eastern rainforest, finding systems that can compete with *tavy* in terms of labor will be the best way of ending this threat.

Weed control on both irrigated and non irrigated land is the most labor intensive part of the agricultural cycle. Project activity will have to address this problem before the next factor, soil fertility is addressed. The team observed several experiments that aim to stabilize *tavy* and other forms of rainfed agriculture by focusing on conservation of soil moisture and fertility. While these improvements are needed, they oftentimes make weeding more time consume labor by provoking denser weed growth. Some technologies and practices that will help reduce labor demands are: improved access to animal traction, mulching, herbicides and better water control in bottom lands.

There has been work with resource-poor farmers that shows the effectiveness of herbicides in removing the labor constraint in subsistence agriculture. Because excessive weed growth is one of the main reasons to abandon a field and cut the forest to create a new field, it is important to help farmers develop a strategy to combat weed growth. The team recommends that SAVEM review its policy which prohibits the use of herbicides. Since local farmers already use some of the more dangerous insecticides and wealthier farmers already have access to herbicides, it is not likely that SAVEM will be introducing a new and dangerous technology.

Soil fertility is the second constraint to production and should be the second priority of projects to improve or stabilize agriculture in the peripheral zones. Of special interest are the traditional systems that we observed that or were told about that improve soil fertility. These included traditional methods of terracing, crop rotations and using natural vegetation as indicators. Most of these systems were only rarely used due to the increased labor demand. We recommend that projects explore ways these systems can be made more labor efficient.

Land tenure and access is a well documented problem observed in several locations. While in theory legal remedies exist for land tenure problems they are difficult to apply. land tenure problems are a major constraint in the Mount d'Ambre area, and in the village of Ambanytoaka next to the Betampona Reserve. At both locations land ownership is clouded by either colonial or recent commercial activities. Priority should be given to resolving this issue in projects that will operate in these areas. With these points in mind, we recommend that SAVEM explore methods of giving access to legal services and other forms of advocacy to secure land tenure. The current atmosphere of reform and the return of integrity to the court system is likely to favor such actions.

Irrigated rice projects as an alternative to *tavy* are currently, and will continue to be, one of the most frequently requested forms of assistance. Few of the many past irrigated rice projects are sustainable. The returns from rice production are not high enough to cover the cost of irrigation system maintenance, especially in areas where direct and indirect cyclone damage will require extensive repairs every few years. It should be pointed out that all of the sites proposed in the SAVEM project would be subject to such damage.

The team agronomist has also noted that in areas with rainy seasons over six months, the only agronomic reason for flooding the fields is weed control. From a strictly agronomic point of view the crude form of flooding and in field storage of rain water serves to save labor, but does not dramatically increase yields in these wetter areas. Also, there are a number of soil constraints, such as low soil fertility, soil acidity and soil erosion, which limit yields.

In the light of this evidence the team considered proposing an outright ban on financing new water projects, but realized this would be politically and socially impossible. Irrigated rice is one of the few activities that directly improves income. As a compromise we recommend that priority for construction of new water development projects be given to areas with rainy seasons shorter than six months. In wetter areas new construction should be avoided as much as possible and priority given to improving maintenance and yields of existing projects.

Cash crops have, in the past played an important role in providing stable agroforestry systems in areas near the protected areas the team visited. Their role as a source of income has dramatically declined recently with low world market prices given as the explanation. We believe, however, that the exploitative collection system might be more of a factor in this situation, since producer prices are only fractions of the export price.

Moreover, official corruption, until recently unmentionable, has surely blocked development of coffee, cloves and pepper. Most observers attribute the end of the coffee support and stabilization program in 1990 to embezzlement of funds.

Currently there are few resources available to renew plantations of cash crops. The team recommends that SAVEM projects provided support for cash crops where suitable. This would be a long-term approach, given the lengthy productive life of coffee and clove trees. In the thirty year life span of a coffee tree surely some improvement in prices will take place. At some locations ICDP nurseries growing eucalyptus trees of marginal value could be used to renew cash crops instead.

Priority Activities in the Forestry Sector

With respect to the Tropical Forestry sector, there are several factors to take in consideration: the apparent weaknesses in past and ongoing projects, demonstrated exploitative forest products marketing practices, and the DEF's inability to exercise its role as the guardian and stewards of the forests. This section of the report outlines the basic elements necessary to address these issues.

In the project documentation, the term forestry is used very generally. It does not seem to distinguish between the small scale village forestry programs as found in development programs in the Sahel and the commercially oriented tropical forestry that will be necessary to sustainably develop the vast tracts of high value hardwoods that border several of the protected areas in Madagascar.

In areas near Mt d'Ambre, Ankarana and Masoala developing the forests outside of the protected areas to provide income for the local population is possible. In contrast to small scale forestry activities

that will probably be promoted in places were the border forests are already gone, these areas could provided communities with significant economic development. A model for this type of activity based on observations near Maroantsetra is given in the foresters report. To accomplish this will require a high level of technical assistance and new marketing opportunities.

Currently an oligopoly of traders keeps prices received by small producers for virtually all primary products low, while at the same time ignoring or bypassing existing laws that might promote conservation. Somehow this impasse must be overcome and ways for a fair price to be received in an atmosphere of regulation. Any project activity that intends to develop forests for the benefit of the local population will have to find alternative marketing outlets.

One of our major concerns is that few of the current or potential NGO's involved in ICDP's in Madagascar have experience in the management of tropical hardwood forests. Tropical Forestry Management requires specifically trained and experienced foresters with actual tropical forestry experience. It is recommended that a private consulting firm, rather than an NGO, be used to employ and support tropical foresters that may be involved in SAVEM activities. There are a few private sector timber companies which have developed environmentally sensitive programs, and they may be able to assist in the efforts to avoid exploitative marketing of forest products.

To achieve these goals, NGOs will have to recruit professionals with specific qualifications - namely, experienced tropical foresters. Foresters who gained their experience in arid or savanna zones forests will have difficulty functioning in the rain forests of Madagascar. Experience in West African, Indonesian or South American rain forests would be most suitable. Also, it should be pointed out that employing foresters with relevant tropical forestry experience will require paying higher salaries than most NGOs are accustomed to.

NGO's working on the Masoala, Ankarana or other areas that are heavily forested outside of the protected areas should review programs relating to management of tropical hardwoods in other countries and explore the possibility of a linkage with a private sector operation. The yet to be elaborated Timber Board might form another way of freeing forest based income generation from the current constraints.

NGO's will also have to assess the level of infrastructure necessary to support different technical options. Simple pit saw operations on steep terrains would not require roads or heavy equipment, while even a portable saw operation would require a much higher level of infrastructure and investment. Other factors would be based on slope road access or boat access and the value of the resources. Also the type of forest and density of desirable species should be addressed in proposals this sector.

The forester's report also outlines problems with the government agencies involved in forest protection and how this might be addressed in community forest management. One of the key criteria of any effort in tropical forest production should be that the villagers become significant beneficiaries from their forest management and conservation efforts. At present, the money they receive for selling their valuable tropical hardwoods is a very small fraction of the world market price. Also, these programs need to be composed of site specific field-based activities, rather than being only policy and legislative changes.

Small Scale Business Opportunities

Small Animal Raising: Small animal production is one activity that can increase farm revenue and improve household dietary intake. From a conservation perspective, animal raising can reduce the

need to hunt wild game in the forest which is currently practiced in sites visited. In Mananara, a model farm has been built to demonstrate improved small livestock raising practices (i.e. chicken coops with raised floors, improved feed, and animal enclosures). Seasonal vaccinations by SAFAFI in Mosoala and the Biosphere Project have decreased the mortality rate of chickens. Such interventions reduce the risks in livestock raising and improve the health of animals. Rather than introducing other types of small animal production, projects should concentrate on improved animal raising techniques of existing production systems, such as ducks, chickens, and geese that are adapted to local climatic conditions and are already consumed by the population.

Eco-Tourism: As mentioned in the business opportunities section of the report, eco-tourism has the potential to be one of the greatest income generating activities in peripheral zones. Local villagers, hired as guides and porters, could directly benefit from the reserves and would thus have more incentives to preserve the flora and fauna. Tourists would purchase goods from village stores thus aiding the local economy.

During the visits to parks and their peripheral zones, the assessment team encountered several tourists. Most were young Europeans or South Africans travelling for three to four week periods and were equipped with backpacks and camping gear. The main attraction of their expeditions was having the opportunity to explore wilderness areas. Tourism in the parks should be geared toward visitors looking for these types of experiences. Package deals could be advertised with a description of main attractions of each park, cost, and approximate number of days it would take to visit two or three different protected areas.

Marine Fishing and Aquaculture: On the Masoala Peninsula, there is great potential for villagers to generate income by fishing in and off the reefs. The high risks of fishing in the open ocean could be reduced if sturdier boats were constructed and if fishermen placed outriggers on their canoes. In Antahala, a Catholic fishing cooperative was formed in 1984 that communally owns motorized fishing boats. Fuel and spare parts are paid for with income generated from their catch. Fishing nets and lines are locally made by cooperative members. Fishing cooperatives should be encouraged in other villages along the coast by providing local fishermen with information on how to construct sturdier canoes and make stronger nets and lines.

In parks located inland, aquaculture would be a viable additional income generating activity in villages. In Betampona, SAF, has experimented with building fish ponds, only to see them destroyed during a recent flood. Building fish ponds is very laborious, consequently, the ponds have not yet been repaired. A less labor intensive alternative to maintaining separate fish ponds would be to raise fish in irrigated rice fields. Fish could be harvested at the same time as rice, thus saving on labor inputs and increasing the value to the cultivated land.

In Masoala, coastal areas provide excellent fishing potential and small fishermen interviewed in Antahala estimated that they could earn up to 15,000 Fmg per day from a good catch. This is three times the local timber exploitation wage per log, yet many villagers prefer to fell wood for commercial loggers. As one villager explained, "a tree can't get away" and the financial rewards from fishing do not out way the risks involved from canoeing in the turbulent waters off the coast. If sturdier outrigger canoes were introduced, however, more villagers would be inclined to fish.

Rural Credit: Both the agricultural economist and the macro-economist believed that offering credit could help unblock transportation, marketing and production constraints. Detailed descriptions of these plans are given in the final report of these team members.

Health Sector Priorities

We recommend that the ICDP's health sector activities should apply the following guidelines outlined by the team physician:

- Focus health sector activities on improvement of drinking water and malaria treatment.
- Provide support for existing community health facilities.
- Support should be provided for Ministry of Health Vaccination programs.
- Family planning should be an ancillary activity.
- As much as possible, SAVEM health programs should be implemented by organizations already active at the sites.
- Health studies should be directly linked to specific diseases, not general surveys.

The team would like to emphasize the importance of health issues in the ICDP concept. Often thought of as an ancillary activity, only weakly linked to either development or conservation, our observations and available literature indicate there could be little, if any, economic development in the peripheral zones if the current health situation continues. We believe that the simplified program recommended can be carried out under the CAG grants.

In several instances the team physician found situations that would probably be considered emergencies in other countries. In the isolated Mananara district, malnutrition is so common that Kwashiorkor and marasma are widely observed in child. In the same area, epidemiology studies (IPM 1990) found that over 46% of the children were infected with bilharzia. Malaria is pandemic in all of coastal Madagascar, and in the Antsirana area, more than 40% of deaths are from malaria. In 1990 a nearly catastrophic dysentery epidemic went through the Tamatave province.

The economic effects of this widespread morbidity are all too evident. In the survey that the team administered, health problems were frequently cited as a constraint to agricultural production. This worsens the already serious labor shortage. In a study of women's time utilization in a village near the Beza Mahafaly Special Reserve (Maille, 1991) found that being sick or caring for ill household members was the second most important use of time after meal preparation.

In some cases proximity to wildlife has been found to have a negative impact on human health. Fotenille et al. (1988) found that *Lepilemur edwardsi* and *Caracopis vasa* were a reservoir of infection for mosquito transmission to humans of several types of fever producing viruses. The team was told informally that recent serological studies in southwestern Madagascar have raised the possibility that lemurs may be a reservoir of malaria.

As serious as these problems are the team physician believes that even a modicum of intervention could dramatically improve the situation. Concentrating health activities in the area of potable water and treatment of malaria could address these problems at relatively low cost.

At a minimum the community health facilities near the reserves should be rehabilitated and supplied with essential medicines. Project collaboration with existing Ministry of Health vaccination programs would have long-term benefits. These activities could be tied to health education.

Much interest was expressed in family planning during group and individual interviews, so much so that the team physician gave a talk on the subject to women in the village of Anbondrafia. She recommends that SAVEM projects include family planning to respond to this demand.

At most sites that the team visited, at least one organization was working in the health sector. These organizations might form the bases of health activities under SAVEM. Cooperation with existing organizations should be required for grantees in the health sector. One local NGO, FI-KRI-FA-MA already has developed potable water programs that could serve as models for SAVEM.

The broad base line health studies that the project documentation suggests seem unnecessary since, the team has recommend highly focused programs. There is little point in gathering large amounts of data that will not be used in ICDP's. Focused studies on individual diseases, malaria, dysentery and nutritional problems are recommended to gage project progress.

Social Factors Related to Natural Resource Use

Recommendations and guidelines for social factors of ICDP's grants should include:

- For better or worse, in most cases the approval of traditional leaders will be necessary for project activity.
- Wherever possible projects should find common ground with local customs and traditions.
- In most places a malagasy social scientist will be necessary to have a full understanding of the cultural environment at specific project sites. Short term expatriate technical assistance does not seem appropriate in developing site specific information for project implementation.
- Public awareness programs are necessary to assure that villagers understand project goals and activities.
- Openness in budgeting and policy matters at the local level will help the public to accept the ICDP concept.
- Technical conservation and vocational training should be part of the system of formal education.
- Project assistance to school building projects should be limited to finishing materials for buildings.

BIODIVERSITY FACTORS FOR PADG GRANT CRITERIA

In developing criteria for linking conservation with development several factors were taken into consideration: the non-resilient nature of Madagascar's ecology and the evidence that small core areas can conserve biodiversity if offered strict protection.

The team recommends that no economic activity, other than tourism take place in the protected areas and that SAVEM support strict protection in the core areas. In summary, we believe that GMU criteria for biodiversity should:

- Maintain the preservationist model for the core of protected areas using existing boundaries.
- Focus attempts at extraction of forest products outside of the protected areas.
- Develop a plan for biodiversity monitoring depending on the final form of the SAVEM biodiversity planning unit.

The models of extractive reserves and other concepts to "develop an income stream from the protected areas to local communities", as called for in the SAVEM project paper, does not conform to the scientific evidence on Madagascar's ecology. In Appendix L there is an extensive discussion of this issue. The conclusions on this matter contradict the "SAVEM Project Philosophy" given in the project paper and current USAID thinking, and it is important that this information be used to the AID Mission and SAVEM staff to re-focus their thinking on these issues and expose themselves to additional information.

BASELINE DATA AND KEY ELEMENTS FOR BASELINE STUDIES

Given the recommendations that ICDP's emphasize income generating activities that relieve pressure on biodiversity, the team recommends that the baseline data collected under the GMU grants include three basic elements: Household income changes, improvements in health as indicated by a decline in the diseases, and changes in patterns of natural resource use.

Collecting the baseline data needed to monitor project progress will pose a challenge to both the GMU and its grantees. The social monitoring called for in the project paper would have used a system of control villages which would be subjected to interviews without participating in project activities. This does not seem to be a workable concept. The social forester's report lists extensive methodologies for collecting data on natural resource use as an alternative to the methods suggested in the project paper. In his report, the agricultural economist has set out criteria for measuring agricultural production indicators other of household income. Recommendations for health baseline data are given in the physicians sectoral report.

Monitoring of biodiversity was not mentioned in the teams scope of work, but it will be such an important factor in assessing the success of the GMU/SAVEM project that it should be discussed here.

A major assumption of the SAVEM project is that habitat loss is the major problem for biodiversity on Madagascar and that the this loss is due to clearing for agricultural land and grazing of animals in forests. Commercial logging appears to play a significant but less easily measured role in biodiversity loss. Also, informed observers have stated that hunting has only minimal, if any, impact on biodiversity losses. The question is whether these generalizations are true for specific protected areas. For example, if commercial logging in some areas is really the most important factor in biodiversity loss, then SAVEM activity that emphasizes agriculture will offer little relief from pressure on protected areas. Therefore, the team recommends that, whether done by the grantees or the Biodiversity Planning Service, biodiversity monitoring should gather data that relates the pressure on the protected area directly to the SAVEM activities.

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ATTACHMENT 1

CONSERVATION ACTION GRANT CRITERIA

CONSERVATION ACTION GRANT CRITERIA[1]

What is Conservation Action Grant?

USAID has mandated the Grants Management Unit to measure two types of grants, the Protected Area Development Grants (PADGS) and Conservation Action Grants (CAGs).

The first type of grant, the Protected Area Development Grant (PADG), is to develop and implement plans for the joint, interactive management of development and conservation efforts in selected protected areas (PAs), and in the communities. These will be large grants which will integrate conservation activities in the protected areas with development activities in peripheral zones. These grants will be limited to Priority I protected areas (as defined in the PAE) with most likely sites being Montagne d'Ambre, Masoala, Ranomafana, Zahamena, Andohahela and Mantadia.

The second type of grant, the Conservation Action Grant (CAG), is a smaller grant for locally initiated conservation and development related actio' ; within or in proximity to one of the 50 protected areas located throughout Madagascar. These grants are intended to support activities by indigenous groups or, in certain cases, individuals. CAGs be used for international as well as national organizations. CAGs should be used for activities designed to have the maximum impact in the shortest possible time (up to one year). It is expected that the amount of CAGs will range from $2,500 to $50,000, with most falling in the $10,000 to $25,000 range.

A wide range of acceptable activities can be funded to enhance the preservation of the protected areas and their peripheral zones. Examples of acceptable activities would include but not necessarily be limited to:

- Income generating activities designed to raise peasant's income;
- Health activities designed to improve the health status of peasants thus rasing their productivity);
- Bridge or road construction designed to open up inaccessible areas to markets;
- Educational programs or school construction;
- Revolving fund designed to raise peasant's income;
- Ecotourism activities designed to generate income.

Generally, all project activities should be community oriented. This means that the communities should be closely involved in the identification, design, implementation and follow-up of the proposed activity and the benefits must be for the community as a whole.

The number of grants that an organization can receive at any one time will depend upon its size, experience and administrative capacity. In most cases, grantees are excluded from receiving more than

[1] Criteria developed from the report The Broken Forest: Applying the Integrated Conservation and Development Paradigm to Madagascar's Protected Areas.

one CAG at a time. However, additional grants would be possible based upon the relative success and management of the initial grant.

Where can CAGs be Given?

CAGs can be given only for activities within or in proximity to any one of the 50 protected areas designated by the PAE (see attached list of PAs). There may be additional geographic restrictions and criteria, and these will be decided at a later date.

CAGs will also made available to those PAs that have benefitted from PADG or other project funding, but the number of CAGs will be limited, if necessary, in order to avoid an over-concentration of the benefits in any one particular PA.

The actual geographical location of the PA will also be taken into consideration in making grants, particularly for certain activities such as income generating projects that would depend upon the accessibility of markets.

What are the Priority Activities for CAGs?

- Health and family planning
- Infrastructure
- Education
- Income-generating activities
- Potable water
- Agriculture
- Irrigation
- Animal traction
- Agroforestry
- Soil conservation
- Village forestry activities
- Aquaculture
- Ecotourism activities
- Construction of health and education facilities

What are Unacceptable Activities for CAGs?

- Construction of offices and other institutional infrastructure
- Activities requiring a high input of non-local materials
- Recreational facilities
- Activities that necessitate the purchase of vehicles or motorcycles

Who is Eligible to Receive a CAG?

As stated above, CAGs are generally intended to be community-based and to provide benefits to the community as a whole. As such, there are a wide range of organizations that could be eligible:

- **Community groups** (village groups. women's groups, youth groups)
- **Local associations** (environmental groups, Red Cross)
- **International NGOs** (although priority will be given to Malagasy NGOs and organizations.
- **Religious organizations** - if they neither discriminate on the basis of religion nor use project activities as a means of proselytizing.

Who is Not Eligible to Receive a CAG?

CAGs are meant for NGOs and non-profit organizations. In general, government entities, profit-making enterprises and individuals are not eligible for CAGs.

However, under exceptional circumstances, grants could be made if the government entity, profit-making organizations or individual were to act as a catalyst to assist the local community develop and execute project activities designed to accrue substantial benefit the community as a whole.

What Institutional Criteria Must an Eligible Organization Meet?

Although many types of organizations could be eligible for CAGs, the awards will be made only to those organizations that meet the following criteria:

- **Institutional History.** The local implementing organization should preferably be a firmly established, viable organization.
- **Legal recognition.** The local implementing organization must have legal statutes or at least some sort of recognition by the Malagasy government (e.g., approval of project activities by the local authorities).

- **Domain-specific track record.** The local implementing organization should have at least one year's on-the-ground experience in implementing development activities similar to the proposed activities.

- **Administrative capacity.** The local implementing organization must have a history of previous and adequate fund administration. A trained accountant must be available to maintain the project's book and do financial reporting.

- **Grass-roots based organization.** The local implementing organization must have developed a positive relationship with the local population.

These criteria will be applied much more rigorously to organizations requesting larger grants than to organizations requesting relatively small grants.

What Technical Criteria Must Project Proposal Meet?

Project activities should be limited in scope and attempt to address the most significant problems or constraints of a community as determined by that community.

The following technical criteria will be applied to all projects to evaluate their technical soundness:

- **Environmental Soundness.** The proposed activity must be environmentally sound. This will be demonstrated by the Initial Environmental Examination (IEE) conducted by the USAID Environmental Officer.

- **Technical Soundness.** The proposed activity must be technically feasible. This should be shown in the proposal by a step-by-step description of the tasks, materials, and labor required to complete planned activities.

- **Economic Soundness.** The proposal must give evidence that the investment required by the activity will result in higher levels of output that would justify the investment.

- **Participation by Women.** Women must be actively involved in all phases of the project as well. Projects that do not encourage substantial participation by women will not be eligible for funding.

- **Social Equity.** The benefits from any project activities should accrue to the community as a whole and should not be unfairly concentrated in the hands of a few individuals or village elites.

What other General Criteria Must the Project Proposal Meet?

- **Simplicity and avoidance of risk.** The proposed activities should not only be simple, but they should also entail low risk to the participants (particularly farmers and other risk groups).

- **Use of local resources.** Proposed activities should use a maximum of local resources and a minimum of non-local or imported resources.

- **Rapid realization of benefits.** The benefits from proposed activities should be realized as short a time as possible.

- **Local participation.** The community must provide some material support for the project (e.g., materials, labor, etc...) equal to at least 10% of the total value of the project.

- **Self-Reliance.** The proposed activities must increase the self-reliance of the community to the community and decrease their dependance upon outside inputs.

- **Continuity.** The proposed activity must be such that it can be replicated in other locations with a minimum of outside assistance.

- **Proportionality.** The amount of funds requested should be proportional to the area of influence and the number of beneficiaries of the project.

PROTECTED AREA DEVELOPMENT GRANTS

GUIDELINES FOR PROPOSAL REVIEW

The following Protected Area Development Grant (PADG) Phase II proposal review guidelines are based on the Preliminary Assessments Synthesis Report[2], the SAVEM Project Paper and input from SAVEM committee members, GMU staff, and representatives from the conservation community in Madagascar.

Background

The philosophy of the PADGs is to promote conservation in protected areas 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.

The purpose of the PADGs is to develop and implement plans for the joint, interactive management of development and conservation efforts in selected protected areas, and in the communities adjacent to those areas (often referred to as peripheral zones). These plans will include not only measures to protect endangered species and virgin forest, but also more effectively local community involvement in resource management.

Field activities financed by these grants thus will link two major domains of action traditionally carried out separately; one cluster of activities conventionally associated with forest protection and another conventionally associated with economic development.

Each Grant is expected to run for a period of three to five years.

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[2] The Broken Forest: Applying the Integrated Conservation and Development Paradigm to Madagascar's Protected Areas.

I. General Conservation/Development Criteria

1) Conservation/Development linkage

- Potential grantees must state how they propose ensuring a linkage between the enhanced economic activities made possible by the development component and the enhanced protection/management activities required by the conservation component.

To fully address the linkage of conservation with development, the proposal should include the following features:

- Characterization of the natural area, identifying zones within the area of particular conservation interest:
- Identification of current or anticipated threats to biodiversity in the area in order of priority;
- Description of how the proposed development activity will address the threats of pressures;
- Description of how villagers are to become stakeholders - given a share of the resources in the peripheral area;

2) Sustainable economic development

- The proposal should clearly indicate an awareness of the economic aspects of forests use and how sustainable economic development alternatives will be promoted.
- PADG grants should recommend alternative activities to current or potentially destructive practices of the local population.
- Priorities for alternative activities should be to: reduce labor, reduce inputs or significantly increase income of villagers.
- The proposal must indicate how a more ecologically and economically sustainable relationship between communities or individuals and their environment will be encouraged.

3) Environmental Soundness.

The proposed projects must be determined to be environmentally sound, conform to Madagascar's Environmental Action Plan and must meet AID's Initial Environmental Examination.

II. Geographical Criterion

PADG grants will be limited to level I protected areas (as defined in the Environmental Action Plan) and their peripheral zones. A functional (rather than strictly geographical) definition of a peripheral zone may be used which will takes into account the source of the threat to the protected area.

III. Criteria for Participating Organizations

Proposals should be submitted jointly by at least two organizations, at least one which should be a Malagasy NGO. The lead organization will receive the grant from GMU and will subcontract with the other organization(s).

1. Field experience. The lead organization must have a minimum of five years field experience in successful project implementations either in Madagascar or another developing county. At least one of the organization must have previous experience in mobilizing and working with community groups.

2. Administrative and logistical capabilities. The lead organization must have a history of previous and adequate fund administration. A trained accountant must maintain the project's books and prepare financial reporting.

3. Participating organizations contributions. Participating organizations should financially contribute to the projects for which they receive funds from GMU.

IV. Project Activity Criteria

1. Use of local resources. The proposal should address how utilization of locally available materials will be maximized in conservation/development activities to the extent that it can be done on a sustainable basis.

2. Land and resource tenure. The proposal should look at the local land tenure issues as they relate to the proposed conservation/development activities.

3. Technical Assistance. Where technical assistance is required, Malagasy technical assistance should be used the greatest extent possible. The use of expatriate technical assistance should only be used when not available in country and a justification for this should be included in the proposal.

4. Appropriate Technology. The technology chosen for project activities must be appropriate to the needs and capabilities of the villagers and must be serviceable at the community level.

5. Simplicity and avoidance of risk. The proposed activities should not only be simple, but should also entail low risk to participants (particularly farmers and other high risk groups). This does not preclude experimenting with possible high risk and will be borne by the project and not the intended beneficiaries.

6. Self-Reliance. The proposed activities must increase the self-reliance of the community and decrease their dependence upon outside inputs.

7. Continuity. The proposed activity must be such that it can continue to provide benefits to the community after the project has ended.

8. Proportionality. The amount of funds requested should be proportional to the size of the project area, the number of intended beneficiaries and the importance of the area from a biodiversity perspective.

9. Local participation. Communities must provide a local contribution (e.g., materials, labor, etc...) for all project supported activities from which they benefit directly. The nature and amount of the anticipated local participation should be outlined in the proposal.

10. Technical soundness. The proposal must document that the proposed activities are technical 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.

11. 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.

12. Community participation. All elements of the community, particularly women and young families, must be actively involved from the start in all phases of the project (problem identification, project design, implementation and evaluation).

13. Social equity. The benefits from any project activities should accrue to the community as a whole and should not be concentrated in the hands of more powerful individuals or village elites. This does not preclude individuals from receiving benefits from project activities as long as those individuals are not receiving a disproportionate share of the benefits.

Consequently, the proposal should outline what benefits are anticipated and how they will be distributed.

14. Targeting. The proposal should demonstrate that groups which most directly impact conservation are included in project activities.

The proposal should also explain how those suffer the cost of conservation (i.e., from conservation-imposed constraints) will be included among the primary beneficiaries of any project interventions.

V. Conservation Criteria

Proposals must include a park management plan developed in collaboration with ANGAP in which the following issues will be addressed as appropriate.

1. Establishment of peripheral and buffer zones. In collaboration with ANGAP and DEF, plans for the determination of the protected area's peripheral and buffer zones must be presented.

2. Park facilities. Proposals must include staffing requirements for the management and monitoring of the protected area. Plans for their selection, training and supervision should be presented, including an organizational chart.

4. Park protection. Proposals must include provisions for anticipating and responding to violations of protected area regulations.

VI. Monitoring and Evaluation Criteria

1. Socio-economic impact monitoring. All proposals should include a socio-economic impact monitoring plan. This plan should be developed in collaboration with ANGAP and should provide for the initial collection of baseline data to include elements such as household income changes, improvements in health as indicated by a decline in diseases, changes in patterns of natural resource use, or other relevant indicators.

2. Ecological impact monitoring. All proposals should also include an ecological impact monitoring plan which should be developed in collaboration with ANGAP and should provide for the initial collection of baseline data appropriate to the natural area.

3. Internal project monitoring and evaluation. Proposals should include a plan according to which project progress towards realizing its objectives is to be measured and evaluated.

The Broken Forest:

Applying the Integrated Conservation and Development Paradigm to Madagascar's Protected Areas

Volume Two: Appendixes

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APPENDIX A

SCOPE OF WORK FOR THE SAVEM ASSESSMENTS TEAM

PRELIMINARY ASSESSMENTS

Design

Step One of the Preliminary Assessments

Objectives:

- confirm the selection of sites (from the two above lists)
- delineate the peripheral zones for the purposes of SAVEM-financed ICDPs (ANGAP's help)

In order to delineate the areas it is necessary to develop a working definition of "peripheral zone." For practical purposes we are using the following working definition proposed by ANGAP's Technical Advisor:

True Buffer (zone 1):	an area contiguous to legal boundary of a protected area, unpopulated, and where there is no agricultural activity. Strictly controlled culling of species is allowed in such areas.
Peripheral Zone (zone 2):	an area contiguous to legal boundary of a protected area or to a "true buffer." Such areas are populated, and agriculture is permitted. Certain restrictions and requirements regarding productive activity apply.
Secondary Peripheral Zone (zone 3):	a geographically distinct area in which an activity can contribute to either protection or destruction of some aspect of a protected area.

Step Two of the Preliminary Assessments has as objective the collection of data to:

- enable the design of ICDPs,
- help assess proposals for subgrants
- provide baseline for future project evaluations, and
- determine the indicators by which impact will be measured.

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This will involve:

- determining ecological profiles of the peripheral zones, highlighting the ecological challenges specific to each one;
- performing rapid rural assessments of the communities in the peripheral zones
- conducting surveys of natural resource management/exploitation practices, constraints to increased production, and potential economic activities in the peripheral zones
- conducting surveys of the institutions active in the peripheral zones including assessment of their capabilities and methods of operation, community relations, interventions.

Execution

This is a complex activity requiring careful timing and coordination, and will take place from mid-January through March 1992.

On-going A.I.D.-financed protected areas projects at various stages in implementation will receive continued financing through the GMU (Phase I PADG grants) through the assessment period. This is to cover their immediate funding needs during redesign and restructuring as per SAVEM's ICDP framework, as funding provisions for some of these projects expire during the time-frame in which Step Two is scheduled to be executed, - i.e. before the ICDP design elements and subgrant criteria are developed.

As the operators of these projects have skills and experiences that can be of great value to Step Two objectives, GMU proposes to learn from these skills and experiences to benefit ICDP planning and design to the advantage of all the sites. We will do this by making the redesign/restructuring activities an integral part of Step Two in the following ways:

- A Phase I Grant to each of the operators to cover:
  - operational costs at on-going project sites for six months as of January 15, 1992 (to maintain community relations, and to avoid the high cost of complete demobilization and re-start);
  - a technical consultant, **selected by the operator**, to be responsible for on-site evaluative review and liaison (technical level) with GMU specialists (to ensure that the operators' experiences and opinions on redesign are well represented in the assessment activity)
  - technical experts (to be supervised by the technical consultant) to study and redesign the project as per an ICDP approach.
- A team of specialists will be hired by GMU from January 15 through March 15, drawing from local, U.S. and third-country expertise. The team will be divided into groups, each one visiting one on-going project site and other sites of importance such as the Tavy Research Center and the research/education facilities at Beza Mahafaly before being installed at their designated "new" site. They will file site reports (data, findings) and recommendations for

ICDP design. The work of these teams at the new sites will be similar to that of the operators' technical experts at the ongoing sites.

Coordination of Work and Information

The Chief of Party will provide coordination.

Working closely with the PADG and CAG Managers at GMU, an ICDP Specialist will be engaged during January 15 - March 30 for two sets of tasks:

1. Regarding the assessments by the technical teams at the new sites, this individual will:
   - review all site reports and recommendations as they are filed,
   - help organize data as it becomes available,
   - assist in the development of PADG and CAG criteria as per SAVEM objectives of integrated conservation/development and sustainability, and
   - help ensure, on the technical level, oversight of the specialists; field activities.
2. The ICDP Specialist, with GMU's PADG and CAG Managers, will assist the operators' technical consultants and project management staff to ensure that the assessment/design work at new sites and the redesign efforts at ongoing sites contribute together to a consistent ICDP approach. Regarding the redesign work by the operators' technical teams at ongoing sites, therefore, the ICDP Specialist will meet regularly with the operators in Tananarive to:
   - provide consistency (in approach) for the redesign of their interventions where appropriate as per ICDP guidelines;
   - to identify role(s) for partners (local as well as international);
   - to determine the capabilities required on the part of partners.

(The operators will solicit proposals for PVOs and NGOs interested in entering into partnerships to implement the redesigned interventions. The operators will make their own selection of their partners from the proposals, and will submit grant requests to GMU for SAVEM Committee approval for Phase II Grants in June, before the expirations of their Phase I Grants.)

Throughout this exercise GMU will hold regular coordination meetings with ANGAP to provide information and solicit input.

The site reports and recommendations regarding "new" sites, accompanied by SAVEM ICDP requirements, will also be made available to PVOs and NGOs. This will be done locally by GMU and in the U.S. by PACT Headquarters through a standard bidding process to solicit gant requests supported by concept papers (to GMU for SAVEM Committee approval) for Phase I Grants.

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GRANT REQUESTS REVIEW/DISBURSEMENTS

During the April-June quarter GMU sill be receiving requests for three categories of grants:

- from operators of on-going project-sites, **re-designed projects proposed for Phase II PADG grants** (expected in June);
- from PVOs/NGOs interested in the "new" sites, **concept papers proposed for Phase I PADG grants** (expected May/June);
- from all qualified parties, **projects proposed for CAG grants** for peripheral zones of any of the 14 priority-one protected areas (expected April/May/June).

GMU staff will evaluate each proposal on its technical merits, and will also conduct a pre-award audit of those organizations whose proposals are determined by GMU to be technically sound. This is to enable GMU to attest, to the SAVEM Committee, as to the grant requestor's ability to manage U.S. Government funds or alternatively to describe the training or administrative strengthening program that will be required in conjunction with the grant if approved. The technical evaluations will include joint reviews with ANGAP staff to ensure each proposal's relevance in the context of other protected areas activities.

The SAVEM Committee will meet to review and approve grant requests on a monthly basis beginning April.

Grant funds will be disbursed to grantees on quarterly basis against a preapproved spending plan submitted as part of a proposal's budget section. Financial reports will be required also on a quarterly basis for review before the disbursement of each tranche. (Please see Appendix 2: "GMU Manual of Management, Accounting and Grant Administration Systems" for details, including regular audits of grantees and financial controls.)

During the July - September quarter GMU will continue to receive proposals for CAGs. Proposal evaluations and SAVEM Committee meetings will continue on a monthly basis as described above.

During the October - December quarter GMU will receive proposals for two types of grants:

- CAG proposals will be continuously received;
- Proposals for Phase II PADG funds (for "new sites").

Proposal evaluations will be conducted and SAVEM Committee meetings will continue as described above. It is expected that Phase II grants for the "new sites" will be awarded by December 31, 1992, with disbursements to begin January 1993.

APPENDIX B

ECONOMISTS PRELIMINARY ASSESSMENT

Pépé Andrianomanana

Evaluation préliminaire des Aires protégées

Mission SAVEM/GMU à Diégo - Montagnes d'Ambre - Fév-Mars 1992

Rapport "Economie" par Andrianomanana Pépé

Objectif du rapport:

Ce rapport vise à caractériser l'économie régionale et comprendre l'économie des zones périphériques aux Aires protégées et l'économie des Ressources naturelles dans le cadre de la dynamique économique régionale. A cet effet, il comprendra 3 parties:

- Images macro-économiques de la région.
- Tendances récentes, potentialités et contraintes de l'économie régionale.
- Potentialités et contraintes des zones périphériques.

1 . Images macro-économiques de la région.

La région ici considérée est celle constituée par les Fivondronana de Diégo I et de Diégo II (Ville de Diégo), dans laquelle sont situées les 3 Réserves Spéciales des Montagnes d'Ambre . Elle peut être caractérisée par les traits suivants:

- Une micro-région "enclavée", c.à.d. à prédominence productions vivrières, dans la région exportatrice qu'est le Faritany de Diégo;
- Une zone d'immigration, à faible densité démographique;
- La ville de Diégo en est le principal pôle urbain et économique.

L'occupation du sol dans Diégo II et les Fivondronana limitrophes fait apparaitre la spécificité de Diégo II:

en %

	Diégo II	Ambilobe	Ambanja	Vohémar
Cultures vivrières	88,0	53,5	37,0	52,0
Cultures de rente	0,5	7,5	48,0	43,0
Cultures industrielles	8,0	37,0	8,0	2,0
Fruits et légumes	3,5	2,0	7,0	3,0

La densité démographique de Diégo II est de 9 hab/km2, contre une moyenne de 20 hab/km2 pour l'ensemble du Faritany:

	habitants/km2
Faritany	20
Diégo II	9
Ambanja	6
Ambilobe	42
Vohemar	20
Nosy Bé	87

Cette faiblesse de la densité démographique était trés perceptible au cours des descentes sur terrain.

Plusieurs fokontany visités sont à majorité immigrés. A Sakaramy, par exemple, les Antandroy et les Antaimoro (ethnies du S.E.) représentent 80% de la population, contre 20% d'Antambongo, les "tompon-tany" ("propriétaires de la terre"). Le cas des fokontany aux bords de l'Ankarana est, cepeendant, different. A Ambondromifehy, par exemple, les Antakarana sont majoritaires.

La ville de Diégo, la "Métropole du Nord", est le principal pôle urbain de la Région. Elle remplit différentes fonctions:

- Centre administratif, en tant que siége des services centraux du Faritany;
- Centre portuaire, le quatrième port malgache, devancé par son voisin, le port de Hell-ville de Nosy Bé;
- Centre de Construction navale: La nationalisation de la D C A N , l'arsenal de la base francaise, a donné naissance à la Société d'Etude, de Construction et de Réparation Navale (SECREN). Sa principale activité est la réparation navale, suivie de la construction navale, auxquelles s' ajoutent des activités dites de "diversifications": atéliers mécaniques, bois, plus une fondérie. La SECREN représente, à elle seule, un pôle économique avec ses 1200 employés, ses 400 à 500 journaliers, ses 7 milliard d'achats annuels, les dépenses des ménages de ses salariés.
- Centre industriel: On y récence une vingtaine d'industries alimentaires, une dizaine d'industries du bois et dérivés, deux savonnéries.
- Centre de Consommation des produits de la fôret: charbon de bois, bois de chauffe, bois de construction, fruits, qat, plantes médicinales. On récence à Diégo 5 à 6 exploitations commerçiales du bois; mais ce sont les données récentes sur la consommation de charbon de bois et de bois de chauffe qui revèlent mieux les relations entre les ressources naturelles et l'économie de cette Région:

en tonnes

	Charbon de bois	Bois de chauffe
Diégo I	8726,2	8775,3
Diégo II	1202,8	31140,6
Région Est Far Diégo	15675,8	144637,8

Il s'agit de consommation annuelle. La "Région Est du Faritany de Diégo" regroupe les Fivondronana de Diégo I, Diégo II, Ambilobe, Ambanja. Sur la base de 150F le kilo, prix éstimé à Diégo-ville, ces consommations de charbon représentent les "chiffres d'affaires" suivants:

en millions FMG

Diégo I	1309,0
Diégo II	180,5
Région Est Far Diégo	2351,1

2. Tendances recentes, potentialités, et contraintes

2.1 On note, en premier lieu, que l'économie régionale a béneficié d'une tendance favorable des investossements au cours des cinq dérnières années:

- La réhabilitation de la SECREN, sur credits de la CCCE (France) a entrainé une multiplication de son chiffre d'affaires par 7,celui-ci passant de 2 à 15 milliard de FMG entre 1985 et 1991. 85% de ce chiffre d'affaire sont desormais réalisé avec les thoniers.

- Des investissements ont été également réalisés dans divers secteurs: Banques (agence BMOI) , Industries des pêches(Pêches et Froids O.I.), Autres industries légères(savonnerie, montage de bicyclettes, fabrication de clous).

- Surtout, les potentialités touristiques de la région commencent à être réconnues. Ainsi, des projets touristiques et hotelliers ont été mis en route: Hotel Triskel et Hotel Haberger, sur financements Banque mondiale et privés locaux; projet hotellier allemand à Ramena; Hotel Savanna-Pullman(réhabilitation des bâtiments de l'ancienne Amirauté).

2.2 Les potentialités pour un développement futur existent dans la Région:

- Elles sont considérables sur le plan du Tourisme: Parcs nationaux, Baies et plages magnifiques, existence de vols réguliers d'Air-Madagascar;

- Possibilités, également, de développement des cultures maraichères, pouvant satisfaire les bésoins des nouveaux hotels;

- Existence d'un marché local potentiel pour des industries de tranformation additionnelles;
- Enfin, il existe un potentiel non négligeables en superficies agricoles.

2.3 Les contraintes majeures se situeraient dans les secteurs des transports et de la formation des prix:

- La dégradation du réseau routier se traduit par coûts prohibitifs du tranports. Ainsi, la comparaison de ces coûts dans le Faritany d'Antananarivo et dans la Région étudiée fait apparaitre les differences suivantes:
  - Antananarivo-Antsirabé(160 km) : 35 Fmg/kg
  - Diégo-Ambilobé (140 km) : 100 à 200 Fmg/kg

Cet écart considérable s'explique par l'etat des routes, mais aussi par l'insuffisance de l'offre de transport, et donc par une situation de monopole de facto dans ce secteur. Ce monopole resulte des coûts élevés des investissements et de la maintenace, mais aussi de l'accès inégal au crédit.

- Les fluctuations saisonières considérables des prix constituent des incitations négatives et dénaturent l'affectation des ressources. Elles ressortent du tableau suivant , et semblent resulter de l'aggravation de l'etat des routes en période de pluies et des saisons de production:

	Octobre-Mars	Avril-Septembre
Tranports(Fmg/kg)	130-200	100-120
Riz(Fmg/kapoaka)	175-300	110-150
Mais "	150	75
Viande de boeuf(Fmg/kg)	2500-3000	1800-2500
Charbon(Fmg/sac de 10kg)	1500-2000	1500

3. La zone périphérique: Potentialités et contraintes

3.1 Les speculations

La riziculture prédomine généralement, associée à d'autres cultures vivrières, telles que le mais, le manioc, et la banane.

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On peut distinguer, cependant, quelques zones "spécialisées":

- Coté Est des Montagnes d'Ambre, notamment le Firaisana de Joffreville: Cultures maraichères. Elle approvisionne Diégo-ville en légumes;
- Andasibe: Culture du Qat
- Sud de l'Ankarana, ou la riziculture est associée à des cultures "industrielles", telles que la canne à sucre, le coton, l'anacarde.

3.2 L'élevage de bovins est principalement destiné au piétinage des surfaces rizicoles. C'est un élevage extensif qui a recours aux feux de brousse. Le parc moyen pour les menages qui en possèdent est modeste; il est 4 à 5 boeufs dans la Montagne d'Ambre, et de 7 à 10 boeufs dans la région de l'Ankarana.

Les boeufs servent aussi à tirer les charrues et les rouleaux piétineurs. Cependant, peu de menages en possèdent; ainsi, à Ambondromifehy (village visité), seul 1 menage/30 en est dotés.
Pour le piétinage, les menages démunis empruntent les boeufs ou font appel à l'entraide.

3.3 Le système foncier

Il existe quatre grands types de propriété: la propriété domaniale(Etat); la propriété militaire heritée de l'ancienne base francaise; les anciennes concessions coloniales(celle de la SCIM est souvent citée par les villageois interviewés); enfin, l'appropriation coutumière. Les terres accaparées par la PROCOOPS, d'origine domaniale et anciennes concessions, sont également souvent citées par nos interlocuteurs villageois.

Ces differentes formes de propriété déterminent l'accés aux surfaces agricoles. Selon le president du Firaisana de Sakaramy, le quart des menages de ce Firaisana vivent du métayage, et 50% des superficies rizicoles sont travaillées par des metayers.

Le tavy est pratiquement inexistant. La jachère semble être pratiquée dans certaines zones.

3.4 La taille moyenne des exploitations est de l'ordre de 1 à 2 ha. Tous les menages interrogés ont affirmé que si on leur attribuait plus, il ne pourront pas les exploiter. Cette taille moyenne semble donc resulter de la "capacité d'exploitation" des menages, limitée par la main d'oeuvre disponible(les membres "actifs" des menages dont la taille moyenne est de 5 à 6 personnes) et par l'insuffisance des instruments de production disponibles.

Etant donnés les rendements, cette taille moyenne correspond aux "revenus"-types suivants:

1,5 ha de paddy	équivalent à	450 000 à 1 800 000 Fmg/an
1,5 ha de légumes	"	5 000 000 Fmg(brut)/an
1,5 ha de qat	"	1 200 000 à 2 000 000 Fmg/an

La majeure partie du riz est autoconsommée. La vente l'autre partie permet aux paysans de se procurer les biens de première nécessité, mais l'oblige aussi à acheter le riz aux prix forts en période de soudure.

Les autres sources de revenus monetaires des menages sont notamment l'exploitation illicite du charbon et la vente d'autres produits de la fôret tels que le miel, les plantes medicinales..

3.5 Les expoitations commerçiales des produits de la fôret

On peut en distinguer deux catégories, les petites et les grandes exploitations.

Les petites ont des permis de coupe inferieurs à 150 ha; elles utilisent la hache, et avec une equipe de 15 personne, en moyenne, une exploitation coupe 15 pieds/semaine. Ces petites exploitations debitent dans la fôret même.

Les permis des grandes exploitations sont de 200 à 300 ha. Elles utilisent la tronçoneuse et peuvent couper 20 à 30 pieds/jour; elles debitent dans leurs scieries, en ville.

On denombre une vingtaine d'exploitants forestiers operant dans l'ensemble du Faritany de Diégo; 7 d'entre eux opèrent dans la Région étudiée, dont 3 grandes exploitations.

Le petit exploitant que nous avons interviewé a souligné l'apre concurrence qui existe petits et grands exploitants. Elle porte sur l'obtention de permis de coupe, les prix, et le recrutement des scieurs. L'avantage des grands exploitants se situe à differents niveaux:

- Au niveau dé l'obtention des permis de coupe, d'abord: Du fait de la non transparence des règles admnistratifs du jeu, ils les obtiennent plus facilement, et exploitent le plus souvent des superficies superieures à celles inscrites sur les permis;

- Au niveau des prix, ensuite: Ils exportent la majeure partie de leur bois, avec des prix superieurs à ceux du marché local, sur lequel ils écoulent les déchets.

- Au niveau de l'acquisition des moyens d'exploitation, enfin: L'accés au crédit permet aux grands exploitants d'acquerir des tronçonneuses, des sciéries, et des moyens de transport(camions).

Cette concurrence est d'autant plus âpre que, selon notre interlocuteur, il est actuellement de plus en plus difficile de trouver des lots d'xploitation dans la Région. Celle-ci connaitrait un problème de bois dans les proches années à venir.

4. Conclusions et premières recommandations

On peut distinguer deux sortes de pressions sur la fôret:

- Les pressions resultant des activités de villageois qui:
  - demandent, en principe, des permis de coupe pour y chercher des bois de construction;
  - y cherchent le bois de chauffe qui constitue leur principale source d'énergie domestique;
  - y pratiquent des activités de ceuillete de fruits, de plantes médicinales.
  - et aussi, des exploitations illicites de charbon.
  - y cherchent les "meilleures" terres, notamment pour les plantations de bananiers et le qat.
- Les pressions resultant des activités des exploitations commerçiales du bois et du charbon.

On peut déduire de ces conclusions les réflexions-recommandations suivantes. Elles sont inspirées des premières réunions de discussion qui ont eu lieu à Diégo:

- Les projets intégrés de conservation et de développement sont une nécéssité, mais ils devrait être appuyés par:
  - La "sustainability" de l'utilisation du charbon de bois dans les zones urbaines environnantes, et par
  - Un management national, local, et communautaire des ressources fôrestières renouvelables.

1 avril 1992

Evaluation préliminaire SAVEM/GMU

Visites de sites sur la Côte-Est (Mars 1992)

Rapport de M. Andrianomanana Pépé

Le périple a conduit l'équipe d'évaluation successivement à Périnet (visite de la Réserve Speciale d'Indri), au village d'Ampahatany, à la Réserve de Betampona, et à la Réserve de la Biosphère de Mananara-Nord.

Ces différents sites se trouvent sur la façade de l'Océan Indien, zone de tavy. Ce rapport décrira donc l'économie villageoise du tavy, et ses relations avec les Aires Protégées. Il conviendrait, cependant, de rappeler,dans un premier temps, certains aspects macro-économiques de cette immense zone, de même que certaines mesures de politique économique prises au cours des années 80, afin de mieux comprendre certaines réalités observées dans les villages.

1. Aspects macro-économiques de la façade de l'Océan Indien de l'Ile, et mesures de politique économique

1.1. Cette zone, constituée par le Faritany de Toamasina, l'Est du Faritany de Diégo, et la partie littorale du Faritany de Fianarantsoa, peut être qualifiée comme celle du tavy.

Selon le PAE (Plan d'Action Environnementale), le tavy, culture itinérante sur brulis, entraine le brûlage de 50 000 à 150 000 ha de forêts primaires et de 50 000 à 150 000 ha de forêts dégradées par an. Soit, 100 000 à 300 000 ha de forêts par an. Le PAE éstime les coûts économiques de ce brûlage à 72 millions à 216 millions de dollars US par an, du fait de la perte de bois et de la productivité du sol.

1.2. Cette zone de tavy est, en même temps, la zone de production de cultures de rente de Madagascar. C'est ce que font ressortir les données suivantes du dernier Recencement National de l'Agriculture:

Distribution/faritany des superficies cultivées en café, girofle, et vanille
en %

Faritany	Café	Girofle	Vanille
Toamasina	38	87	6
Fianarantsoa	30	6	-
Diégo	29	7	90
3 Faritany	97	100	96

Ces trois produits représente, selon les années, 40 à 65% des recettes d'exportation de Madagascar.

1.3. La politique d'ajustement menée à Madagascar, depuis les débuts des années 80, a entrainé la mise en oeuvre de différentes mesures de libéralisation. Elles semblent avoir eu des répercussions notables sur les activités et les revenus des villageois. Il est donc utile de les rappeler ici:

- Libéralisation de la commerçialisation du riz — Déc 1986
- Libéralisation de la commercialisation interne de tous les produits agricoles — Janv 1988
- Libéralisation de la commerçialisation externe des produits agricoles, sauf la vanille — Oct 1988
- Dérèglementation des prix agricoles à la production — 1985-1990
- Suppression de l'Office du café, du poivre, et du girofle — Sept 1990
- Suppression des Caisses de stabilisation du café, du poivre, et du girofle — Nov 1990

2. Economie de subsistance au village d'Ampahatany

Ce village se trouve dans le Fokontany d'Andranokoditra, à 62 km, environ, de Toamasina. En l'absence de cultures de rente, l'économie du tavy se reduit, dans ce village, à une veritable économie de subsistance.

En effet, ses habitants ne font pratiquement que des cultures vivrières: paddy, manioc, ananas, banane, ampalibe. Des pieds de café existent, à titre décoratif, sur l'allée du village.

Les instruments de production sont rudimentaires et se réduisent au "antsilava"(coupe-coupe); certains ménages possèdent, en plus, l'"angady"(pioche).

Outre la vente occasionnelle du riz, les seules sources de revenus monétaires sont la vente de poissons fumés et de raphia.

Le système foncier est dominé par l'appropriation coutumière des terres.Seul le Tangalamena(chef de clan) possède une concession de 7 ha de café et de girofle, et de 12 ha de rizières "horaka"(de bas-fond).Le métayage semble concerner une large partie de la population.

La pauvreté semble découler des contraintes suivantes:

- la terre tavy est peu fertile
- la possibilité d'extension du tavy semble exister,mais les moyens de ménages ne le permettent pas

- les possibilités de rizières "horaka" sont limitées

- les moyens financiers des ménages sont extremement limités; les villageois se plaignent, en particulier, des conséquences négatives des prix élevés du riz, de l'ordre de 1000 Fmg/kg.

Dans cette économie de subsistance, la forêt, primaire et secondaire, est source de raphia, de bois de construction, de bois de chauffe. Des exploitants commerciaux opèrent dans cette zone. La forêt y continue à disparaitre.

3. Menaces sur la Reserve de Betampona

APPENDIX C

TROPICAL FORESTRY ASSESSMENT

Ray Daviesson

TROPICAL FORESTRY ASSESSMENT

Raymond Carl Daviesson
Tropical Forester

Preface:

The Terms of reference for the tropical forester are:

1.1. Report on the type and extent of damage to the peripheral zones including identification of the primary threats to these areas.

1.2. Recommend how to assess the impact on natural areas of a proposed development activity.

1.3. Report on existing exploitation of forest products in protected areas and buffer zones.

1.4. Determine potential income generation from sustainable exploitation of forest products.

1.5. Recommend how and to what degree reforestation, natural forest and Plantation management and Agroforestry activities in peripheral zones can be integrated in the interest of promoting environmentally sustainable economic development.

Please Note: The last term of reference has been added to those of the Tropical Forester because it lies more properly within his field of expertise. The term of reference starting with "Determine the non lumber use..." has been given to the Social Forester to address.

Methodology:

Based on the individual terms of reference, the methodology used in this report follows a defined concept of the I.C.D.P.

2.1. Report on the type and extent of damage to peripheral zones. Identify primary threats.

(a). The major type of damage to the peripheral zone forests and reserves is from a combination of un-managed concession exploitation, and from tavy incursions which follow on the heels of the exploitation activities. The dynamics of this major threat to forest lands is one of cause and effect. The exploitation creates cleared forest areas which tavy farmers then further exploit by burning and clearing for tavy.

During the ten weeks in country, the team saw only one site where tavy incursion took place without there being prior exploitation. The resulting damage to this type of incursion is quite dramatic. From the physical and biological standpoint, the loss of biodiversity, habitat, top soils and deteriorating watershed is cause for concern. Together with the huge potential in hard currency loss for diminishing hardwoods the question must be asked, is such a waste of natural resource going to continue,

Comparative studies of recent satellite imagery flyovers (1972 to 1990) by Landsat, indicate that the average loss of forest lands to tavy is between 1.2 to 1.8 per cent a year, with an increased yearly loss for the last five years. World Bank 1991. Additionally, Green and Sussman "Deforestation History of the Eastern Rain Forests of Madagascar from Satellite Imagery," A. A. for Advancement of Science, April 1990.

Peripheral Buffer Zones:

The so called peripheral buffer zones surrounding Montagne D'Ambre and the Betampona Forest reserves do not exist. In both sites cultivation extends to the border of the park and reserve. On the Masoala Peninsula and the Mananara Nord Biosphere Park site the peripheral forests are under threat with concessionary exploitation and tavy increasing each year.

From talking to local farmers, they say that under present laws, if they clear forest lands and plant trees such as coffee or cloves, the land becomes theirs. There is a rush on now with news that a national park is going to be established on the peninsular, to get as much land cleared before the park is established. The longer this delay takes to delineate the boundaries of the park, the greater negative impact this land grab will have. The question again rises. Are buffer or peripheral zone forests going to be a reality, or will they be allowed to be destroyed by commercial exploitation and the resulting tavy incursions, or will a ban on such exploitation be placed on the forests in these zones to allow restrictive use for village needs only??? It is only by establishing such limitations that buffer zones will protect Forest Reserves and National Parks.

Assessment of Impacts:

The methodology in assessing impacts on the natural areas of proposed development activities would incorporate a combination of indicators. In the case of a Community Forest Management Unit (CFMU), A complete inventory and forest area mapping would be considered a unit data baseline. Further information such as watershed and ground water, slope erosion, and natural regeneration of key indicator species complete the required data for Impact assessment (both negative and positive). Remote assessment could be obtained through satellite imagery on say a yearly basis.

The reverse or negative impacts of such an activity would be seen in the lack of proper forest management, Clear cutting without provision of "seed bank" trees maintained throughout the forest block to ensure natural regeneration, lack of reforestation after exploitation, watershed erosion and siltation. Assessment would therefore be possible by analysis of the indicators.

Existing Exploitation:

The existing exploitation of protected areas and buffer zones can be classified into three major categories. Commercial exploitation, Tavy incursions, and Traditional usage by villagers living close to forest zones. At present, with reduced ability to manage or control actual forest exploitation by concession holders,the DEF is ineffective in day to day management of these exploiters.

The writer has seen first hand some of the most wasteful exploitation being carried out in Madagascar than he has seen in his career. As many as seven hardwoods (approximately 150 years old or about 35

to 45 cm diameter) cut down and left in the forest just to ease the felling of one Pallissander (Dalbergia Retusa).

The tree in question was almost 1 meter diameter, and only a three meter log was cut from a tree of 40 meters. The rest of the tree was left in the forest to rot (see photograph). In this same felling site the writer saw several immature Bois Rose (Dalbergia R.) that had been cut to provide access to the Palissander.

We visited seven such felling sites in this one zone, and the story was repeated in each. One three meter log taken from each tree, the residue, 82% of the biomass left to rot. In case it was claimed that villagers would return to the tree to use the felling residues for firewood,we visited a felling site of three years previous, the residues were still there. In order to visit these sites, we had to walk through extensive abandoned savoka lands which only five years previously was virgin rain forests, They had already been abandoned one year.

Such uncontrolled exploitation is common throughout the country. No reforestation was carried out, and no control exercised over the villagers who do the actual felling for the exploitant who pays them for a log brought to the access road. The DEF have no idea what is being cut, how much or if they even have a concession permit. In the entire ten weeks in country, we have not met one DEF agent in the forest, and when we visited the Provincial Headquarters, we are told that they have no transport or money to send people out to the forests.

The Antahla DEF office said that all of the field agents positions have remained unfilled for four years due to insufficient funds. With such lack of management, the only answer to this situation is for villagers to manage forests in their own areas with a CFMU backed by an NGO that can demonstrate tropical forestry management capabilities.

The case of Tavy incursions is of course well known. Following close behind the exploiters (in many cases it is the same villager who was paid to fell the trees), the tavy farmer utilizes the felling debris to burn off the remaining vegetation to plant rice, but with the added incentive that if he plants a few trees such as coffee or cloves, the land will eventually be his. Enough has been said in this regard, but little has been done to effectively curtail such activities and to establish a limited use forest buffer zone.

Traditional Usage. The negative impact of village usage of forest products for private use is limited to construction poles, Ravenela Palm fronds for walls and roofs of their houses, firewood (deadwood being dry preferred) and medicinal plants constitute the major usage. Most foresters agree that such usage is of little negative impact on healthy forests, Indeed, there are as many positive impacts as negative.

Potential Income Generation:

The potential income generation from the sustainable exploitation of forest products is considerable, and would come from two areas. Firstly, and the most profitable would be from the sale of logs, sawn lumber, charcoal and firewood. The second source of income would be income generation for paid labor.

Inasmuch as sustained exploitation requires a work force, wages to villagers when spent has a ripple effect on the village economy it has been stated in field reports that the CFMU would provide labor to

commercial exploiters and carry out reforestation and nursery operations to fulfill DEF regulations on reforestation after exploitation.

While this assessment does not include project design, the writer would refer to other such Community Forest Management Units presently in operation in Ghana, Cameroon, Kenya and other parts of the world where communities living close to the forest manage, and derive financial benefit from forests in their areas. In this vein, there is already a prototype CFMU in the village of Morafeno in the Rantabe forest region near Maransetra. The village has a small concession, a sawmill which produces timber for local use and for sale elsewhere.

The CFMU envisioned by the writer would be based on a concession of a minimum of 500 to 600 hectares and involve a village or villages with a minimum of 50 available workers if and when needed on an availability basis.

Reforestation, Natural Forest Management:

The degree that reforestation, natural forest and plantation management together with Agroforestry activities in the peripheral zones can be integrated in the interest of promoting environmentally sustainable economic development is potentially enormous. It is largely the total lack of these elements of natural resource management that is having such negative effects on forests in Madagascar.

Any sustainable development that addresses these problems will have a multi beneficial effect on natural resources such as forests, soils, watersheds and the economic well being of rural peoples, both directly and indirectly. Reforestation and natural forest/plantation management are all activities in which peripheral zone development can be carried out by local villagers under an I.C.D.P.

Inasmuch as present regulations for concession exploitation calls for mandatory reforestation, none is in fact being done since exploiters claim that the DEF are unable to supply them with sufficient seedlings. Additionally, the DEF only grow eucalyptus if they grow anything for reforestation, In the case of concession felling, the villagers normally supply labor for such tasks anyway, but at wages dictated by the concessionaire.

Here too the CFMU can perform this task at higher wages than individuals can negotiate. The unit would be responsible to ensure that no destructive felling was done by the exploitant, would ensure that proper stump taxes were levied, and that strategically located "seed bank" trees were left throughout the concession to ensure natural regeneration. All of these activities are within the CFMU's capabilities providing training and technical guidance was given by the NGO professional staff.

In forest management, the CFMU would require the assistance of qualified foresters. One possible approach to this would be that in addition to the NGO's professional assistance, training courses in such things as forest management, inventories, charcoal production and felling techniques be part of the organizational project funding. Additionally, it is assumed that DEF trained foresters could also have a beneficial impact on the standard of professionalism attained by the CFMU. Perhaps DEF foresters could be paid per diem to visit CFMU sites to give professional back up. While paying of salaries would be difficult to justify, per diem, equipment and other incentives might well prove possible.

Indigenous Species

The replanting of indigenous species has been debated by foresters in Madagascar. The thought that such rain forest species are difficult to germinate in nurseries, and that they take so long to mature is used as the argument in favor of Eucalyptus. If the foresters of the world all thought this way, we would be living in a mono culture, and a world with vastly more hostile climates. In the late 1940s the French Colonial Forestry Service planted a hardwoods plantation near Maransetra. The object of the trials was to see if tropical rain forest species could be replanted in large numbers. They planted Afzelia Bijunga, Canarium Madagascariense, Terminalia Mantaly Dalbergia SP.P. and Adina Microcephala. Since that time the trees have grown at a significantly faster rate than in the forest (mainly due to the lack of competition for nutrients in richer soils, In another twenty years, these trees could be harvested. A rotation of seventy to eighty years is not an insignificant achievement for species in their natural setting taking two hundred and fifty years to mature, From the various positive returns stated in the foregoing, consideration should be given to reforesting exploited concession sites with indigenous species and confining exotics to plantations and an Agroforestry approach to fuel and firewood production and soil improvement. I know of no country where the stated commitment to conservation is in fact sponsoring mono cultured forestry practices.

Agroforestry:

A form of agroforestry is already being practiced by most villagers in planting coffee, cloves, fruit and shade trees. The concept is therefore not a new one to them. Agroforestry as a soil amelioration method is also not unknown, but rarely practiced. The reason for this being that a high percentage of tavy farmers are sharecroppers, and agroforestry is a relatively long term investment of labor and time taken from cash crop activities. Therefore, the only activity that a CFMU would be best suited for, would be to provide villagers and concessionaires with a variety of local indigenous species as well as species that have beneficial soil improvement abilities as well as fruit trees. In this regard, the Tavy Institute at Beforona would be a source of training, especially in on farm soil improvement through an agroforestry approach.

Recommendations:

Peripheral Zone Forests. As stated many times in field reports, the exploitation of forests throughout Madagascar is being conducted without any day to day management. With the present situation with the DEF, there is little likelihood of change in the status quo in the foreseeable future, and this brings us to an I.C.D.P. based on Community Forest Management as one form of a environmentally sustainable community development.

I therefore recommend the establishment of a pilot CFMU to address the needs of the people, the forests and the nation. The structure would follow the outlines given in my first field report, or something close to those outlines. Once such a unit is found to be workable, and any refinements made, that the format be established in other forest regions on a prioritized basis. Any such units must be equipped with radio communications between them and the management NGO office, transport being of secondary importance. With radios one can plan activities taking advantage of local transportation facilities.

Community Forest Management is not a new concept, it has been in Europe since the seventeenth century, the unit envisioned will have the stamp of local conditions but will be essentially the same.

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Timber Marketing Board:

While it is perhaps not in the purview of SAVEM to address legislative or regulatory issues, the question of valuation in regard to natural resources is one that requires urgent attention, When tropical hardwood logs are being harvested and sold for a fraction of their real worth, and when vast numbers of such valuable trees are being lost to tavy, efforts should be made to at least ensure that value is added at the stump.

West African and other tropical hardwood producers have addressed this issue by the creation of Timber Marketing Boards. Comprised of Timber Trade, Natural Resource Board, and the Department of Forestry, members regulate export prices, establish marketing and export documentation. Visits to the docks at Diego Suarez and Tamatav indicates (we have Custom Declaration forms) continued exports of logs as well as sawn lumber. Such a Board will go a long way towards maximizing the value of timber. This Board also undertakes inventory and valuation of standing timber.

Eco-Tourism:

The National Park of Montagne D'Ambre, the Forest Reserve at Betompana, and the island Marine Park of Atafana, Mananara Nord have excellent potential for eco-tourism. Requiring little or no infrastructure (it is exactly the lack of normal tourist facilities which draw eco-tourists to such places), these sites offer the possibility for and I.C.D.P. backed project. In as much as people are not allowed to establish hutments within the sites mentioned, a village based eco-tourist center could be constructed in tradition style, pitdrop toilet and bathing facilities could all be constructed at very little expense to accommodate tourist.

At Amber Mountain, the attractions offered could be mountain bike tours, trekking and wildlife viewing. At Betompana, wildlife and trekking. At the Marine Park at Nosy Atafana, snorkeling/diving activities. In all sites, villagers would provide trained guides, porters, hutment accommodations, meals and possibly a small shop selling books, posters and t-shirts of the area. They would also share in entrance fees which would be increased to allow this sharing.

Promotion:

Promotion of such activities would be of prime importance and this could be accomplished by engaging the assistance of international wildlife, birding and nature based organizations, the national airline, and those serving Madagascar, the national tourist office and incountry NGO's involved in conservation projects. Training would be required for guides, and this might well be done through WWF. The sites identified currently enjoy somewhat regular air services with the capitol, and this can only improve. This kind of enterprise enables people living close to parks or forest reserves to profit from such activities in lieu of similar activities in peripheral forest zones.

Criteria:

Rationale and Supporting Evidence

In the Tropical Forestry sector, the rational for the criteria in the apparent weaknesses in past and ongoing projects, on demonstrated exploitation practices and the over riding issue of the DEF's inability to exercise its role as the guardian and stewards of the forests. The criteria does not make judgements, but outlines basic elements necessary to address the forestry issues identified by the terms of reference,

Realistic Approaches to Tropical Forestry Management Issues:

There is a vital need to address real issues in the tropical forestry sector, and to devise methods which while recognizing constraints and limitations of DEF, address the issues in a realistic and practical manner to counter constraints and achieve project goals. In this regard, it is as vital to recognize that these goals should be within the NGO's ability to carry out its functions, and that the qualifications match the assigned tasks of the organization. In this regard, if NGOs are unable to recruit experienced, qualified personnel due to their low salary scales, provisions in funding should be allocated to do so,

In conjunction with this, project funding should include provisions for adequate transportation and radio communications (this last item is particularly true for the Masoala Project). Tropical Forestry Management requires specifically trained and experienced foresters with actual tropical forestry experience. Foresters who gained their experience in arid or savanna zones forests will have difficulty functioning in the rain forests of Madagascar. Experience in West African, Indonesian or South American rain forests would however meet the requirement.

Sustainability:

An I.C.D. backed Community Forestry Management or Eco-Tourism Project to be successful must create a self supporting local structure(s) that will allow it to function with a minimum of dependance on local organizations to function smoothly. This goal within the project pertains to financial as well as technical assistance. Ideally, the project should aim for total self sustainability as soon as possible.

Responsiveness:

One of the core issues in natural resource management and environmentally sustainable integrated rural development is the degree of responsiveness the project addresses the needs of the local people, and through this, that of interests of the natural resource, the forests. This responsiveness should address the economic, the health and the general well being of rural peoples that raises them above the subsistence level. If they are denied the right to exploit natural resources in protected areas, or in peripheral forest zones, then they have a right to expect some form of compensatorial development assistance.

Role Definition:

Central to the project design is the question of the definition of the roles key players have in the overall responsibility. One of the problems encountered during our stay in country concerned the miss understanding of roles by participating elements of the project. While there are many reasons for this problem, indications, particularly in regard to the Masoala Project, point to badly defined roles in the project design especially when more than one NGO is involved.

Project Image:

In its effort to gain the trust of villagers and local authorities, the question of project image is a constant source of constraint. In the case of Maranara Nord, Biosphere, their biggest problem is to counter the image that they are a governmental body who are out to prevent them from tavy and forest exploitation. The project has been in operation since late 1988, and yet there still persists this impression. A similar attitude is held by villagers towards the Masoala project. The result has been a "land grab" before they are stopped by the government. Such images are a major negative constraint on any project.

Community Forest Management is not a new concept, it has been in Europe since the seventeenth century, the unit envisioned will have the stamp of local conditions but will be essentially the same.

Community Forestry Management Unit (C.F.M.U.) Outline:

Accepting that a Community Forest Management is both desirable and viable, what would the criteria for sustainability demand?. The following is an outline of such demands as one of many approaches that would achieve the desired results both for the local populations and forest management needs.

The D.E.F. must evidence active support for the concept, and the creation of a pilot C.F.M.U. project. They must grant concessionary rights and provide technical assistance to the project to ensure its effectiveness. As the statal body entrusted with the management of the forests, any forestry issue is impossible without their support.

Specifically, they would be required to grant a concession to the C.F.M.U. without the normal fee being imposed up-front. This would be paid from funds derived from the sales of timber and timber by products (the C.F.M.U. would eventually pay the legally imposed fees and stump taxes). In addition, the D.E.F. would grant management rights to the C.F.M.U. of the concession, including that of policing the concession from illegal exploitation. The D.E.F. would provide assistance to the C.F.M.U. on request in training and technical inputs in the areas of concession inventory, map making, nursery operations, planting and other areas of technical development.

Finally, the D.E.F. would be requested to liaise with the C.F.M.U. on any concessionary permits issued in areas close to the C.F.M.U. and to encourage these concessionaires to use the services of the C.F.M.U. for reforesting and felling debris clearing (to be converted to charcoal by the unit). The unit would charge a fee for reforesting the concessionaires site,

Supporting Organizational Inputs

In addition to the D.E.F., other organizations could provide skills training and technical assistance to the unit. For Agroforestry extension, the Tavy Institute at Beforana could send extensionist to the unit to train nursery and soil improvement activities personnel. The UNDP-FAO Charcoal Project at Moramanga offers a five week course on kiln and charcoal making techniques free of charge (including room and board): The implementing NGO would identify and provide any additional inputs as they are needed.

Implementing N.G.O.:

It is important that the implementing N.G.O. can demonstrate ability to provide tropical forestry exploitation & management personnel to act as the TA to the project. As stated elsewhere in reports, generalists will have problems dealing with the specific questions in a rain forest environment.

Location & Concession:

The C.F.M.U. would be located in the peripheral zone forest areas where village (or several villages) have a minimum population of 500 to 600. Of this, at least 100 should be men of working age to provide the unit labor force. Additionally, women would be employed in charcoal making. A unit field operation program would take place between planting and harvesting when traditionally the villagers engage in cash crop activities, and when timber exploitation is usually done, The concession size granted to the C.F.M.U. should be a minimum of 500 hectares, The management and exploitation would be the responsibility of the unit. In addition to the usual exploitation and concession management activities, the unit nursery would be involved in producing seedlings for reforestation, agroforestry activities (soil improvement) and fruit trees.

Income Generation:

The C.F.M.U. would generate income from the sale of timber, charcoal, Firewood and seedlings. Additionally, it would earn fees for providing reforestation services and seedlings for other concession activities,

Training:

Specific training of the unit's personnel would be given on site by extensionist in the various disciplines, or at workshops offered by supporting organizations. Forest Management, Nursery Operations, Felling Techniques (use of power saws), Charcoal making, and other additional training to be identified by the project designers.

Equipment:

Since labor is a major constraint in most villages, the introduction of power saws will enable the unit to accomplish felling and debris clearance more effectively. Other tools and equipment must meet the tasks

assigned to the unit. Additionally, it is of vital importance that the unit has reliable radio communication with the implementing NGO and the local D.F.F. office.

Operational Time Table:

In order to establish a C.F.M.U., a phased approach would seem indicated.

APPENDIX D

AGRICULTURAL ECONOMICS SYNTHESIS REPORT

Bill Guyton

SAVEM Assessment Team's Agricultural Economic Synthesis DRAFT REPORT

Bill Guyton

April 15, 1992

INTRODUCTION

The following report is a synthesis of information and recommendations made during field trip visits to Amber Mountain, Betampona, Mananara, and the Mosoala Peninsula. The main objectives of the study were to gain a better understanding of protected areas and their peripheral zones, develop guidelines and criteria for assessing integrated conservation/development project grants, and to identify potential development activities in peripheral zones. The author was asked specifically in the terms of reference to assess the state of the local infrastructure, conduct assessments of available human resources and training information in agriculture, identify perverse incentives for environmental conservation, establish a protocol for the economics of tavy, identify small scale business opportunities, and recommend elements needed for an agro-economic baseline study. Based on information from the terms of reference, site specific recommendations are addressed in Section III, followed by criteria for assessing Protected Area Development Grants (PADGs) and Conservation Action Grants (CAGs) in Section IV.

TERMS OF REFERENCE

State of the Local Infrastructure

Road access to the protected areas and their peripheral zones varies considerably among the different sites visited. At Amber Mountain, the road leading to the park entrance outside of Joffreville is in good condition and provides easy access to the provincial capital of Diego. Loggers maintain some feeder roads to timber exploitation sites and taxibuses pass along the major road arteries. In Betampona, road and bridge rehabilitation is necessary. Although taxibuses still are able to transport agricultural goods from peripheral zones to Tamatave, a heavy rainfall could easily make the road impassible (see Trip Report II for details). At the Mosoala Peninsula, there are only foot paths connecting villages along the southeastern and southwestern extremities. Villagers transport goods by boat. The introduction of roads into the peninsula would be costly and would increase migration into the area, thus creating additional pressure on the forest.

Irrigation dams and canals were visited in Betampona and Mosoala. Due to the steep terrain and high watershed, such structures are easily destroyed during heavy rains. Valleys are narrow, providing limited surface area for irrigated rice cultivation. The installation of new dam and canal systems at these sites would be extremely costly and difficult to reach due to the rugged topography of the area. Thus the repair of existing dam and canals would be more practical, such as being conducted by SAFAFI in

Nandrahanana where villagers participate in collaboration with the project to transport cement and clear irrigation canals after heavy rains.

Assessment of Available Human Resources

The population of villages in peripheral zones is growing in all the sites visited due to inter-regional migration and/or increased birth rates. Villagers in some areas estimated that forty percent of the population was under the age of 15. Agricultural land holdings are primarily owned by village elders though, so as the younger generation reaches adulthood, there will be increased pressures to clear remaining forested land for agricultural use.

Many farmers voiced concerns of labor constraints and the lack of disposable income necessary to hire seasonal labor. Animal traction and/or farm mechanization is not practical on much of the cultivated land due to the steep terrain near the reserves. Thus, there are incentives to increase family size to provide the necessary labor inputs for farming, especially where land constraints do not exist.

Nearly all the labor force is involved in agriculture in the peripheral zones, although some villagers are also skilled in fishing, timber sawing, and local construction. The educational level is low since most towns only have access to primary school education. Some seasonal underemployment exists following the rice harvest season.

Perverse Incentives for Environmental Conservation

At the Biosphere Project in Mananara and Mosoala Peninsula, there are several disincentives to conserve forests. In both sites, commercial logging operators employ local villagers to exploit timber for an average wage of between 2,500 and 5,000 Fmg ($1.50 to $3.00) per three meter log. Exploitation sites are usually isolated so logs are cut and carried by villagers to the roads were the planks are loaded onto trucks. The tree canopy and much of the trunk is left at the felling site since it is too heavy to carry and will not be purchased by the loggers. Logs that are cut shorter than the specified three meters are rejected.

Cleared land in the exploitable forests (Foret Dominale) is then planted in tavy the first year, followed by cash crops (coffee, cloves, and vanilla) in subsequent years. Although villagers cultivating in these areas do not have legal title to the land, they believe that by planting perennial crops, they will be granted ownership over time. Interviews with villagers 25 kilometers south of Antalaha revealed that many farmers hoped to increase the surface area of their fields in the near future before the boundaries of the proposed national park on Mosoala are delineated.

Amber Mountain faces different types of disincentives to environmental conservation. Most agricultural producers in the peripheral zones of the reserve are tenant farmers who have migrated from other areas. Consequently, they have limited incentives to invest in environmental conservation programs. Illegal charcoal production has been curbed in the past year due to the efforts of the World Wildlife APNs, but reforestation efforts have been effective only on a very small scale.

Protocol for the Study of the Economics of Tavy

Establishing a protocol for the economics of tavy will require a comparison between the economic benefits gained from cultivating tavy rice and/or cash crops on a deforested slope in relation to the lost value of timber and soil degradation caused from tavy farming. This study can be achieved by first calculating projected input costs and output value of tavy farming over a five or six year period. For example, labor time requirements to clear, seed, weed, and harvest a crop during and agricultural season could be calculated using the local opportunity cost of labor (daily wage rate for hired labor at a particular site). Outputs would be calculated by estimating yields per hectare multiplied by the local farmgate price at harvest. Any additional value gained from timber sales in the first year must also be included (i.e. charcoal or planks sold from the cleared land). Input costs subtracted from output value would give the net crop value in year one. Net crop value in subsequent years (year 2-6) would also be calculated to determine the true loss in value of agricultural land over time, including years that were left for fallow.

The total net value of one hectare of crops would be compared with the real value of one hectare of timber using international timber prices. The difference between the net value of crops subtracted from the net value of timber would directly show the economic losses from tavy farming. Economic losses would vary depending on the types of timber and soil characteristics at different sites, so data would need to be collected in peripheral zones at different locations.

Availability of Information and Training in Agriculture

Information and training in agriculture can be subdivided into formal and informal education. Formal educational services comprises college and university training and informal includes local extension programs and private training centers. There are two functioning agricultural colleges in the country (Antananarivo and Tamatave) and one university in Antananarivo with specialized training in agriculture, animal husbandry, forestry, rural economics, and industrial agriculture.

Private agricultural training centers include Bevalala, Antisarbe, and C.A.P.R. near Fianaransoa. The Tavy Institute in Beforona is a research center, but could be visited to teach the benefits of improved tavy farming (see Field Trip Report 2 for details of activities). Closer to the project sites, information and training in agriculture is limited. The Catholic mission on the road to Betampona has an agricultural extension program working on irrigated rice dams and canals and animal husbandry in the area. In Mosoala, SAFAFI and the state agricultural extension service provide information on agriculture to villagers living on the coast.

Small Scale Business Opportunities

Mosoala Peninsula

Business opportunities vary greatly depending on the site considered. In Mosoala, coastal areas provide excellent fishing potential and small fishermen interviewed in Antahala estimated that they could earn up to 15,000 Fmg per day from a good catch. This is three times the local timber exploitation wage per log, yet many villagers prefer to fell wood for commercial loggers. As one villager explained, "a tree can't get away" and the financial rewards from fishing do not outweigh the risks involved from canoeing in the turbulent waters off the coast. If sturdier outrigger canoes were introduced, however,

more villagers would be inclined to fish. This will be addressed more fully in the recommendations section.

There is currently one village operated timber coop south of Maraonsetra on the western side of Mosoala that fells timber on twenty hectare concessions. Timber is sawed into planks and transported by boat to Maraonstetra. Small scale, controlled timber exploitation run by local cooperatives, such as this example is another strategy that can improve the economic well-being of the population.

Vanilla, coffee, and cloves are the major cash crops on the Peninsula, but as in Mananara, a small number of traders are able to fix prices and create barriers to entry in the market. Due to poor infrastructure and their reliance on large traders, farmers do not have many agricultural alternatives to growing these three principal cash crops.

Betampona

In Betampona, small scale business opportunities are extremely limited. The road leading to the peripheral zone is in poor condition, thus inhibiting the trade of agricultural produce. Soils are infertile due to overcultivation and prices of existing cash crops, namely cloves and coffee, have fallen below the local per kilogram price of rice. Bananas are traded in villages closer to Tamatave and are transported by road and river, but high transportation costs from the peripheral zone in Betampona is a deterrent to marketing this crop.

Small animal elevage and aquiculture are development activities that could provide additional revenue to the local population. Chickens, ducks, and geese are already raised but are mostly kept for home consumption. Fish farming in irrigated rice fields is practiced in other parts of the world and would be less labor intensive than building separate fish ponds. Poultry and dried fish could be traded locally or transported to Tamatave for sale.

One of the greatest income generating opportunities would be to develop a small-scale ecotourism industry in Betampona. Due to its close proximity to Tamatave and frequency of national flights, Betampona would be an ideal location to bring visitors interested in ecology and forestry, providing that the major road was rehabilitated. The local economy would benefit from tourism by employing and training guides and porters in villages around the park.

Amber Mountain

Soils in the peripheral zone of the Amber Mountain Complex are rich, yet most farmers are not self-sufficient in rice. The is due to labor constraints and the fact that the majority of farmers are sharecroppers and cultivate small land plots. Taking into account these constraints, small scale agricultural business opportunities might include off season vegetable gardening when labor is less constraining and retail prices of garden vegetables in Diego nearly double. Produce from gardens, planted in valleys near water sources, could provide farmers with an additional source of income during the dry season.

The Amber Mountain complex is probably the best suited for a ecotourism industry due to its close proximity to Diego and relatively good road system. The wide variety of flora and fauna would attract tourists interested in natural forests. The World Wildlife Fund organizes and advertises ecology tours in other countries, and could include a description of Amber Mountain in travel brochures.

Elements Necessary for an Agro-Economic Baseline Study

An agro-economic baseline study should be conducted at the onset and end of each year to evaluate existing economic household conditions and to determine the impact of project activities over time. Elements necessary to create an economic household profile (i.e. farm budgets and income statements) encompass six principal categories of information;

- **Household Composition and Characteristics**; age, sex, literacy level, and principal occupation of each member in the household. Additionally, the number of years that each family has lived in the village should be included.

- **Agricultural Production**; Household data on the production of food and cash crops is necessary to determine average area cultivated and yields. Rice production should be subdivided into tavy, hill flooded, and irrigated. The production of cloves, coffee, vanilla, bananas, maize, manioc, and vegetables would also be included. The surface area of each crop should be measured by project personnel equipped with field measuring cords and compasses. Computer programs exist that can automatically calculate surface areas from field angles and perimeter measurements.

  Years of fallow and number of years in cultivation are indicators of soil fertility. The distance of the field from the village is also an indicator of soil fertility and the availability of land. Below is an example of a basic format that could be used:

Example of Agricultural Production Data to Collect

Crop	Area in Cultivation	Yield	Ownership	Planting Date	Harvest Date	Last Fallow	Fallow Period	Field Dist.
Rice; tavy irr flood Cloves Coffee								

- **Labor Use**; in addition to determining yields of different crops, it is also necessary to calculate labor time requirements during the agricultural season. Labor inputs, such as land clearing, planting, weeding, harvesting should be calculated for different crops and seasonal labor shortage periods identified.

- **Household Inventory**; Zebu, plows, machetes, axes, fishing nets, canoes, shovels small animal elevage (chickens, ducks, geese, turkeys) are indicators of the households relative wealth. Inventories for household surveys are usually conducted at the beginning and end of each agricultural season.

- **Economic Activities;** Each households monthly economic activities should be included in any economic survey of households in peripheral zones and carried out for an entire year. An example of elements to include would be as follows;

Monthly Sales;

ITEM	Date	Quantity Sold	Price/Kg	Barter	Gift
Agriculture: Rice Cloves Coffee Bananas Forest Prod: timber charcoal firewood Fishing Other					

Monthly Purchases;

ITEM	Date	Quantity Sold	Price/Kg	Barter	Gift
Rice Soap Sugar Salt Clothing etc..					

- **Household Rice Consumption;** the final category of information necessary to accurately determine household economic well-being of households in peripheral zones is an accurate estimate of monthly rice consumption per family.

RECOMMENDATIONS FOR DEVELOPMENT ACTIVITIES AND SUMMARY

This section of the report is subdivided into three principal areas of recommendations; agricultural production, marketing, and alternative income generating activities.

Agricultural Production Recommendations

Animal Traction

One universal constraint identified in all the sites visited was that of labor. Thus, labor saving technologies would be an important component of development/conservation activities in peripheral zones. Labor shortages are particularly acute during the first few months of the agricultural season when fields are cleared and planted. In several sites, such as Mananara and Mosoala, bottomland suitable for irrigated rice is left uncultivated because of the immense labor requirements necessary to clear and plow the fields. Consequently, many villagers at these sites prefer to tavy farm, thus adding to the destruction of natural forests. In both of Mosoala and Mananara, villagers own zebus but are underutilizing cattle to serve in agriculture. Farmers in Ambanizana lack plowing equipment and the technical knowledge necessary for successful animal traction programs.

Projects in peripheral zones should address the issue of animal traction by extending programs to teach local populations improved cultivation techniques using cattle-drawn plows. Since many farmers do not own plowing equipment, credit should be provided by the project to purchase necessary equipment. This is most specifically applicable in sites such as Mananara and Mosoala where villagers already own zebu and the land they cultivate.

Dam and Canal Rehabilitation

The topography of peripheral zones is characterized by steep mountains and narrow valleys. Torrential downpours during the rainy seasons can easily destroy even the sturdiest irrigation dams and canals. In all the sites visited, villagers commented on the need for improved irrigation systems to provide an adequate water supply for existing rice fields and to increase the surface area of irrigated land. According to the team's tropical agronomist, much of the land villagers have proposed for paddy rice is not suitable for irrigation and that efforts should be directed more toward flooded rice cultivation in areas with abundant rainfall.

From an economic standpoint, the construction of new dams and canals would be costly and in many cases would only benefit a small number of villagers who own bottomland. Projects could better invest their efforts by repairing existing irrigation systems. Repairs and rehabilitation should involve the local community as is organized by SAFAFI in Nandrahanana, where villagers work one day of labor each week to clear canals at the beginning of the planting season. If new dams are programmed to be built at a given site, a benefit/cost analysis should first be conducted.

Abandoned Land Rehabilitation

Abandoned agricultural land or "savoka" as it is called locally, is increasing at alarming rates. Perverse incentives to clearcut forests instead of investing in the improvement of existing agricultural land has increased pressures on peripheral zone forests. An easy solution to this problem does not exist. Areas such as Betampona, where land is constraining, land ownership exists, and soil fertility is low would be the best sites to introduce soil improvement programs such as recommended at the Tavy Institute in Beforona. Agroforestry using nitrogen-fixing trees would provide long-term benefits of increased yields on lands currently depleted of much of its agricultural productive value.

Communities in Manananra and Mosoala would be less likely to adopt soil amelioration techniques on savoka land since cultivation on newly deforested land provides higher yields and is less labor intensive. At these sites, the next best solution to stricter state regulatory intervention would be to increase the posting of locally hired forestry APNs near threatened areas. In Amber Mountain, the presence of World Wildlife APNs has been successful in curbing incursions into protected areas. This approach should be stressed in places such as Mosoala and Mananara where the destruction of primary forest is most acute.

Small Animal Elevage

Small animal elevage is one activity that can increase farm revenue and improve household dietary intake. From a conservation perspective, animal raising can reduce the need to hunt wild game in the forest which is currently practiced in sites visited. In Mananara, a model farm has been built to demonstrate improved small livestock raising practices (i.e. chicken coops with raised floors, improved feed, and animal enclosures). Seasonal vaccinations by SAFAFI in Mosoala and the Biosphere Project have decreased the mortality rate of chickens. Such interventions reduce the risks in livestock raising and improve the health of animals. Rather than introducing other types of small animal elevage, projects should concentrate on improved animal raising techniques of existing elevages such as ducks, chickens, and geese that are adapted to local climatic conditions and are already consumed by the population.

Agricultural Marketing Recommendations

The cash crop market of cloves, coffee, and vanilla is controlled by a small number of traders who are able to set farmgate prices. Farmers have no bargaining power since they are misinformed of existing market conditions and usually only have one buyer to whom they can sell their produce. Traders impose strict regulations on cash crops, only purchasing for example vanilla pods that are 14 centimeters or more in length. The best strategies to combat these problems, as discussed in the criteria section, are to better inform traders of current market conditions. One way this could be accomplished would be by broadcasting weekly prices on local radio stations at different locations.

The formation of farming cooperatives, with an elected official from each village, could also help farmers bargain collectively with traders to establish prices rather than always being price takers.

Road conditions directly affect the prices of marketed agricultural produce. In Betampona, for example, traders estimated that sixty percent of their transportation costs are incurred carrying produce to the paved road where it is then transported by taxibus to Tamatave. Road improvements at this site would lower transport cost, thus adding to the net value of the shipped produce.

Alternative Non-Agricultural Income Generating Activities

Eco-Tourism

As mentioned in the business opportunities section of the report, eco-tourism has the potential to be one of the greatest income generating activities in peripheral zones. Local villagers, hired as guides and porters, could directly benefit from the reserves and would thus have more incentives to preserve the flora and fauna. Tourists would purchase goods from village stores thus aiding the local economy.

During the visits to parks and their peripheral zones, the assessment team encountered several tourists. Most were young Europeans or South Africans travelling for three to four week periods and were equipped with backpacks and camping gear. The main attraction of their expeditions was having the opportunity to explore wilderness areas. Tourism in the parks should be geared toward visitors looking for these types of experiences. Package deals could be advertised with a description of main attractions of each park, cost, and approximate number of days it would take to visit two or three different protected areas.

Marine Fishing and Aquaculture

On the Mosoala Peninsula, there is great potential for villagers to generate income by fishing in and off the reefs. The high risks of fishing in the open ocean could be reduced if sturdier boats were constructed and if fishermen placed outriggers on their canoes. In Antahala, a Catholic fishing cooperative was formed in 1984 that communally owns motorized fishing boats. Fuel and spare parts are paid for with income generated from their catch. Fishing nets and lines are locally made by cooperative members. Fishing cooperatives should be encouraged in other villages along the coast by providing local fishermen with information on how to construct sturdier canoes and make stronger nets and lines.

In parks located inland, aquaculture would be a viable additional income generating activity in villages. In Betampona, SAF, has experimented with building fish ponds, only to see them destroyed during a recent flood. Building fish ponds is very laborious, consequently, the ponds have not yet been repaired. A less labor intensive alternative to maintaining separate fish ponds would be to raise fish in irrigated rice fields. Fish could be harvested at the same time as rice, thus saving on labor inputs and increasing the value to the cultivated land.

Community Forestry Management

Current commercial logging operations are tremendously wasteful. In areas such as eastern Mosoala near Cap Est, villagers are hired to fell three meter logs leaving the entire tree canopy and much of the trunk to be burned afterwards. Methods of the utilization of these forest residues employing labor-saving techniques are addressed by the tropical and soil foresters of the Assessment Team. Improved exploitation techniques, employed by villagers near the felling sites, would provide greater then in turn, sell timber to the loggers. Villagers would be taught how to construct improved charcoal making kilns to reduce the waste of forest residues.

CRITERIA

Field trip visits to Amber Mountain, Betampona, Mananara, and the Mosoala Peninsula provided the Assessment Team with a realistic picture of some of the key elements necessary for a successful integrated conservation/development project. Likewise, shortcomings were identified that through careful organizational planning and technical support can be avoided in future projects. Based on observations and information collected during the assessment, the following criteria were identified to aid in assessing Conservation Action Grants (CAGs) and Protected Area Development Grants (PADGs) proposals:

General Criteria

Number of Participating Organizations in Projects

Ideally, one main NGO should manage and coordinate development and conservation activities at a given site. This would avoid conflicts concerning which NGO should carry out different tasks and at different locations. The managing NGO could be provided with technical support from other NGO's as needed, but would still be responsible for the coordination of all project activities in the peripheral zone.

Infrastructure improvements such as road rehabilitation or dam construction should be contracted to local businesses in regional capitals. Such work would be supervised by the principal NGO.

Focused and Limited Number of Project Activities

One of the major shortcomings identified during project visits was the broad and dispersed array of development activities undertaken in peripheral zones. In an attempt to address site specific needs, several of the development organizations seemed to have lost the focus of project goals. There were many trial and error techniques used to see what might work without carefully weighing the feasibility and outcomes of such activities.

To avoid this problem, a targeted action plan must be developed with a limited number of priority needs for different communities. Agricultural extension/education, health improvement, economic development, and forestry management are the essential elements necessary for the integrated conservation/development projects. No more than three or four specific activities should be targeted for each of these project components.

Logistics and Communications

Projects covering a large geographic area such as Amber Mountain, Mananara, and Mosoala require special logistical considerations. NGO's who apply for PADGs must have appropriate transportation and communication equipment to support field staff. The lack of such logistical support, according to evaluation reports, was the major constraint in the former Mosoala project. Future project plans should require short-wave radios at basecamps and boats large enough to pass safely along the eastern coast of the Peninsula in Mosoala. Likewise in Amber Mountain, personnel living in the project area should be equipped with radios to contact the main office in Diego.

Collaboration with Existing Agricultural Extension Programs

At most of the sites visited, there was a lack of agricultural production information available to farmers. The State Extension Service is unable to reach more isolated areas, such as peripheral zones of reserves, due to the same financial and logistical difficulties as the Deppartement des Eaux et Foret (DEF). Extension agent staffing in some zones has been reduced by fifty percent over the past four years and agents have no mode of transportation to visit villages in their jurisdiction. Many of these agents have experience in cash crop production and irrigated rice cultivation. In some cases, they could work in collaboration with the project on short term on-farm technical training.

Agricultural Criteria

Abandoned Land Rehabilitation

Rationale and Supporting Evidence. Large tracts of land in peripheral zones around the reserves are left uncultivated for several years after tavy farming. 1989 World Bank satellite imagery of Betampona, for example, shows that over forty percent of land cleared for agriculture has been temporarily or permanently abandoned due to the depletion of soil fertility.

CAG and PADGs must specifically address strategies of bringing this abandoned agricultural land back into production through soil amelioration practices. An agricultural specialist with pluvial rice experience and an understanding of agro-forestry techniques to improve soil fertility in mountainous terrain should be employed. Research has already been conducted and documented on this subject at the Tavy Institute in Beforona and at the Biosphere project, but extension thus far has been minimal.

Areas such as Betampona, where farmers own the fields they cultivate, land is constraining, and tavy rice yields are low (400 to 500 kg/ha) would be sites well-suited for the introduction of improved tavy techniques. Agricultural producers would be likely to adopt such techniques, despite the additional labor inputs requirements, providing that they could be convinced of long term yield improvements and additional benefits from agroforestry such as firebreaks, firewood, and weed control.

Mananara and Mosoala are a completely different case since land is not constraining, deforestation is left mostly uncontrolled, and yield per traditional labor inputs is still acceptable (800 kg/ha).

Repair Existing Dams and Canals but Limit Investment in New Rice Irrigation Systems

Rationale and Supporting Evidence. According to several project documents and the "Regions et Developpement Programmes Regionaux et Projets Locaux" an estimated 75 percent of rice cultivation in some areas along the eastern coast is tavy. Due to the steep terrain and high watershed in most of the peripheral zones, limited surface area is suitable for irrigated rice cultivation and many existing dams have been destroyed from cyclones and heavy rainstorms. The installation of new dam and canal systems at these sites would be extremely costly and difficult to reach due to the rugged topography of the area. Additionally, land holdings in these narrow valleys are often owned by a select few in each village.

The repair of existing dam and canals would be more practical than building new irrigation systems in most cases, such as being conducted by SAFAFI in Nandrahanana where villagers participate in collaboration with the project to transport cement and clear irrigation canals after heavy rains.

Develop Strategies to Better Inform Local Farmers of Existing Agricultural Marketing Conditions and Methods of Collectively Negotiating Prices with Traders

Rationales and Supporting Evidence. Large traders in nearly all the sites visited are able to fix farmgate prices of coffee, cloves, and vanilla at artificially low levels. This is due primarily to imperfect market information and barriers to entry in the cash crop market. High transport cost, initial capital investment, and vertically integrated ties with exporters make it virtually impossible for small collectors to trade these crops and consequently, the market is non competitive. Adding to the domestic

marketing problems, international prices of coffee and cloves have also fallen substantially in the past few years.

Farmers in peripheral zones live in isolation and are unaware of farmgate prices offered to agricultural producers in other areas and the wholesale prices of the crops they harvest. One method to alleviate this problem would be to broadcast weekly prices of agricultural goods in different markets on local radio stations. Improved market information would help farmers develop production and marketing strategies for future years. This would help to decide when to sell crops depending on market conditions. The formation of farm marketing cooperatives comprised of different representatives from each village in a given area would give farmers a collective and unified voice when negotiating prices with traders.

Summary

a. Plan soil improvement programs in areas where land ownership exists, land is constraining, and soil fertility is low (Betampona). Adoption rates of tavy improvement techniques will be linked to these three factors.

b. Improve market information to farmers by broadcasting prices of agricultural goods on local radio stations. Encourage farm marketing boards (cooperatives) that can act collectively when negotiating prices with traders.

c. Aid in the repair of existing dam and canal systems but do not invest in new irrigation schemes unless;

- the soil is suitable for irrigation (high clay content)
- the surface area brought into cultivation benefits the majority of the population (i.e. often a few wealthier villagers own the majority of valley land as was the case in Betampona and Amber Mountain. In such situations, irrigation systems would only benefit a few).

FIELD TRIP ITINERARY

DATE	LOCATION	ACTIVITIES
Feb 23	Diego	Price collection at local market.
Feb 25	Sakaramy	Interviewed local Farmers in village.
Feb 28	Andasibe	10 kilometer hike to visit village on southeastern border of Amber Mountain. Interviewed farmers, visited plantations WWF reforestation project.
Mar 1	Ambondiomifehy	Interviewed WWF APN discussing land tenure issues and labor constraints. Visit to reforestation project.
Mar 12	Andasibe	Visit to Perinet Reserve
Mar 13	Beforona	Meeting with staff at the Tavy Institute. Visited demonstration fields.
Mar 13-15		Rapid Rural Appraisal in Ambahantany, visit of private reserve.
Mar 16-20	Betampona	Interviews with traders, farmers, and SAF agent. Visits to rice fields and hike to inspect canal systems and dams supervised by SAF.
Apr 4	Antahala	Arrival in town. Tour of market.
Apr 5	Antahala	Interview with vanilla trader and arranged trip to Cap Est.
Apr 6	Andasibe	30 km south of Antahala, bad weather forces team to dock at Andasibe. Farmers interviewed and irrigated rice fields visited.
Apr 7	Antahala	20 km hike back to Antahala.
Apr 8	Antahala	Interview with DEF.
Apr 9	Antahala	Visit to Catholic Fishing Coop.
Apr 10	Antahala	Interviewed state agricultural extension service chef de zone.
Apr 11	Maroansetra	Plan trip to Ambanizana, meet with SAFAFI, and team meeting to discuss final reports.
Apr 12	Ambanizana	Interview with president of Fok. and tour of SA. AFI health center.

Apr 13	Nandrahanana	20 km hike to see SAFAFI well installations, health center, and canal and dam rehabilitation.
Apr 14	Maroansetra	Visit to sawmill and interview with boat builders. Team meeting to discuss criteria.
Apr 15-19	Maroansetra	Report writing and team meetings.

APPENDIX E

SUMMARY SOCIAL FORESTRY ASSESSMENT

Paula Williams

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HUMAN USE OF FORESTS AND TREES

Throughout Madagascar, people use forests and trees for a wide range of needs, including timber (construction wood for houses and boats, wood for furniture, woodworking, and tools), fuel (charcoal and firewood), food, animal fodder, medicinal plants, honey, decorative plants, fibers and other resources for artisanal production. These products are used both for household consumption and in some areas sold to generate cash income. Many forests serve as watersheds, and provide water for household consumption and agricultural purposes in surrounding areas. Forests provide valuable habitats for fish and game consumed by local residents. In many areas, forests also serve as a reserve of agricultural land. People also use forests for spiritual reasons, recreation and tourism, environmental education, and scientific research.

How dependent are rural people on forests and trees? In all the areas that we visited, the majority of the people earn their livelihoods from agricultural production. We did not visit a single community that is wholly and entirely dependent upon the forest for its sources of income. Nonetheless, forests and trees play vital roles in rural economies. In some villages, certain individuals, such as timber exploiters, carpenters, furniture makers, or boat builders depend upon the forest for their wood supplies. In all the areas visited, wood constitutes the major energy source for cooking and lighting, and the major construction material.

In the peripheral zones visited, many examples of existing agroforestry systems were observed, such as planting live fences, intercropping trees with agricultural crops, and use of shade tree in fields. People living near existing forests and Protected Areas plant primarily plant fruit trees and other cash crop trees, such as cloves and coffee. Trees are planted around homes and in fields for food, animal fodder, fencing, medicinal use, fibers, wood, shade, soil improvement, and other uses. In some areas, large-scale reforestation or afforestation activities have been undertaken.

Where forest plantations exist, some rural residents currently obtain economic benefits by working as hired or piece-work labor for commercial operators having exploitation permits. Natural forests are currently being exploited for timber, charcoal, honey, and other resources that bring rural residents cash income. Where commercial timber and charcoal concessions are operating, rural residents obtain employment. Other employment opportunities around natural forests exist for APNs, tourist guides, and research assistants.

APPROACHES TO MANAGING FOREST RESOURCE USE

Forest management activities in Madagascar have been undertaken by various social groups -- state and local governments, parastatal organizations, non-governmental organizations, communities, cooperatives and groups, and individuals. The basic management approach has been one of attempting to control use of forest areas, either through general regulations or piece-meal allocation of permits. Thus, "management" has consisted primarily of forest protection and exploitation, with limited efforts at reforestation and tree planting.

The concept of rational forest management encompasses a process wherein in forest resources are assessed, management objectives are established, and overall management plans for forested areas are developed and implemented. This approach to forest management is not well-developed in Madagascar.

The SAVEM Project, however, offers opportunities for developing this forest management approach in working with rural communities living adjacent to Protected Areas. Recommendations are suggested for collaborating with the government forest service, the Direction of Waters and Forests, to build local expertise in forest management.

BUILDING A PARTICIPATORY APPROACH TO FOREST CONSERVATION AND DEVELOPMENT: GUIDELINES AND RECOMMENDATIONS

To work with local communities on natural resource management activities that will jointly address conservation and development needs, the following guidelines are suggested.

General Guidelines

1. The project needs to establish rapport with the local communities, to establish confidence and willingness to work together.

2. It is vital that small-scale concrete activities be quickly launched, to demonstrate the willingness and potential for change.

3. To facilitate community action, project extension agents should live in the area, and gradually develop concrete activities with the people.

4. Based upon sociological understanding of the community's authority structure and forms of social organization, strategies for working with village leaders and communities can be proposed. All development, conservation, and related research should stress the active participation of local people.

5. The scale and approach to resource management activities will vary. While some activities can be undertaken by individual farm households, others can only be successful if they are adopted by groups of resource users or even entire communities.

6. As stated in the Project Proposal, efforts must be taken to ensure that those who bear the costs of conservation and protection of Protected Areas should receive some benefits from project development activities.

7. To address questions of project effectiveness and equity, efforts are needed to work with a wide range of community members and resource users. Projects must develop explicit strategies to ensure that a wide range of community members participate in project activities and that participants receive direct benefits from their participation.

8. Projects should ensure that women have equitable opportunities to participate in, and derive benefit from, project activities and employment.

9. Efforts should be undertaken to integrate development activities with one another, and with conservation activities. Possible examples include:

- undertaking trials to cultivate medicinal plants and using these plants in health or nutrition programs;
- coupling functional literacy programs for adult women and men with extension activities in agricultural, forestry, agroforestry, fisheries, and other natural resource management and enterprise development activities; and
- developing employment or income-generating activities with women in conjunction with family planning efforts.

Guidelines for Social Forestry Activities

1. Understanding human use of trees and forests is vital for successful integrated forest conservation and forest development efforts.

2. Community management of forest resources should be introduced in a phased, gradual approach, to gradually build up local capacity and skills.

To summarize, the approach advocated would involve the following steps:

Forestry exploitation cooperative or group - in either a natural forest or forest plantation

a. Through "animation" and PRA techniques, assess extent of interest in participation in cooperative and important social factors that will influence group activities

b. Take steps to ensure that specific target groups, e.g., those who will bear the costs of Protected Area protection or women, have the opportunity to participate

b. Negotiations with interested villagers, project staff, and DEF, e.g., roundtable to negotiate on parcels, management practices

c. Technical assistance

d. Forestry exploitation, management, and reforestation training, e.g., Morondava

e. Training in management, accounting, marketing, etc.

f. Develop a gradual phased approach to community forest management

i. Begin with limited use and exploitation of forest area

ii. Monitor impacts of use

iii. Develop forest management plan with community and technical advisors

iv. Gradually increase local rights and responsibilities

3. Agroforestry activities should build upon existing agroforestry practices, and perceived conservation and development needs. A possible approach might be as follows:

a. Analyze reasons for tree cutting, deforestation, and agricultural and livestock practices to assess needs for possible agroforestry interventions

b. Examine local interest, opportunities, constraints

c. Develop strategies with local participants

d. Involve interested parties in tree nurseries and demonstration field trials (participatory effort)

e. Provide appropriate training and technical support, e.g., village nursery training program of UNICEF and DEF improved tavy institute at Beforna

4. Social forestry extension approaches need to maximize active local participation. To introduce new activities, the following are recommended:

a. Demonstration sites

b. Village extension agents ("animateurs"/"animatrices")

c. Training for project staff and forest agents in PRA/RRA, social forestry, rural sociology, gender analysis, etc.

CRITERIA FOR SAVEM-FUNDED PROJECTS

Conservation Action Grants

A wide variety of social forestry activities could be funded by CAGs. Local groups and individuals might engage in income-generating activities, such as commercial tree nurseries, horticultural production of fruit and other cash crop trees, woodlots for timber, poles, and charcoal, honey production, or propagation of medicinal plants. Some possibilities for artisanal production, such as making of baskets or producing fuel-efficient cookstoves, might be feasible in certain areas. In areas where eco-tourism possibilities exist, local groups might be able to earn money through running tourist camps or hostels, providing guide services, or selling local artisanal products and souvenirs to tourists.

Some activities might also be funded that have important social values, even if they cannot be economically quantified. Examples might include purchasing parcels of forest land that has a sacred or spiritual value for local people, or developing environmental education programs for local residents.

Start-up funding for small-scale enterprises and other such economic activities might be provided as credit on a revolving fund basis. Such funding could be provided for tools, other capital equipment, and construction. Other activities, such as applied research or training, might be funded as outright grants. Many small local groups would benefit from training in technical issues, such as forest exploitation and management techniques, as well as training in project design, management, and accounting procedures.

Suggested Criteria

Suggested criteria for SAVEM-funded Projects follow. Due to the differences in project scale and funding, more detailed criteria are proposed for the PADGs than for the CAGs.

Conservation-Development Links

For PADGs, the Phase I assessment must clearly articulate how the Phase II activities will link conservation and development efforts. The project proposal must specify how it intends to examine the fundamental hypothesis of the SAVEM Project. Operational definitions of concepts and indicators must be provided.

For CAGs, the proposal must state how the proposed activities will contribute to conservation, and how impacts can be assessed.

Rationale and Supporting Evidence: The SAVEM Project intends to support activities that directly link conservation and development. The goal is to empower local people to manage and conserve natural resources. The assumption is that if people can receive social and economic benefits from these resources, they will be motivated to conserve, rather than destroy, them.

An example of local involvement in resource management is the collaboration between the Biosphere Project and members of three fishing communities. The Project has established a 1000 ha. marine park, consisting of three islands and surrounding water. Residents of the three nearby villages are permitted limited fishing rights within the park, in exchange for assisting the Project in protecting the park from unauthorized use. Since this program has been started, the abundance of fish, shellfish, and marine animals has increased, as have fishing catches for the local participants.

Suggested ways of meeting this criterion: To promote linked conservation and development activities, the following actions are proposed for PADGs:

1. Baseline studies and inventories of resources and areas to be conserved, with an analysis of local use patterns and priorities.

2. Participatory analysis of the conservation and development links, and negotiation on local involvement in resource use and management.

3. Gradual development of local participation in management, with necessary technical support, training and development of local human resources, and local institution-building.

4. Participatory monitoring of key indicators, to assess social and environmental impacts of interventions. Indicators should assess conservation of resources, social and economic development, and empowerment. These indicators need to be able to track participation by different resource users and spatial impacts upon the areas being conserved.

Sustainability

Proposed activities must have reasonable prospects for long-term ecological and socio-economic sustainability and replicability.

Rationale and Supporting Evidence: The purpose of the SAVEM Project is to support and examine various approaches to integrating conservation and development activities that will be sustainable and can be replicated to other sites. As projects will be funded for a short time period, i.e., three or four years, it is vital that activities can be continued by rural residents, local groups, and Malagasy NGOs after project funding ends.

Suggested ways of meeting this criterion: The project proposal should indicate that the following types of issues have been considered, and that project strategies are adequate to address them:

- Will proposed development activities be economically viable, considering fluctuating markets, availability of transport, and alternative economic activities, e.g., cash crops. Will the proposed activities use locally-available materials and inputs?

- Community stability issues should also be examined. Are there links between political instability and attacks on the forest? What is the development objective, to stabilize the community size or grow? What degree of social cohesion (ethnicity, immigration) exists, and what are possibilities for negotiating binding social contracts on resource conservation?

- What mechanisms are proposed to empower local people to sustainably manage resources? Are there local social organizations or other mediating social structure that can be supported and reinforced? Will efforts be made to develop individual human skills, to empower local management? Will the people be able to continue with the activities when the project funding ends?

Project Scale

The size of the project intervention zone must be identified and justified in the course of Phase I planning. The project must identify how zones of total preservation, conservation buffer zones with limited uses, and exploitation and management of natural resources in the peripheral zones will be negotiated with local residents. The proposed activities, staffing levels, and logistical support need to be on an adequate scale to address the problems identified in the project area.

Rationale and Supporting Evidence: Each project must determine the scope of its interventions. The Biosphere Project, for example, has undertaken research to ascertain where human pressures are being exerted upon the Protected Area, and identified 22 target villages for interventions. Other projects are working with fewer communities.

Some projects have adequate logistical support and staffing levels to make a significant impact. Other projects have underestimated the logistical support and staffing necessary: their activities, thus, are very thinly dispersed.

Suggested ways of meeting this criterion: First, adequate participatory research and appraisal is needed to identify and negotiate with local residents the various zones to be managed -- for total preservation, conservation with limited use, and exploitation and management of resources in peripheral areas. Such an analysis should identify what key development interventions, in what locations, are hypothesized to lead to the desired conservation and preservation objectives. Based upon this initial work, then activities, staffing, and logistics can be proposed to address the planned strategy.

Participation

Efforts to develop integrated protection, conservation, and development plans for Protected Areas and peripheral zones must involve the active participation of, and negotiation with, local residents. The project must use participatory methods for project development, implementation, monitoring, and evaluation.

Rationale and Supporting Evidence: Ample evidence suggests that active participation of local people is essential for long-term sustainability of development activities.

Projects working on conservation and development activities have involved local people to varying degrees. Some projects have sought local participation in identifying development needs and priorities. Several of the projects visited have conducted socio-economic studies. Local participation has been sought in demonstration sites and field trials: this approach needs to be further developed.

In some areas, concern has been expressed by local people that the conservation projects will take away their land or deprive them of use of resources. It is vital that local people participate in projects to understand the objectives of joint conservation and development.

Suggested ways of meeting this criterion: The community and community leaders, in collaboration with project staff and other technical specialists, can identify local priorities and possibilities for action. A wide number of techniques are available for facilitating participatory development efforts. The Catholic Diocese of Diego Suarez has used the DELTA approach in working with several villages around Amber Mountain.

GRAPP (Groupe de Recherche d'Auto-Promotion Paysanne), based in Bobo-Dioulasso, Burkina Faso, has techniques for promoting group or village-level discussions and analysis of various social problems, e.g., health issues, such as malaria, and environmental degradation. GRAPP techniques have been widely used throughout West Africa by extension agents working on community forestry programs.

In some communities, it may be appropriate to develop community resource management plans. One approach is through a Participatory Rural Appraisal (PRA) process. This methodology is a subset or offshoot of Rapid Rural Appraisal (RRA) techniques developed by the International Institute for Environment and Development in London and the Institute for Development Studies at the University of Sussex. RRA techniques have been widely used in farming systems, agriculture, agroforestry, natural resource, and community forestry development activities. These techniques have also been applied to

other areas, such as health, sanitation, disaster relief, education, and sociological research (McCracken et al. 1988).

Work in developing and applying this PRA methodology has been conducted in Kenya and elsewhere. A handbook and training materials exist, as well as case studies documenting how the process has been applied in particular communities. As noted in the Participatory Rural Appraisal Handbook (National Environmental Secretariat of Kenya et al. 1990), this approach can only be used if it has the full support of government officials and community leaders, and the interest of the community. Participants in the PRA team need to be fully familiar with the PRA methodology, and preferably should have prior experience or training in PRA.

Social Equity

The project must consider social equity issues, and how they are to be addressed. Since concepts of social equity are culturally-specific, local participants and project personnel together must define an approach.

Social equity issues include consideration of who will benefit from project activities. This question needs to be addressed on two levels -- beneficiaries of project field activities, and personnel directly employed by projects. Wherever possible, local residents should be able to realize direct benefits from the conservation and protection of Protected Areas and buffer zones. Hiring policies must be equitable.

Rationale and Supporting Evidence: Some Protected Areas, such as Amber Mountain National Park, are open to tourists. The current policy of ANGAP is that entrance fees should be used to help protect these areas. Thus, any direct economic benefits for local communities will only come from employment, and goods and services provided to tourists.

The question of employing local residents as APNs is a sensitive one.
In several villages we visited in the Amber Mountain Region, the APNs told us that they did not come from the village in which they worked, but from nearby villages. In Ambodirafia, the Tangalamena noted that all four WWF APNs hired for the Betampona Reserve came from the village of Fontsimato. He felt that this situation was unjust, and that someone from Ambodirafia could have been hired.
The Project Paper also noted the possible problem of locally-hired APNs being unable or unwilling to ensure that their family members or neighbors observe restrictions on use Protected Areas.

If the Protected Area is important as a watershed, the nearby residents should be able to benefit from protection of the watershed. In both Amber Mountain and Betampona, the forests contain important water sources. In Joffre-ville and Ambodirafia, local residents lack access to safe potable water.
In Sakaramy, residents have become concerned about the drying up of a local source, which has increased the work burden for women in fetching water for household needs. The watershed of Amber Mountain is being protected for the urban residents of Diego Suarez, not for the residents of the adjacent villages.

The lack of potable water has negative impacts on health, which is a major priority for local people. If people are frequently ill, this negatively affects their ability to work in their fields or engage in other productive activities. Poor health also increases their expenditures of time and money, to seek medicinal plants or to purchase modern pharmaceutical. Health problems can also directly affect conservation and protection activities. For example, last year there was an outbreak of dysentery in the

region around Fenerive-Est. Due to this epidemic, the APNs were reluctant to go into the field to carry out their work, for fear of falling ill. One APN did contract dysentery, and had to be hospitalized.

Suggested ways of meeting this criterion: Local residents should benefit directly from preservation and conservation of Protected Areas. Possibilities exist for both consumptive and non-consumptive uses and benefits of Protected Areas. Within Protected Areas, local residents could benefit from eco-tourism development, employment as APNs, guards, guides, or research assistants, or environmental education. If the Protected Area is an important watershed, the nearby residents may need access to potable water. If buffer or peripheral zones are managed for resource use, such as collection of medicinal plants or charcoal production, rights to these resources should be negotiated with, and reserved for, local residents.

The issues of local participation need to be addressed at several levels: individual, household, groups, and communities. Clear strategies must exist to identify and target activities to reach groups of particular concern. These include:

- those currently using the Protected Areas, who will bear the costs of enforcement and/or restriction of their former activities, i.e., those cultivating in P.A.s, or those harvesting forest products, such as wood, firewood, medicinal plants, or game;
- those suffering the worst impacts of environmental degradation;
- "landless" people, particularly young people;
- poor households;
- women.

An example of how specific strategies for target groups could be developed is provided for women's participation [see Criterion 6].

Hiring policies for project activities need to be clearly stated. They should stress local employment. Hiring policies need to ensure that a diversity of local people from different villages have opportunities for employment. Efforts should also be made to ensure equitable hiring of project personnel from outside of the local area.

Women's Participation

SAVEM-funded projects must ensure that women have equitable access to funding, assistance, employment, and training. Women must be involved as active participants and decision-makers in project activities, both as local participants and project staff.

For PADGs, the project must offer women equitable opportunities for employment at all levels of project activities, training, and advancement.

Rationale and Supporting Evidence: Women are actively involved in using natural resources. They, therefore, represent important and likely collaborators in conservation and development activities.

It is also an explicit USAID policy, and an objective of the SAVEM Project that women have equitable opportunities for involvement in development activities.

Integrated conservation and development projects in Madagascar are already working with women. For example, the Biosphere Project has found that women are very interested in working with improved bee hives outside of the forests. In some sites visited, women are already organized in social organizations that undertake natural resource activities. A women's association based in Maroansetra has already engaged in reforestation activities. Some ICDPS visited, such as the WWF project in Amber Mountain, SAFAFI rural development activities in Masoala, and the Biosphere Project in Mananana-Nord already have a number of women staff members, working on both professional and field extension activities.

Suggested ways of meeting this criterion: Within the total range of CAGs funded, efforts should be made to ensure that women have equitable access to funding, assistance, employment, and training. To obtain women's participation, special efforts may be needed to help women formulate and submit proposals for funding. GMU may be able to provide training or technical assistance in this area. Another possibility would be to work through intermediary NGOs or regional representatives.

For PADGs, the involvement of women in Phase I activities and proposed staffing for Phase II activities should be assessed. To promote women's participation, a gender analysis can be conducted, to assess existing activities, constraints, and potentials. Specific strategies should be proposed to enhance women's participation in project design, implementation, monitoring, and evaluation. For example, training and hiring of women extension agents can be a particularly effective means of working with women resource users. Gender-disaggregated data needs to be included in the indicators for tracking project progress.

Training

PADGs must have clear strategies for training of project personnel, collaborators (such as DEF agents), and local participants.

Rationale and Supporting Evidence: Education, extension, and training are vital for human resources development and empowerment. If the Project's major objective is to change human behavior from destruction of the environment to conservation, training in specific skills will be needed.

Suggested ways of meeting this criterion: Depending upon an assessment of needs, training could be provided to project staff and collaborators in basic rural sociology and anthropology, Participatory Rapid Appraisal techniques, other "animation" and "sensibilisation" techniques, gender analysis, and other issues important for working with rural people.

At all levels, including local participants, technical training may be needed in agroforestry, forest exploitation, natural forest and plantation management techniques. Training may also be needed in areas of needs identification, project identification, planning, implementation, and monitoring, budgeting and accounting, and management. Besides formal courses and technical assistance for in-service (on-the-job) training, other forms of training should be considered. These might include attending workshops or conferences, study tours, farmer-to-farmer visits, etc.

Research and Indicators

For PADGs, research and evaluation must be targeted towards key indicators (to assess the impact of conservation and development activities) and towards hypothesis-testing. Key indicators will be used to identify baseline ecological, economic, and socio-cultural conditions and monitor changes during project implementation. Such key indicators should be identified during the course of Phase I project design activities, in collaboration with the Biodiversity Planning Service (BPS). To the maximum extent possible, participatory research with the resource users and managers should be developed.

Rationale and Supporting Evidence: A major purpose of the SAVEM project is to research viable and sustainable approaches to environmental management of Protected Areas and surrounding peripheral zones. The aim is to replicate successful efforts to conserve biological diversity and promote development elsewhere in Madagascar. The project also hopes to contribute to overall understanding of ways to shape human behavior with natural resource use.

Suggested ways of meeting this criterion: Guidelines have already been suggested for ways of developing indicators to examine human uses of trees and forests, and recommendations have been proposed for key elements for baseline studies. In addition, for the overall SAVEM Project, cross-cultural, comparative sociological methods can be employed to examine similarities and differences between sites within a specific project, and among projects.

Social Forestry Activities (Agroforestry, Reforestation and Tree Planting, Plantation and Natural Forest Management)

For both CAGs and PADGs, any agroforestry, forestry, or natural resource management activities will minimize adverse environmental and social impacts.

For PADGs, Phase I will identify the type and degree of forest resource use by various local groups, and will analyze the threats to forest and biodiversity conservation. Development strategies to be implemented in Phase II must respond to those specific issues. Proposed social forestry activities must respond to both conservation and development needs. Efforts must be made to link social forestry activities with other local development priorities.

Before embarking on social forestry interventions, appropriate baseline studies should be conducted. For example, for agroforestry activities, it is vital that the land tenure and labor constraints and requirements are well understood.

Rationale and Supporting Evidence: Where threats to the preservation of forest and biodiversity are linked to uses of forest resources, social forestry activities in buffer or peripheral zones may be able to lessen pressure on the core areas. If, for example, people are cutting trees for building materials for their houses, it may be possible to replace such activities with managed exploitation of forest plantations or parcels of natural forest in state or classified forests.

Suggested ways of meeting this criterion: Baseline studies should be used to indicate the existing uses of forests, both within the Protected Areas, and in surrounding peripheral areas. Using such information, project personnel, local residents, and technical advisors could develop plans to for appropriate social forestry interventions.

Depending upon the local conditions, various social forestry interventions may be desirable. Agroforestry can be used to improve soil fertility and reduce soil erosion, in order to improve agricultural productivity. Agroforestry can also be used to diversify farm incomes, such as establishing perennial tree crops such as fruit, coffee, and cloves, or provision of animal fodder. Opportunities exist for: (1) reforesting commercially logged sites, (2) reforesting areas exploited by local communities, and (3) establishing plantations to produce various forest resources. Where needed, tree nurseries can be run with community participation or established as small-scale commercial enterprises. It may be possible to turn the exploitation and management of some forest plantations over to local people. Where state and classified forests exist outside of Protected Areas, some could be made available to local communities or groups to manage. If such areas do not exist, and the forest in the Protected Area is large enough, it might be possible to establish a core area that would be totally preserved, and declassify buffer zones where limited forest exploitation would be permitted.

Community Management of Forest Resources

Any plans for community management of forest resources must be based upon an incremental, phased approach, which will build local capacity for management. After negotiating with local communities or groups, they can be granted limited rights to use and exploit specific forest resources within a given area. With technical assistance and training, management plans for these areas can be developed. Based upon management capabilities and performance, increasing rights and responsibilities can gradually be entrusted to the local community.

Rationale and Supporting Evidence: Examples already exist of communities that have been granted exclusive, limited rights to forest parcels. Traditionally, some communities have been able to control use of certain areas of forest. At least one forest exploitation cooperative is known to be functioning in Masoala Peninsula. As both foresters with DEF and community members and leaders have expressed concern about the ability of local communities to rationally manage forest parcels, it would be advisable to adopt a gradual phased approach, building local skills and capacity to manage such areas.

Suggested ways of meeting this criterion: First, the community's current forest activities and uses should be assessed. Second, it is important to assess existing local community experience in communal work and management of development activities or economic enterprises. Third, community members would need to be provided appropriate training and technical assistance in forest exploitation and management techniques. It may be possible to provide training for foresters, so that they could assist communities in drawing up forest management plans. The community would have limited rights to use and exploit the forest parcel: as they develop the appropriate knowledge and skills, they could gradually assume total management rights and responsibilities.

Collaboration with and Operational Support for DEF

Where PADGS plan to engage in social forestry activities, collaboration with and operational support for field DEF agents should be developed.

Rationale and Supporting Evidence: Government foresters and forest agents working with Eaux et Forêts have much experience, training, and potential in the areas of forest conservation and management. Many individual foresters are enthusiastic and motivated to undertake their work, but hampered by the lack of logistical support.

Some ICDPs have been successful in enlisting the support and collaboration of local forestry agents. In Betampona, the DEF agent works with APNs funded by SAF-JFKM and WWF to protect the Reserve. A DEF forestry agent based in Toamasina is responsible for training and supervising the APNs in Betampona. The Biosphere Project has worked with the two forestry agents stationed in Mananara-Nord on tree nursery activities. The forest agents, along with the Project's own Agents for the Conservation of Nature, have received training, uniforms, and other logistical support. The GMU has sponsored the participation of a forest agent from Maroansetra in a one-month training course in rapid rural appraisal being held in Dakar, Senegal (in April-May 1992).

These examples suggest that constructive collaboration between the Direction of Waters and Forests and NGOs is possible and desirable. Major policy and programming issues, such as the revision of forest laws or institutional-strengthening of DEF, are beyond the scope of the SAVEM Project. (Some of these issues are being addressed by another USAID Project, KEAPEM.)

Suggested ways of meeting this criterion: On an operational, field-level, SAVEM can collaborate with local forestry agents. They can be provided with logistical support (uniforms, bicycles, equipment) and training, and other incentives to undertake conservation and development activities in collaboration with ICDPs.

Collaboration on policy issues is also important. To protect forest areas important for biodiversity, the SAVEM project needs assistance on the level of policy reforms and policy implementation. The USAID KEAPEM Project is working on forest and related policy issues. A major issue for forest and land use is land tenure, particularly policies, laws, and DEF enforcement of conversion of forest land to tavy.

APPENDIX F

MONTAGNE D'AMBRE SOCIAL FORESTRY ASSESSMENT

Paula Williams

MONTAGNE D'AMBRE: SOCIAL FORESTRY ASSESSMENT

INTRODUCTION

The USAID Sustainable Approaches to Viable Environmental Management (SAVEM) Project intends to support integrated conservation and development projects. These projects are intended to conserve some of Madagascar's unique biological diversity, and promote rural development in surrounding areas. This integrated approach is based upon the following central hypothesis:

- 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.

This hypothesis seems to be based upon two basic assumptions:

- Local populations are currently destroying their environment.
- Behavior can be changed through education, i.e., seeing relationships, and through empowerment to make decisions.

For the SAVEM Project to examine this hypothesis, it will be necessary to consider carefully examine these assumptions and consider how the various concepts are being operationalized. The Assessment Team will need to consider these issues in order to suggest criteria and guidelines for possible IDCPs.

DEVELOPMENT AND PARTICIPATION ISSUES

Many definitions of development exist. For work on natural resource issues, it can be useful to consider a people-centered, participatory approach to development (e.g., Williams 1983, 1991). Development is a process that empowers individuals to better control their own lives. People develop themselves: development is thus, by definition, inherently participatory.

Development occurs when people gain increased access to, or control over, resources. These include not only natural, or material, resources — such as land, trees, other plants, animals, and water — but also social and human resources — such as knowledge, education, extension, skills, informal and formal organizations, time and labor, money, credit, income opportunities, mobility and transportation. For development to be sustainable, it must not only meet ecological criteria, but also social criteria — such as acceptability and equity, for present and future generations.

If people are to derive economic and social benefits from conservation activities, and are to be empowered to make decisions on natural resource management, then a participatory development and a people-centered approach to conservation will be needed. As noted in *People and Parks* (Wells et al. 1990), many integrated conservation and development projects have focused on providing benefits to local people in a passive beneficiary approach. Fewer have tried to adopt an active participatory approach,

especially with respect to fostering local participation in: (1) information gathering; (2) consultation; (3) decision-making; (4) initiating action; and (5) evaluation.

SOCIAL FORESTRY ISSUES

Human Uses of Forest Areas

In this region, people use forest areas for various purposes. Forests provide resources used for both household subsistence and for income generation. The most common uses of the forest seem to be for construction wood, firewood, charcoal (primarily for sale), and medicinal plants. Wood and cuttings are also used for fencing. Some honey is also obtained from the forest. The forest is also used as a source of good agricultural land for certain crops, such as qat and bananas. Some people recognize the role of the forest as a watershed or water source. According to WWF surveys, few local people claim to use the forest for hunting or fishing. No one mentioned using the forest for grazing their livestock, collecting wild flora and fauna for sale, or obtaining materials for handicrafts, though such uses may occur.

When WWF surveyed villagers on the roles of the forest, the most common response given was that it provides construction wood. Other common responses were that it provides water or "toute la vie." Few respondents cited the forest as a sacred place. In our discussions with local residents, however, some taboos (*fady*) on uses of specific areas or species in the forest were noted.

When villagers were surveyed about species used for various purposes, they obtained the names of 30 common species used as medicinal plants. According to WWF staff members, the number of medicinal plants is under-reported, as plants with specialized uses are often not discussed. In only 2 out of 12 fokotony were WWF staff able to meet traditional healers. WWF staff members also believe that survey respondents under-report their use of traditional healers and traditional medicines, and over-report their use of modern doctors and modern medicines.

Survey respondents reported using 2 wild plant species, *oviala* and *majola*, as food. They also collect 10 wild fruit species as food. These include: *konokono*, *vavandriky*, *mokotra*, *paisoala*, *lamonty*, *satrana*, *gavo*, *vahipingotra*, *madiro*, and *sondririna*.

In WWF's socio-economic studies, information was obtained on 30 tree species used for construction purposes.

In Antsiranana Province, major exploitation of timber is conducted on a commercial basis. Other team members examined commercial logging and charcoal production, which is carried out by commercial exploiters under permits from the Provincial Service of Waters and Forests.

Based upon interviews and observations during our field trip, it seems that firewood is not perceived to be in short supply. In Sakaramy, a couple of families noted that they obtained firewood within 30 minutes of their homes. In Joffreville, one respondent noted that the town has many old fruit trees and deadwood is easy to find. When branches no longer bear fruit, they are cut for fuel. Several villagers interviewed stated that men obtain the firewood for household use. Around some villages visited, lots of Leucaena trees line the roads. Some is being used for fuel, but other stands seem to not be exploited.

Charcoal-making, in contrast, has been an important income-generating activity. With traditional methods, we were told, charcoal can be made in 15 days, providing a quick source of income. This charcoal is generally sold for the Antsiranana market. In Joffreville apparently a small quantity is sold for local needs, such as ironing: most households cook with firewood.

In several villages, the illegal production of charcoal has decreased since APNs have started working in the villages. We visited an illegal charcoal kiln site outside of Sakaramy, which was in an area of state-owned forest. In some cases, since the arrival of an APN, more villagers have obtained permits from Eaux et Forets to make charcoal for sale. Elsewhere, villagers have expressed resentment that they cannot make charcoal, whereas commercial exploiters are permitted to do so. The APN in Sakaramy, mentioned that sometimes commercial exploiters, who have permits for producing charcoal from nearby Eucalyptus plantations, sometimes ask villagers to make and sell them charcoal.

In Andranomanitry, which borders the Montagne des Francais classified forest, village men expressed their desire to have the legal right to exploit the forest for commercial charcoal production. They already make charcoal illegally. Villages like Andranomanitry, Joffreville, and Sakaramy are linked to the provincial capital by good roads, so it is easy to sell charcoal in comparison with more remote villages, such as Andasibe.

Forest areas are also used, on a very limited basis, for recreation — primarily by tourists. The Montagne d'Ambre National Park is open to tourists, whereas the Special Reserves of Montagne d'Ambre, Ankaranana, and Analamera are not. The Montagne des Francais is listed in tourist guidebooks as a hiking site. The potential for local residents to derive economic benefits from visiting tourists seems to be extremely limited. Some forest areas have a potential role in environmental education and extension programs, such as those currently being developed by WWF.

Managing Forest Use

Traditionally the Direction of Waters and Forests (Eaux et Forets) has been responsible for managing use of forested areas, such as state and classified forests. ANGAP has recently been created, to assume responsibility for managing of Protected Areas (National Parks and Reserves).

The Provincial Service of Waters and Forests for Antsiranana has difficulties in carrying out its management and enforcement responsibilities due to limited personnel, lack of transport and other means. While it issues permits for timber and charcoal concessions, it lacks the means for follow-up in the field to ensure compliance with permit regulations, such as replanting of harvested areas, and for developing forest management plans. This current situation of government forestry department is well-known and documented (e.g., Seyler 1987). The Direction of Waters and Forests has itself noted that it has only 400 agents nationwide (USAID 1990). The Provincial Service is currently staffed by only two forest engineers. For enforcement of regulations, they also receive help from the police and military.

Extension activities are similarly limited. Forest agents, for example, do not provide training in improved charcoal-making techniques. Some forest exploiters have received training at Morondava.

The forestry department does maintain some tree nurseries and provides seedlings for citizens to plant. In Sakaramy, for example, the local forest agent and the Agent for the Protection of Nature worked with local residents in mid-January 1992 to plant some trees. The recent creation of the APN

(Agents for the Protection of Nature) system provides personnel for protection of conservation areas and extension activities.

Conservation of forest resources and biological diversity has improved since the launching of WWF activities and the hiring of the APNS. Villagers, local political authorities, and WWF project personnel all note that local residents are increasingly observing restrictions on the protected areas. In some areas, however, the boundaries of the protected areas are either not marked or are in dispute. Villagers' production of charcoal in the reserves has decreased, as has the overall incidence of bush fires.

Village or community-level management exists to a limited degree. Some communities have taboos about using certain parts of the forest, or certain plant or animal species. Other communities have regulated forest use. For example, in Joffreville, according to the WWF animatrice, some people are now protecting certain areas of state-owned forest to protect the water sources, while others are planting their own "private forests" for their children. The WWF survey team learned in Antsahampano that a man was "excommunicated" from the fokonolona for not respecting regulations of the fokotany, especially concerning the forest. He had paid youth to cut 5000 logs in the forest of Beantely.

Use and Management of Trees Outside of Forest Areas

Agroforestry activities already exist in the region. Farmers commonly plant fruit trees around their homes, in home gardens, and in their fields. Some people use trees or shrubs for live fences, or make fences out of wood cuttings that may sprout. In certain areas, Leucaena trees are very common along the roadsides: use of these trees for fodder or firewood seems to be limited.

In the province, neither Waters and Forests nor Agriculture currently has any agroforestry extension activities. WWF has an agronomist who has attended a training course in agroforestry held at the International Council for Research on Agroforestry (ICRAF) in Kenya.

Individuals and communities have engaged in establishing tree nurseries and planting tree seedlings. In some places, such as Joffre-ville, people have their own nurseries for producing fruit tree seedlings. Other village-level nurseries have been established by WWF, working with villagers, APNs, or animatrices or animateurs. Some villagers obtain their tree seedlings from Eaux et Forets.

Tree planting is already taking place for several purposes. In some areas, such as Sakaramy, villagers have planted trees to protect and try to rehabilitate water sources, as well as to provide fruit for the local population. In Joffre-ville, many people plant fruit trees in their fields. According to the animatrice, some people have begun planting their own private forests, with local species, to provide trees for their children ("future generations").

We also visited a ZODAFARB reforestation site, which was approximately 10 kilometers from Sakaramy. This site was planted by some villagers and some functionnaires, including a WWF forester: apparently land title has not yet been clarified, and there has been no local surveillance of tree planting efforts over the past three years of planting.

Some large tracts of land are unavailable to local people for either agriculture or forestry activities. Some areas had been granted to colonialists, industrial or horticultural concerns, but were no longer being used. Other areas are allocated to the government, such as a military reservation (firing

range) in Sakaramy and property controlled by the livestock (Elevage) department in Andasibe. It might be worth exploring possibilities of negotiating local use of some of these areas.

LINKING CONSERVATION AND DEVELOPMENT

How can conservation and development be linked? This relationship can be fostered by promoting greater local control and management of natural resources. If people can gain the resources they need from their village and surrounding areas, then pressure on the Protected Areas can be diminished.

To conserve the Montagne d'Ambre Reserve Complex in northern Madagascar, it seems highly desirable to further develop local systems of agroforestry, natural forest management, and reforestation in areas outside of the reserves. Efforts to strengthen these activities should build upon existing local knowledge, practices, and social organizations. For such efforts to be socially sustainable, more local participation will be needed in identifying development priorities, constraints, opportunities, and alternatives, and negotiating community-based natural resources management systems.

The focus should be to ensure sustainable livelihoods for local people living near the reserves. Possibilities should be explored — on a pilot basis — to make alternative forest resources, including those in some state-owned and classified forests, available to local residents for both subsistence use and income-generating activities. Some specific examples can be suggested.

Local people already recognize interrelationships between conservation and development. In Sakaramy, the villagers have become concerned about diminishing water sources. The local people previously cut trees and the water sources dried up. Whereas the water used to come within 300 meters of the Firaisana office, now the nearest water is 1.5 kilometers away. This has greatly increased women's workload in getting water for household use. Consequently, the people have planted trees to try to restore the water sources and to protect the land. They have also planted fruit trees for community as well as individual use. They have obtained their tree seedlings from the WWF nursery in Joffre-ville.

Local social organizations that could undertake reforestation and natural resource management vary enormously between villages and fokotony. Some communities, such as Andasibe, have one village leader, who can easily mobilize the community, such as for reforestation activities. Other communities, such as Joffre-ville, which are more ethnically diverse and have experienced much immigration, seem to be organized more along ethnic and family lines. Mutual aid working parties may exist for agricultural labor, on either a regular, i.e., weekly, or occasional basis. Other organizations that may be useful for environmental education and community-based resource management activities include schools and youth groups. In some communities, it may be most effective to work with individual households or farmers.

How to introduce such activities? It seems wisest to begin with existing organizations and social structures, partnerships among government, NGOs, and local people. APNs, animateurs/animatrices, and other extension agents can introduce such ideas, and facilitate community discussions. Some pilot projects, such as use of state or classified projects for community forest management, could be tried.

To the greatest extent possible, such activities should be promoted in a fully participatory manner. It may be useful to provide technical assistance in Participatory Rural Appraisal methods, to help rural communities themselves analyze their situation, identify their problems and priorities, and find their own

solutions. Any applied research, monitoring, and evaluation carried out should have active local participation.

One issue that requires particular attention is that of social equity. In establishing demonstration sites, or working with model farmers, care is needed to avoid the appearance that a project is just favoring a few individuals in the community. When we interviewed villagers in Andranomanitry, concern was expressed about the idea of some villagers receiving development benefits, e.g., a plow, which would enable them to become richer than the others.

In terms of both equity and effectiveness of development activities, attention must also be paid to how various social groups — including women — will participate in project activities(c.f., Williams 1985, 1991). It is commonly argued that differences between women and men are less pronounced in Madagascar than in Africa. Nonetheless, in many of our village visits, we found that if men were present, they would do the talking and the women kept quiet. The social customs, constraints, and opportunities for women's participation probably differ by ethnic background and origin.

Possible development interventions include extension work and technical improvements in existing activities, and introduction of new activities:

Agroforestry	
Existing activities	Fruit trees, live fences in home gardens and fields
New activities	Efforts to improve soil fertility and control erosion
Natural forest management	
Existing activities	Firewood collection, charcoal production, harvesting of medicinal plants and honey, cutting construction wood and timber; some protection of water sources and taboos on exploitation of certain species
New activities	Negotiate arrangements for local groups or communities to plan and manage forests for various products, such as charcoal, medicinal plants, or honey; provide necessary technical advice and extension for institution-building. Logged natural forests could be rehabilitated by hiring or allowing local people to convert logging residues to charcoal and replanting with indigenous species
Plantations	
Existing activities	Private and community plantations of timber, fuel, and fruit species, primarily exotic species
New activities	Experimental trials with indigenous species, including possible work with medicinal species

Wherever possible, these forestry-related activities should be integrated with efforts to meet local development priorities for water, health, education, improved agriculture, transportation, and increased income-earning opportunities.

Other natural resource-related activities might include programs to jointly protect watersheds and water sources, and provide water to rural communities.

Another activity that might bring development benefits to local people could be the establishment of tourist hostels (campements), to be run as income-generating activities by local groups. Such tourist camps are quite common in the Casamances, in southern Senegal. In Popenguine, Senegal, for example, a women's group is establishing such a tourist hostel in a nature reserve.

An example of possible development interventions can be suggested for Sakaramy. In Sakaramy, villagers use forest resources for firewood, charcoal production. Some honey and many medicinal plants are collected for sale in Antsiranana. The villagers' illegal production of charcoal has decreased since the WWF hired an APN (Agent for the Protection of Nature) to work in the area. In 1991, 20 villagers obtained permits for charcoal production.

Near Sakaramy is a eucalyptus plantation, established by the local population during the First Republic. This plantation is currently being exploited by 5 commercial operators, who come from Antsirana and have permits from the Provincial Service of Waters and Forests. One possibility would be to turn this plantation over to community-level management. It would be possible to manage the Eucalyptus plantation to produce charcoal, firewood, and honey.

Another possibility to explore would be forest management — of either small-scale (i.e., 1/4 ha.) plantations of medicinal plants or management of small areas of natural forest to produce medicinal plants. Such work would involve addressing a number of key questions concerning plant replication, medicinal dosage and toxicity, and impacts on biodiversity (Cunningham 1990). Small-scale plantations of medicinal plants have been established in Africa, such as in Senegal and Botswana.

As the local community has already participated in tree planting, and local cooperative work groups already exist, it seems that such activities should be feasible from a social and organizational viewpoint. Such an approach would require extension work and technical assistance, to maximize community participation in all phases of the development and management activities. Collaboration among development partners — government, NGOs, and local communities — would be vital.

It is also essential that links be promoted among development efforts in various sectors. For example, GTZ is undertaking a study of firewood and charcoal consumption in Antsiranana Province. If GTZ were to decide to promote alternative energy sources, improved cookstoves to reduce charcoal consumption, or more efficient charcoal production techniques, how would that affect rural charcoal producers?

ASSESSING IMPACTS

In developing indicators for agro-forestry and other natural resource baseline studies, it seems wise to draw upon the preliminary experiences of NGOs working on conservation and development projects in Madagascar. Standard socio-economic surveys can provide some useful descriptive baseline

data. If surveys are to be conducted, adequate support is needed so that the data can be used to examine hypotheses and explain variation (e.g., do landowners conserve resources more than tenant farmers? How do perceptions of the availability of the forest vary by length of residence? etc.)

A wide variety of other rapid assessment methods, however, can often provide data in a more timely manner. As previously suggested, such applied research and assessment should actively involve the local people — not just in providing the information, but in analyzing the situation and impacts.

FURTHER QUESTIONS

Based upon the initial field observations, it seems important to obtain information on the extent to which conservation and other development projects in Madagascar have been able to work with or develop community organizations for participatory development activities and management of natural resources.

Major challenges ahead for integrated conservation and development projects include addressing the following questions:

- How to increase local participation in both conservation and development?
- How to strengthen direct relationships, or links, between conservation and development?
- How to coordinate and collaborate more between organizations, government agencies, NGOs, and donors on development efforts?

CHRONOLOGICAL LOG

22 February 1992

Adrianne Raoelijaoma, Chef de Service Provincial de Conditionnement, Agriculture
Jeanine Razerfindramanana, Responsable de l'Agriculture Provincial
Representatives from:
the Development Committee of Catholic Diocese of Diego

24 February 1992

Brief meeting with WWF staff
Raphael Dieudonné Razafindrainibe, Service Provincial des Eaux et Forets
Georges Augustin Jao, Debt-for-Nature, SPEF
Moathilde Narove, President, Assn. pour le Sauvegarde de l'Environnement (ASE)
Imbe Venance, Secretaire-General, ASE
2 other representatives, ASE

25 February 1992

Team meeting with WWF staff
Individual meeting with Amidou Djaovita, WWF, concerning socio-economic studies
Théodard Zony, SPEF

26 February 1992

Field trip: Sakaramy
Tsiraony, President du Firaisana, Antsiranana II
Zamany Jaoseny, APN
Visited ZODAFARB afforestation site and illegal charcoal production site
Interviewed one family

27 February 1992

Théodard Zony, SPEF
Field trip: Anivorano-Tsarabibany-Ampasimbengy (never reached logging site)

28 February 1992

Field trip: Andasibe

2 March 1992

Field trip: Joffre-ville
Vivian, WWF Animatrice
Interview with one woman
Interview with husband and wife

3 March 1992

Field trip: Andranomanitry (village next to Montagne des Francais)
Théodard Zony, SPEF
Group interview with 20 village men and one woman

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APPENDIX G

SOCIAL FORESTRY ASSESSMENT FOR SECOND FIELD TRIP

Paula Williams

SECOND FIELD TRIP: SOCIAL FORESTRY ASSESSMENT

FIELD TRIP #2

**Perinet, Ankan'ny Nofy, Fenerive-Est,
Toamisina, Bentampona, Mananara-Nord, and Antanambe**

12-28 March 1992

This report summarizes information from interviews, meetings, and field observations for the sites visited: the Perinet Reserve in Andasibe, the village of Ampahabany and private forest reserve on Lake Ampitabe near Akan'ny Nofy, the UNICEF Integrated Development Project in Fenerive-Est, the Provincial Service of Waters and Forests, the Reserve of Bentampona, the Zoological Park of Ivoloina, and the Man and the Biosphere project based in Mananara-Nord. A detailed chronology of visits is provided in the Annex.

Site-Specific Information (Relating to Social Forestry Issues)

Perinet

The Perinet-Analamazoatra Special Reserve in Andasibe has been established to protect the indri and other lemur species. Unlike many reserves that are only open to scientific researchers, this reserve can be visited by tourists. A sliding scale exists for entrance fees, with foreign visitors paying 20,000 FMG and Malagasy nationals 5,000 FMG. The Reserve is readily accessible to tourists, being located on the major road and railroad line between Antananarivo and Toamisina.

Within the reserve is a fish breeding station. The remnants of a former cages for captive lemur studies can still be seen. Otherwise, the Reserve is devoted to preservation of the local flora and fauna. During our visits, we were able to see three species of lemurs in the forest — the indri, brown lemurs, and grey (?) lemurs. Trees along the trails have been numbered, for identification purposes. The Reserve is also well-known for its orchids. The only information on the species in the Reserve was provided by the guides: no environmental education materials exist at the site. The Reserve economically benefits the local population, by providing employment for guards, guides, and staff at the local hotel, the Hotel de Gare.

The Zoologic Park of Ivoloina

This forest reserve is located just 12 kilometers from Toamisina. It contains a small zoo, with cages of several species of lemurs and radiated tortoises. After a cyclone, the park was closed for three years for rehabilitation: it was reopened in 1990.

The site is being used for lemur research and captive breeding of endangered lemur species. In 1987, two primate researchers from Duke University, Andrea Katz and Charles Welch, began working with the Direction of Waters and Forests in the park. An island within the park will be used for future

release of lemurs (in a controlled semi-wild environment). Eventually, the researchers hope to be able to reintroduce lemurs into the wild in the nearby Reserve of Bentampona.

Sliding entrance fees for the park range from 5000 FMG for foreign tourists to 500 FMG for Malagasy nationals. Katz stated that the park entrance receipts go for employee salaries and for bananas for the lemurs.

The entrance booth for the park sells an educational comic book, *Lemurs in Peril* (Vaucoulon 1990), available in French or Malagasy, as well as commemorative T-shirts and lemur posters. In the zoo, several posters and maps provide information on the lemurs. On the cages are signs providing information about the lemurs, written in Malagasy, French, and English. According to Katz and Welch, the park had 5000 visitors during the first year, of whom 75 percent were Malagasy. The park is used for environmental education and "sensibilisation," especially for students from Toamisina. In the past year, however, the strike interfered with the school program. Local benefits from the park consist of employment and environmental education.

Lac Ampitabe: Akan'ny Nofy, Ampahabany, and a private forest reserve

Lac Ampitabe is part of the inland waterway system, the Pangalanes lakes and canal. The three tourist hotels on the lake are accessible by train (station at Andranokoditra) and by boat. Despite former breeding of crocodiles (reputed to have escaped!) the lake is considered safe for swimming.

Travelling to and from the lake, we noted a wide range of indigenous and exotic tree species. Along the railroad line, many exotic species were evident, such as teak and eucalyptus sp. These probably date from colonial times.

We spent one morning visiting the nearby village of Ampahabany. A fire had recently swept up a hillside toward the village. The villagers just managed to save the school from being burnt. The only forested areas in the region consist of a Grevillea sp. plantation, some forested areas in Akan'ny Nofy, and the nearby reserve.

The team divided into three groups and conducted a "rapid survey" with 5 households. As many men were working in the fields, we primarily met with village women. That evening, the team met to discuss the results of our survey.

With respect to forest resource use, respondents stated that they use the forest for construction wood (e.g., baobao), firewood, and honey. Other "forest" resources used include raphia, which can be found in the savoka, and is harvested as a cash crop. Leaves are also used as plates. Medicinal plants are obtained from both the forest and the *savoka*. While some respondents discussed use of medicinal plants, others stated that they doubted that such plants exist.

When villagers were asked about the forest, they noted that the primary forest was 4 km. away, but plantations of Grevillea and Eucalyptus spp. were located next to the village. Some respondents stated that they had noted no change in the distance to the forest, whereas others stated that the forest had diminished.

Villager perceptions on how to protect the forest varied. Some stated that there was no problem, that there was sufficient forest and rich soil. An older woman noted the villagers were divided on the

issue: while some were conscious of the need to conserve the forest, others destroyed the forest through tavy. Another person noted that the only person protecting the forest was Mr. Gottlieb, who had purchased 40 ha. of primary forest as a private reserve. One woman stated that the President of the Fokotony was responsible for forestry issues. Another said that the forest agent based in Ambobile never visited the village — not even after their fire. The Eucalyptus and Grevillea plantations had been created by the villagers, who had been provided the seed by the Direction of Waters and Forests.

The village has a single chief responsible for approximately 50 families. Some traditions of communal work, such as helping to construct a house, or working together on the school, exist. An association of students' parents (FRAM) exists. When asked about NGOs, some respondents did not know of any. Others mentioned Catholic nuns and priests in nearby villages (Ivoriane and Brickville) who provide food and medicine. The villagers interviewed mentioned the following development needs: health, medicine, and vaccines; money; the high price of rice; and housing.

The women interviewed were either reluctant or unable to answer certain questions, particularly when asked by men. One older woman explained to female team members that the village men make the decisions: sometimes the women may be called to a meeting, but they do not have the right to speak.

The following morning we visited the private forest reserve. Part of the area has been set aside as a small zoo and botanical garden, with a population of somewhat tame lemurs. Visitors pay entrance fees: foreign tourists pay 5000 FMG, whereas Malagasy nationals pay 500 FMG (?).

Nurseries for plant and tree propagation provide seedlings for sale and for planting within the reserve. The natural forest vegetation is being preserved in some areas of the reserve, whereas in other areas new species are being introduced. One section, for example, was being planted with a variety of palm species.

The reserve, botanical garden, and zoo have potential for environmental education purposes. No audio-visual materials exist, but some species are identified with signs. The reserve guard is also able to provide some explanations. The visitors to the reserve are probably just tourists and a few researchers.

A few local residents benefit from paid employment in the reserve. Other residents have lost rights to use the reserve since Mr. Gottlieb purchased the reserve from the state. An adjacent section of natural forest remains under state control, to which the local people have usage rights ("droit d'usage" for personal, but not commercial, purposes). Based upon our interviews in Ampahabany, however, it seems that some local residents are unaware that they can still use this state forest.

Fenerive-Est and Mahambo

UNICEF has an integrated development project in the region around Fenerive-Est. This project is working on a wide variety of development activities — village tree nurseries, improved cookstoves, health, nutritional education, nursery schools, vegetable gardens, livestock raising, and fish culture. UNICEF supports activities to improve the lives of women and children, and is integrating environmental concerns into all its activities.

The UNICEF project has an integrated approach. It works with the government. Its activities are guided by an Intersectoral Committee, composed of representatives of the concerned Ministries. UNICEF provides the materials for the different activities undertaken. Participants are expected to make

contributions to activities. In each village where UNICEF works, they usually sponsor between one and three activities, seeking synergistic results by grouping activities together. The Intersectoral Committee is also a means for "sensibilisation" of the government civil servants regarding development needs.

We took a day trip to Mahambo and Fenerive-Est. In Mahambo we visited a nursery school and health center. At the nursery school, we talked briefly with the two teachers. They have a total of 26 students between the ages of two and six years. On the day that we visited, 11 children were absent due to illness. The parents contribute 1500 FMG per month per child. The community is supposed to pay the teachers. Due to financial problems, however, the teachers were working practically as volunteers. UNICEF is providing materials for the school.

In Mahambo, we also talked to a local official concerning the health center, which has health and nutritional programs twice a week for mothers and children. Participants come from villages up to 10 kilometers away. Cooking demonstrations are done on the improved cookstoves. Catholic Relief Services (CATHWELL) provides milk and powdered maize for malnourished children. UNICEF is providing seeds for vegetable gardens, such as carrot, Chinese cabbage, cucumber, cabbage, courgettes (zucchini), and tomatoes. UNICEF is also working with primary schools to plant fruit trees, such as coconuts, grafted orange trees, and grafted mandarins.

In Fenerive-Est, we met Mr. Chan Peng of CIRESFB, who works with UNICEF on educational programs. Then we stopped briefly at the hospital, before continuing to a Health Center for Mothers and Children.

At the Health Center, we spoke with Dr. Gertrude Raharimanana concerning health problems, vaccination programs, essential medicines, family planning, and training needs. She told us that medicinal plants are used a great deal in the region, particularly in the villages. People search for these plants in the wild: they do not need to buy them or go into the forest for them. We also discussed nutritional issues. Tree fruits, such as lichees, are abundant and widely consumed. The basis of the daily diet is rice and *bredes*. Nutritional problems arise from a scarcity of protein, as people often will sell their chickens, eggs, and fish.

We then went to meet Mr. Raymond Rakotondrasoa, a forest engineer responsible for the local Circumscription of Waters and Forests. They collaborate with UNICEF in training villagers to establish tree nurseries. Each year training courses are held at a training center in Rantolava. UNICEF provides the participants' per diem and materials. (For example, UNICEF obtains the tree seed from a forestry seed bank in Antananarivo.) The villagers are trained in techniques that they can replicate in their villages, such as preparing "boulettes" for outplanting of the tree seedlings. Trained villagers return to their homes to establish cooperative nurseries with other interested villagers. They work together on a voluntary basis. The participants divide the seedlings amongst themselves and plant them on an individual basis. DEF forest agents go to the villages to follow up on the activities.

After a brief discussion in his office, we went to visit the Forest Station of Tampolo, located about 10 km. north of Fenerive-Est. The Forest Station consists of 675 ha. It was originally a "foret dominale" and was exploited in the 1950's. In the early 1960's, it was gazetted as a "classified forest." It has been used for silvicultural research trials. The research station has been handed over to the forestry department at ESSA (Ecole Superieure des Sciences Agronomiques) at the University of Antananarivo. ESSA sends forestry students to the Research Station for training and research, including those at both the forest engineer and "doctorat de 3eme cycle" levels. Three employees work at the research station — one station chief and two temporary employees. We visited the nursery where forestry students

produce seedlings of indigenous species, such as *ramy* and *vopaka*, using seed collected locally from the natural forest.

A map of the research station indicated that research trials have been established for the following 24 species:

Cedrella sp.	Niangon
Eucalyptus 12 ABC	Okoumé
Eucalyptus robusta	Ramibe
Eucalyptus sp.	Ramikely
Grevillea sp.	Ramy
Hazondronona	Swietenia macrophyla
Hintsy	Swietenia macrophyllis
Hompa	Terminalia ivorensis
Khaya sp.	Terminalia mantaly
Limba	Varongy
Maesopsis	Vintanina
Monlanga	Voapaka

We also discussed the general difficulties of protecting forest areas, given the national development policies and the situation of DEF. Rakotondrasoa noted that community forest management would work if the villagers were well-motivated. They must be willing to acquire the necessary technical knowledge and to wait 10-15 years before harvesting. The village of Manankafana, located in Soanierana-Ivorngo (?) has conserved a forest area to meet villagers' needs.

Provincial Service of Waters and Forests

In Toamisina, we met with four foresters to discuss the general forest management and protection policies and practices. One forester, Ramala Zony, had previously been the Chief Forest Agent for Bentampona Reserve from 1976 until 1986. He provided information on the Reserve, adjacent forests, activities of the DEF agents and APNs.

The foresters stated that community forest management activities around Bentampona would be difficult for several reasons. First, individuals who still have access to small parcels of forests are not interested in reforestation. Second, people in this area find it difficult to survive. Third, any such work would need to be long-term. Finally, they believed that the local people are motivated by individual interests and lack a collective spirit. Past experiences with socialistic agricultural cooperatives had failed, and the people lack courage to try such collective endeavors again.

Bentampona

The Bentampona Reserve is currently well-protected. On a 10-kilometer loop hiked within the Reserve, I saw little evidence of illegal human activities. In one location in the trail I saw a log being squared off as timber. The APNs and DEF agent reported that they occasionally see evidence that people have entered the Reserve to collect medicinal plants. Residents in Ambodirafia, 4 km. from the Reserve, are aware that they are forbidden to enter the Reserve. Tavy incursions into the Reserve had occurred

in the past. Due to the rugged terrain and accessibility of the forest, it has never been subjected to significant logging.

The forest is quite beautiful, with a wide variety of trees, plants, orchids, butterflies, chameleons, lizards, and birds. Although I did not see any, the forest has a population of lemurs. According to Katz and Welch, Bentampona currently has 30-50 individuals of an endangered species of lemurs. They think the Reserve might be a suitable site for reintroduction of lemurs from the captive breeding program at the Zoological Park at Ivoloina.

Existing use of the forest is legally limited to scientific research and patrolling of the Reserve by the DEF agent and APNs. The forest has potential values for controlled, low-level tourism and local environmental education. Any efforts to introduce such activities, however, must be based on careful studies of the possible environmental impacts, particularly for the lemur populations.

The forest contains several rivers and streams that provide water to the surrounding villages. Another direct local benefit from the forest
consists of limited employment for the DEF agent and APNs.

During our team's stay in Ambodirafia, we conducted our second rapid survey. Our team split into four groups. We conducted a total of ten surveys in Ambodirafia. Two team members also conducted two surveys in a neighboring village. The team has not yet synthesized our findings from this survey.

From the four surveys in which I participated, however, certain aspects of the forestry situation are evident. First, local residents note that the forest area has decreased, due to past clearing for tavy and cutting construction wood for houses. They stated that permits are needed to obtain construction wood from the forests outside of the Reserve. They get firewood from the adjacent forests or savoka areas. The Reserve itself is untouchable.

Second, despite the presence of a cooperative village pharmacy, many residents still use medicinal plants. Some medicinal plants grow in the fields, others are found in the savoka or forest. Some people noted that they only used a few plants, due to their limited knowledge.

Third, some residents recognize the need to protect the Reserve because it is the source of the village's water. One respondent noted that protection of the forest could not be left to the villagers alone, but would need the DEF Chef de Cantonnement to assure that the regulations are respected. The village president (?) noted the activities of the DEF and the APNs to protect the forest, and to start the tree nursery.

When villagers were asked about the development needs, they cited potable water, medicines and health, repair of the road to improve access to the village, food and nutrition, cleanliness, production activities to develop the village, provision in essentials goods, such as rice, improving the price of cash crops, and political security. One couple discussed the problem that the youth no longer want to work in the fields, but prefer to work for daily wages. Many respondents noted that they had difficulties in working their fields, due to their old age, ill health, and the lack of assistance from the young people.

A meeting was held one evening with a group of approximately 40 women, many accompanied by young children. When women were asked, they listed their problems as fertility (too many children

and the need for family planning), diarrhoea (due to uncleanliness, insufficient food, and dirty water), a dam for rice cultivation, and insufficient tools for women's work, e.g., rice cultivation.

The villagers seemed to respond well to the SAF activities in the area. Some noted that they saw results from working with NGOs, but not with government agents. One respondent noted that it was important that NGO-community relations be transparent, that all issues be openly discussed. Other NGOs that the villagers were aware of included a youth group related to the church, and a former youth group related to the political party. At the women's meeting, the women agreed that perhaps they need to work together to solve their development needs.

Within the village of Ambodirafia, SAF has worked with villagers to establish a community pharmacy and a community granary. After a difficult start, the pharmacy seems to be working well. The granary, however, has not been well managed. The village has elected a committee to oversee these community activities: of 14 members, the President and 5 others are women.

According to the extension agent, Mahefa, SAF-JKFM is working in five principle villages around the Bentampona Reserve. Development activities include village pharmacies, village shops, village granaries, and small-scale rice irrigation systems. At Ambodiatafana, Mahefa has demonstration activities in improved poultry raising and fish culture. He is thinking of starting agroforestry demonstration activities. SAF-JFKM hopes to hire another extension agent to work on agroforestry activities, and is considering about family planning efforts. With respect to conservation, SAF has hired two forest guards, who work with the DEF agent and the four WWF Debt-for-Nature APNs. Mahefa admitted that it was difficult to see clear relationships between their development and conservation activities.

Agroforestry activities exist in the village. We visited fields where agricultural crops, such as rice, maize, bananas, pineapples, and pepper, are interplanted with coffee, clove, olive, kapok, jackfruit, lichee, and mango trees. Many farmers have planted trees, such as *Albizia* sp. or *Terminalia* sp., as shade for coffee plants. This practice was introduced in the colonial era, and has been continued. One farmer said he was unsuccessful in planting Albizia — that perhaps he didn't know the right techniques. Some farmers use trees as boundary markers or live fences in their fields. We did not, however, see trees used to combat soil erosion on steep slopes (30 percent slope and greater). Everyone noted that fields are suffering from declining yields and productivity.

Within the village itself, many people have planted fruit trees next to their homes. These trees can have multiple uses. One woman, for example, told us that her mortar and pestle was made from jackfruit wood. Several compounds were surrounded by a live fence of *sintavy*: the leaves of this woody shrub are used for food, often cooked in soup.

A tree nursery was started by the APNs to provide seedlings to local residents. I visited the nursery with the Tangalamena and Mahefa. It is located 1 km. from Ambodirafia and 5 km. from Sahambala, near a water source, away from risks of cows or chickens. The villagers helped to clear the land for the nursery. All subsequent construction of the nursery, fence, and growing of the seedlings was done by the APNs. The nursery produced *Eucalyptus rostra* and *Grevillea sp.* seedlings. When the seedlings were ready for outplanting, the APNs notified the villagers. Interested residents took seedlings to plant on their own land.

According to the Tangalamena, DEF is encouraging people to plant trees for the future, as the forest will disappear. In the 1960s, DEF had had a tree nursery at the forestry post at Rendrirendry to

provide tree seedlings. Other people had also grown trees previously by scattering Eucalyptus seeds on a tavy field after they abandoned it for rice cultivation. Due to natural regeneration and replanting of wildings, farmers have plenty of fruit and coffee tree seedlings. Some people have grown forest species, such as *hintsina* and *voapaka*: some had been planted at a nearby tomb. The Tangalamena expressed a desire to have someone teach the villagers agroforestry techniques. He also noted that all the APNs for the Reserve had been hired from the village of Fontsimato. He felt that this was unjust: employment could have been offered to someone in their village. (Neither of the SAF forest guards came from the village of Ambodirafia.)

University of Tamatave (Toamisina)

The Rector spoke about the University's interest in developing a master's level program to train students to manage integrated conservation and development projects. He suggested that such students could do studies or extension activities with a project, such as in Bentampona or Masoala, as part of their training. This idea presents an interesting alternative to the current situation, where many directors or managers of ICDPs are foresters, ecologists, or others without any training in management or development issues.

Biosphere Reserve

The UNESCO/PNUD Man and the Biosphere Project is an extremely large project, covering an area of 140,000 ha. Of this area, 23,000 ha. is set aside as a terrestrial park, and 1000 ha. as a marine park. The project area is inhabited by approximately 40,000 people. The project is undertaking conservation and protection activities in the parks, and integrated development activities in 22 target villages around the parks.

One afternoon, some team members visited demonstration activities in livestock rearing and rice cultivation. The livestock activities will involve raising pigs and poultry using surplus manioc and maize production as animal feed. The demonstration site was located only a few kilometers from Mananara-Nord, which allows close follow-up by the project veterinarian. afterwards, we met some farmers and discussed their rice cultivation problems. They explained how one rice field was no longer useable. Trees along a streambed had been cut, so the stream had dried up and no longer watered the ricefield. This area was one that was marked by an abundance of fruit trees, such as bananas, jackfruit, breadfruit, mango, lichees, coffee, and cloves. Use of trees for live fences around the household compounds was also quite common.

We met with project staff to discuss their activities, including their extensive research program. With respect to forestry activities, the project has one forest agent and nine conservation agents. They are paid by the state, and assigned to the project. The project is protecting a boundary of 230 km. around the terrestrial park. Efforts to plant exotic tree species as a park boundary were not very successful (only 20 percent germination rate), so 110 km. of boundary has been marked with red paint (UNESCO/PNUD 1991b).

A major problem is that commercial exploiters harvest lots of wood from the state forests. The villagers, who must get a permit for any commercial use of the forests, do not agree with this situation. In several target villages, the project reportedly has worked with village forestry committees to establish village tree nurseries (UNESCO/PNUD 1991b: 6). In some villages, these committees have

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been hampered by recent political troubles. The project is also helping support the central nursery in Mananara-Nord. In addition to producing Eucalyptus seedlings, they have done trials with Ramy and Hintsia. The project also plans to plant species used for artisanal crafts, such as raphia and ravenola. Other project activities to develop forest resources include a beekeeping program, introducing improved hives and training women to harvest the honey, and collection of butterflies in a semi-natural situation at Akarifantsy. Although medicinal plants are widely used, they are not commercially marketed in the region. The scale of their usage does not threaten conservation of the forest.

We also discussed possibilities for small-scale ecotourism and community forest management. Guy Suzon Ramangason, the project advisor, noted that both of these would require a lot of work to prepare the local communities. Regarding local management of forests, they major problem is that the people are poor.

At a 1990 project meeting, 41 different research topics were identified for the project, ranging from studies in forestry, agroforestry, agriculture, ornithology, and ecology to health and socio-economic studies. The project has already undertaken a great deal of research, including socio-economic studies of a number of villages and fishermen near the marine park.

Our team went on a two-day trip to visit the marine park and the research station in Antanambe. The marine park consists of three islets and surrounding coral reef areas. It provided a very interesting model of local involvement in natural resource management. Although originally the park was closed to fishing, now fishermen from three nearby villages have the right to harvest fin fish, squid, and octopus three days a week. The local fishermen held the two resident guards police the area, and ensure that fishing regulations are observed.

Fishermen interviewed said that since the regulations went into effect, the abundance of fish and their catches have improved. Some noted, however, that sometimes they need money. They cannot fish within the park if it is not one of the permitted days. On such days, they can only fish further out at sea, where it is more dangerous. They wished they could fish within the marine park on any day of the week.

When asked if they thought such an approach might work for community management of an area of forest, they seemed interested in the idea. They all have needs for wood, but currently are forbidden to enter the park.

In Antanambe, some members of our team conducted a rapid survey one evening. The data from this survey has not yet been systematically discussed by the team. Antanambe is located some distance from the forest. It is not one of the Biosphere's target activity villages. The two families that I visited both discussed use of the forest for building materials and for medicines. They claimed that the village was located on the site of a former forest, which had been cut in 1964 to obtain building materials for the village. One man mentioned that some farmers now cultivate rice underneath their clove or coffee trees, instead of clearing new areas of forest for tavy. Both households expressed interest in the idea of community forest management.

Some team members visited some agroforestry research trials being conducted by a doctoral student, Daniel Rakotondrajaona. He took us out to see a farmer's field trials. The parcel is an area of 1500 square meters of reclaimed savoka. In September 1991, the grasses on the parcel were cut and left to decompose. In December, the trees were cut and the rice was planted. The cut woody material was used to make anti-erosion berms on the contours, along which they plan to plant pigeon pea. Some trees were left in the parcel, such as *Eugenia jambolona*, *Albizia stipulata*, and *Dahlbergia* sp. After the rice

is harvested in May, the parcel will be planted with peanuts and a leguminous vine, *vonuburi*. Although the initial preparation had involved more work than the traditional method of clearing the land by burning, the farmer told us that he thought it was a good method, and his rice was growing well.

En route to this site, we had also stopped briefly to talk with three men. They were pit sawing up a large Polisandre tree that had fallen over in a field. They had been hired by the owner of the field. He was planning to sell the wood to someone in Tamatave.

At our final meeting with the Biosphere staff, we discussed our impressions of the project. A major question was posed as to whether or not the project activities were too thinly dispersed on the ground. We also talked about how they were planning to use all their research in project implementation activities.

GENERAL OBSERVATIONS AND DISCUSSION

[Yet to be written: to draw from the specific observations and to compare, contrast, and extend ideas presented in field report #1]

Human Use of Forest Resources on the East Coast

Forest Management: Practice and Potential

Agroforestry, Reforestation, and Tree Nurseries

Possible Interventions

Linking Conservation and Development

Preliminary Ideas on Guidelines and Criteria for ICDPs

Methodologies

Socio-economic Studies Undertaken by Projects

Recommended Studies for SAVEM BPS

POSTSCRIPT

SAVEM Assessment Methodology: Rapid Assessment vs. Rapid Surveys

The SAVEM Assessment Team is conducting a rapid assessment of the sites visited, to assess the existing and potential conservation and development activities. The multi-disciplinary team is using a wide variety of methods to obtain information on the areas visited: review of documentation, aerial photos, maps, semi-structured and information interviews with farmers and key informants, group meetings, and observations of villages, markets, farms, forests, and other areas. Team members are usually work on obtaining such information in small groups of two or three. We have had several meetings at which the team members have reported on some of their findings.

The team has also, on three occasions, conducted a "rapid survey." This survey consists of 17 questions, which each sub-team poses to the household respondents chosen at random. Each team member contributed two questions to the survey. The survey provides an opportunity to look at the team's concerns in a more integrated fashion.

All of these activities can be used to conduct a Rapid Rural Appraisal. This RRA approach attempts to integrate and synthesize the findings of a multi-disciplinary team, to systematically analyze development needs and possible interventions. The hallmark of this approach is that the team together shares and synthesizes its findings day-by-day, as the assessments are conducted in the field. Numerous techniques have been developed for summarizing and evaluating the information collected, and for prioritizing the issues, possible interventions, and recommendations (c.f., McCracken et al. 1988; Environmental Secretariat of Kenya et al. 1990).

RRA is just one set of techniques that multi-disciplinary teams can use to develop recommendations for development interventions. Many other approaches have been suggested, such as the consensus building approach (Olson n.d.).

Although some members of the SAVEM Assessment Team are familiar with the literature on Rapid Rural Appraisal, none have been specifically trained in the RRA methodology. Each team member is responsible for meeting their individual terms of reference for the assessment. Although all team members are expected to contribute to the assessment's synthesis and the general criteria and guidelines, the mechanism and responsibility for doing so is not specified. Some team members remain confused about the idea of a RRA, thinking that the "rapid survey" itself constitutes the RRA, instead of being merely one element.

It is the opinion of this consultant (perhaps a minority viewpoint) that more time is needed for the team as a whole to work together to identify major issues and recommendations. As Olson notes,

> For this exercise to be successful, the entire team must participate. The absence of even one member makes it difficult to carry out in any meaningful way.

Olson also remarks that it can be useful if such team meetings take place before team members write their individual reports. Although team members have already written individual field reports, I hope that team synthesis meetings can be scheduled before team members prepare their final (overall) reports.

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ANNEX

CHRONOLOGICAL LOG

FIELD TRIP #2

Andasibe, Akan'ny Nofy, Toamisina, Fenerive-Est, Bentampona, Mananara, Antanambe

(12-28 March)

12 March 1992

Travel from Antananarivo to Andasibe
Evening walk in the Perinet Reserve

13 March 1992

Visit the Perinet Reserve to see the lemurs
Travel to Everglades, then to Akan 'Ny Nofy
Team Meeting on Rapid Survey

14 March 1992

Rapid Survey and visit in Ampahantany
Team Meeting on Rapid Survey

15 March 1992

Visit to private forest reserve
Travel by boat through the Pangalanes to Toamasina (Tamatave)

16 March 1992

Team Meeting
Meeting with Theophile Honore Randriarimana, Albert Simon, Ramala Zony, and Gabriel Ralaivoavy at the Provincial Service of Waters and Forests, Toamasina
Meeting with Jean-Baptiste Beresaka, UNICEF Directeur-Adjoint, Toamisina

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17 March 1992

Travel to Fenerive-Est to see UNICEF's Integrated Development Project with
Jean-Baptiste Beresaka
Mr. Chan Peng, CIRESFB
Visited nursery school and health center in Mahambo
Visited UNICEF health center and met with Dr. Gertrude Raharimanana
Visited Station Forestière de Tampolo with DEF forester, Raymond Rakotondrasoa

18 March 1992

Travel from Toamisina to Ambodirafia
Met the Tangalamena
Met the Village President and traditional mid-wife (rapid survey)

19 March 1992

Visited the Forest Station in Rendrirendry and the Reserve of Bentampona

20 March 1992

Meeting with Mahefa, SAF-JKFM extension agent
Walked around Ambodirafia to see agroforestry activities
Visited the village nursery with the Tangalamena and Mahefa
Rapid survey of 3 households

21 March 1992

Travel from Ambodirafia to Toamisina
Meeting with Eugene Mangalaza, Rector, University of Tamatave

22 March 1992 (Sunday)

Visited the Zoological Park of Ivoloina
Beach in Mahambo
Team Meeting

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23 March 1992

Travel from Toamisina to Mananara-Nord

24 March 1992

Man and the Biosphere Project office: consulted documentation
Visited demonstration site for improved poultry and pig raising activities and surrounding village and agricultural areas

25 March 1992

Meeting with staff members of Biosphere project
Discussions with Guy Suzon Ramangason and Victor Solo Rakotonirina

26 March 1992

Visited Biosphere Marine Park
Travel to Antanambe
Rapid surveys with 2 households in Antanambe

27 March 1992

Visited field research trials in savoka reclamation (agroforestry)
Travel to Mananara-Nord
Meeting with Biosphere Project Staff
Discussion with Charles Rabe

28 March 1992

Travel to Antananarivo

APPENDIX H

PRELIMINARY SOCIAL FORESTRY ASSESSMENT

Paula Williams

PRELIMINARY SOCIAL FORESTRY ASSESSMENT

Paula J. Williams

Social Forestry, community forestry, rural forestry, and farm forestry all refer to forestry activities that focus on rural people and their needs (Arnold 1991). As such, they are contrasted with traditional approaches to forestry, often termed "commercial forestry" or "industrial forestry," which focus on managing forests for production, e.g., timber or resin, and protection, e.g. watersheds or wildlife.

These terms are most widely used to refer to forestry activities in developing countries, where most rural people depend upon trees in their daily lives — as sources of food, fuel, animal fodder, building materials, traditional medicines, tools and artisanal products, or income. Trees and forests may also have spiritual and other important functions.

Within the scope of this assessment, the Social Forester has examined the actual and potential use of trees and forests in Protected Areas and adjacent peripheral zones. The objective has been to examine how conservation of protected areas can be linked with social and economic development. The Social Forester has worked with all members of the multidisciplinary assessment team, but most closely with the team's Tropical Forester and Sociologist.

In addition to the original written terms of reference, the Team Leader also asked the Social Forester to present ideas to the Team on Rapid Rural Assessment methodologies, and to suggest possible approaches to multidisciplinary field work. The Team decided to conduct a joint household survey, to obtain a broader understanding of issues and local perceptions regarding resource use, constraints, potentials for conservation and development, and local priorities. Each Team Member contributed two questions to this survey. The survey was used by small teams composed of two or three Team Members. It served as the basis for semi-structured interviews with a small number of randomly chosen households in three villages visited. Besides this survey, other field methods employed by the Team contributed to the overall rapid assessment conducted of the sites.

The methodology used to address these issues has included a variety of techniques: review of secondary data and literature; semi-structured interviews with individuals, key informants, project personnel, local authorities, government officials, researchers, and development aid workers; and visits to Protected Areas and adjacent peripheral zones, to see villages, farms, and forests; examining development activities. A log of the consultant's activities and sites visited in provided in the Annex.

This document constitutes the overall Social Forestry Assessment synthesis report. It incorporates and expands upon some information presented in the first two field reports.

Forest Conservation and Development: Building a Participatory Approach

The Environmental Action Plan for Madagascar (1988) notes that in 1984 the Government of Madagascar adopted a National Strategy of Conservation for Development, which emphasizes that conservation strategies must focus on human development needs. Deforestation and accompanying environmental degradation pose serious costs to the national economy and potentials for development.

The USAID Sustainable Approaches to Viable Environmental Management (SAVEM) Project intends to support integrated conservation and development projects. These projects are intended to conserve some of Madagascar's unique biological diversity, and promote rural development in surrounding areas. This integrated approach is based upon the following central hypothesis:

> 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.

This hypothesis seems to be based upon two basic assumptions:

1. Local populations are currently destroying their environment.

2. Behavior can be changed through education, i.e., seeing relationships, economic and social incentives, and empowerment to make decisions.

For the SAVEM Project to test this hypothesis, it will be necessary to consider carefully these assumptions and consider how the various concepts are being operationalized. A fundamental criterion for IDCPs is that they must specify how this hypothesis will be tested:

- How can relationships between rural communities and their environments be examined? What human activities are considered to conserve the environment and which ones destroy the environment?

- For a community, what is the area (environment) that its inhabitants use? Of this area, how much should be conserved and in what way(s)?

- In what ways are people's social and economic well-being dependent upon these areas? How can their social and economic benefits be enhanced and developed?

- What type(s) of education are needed to support this process?

- How can people be empowered to make decisions?

- What constitutes the "right decisions" that will result in conservation of the environment?

Development and Participation Issues

Many definitions of development exist. If people are to derive economic and social benefits from conservation activities, and are to be empowered to make decisions on natural resource management, then a participatory development and a people-centered approach to conservation will be needed.

Such an approach requires consideration of what we mean by development, participation, benefits, and empowerment.

Development is a process that empowers individuals to better control their own lives. Development is thus, by definition, inherently participatory. For people to gain greater control over their

own lives, they need to gain greater access to and control over resources. These include not only natural and material resources, but also social resources (Blumberg 1981; Dixon 1978; Williams 1983, 1991).

These issues are important for understanding the nature and impact of participation. All forms of participation do not lead to development or empowerment. It is possible to participate in activities, e.g., through providing labor or responding to questionnaires, without deriving any benefits from the activities. For example, people can plant trees, on either a coerced or voluntary basis, without having the rights to use or harvest those trees (Hoskins 1978).

As noted in *People and Parks* (Wells et al. 1990), many integrated conservation and development projects have focused on providing benefits to local people in a passive beneficiary approach. Of the 23 projects reviewed, few have tried to adopt an active participatory approach. Wells et al. argue that it is especially important to promote local participation in: (1) information gathering; (2) consultation; (3) decision-making; (4) initiating action; and (5) evaluation.

Sustainable development consists of activities that individuals, households, groups, and communities develop and manage themselves. For development to be sustainable, it must not only meet ecological criteria, but also social criteria — such as acceptability and equity, for present and future generations. Empowerment of local people to manage their environments and their resources is not necessarily easy. Rarely does community consensus exist on resource use. Thus, it is important to consider various resource user groups and negotiations among them. It is vital that equity issues be considered, in order to prevent unintended social impacts, to reach target groups, and to improve project effectiveness (Chambers 1983; Hoskins 1982; Rocheleau 1987).

A wide body of literature, for example, documents the important of involving women in development activities, in terms of both project effectiveness and social equity. USAID and many other donor organizations have adopted development policies concerning the integration of women in development. Many guidelines suggest strategies for integrating women into forestry and natural resource activities (e.g., FAO 1988, 1989; Molnar and Schreiber 1990; Russo et al. 1989). Several case studies document how forestry and agroforestry projects have worked with women (e.g., Williams 1991; Feldstein and Poats 1989; FAO 1991). Despite the abundance of guidelines, however, many projects continue to ignore or marginalize women's participation (e.g., Sfeir-Younis 1991).

Human Uses of Forests and Trees — e.g., What people use the forest for (what do they need from the forest)

Throughout Madagascar, people use forests and trees for a wide range of needs, including timber (construction wood for houses and boats, wood for furniture, woodworking, and tools), fuel (charcoal and firewood), food, animal fodder, medicinal plants, honey, decorative plants, fibers and other resources for artisanal production. These products are used both for household consumption and in some areas sold to generate cash income. Many forests serve as watersheds, and provide water for household consumption and agricultural purposes in surrounding areas. Forests provide valuable habitats for fish and game consumed by local residents. In many areas, forests also serve as a reserve of agricultural land. People also use forests for spiritual reasons, recreation and tourism, environmental education, and scientific research.

Outside of forests, trees are widely used to provide wood, fuel, fruits, shade, animal fodder, and medicines. Trees function as living fences, shade agricultural crops, and enrich fallow and agricultural

soils. Trees may be planted in household compounds, along roads, in school compounds, and adjacent to tombs.

How dependent are rural people on forests and trees? In all the areas that we visited, the majority of the people earn their livelihoods from agricultural production. We did not visit a single community that is wholly and entirely dependent upon the forest for its sources of income. Nonetheless, forests and trees play vital roles in rural economies. In some villages, certain individuals, such as timber exploiters, carpenters, furniture makers, or boat builders depend upon the forest for their wood supplies.

In all the areas visited, wood constitutes the major energy source for cooking and lighting. People obtain their daily firewood from forests and trees. In most places, people collect dead wood for fuel. In Ambanizana, however, we were told that live trees may be cut for firewood. In Ambodrafia and Joffre-ville, when fruit or coffee trees are no longer productive, they may be cut for fuel. Charcoal is manufactured for sale in nearby urban areas: rural use of charcoal, such as for ironing, is limited. Fuel is also important in other rural production systems, such as smoking fish.

In this assessment, information on human uses of forests and trees was obtained primarily through interviews and observations. Socio-economic studies conducted by some of the projects visited provide more detailed information on the range of uses. The surveys conducted by the WWF Project in Amber Mountain contain a series of questions explicitly relating to forest resource use. For some of the villages surveyed, attempts were made to quantify the amount of wood used in house construction. For the socio-economic studies conducted by the Biosphere Project, descriptive information is available on resource use in specific sites. The reports compiled by SAFAFI for Masoala Peninsula provides very limited descriptive information.

Prior to undertaking any further studies, however, it will be vital to assemble and analyze existing information. A wide range of research pertaining to these Protected Areas already exists, but is widely dispersed. For example, while we were visiting the Amber Mountain region, we met researchers working on a household fuelwood consumption study for a German (GTZ) energy project. They had conducted urban and rural surveys on firewood and charcoal consumption. For existing projects, efforts should be made to complete analyses of data already collected.

Forest Management in Madagascar

Forest management activities in Madagascar have been undertaken by various social groups — state and local governments, parastatal organizations, non-governmental organizations, communities, cooperatives and groups, and individuals. The basic management approach has been one of attempting to control use of forest areas, either through general regulations or piece-meal allocation of permits. Thus, "management" has consisted primarily of forest protection and exploitation, with limited efforts at reforestation and tree planting.

The concept of rational forest management encompasses a process wherein in forest resources are assessed, management objectives are established, and overall management plans for forested areas are developed and implemented. This approach to forest management is not well-developed in Madagascar. The SAVEM Project, however, offers opportunities for developing this forest management approach in working with rural communities living adjacent to Protected Areas.

Forest Service's Approach to Forest Management

The state forest service is the Direction of Waters and Forests ("Direction des Eaux et Forêts" (DEF)). Information on DEF field activities was obtained to better understand the situation for forest management activities in and near the Protected Areas. Discussions with DEF personnel were held to assess possibilities for community management of forest areas in the Protected Areas and peripheral zones.

Interviews were conducted with DEF agents in the Provincial Services of Antsiranana and Toamasina, the Circonscription of Fenerive-Est, and the Cantonnement of Maroansetra. [The Tropical Forester also met with DEF agents in the Circonscription of Antalaha and the Reserve of Betampona.] In the sites visited, local people and project personnel were also asked about DEF activities.

The DEF has a classic approach to forest management. DEF agents have tried, over the years, to combine two conflicting roles: (1) policing and protecting the forest and (2) extension activities with rural residents, to promote tree planting, management, and protection, e.g., control of fire, and to promote development around the forests.

James Seyler (1987) reviewed forest management activities over the past century, between 1881 and 1987. He noted that efforts to protect forests and control tavy began in 1881, prior to the arrival of French colonial foresters in 1896. The first forest reserves were established in 1927. Concern with soil conservation issues developed in the 1950s. After independence in 1959, particularly during the period from 1963 to 1973, the DEF placed increasing attention on rural development and extension activities.

DEF is responsible for managing forest use on classified ("forêt classées") and state forests ("forêts domaniales") and managing Protected Areas. Due to funding, personnel, institutional, and other constraints, the National Direction of Waters and Forests is unable to adequately protect and manage forests resources found in Protected Areas.

Reforestation, Afforestation, and Tree Planting

DEF has been involved in programs of reforestation, afforestation, and tree planting. To support these activities, DEF has run tree nurseries and has helped rural communities to establish village nurseries. In Fenerive-Est, UNICEF has collaborated with DEF in an annual program to train villagers to establish and run tree nurseries. The MAB Project has worked with DEF in establishing village nurseries in six villages. For the Betampona Project, the APNs under DEF supervision have established a nursery 1 km. from Ambodirafia.

According to permits issued by DEF, commercial loggers are required to replant at least 40 percent of areas logged or alternative sites. In most cases, according to DEF foresters, this reforestation does not occur. In Fenerive-Est, however, we were told that reforestation rates had increased from 6 percent to 40 percent last year. The major obstacle to greater reforestation rates is the lack of land. In that region, much government land ("terrain domanial") has already been granted to people through formal land registration.

ZODAFARB. In some regions of the country, the government has made available lands for reforestation through a program called ZODAFARB ("Zones Delimitées d'Action en Faveur de l'Arbre"). According to this program, started in 1987, people can gain land title to parcels that they reforest.

Swiss Cooperation supported a pilot Village Reforestation Project in the Sisaony watersheds. This project was the first large-scale attempt to apply the ZODAFARB concept. After the initial efforts, a Malagasy NGO, ORIMPAKA, received funding to extend project activities into neighboring areas. Initial responses to the project were very positive. Although the project did not explicitly target women, approximately one-third of the participants were women. The project, however, ran into difficulties in registering land titles for participants. Project staff also decided that they needed to broaden beyond reforestation to encompass other development activities. As a result, a Malagasy NGO, Centre FAFIALA, has been established, which provides technical assistance and training on forestry and other rural development activities to farmers (Gabathuler 1987; Edmond Randrianarivony, personal communication, 6 March 1992; Seyler 1987; Williams 1988; Zimmermann 1991).

The only ZODAFARB site that our team visited was in northern Madagascar, near the village of Sakaramy. This site was planted by some villagers and civil servants who live in Antsiranana, including a WWF forester. Apparently land title has not yet been clarified, and there has been no local surveillance of tree planting efforts over the past three years of planting.

Village forestry. DEF nurseries for rural afforestation and reforestation are not new. Adjacent to the Betampona Reserve, at the Forest Post at Rendridreny, DEF had a nursery in the 1960s. In many sites we visited, plantations or individual plantings of Eucalyptus sp. and other exotic tree species are evident.

Collaborating with NGOs: Agents for the Protection of Nature. The WWF Debt-for-Nature swap has provided funding to hire Agents for the Protection of Nature (APNs). These agents collaborate with the DEF. Their role is to assist in protecting Protected Areas throughout the country. APNs do not, however, have the right to bring legal sanctions against offenders. APNs also work on education and extension programs with the local populations.

Some DEF agents have been assigned the responsibility of working as coordinators and trainers of APNs. This role is difficult, as the DEF agents often lack the necessary means to effectively perform their work. Whereas the APNS have been provided with transport, e.g., mountain bikes, the DEF coordinators often do not have any means of transport. The DEF coordinator responsible for the APNs in the Betampona Reserve is based in Tamatave, and must travel to Betampona by bush taxi. D E F agents must also face the demoralizing situation of being paid less than the APNs, often despite having years of experience. Recently, many DEF agents have not been paid at all.

The nature of the collaboration between DEF agents, APNs, organizations managing ICDPs, and other ministries varies throughout the country. In our interviews in the Province of Diego Suarez (Antsiranana), it seemed that DEF agents did not work closely with the APNs on the WWF Montagne d'Ambre project. (The National Director for the Project, however, is a DEF forester.) A forester in the Provincial office told us that DEF did collaborate with the police and military in enforcing regulations on forest use. This situation was in marked contrast to that which we found along the East Coast. In our discussions in Tamatave, Fenerive-Est, Betampona, and Mananara-Nord, we found that DEF foresters and forest agents working closely with other organizations, such the WWF APNs, UNICEF, and the MAB Project. Overall, the Provincial Service of Waters and Forests in Tamatave seems more organized,

more effective, and better equipped than that in Diego Suarez. This difference may be due to the greater economic importance of forestry along the East Coast.

DEF Constraints. DEF, like other government ministries in Madagascar, faces severe institutional and organizational constraints, including declining funding and decreasing staffing levels. As the forestry technicians' school was closed for many years and only recently reopened, few young forest technicians are employed in DEF. Most forest agents are have been with DEF for years, and are approaching retirement age. Due to financial constraints, when forest agents retire, they are not replaced. In Fenerive-Est, for example, the forest engineer stated that six of his agents retired at the end of 1991 and were not replaced.

In late March 1992, the World Bank evaluation team recommended suspension of funding for a project supporting DEF activities (the Management and Protection of Forests (GPF, or "Gestion et Protection des Forêts") Project). DEF foresters in the field have been told that blockage of funds from this project is the reason why they have not been paid in three months and lack fuel. This situation makes it difficult, if not impossible, to perform their field responsibilities.

Overall Impact of DEF Management Efforts. Despite the efforts of DEF, forest areas in Madagascar have steadily decreased. Many reserves, classified forests, and state forests have been in existence since colonial times.

The situation for the DEF in Madagascar is like that found elsewhere in the tropics. As Jeffrey Sayer (1991: 41-42) has noted,

> Forest departments and nature conservation bodies found themselves unprepared for the dramatic increase in pressure on tropical forest resources. Legislation enacted in days when pressures were fewer, proved inadequate, inappropriate, and unenforceable in the changed circumstances. Powerful logging interests found it easy to circumvent or ignore forest management plans, and burgeoning rural populations living on the brink of subsistence could not be denied access to the only unoccupied lands available. The period from 1950 to 1990 saw unprecedented degradation, clearance and fragmentation of the world's rainforests.

Glen Green and Robert Sussman (1990) recently compared aerial photographs and satellite images to assess deforestation rates for the Eastern rain forests of Madagascar. Their study estimated that the Eastern rain forests had originally covered an area of 11.2 million hectares. By 1950, this forest had declined to 7.6 mil. ha. and by 1985 to 3.8 mil. ha. For the period 1950-1985, the annual deforestation rate averaged 111,000 ha. Deforestation rates were highest in areas with population densities exceeding 10 inhabitants per square kilometer and with low slopes (< 5 percent). The rates of secondary forest growth and establishment of eucalyptus and pine plantations were estimated to be minimal.

Green and Sussman argue that establishment of reserves will not alone protect the rainforests. They cite the example of the Reserve of Betampona, created in 1927. A 1984 satellite image documented deforestation within the Reserve, in comparison with the situation in 1950. (Due to problems with cloud cover in the aerial photos for 1973, this region of the East Coast was not mapped for 1973.) They suggest that to preserve these rain forests, efforts are needed to promote sustainable agriculture and agroforestry, and to reduce population growth.

In our visit to the Betampona Reserve and surrounding areas, we learned that tavy incursions had taken place in the reserve. These incursions were attributed to two factors. First, previously the government had encouraged farmers to maximize agricultural production. The DEF forester had, therefore, authorized local residents to tavy areas within the reserve. Second, during "political problems" in 1972 and 1975, the population had taken advantage of the situation to begin farming within the Reserve.

During the most recent political problems, in 1991, this situation did not arise. Currently four WWF APNs, two SAF-JFKM APNs, and one DEF forest agent patrol the Betampona Reserve. This level of surveillance, coupled with SAF-JKFM development activities in the region, may be responsible for the lack of recent incursions. (Suggestions for building upon DEF expertise and strengthening collaboration with NGOs are discussed in Section ____.)

Local Community Control and Management of Forest Resources

Fady Concerning Forest Resource Use

One traditional mechanism for controlling forest resource use in Madagascar has been the observance of fady, or taboos. Taboos can be considered to be a traditional form of social control on individual and group behavior. The observance of fady varies with numerous factors, such as the exposure to development, religion, or immigration of different ethnic groups.

This topic is being investigated by the Team's Sociologist. She has identified two major types of fady that influence forest resource use: territorial fady and individual fady. These may affect the use of specific locations, days of the week when people work, or alimentary fady.

Fady may concern specific locations or objects. Certain parcels of forest, for example, may be prohibited areas, which no one enters, or sacred sites, where no tree cutting or burning is permitted. Some such sites were identified in the region around Amber Mountain. Specific trees, often those with an unusual shape, may be considered fady, and thus no one would cut them. An example of such a tree was pointed out to us in the Reserve of Perinet.

Water courses and sources may also be protected either through explicit fady or implicit understandings among the community members.

Local Control of Forest Areas

Due to the legal framework, most forest areas are controlled by the state. Some examples do exist, however, of local control of forest areas.

The WWF animatrice working in Joffreville, next to Amber Mountain National Park explained efforts at local protection. Some people now protect certain areas of state-owned forest to protect water sources. Others are planting their own "private forests" for their children. The WWF survey team learned in Antsahampano that a man was "excommunicated" from the fokonolona for not respecting regulations of the fokotany, especially concerning the forest. He had paid youth to cut 5000 logs in the forest of Beantely.

DEF foresters told us about other examples that exist along the eastern coast. The village of Manankafana, located near Soanierana-Ivongo, has conserved a forest area to meet villagers' needs.

Another Fokotany, Morafena Ratitabe, 40 km. from Maroansetra, collaborated with DEF to establish a community forest. This 20 ha. parcel of primary forest was established as a Protected Reserve in 1990. The residents of the Fokotany have the exclusive rights to use this forest. They are permitted to collect firewood in the forest. If they want construction wood for household needs, they must first request permission from the President of the Fokotany, who requests a permit from DEF. DEF would not, however, grant a permit for a valuable hardwood such as Palissandre. The residents do not have the right to clear the forest for cultivation. In this area, however, they have ample land to rotate in fallow, so they do not need to cut the forest for tavy. The villagers have not done any reforestation, nor have they established a tree nursery. DEF agents noted that this was an example of community management of a forest. The original idea for the community forest, however, had been proposed by DEF. Although the community has use rights, DEF has retained authorization rights for cutting live trees.

Interest of Communities in the Notion of Managing the Forest

Although communities have limited experience in forest management, in some regions people have expressed interest in the idea. In all the areas visited, rural residents need forest products in their daily lives. They also need ways to improve agricultural production and diversify their sources of income.

In several areas visited, local residents expressed concern about current and planned efforts to prohibit use and exploitation of forest resources within Protected Areas. If these forested areas are preserved, where, they ask, will they be able to get forest resources they need? How will they be able to expand their agricultural production if they will no longer be able to tavy in these forests?

In some villages, villagers themselves proposed the idea of community or local management and exploitation of forest resources. In the village of Andranomanitry, which borders the Montagne des Francais classified forest, village men expressed their desire to have the legal right to exploit the forest for commercial charcoal production. They already make charcoal illegally.

In the village of Ambanaizana, on the Masoala Peninsula, the Fokotany President stated that they would like to have the right to exploit some forest parcels. He noted that a forestry exploitation cooperative exists 15 km. to the north of Ambanaizana, where Betsileo are harvesting trees, sawing them into planks, and exporting the wood in their boat to the market in Maroansetra. He noted that the residents of Ambanizana would like to have a roundtable discussion with DEF to negotiate areas they could exploit. If it were possible to obtain large enough areas for commercial exploitation, they would be interested in such activities. They are aware that the forests contain valuable hardwoods, which they would like to sell if they could find a market. If that were not possible to be allocated large areas of forest, then they would at least like to have areas set aside for their local consumption needs.

In other villages, when people were asked about the concept of community forest management, they responded positively to the idea. This response does need to be interpreted carefully, as many people were being asked about a hypothetical situation with which they have no direct experience.

Other Examples of Forest Management Activities

Private individuals, parastatal organizations, universities, and non-governmental organizations and bilateral donors are also involved in forest management activities. For example, we visited a 40 ha. private forest reserve located on Lake Ampitabe. This area was being managed for natural forest preservation, environmental education and tourism, and commercial production and export of certain plant species, such as orchids. The Zoological Park at Ivoloina is being managed by the government, with assistance from universities and conservation NGOs, for captive breeding, research, and controlled release of lemurs, environmental education, and tourism.

Some commercial management of forest plantations already exists. The largest scale operation is that of Société Fanalamanga, which has extensive pine plantations. These are being managed for wood, charcoal, and resin production. The organization also manufactures pine furniture. Fanalamanga has a 300,000 ha. concession, of which 72,000 ha. is planted. They currently have 1200 full-time employees and 500-700 temporary employees. One-fifth of the employees are women, who work on resin tapping, bagging charcoal, and in the tree nurseries. The employees and their families number a total of approximately 10,000 people, who live in 13 villages established by the project (Johan Lejeune, personal communication, 9 March 1992).

Training institutes and universities are also involved in forest management activities. Examples include the Forestry Training Center at Morondava and the University of Antananarivo's Research Station of Tampolo, 10 km. north of Fenerive-Est.

As previously discussed, non-governmental organizations are involved in forest management through the WWF Debt-for-Nature swap program that funds Agents for the Protection of Nature (APNs). Approximately 375 APNs are employed throughout Madagascar.

Promoting Environmentally Sustainable Economic Development in Peripheral Zones Through Agroforestry, Reforestation, Plantation Management, and Natural Forest Management

Economic development involves developing the local economy to better meet local needs. This has several dimensions, including increasing the cash economic returns for productive activities and reducing cash expenditures by producing more to meet household consumption (subsistence) needs. A key question is whether individual participants obtain increased income or access to resources as a result of their labor or other forms of participation.

This section examines existing activities in agroforestry, reforestation and tree planting, plantation management, and natural forest management. Recommended potential activities are discussed in Section ___.

Agroforestry

According to the International Council for Research on Agroforestry (ICRAF), agroforestry consists of combinations of trees and agricultural crops or trees and livestock rearing over time or space. A wide variety of agroforestry systems, thus, exist, such as: interplanting of trees with crops in agricultural fields to produce timber, fruit, organic matter, nitrogen, animal fodder, or shade; home garden systems, growing trees and crops adjacent to the home; living fences and windbreaks; boundary

plantings of trees; and use of trees for soil improvement and erosion control. Agroforestry is commonly considered to be synonymous with most forms of farm forestry, social forestry, or community forestry, with the exception of woodlots, pure forest plantations, or natural forest management.

Existing activities

In the peripheral zones visited, examples of existing agroforestry systems were observed, many of which were developed by farmers themselves, introduced during colonial times, or introduced subsequently. Projects and agricultural extension activities focusing on cash tree crops, such as coffee and cloves, have also introduced some agroforestry practices, e.g., use of shade trees for coffee. Extension work in agroforestry techniques, by the government forest and agricultural agents, is currently limited. Some research trials, such as at the Improved Tavy Institute in Beforna, in the Biosphere Project in Antanambe, and with the SAFAFI agricultural extension activities in Masoala Peninsula, are currently underway.

[Many concrete examples of agroforestry activities were cited in Field Reports #1 and #2. Additional examples can be provided from the visit to Masoala Peninsula.]

Reforestation and Tree Planting

Reforestation involves planting or establishing trees to re-forest areas that had once been forested, but have been partially or completely cleared of trees. (The term "afforestation" refers to planting or establishing trees on areas that were not formerly forested.) Reforestation can consist of replanting a natural forest with the indigenous tree species, or establishing plantations of either indigenous or introduced ("exotic") tree species. In a loose sense, reforestation can also be taken to encompass other tree planting activities, including those for household, community, or farm use.

Existing activities

People living near existing forests and Protected Areas plant primarily plant fruit trees and other cash crop trees, such as cloves and coffee. Trees are planted around homes and in fields for food, animal fodder, fencing, medicinal use, fibers, wood, shade, soil improvement, and other uses. In some areas, large-scale reforestation or afforestation activities have been undertaken. Examples include establishment of Eucalyptus sp. and Grevillea sp. woodlots, tree plantings in schools, along roads, and along stream beds. Examples were found of people sowing fallow fields with Eucalyptus seeds. Some people have successfully grown and planted indigenous hardwood species, such as hintsina and voapaka, from seed.

These reforestation efforts have been ongoing for many years. Rural residents plant their trees by replanting naturally regenerated seedlings or "wildlings," directly sowing tree seed, planting cutting, and in some places, establishing their own private tree nurseries, such as for fruit tree seedlings. Practices of individual tree protection, to protect against animal browsing, have also been observed. [More concrete examples from field reports and sites visited can be provided.]

For the sites visited, people do not currently experience difficulties in obtaining firewood for household consumption. Thus, in most cases it would not be currently advisable to try to establish either

individual or community fuelwood lots. Possibilities for individual tree planting are suggested under proposed agroforestry interventions.

Plantation Management

Existing activities

Where forest plantations exist, some rural residents currently obtain economic benefits by working as hired or piece-work labor for commercial operators having exploitation permits. Around Amber Mountain, for example, some individuals who have permits to exploit plantations for charcoal will pay local villagers for charcoal they produce (whether it comes from the plantations or elsewhere).

Some existing forest plantations may be suitable for local or community management. An example of possible development interventions can be suggested for Sakaramy, where villagers use forest resources for firewood, charcoal production. Some honey and many medicinal plants are collected for sale in Antsiranana. The villagers' illegal production of charcoal has decreased since the WWF hired an APN (Agent for the Protection of Nature) to work in the area. In 1991, 20 villagers obtained permits for charcoal production.

Natural Forest Management

Existing activities

Natural forests are currently being exploited for timber, charcoal, honey, and other resources that bring rural residents cash income. Where commercial timber and charcoal concessions are operating, rural residents obtain employment. Other employment opportunities around natural forests exist for APNs, tourist guides, and research assistants.

Introducing Social Forestry Activities to Local Communities: Guidelines and Recommendations

To work with local communities on natural resource management activities that will jointly address conservation and development needs, the following guidelines are suggested. First are presented general guidelines for integrated conservation and development projects. Then, more specific guidelines are suggested for a few examples of social forestry interventions. Recommendations are proposed for types of social forestry activities to be supported.

General Guidelines

1. The project needs to establish rapport with the local communities, to establish confidence and willingness to work together.

Based upon field observations, many rural Malagasy communities — particularly along the East Coast — do not have much confidence in central government. Past experiences with socialistic production cooperatives have also been disappointing. In some areas, such as around the Betampona Reserve, experiences with NGO extension agents seem promising.

Many areas have been repeatedly visited by teams to assess development needs. As a result, many rural communities have hopes of seeing changes, but to date have received little tangible assistance.

2. It is vital that small-scale concrete activities be quickly launched, to demonstrate the willingness and potential for change.

As rural communities better organize themselves to undertake development activities and see the results of their efforts, activities can be expanded.

3. To facilitate community action, project extension agents should live in the area, and gradually develop concrete activities with the people.

The SAF-FJKM project around the Reserve of Betampona has successfully used this approach. The extension agent, Mahefa, has worked in five target villages. In these villages a variety of community efforts have been launched, such as village pharmacies, village granaries, and small-scale irrigation activities. In Ambodirafia, after some initial difficulties, the village pharmacy is functioning well. Problems, however, have arisen with the management of the village granary. Overall, villagers view collaboration with non-governmental organizations as more promising than relying upon government assistance.

4. Based upon sociological understanding of the community's authority structure and forms of social organization, strategies for working with village leaders and communities can be proposed. All development, conservation, and related research should stress the active participation of local people.

This issue is discussed more by the Team's Sociologist, and also under Likely Collaborators (Section ___) and Criteria (Section ___).

5. The scale and approach to resource management activities will vary. While some activities can be undertaken by individual farm households, others can only be successful if they are adopted by groups of resource users or even entire communities.

For example, certain resource management interventions, such as irrigation systems or windbreaks, may only be successful if a group of farmers cooperate. Other interventions, such as alley-cropping, can be successfully adopted by individual farmers.

The MAB Project has worked with fishing groups in three villages near the Marine Park. They have negotiated an arrangement whereby the villagers have exclusive rights to fish three days a week for fin fish, squid, and octopus. The villagers help the two MAB guards police the area and enforce the regulations. This approach to local involvement in resource management seems promising. In discussing the idea with fisherman and villagers in the area, they expressed interest in applying a similar concept to forest management. Biosphere Project staff members believe that such an approach would be possible, but more difficult, for forest management.

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6. As stated in the Project Proposal, efforts must be taken to ensure that those who bear the costs of conservation and protection of Protected Areas should receive some benefits from project development activities.

7. To address questions of project effectiveness and equity, efforts are needed to work with a wide range of community members and resource users. Projects must develop explicit strategies to

ensure that a wide range of community members participate in project activities and that participants receive direct benefits from their participation.

8. Projects should ensure that women have equitable opportunities to participate in, and derive benefit from, project activities and employment.

9. Efforts should be undertaken to integrate development activities with one another, and with conservation activities. Possible examples include:

- undertaking trials to cultivate medicinal plants and using these plants in health or nutrition programs;
- coupling functional literacy programs for adult women and men with extension activities in agricultural, forestry, agroforestry, fisheries, and other natural resource management and enterprise development activities; and
- developing employment or income-generating activities with women in conjunction with family planning efforts.

Recommended social forestry activities

Recommendations of possible interventions need to be developed on a site-by-site basis, based upon consideration of uses of the forest, constraints, and opportunities. Examples have been developed for three of the proposed PADG projects [See Boxes 1-3 for Amber Mountain, Betampona, and Masoala].

Agroforestry

Agroforestry systems could be used to increase agricultural productivity or farm incomes. With respect to improving agricultural productivity, agroforestry can be used to improve soil fertility and reduce soil erosion, as well as to diversify farm incomes. The research that it being undertaken on methods for improving soil fertility through improved fallow systems, savoka reclamation, or alley-cropping could potentially be extended in peripheral zones. These approaches might be particularly appropriate around Betampona and on the Masoala Peninsula.

Reforestation and Tree Planting

From an economic development standpoint, a number of opportunities exist for promoting reforestation activities in the peripheral zones. First, as the Tropical Forester has suggested, local communities could be granted contracts to reforest areas that are commercially logged for timber and charcoal production. Second, if communities or local groups were to undertake management and exploitation of forest parcels, they should be required to reforest areas that are logged. Third, in some areas, such as around Amber Mountain, it may be possible to obtain land to establish plantations to produce forest resources, such as timber, charcoal, artisanal materials, honey, or medicinal plants.

With respect to tree nurseries, greater efforts should be made to involve local people in the actual work of running village nurseries. In some areas it may be possible to develop tree, vegetable, and flower nurseries as small-scale commercial nurseries.

Plantation Management

Where forest plantations already exist, it may be possible to turn their management over to local people. For example, near Sakaramy is a eucalyptus plantation, established by the local population during the First Republic, which is currently being exploited by 5 commercial operators from Antsirana holding permits from the Provincial Service of Waters and Forests. One possibility would be to turn this plantation over to community-level management. It would be possible to manage the Eucalyptus plantation to produce charcoal, firewood, and honey.

BOX 1

POSSIBLE SOCIAL FORESTRY INTERVENTIONS: AMBER MOUNTAIN

Uses of the Forest: timber, charcoal, firewood, cultivation of crops, medicinal plants, honey, tourism, Christmas tree production, research, watershed.

Forest Situation: major threats to forest areas are uncontrolled forest exploitation for timber and charcoal, and agricultural incursions to cultivate crops such as bananas and qat. In a few locations, medicinal plants and honey are collected and charcoal is produced for sale.

Constraints:

- land availability
- labor
- high degree of immigration
- high proportion of tenant farmers/sharecroppers
- isolation of some villages, such as Andasibe
- DEF lack of control on timber logging activities
- lack of reforestation on logged areas
- fires

Opportunities:

- large tracts of land, which are assigned to the government, military, private enterprises, or former colonial concessions, might be available for expansion of agricultural production
- land available for ZODAFARB reforestation activities
- Eucalyptus plantations, e.g., Sakaramy
- extensive cultivation of fruit trees
- villagers have their own private fruit tree nurseries
- market in Antsiranana for forest products: charcoal, medicinal plants, honey
- eco-tourism potential
- logging concessions: opportunities for reforestation activities
- community interest in protecting water sources
- community participation in tree planting
- APN protection and extension activities
- environmental education activities and potential
- WWF presence and activities to date
- other NGOs working in the area (ASE, Diocese of Diego)
- support by Prince of Anakarana

Possible Social Forestry Activities/Interventions:

- further develop fruit tree cultivation
- community management & exploitation of Eucalyptus plantations for wood, charcoal, and honey
- possibility of medicinal plant cultivation (plantations) or managed harvests (natural forest management)
- community reforestation of logged parcels in state forests
- eco-tourism development, e.g., village tourist camps/hostels
- artisanal production for sale in Antsiranana and to tourists

BOX 2

POSSIBLE SOCIAL FORESTRY INTERVENTIONS: BETAMPONA

Uses of the Forest: biological research in the Reserve, watershed, timber, firewood, medicinal plants

Forest Situation: major threat to forest areas is tavy. Forest areas outside the reserve are used as sources of local construction timber. Reserve is important as water source. Research on lemurs in Reserve connected with lemur research at nearby Zoo in Ivoloina.

Constraints:

- declining agricultural productivity
- declining cash crop (coffee, clove, vanilla) prices
- limited land
- demographic pressure
- illness
- remoteness/inaccessibility
- DEF constraints: DEF agent not paid, DEF APN supervisor has difficulty in traveling to site
- in past, whenever political problems arose, tavy incursions into Reserve
- land tenure: policies/regulations concerning tavy
- almost all tree nursery work done by APNs

Opportunities:

- limited immigration
- most farmers own their own land
- successful development activities with SAF-JFKM
- cooperative pharmacy working well
- in some villages, cooperative granaries working well
- people respect the Reserve restrictions
- some people understand the importance of the Reserve for water
- agroforestry activities and interest in expanding...
- tree nursery and planting of trees
- some work with indigenous species
- limited potential for eco-tourism (in conjunction with Zoo)
- good collaboration of DEF-WWF-SAF on forest protection
- environmental education and tourism at nearby Zoo

Possible Social Forestry Activities/Interventions:

- improved agricultural practices, using agroforestry interventions developed at Beforna Tavy Institute to improve soil and reduce erosion, aiming to intensify agricultural production and augment yields
- eco-tourism development could diversify local incomes
- environmental education potential

BOX 3

POSSIBLE SOCIAL FORESTRY INTERVENTIONS: MASOALA PENINSULA

Uses of the Forest: timber for house and boat construction, firewood, medicinal plants, hunting, fishing, watershed, biological research.

Forest Situation: The greatest threat to the forest is tavy. This threat is more pronounced on the eastern side of the peninsula, where the terrain is less steeply sloped. Other forest uses include timber logging, collection of firewood, harvesting of other forest products such as bamboo, hunting, fishing, use of medicinal plants.

Constraints:
- inaccessibility makes it difficult to market produce
- lack of local market
- lack/high cost of boat transport
- monopoly of collectors
- low prices for cash crops
- corrupt DEF agent on eastern side
- DEF constraints on travel, personnel e.g., broken outboard engine
- the Peninsula falls under the jurisdiction of two different DEF offices
- limited collaboration existed in old Masoala Project
- land tenure: policies/regulations concerning tavy
- almost all work in agroforestry demonstration site done by SAFAFI agents

Opportunities:
- limited immigration on western coast
- inaccessibility means that much of forest has not yet been exploited
- possibility to create National Park
- example of forest exploitation cooperative
- DEF agent on western side controls tavy incursions
- DEF Circonscription of Fenerive-Est has experience in working with community forests & training villagers for tree nurseries
- extensive planting of trees, e.g., fruit trees, cash crops (coffee, cloves, cinnamon), live fences
- interest in fodder trees
- SAFAFI presence (agents motivated and appreciated by local people)
- SAFAFI trials with agroforestry species for soil improvement of fallows

Possible Social Forestry Activities/Interventions:
- negotiate some parcels of forest for community/local management
- cooperative forest exploitation
- eco-tourism development
- fodder production, e.g., Leucaena
- agroforestry interventions for improved tavy
- local employment to support/assist researchers
- if fisheries exploitation is developed, examine the use of wood for smoking fish

Another possibility to explore would be forest management — of either small-scale (i.e., 1/4 ha.) plantations of medicinal plants or management of small areas of natural forest to produce medicinal plants. Such work would involve addressing a number of key questions concerning plant replication, medicinal dosage and toxicity, and impacts on biodiversity (Cunningham 1990). Small-scale plantations of medicinal plants have been established in Africa, such as in Senegal and Botswana.

Natural Forest Management

In some areas, it may be possible to turn over parcels of natural forest to local communities or groups for management and use. Two different possibilities seem most likely. First, where ample parcels of classified and state forest still exist outside of Protected Areas, some of these areas could be made available.

Second, where the size of the forest in the Protected Area is large enough, it might be possible to establish a core area that would be totally preserved, and buffer zones where limited forest exploitation would be allowed. As Sayers has argued, it may be possible to manage buffer zones of natural forest in ways that preserve much of the biodiversity. Sayers (1991: 45) advocated that "the best land uses will therefore be the harvesting of non-wood products from the natural forest, and selective logging systems where a small number of high-value timber trees are extracted without gross disruption to the remaining vegetation." The latter situation, for example, might hold in the Masoala Peninsula.

Guidelines for Social Forestry Activities

1. Understanding human use of trees and forests is vital for successful integrated forest conservation and forest development efforts. This topic is one that will require more in-depth analysis in the Phase I and Phase II Protected Area Development Projects. Efforts will need to be made to quantify resource use — in terms of amounts of resources used, income or economic benefits derived, and amount of time that people spend obtaining and processing forest products. These patterns of resource use will need to be spatially analyzed and mapped. It will also be important to disaggregate the use patterns by types of resource users, to more precisely target resource management and development interventions.

Indicators should be developed and used to assess the reliance of the local population on forest products, such as use of non-wood building materials or alternative energy sources. Indicators could also be used to track the contribution of forest products to the local cash economy. Studies could be done of dietary consumption, to assess the importance of forest foods.

2. Community management of forest resources should be introduced in a phased, gradual approach, to gradually build up local capacity and skills. Both villagers and DEF foresters expressed some concerns about community forest management activities. Several major issues were identified. First is the ability of the local residents to actually protect forest areas from unauthorized users. Second, they acknowledged that they would need technical advice and training to have the skills to rationally manage the forest parcels. Third, political and organizational issues would need to be addressed. Fourth, the relationship between the forest service and the communities would need to be clarified: would all forest management rights and responsibilities be turned over to the community, or would the forest service retain certain rights?

As experience with community or local management of forest resources is limited in Madagascar, it would be wise to proceed cautiously. First, the community's current forestry activities and uses need to be assessed.

Second, it is important to consider local experience in communal work and community management of development activities or economic enterprises. Examples were found in the communities visited of collaboration on irrigation works and dams, village pharmacies, village granaries, school construction, and agricultural work groups.

Technical assistance and training in forest exploitation and management will be needed. Possibilities for sending villagers for training in forest exploitation, e.g., the Forestry Training Centers at Morondava and Fianarantsoa, or in charcoal production, e.g., Société Fanalamanga, should be seriously explored. It might also be a good idea for a delegation of interested villagers to go on a study tour to visit areas where community management activities already exist.

Another alternative would be to explore the possibility of training some forest agents (either with DEF or in the private sector) to act as forest management consultants to communities. They could function to help communities inventory forest resources and uses, and design sustainable, rational forest management plans. (In some parts of the United States, for example, consulting foresters will assist private landowners in drawing up forest management plans that will meet the landowner's management objectives and also satisfy state requirements to mitigate environmental impacts.)

The community or local group could initially be granted limited rights to use and exploit a forest parcel. Specific conditions for use and reforestation would be specified. Over time, based upon performance and development of a sound management plan, the community could gradually assume increasing rights and responsibilities for the area.

To summarize, the approach advocated would involve the following steps:

- Forestry exploitation cooperative or group - in either a natural forest or forest plantation

  a. Through "animation" and PRA techniques, assess extent of interest in participation in cooperative and important social factors that will influence group activities

  b. Take steps to ensure that specific target groups, e.g., those who will bear the costs of Protected Area protection or women, have the opportunity to participate

  b. Negotiations with interested villagers, project staff, and DEF, e.g., roundtable to negotiate on parcels, management practices

  c. Technical assistance

  d. Forestry exploitation, management, and reforestation training, e.g., Morondava

  e. Training in management, accounting, marketing, etc.

f. Develop a gradual phased approach to community forest management

i. Begin with limited use and exploitation of forest area

ii. Monitor impacts of use

iii. Develop forest management plan with community and technical advisors

iv. Gradually increase local rights and responsibilities

3. Agroforestry activities should build upon existing agroforestry practices, and perceived conservation and development needs. A possible approach might be as follows:

a. Analyze reasons for tree cutting, deforestation, and agricultural and livestock practices to assess needs for possible agroforestry interventions

b. Examine local interest, opportunities, constraints

c. Develop strategies with local participants

d. Involve interested parties in tree planting

APPENDIX I

CRITERIA FOR ADDRESSING SOCIAL FACTORS

CRITERIA FOR ADDRESSING SOCIAL FACTORS

Rationale and Supporting Evidence

The areas visited by the team present a mosaic of cultural diversity, yet common cultural elements are found throughout Madagascar. The recent nationwide changes in Madagascar have unmasked the unrepresentative nature of the previous local "modern" political structures and the durability and importance of traditional leaders.

The traditional social hierarchy based on caste and family lineage has very large ramifications for any project working near protected areas. The remoteness of these peripheral zones reinforces the divergence between the modern and traditional social organization. In contrast to the southern part of Madagascar where traditional rulers are often poor and without much influence, in the north they seem to have maintained their influence and are generally the more well off than other villagers.

At several locations such as Betampona and Ambilobe, traditional leaders were educated, influential men who appeared to command respect in the community. The team has been told that the opposition of the local tangalamena, or clan chief has made extension of new techniques developed at the tavy institute at Biforona more difficult.

While some team members have found traditional leaders to be a source of obstruction to economic changes and to have participated in exploitative activities, SAVEM projects will have to deal with traditional leaders. At a minimum their approval of activities will probably have to be sought for project activity. Ideally they would be active participants in projects.

To work in such an environment projects will have to have well trained, probably malagasy, social scientists to work at specific project sites.

The importance of ceremonial sites in protected areas were emphasized in an interview the team had with his excellency the Prince of the Antakarana, Tsimisoro(?) III. The team has found common ground in local interest to protect these sites and conservation. In the Mt d'Ambre area these ceremonial sites often serve to protect forested water sources. Local prohibitions against killing or eating a large number of indigenous species forms another area of common interest.

Days in which agricultural work is prohibited by custom, might be helpful in timing meetings and other development activities.

As much as possible project activities should seek to understand local customs that might promote conservation.

The team has also found that in many places there is a poor understanding of the nature and goals of existing ONG activities. Even where these things were understood a certain level of glasnost seemed lacking. At Joffreville villagers complained that wanted know why they did not benefit from fees collected at the National Park and why researchers and tourists had access to the park while they were excluded. Under the SAVEM project openness concerning budgets and other aspects of activity should be required at the local level.

Formal education is one of the most frequently mentioned social needs. A large drop out rate at the primary school level, which raises the real cost of education, and a lack of interest and opportunities in vocational and technical education were problems that the team found. NGO's might consider how conservation education at the primary and secondary level might lead to training for vocational and technical work in conservation.

School buildings are a major problem. Many of them have been damaged or destroyed by repeated cyclones. Investment in expensive masonry construction seems unnecessary and perhaps futile in such conditions. At Ambanytoaka near Betampona, parents had donated local material to build a school and needed only about three hundred dollars in purchased materials to complete the project. Given the relatively low cost of construction using locally available materials, projects could easily provide purchased finishing material as a gesture of good will.

Summary of Social Criteria

- For better or worse, in most cases the approval of traditional leaders will be necessary for project activity.
- Wherever possible projects should find common ground with local customs and traditions.
- In most places a malagasy social scientist will be necessary to have a full understanding of the cultural environment at specific project sites. Short term expatriate technical assistance does not seem appropriate in developing site specific information for project implementation.
- Considerable public awareness programs seem necessary to assure that villagers understand project goals and activities.
- Openness in budget and other policy matters at the local level might help public understanding of the ICDP concept.
- Some attempt should be made to develop programs in conservation technical and vocational training as part of the support for formal education.
- Project assistance to school building projects should be avoid materials not locally available and be limited to finishing materials for buildings.

ECONOMIC CRITERIA

Criteria

(see document of synthesis)

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Rationale

SAVEM's hypothesis according to which conservation should be compatible with villagers' interests, implies alternative income-generating activities.

Evaluation of constraints and parameters which conditions both achievement and sustainability of these activities and incomes makes up the main objective of the present mission. Criteria as suggested above aims at responding to different constraints that have been identified.

a) A "cultural tradition" implanted in a huge area of the island: it can be sustainable in a period of low density population and forest abundance. The present scarcity of resources gives the opportunity to trigger the generalization of an alternative cultural system. One cannot be sure of anything in middle course. However, it is suggested to:

   - develop, if the relief allows it, the bottom-land rice-cropping potentiality.
   - settling taby rice-cultivation by agro-forestry means.

b) The national and local management deficiency of forest resources, thus permitting forest exploiters and log-exporters' unsustainable practices. At SAVEM projects' level, initiatives can be taken to give responsibilities to local communities.

d) Climate and macro-economic tendencies. Adjustment measures used for the last ten years have had positive impacts in few cases and negative ones in few others.

   - In the region of Diego Suarez, they were translated into the boosting of urban and touristic investments. The latters contribute to the development of the biodiversity.
   - Conversely, the following measures have brought about very outstanding drop of the villagers' real incomes: cloves and coffee trade total liberalization, in spite of the market specificity of these cash-crops; the non-repercussion of these "surplus" (plus-value) in FMG of devaluations on producers' prices; inflation, which essentially means increase in the price of consumer goods, notably rice. These income-drops have affected both the villagers' consumption and exploitation (non-maintenance of the coffee-trees, inclination towards tavy-practices...), and therefore, appear as major hindrances to the success of initiatives for alternative activities to tavy. The criteria put forward different measures to address these constraint

e) The decline of road facilities also represents a major handicap for peripheral zone development and even for the SAVEM projects implementation.

f) The decline of basic services worths to be taken into consideration from social and economical viewpoint.

SDAPs and SACs Criteria

Following the analysis of constraints and above proposed activities, the following criteria are put forward:

General Criteria

- concerning the size of the project: it will be a function of the size of the protected area. The different activities of the project can be carried out by different NGOs. The coordination board's formula under the leadership of the most efficient NGO seems to be appropriate. A Malgache executive coordinator, preferably a tropical forester, is strongly recommended.

- concerning classification of activities: the following is being suggested:

  * Agricultural development and road building

  * Touristic and credit initiatives

  * Education and health related activities

  * Activities related to conservation

Specific Criteria

- The NGO has to identify the potentialities of the region concerned by the protected area over the different types of activities as follows: irrigation, agroforestry, reforestation and road construction and repair.

- It has to indicate the approach, the objectives and the means, prioritization and timing of contemplated works.

- Measures to be taken in favor of assistance to rehabilitation of basic services such as health and education in the targeted region.

- Identification, on social and institutional plane, of local management possibilities of forest within the projected area.

- Identification of forms of consciousness-raising campaign towards popularization of the use of improved "fatampera". Necessity of working together with all local NGOs.

- Identification of small credit development possibilities in favor of medium size commercial exploitations in the field of trading, transport and forest exploitation.

- Identification of touristic potentialities of the targeted region in order to contribute to their development within the scope of the project.

- Identification of possibilities for developing non-traditional cash-crops and any other crops likely to bring in additional or alternative cash such as market gardening.

- Knowledge of the activities, in "its" project region and ministerial departments working in the field of conservation, agricultural development, touristic advancement and health care.

AGRICULTURAL SECTOR CRITERIA

Based on the findings of the team agronomist the following technical criteria have been proposed for agricultural activities funded by SAVEM 's Protected Area Development Grants (PADG).

Rationale and Supporting Evidence

Labor constraints are the most important factors limiting agricultural productivity at most of the sites that the team visited. Weed control on both irrigated and non irrigated land is the most labor intensive part of the agricultural cycle. Project activity will have to address this problem before the next factor, soil fertility is addressed.

Several of the experiments that the team observed that are attempting to stabilize rainfed agriculture seem more focused on conservation of soil moisture and fertility. While these improvements are needed, in some cases they will make weeding more difficult by provoking denser weed growth. Methods that might eliminate this problem are animal traction, natural and plastic mulching and better water control in bottom lands.

Work by Pedro Sanchez, the current head of ICRAF in Nairobi has also demonstrated the effectiveness of herbicides in removing the labor constraint in subsistence agriculture. His work at Yramagas significantly improved productivity in a sustainable manner according to most observers (Sanchez and ___ 1985). We understand, however that current SAVEM policy does not permit the use of any pesticides in project activity.

Soil fertility is the second constraint to production and should be the second priority of projects to improve or stabilize agriculture in the peripheral zones

Land tenure and access is a well documented problem observed in several locations. It is a major constraint in the Mt d'Ambre area and in the village of Ambanytoaka next to the Betampona Reserve. At both locations land ownership is clouded by either colonial or recent commercial activities. Priority should be given to resolving this issue in projects that will operate in these areas. In theory, legal remedies exist to these problems. We recommend that SAVEM explore methods of giving access to legal services and other forms of advocacy to secure land tenure. The current atmosphere of reform and the return of integrity to the court system might favor such actions.

Irrigated rice projects as an alternative to tavy are currently and will be, one of the most frequently requested forms of assistance. Few of the many past efforts of this type have achieved this goal. Returns from rice production do not seem high enough to cover the cost of maintenance, especially in areas where direct and indirect cyclone damage will require extensive repairs every few years. All of the sites proposed in the SAVEM project would be subject to such damage.

The team agronomist has also noted that in areas with rainy seasons over six months, the only agronomic reason for flooding the fields is weed control. From a strictly agronomic point of view the crude form of flooding and in field storage of rain water serves to save labor, but does not dramatically increase yields in these wetter areas.

In the light of this evidence the team considered proposing an out right ban on financing new water projects, but realized this would be politically and socially impossible. Irrigated rice is one of the few activities that would directly improve income. As a compromise we are recommending priority for construction of new water development projects be given to areas with rainy seasons shorter than six months. In wetter areas new construction should be avoided as much as possible and priority given to improving maintenance and yields of existing projects.

Cash crops have, in the past played an important role in providing stable agroforestry systems in areas near the protected areas we visited. Their role as a source of income has dramatically declined recently with low world market prices given as the explanation. We believe, however, that the exploitative collection system might be more of a factor in this situation, since producer prices are only fractions of the export price.

Moreover, official corruption, until recently unmentionable, has surely blocked development of coffee, cloves and pepper. Most observers attribute the end of the coffee support and stabilization program in 1990 to embezzlement of funds.

Currently there are few resources available to renew plantations of cash crops. We recommend that SAVEM projects provided support for cash crops where suitable. This would be a long term approach, given the lengthy productive life of coffee and clove trees. In the thirty year life span of a coffee tree surely some improvement in prices will take place. At some locations ICDP nurseries growing eucalyptus trees of marginal value could be used to renew cash crops instead.

Summary of Agricultural Criteria

- Labor constraints and especially weed control should be the focus of agricultural improvement projects.
- Soil fertility is actually a secondary priority but should still be addressed.
- If reforms continue, SAVEM should explore legal services and advocacy as a means of improving the land tenure situation.
- New rice irrigation projects should be limited to areas with less than a six month growing season. In wetter areas, priority should be given to maintenance and yield improvements of existing projects.
- Renewal of perennial cash crops should be adopted as a long range strategy for income improvement.

HEALTH SECTOR CRITERIA

Rationale and Supporting Evidence

The team would like to emphasize the importance of health issues in the ICDP concept. Often thought of as an ancillary activity, only weakly linked to either development or conservation, our

observations and available literature indicate there could be little, if any, economic development in the peripheral zones if the current health situation continues.

In several instances the team physician found situations that would probably be considered emergencies in other countries. In the isolated Mananara district, malnutrition is so common that Kwashiorkor and marasma are widely observed in children. In the same area, epidemiology studies (IPM 1990) found that over forty six per cent of the children were infected with bilharzia. Malaria is pandemic in all of coastal Madagascar. In the Antsirana area over forty eight per cent of morbidity is from Malaria.

In 1990 a nearly catastrophic dysentery epidemic went through the Tamatave province. Villagers near the Betampona Reserve at Ambodranifia told us that only the availability of medicines from the SAF-FJKM sponsored village pharmacy prevented deaths from dysentery during a more recent epidemic.

The economic effects of this widespread morbidity are all too evident. In the joint survey that the team administered, health problems were frequently cited as a constraint to agricultural production. This worsens the already serious labor shortage. In a study of women's time utilization in a village near the Beza Mahafaly Special Reserve R. Maille (1991) found that being sick or caring for ill household members was the second most important use of time after meal preparation.

In some cases proximity to wildlife has been found to have a negative impact on human health. Fotenille et al. (1988) found that *Lepilemur edwardsi* and *Caracopis vasa* provided a reservoir of infection for mosquito transmission to humans of several types of fever producing viruses. The team was told informally that recent serological studies in southwestern Madagascar have raised the possibility of lemurs being a similar reservoir of malaria infection.

As serious as these problems are the team physician believes that even a modicum of intervention could dramatically improve the situation. Concentrating health activities in the area of potable water and treatment of malaria could address these problems at relatively low cost.

At a minimum the community health facilities near the reserves should be rehabilitated and supplied with essential medicines. Project collaboration with existing Ministry of Health vaccination programs would have long term benefits. These activities could be tied to health education. Ways of categorizing and improving traditional practices should be explored.

Much interest was expressed in family planning during group and individual interviews, so much so that the team physician gave a talk on the subject to women in the village of Anbondrafia. She recommends that SAVEM projects include family planning to respond to this demand.

At most sites that the team visited at least one organization was working in the health sector. These organizations might form the bases of health activities under SAVEM. Cooperation with existing organizations should be required for grantees in the health sector. One local NGO, FI-KRI-FA-MA already has developed potable water programs outside of the ICDP context that might serve as models.

The team physician has also recommended that the large scale baseline studies called for in the project document be dropped i favor of studies focused on the diseases on which the .....

Summary of Health Sector Criteria

- Focus health sector activities on improvement of drinking water and malaria treatment.
- Provide support for existing community health facilities.
- Support should be provided for Ministry of Health Vaccination programs.
- Family planning could be an ancillary activity to respond to health needs.
- SAVEM health programs should be implemented by organizations already active at the various sites as much as possible.

APPENDIX J

GUIDELINES FOR SAVEM-FUNDED PROJECTS

GUIDELINES FOR SAVEM-FUNDED PROJECTS

1. Conservation-Development Links

For PADGs, the Phase I assessment must clearly articulate how the Phase II activities will link conservation and development efforts. The project proposal must specify how it intends to examine the fundamental hypothesis of the SAVEM Project. Operational definitions of concepts and indicators must be provided. For CAGs, the proposal must state how the proposed activities will contribute to conservation, and how impacts can be assessed.

Rationale and Supporting Evidence: The SAVEM Project intends to support activities that directly link conservation and development. The goal is to empower local people to manage and conserve natural resources. The assumption is that if people can receive social and economic benefits from these resources, they will be motivated to conserve, rather than destroy, them.

An example of local involvement in resource management is the collaboration between the Biosphere Project and members of three fishing communities. The Project has established a 1000 ha. marine park, consisting of three islands and surrounding water. Residents of the three nearby villages are permitted limited fishing rights within the park, in exchange for assisting the Project in protecting the park from unauthorized use. Since this program has been started, the abundance of fish, shellfish, and marine animals has increased, as have fishing catches for the local participants.

Suggested ways of meeting this criterion: To promote linked conservation and development activities, the following actions are proposed for PADGs:

1. Baseline studies and inventories of resources and areas to be conserved, with an analysis of local use patterns and priorities.

2. Participatory analysis of the conservation and development links, and negotiation on local involvement in resource use and management.

3. Gradual development of local participation in management, with necessary technical support, training and development of local human resources, and local institution-building.

4. Participatory monitoring of key indicators, to assess social and environmental impacts of interventions. Indicators should assess conservation of resources, social and economic development, and empowerment. These indicators need to be able to track participation by different resource users and spatial impacts upon the areas being conserved.

5. Efforts should be undertaken to integrate development activities with one another, and with conservation activities. Possible examples include:

   - undertaking trials to cultivate medicinal plants and using these plants in health or nutrition programs;

   - coupling functional literacy programs for adult women and men with extension activities in agricultural, forestry, agroforestry, fisheries, and other natural resource management and enterprise development activities; and

- developing employment or income-generating activities with women in conjunction with family planning efforts.

2. Sustainability

Proposed activities must have reasonable prospects for long-term ecological and socio-economic sustainability and replicability.

Rationale and Supporting Evidence: The purpose of the SAVEM Project is to support and examine various approaches to integrating conservation and development activities that will be sustainable and can be replicated to other sites. As projects will be funded for a short time period, i.e., three or four years, it is vital that activities can be continued by rural residents, local groups, and Malagasy NGOs after project funding ends.

Suggested ways of meeting this criterion: The project proposal should indicate that the following types of issues have been considered, and that project strategies are adequate to address them:

- Will proposed development activities be economically viable, considering fluctuating markets, availability of transport, and alternative economic activities, e.g., cash crops. Will the proposed activities use locally-available materials and inputs?

- Community stability issues should also be examined. Are there links between political instability and attacks on the forest? What is the development objective, to stabilize the community size or grow? What degree of social cohesion (ethnicity, immigration) exists, and what are possibilities for negotiating binding social contracts on resource conservation?

- What mechanisms are proposed to empower local people to sustainably manage resources? Are there local social organizations or other mediating social structure that can be supported and reinforced? Will efforts be made to develop individual human skills, to empower local management? Will the people be able to continue with the activities when the project funding ends?

3. Project Scale

The size of the project intervention zone must be identified and justified in the course of Phase I planning. The project must identify how zones of total preservation, conservation buffer zones with limited uses, and exploitation and management of natural resources in the peripheral zones will be negotiated with local residents. The proposed activities, staffing levels, and logistical support need to be on an adequate scale to address the problems identified in the project area.

Rationale and Supporting Evidence: Each project must determine the scope of its interventions. The Biosphere Project, for example, has undertaken research to ascertain where human pressures are being exerted upon the Protected Area, and identified 22 target villages for interventions. Other projects are working with fewer communities. Some projects have adequate logistical support and staffing levels to make a significant impact. Other projects have underestimated the logistical support and staffing necessary: their activities, thus, are very thinly dispersed.

Suggested ways of meeting this criterion: First, adequate participatory research and appraisal is needed to identify and negotiate with local residents the various zones to be managed -- for total preservation, conservation with limited use, and exploitation and management of resources in peripheral areas. Such an analysis should identify what key development interventions, in what locations, are hypothesized to lead to the desired conservation and preservation objectives. Based upon this initial work, then activities, staffing, and logistics can be proposed to address the planned strategy. Other guidelines:

- It is vital that small-scale concrete activities be quickly launched, to demonstrate the willingness and potential for change.

- The scale and approach to resource management activities will vary. While some activities can be undertaken by individual farm households, others can only be successful if they are adopted by groups of resource users or even entire communities.

4. Participation

Efforts to develop integrated protection, conservation, and development plans for Protected Areas and peripheral zones must involve the active participation of, and negotiation with, local residents. The project must use participatory methods for project development, implementation, monitoring, and evaluation.

Rationale and Supporting Evidence: Ample evidence suggests that active participation of local people is essential for long-term sustainability of development activities.

Projects working on conservation and development activities have involved local people to varying degrees. Some projects have sought local participation in identifying development needs and priorities. Several of the projects visited have conducted socio-economic studies. Local participation has been sought in demonstration sites and field trials: this approach needs to be further developed. In some areas, concern has been expressed by local people that the conservation projects will take away their land or deprive them of use of resources. It is vital that local people participate in projects to understand the objectives of joint conservation and development.

Suggested ways of meeting this criterion: The community and community leaders, in collaboration with project staff and other technical specialists, can identify local priorities and possibilities for action. A wide number of techniques are available for facilitating participatory development efforts. The Catholic Diocese of Diego Suarez has used the DELTA approach in working with several villages around Amber Mountain.

GRAPP (Groupe de Recherche d'Auto-Promotion Paysanne), based in Bobo-Dioulasso, Burkina Faso, has techniques for promoting group or village-level discussions and analysis of various social problems, e.g., health issues, such as malaria, and environmental degradation. GRAPP techniques have been widely used throughout West Africa by extension agents working on community forestry programs.

In some communities, it may be appropriate to develop community resource management plans. One approach is through a Participatory Rural Appraisal (PRA) process. This methodology is a subset or offshoot of Rapid Rural Appraisal (RRA) techniques developed by the International Institute for Environment and Development in London and the Institute for Development Studies at the University of

Sussex (McCracken et al. 1988). Work in developing and applying this PRA methodology has been conducted in Kenya and elsewhere. A handbook and training materials exist, as well as case studies documenting how the process has been applied in particular communities. As noted in the Participatory Rural Appraisal Handbook (National Environmental Secretariat of Kenya et al. 1990), this approach can only be used if it has the full support of government officials and community leaders, and the interest of the community. Participants in the PRA team need to be fully familiar with the PRA methodology, and preferably should have prior experience or training in PRA.

Other guidelines to promote participation include:

- The project needs to establish rapport with the local communities, to establish confidence and willingness to work together.
- To facilitate community action, project extension agents should live in the area, and gradually develop concrete activities with the people.
- Based upon sociological understanding of the community's authority structure and forms of social organization, strategies for working with village leaders and communities can be proposed. All development, conservation, and related research should stress the active participation of local people.

5. Social Equity

The project must consider social equity issues, and how they are to be addressed. Since concepts of social equity are culturally-specific, local participants and project personnel together must define an approach.

Social equity issues include consideration of who will benefit from project activities. This question needs to be addressed on two levels – beneficiaries of project field activities, and personnel directly employed by projects. Wherever possible, local residents should be able to realize direct benefits from the conservation and protection of Protected Areas and buffer zones. Hiring policies must be equitable.

Rationale and Supporting Evidence: Some Protected Areas, such as Amber Mountain National Park, are open to tourists. The current policy of ANGAP is that entrance fees should be used to help protect these areas. Thus, any direct economic benefits for local communities will only come from employment, and goods and services provided to tourists.

The question of employing local residents as APNs is a sensitive one.
In several villages we visited in the Amber Mountain Region, the APNs told us that they did not come from the village in which they worked, but from nearby villages. In Ambodirafia, the Tangalamena noted that all four WWF APNs hired for the Betampona Reserve came from the village of Fontsimato. He felt that this situation was unjust, and that someone from Ambodirafia could have been hired.
The Project Paper also noted the possible problem of locally-hired APNs being unable or unwilling to ensure that their family members or neighbors observe restrictions on use Protected Areas.

If the Protected Area is important as a watershed, the nearby residents should be able to benefit from protection of the watershed. In both Amber Mountain and Betampona, the forests contain important water sources. In Joffre-ville and Ambodirafia, local residents lack access to safe potable water.

In Sakaramy, residents have become concerned about the drying up of a local source, which has increased the work burden for women in fetching water for household needs. The watershed of Amber Mountain is being protected for the urban residents of Diego Suarez, not for the residents of the adjacent villages.

The lack of potable water has negative impacts on health, which is a major priority for local people. If people are frequently ill, this negatively affects their ability to work in their fields or engage in other productive activities. Poor health also increases their expenditures of time and money, to seek medicinal plants or to purchase modern pharmaceutical. Health problems can also directly affect conservation and protection activities. For example, last year there was an outbreak of dysentery in the region around Fenerive-Est. Due to this epidemic, the APNs were reluctant to go into the field to carry out their work, for fear of falling ill. One APN did contract dysentery, and had to be hospitalized.

Suggested ways of meeting this criterion: Local residents should benefit directly from preservation and conservation of Protected Areas. Possibilities exist for both consumptive and non-consumptive uses and benefits of Protected Areas. Within Protected Areas, local residents could benefit from eco-tourism development, employment as APNs, guards, guides, or research assistants, or environmental education. If the Protected Area is an important watershed, the nearby residents may need access to potable water. If buffer or peripheral zones are managed for resource use, such as collection of medicinal plants or charcoal production, rights to these resources should be negotiated with, and reserved for, local residents.

To address questions of project effectiveness and equity, efforts are needed to work with a wide range of community members and resource users. Projects must develop explicit strategies to ensure that a wide range of community members participate in project activities and that participants receive direct benefits from their participation. As stated in the Project Proposal, efforts must be taken to ensure that those who bear the costs of conservation and protection of Protected Areas should receive some benefits from project development activities.

The issues of local participation need to be addressed at several levels: individual, household, groups, and communities. Clear strategies must exist to identify and target activities to reach groups of particular concern. These include:

- those currently using the Protected Areas, who will bear the costs of enforcement and/or restriction of their former activities, i.e., those cultivating in P.A.s, or those harvesting forest products, such as wood, firewood, medicinal plants, or game;
- those suffering the worst impacts of environmental degradation;
- "landless" people, particularly young people;
- poor households;
- women [see Criterion 6].

Hiring policies for project activities need to be clearly stated. They should stress local employment. Hiring policies need to ensure that a diversity of local people from different villages have opportunities for employment. Efforts should also be made to ensure equitable hiring of project personnel from outside of the local area.

6. Women's Participation

SAVEM-funded projects must ensure that women have equitable access to funding, assistance, employment, and training. Women must be involved as active participants and decision-makers in project activities, both as local participants and project staff.

For PADGs, the project must offer women equitable opportunities for employment at all levels of project activities, training, and advancement.

Rationale and Supporting Evidence: Women are actively involved in using natural resources. They, therefore, represent important and likely collaborators in conservation and development activities. It is also an explicit USAID policy, and an objective of the SAVEM Project that women have equitable opportunities for involvement in development activities. Projects should ensure that women have equitable opportunities to participate in, and derive benefit from, project activities and employment.

Integrated conservation and development projects in Madagascar are already working with women. For example, the Biosphere Project has found that women are very interested in working with improved bee hives outside of the forests. In some sites visited, women are already organized in social organizations that undertake natural resource activities. A women's association based in Maroansetra has already engaged in reforestation activities. Some ICDPS visited, such as the WWF project in Amber Mountain, SAFAFI rural development activities in Masoala, and the Biosphere Project in Mananana-Nord already have a number of women staff members, working on both professional and field extension activities.

Suggested ways of meeting this criterion: Within the total range of CAGs funded, efforts should be made to ensure that women have equitable access to funding, assistance, employment, and training. To obtain women's participation, special efforts may be needed to help women formulate and submit proposals for funding. GMU may be able to provide training or technical assistance in this area. Another possibility would be to work through intermediary NGOs or regional representatives.

For PADGs, the involvement of women in Phase I activities and proposed staffing for Phase II activities should be assessed. To promote women's participation, a gender analysis can be conducted, to assess existing activities, constraints, and potentials. Specific strategies should be proposed to enhance women's participation in project design, implementation, monitoring, and evaluation. For example, training and hiring of women extension agents can be a particularly effective means of working with women resource users. Gender-disaggregated data needs to be included in the indicators for tracking project progress.

7. Training

PADGs must have clear strategies for training of project personnel, collaborators (such as DEF agents), and local participants.

Rationale and Supporting Evidence: Education, extension, and training are vital for human resources development and empowerment. If the Project's major objective is to change human behavior from destruction of the environment to conservation, training in specific skills will be needed.

Suggested ways of meeting this criterion: Depending upon an assessment of needs, training could be provided to project staff and collaborators in basic rural sociology and anthropology, Participatory Rapid Appraisal techniques, other "animation" and "sensibilisation" techniques, gender analysis, and other issues important for working with rural people.

At all levels, including local participants, technical training may be needed in agroforestry, forest exploitation, natural forest and plantation management techniques. Training may also be needed in areas of needs identification, project identification, planning, implementation, and monitoring, budgeting and accounting, and management. Besides formal courses and technical assistance for in-service (on-the-job) training, other forms of training should be considered. These might include attending workshops or conferences, study tours, farmer-to-farmer visits, etc.

Social forestry extension approaches need to maximize active local participation. To introduce new activities, the following are recommended:

a. Demonstration sites

b. Village extension agents ("animateurs"/"animatrices")

c. Training for project staff and forest agents in PRA/RRA, social forestry, rural sociology, gender analysis, etc.

8. Research and Indicators

For PADGs, research and evaluation must be targeted towards key indicators (to assess the impact of conservation and development activities) and towards hypothesis-testing. Key indicators will be used to identify baseline ecological, economic, and socio-cultural conditions and monitor changes during project implementation. Such key indicators should be identified during the course of Phase I project design activities, in collaboration with the Biodiversity Planning Service (BPS). To the maximum extent possible, participatory research with the resource users and managers should be developed.

Rationale and Supporting Evidence: A major purpose of the SAVEM project is to research viable and sustainable approaches to environmental management of Protected Areas and surrounding peripheral zones. The aim is to replicate successful efforts to conserve biological diversity and promote development elsewhere in Madagascar. The project also hopes to contribute to overall understanding of ways to shape human behavior with natural resource use.

Suggested ways of meeting this criterion: Understanding human use of trees and forests is vital for successful integrated forest conservation and forest development efforts. Guidelines have already been suggested for ways of developing indicators to examine human uses of trees and forests, and recommendations have been proposed for key elements for baseline studies. In addition, for the overall SAVEM Project, cross-cultural, comparative sociological methods can be employed to examine similarities and differences between sites within a specific project, and among projects.

9. Social Forestry Activities (Agroforestry, Reforestation and Tree Planting, Plantation and Natural Forest Management)

For both CAGs and PADGs, any agroforestry, forestry, or natural resource management activities will minimize adverse environmental and social impacts.

For PADGs, Phase I will identify the type and degree of forest resource use by various local groups, and will analyze the threats to forest and biodiversity conservation. Development strategies to be implemented in Phase II must respond to those specific issues. Proposed social forestry activities must respond to both conservation and development needs. Efforts must be made to link social forestry activities with other local development priorities.

Before embarking on social forestry interventions, appropriate baseline studies should be conducted. For example, for agroforestry activities, it is vital that the land tenure and labor constraints and requirements are well understood.

Rationale and Supporting Evidence: Where threats to the preservation of forest and biodiversity are linked to uses of forest resources, social forestry activities in buffer or peripheral zones may be able to lessen pressure on the core areas. If, for example, people are cutting trees for building materials for their houses, it may be possible to replace such activities with managed exploitation of forest plantations or parcels of natural forest in state or classified forests.

Suggested ways of meeting this criterion: Baseline studies should be used to indicate the existing uses of forests, both within the Protected Areas, and in surrounding peripheral areas. Using such information, project personnel, local residents, and technical advisors could develop plans to for appropriate social forestry interventions.

Depending upon the local conditions, various social forestry interventions may be desirable. Agroforestry can be used to improve soil fertility and reduce soil erosion, in order to improve agricultural productivity. Agroforestry can also be used to diversify farm incomes, such as establishing perennial tree crops such as fruit, coffee, and cloves, or provision of animal fodder. Opportunities exist for: (1) reforesting commercially logged sites, (2) reforesting areas exploited by local communities, and (3) establishing plantations to produce various forest resources. Where needed, tree nurseries can be run with community participation or established as small-scale commercial enterprises. It may be possible to turn the exploitation and management of some forest plantations over to local people. Where state and classified forests exist outside of Protected Areas, some could be made available to local communities or groups to manage. If such areas do not exist, and the forest in the Protected Area is large enough, it might be possible to establish a core area that would be totally preserved, and declassify buffer zones where limited forest exploitation would be permitted.

Agroforestry activities should build upon existing agroforestry practices, and perceived conservation and development needs. A possible approach might be as follows:

a. Analyze reasons for tree cutting, deforestation, and agricultural and livestock practices to assess needs for possible agroforestry interventions

b. Examine local interest, opportunities, constraints

c. Develop strategies with local participants

d. Involve interested parties in tree nurseries and demonstration field trials (participatory effort)

e. Provide appropriate training and technical support, e.g., village nursery training program of UNICEF and DEF improved tavy institute at Beforna

10. Community Management of Forest Resources

Any plans for community management of forest resources must be based upon an incremental, phased approach, which will build local capacity for management. After negotiating with local communities or groups, they can be granted limited rights to use and exploit specific forest resources within a given area. With technical assistance and training, management plans for these areas can be developed. Based upon management capabilities and performance, increasing rights and responsibilities can gradually be entrusted to the local community.

Rationale and Supporting Evidence: Examples already exist of communities that have been granted exclusive, limited rights to forest parcels. Traditionally, some communities have been able to control use of certain areas of forest. At least one forest exploitation cooperative is known to be functioning in Masoala Peninsula. As both foresters with DEF and community members and leaders have expressed concern about the ability of local communities to rationally manage forest parcels, it would be advisable to adopt a gradual phased approach, building local skills and capacity to manage such areas.

Suggested ways of meeting this criterion: First, the community's current forest activities and uses should be assessed. Second, it is important to assess existing local community experience in communal work and management of development activities or economic enterprises. Third, community members would need to be provided appropriate training and technical assistance in forest exploitation and management techniques. It may be possible to provide training for foresters, so that they could assist communities in drawing up forest management plans. The community would have limited rights to use and exploit the forest parcel: as they develop the appropriate knowledge and skills, they could gradually assume total management rights and responsibilities.

To summarize, the approach advocated would involve the following steps:

Forestry exploitation cooperative or group — in either a natural forest or forest plantation

a. Through "animation" and PRA techniques, assess extent of interest in participation in cooperative and important social factors that will influence group activities

b. Take steps to ensure that specific target groups, e.g., those who will bear the costs of Protected Area protection or women, have the opportunity to participate

b. Negotiations with interested villagers, project staff, and DEF, e.g., roundtable to negotiate on parcels, management practices

c. Technical assistance

d. Forestry exploitation, management, and reforestation training, e.g., Morondava

e. Training in management, accounting, marketing, etc.

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f. Develop a gradual phased approach to community forest management

i. Begin with limited use and explcitation of forest area

ii. Monitor impacts of use

iii. Develop forest management plan with community and technical advisors

iv. Gradually increase local rights and responsibilities

11. Collaboration with and Operational Support for DEF

Where PADGS plan to engage in social forestry activities, collaboration with and operational support for field DEF agents should be developed.

Rationale and Supporting Evidence: Government foresters and forest agents working with Eaux et Forêts have much experience, training, and potential in the areas of forest conservation and management. Many individual foresters are enthusiastic and motivated to undertake their work, but hampered by the lack of logistical support.

Some ICDPs have been successful in enlisting the support and collaboration of local forestry agents. In Betampona, the DEF agent works with APNs funded by SAF-JFKM and WWF to protect the Reserve. A DEF forestry agent based in Toamasina is responsible for training and supervising the APNs in Betampona. The Biosphere Project has worked with the two forestry agents stationed in Mananara-Nord on tree nursery activities. The forest agents, along with the Project's own Agents for the Conservation of Nature, have received training, uniforms, and other logistical support. The GMU has sponsored the participation of a forest agent from Maroansetra in a one-month training course in rapid rural appraisal being held in Dakar, Senegal (in April-May 1992). These examples suggest that constructive collaboration between the Direction of Waters and Forests and NGOs is possible and desirable. Major policy and programming issues, such as the revision of forest laws or institutional-strengthening of DEF, are beyond the scope of the SAVEM Project. (Some of these issues are being addressed by another USAID Project, KEAPEM.)

Suggested ways of meeting this criterion: On an operational, field-level, SAVEM can collaborate with local forestry agents. They can be provided with logistical support (uniforms, bicycles, equipment) and training, and other incentives to undertake conservation and development activities in collaboration with ICDPs.

Collaboration on policy issues is also important. To protect forest areas important for biodiversity, the SAVEM project needs assistance on the level of policy reforms and policy implementation. The USAID KEAPEM Project is working on forest and related policy issues. A major issue for forest and land use is land tenure, particularly policies, laws, and DEF enforcement of conversion of forest land to tavy.

APPENDIX K

THE AGRONOMIST'S FIELD NOTES

AGRONOMIST'S FIELD NOTES

A concern that the team had was the SAVEM project might only offer short term support to local populations who would be asked to give up resources over the long term. Surprisingly, many people working in protected area issues made statements to the team indicating that the poor human conditions surrounding the reserve help conservation. Perhaps then the goal of this mission is not just to show that conservation is linked to development, but to refute the idea that poverty promotes conservation.

The overall macro-economic problems cannot be ignored. In the end, the team concluded that a "time based strategy" would be most appropriate for the SAVEM project. Frankly, this is a euphemism for delaying immediate loss of biodiversity, waiting for better days. This, the team believes, the SAVEM project can accomplish.

Part of the last objective, to establish baseline data for the areas visited, was completely out of range for the amount of time the team had. However, the team members were able to determine the key data elements needed in baseline studies. These elements are presented in the individual reports of the team members, and the information is summarized later in this report.

The scope of work implies that the concept of Integrated Conservation and Development Projects is a standard set of practices which have a well known definition. In reality, this concept has struck the team as rather amorphous as demonstrated by the range of current ICDPs. One of our objectives during this exercise has been to narrow the definition of the ICDP concept. The team feels that a narrow definition for ICDP is important because, in looking back at other development initiatives, such as integrated rural development, appropriate technology, farming systems research, and so forth, there has been the tendency to over apply new ideas. Enthusiasm for the original concept effervesces into misapplication and eventually, disillusionment.

The end result has been that the team recommends that the GMU simplifying the types of programs it finances (further details are provided later in this report).

The hypothesis of the SAVEM project is that development and conservation can be linked. Though often stated as a given, this hypothesis is not yet proven. The project paper also assumes that testing this hypothesis will produce benefits in terms of conservation and development. The team believed this approach needs to be challenged.

While the methodology suggested in the terms of reference made a good starting point, we believed that our effectiveness was enhanced by visiting activities taking place outside of the USAID sphere, and becoming more familiar with the Malagasy technical resources available.

Although given only brief mention in the scope of work the importance of secondary vegetation in the peripheral zones required that the team develop ways to characterize these areas. In this case both a linguistic and biological approach was used. Local terminology used to describe different types of degraded areas was identified. These terms were then matched with biological information, such as indicator species for soil fertility.

For biodiversity and ethnographic material,the team developed two bibliographies to assist our literature review. Both of these are now available to ANGAP and USAID.

The team agronomist felt strongly that activities too close to reserves would encourage people to stay near the protected reserves and parks and further degrade these areas. Keeping activities at least ten kilometers from the protected area would draw people away from environmental sensitive areas, he concluded.

The team agronomist's own study and a recent paper by Professeur Albignac, coordinator of the Biosphere program at Mananara, suggests that subsistence activities more than ten kilometers away from protected areas have little impact on primary forests, and thus there is evidence to support this idea.

Other team members disagreed. From our observations, in most cases, there is no possibility of moving for most communities directly adjacent to the protected areas. Good land is in short supply almost everywhere and moving away does not seem to be an option. The large number of young people in these villages with neither land nor work would testify to this.

The team recommend that ICDP projects attempt to resolve this through observing the effects of project proximity to conservation goals. Projects should define the peripheral zone in which they plan to work in terms of either geography or function.

The CAG grants should be limited to communities in relatively close proximity to the reserves, given their smaller impact. Attempts to address basic needs would have to be limited given the

The increasing poverty in some areas has resulted in the breakdown of the groups since many members could no longer reciprocate hospitality. Also the amount of land available for clearing was minimal. The team anthropologist was told that they had not been active for about ten years.

The amount of monitoring of biodiversity that grantees would have to do is unclear at the time of this writing since the role of SAVEM's Biodiversity Planning Service has not been fully elaborated. The assessment team has been given conflicting information as to the scope of this part of the SAVEM project.

As discussed in the biodiversity section of this report, the biodiversity monitoring called for in the SAVEM project paper is unworkable. Inventories of all know species would not be possible within the time frame of the project.

From past experience the end-of-project evaluations done by short term teams are not suitable. These new approaches might include. New approaches should include:

- establishing benchmarks,
- participatory interviews
- involving in-country evaluators from other organizations.

One of the principal observations of the assessment team is that there are no wholly forest dependent populations in the zones surrounding the reserve. The information in this section is focused on material for PADG grants. As far as we can tell products from the primary forest have only ancillary or perhaps even marginal contributions to subsistence or the traditional local economy. Fuelwood for example was taken from areas of secondary vegetation at most sites the team visited. In those instances where considerable economic value has been derived from forest products, little of this value is captured

for the local community. In the traditional subsistence economy the primary forest serves as a nutrient reserve for future cropping or more remotely, as a water shed for irrigated rice.

The Malagasy are not a forest people per se. Herding and rice production were the earliest focus of subsistence (Hesseltine 1972). Upland crop production now based mostly on New World crops is surprisingly recent. In some areas of the southwestern part of the island, dryland cultivation of maize dates only from the 1940s (Humbert 1954). On the east coast the older, but still relatively recent system of rice based *tavy* as the major form of upland cultivation has formed the local concepts of land stewardship.

While this lack of dependance on primary forest products might make conservation easier, it makes linking conservation to development more difficult.

The areas visited by the team present a mosaic of cultural diversity, yet common cultural elements are found throughout Madagascar. The recent nationwide changes in Madagascar have unmasked the unrepresentative nature of the previous local "modern" political structures and the durability and importance of traditional leaders.

The traditional social hierarchy based on caste and family lineage has very large ramifications for any project working near protected areas. The remoteness of these peripheral zones reinforces the divergence between the modern and traditional social organization. In contrast to the southern part of Madagascar where traditional rulers are often poor and without much influence, in the north they seem to have maintained their influence and are generally the more well off than other villagers.

At several locations such as Betampona and Ambilobe, traditional leaders were educated, influential men who appeared to command respect in the community. The team has been told that the opposition of the local *tangelamena,* or clan chief has made extension of new techniques developed at the *tavy* institute at Biforona more difficult.

While some team members have found traditional leaders to be a source of obstruction to economic changes and to have participated in exploitative activities, SAVEM projects will have to deal with traditional leaders. At a minimum their approval of activities will probably have to be sought for project activity. Ideally they would be active participants in projects.

To work in such an environment projects will have to have well trained, probably malagasy, social scientists to work at specific project sites. It is interesting to note that the Biosphere project, SAF/FJKM and the Catholic Archdiocese Development Committee plan a year of study before beginning activities. while this might seem too long by USAID standards the....

The importance of ceremonial sites in protected areas were emphasized in an interview the team had with his excellency the Prince of the Antakarana, Tsimisoro III. The team has found common ground in local interest to protect these sites and conservation. In the Mt d'Ambre area these ceremonial sites often serve to protect forested water sources. Local prohibitions against killing or eating a large number of indigenous species forms another area of common interest.

Days in which agricultural work is prohibited by custom, might be helpful in timing meetings and other development activities.

As much as possible project activities should seek to understand local customs that might promote conservation.

Researchers might involve local populations in the collections of data. Mackinnon et al(1990) have suggested local involvement in research projects. At the Beza Mahafaly Special Reserve WWF has already used the APNs for phenological data collection. Training local people to do so could be related to monitoring and evaluation of project biodiversity conservation.

Another major observation is the apparent age difference between those with rice land and the younger people who are forced to clear the steepest most environmentally degrading areas of *tavy* .

The team has also found that in many places there is a poor understanding of the nature and goals of existing ON activities. Even where these things were understood a certain level of glastnost seemed lacking. At Joffreville villagers complained that they wanted know why they did not benefit from fees collected at the National Park and why researchers and tourists had access to the park while they were excluded. Under the SAVEM project openness concerning budgets and other aspects of activity should be required at the local level.

Formal education is one of the most frequently mentioned social needs. A large drop out rate at the primary school level, which raises the real cost of education, and a lack of interest and opportunities in vocational and technical education were problems that the team found. NGOs might consider how conservation education at the primary and secondary level might lead to training for vocational and technical work in conservation.These activities seem more appropriate for CAG grants.

School buildings are a major problem. Many of them have been damaged or destroyed by repeated cyclones. Investment in expensive masonry construction is unnecessary and perhaps futile in such conditions. At Ambanytoaka near Betampona ,parents had donated local material to build a school and needed only about three hundred dollars in purchased materials to complete the project. Given the relatively low cost of construction using locally available materials, projects could easily provide purchased finishing material as a gesture of good will.

APPENDIX L

THE NATURE OF MADAGASCAR'S PROTECTED AREAS

THE NATURE OF PROTECTED AREAS IN MADAGASCAR

The models of extractive reserves and other concepts to "develop an income stream from the protected areas to local communities", as called for in the SAVEM project paper, does not conform to the scientific evidence on Madagascar's ecology. A extensive discussion of this issue is presented here because it contradicts the "SAVEM Project Philosophy" given in the project paper and current USAID thinking.

While five different categories of protected areas exist in the country (IUCN 1989), they share a common purpose in that they were created, with few exceptions, for the protection of specific species and biodiversity.

In other parts of the world National Parks have been created for much broader purposes such as aesthetic or preservation of geomorphological features (Abuzinada, Grainger and Child 1991), but here the biological considerations have been foremost, both in those areas originally set aside under the colonial administration and the few more recently created protected areas. In only one of the protected areas of Madagascar, the Isalo National Park, has biology been a secondary consideration. Isalo has been set aside for aesthetic and geomorphological reasons.

The biology of Madagascar differs significantly from other parts of the world in many ways that affect efforts to protect it. Some of these factors help conservation. As outlined in Leigh (1988) the evolution of Madagascar's fauna and flora was determined by the island's isolation and unusual size. A rich plant diversity and a high radiant evolution of small mammals make the preservation of biodiversity possible on relatively small areas. Few of Madagascar's animals require large ranges. While large integral tracts of land are always preferred from a biodiversity standpoint, the large tracts necessary to preserve large carnivores or other wide ranging animals may not be needed here.

Consistent with Leigh's conclusions, several very small reserves, Nosy Mangabe, Perinet, Beza Mahafaly and Betampona all appear to have stabilized, or as recent research has shown, improved biodiversity on relatively small areas. At Beza Mahafaly Richard (1991) has documented increases in the lemur *Propethicus verreuxi*. WWF technical staff have told us that the core areas of Mt d'Ambre and Andohahela appear stabilized and not visibly degrading.

The Case for the Preservationist Model

The preservationist model was practiced more or less successfully in Madagascar until 1972. At that time political problems and a following government policy that encouraged the expansion of agriculture lead to large scale encroachment into many of the protected areas.

In wetter areas such as Betompona, the forest seems to be recovering. At this site and at those in Antahala, Mananara, Antanabe, and the Maosola peninsula, the team did not find conversion of secondary vegetation of cleared forest to grasslands as was the case in the Mt d'Ambre sites. This is an indication of possible recovery. It would seem premature then, to degazetted these areas until the ecology of regeneration is understood. To do so would render irreversible forest loss, perhaps unnecessarily.

The SAVEM project paper calls into question the protectionist model. In the recent evaluation of WWF activities at Amber Mountain National Park and the Andohahela Reserve, USAID natural resources advisor, Andre DeGeorge criticized the preservationist policies that are being applied and called for a more liberal " conservationist " approach that would permit a rational and sustainable use of protected areas.

DeGeorge's comments are in line with the primary goals of the SAVEM project: to link conservation to development. One of the major premises of the project is that Integrated Conservation and Development Projects can go beyond simply having a "development component".

The recommendation in the project paper that protected areas be opened up for economic activities such as village level extraction of plants and animals seems ill-advised and contrary to the scientific literature concerning Madagascar's ecology.

An illustration of this is given in the recently completed inventory of flora (Schatz 1992) of the small (520 hectares) island of Nosy Mangabe in the Bay of Antongila. It provides insights and examples of the issues of developing criteria for ICDP's in the eastern rainforest. It also provides an example of an whole ecosystem preserved and stabilized by the protectionist model.

Since its establishment as a special reserve in 1972? the 520 hectare island has been a research site. The inventory of flora was conducted from 1988 to 1990 by the Missouri Botanical Garden, with contributions from researchers from Yale School of Forestry and Environmental Studies.

The inventory demonstrates that from its isolation and absolute protection it is probably the most intact parcel of low land rainforest formed on lateritic soils left in Madagascar, with a floral composition probably only somewhat different from the large Masoala peninsula forest, which has been selected as a priority site by the SAVEM project. Many of the observations in this taxonomic study relate directly to management for ICDP's in similar areas.

Schatz found the number of exotic on the island low. They are almost all associated with disturbance, only two introductions, *Clidemia hirta*, from the neotropics and *Aframomun angustifolium*, from Africa, invade the indigenous forest. Even minor disturbances, such as paths or small clearing result in a high level of introductions at the expense of indigenous flora. Even several cultivated plants that had escaped on the island such as *Lantana camara* and pineapple posed threats to the native vegetation according to Schatz (1992).

Schatz goes on to note that as many as 40 to 50 species, about 10 % of the flora have never been described. In the genus *Diospyros* as many as fifteen of the species observed are new to science. Phenological data is even thinner. About one third of the identified plants bear large fruit which may depend on lemurs for dispersal. Staggered reproduction cycles cloud any possible conclusions concerning regeneration at this point.

In spite of its rich diversity, the island was selectively logged at the beginning of the century, suggesting that perhaps some form of exploitation of this forest is possible. Never the less Schatz suggests elimination of exotic and implies that further restrictions on access might be useful in preserving the biodiversity.

If these observations hold true for the larger Masoala area and other parts of Madagascar's eastern rain forest, then preserving biodiversity will depend on continued application of the protectionist model.

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The assumption in the SAVEM project paper that their could be rapid forest inventories of all species does not seem valid, given the time and only partial results of attempting to inventory even this small protected area.

Additional evidence concerning the effects of disturbance on fauna are discussed by Nicoll (1988). In that papor the author found that foot paths at the Perinet reserve resulted in the ecological niche of several beautiful species of tenerecs being taken over by *Rattus*, the ever unwelcome common rat.

Available evidence, then suggests that the protectionist model is valid. Excluding most human activity from the protected areas has wide support among the foreign and local scientific community here. One member of the assessment team members did not agree with such strict, absolute protection.

Conservation - Development Linkages

The project documentation assumes that through sustainable management of natural resources, conservation will improve incomes and living standards in areas adjoining protected areas. While examples of a development component in various conservation project's exists, there are few, if any, models for sustained economic use of Madagascar's forests. As mentioned earlier the team does believe that community forestry is possible with adequate technical and marketing assistance.

For example, evaluations of the Beza Mahafaly project in south Western Madagascar (Wells, Bradon, Kand and Hannah 1991, F. Weber, 1990) found no link between the " development component" and conservation activities at that long running project. Weber, (1990) did find, however, that the local population is aware that the activities in the valley are part of the conservation effort. In this case local farmers willingly gave forested areas to the University of Madagascar and view these activities as compensation (Richard and Dewar, 1991).

Their has been some discussion among ANGAP staff of degazetting areas inside the protected reserves boundaries that are no longer forested. In some cases this might be appropriate, but there is no evidence that this would promote conservation or development. The team's forester felt strongly that stricter application of protected area regulations was needed, not a new relaxation. Most although not all, of the team agreed with him. In support of this position we observed that at Betampona the incursions from 1972 seem to be recovering with evidence of regeneration of the natural forest.

Biodiversity Issues Summary

If the SAVEM project is to halt or significantly slow down the loss of biodiversity in Madagascar, the special ecology of the island will have to be respected. Models of mixed use and economic development from East Africa and the Amazon Basin do not seem appropriate. Protection of core areas from human activity seems to be the only certain way to accomplish this. Experiments with different methods should take place outside of the protected zones.

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APPENDIX M

SUMMARY OF THE TEAM'S FINDINGS

A SUMMARY OF TEAM FINDINGS

Although there are few, models of conservation linked to development in Madagascar, the SAVEM project intends to test the hypothesis that local people will alter their behavior in favor of conservation if their economic well being becomes linked to protected areas.

The team wanted to distinguish the ICDP paradigm from other development efforts and assure that this concept did not become similar to the old integrated rural development approach of the late 1970s and early 1980s. Looking back at other development initiatives such as integrated rural development, appropriate technology, farming systems research, and so forth, there seems to be a tendency to over apply new ideas. Enthusiasm for the original concept effervesces into misapplication and eventually, disillusionment.

In visiting and analyzing current ICDP activity, the team found that an environmental truce has taken place at sites were reapplication of the protectionist model of conservation was matched with efforts to address basic needs of the surrounding populations. In many cases these activities were not directly linked to conservation and participation by the villagers was basically passive. Putting aside the obvious, all to easy criticism of these current projects, we found a number of positive factors that have helped us determine criteria for new funding.

The projects we visited were almost entirely run with Malagasy technical assistance. Long standing, local private voluntary organizations with their own resources have become involved in the integrated conservation and development concept. At some locations villagers appeared to understand clearly that the attempts to address their basic needs were related to the protected areas and its continued existence, although this was not always the case.

For the time being the increased presence of conservation personnel and the modicum of support for DEF field agents offered by the debt for nature program has increased the protection for the previously not-so-protected areas. This has been relatively easy since the communities in the surrounding areas are not dependent on the primary forest for their livelihood. The zones of secondary vegetation, ny ala simba, the broken forest as it is called in official Malagasy, appears to be more important for subsistence than products from the primary forest. The primary forest is seen more a reservoir of fertile land and more remotely as a water shed for irrigation by the local populations. The question remains as to how long this mild increase in presence will be able to withstand pressure for new land.

The less optimistic factors are large and daunting. The loss of revenue form cash crops, an alarming, debilitating health situation, exploitative collection and manipulated marketing of primary products, all add to the difficult conditions in the isolated, very isolated communities that surround the parks and reserves we visited. Opportunities for increased income generation are limited.

The suggestions in the project paper that protected areas be opened up for economic activities such as village level extraction of plants and animals seems ill-advised and contrary to the available scientific literature concerning Madagascar's ecology. As discussed in the body of the report, the literature overwhelmingly shows that even mild disturbance results in dramatic loss of biodiversity. The project paper suggestions are apparently based on experiences in other environments with greater resilience and already identified high value forest products such as rubber and nuts the Amazon.

The importance of disturbance for fauna has been documented by Nicoll (1988). In that paper the author found that even foot paths at the Perinet reserve resulted in the ecological niche of several beautiful species of tenerecs being taken over by *Rattus rattus*, the ever unwelcome common rat.

The one site at Ankany 'ny Nofy where a commercial operation extracting plants and animals from the forest was taking place did not operate at the village level, but instead provided jobs for a few well educated and trained malagasy.

Realistically, can a series of projects in these areas bring about economic development given the overall economic situation in Madagascar? Probably not. In the end we concluded that a "time based strategy" would be most appropriate for the SAVEM project. Frankly, this is a euphemism for delaying loss of biodiversity, waiting for better days; this we believe the SAVEM project can accomplish.

To achieve this strategy the team has come forward with a relatively simple series of guidelines and criteria. Unlike the old integrated rural development projects SAVEM activities should not attempt to make up for the lack of local infrastructure. Never the less to continue the truce, an effort to meet basic needs is necessary.

While some team members have found traditional leaders to be a source of obstruction to economic changes and to have participated in exploitative activities, SAVEM projects will have to deal with traditional leaders. At a minimum their approval of activities will probably have to be sought for project activity. Ideally they would be active participants in projects.

We discuss in detail in the body of the report the different types of groups that the project might work with, but would like to note that we found a number of ethnically based groups at several locations, which presents a certain danger. These groups although having practical functions might not be appropriate.

One of the more interesting findings was not just asking what people wanted but under what circumstances would they participate in projects. In most cases villagers wanted individual benefits and basic needs addressed. Although collective work is not excluded this emphasis seems logical.

To work in such an environment projects will have to have well trained, probably malagasy, social scientists to work at specific project sites. It is interesting to note that the Biosphere project, SAF/FJKM and the Antsiranana Diocesan Development Committee required a year of study before beginning activities. While this might seem too long by USAID standards the team believes that some combination of study and activities as outlined in the phase one grants will have to be undertaken.

Labor constraints are the most important factors limiting agricultural productivity at most of the sites that the team visited. Weed control on both irrigated and non irrigated land is the most labor intensive part of the agricultural cycle. Project activity will have to address this problem before the next factor, soil fertility, is addressed.

The continued attractiveness of *tavy* is its competitiveness in terms of labor.

Irrigated rice projects as an alternative to *tavy* are currently and will be, one of the most frequently requested forms of assistance. Few of the many past efforts of this type have achieved this goal. Returns from rice production do not seem high enough to cover the cost of maintenance, especially

in addition to direct damage will require extensive repairs every few years. All of the sites proposed in the SAVEM project would be subject to such damage.

The team agronomist has also noted that in areas with rainy seasons over six months, the only agronomic reason for flooding the fields is weed control. From a strictly agronomic point of view the crude form of flooding and in field storage of rain water serves to save labor, but does not dramatically increase yields in these wetter areas. There also seems to be a number of soil constraints. In many areas the soil lacks enough clay to make irrigation efficient.

In the light of this evidence the team considered proposing an outright ban on financing new water projects, but realized this would be politically and socially impossible. Irrigated rice is one of the few activities that would directly improve income. As a compromise we are recommending priority for construction of new water development projects be given to areas with rainy seasons shorter than six months. In wetter areas new construction should be avoided as much as possible and priority given to improving maintenance and yields of existing projects.

Cash crops have, in the past played an important role in providing stable agroforestry systems in areas near the protected areas we visited. Their role as a source of income has dramatically declined recently with low world market prices given as the explanation. We believe, however, that the exploitative collection system might be more of a factor in this situation, since producer prices are only fractions of the export price.

Moreover, official corruption, until recently unmentionable, has surely blocked development of coffee, cloves and pepper. Most observers attribute the end of the coffee support and stabilization program in 1990 to embezzlement of funds.

Currently there are few resources available to renew plantations of cash crops. We recommend that SAVEM projects provided support for cash crops where suitable. This would be a long term approach, given the lengthy productive life of coffee and clove trees. In the thirty year life span of a coffee tree surely some improvement in prices will take place. At some locations ICDP nurseries growing eucalyptus trees of marginal value could be used to renew cash crops instead.

Land tenure and access is a well documented problem observed in several locations. It is a major constraint in the Mt d'Ambre area and in the village of Ambanytoaka next to the Betampona Reserve. At both locations land ownership is clouded by either colonial or recent commercial activities. Priority should be given to resolving this issue in projects that will operate in these areas. In theory, legal remedies exist to these problems. We recommend that SAVEM explore methods of giving access to legal services and other forms of advocacy to secure land tenure. The current atmosphere of reform and the return of integrity to the court system might favor such actions. We understand that the KEAPEM project might address these issues.

The team would like to emphasize the importance of health issues in the ICDP concept. Often thought of as an ancillary activity, only weakly linked to either development or conservation, our observations and available literature indicate there could be little, if any, economic development in the peripheral zones if the current health situation continues.

In several instances the team physician found situations that would probably be considered emergencies in other countries. In the isolated Mananara district, malnutrition is so common that Kwashiorkor and marasma are widely observed in children. In the same area, epidemiology studies (IPM

1990) found that over forty six per cent of the children were infected with bilharzia. Malaria is pandemic in all of coastal Madagascar. In the Antsiranana area over forty per cent of morbidity is from malaria.

In 1990 a nearly catastrophic dysentery epidemic went through the Tamatave province. Villagers near the Betampona Reserve at Ambodranifia told us that only the availability of medicines from the SAF-FJKM sponsored village pharmacy prevented deaths from dysentery during a more recent epidemic.

The economic effects of this widespread morbidity are all too evident. In the joint survey that the team administered, health problems were frequently cited as a constraint to agricultural production. This worsens the already serious labor shortage. In a study of women's time utilization in a village near the Beza Mahafaly Special Reserve R. Maille (1991) found that being sick or caring for ill household members was the second most important use of time after meal preparation.

In some cases proximity to wildlife has been found to have a negative impact on human health. Fotenille et al. (1988) found that *Lepilemur edwardsi* and *Caracopis vasa* provided a reservoir of infection for mosquito transmission to humans of several types of fever producing viruses. The team was told informally that recent serological studies in southwestern Madagascar have raised the possibility of lemurs being a similar reservoir of malaria infection.

As serious as these problems are the team physician believes that even a modicum of intervention could dramatically improve the situation. Concentrating health activities in the area of potable water and treatment of malaria could address these problems at relatively low cost.

The large baseline health studies called for in the project design and our scope of work seem unnecessary, given the relatively simple program recommended.

In the project documentation, the term forestry is used very generally. It does not seem to distinguish between the small scale village forestry programs as found in development programs in the Sahel and the commercially oriented tropical forestry that will be necessary to sustainably develop the vast tracts of high value hardwoods that border several of the protected areas in Madagascar.

In areas near Mt d'Ambre, Ankarana and Masoala developing the forests outside of the protected areas to provide income for the local population seems possible. We are recommending that an effort be made to see if forestry can become the alternative to *tavy* in these areas. In the body of the document recommendations are made for a self-financing plan of this sort.

In contrast to small scale forestry activities that will probably be promoted in places were the border forests are already gone, these areas could provided communities with significant economic development. A model for this type of activity based on observations near Maroantsetra is given on page ___ of the foresters report. To accomplish this will require a high level of technical assistance and new marketing opportunities.

Currently an oligopoly of traders keeps prices received by small producers of virtually all primary products low, while at the same time ignoring or bypassing existing laws that might promote conservation. Somehow this impasse must be overcome and ways for a fair price to be received in an atmosphere of regulation. Any project activity that intends to develop forests for the benefit of the local population will have to find alternative marketing outlets.

We also doubt that local community organizations will be able to by pass these marketing constraints on their own, even with project advocacy. Under the framework of the KEAPEM project a timber marketing board may be established to address this issue, but this remains to be seen.

One of our major concerns is that few of the current or potential NGOs involved in ICDPs in Madagascar have experience in the management of tropical hardwood forests. Tropical Forestry Management requires specifically trained and experienced foresters with actual tropical forestry experience.

If this level of expertise is not found within the NGO framework, we recommend that the SAVEM project consider involvement with private sector timber interests. Although this will probably provoke a strong reaction in some conservation circles, companies such a Weyerhauser which have developed environmentally sensitive programs in Indonesia and the Philippines, might also be able to provide the institutional framework to by-pass the currently exploitative marketing of forest products.

Project size will probably be dictated by logistical considerations more than activity level. For example the logistical requirements in Masoala mean that the project will have to be large with some sort of central administration. In Betampona there could be a series of smaller projects run by different organizations. M. Albigniac has pointed out that there is no model for activity and a wide variety of approaches should be good. At the MAB project one organization is trying to do a number of things. We believe that spreading the tasks among organizations could be of most help.

We also believe that some new form of evaluation is necessary. The social and biological monitoring called for in the project document seems inappropriate, if not impossible in most circumstances.