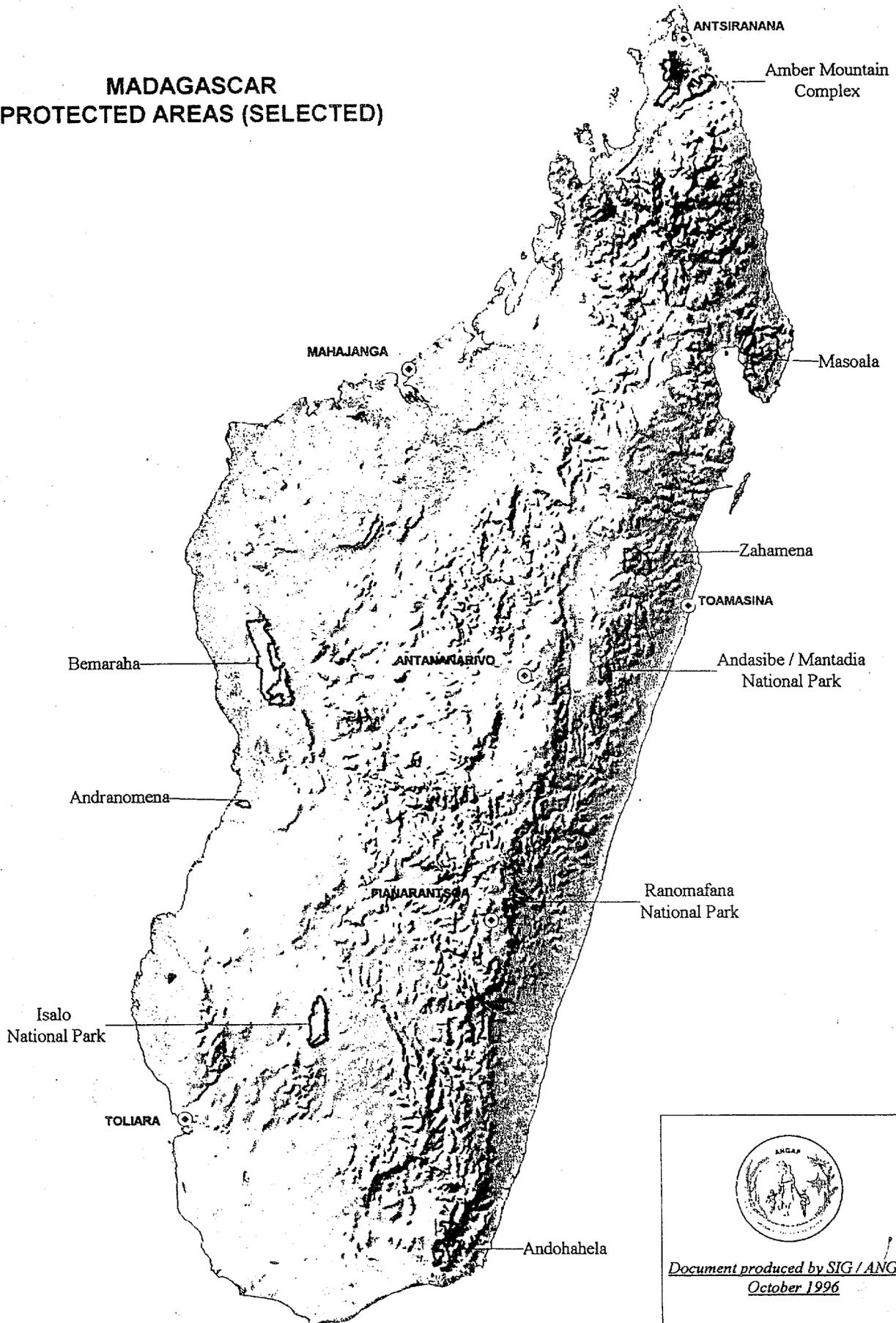


Richard Swanson

Hypothesis Testing: Do Targeted Activities Reduce Pressures on Parks/Reserves through Changed Human Behavior, Report for SAVEM Project, USAID/Madagascar (TR&D)

**MADAGASCAR
PROTECTED AREAS (SELECTED)**



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Hypothesis Testing: Do Targeted Development Activities Reduce Pressures on Parks/Reserves through Changed Human Behavior?

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Note:

The author has developed three documents to address lessons learned in Madagascar ICDP programs over the past five years (1991-1996). A first report (Swanson, 1996c), "*National Parks and Reserves, Madagascar's New Model for Biodiversity Conservation*" focuses on the conservation side of the ICDPs and on ANGAP's evolution as an institution and its future. The second report (Swanson 1996a), "*ICDP Protected Area Program Baseline Data (1994-1996)*" presents the existing state of socio-economic, ecological, and program baseline data for current and future monitoring needs of the protected area program in Madagascar. A third document (Swanson, 1996b), "*Hypothesis Testing: Do Targeted Activities Reduce Pressures on Parks/Reserves through Changed Human Behavior*" focuses on the development side of ICDPs and draws lessons on those which have proven most promising to date. This document represents the third of these three documents. The observations and remarks found in these documents are my own, and do not necessarily represent the points of view of ANGAP, TR&D, or USAID Madagascar.

Overview

One of the major donors to Madagascar's first environmental action program (1991-1996) has been USAID through its SAVEM project. The principal goal of the Sustainable Approaches to Viable Environmental Management (SAVEM) project was: "To establish sustainable human and natural ecosystems in areas of Madagascar where biodiversity is threatened."¹ Its purpose was "To identify and establish sustainable systems, including institutions, methods, and behavior for management of protected areas of Madagascar and their peripheral zones."

The SAVEM project had two basic strategies, or approaches. In order to 'establish sustainable institutions', support was given to "the National Association for the Management of Protected Areas (ANGAP), created to coordinate and manage protected areas and the peripheral zones"². The Tropical Research and Development, Inc.



(TR&D) was awarded the USAID SAVEM contract to provide the institutional support to ANGAP. The second strategy "will test the hypothesis that the local population 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 decision"³. To achieve this, SAVEM would "award up to six Protected Area

Development Grants (PADG) to local and international NGOs for more limited, locally initiated interventions in the peripheral zones adjacent to any of Madagascar's ...protected areas"(Ibid:2). The PACT/GMU was given the USAID SAVEM contract to manage the grants to the six ICDP's eventually awarded to 5 American based international NGOs (CARE, CI, WWF, VITA) and one American university (Stony Brook), with a seventh, Isalo, awarded directly to ANGAP in 1996. These ICDPs were intended to be 'coordinated and (eventually) managed' by ANGAP as it was recognized that "the ad hoc designation of various international NGOs to manage protected areas could not continue indefinitely", and "DEF proposed the creation of a flexible agency capable of coordinating NGOs, ensuring the integration of conservation and development, and eventually replacing foreign operators" (Ibid:2).

The ICDP (Integrated Conservation and Development Project) concept was taken as a primary methodological approach by the GOM and donors alike during the first phase of EP-1 (1991-1996) in Madagascar, to more effectively address environmental concerns. The basic philosophy upon which various USAID funded SAVEM ICDPs developed, reformulated as a hypothesis, suggests that "If economic development activities are linked to the conservation objectives of protected areas, then this will produce benefits which will attract and focus the productive forces of a local population into sustainable and environmentally sound activities." (Swanson, 1994:5). Stated another way, if the socio-economic development needs of the desperately poor and frequently isolated people living in the

¹ SAVEM Project Document Logframe, p. A2:2, 1990.

² SAVEM Project Document, 1991, pp. 1-2.

³ SAVEM Project Document, 1991, p. 2.

peripheral zones and regions surrounding protected areas are not addressed⁴, and resolved, then there is ultimately no hope for these protected areas. There are reasons (causes) why people exert the non-sustainable pressures they do upon biodiversity and the environment in general, whether in a protected area or outside of it. Unless these causes are successfully addressed, and removed or diverted, these pressures will continue. It would appear impossible for any organization, however well financed and manned, to be able to patrol and safeguard the perimeter and interior of these parks and reserves sufficiently well to protect them from determined individuals seeking a livelihood. As we shall see, the operational word is "linkage".

However, no matter how important addressing human and socio-economic, sometimes political, problems of non-sustainable human impact upon protected areas, it is yet also true that resources must be protected, laws must be obeyed and enforced. There will always be those who will, for personal

financial gain, try to circumvent what even a majority may desire (ie. protection). Many of the most destructive and outrageous attacks on park and reserve biodiversity come directly from well-off, well connected, individuals who should and do know better, but who nevertheless will exploit natural resources for personal gain - or who simply



don't care what anyone else thinks. It is not the peasant farmers around Masoala who are most responsible for the disappearance of ebony trees within the forest - they are but the pawn of others. It is not the poor farmer near Ranomafana who harvests fern pots or strangler figs who is most responsible for this pressure. The man and his family need money. Malagasy and expatriates alike are quite willing to purchase endangered or protected plant or animal biodiversity at road side stands and in the capital city of Tana itself. Therefore a strong organization, a protector, a guardian, a national parks service, is required as any reasonable first step towards slowing down, if not stopping completely, continuing pressures upon these resources. The organization must have people of integrity, with sufficient authority, of commitment, with a true love of the parks and reserves they are empowered to protect. ANGAP, as a non-government semi-private association, is developing into such an institution - with yet a long way to go.

Therefore a balance must be sought. It is neither "just more rural development is needed", nor is it "conservation agencies can do the entire job". On the one hand, a properly empowered organization must become the protector, with rights of enforcement, to manage, in a sustainable manner, the protected areas of Madagascar. Such management must include the understanding that

⁴ Pressures upon protected areas can come from wealthy interests far from protected areas, who provide economic incentives to economically disadvantaged peoples living near these areas to 'break the law' by plundering park and reserve biodiversity for their own gain.

this does not mean "not touching" anything within a protected area, keeping people away. People are not the problem. It is the selfish or unsustainable actions of a small group of people, with short term personal objectives, who are the problem. Five years ago, an organization did not exist in Madagascar willing and with the vision to fill the role of protector and steward. Today, this could be becoming a reality through ANGAP. On the other hand, one must address the socio-economic needs of a poor population, and the economic needs of a region and a country. Parks and reserves, when properly managed, can become the economic motors for the socio-economic development of peripheral zone populations and people of the entire country. But non-sustainable pressures and their causes must be aggressively addressed through targeted development assistance.

EP-1 experience with ICDPs has begun to provide lessons of the kind needed for more enlightened assistance of this kind. The USAID funded SAVEM project over the past five years has invested heavily in seeking to identify the kinds of development assistance which proves most effective for addressing environmental issues.

0.1 History of Hypothesis Testing in Madagascar SAVEM Project

Because of the vital importance of sustaining the biodiversity of Madagascar's remaining protected areas, and because of the promise which many believed the ICDP approach held for linking a country or region's long term economic health with its environmental health, it was critical that strategies be developed for monitoring the results of these ICDP efforts over time, permitting objective evaluation. The general goal was to identify what kind of development activities or approaches would, in fact, result in reducing human pressures upon given protected areas. It was understood that future program funding, such as anticipated through EP-2, would focus on proven activities or approaches. ICDP's are very expensive, so it was essential that lessons be learned that could be extended to the remaining protected areas and other regions not benefiting from such donor largess.

When a program wide M&E system began to be developed in November 1993 by the author, it became apparent that **not one** of the six SAVEM protected area projects (initiated in 1991) had laid out any strategic approach which would permit verification of the general SAVEM ICDP hypothesis (see above) being tested. In order to provide the tools that would permit the monitoring and ultimate evaluation of the program, based on program objectives, the M&E advisor was put into the position of creating a system which could help the program clarify its program objectives so as to ultimately meet the hypothesis testing orientation of the program. M&E was therefore developed within ANGAP and the ICDP program not only for regular monitoring purposes, but also as a vehicle to promote discipline in early, up-front, identification of anticipated short and long term results of activities pursued in both conservation and development activities, and in assuring clear hypothesis statements⁵ exist linking them - hypotheses which must be tested for impact on the conservation objective of reducing human pressures upon the protected areas.

Prior to 1994, there was little, if any, clear linkage between development activities and conservation activities of SAVEM ICDPs. Each project component was basically going its separate

⁵ By "hypothesis statements" we mean "if activity x is implemented, in this area, with this number of these people, we can expect a result y, which we believe will have an anticipated impact z on the reduction of human pressures upon the protected area".

way. This tendency was assisted by the fact that all Madagascar SAVEM ICDP projects had one NGO operator responsible for conservation activities (eg. WWF at Amber Mountain National Park) and another for development activities (eg. CARE). Though some programs had provided some spatial identification of human pressures within peripheral zones upon adjacent protected areas (eg. Andohahela), subsequent development activities did not appear to be related in any particular way to these areas of pressure. Projects used the "shotgun approach" to defining activities: try many small activities, widely dispersed, and hope to "hit" the target, or to have an impact. Projects also justified trying to respond to the "shopping-list of activity requests" identified by early application of participatory rural appraisal (PRA) findings. Projects felt they needed to become "recognized" by local people - many activities were therefore "door openers". There was little prioritization of either human pressures or activities, little focus of efforts, and even less consideration of the scale at which activities should be addressed in order to seriously have an impact on the pressures concerned. It became necessary for the author to assist in more clearly laying out these design steps and to create a M&E system which would also support the approach. 1994 annual reports of ANGAP coordinated ICDPs (including SAVEM) showed significant improvement in focus and attention to linkage.

In 1994 annual work plans, ICDPs were requested, by ANGAP, in the description of development activities to be undertaken, to write out clear *hypothesis statements* linking the development activity with the conservation objective. A great deal of effort was given to support this reassessment of program activities. ICDP projects responded well, and actually went far beyond what was requested or expected by designing hypothesis statements for ALL project activities - sometimes going to extremes. This was good to the extent that program personnel were obligated to think about why they were doing particular activities, and what they expected as outputs.⁶ Defining hypothesis statements for activities other than the development activities of the project turned out to have a down side, however. Criticism (the extremes, why need a hypothesis for everything, etc.) of this extra effort on the part of ICDPs led to a suggestion that maybe activity level hypothesis statements were perhaps



“not as important” as the “strategic hypothesis” of each ICDP supporting “their own special approaches”. However, if programs indeed had such a strategic hypothesis, they would still need to demonstrate at an activity level, where real households and real people are

⁶ This also helped to define, for annual work plan activity reporting, the outputs to be monitored by the project itself.

concerned, that impact (behavioral change) was occurring. Some 1995 annual work plans subsequently changed some of the focus of these hypothesis statements, generalizing them.

Hypothesis testing discussed in this document concern hypothesis statements at the activity level. Results at this level will inform us on the appropriateness of the particular approaches, or lack of approaches, used by individual ICDPs.

0.2 Description of M&E System in Place for Hypothesis Testing

The M&E system put into place for the ANGAP protected area program was built upon four monitoring "pillars", described in more detail elsewhere (Swanson, 1994:23; Swanson 1995:5). Information to be gathered for this monitoring was organized by ICDP personnel into standard formats. One of the monitoring "pillars" concerned "activity impact on human behavior and hypothesis testing analysis".⁷ The monitoring system laid out a methodology whereby each ICDP would identify the principal pressures upon the biodiversity of the concerned protected area, and prioritize them using a matrix worksheet. The causes of these pressures would subsequently be analyzed and also prioritized. The population groups (stakeholders) most intimately identified with these pressures/causes were also identified. Development activities then proposed by the program, in the annual work plan, would show expected linkages between conservation and development, and the anticipated outcome of these activities. Given adequate time, one would hope to expect a reduction upon the targeted group of pressures or their causes.⁸ Table 1 below provides an illustration, from the Ranomafana 1994 Annual Work Plan (pp. 20,37) of several activities laid out in this way. ANGAP was able to encourage all ICDP's, not just SAVEM ones, to follow this approach.

Table 1: Activity	Location: Keyed Villages	Pressure	Causes of Pressures	Hypothesis	Key Groups	Scale	Calendar
Beekeeping	112, 322, 432	Exploitation of forest natural resources	Tradition; lack of alternatives for earning money, and obtaining food; productive resource base disappearing	If farmers are able to build better hives, with better management, one should expect increased productivity with beekeeping, and a decrease in foraging in the park - leading to a decrease in illicit exploitation of forest natural resources.	Peripheral Zone Villagers	200 Hives built; 2 micro-projects; 50 households	August - December
Park Delimitation	New or revised boundaries to park	All 11 identified pressures on park	Lack of knowledge of existing laws; lack of adequate surveillance; Land tenure traditions	If the limits of the park are legally defined and physically marked, regulations will be more easily applied and respected, leading to better protection of the biodiversity. If cartographic information on park boundaries, village locations, etc. are available, activity prioritization will be facilitated.	Conservation agents; project personnel; park guides, peripheral zone farmers	Document given to DEF; Cartographic data completed; 10% of border digitized with GPS; Base line data on illegal park entries established	July August August September - December

⁷ Impact indicators here were specifically focused on measuring changed behavior among a sample of recipient households of the most important activity (in judgment of ICDP personnel) developed for each of the top three prioritized pressures upon the protected area of each ICDP (focus on activity). Twenty households were suggested as the preferred sample size for each of these, to be dispersed among the top four prioritized sub-zones of the peripheral zone. A control sample of 20 households in an area with little or no project activity (within peripheral zone) was included by many operators. A total of about 100 households will be monitored in each ICDPs with the financial resources to do so.

⁸ How much time? Changing behavior can take a generation. First results may show up in a significant way after five or ten years. Indication of changes among some people could happen earlier.

Following prioritization of development activities upon the basis of the degree of their "linkage" to conservation objectives, each ICDP's identified a number of key activities among the highest ranked activities for which a sample of households would be monitored. Special household level questionnaires were developed, a sample selected, with each SAVEM ICDP⁹. Data began to be obtained for these households in 1996 and ICDP monitoring units have used some of these as data for reporting progress of these activities. These activities and some of these households have formed the basis for the case studies of this document.

In the sections to follow, each of the six USAID funded SAVEM ICDP's programs (Ranomafana, Amber Mountain, Andasibe, Andohahela, Zahamena, and Masoala), the Bemaraha *Tsingi* ICDP, and Andranomena will be described in terms of what actually was carried out in terms of the hypothesis testing described above.¹⁰ A description of the development activities of each will be given, with a brief summary of conclusions to date. Finally, case studies of several promising activities are summarized. The protected area program, and the SAVEM ICDP's, have been making a very significant impact on the lives of many thousands of people in many parts of Madagascar - as these few case studies will clearly show. The reader must remember that these case studies, and the many people one meets through them, are but the very tip of the pyramid of impact - which will continue to swell and grow with the coming years.



⁹ ANGAP consultant Henri Abel RATOVO assisted in this process in 5 of 6 SAVEM ICDP's.

¹⁰ Time precluded the author developing case studies with field program personnel from four other non-SAVEM ICDP's (Andringitra, Marojejy, Mananara -nord, and Ankarifansika).

1.0 Ranomafana National Park

Declared a national park in 1989, the Ranomafana National Park initially received USAID funding beginning in August 14, 1990, for studies to define program priorities for an integrated conservation and development program (ICDP) of five years. USAID funding was awarded to Duke University, as principal operator, to lead this program, with the University of South Carolina serving as the development operator under sub-contract. A first phase of two years concentrated on program planning and conceptualization for the future, and considerable basic research and some socio-economic research was undertaken within the park and surrounding peripheral zone. Following this first phase, Stony Brook University replaced Duke, and Cornell replaced USC.

The park is enclosed by a peripheral zone, defined as all areas within 5 kilometers of the park boundary, and includes about 100 villages with some 25,000 inhabitants. Most of the peripheral zone populations are subsistence farmers, practicing slash and burn tavy agriculture on mountain hillsides. These people are highly dependent of forest by-products for their way of life.

1.1 Pressures

Park personnel, with the assistance of the rural development team, and ANGAP.M&E support staff, defined over a period of time between November 1993 and early 1994 the most important categories of pressures or threats to the biodiversity of the Ranomafana National Park (cf. Map #1). Results, ranked in order of their importance, were:

- (1) Tavy slash and burn farming on slopes
- (2) Exploitation of forest natural resources (minerals)
- (3) Exploitation of bamboo
- (4) Trapping and hunting of wildlife (birds, lemurs)
- (5) Exploitation of building materials for homes (roofing, timber)
- (6) Exploitation of precious hardwoods from the park
- (7) Collection and exploitation of aquatic resources
- (8) Collection and exploitation of other plants (basket weaving, strangler figs, etc.)
- (9) Fire
- (10) Exploitation of Nonoka
- (11) Exploitation of fern tree root systems for the fern pot trade
(Ranomafana AWP 1994:18)

1.2 Causes

Why do peripheral zone people around the Ranomafana National Park illegally exploit the natural resources of the park as they do? What are the causes behind their actions?

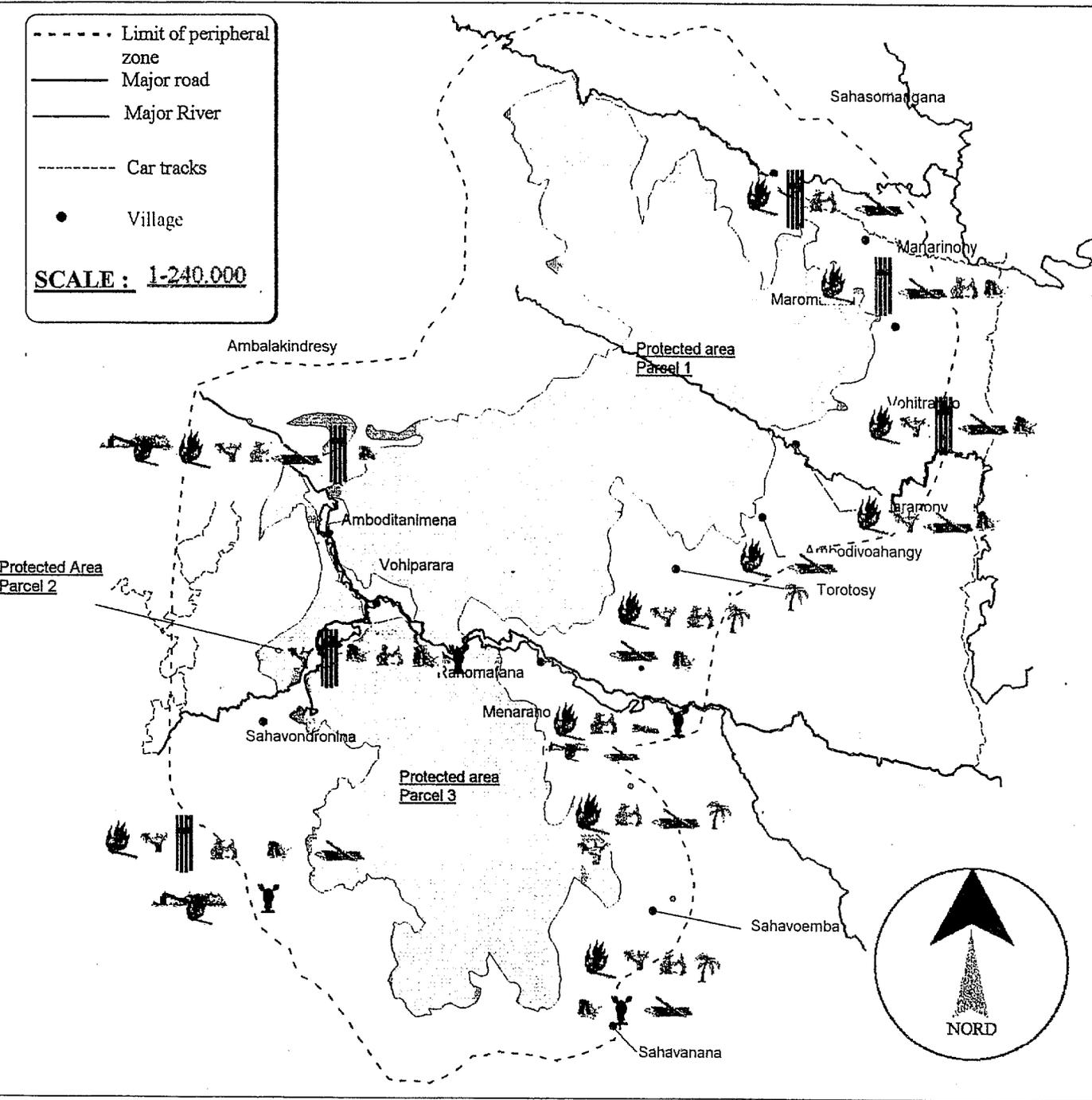
Continued study of this situation led to the following reasons, given in order of importance.

1. Growth of the peripheral zone population through reproduction, better health/hygiene, etc.
2. Growth of the peripheral zone population through in-migration.
3. Lack of diversification/alternatives to meet household financial and food needs
4. Lack of information/appreciation or understanding by PZ residents on value of PA Resources
5. Lack of enough crop land or pastures within the PZ for PZ resident needs, and what have is deteriorating.
6. Forest resources rapidly disappearing within the PZ - increasing pressure on the PA.
7. Poor management of cutting permits (particularly location given for cutting by DEF).
8. Lack of understanding or knowledge of laws in existence.
9. Non existence of regulations on use of certain natural resources.
10. Lack of sufficient direct surveillance within the PA by forestry agents.
11. Discontent by PZ residents concerning (existence) of the PA.
12. Tradition, long standing ancestral cultural practices.
13. Problems with regard to land tenure. (Ranomafana AWP 1994:18)

RANOMAFANA NATIONAL PARK

PRESSURES AROUND THE PARK

- - - - - Limit of peripheral zone
 ——— Major road
 ——— Major River
 - - - - - Car tracks
 • Village
SCALE : 1-240.000



key :

	BAMBOO		HARD WOOD		CRAYFISH
	TAVY		AQUATIC PLANTS		PLANTS
	HONEY		BUSH FIRE		FICUS
	TRAPPING		WOOD FOR CONSTRUCTION		

1.3 Development Activities Proposed as Alternatives

Two principal objectives were set for all activities at Ranomafana:

- (1) Put into place a rational management system to manage the park to assure the sustainability of its biodiversity, and
- (2) diminish human pressures through a program of socio-economic development.

Slash and burn *tavy* farming, combined with illegal use of forest timber resources and other selected forest products had been identified as the most serious pressures upon the park for which development activities would need to seek potential solutions. The strategies laid out for these development activities, having considered the principal pressures/threats and their causes, include:

- (1) "to increase the area of land under cultivation (eg. putting unused lowlands into rice production from improved irrigation systems)
- (2) Intensify agricultural production
- (3) Diversify into new crops (eg. vegetable production) and alternative activities
- (4) Reinforce the ability of local schools to teach environmental messages
- (5) To develop a capacity to communicate better to local populations
- (6) Create new opportunities for local communities to have access to credit/capital
- (7) Stabilize the rapid growth of the population (family planning)
- (8) Lower the need for medications (better health) and money (cash for medicine)
- (9) Demonstrate to local communities the link between their economic development and conservation through the application of tourist generated funds for micro-projects"

(Ranomafana 1995 annual report, pp. 2-3).

A very ambitious program, with a great many activities, has been underway in Ranomafana for many years - some dating back more than 5 years. The 1995 program field costs (expatriate salaries and benefits, and overhead excluded) about \$220,461, of which about 27% (\$60,000) went for specific rural development activities in the peripheral zone.¹ 100% of funding came from USAID with no support from the government of Madagascar. Map # 2 below, created by the Ranomafana GIS unit, shows the boundaries of the national park, the adjacent peripheral zone, and the principal development activities being undertaken by program staff.

¹ Information drawn from M&E financial monitored data, Ranomafana 1995 annual report, annex I.3,4).

1.4 Ranomafana Case Studies

1.4.1 The Toapina Community Rice Granary: A Park Entrance Fee (DEAP) Funded Micro Project

The Hypothesis: *Those benefiting from this activity would realize improvement in their conditions of life through food security, realizing increased financial resources, and resulting in reduced pressure upon the Park. Pressure upon the first eight pressures could be directly effected. (Ranomafana AWP 1994:51.)*

The Issue:

Rice is the staple food of every Malagasy. Every year, local farmers near the Ranomafana National Park go through a period when the last season's rice stocks are running out. They are forced to go to the open market, usually in a village far from home, often a day's walk each way by foot, to look for rice. Rice at harvest costs less than half the cost it does during such periods. To purchase such rice, they must go into debt, taking out high cost loans, or sell some asset or forest product, such as a fowl or wood. Some of the products sold at this times are taken from the adjacent National Park, since they are "free" to gather - though illegal. Such products include fresh water shrimp, trapped birds and lemurs, hardwoods, bamboo, etc. (cf. pressures list). During times of rice harvest, farmers frequently are forced to sell significant amounts of their rice to obtain cash to pay off debts, purchase needed household items, pay for children's school materials, etc. etc. And so the cycle continues from year to year with farmers never able to get ahead. With the exception of natural disaster periods, this is an area in which farmers should be self-sufficient for rice. While they generally produce what they do need to consume, they can't keep it and so sell when prices are low, buy when prices are high.

A Potential Solution:

Of the park entrance fees collected from visiting tourists to the Ranomafana National Park, 50% are returned to communities to fund development activities in a defined peripheral zone around this park. Last year this "50%" amounted to \$9,336 from some 6,245 park visitors. Among the micro-projects financed by such funds were community granaries, of which there are currently 16. Map # 3 shows the location, within the peripheral zone of Ranomafana, of all the different kinds of micro-projects financed by DEAP funds.

On Thursday, July, 17, 1996 we had a discussion with M. Paul Ravelo (President of the local DEAP² management committee) concerning the community rice granary of the Toapinga *fokontany*. M. Ravelo explained that this activity was chosen in order to assure a rice supply during the shortage period which lasts each year for about (September to December) and also to allow local people to pursue other productive activities, instead of wasting time walking long distances to distant markets of other villages to buy rice.

In early February 1996, with Park personnel assistance, 105 households in 5 villages of the Toapinga *fokontany* decided to create this granary (cf. Map # 3 for location). The Park first gave 840 kg of husked rice costing \$404 or 1,617,000 fmg (1925 Fmg/kg) from the entrance fee DEAP fund. About fifteen days later, this rice was distributed to the 105 member households, who were required (based on common agreement) to pay 2100 fmg/kg. (at a time when rice in the market would have cost them 2625 Fmg/kg). Most households received about 8 kgs of rice each. Because some households of the association could not afford to pay the price, they gave their "right of purchase" to other households. Thus, already, most household had benefited by an average 525 fmg/kg representing a "savings" of about 4200 Fmg per household. The benefits were: needy households did not have to purchase rice at the higher rate from markets - thus saving money, and they did not have to go to markets looking for rice to purchase - saving time for other activities.

During the harvest period this year (May 1996), the community granary members agreed that each family would be required to give back to the group 30 kg of paddy (equivalent to about 20 kg of husked rice per member) at the harvest low price of 1250 Fmk/kg. as a compensation for the 8 kg received earlier (30 kg of paddy costs about 25000 Fmg). This situation shows the motivation of the members to increase stocks.

Decisions on quotas of rice to be collected and sold, prices and dates of sale and purchase are always made in consensus. To be members, villagers have to take part in the building of the community granary and contribute rice each year. When sold, each member has the right to withdraw "their 30 kgs" - though they can give these rights to another member if they don't need it. But members can not purchase rice from the community granary for commercial reasons. That is, a member can not put in 30 kgs of paddy in May and take out 30 kgs of paddy in November to sell when prices are high for profit motives. The intention of this

² DEAP = Fees collected for entrance into protected areas.

community effort, at this time, is to make sure rice stocks are available within their area during periods of scarcity so that members can repurchase at reasonable rates (though higher than harvest prices). For example, the 30 kgs worth about 25,000 Fmg at harvest could in principal be sold for about 50,000 Fmg or more when prices are high. But the group would actually sell for around 40,000 Fmg. Last year the member village of Amboasany had very poor harvests and people were forced to purchase 30 kgs of paddy for about 60,000 Fmg. The community granary will help protect these farmers from such prices in the future. This is therefore not a cereal bank, where the motivation is to speculate as a group on rising prices. Once food security for the group can be assured, it may be foreseen that part of these stocks could be used as cereal bank for the further economic enhancement of the community members.

After a general assembly of the members, it was decided that the stock would be sold in October 1996 (during the shortage period) at a lower price than the market price (minimum of 40000 Fmg for 30 kg of paddy instead of up to 60000 Fmg) but higher than the harvest purchase price - thus raising the group's capital. To allow the project to function properly, members would have to restore to the community granary quantities of rice corresponding to 40,000 Fmg (about 48 kg of paddy) during the next harvesting season (around May 1997) in order to increase the stock.

Paul Ravelo believes that no other activity would be more important than the community rice granary for his *fokontany*. Villagers are very much motivated for this kind of activity as it can spare them the trouble of borrowing during the shortage period and in case of unexpected events (natural cataclysm, economic problem, ...) The granary is a community good, he said "because solidarity brings strength". This is why they built the loft in one village so as to ensure its sound management.³ Because the granary building was not yet completed, the rice stocks have been stored by the leading community member from each of the 5 villages. We were able to visit the rice storeroom of Mr. Ravelo where at one end of a cleanly swept, dry room were stacks of 30 kg and 60 kg bags of rice with people's names on them - including Mr. Ravelo's own bag. At the other end of the room was Mr. Ravelo's own rice, in bags and in open piles. Asked why people's names were on each bag, the response was that members wanting to buy back rice had to buy their own - thus controlling for the quality of rice given. If someone gave poor rice, he would get his poor rice back! M. Ravelo cannot see a better way of managing products than working in a group.

Conclusions:

It is interesting to notice that Paul Ravelo, and those with whom we spoke this day, understood the link between development and conservation (via ecotourism development) and explained that this activity had been funded through the entry fees to the park.

Tourist visits in Ranomafana National Park contribute to the development of peripheral zone communities by offering an alternative to reduce destructive use of natural resources in the protected area. The \$404 of tourism generated funding which made this important activity possible for all these people only represented 4% of the funds available from 1995 tourism income to be distributed to park peripheral zone communities. A little can go a long way!

If the Toapinga community granary keeps functioning through this first phase, it will certainly achieve financial sustainability in the second phase of the project (October '96) and food self-sufficiency for the community in the third phase of the project (May '97). Later, perhaps, this will lead to greater economic security as well.

Rakotoarisoa Baolalao, Socio-Economic Monitoring
Rakotonirina Josiane, Micro-Projects Officer
Dr. Richard Swanson, TR&D Monitoring Advisor

³ We were shown the granary under construction near the homestead of Mr. Ravelo. The walls of the one room building were very thick (about 60 cm.), and over head high. The walls had been completed by three different work groups. Remaining is the roof, whose materials and ceramic tile were already available at site. Labor and materials were contributed by the group members. Termination of the building is expected before end of July.

1.4.2 Federation of Crafts Men and Women of Ambatolahy

The Hypothesis: *Success in selling higher quality crafts to tourists visiting the Park will result in increased household incomes and alternative means of livelihood for Ambatolahy families. This in turn will help in reducing dependency on the sale of various Park forest products currently collected (fern pots, strangler figs, birds, etc.), resulting in diminished pressures upon the park. (Ranomafana AWP 1995)*

Map #4 shows the location of the three principal types of sub-groups involved in the village crafts program for sales to tourists (embroidery, basket making, wood sculptures).

The Issue:

Farmers in the village of Ambatolahy and other communities in the peripheral zone around the Ranomafana National Park exploit the natural resources they can find and collect to meet their financial and food needs. This is particularly true during the "hunger months" between September and December each year - when the last season's rice is running out, but before the new year's harvest is in. Products collected by these farmers include fern pots, strangler figs, crayfish, wild honey, precious wood (cf. list of pressures above, and Map # 2).

A Potential Solution:

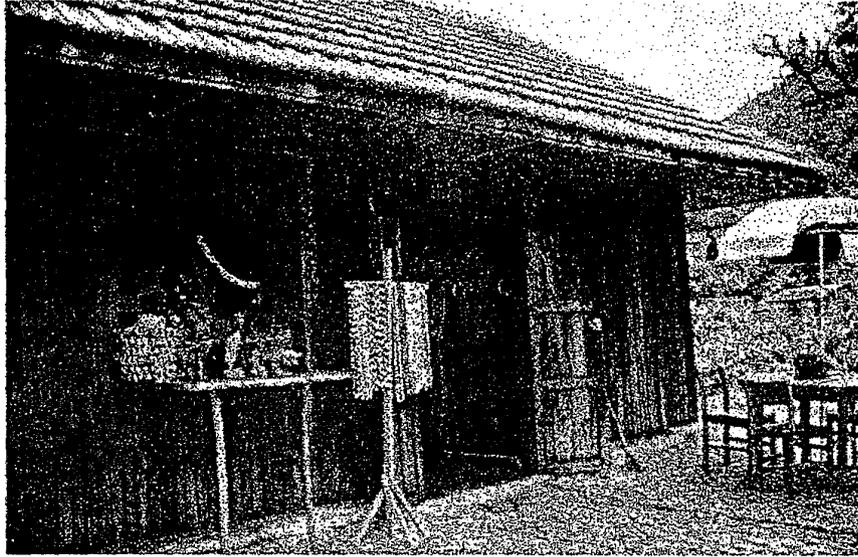
One of the strategies of the Ranomafana team for the socio-economic development of communities around the Park was to seek means of diversifying income and food production activities. To this end, building upon already existing local crafts through better organization of commercialization, improvement in the quality of items to be sold to tourists, was seen as one means of achieving this objective. In 1994, the project team identified six peripheral zone villages with both men and women interested in forming a federation which would market their products through a common outlet near the entrance to the park.

By 1995, there were 104 members who were split into 15 groups, depending on the activity being pursued or the location of the communities where they lived (cf. Map: Federation of Artists). Of these 15 groups, 10 were women groups working on basketry or embroidery, 5 with men creating wood carvings (birds, chameleons, insects, etc.). Outside expertise has been brought in on a number of occasions to provide new ideas and designs for representatives of all these groups, and providing advice on how quality might be improved.

Villages	# of Men Involved	# of Women Involved	Activities
1. Ambodiaviary		7	Embroidery, T- shirts
2. Tsararano		12	Embroidery
3. Vohiparara		7	Embroidery
4. Ranomafana		7	Embroidery
5. Ambatolahy		6	Embroidery
6. Ambatovory		6	Embroidery
7. Sahavondonina		10	Embroidery
8. Tsantsahamiezaka		11	Embroidery
9. Sahavondonina	7		Wood Carving
10. Vohiparara	7		Wood Carving
11. Ambatolahy	5		Wood Carving
12. Ambodiaviary	5		Wood Carving
13. Ambatovory	5		Wood Carving
14. Sahavondonina		4	Basketry
15. Vohiparara		5	Basketry/weaving

Activity Review and History:

A small shop was built and officially opened November 25, 1994 by the Park at Ambatolahy, about one mile downhill from the entrance to the Park, and made available to the Crafts Federation. During the first year and a half, the project supported these groups at a technical, raw material and financial level. Initially the salary of the local Crafts Shop saleswomen was also covered by the project. This young woman, Mrs. Razafinirina Bao Angele, was given training in managing and accounting for funds, and in display of wares. Our team visited with Angele for part of one morning in July 18, 1996, and reviewed her



books and spoke to her about her experience with tourist clients. Her record keeping was well done and easy to follow; income was well recorded and divided out between recipient groups. Every item which is brought into the shop is marked down in a special book, showing the group concerned, and the specific woman producer. When an item is sold, she marks down the sale date and price received. The amount is divided up into the portions to be given to the federation (15%), and the portion given to the group (15%), with the balance to the individual crafts person. The funds are regularly transferred to the groups.

Since July 1995, group members have been able to buy for themselves their own raw materials out of the profits from their sales. Between July and the end of October 1995, the Federation and the Park evenly shared the cost of the saleswoman. Since November 1995, the Federation has been paying the saleswoman's monthly salary of 100,000 Fmg. (\$25) a month. Therefore, the salary of this woman has consumed almost 98% of the financial gain of the Federation. The small balance was used for the cost of some furniture and supplies for the Shop.

In order to better describe the internal functioning of this federation, the management of the federation is first reviewed with one of its leaders, followed by examples drawn from each of the three main activity groups currently functioning: basketry, embroidery, and wood carving.

The Federation:

To become acquainted with the functioning and organization of this Federation, we conversed with the vice-chairman of this federation, Mr. RAZAFINANDRIANA Clet on Friday, August 2, 1996. He explained to us that the crafts shop had been installed at Ambatolahy because this village is located halfway between



Ambodiamontana where the park entrance is and the town of Ranomafana, and that the corner setting, beside the bridge and "Tomaro" river, is so pleasant and picturesque.

Mr. Razafinandriana explained that the Federation had signed a ten-year renewable contract with the landowner, in June 1995, for the shop building so as to render this activity sustainable. He also talked about the constraints they met in the management and organization of this shop. One problem has been that sales of

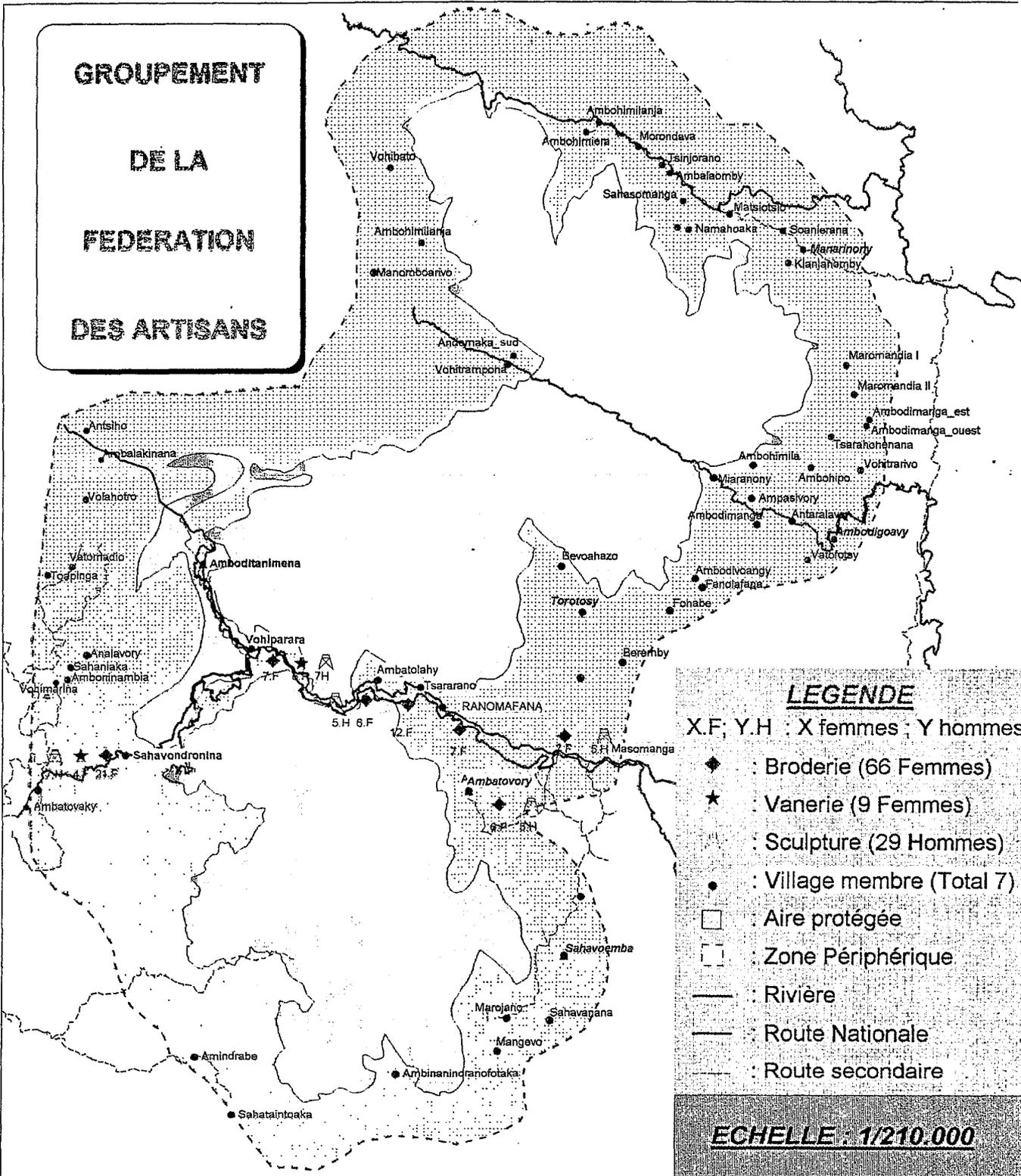
PARC NATIONAL DE RANOMAFANA

GROUPEMENT

DE LA

FEDERATION

DES ARTISANS



products vary according to high and low periods of tourism, which means that while sales may be good during the high months (July - September), they can be low or non-existent during the low season. Another problem experienced is that tourists coming by road from Fianarantsoa or Antananarivo go no further than the park entrance at Ambodiamontana, and then make a U-turn and return to Fianar for the night. They do not go down, past the craft shop and on to Ranomafana - principally because, until very recently, no decent lodging could be found in that town. Or, worse, tourist vehicles will pass by the Ambatolahy crafts shop without stopping because sometimes drivers or guides of these vehicles want to get tips from the saleswoman at Ambatolahy but the latter can neither afford nor has the right to do this.

Mr. Razafinandriana also spoke about the present low volume of sales - though these might rise now as the major tourist season begins to pick up. Men's groups have been less dynamic than women's, mainly because they are not spending the time needed in perfecting their craftsmanship, or in profiting by low periods of activity to build up an inventory which they can sell when tourism picks up. They want to create their pieces and get paid for them right away. Their low periods of activity do not correspond to high periods of tourist visits (and sales).

The Federation does not pay a rent for the land or for the building. Part of the original agreement with the land owner was that this owner could maintain a snack bar beside the Shop where soft drinks and snacks can be purchased. Should at some future date the kiosk activity should cease, the land owner would gain possession of the building. The Park also agreed to provide the tables and chairs for visitors to sit down at.

From their beginning in December 1994 through to the end of July 1996, the period of our visit, the gross shop sales were 7,500,400 Fmg. (\$1,875). The Federation takes the first cut of 15% from all sales, which amounts to 1,125,210 Fmg. (\$281), which covers the saleswoman's salary and the purchase of some supplies for the Crafts Shop (chair, table, displays). The Federation barely is able to meet their costs since almost 98% of their income goes to this salary. Should these figures not improve, the vice-chairman of the Federation is doubtful that the shop can continue to be sustainable. However, despite these problems, he intends to carry on looking for possible solutions. These include support to group members to increase their awareness of the market needs and in quality improvement. The members of the federation may increase their share of income from gross sales from 15% to 20%, while reducing that received by individual groups from 15% to 10%. This will not touch the profit realized by individual groups, while at the same time addressing the problem of not having enough funds to purchase basic and raw materials for producing products for sale. This is particularly true for women's groups in the purchase of cloth, colored thread, needles, etc. There is also the possibility the federation will approach LOVA, a USAID/PACT support program for local NGOs, for some funding.

In order to understand better the activities taking place within each of the principal activity groups. Interviews were held with key members.

Embroidery:

For the group making embroidery from the village of Ambatolahy, we conversed with Mrs LAHADY Françoise, a member of the group, on Tuesday, July 30, 1996. Mrs. Lahady is married and has four children and is also active in farming. She told us that she joined this group in order to extend her knowledge in the craft field, as well as to increase her income. She already has skills in weaving. She had originally intended to pursue this activity on her own, but because of lack of funds in order to obtain the necessary materials for embroidery, she decided to be part of the group, this way being able to help each other get started.

Françoise believes her group's experience between 1994 and 1995 has shown how sales are really slow when tourists to the Ranomafana National Park are few (from January to June), but that they do better when tourism picks up (July to December). This reality has had an influence on how the group has organized its internal organization. During the low period, after deduction of the 15% going to the running of the federation, the remaining 85% of their revenue is split into two equal portions: one half is divided among the women, the other half is used to reinvest in the purchase of basic materials (T-shirts, pieces of cloth, various colored threads for embroidery....). During the high period, because they have no capital of their own, all 85% of the receipts they receive are reinvested into purchase of the raw materials needed to produce new items for sale. This is to permit them to make the most of the demands of tourists during this time (T-shirts, table mats, etc.).

As for the actual work that Françoise puts into this activity, she devotes between 7-8 hours to embroider one tee-shirt, for example. Raw material costs she has recently used include:

A non-decorated new t-shirt costs:	12,000 Fmg.	(\$3.00)
Two pieces of thread for embroidery:	100 Fmg.	(\$0.03)
Sells tee-shirt for:	30,000 Fmg.	(\$7.50)
Profit (including cost of labor): ⁴	17,880 Fmg.	(\$4.47)
One piece of cloth (eg. for table mat):	3,000 Fmg.	(\$0.75)
One thread for embroidery of table mat:	500 Fmg.	(\$0.13)

⁴ Labor is included as a "profit" because these women are very happy to find any kind of activity which will remunerate them for their time. Cost of labor for a man's hard labor to prepare an irrigated rice field is about 1,643 Fmg/day, less for a days preparing land for *tavy* (1167 Fmg/day) (Source: General Ranomafana socio-economic data indicators).

Sells table mat for:	15,000 Fmg.	(\$3.75)
Profit (including cost of labor):	11,480 Fmg.	(\$2.87)

Compared to the local cost of labor, this is a decent return on expenses and the time spent by these women in this activity. Financial gains to Mrs. Lahady through her embroidery work, between December 1994 and December 1995, amounted to 309,967 Fmg. (\$77). And this year, her personal gain, through September, has been 158,950 (\$40).

For the period between January to July 1996, Françoise's group created 9 table mats, 3 of which were sold for a total of 45 000 fmg, and 13 t-shirts, 8 of which were sold for a total of 240 000 fmg. During this same period, after the sales of 8 t-shirts, the group reinvested 60,000 Fmg for the purchase of 5 meters of cloth. The balance of revenue, 225,000 Fmg. (\$56.25) was evenly shared with the three women who created these products. Since they began working together in December, 1994 through until September 1996, this group of women have earned 607,950 Fmg. (\$152).

Mrs Lahady delivered 2 t-shirts and 3 table mats at the end of July to the Crafts Shop, and the very next day one of these was sold. After deduction of the 15% for the functioning of the federation, her profits from personal and group activities were used to purchase raw materials for herself and cover 25% of her daily needs (foods...). Mrs. Lahady very much likes this activity with the federation, and made it clear that she would keep on doing it this to diversify her sources of income. Her own strategy during the tourist low periods is to stop production of sale items until what she has already produced, and which is already in the shop, has sold. This also gives her time to work on agricultural activities.

Examination of the books kept by the women show that this group has already shared out its profit to members four times since they began to work together - once already this year. Profits made are used in joint consultation between Françoise and her husband.

Before leaving, Françoise expressed to us that the existence of the Ranomafana National Park had done her much good because she said: "without the park, no tourists, and without tourists, no clients to buy my articles".

Woodcarving:

That same day (July 30, 1996), we met with Mr André Armand, a member of Ambatolahy men's group of woodcarvers. André began this wood carving career for the first time in September 1994, after the Park's Crafts Shop program had started up. He also wanted to diversify his sources of income, and chose to take advantage of the ICDP's training in crafts. He decided to join with a number of men in wood carving, becoming in a short time a very skillful carver. During the time of our interview, Andre was the only person actually still active in his group - the other men were devoting their time to other jobs.

When he began carving, Andre made only 2 items (small carved wooden insects, bats, chameleon, birds, etc.) per month. Now he can make as many as 3 per week. When asked why this is so, he replied that he is really motivated to produce more, because given the evolution of his turnover in 1995 during the peak tourist season, his income increased significantly. The raw materials he uses are collected as deadwood from fields in the area, and therefore cost him nothing. He devotes about 5 hours to make one item. The sale price for one item is 30 000 fmg. Again, given the cost of hired manual labor, if work can even be found, his returns from this activity are very good.



Constraints Andre has come across with this activity are principally associated with the up and down nature of the business - when there are tourists to the Ranomafana National Park, he has sales, when there are none, there are no sales. He also spoke of the inadequacy of materials, principally carving tools. He has located a local blacksmith who has already created for him two implements. He even sells some of his items to members of his own group (for less than 30,000), who resell them to the shop, thus encouraging his fellow group members to keep the group dynamics alive. These facts show just how motivated Andre is in keeping this group activity on its feet - as the group also provides support during times of crisis. Andre consequently plans to continue on with this activity. He believes there will always be tourists and he will strive to improve his quality as this increases orders from tourist visitors.

We asked Andre if he would tell us how much he has been making from these sales. He could not make (or did not want to make) an accurate assessment of his earnings but he did say he earns "lots of money" during the tourist peak season. He earns 25,500 Fmg per item after deduction of the 15% taken out for the running of the federation. His group does not get any share. His earnings cover 30% to 50% of his daily household expenses (purchase of food, other small items). He appreciates the income he can earn in this way, saying that it brings him help in times of crisis and daily living needs. Within his home, his wife is the one who decides how income will be used against expenses.

The existence of the Ranomafana National Park worried him a bit at the first because previously, the park had provided him financial and food resources. And the Park discouraged continued use of these forest products. But, because of the tourist's purchasing of his crafts, this advantage comes back to him in another form.

Basketry:

The following day, Wednesday, July 31, 1996 we visited with Mrs Razafindrasoa Justine and Rabaozafy Philomène during our visit to the village of Sahavondronina. This village is one of the peripheral zone villages of the Ranomafana National Park, a women's group is involved in basketry (hats, small baskets...). During our visit, both women were just finishing two hats. They spoke about their group and their own work.

It takes them 4 hours to make a hat. Each of them can make two per day. Inputs for hat making cost them 500 fmg/article or 300 fmg for the purchase of cyperus and 200 fmg for paints. The selling price of one hat is 3 000 fmg. (\$0.75). After deduction of the 15% (450 Fmg) for the federation, the balance is shared as follows: 300 fmg per sold hat goes back to the group for the purchase of new raw materials which are redistributed to the members for creation of new hats. The balance of the money is given to the person who made the hat. These women plan to carry on this activity because it brings them a "lot of money", they say.



Principal constraints are in finding enough supplies of the raw product, *cyperus*, and the difficulty in selling during the low tourist season. The group of women have discussed these problems together and have decided to initiate cypero-fish farming in the future - providing two needed resources at one time. This case proves that group dynamics can develop, and that a group can manage to find solutions on their own.

Each of the two women we spoke with sells ten hats every two weeks during the tourist peak season, but almost nothing during the rest of the year. According to their own testimony, this activity helps them in their daily life by diversifying their income. They appreciated very much the money from this activity saying that previously (without the craft shop) they only could made a profit of about 250 Fmg/hat. Now they can earn about 2,250 Fmg/hat (not counting cost of their own labor). This is an increase in income from this activity of about 8 times!

Actually, these two women had already done this same kind of basketry business prior to the existence of the craft shop program. The shop helped them to obtain better prices (3000 Fmg/hat rather than 750 Fmg./hat).

The Ranomafana National Park helps them a lot because tourists pay well for their purchases and so benefit these women and the many like them.

Conclusion:

In short, it is clear that the Federation of Crafts Men and Women of Ambatolahy helps to coordinate and support the activities of these various groups of crafts people. It further helps members through reinvesting a share of earnings towards the purchase of raw materials. Tourists to the park provide a critical contribution to the economic development of these people within the peripheral zone of the park. Once these people could not understand why tourists were coming to "see the forest and lemurs" - and were disturbed. Now, increasing numbers of the Park's neighbors, such as these crafts people, are eager for the coming of these same tourists. Now, they complain when their numbers drop. They are realizing concrete economic benefits from the sales to Park visitors.

1.4.3 The Ambodiamontana Village Campground

The Hypothesis: *If this is activity, aimed at increasing the incomes of the people living around the Ranomafana National Park through ecotourism, is successful, it will reduce their exploitation of natural resources and therefore conserve the biodiversity of the park.*

The Issue:

The village of Ambatolahy is located along the paved road which splits the Ranomafana National Park into two blocks. The people of this village have always lived upon the exploitation and collection of various products coming directly out of the forests of the park. This village has long sold fern pots, fig vine sculptures, and other products on the roadside to passing visitors. The demand for these products comes from as far as the capital of Madagascar, Antananarivo. These pressures have long been a very visible, persistent, and troubling problem for ecotourism development in the area, and in the harm this trade has brought to the biodiversity of the park.

The Ranomafana National Park program ICDP targeted the village of Ambatolahy to test the above hypothesis. Could alternative activities be generated for the few households who actually made up this village so as to remove this problem and to create new partners for conservation from the community.

A Potential solution:

To help the villagers of Ambatolahy understand that they can still rely on the forest for their living, but in a better way and without destroying it, the Ranomafana National Park program funded a campground project with funds from park entry fees (DEAP). This village, which in fact is a small community of six families who all belong to the same extended family, own a nice piece of land over-looking the spectacular Namorona River, which flows through the park, and along which the paved road runs. The land is also located near the major entrance to the park. The parks program offered to help this group of families to organize themselves and put into place a campground on this plot of land.

Activity Review:

The campground was first constructed with the help of the project technical, material and 800,000 Fmg. (\$200) financial support, coming from the 50% of park entrance fees returned to peripheral zone communities by ANGAP. Members of the six families provided the labor. Five tents, with a cost of \$1,250 were donated by Dr. Patricia Wright of Stony Brook University - the principal operator of this ICDP.

In February and March 1994, the first sample shelters were constructed by the project. During the seven following months, other shelters and toilets were made by the families own. They were simple shelters, covered with local palm leaf thatching, with prepared rectangular areas covered with clean sand. The campground site included 6 shelters designed to protect tents, a large open shelter to serve as a dining-room area, and another one as a kitchen area. One toilet area was provided, made in the local manner (enclosed shelter, with enclosed, boarded pit, and open hole). Water was provided by a natural spring passing near the site. In October 1994, the campground started to operate. Its first occupants included a delegation of Peace Corps volunteers in the park for a training program. Rates charged were:

- (1) a shelter with supplied tent for 2 persons cost 10,000 Fmg/night (\$2.50)
- (2) a shelter without tent cost 5,000 Fmg/night (\$1.25). Visitor supplied own tent.

On Thursday 12, September 1996, we discussed with two members of the group, M. Raliva Paul (secretary) and Ms Lahady Therese (treasurer) about the functioning and organization of the campsite and its impact on their lives. According to them, the six members owning the land created a group and chose this activity in order to receive tourists and have an additional source of income. They said that they had prepared the site and constructed the shelters and that each of the concerned families were involved. But when asked about the funding, they were confused and had always thought that "the funding comes from Mrs. Patricia Wright" or "... the government". This shows they have never understood the nature of the initial financing of this activity. And may also explain why this activity has been beset with many problems from its very beginning.

According to its legal statute, the group has a board composed of one president, one treasurer and one secretary. They have never been able to designate one of their own members to receive the money from tourists because they do not trust one another. So a member of the Parks staff, located at the entrance to the park, has

been doing this as a free service to them. The treasurer or the president can take the money from Henriette when they want to.

General assemblies of members or the board are rare. No-one has been designated for the permanent surveillance of the site nor for the follow-up of the activity as they are always waiting for one another to do the job. So nothing in fact takes place. After less than a year, the 5 tents and the roofs of the shelters were in total disrepair and had to be removed completely. The one wooden table provided to the site had lost one of its legs somehow and was unusable. Unless someone from the parks program reminded them to cut the grass in the area, this was permitted to go wild. And the toilet became something one did not wish to get anywhere near for the smell.

After discussions between this group, ANGAP, and the parks program, members of the group have begun to repair some of the shelters in May of this year, 1996, changing all of the roofs of the shelters. The grass is now cut every Saturday. But the collection of money from tourists still has not been resolved - with Parks staff (Henriette) stilling filling this role.

During its first year of operation (October 1994 through September 1995), the campground generated over 6 million Fmg (\$1,500), 4.5 million alone of this came in during the first three months, and 1 795 000 Fmg (\$449) during 1995. During this period, tourists renting shelters with tents were the most numerous. From January 1996 to May 1996, when the shelters and tents were gone, the campground only collected 30,000 Fmg. (\$7.50). Seeing this, the group started to make repairs and maintenance. But this action came from the encouragement of the Parks program staff, it was not self-motivated or self-initiated. From mid-July to mid-September 1996, the turnover increased again up to 610.000 Fmg. (\$153).

Profits are shared between the six families. A small amount has been kept aside for unexpected expenses. No money is used for productive investments or operational costs as was agreed to in the original by-laws of the association. Each family uses all its share to meet basic needs (food, clothing,...).

Conclusions:

Members understand that the campground is not functioning as it should and said "there are more and more visitors to the park but few stay at our campground because they go down to Ranomafana to eat or because our site is not well maintained." We asked them what solutions they could propose and they said they did not know. With no initiative and creativity, they always want to be assisted by the Parks program to find solutions. However they do say that they are taking advantage of the presence of tourists and that the income from this activity

covers 1/2 to 2/3 of their daily needs. They do appreciate this income as it adds to other income like cultivating cassava or rice, potatoes.

Association members agree that they could live on benefits the park and appear to be trying to improve their management.

There is agreement that, from now on, they will take responsibility to receive camping fees directly from tourists themselves, and that

receipts will be given out. Thoughts are being given to a rate increase, with a portion of this regularly set aside for repairs.



This association clearly must improve management and organization, reinforce their internal regulations and involve more of their time and money in the activity if this campground initiative is to succeed and draw tourists regularly. Ranomafana Parks staff are fully convinced that ecotourism will help peripheral zone residents economically and that this has the potential to reduce pressures upon the park. No longer are there fern pots or other forest products being sold along the roadside beside the village of Ambatolahy.

Whether this is because of perceived benefits from tourists or because the Parks staff have succeeded in convincing the local DEF Forestry rangers to confiscate these illegal items, this is a change for the better. But it is also certain that this activity has not yet succeeded in making partners in conservation out of these people, nor do they yet properly understand the potential or importance of their campground. Until these family members are prepared to invest more of themselves in the success of this campground, the results will continue to be disappointing.

What the future holds for this campground is not certain. There may be alternative ways in which these families could benefit from this asset without directly attempting to manage a campground. This takes special expertise and dedication. It is possible that, in trying to help the local population to benefit from a local resource, the program is asking for more than one can reasonably expect from them.

Razaivaovoloniaiana H. Diamondra, Community Development, Ranomafana National Park
Rakotoarisoa Baolalao Emma, Socio-Economic Monitoring, Ranomafana National Park
Rakotonirina Josiane, Responsible for micro-projects

Dr. Richard Swanson, TR&D Monitoring Advisor

1.4.4 The Hotel Restaurant Manja of Ranomafana

The Hypothesis: *An increase in regional revenues due to tourist visitors will result in a reduction of pressures upon the Ranomafana National Park. Ecotourism will contribute to encouraging the inhabitants of the peripheral zone of the Park to conserve the Park.*

The Issue:

The development of ecotourism has become one of the major development orientated activities of the Park's program in Ranomafana which is expected to contribute to the sustainability of the Park. Infrastructure for visitors to the park were almost non-existent four years ago when the ICDP activity began. Through improvements in services and activities for visitors to the Park, number of visitors began to increase significantly each year, rising from 649 in 1992 to 6,245 visitors by the end of 1995! Yet most of these visitors spent no more than one day in the area because of the lack of appropriate lodging. The only available second-class hotels were without mosquito nets, toilets, or running water. One could expect to find unclean sheets on beds, and be bitten by bed bugs during the night, as well as mosquitoes. This situation was causing local communities to lose considerable tourist generated revenues through artisan sales, food services, and increased visits to the park and surrounding countryside and villages.

Ranomafana is located on the principal highway leading from Tana and Fianar to the western coast. A hydro-electric plant near the town supplies the towns of the coast, Fianarantsoa, and other towns in the central highlands with electricity - yet using only about 30% of its generating capacity. Historically, the hot springs which gave the town its name drew colonial period elite from all over the Island to its hot thermal water and mud baths. - reputed to have healing properties. During this colonial era, the town was very important and considered a vacation resort of sorts. One small 10 room hotel - Hotel Thermal - was built for this clientele. With the departure of the French and independence, this town fell increasingly into disrepair and completely lost its destination value. The old Hotel Thermal, though used, was no better than the other second-class hotels described above.

A Potential Solution:

The coming of the USAID funded SAVEM project, with its ICDP program of conservation and development began to infuse new life into this town in 1992. Among many other activities, the Ranomafana ICDP, operated by Stony Brook University, began to encourage local entrepreneurs to consider up-grading their restaurants and hotels. ANGAP from Tana also publicly sought to interest private sector investors to build up-scale hotels in the area. Park services were further up-graded. Guides were trained. Trails were up-graded. An excellent interpretation center focusing on both the people and animal and plant biodiversity of the park was set up. This improvement led to the increased visitors noted above, which began to seriously attract private investment into the area. The Hotel Manja was among the early ones which developed during this time to fill a new need. It has been subsequently followed by several upper scale hotels.

Activity Review:

Four years ago, in 1992, Mrs. Ramaroson's family settled for the first time in Ranomafana. She set up a small shop selling foodstuffs and other goods to the community. Noticing the influx of tourists visiting the park, she decided to invest in a small hotel with a restaurant. She wanted to provide a future for her children and enjoyed getting to know new people.

In January 1993, her hotel opened up for business. She called it "Manja" meaning "pretty" in Malagasy. It is located along the Ranomafana River and is on the outskirts of the town itself. It is a lovely site with a clear view of the river and the mountains behind it. In the beginning, she built 5 small bungalows and two shower/toilets with a cesspool. In the interview with Mrs. Ramaroson, she stressed the fact that the Parks program staff helped her in obtain access to electricity. She didn't pay installation costs because the Park's program shared with her their own installation.

Mrs. Ramaroson and her brother run the hotel, with the help of 4 other members of her family. The number of people allowed per bungalow is two people and income generated varies considerable depending on the season for tourists. The low season lasts for about three months, between January and March, while the high season lasts the remaining months between April and December. The owner has noticed that as the number of tourists visiting the park increases, the number staying in her hotel also increases - and so does her revenue! During the high seasons of the past several years (1993-1996), she has grown from 10 to 20 people per day - increasing the number bungalows in the process. Her bungalows are fully booked between mid-July and mid-September.

On the average, the length of tourist's stay in her village varies between two and three days - a big increase from the days before these services were available! The impact of tourism is also felt in the service of the hotel. At the

beginning, Mrs. Ramaroson had her 5 bungalows. A year later she added five more. She has invested in the improvement of services by up-grading the bathroom facilities, and by adding two additional shower stalls, with running water in sinks. She currently plans to add an additional five bungalows. We observed her laying out the new grounds for this. A number of Tana based travel agencies have regular bookings with her now.

Most of her guests eat at her restaurant. And for good reason. Hotel Manja's restaurant is considered the best in town and is a favorite gathering place for many park visitors. Recently, she has been serving as many as 105 meals each day! In comparison to her 1993 beginnings, there has been substantial growth in revenue. The exact amount was kept confidential.

Most of the hotel's supplies come from Fianarantsoa as the dishes requested by most tourists include beef, vegetables (carrots, French beans, and potatoes). Her major suppliers are based in Fianar. This supply line costs money as it requires both time and travel expenses for a person each way. It also points out a weak point in the local communities' ability to furnish supplies. The parks program has initiated several ventures with peripheral zone residents to directly address this problem. Some farmers are beginning to supply vegetables from their gardens.

Mrs. Ramaroson observed that 60% of her earnings are reinvested to improve the hotel or for goods and services for the clients. Tourists demands are growing, she said. The remainder of this income is her own for daily needs of food and clothing for the family. Running this hotel has not given her any particular problems, all is going smoothly, and it pays her well. She observes that her standard of living has risen.

Conclusions:

It is interesting to note that the Ramaroson's have clearly understood the importance of the park to their lives and well-being. In every room of the hotel, one can read in French and English an information sheet describing the various services and fees of the Ranomafana National Park. The park, they will point out, provides them their profits through tourists, and they want to help the park's program in any way they can. The park is there to preserve the area's biodiversity so that the region won't become arid like the South. Ecotourism has had an impact on the economic development of this household, and many like them in Ranomafana. It is providing the kind of alternatives needed to reduce pressures upon the park itself.

Rakotoarisoa Baolaiao Emma, Socio-Economic Monitoring of Ranomafana National Park
Dr. Richard Swanson, TR&D Monitoring Advisor

2.0 Amber Mountain Complex (Amber Mountain National Park and the Ankarana)

The Amber Mountain Complex has been led by the World Wide Fund (WWF) since September 29, 1989. Following two years of setting up the program, and defining the priorities for future program development, the SAVEM ICDP program was initiated in October 1992, within which WWF had, as partners in the development portion of the program, the Veterinaires Sans Frontieres (VSF) and CARE International. The latter partner ceased operations in 1995. The principal goal of the program has been to maintain the biodiversity of the natural ecosystems found in the north of Madagascar, and more specifically in the complex of parks and reserves which make up the Amber Mountain Complex. Major activities have concentrated on the surveillance and re-delimitation of the four protected areas, the development of micro-projects with 50% of park entrance receipts, research into the biodiversity of these parks and reserves, and in general development efforts in improving livestock management in the region (chickens, bees, pigs, cattle), and in support to environmental education through the schools in the area.

Four major objectives were defined for the program.

- (1) "To assure the efficiency of the protection and management of the 4 protected areas of the Amber Mountain Complex.
- (2) To diminish the pressures upon these protected areas through the development and implementation of sustainable rural development actions which will provide alternatives to local communities;
- (3) To describe and implement a link between conservation and development through extension and support to education in order to stimulate a change in attitude towards greater appreciation for the conservation of the protected areas;
- (4) To stimulate and assure the transfer of competence and capacity of program management from the project to the government organizations and village associations of the region for the sustainable management of the natural resources of the region."

2.1 Pressures

In 1994, an effort was initiated between ANGAP, TR&D, and the operators for the Amber Mountain Complex to more systematically identify the pressures upon the four protected areas and to seek to identify in which areas of the peripheral zone these pressures were found. The peripheral zone was defined as the smallest administrative unit (fokontany) which physically touched a border of a park or reserve. Increased understanding of pressures led to an effort to focus development activities, as much as possible, towards addressing these problems. The various pressures were identified, and subsequently prioritized, as shown below.

1. Commercial forest logging
2. Fire
3. Crop cultivation within the PA
4. Wood cutting (for firewood, charcoal)
5. Human settlements within the PA
6. Pasturing of cattle within the PA
7. PZ resident wood cutting within PA (house construction, tools, etc.)
8. Live collection of animals for sale: lemurs, birds, etc.
9. Discontent among PZ residents towards existence of PA
10. Honey harvesting within PA
11. Collection of wild tubers (yams)
12. Meat hunting (lemur, birds, etc.)

13. Medicinal plants
14. Fishing (fish, shrimp, eels, crabs)
15. Invasion of exotic plants (lantana)

(Amber Mountain Complex, Annual Work Plan, 1994: Annex 1, p.9)

2.2 Causes

Analysis of pressures led to the identification of the principal causes for these pressures upon the protected areas. These were in turn prioritized as follows:

1. Poverty, sources of revenue very low
2. The need of surrounding villages for forest products
3. Lack of respect for existing legislation (concerning non-exploitation of PAs)
4. Lack of control (direct surveillance of PA by forestry agents)
5. PA boundaries are not sufficiently clear or well known to many PZ residents
6. Lack of understanding or knowledge by PZ residents for need for PA
7. Lack of enough cultivatable (good) land within PZ - therefore pressure upon PA
8. Need for water (for irrigation)
9. Growing population within PZ (reproduction)
10. Land tenure problems or orientations
11. In-migration of people towards the PA
12. Lack of community organization for management of their resources
13. The strong demand for "khat" (plant product)
14. Need for new pastures
15. Low agricultural yield within the PZ
16. Destruction of the savanna
17. Need for commercial outlets for local products
18. Poor control/management of streams/water channels (for irrigation)
19. Existence of a "black market" for live lemurs
20. Need for wood materials for construction of farm implements
21. Need for credit
22. Invasion of the PA by exotic species of plants
23. Lack of soil fertility in the peripheral zones (due to over-cultivation)
24. Traditions & customs (leading to unsustainable natural resource utilization)

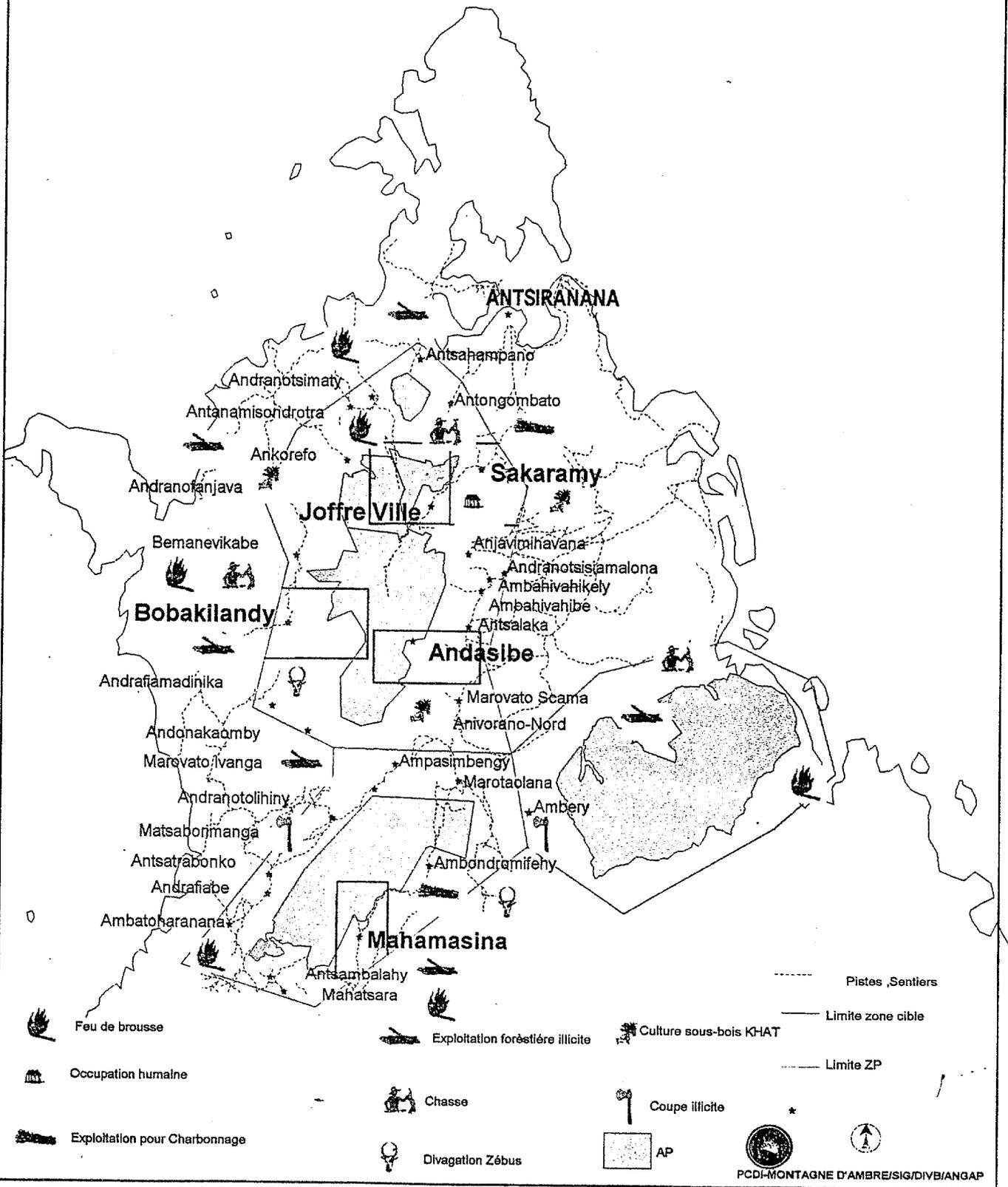
(Amber Mountain Complex, Annual Work Plan, 1994: Annex 1, p.9)

2.3 Development Activities Proposed as Alternatives

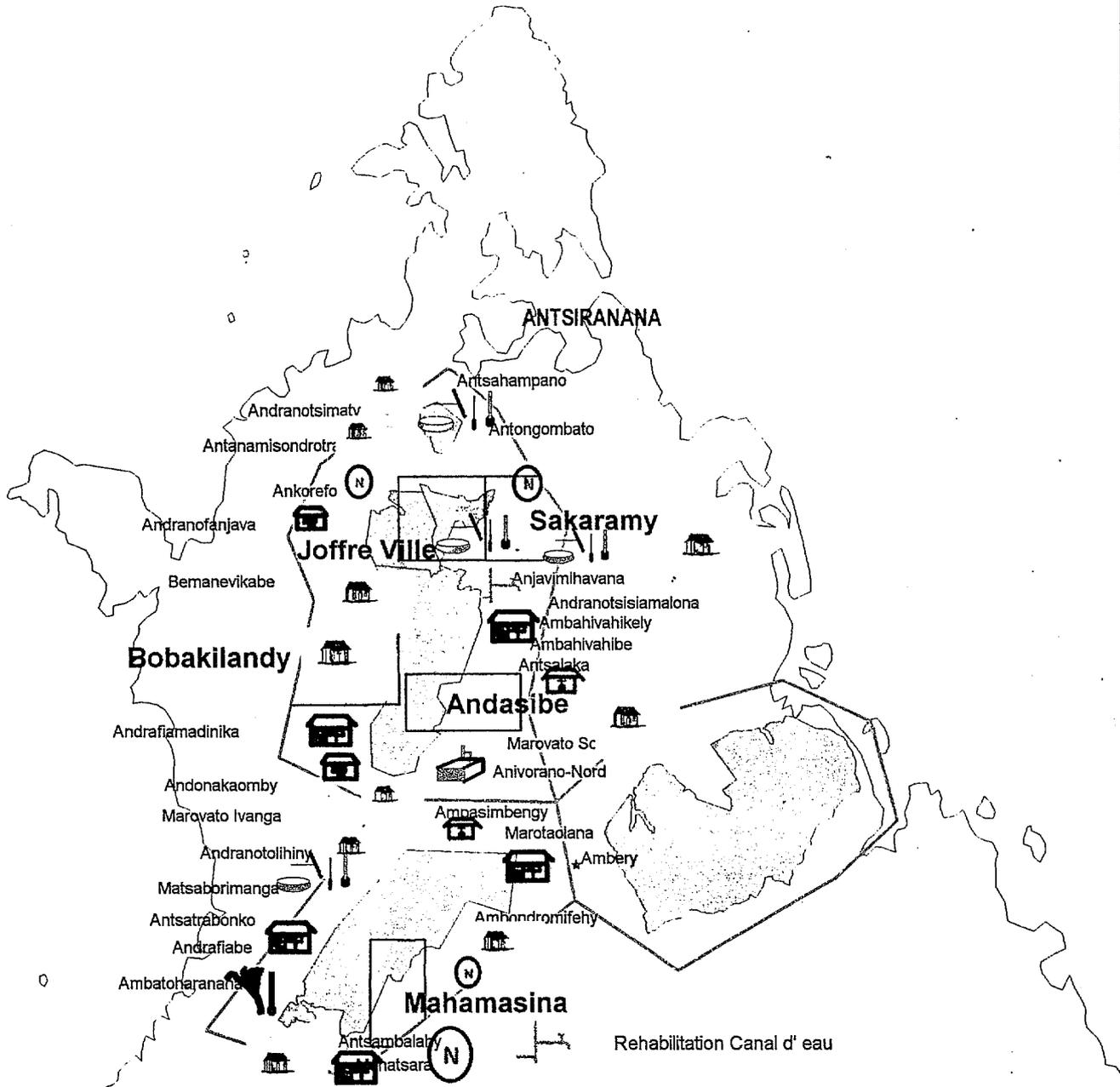
With a better understanding of the nature of the pressures, and causes, and the identification of the principal actors responsible, and their areas of influence, the program was prepared to take another look at their development activities to assess how they might be leading towards the program's third stated objective above. Hypothesis statements were developed seeking to express how program staff saw the linkage between development activity and conservation. The 1994 annual work plan defined hypothesis statements for all development activities, and even other program activities, in this light.

The case studies developed below for the Amber Mountain complex were those identified and selected by the WWF/VSF field program staff themselves as representative of the best development activities they have undertaken.

**PROJET DE CONSERVATION ET DE DEVELOPPEMENT INTEGRES
COMPLEXE MONTAGNE D'AMBRE
CARTE DE PRESSION**



PROJET DE CONSERVATION ET DE DEVELOPPEMENT INTEGRES COMPLEXE MONTAGNE D'AMBRE CARTE DES ACTIVITES



<p>(N) Pharmacie Communautaire Vétérinaire</p> <p> Construction EPP</p> <p> Grenier Communautaire</p> <p> Réhabilitation Ecole</p>	<p> Construction Logement Instituteur</p> <p> Plantation Canne à sucre</p> <p> Réhabilitation lavoire public</p> <p> Construction Pharmacie Communautaire</p>	<p>— Limite ZP</p> <p>— Limite ZC</p> <p>— Limite AP</p> <p> Rehabilitation Canal d'eau</p>	<p></p> <p></p>
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PCDI - MONTAGNE D'AMBRE
Edité en collaboration avec SIG/DIVB/ANGAP

2.4.0 Amber Mountain Complex Case Studies

2.4.1 The Antanamisondrotra Community Granary: A Park Entrance Fee (DEAP) Funded Micro Project

The Hypothesis: *Villagers living in the peripheral zones of Amber Mountain and the Ankarana will have a greater sense of being a partner in conservation of these parks, and will contribute to surveillance of park entrances and exits, when they begin to receive revenues from these parks, as through their share of park entrance fees*" (Amber Mountain Complex Annual Work Plan, 1995).

The Issue:

The principal activity in the peripheral zones surrounding the Amber Mountain National Park and Ankarana Special Reserve is rice farming. When the 'hunger season' comes (January-March), followed by the planting season (March-April), farmers frequently no longer have rice to eat, or seed to plant. They are forced to purchase new supplies from often distant markets at very high prices. As is frequently the case, many farmers do not have any ready cash on hand, so they are led to illegal logging for the big timber and precious wood collectors out of Diego and elsewhere.

The difficulty in managing individual household level granaries is that household heads, always in urgent need for money for one problem or another, can not resist the seemingly high prices visiting grain merchants are proposing. Prices proposed are always much higher than that at the time of harvest. So farmers frequently sell off their stock without thinking ahead of their needs during planting season. Furthermore, rice yields of most households is not great enough to permit year long satisfaction of household consumption needs plus the surplus needed to sell for income needs. Low yields of most traditional rice management systems in this region could also be significantly increased through better varieties and water and other-improved management systems.

A Potential Solution:

With 50% of park entrance fees returned to members of the park and reserve peripheral zone communities by ANGAP, Amber Mountain and Ankarana field teams have for several years now sought to involve these communities in developing micro-projects with these funds. In 1995, for example, revenues available for such activities amounted to \$7,957 - an amount which has been increasing significantly each year as tourist visitors have increased. ANGAP's drive to raise the quality of park services to visitors is also expected to further increase such revenue. Among the micro-projects funded during the past two years are 12 community granaries of the kind to be described below. The specific activity hypothesis developed for granaries reads:

If a community granary is developed in this fokontany, this will help these people to resolve their problem of food security during the shortage months (November - February). Knowing such funding comes from tourist revenues and the technical assistance from park personnel, people will have increased respect for the value of these protected areas, becoming rather partners for conservation and park surveillance, and will reduce their illegal use of park and reserve resources as a result.

Activity Review:

On August 7, 1996, a multi-disciplinary ANGAP and Amber Mountain/Ankarana program team made a field visit to Antanamisondrotra, one of the communities which has received a community granary financed through park entrance fees returned to peripheral zone communities. We left the northern coastal town of Diego Suarez at 9:00 am and arrived, after passing over an extremely bad road, around 11:30 am. This was the dry season, a period when road access was possible. During the rains, this area is completely cut off by road. The community had been alerted to our visit the day before, and some fifteen minutes later we had a gathering of about 15 beneficiaries of this activity. Questions were asked on the granary, their perception of its functioning, with details about management, revenue flow, and book-keeping.

The community has organized into a form of association to manage this granary. Books are kept by one of the village leaders, who showed us the records for the association and accompanied us for a look at the granary itself. From these data, interview information and our observations form, the following observations can be made for the period between 1994, when the association was formed, until the present day.

Antanamisondrotra is located seven or eight kilometers from the Amber Mountain national park boundary with a population of some 300 people, divided up into 65 households. The community granary was created in 1994

through efforts of park personnel working closely with this community. It developed into an association with six elected leaders: a president, vice-president, granary watchman, the rice collector, and the treasurer. It has a legal statute, with 34 official members. Members here did not pay any membership fee other than promising to sell to the association at time of harvests. Members must be adults over 18, and come from four small villages in this area: Ankorabe, Labandy, Tsarantanana, and Antanamisondrotra.

1994

The granary itself was built as the contribution of the members to this activity. They supplied the labor and materials for its construction. The total value of the building was estimated at 586,000 Fmg. (\$147). The park's first contribution to the venture was a payment of 800,000 Fmg. (\$200) from park entrance fee revenue. These funds permitted the association to purchase 93 *dabas* of paddy rice, (33 bags), at 8000 (\$2) Fmg./daba. The rice was purchased between August and October, 1994, from both members and non-members in small amounts. It was not purchased in quantity in any market place!

They also purchased 93 empty bags at 1,500 Fmg. each, for a total of 49,500 Fmg. The total initial expenditure this first year out of the 800,000 Fmg. received was 793,500 Fmg.

1995

The paddy rice, purchased last year, was resold in February 1995, at the height of the "hunger season" on days set by the association council. Rice was sold in quantities of between 1-5 *daba* per member. The records showed that some individuals had purchased more than the maximum of 5 *daba*/member allotted. When questioned about this, we were informed that some members were husband and wife units, who each had right to 5 *daba*. In some cases, members give their rights to others. The dates for sale of this rice was announced in advance to all members by the granary guardian. All members were first given the opportunity to purchase rice - up to their share of 5 *daba*/member. Non-members were allowed to purchase after members had had their chance over a period of three weeks. The records show, for instance, that:

24 *Daba* were sold on Feb. 14, -- to 6 people
34 *Daba* were sold on Feb. 23, -- to 9 people
21 *Daba* were sold on Feb. 28, -- to 3 people
8.5 *Daba* were sold on March 1, -- to 2 people

The selling price was 12,000 Fmg./*daba* (\$3) to members, and 12,500 Fmg./*daba* (\$3.13) to non-members. Had these people been obliged to purchase rice, at this time, in the nearest market, they would have had to pay 15,000 Fmg./*daba* (\$3.75). Such a savings was considered one of the major values of the granary. Also, because stocks were under supervision of the granary guardian, with only an agreed upon date for sales, people had a built-in way of "saving for a rainy day". By March 1, 1995, all the paddy rice stocks in the granary had been sold off.

The association identified only one major problem at this time. Only 87.5 *dabas* were sold, as opposed to the 93 which they had expected to sell. The loss was due to a problem with the floor of the granary, through which some 5.5 *dabas* of rice were lost. But the final balance from this purchase - sale cycle was 1,056,000 Fmg. (\$264) - a \$64 increase on investment.

The association received a second infusion of money from park entrance fee receipts of 1,000,000 (\$250) in mid-1995. This added to the gross take of the previous cycle gave a total of 2,056,000 Fmg. (\$514) to invest in the next round of rice purchasing for the granary. Between June and October 1995, the association purchased 137 *dabas* of rice at the then price of 10,000 Fmg./*daba*. - totaling an investment of 1,373,000. The higher cost from last year was due to fact that the association was delayed in purchasing paddy. The delay was because members had decided this year to wait until local rice was brought in to the villages (for sale), rather than going around right at time of harvest looking for cheap rice to buy directly from farmers. A big mistake!

During this year, part of their funds (exact amount was not recorded) were used to repair the granary (purchasing nails, a lock, and labor). A further 250,000 Fmg. (\$62.50) + 200,000 Fmg. (\$50) was used, as emergency social assistance to two sick association members. One would have probably died without this money to rent space in a car to go to the Diego hospital, and the purchase of medicine! Both loans were repaid. But the association did not have the use of the funds borrowed to purchase rice, with which to make a profit. However, the service to the community members certainly justified this loss!

1996

Between February 1 and March 12, 1996, the association sold the paddy in the granary at the same price to both members and non-members alike: 12,500 Fmg./daba. (\$3.13). The going price in the nearest markets of this time was 15,000 Fmg./daba (\$3.75), like last year. Again, like last year, sales were opened up to selected days:

25 Daba sold on February 13, - to 6 people - who bought in units of 2-2-7-9-4-1 daba each
19 Daba sold on February 20, - to 8 people - who bought in units of 2-2-2-4-2-1-2-4 daba each
48 Daba sold on March 5, - to 17 people - who bought in units of under 5 daba each
4 Daba sold on March 26, - to 4 people - who bought 1 daba each
25 Daba (balance) sold March 30 to President of Association. No one else wanted to buy balance.

Conclusions:

The association has managed to keep its principal intact, and earning a small profit each year on top of this. Members seemed enthusiastic about their granary, in spite of the problems mentioned. We observed what we considered an even more serious potential problem. The group is keeping very poor accounting and has not received much help from the Amber Mountain/Ankarana ICDP in improving this situation. Keeping transparent outgoing and incoming track of funds for purchase of rice, with clear amounts of rice quantities noted, is essential if future problems of accountability are not to appear. Such training should take place before next year's sales.

At the time that we visited, the granary was empty. The granary guardian had not yet returned from his own fields to town, where the granary is located near his home. This man returns in October to take reception of the paddy rice which the paddy rice collector has already begun to purchase. Some 40 dabas have already been purchased for the grain sales of March 1997. This is an indication of the trust that exists between the association, in that sellers have already received payment for a certain quantity of rice which they have yet to deliver to the granary. We also observed that the granary is in fact empty for about half the year (between sales in March, and purchases between August and September, and that the association might consider other uses for this space at this time.

When asked for the advantages of this community granary, members noted that if the rice sold to the community granary had stayed in their own private granaries, some members would have used it up before the 'hunger season' or planting season. These people can't resist selling out to traders looking for grain, promising good prices. Or as frequently happens, the husband removes small quantities over the passage of weeks and months to purchase small things like cigarettes, or other small, often non-essential, needs. The granary provides some community discipline to this problem - providing greater security.

Mr. Andriamampiray Fanomezantsoa Jaona, GIS and Ecological Monitoring
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Mrs. Barivelo Patricia Tiana, Socio-Economic Monitoring
Mr. Alphonse, ANGAP, Program Monitoring
Dr. Richard Swanson, TR&D Monitoring Advisor

2.4.2 Community Egg Production Program in Sakaramy (Amber Mountain)

The Hypothesis: *Increase in the revenue of farmers near Amber Mountain will contribute to decreasing their need to exploit the 'free' natural resources offered in the adjacent National Park forests. Improvement in poultry raising will contribute to diminishing such pressures through increased revenues.*

The Issue:

Traditional poultry raising systems do not permit a steady source of income to farmers. This is because no form of care or vaccination is given to chickens. Every year or two, a common chicken disease, *koropoka*, will wipe out most chickens. Chickens are raised with no management. They are fed only occasionally with rice left-overs, and this lack of a balanced feed greatly reduces growth.

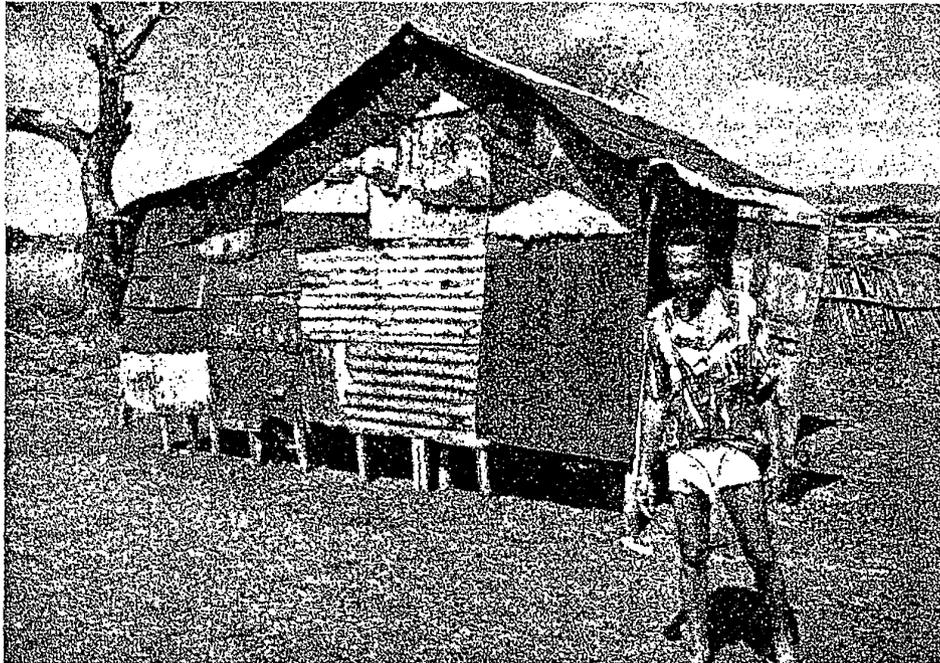
A Potential Solution:

As part of the development efforts of the WWF led ICDP program in the Diego-Suarez region near Amber Mountain National Park, the Veterinaires Sans Frontieres (VSF) development agency with expertise in livestock management systems proposed a program to improve local races of chickens, as well as management systems. A key element of this effort was to transmit to a number of target farmer groups improved poultry raising - specifically orientated towards production of eggs for the Diego market. Revenue increases to the poor farmers of this area from the sale of eggs was considered to hold considerable promise.

Activity Review:

On August 8, 1996, a combined ANGAP/ICDP team left for the village of Sakaramy, by land rover to meet with farmers engaged in this activity. About an hour's drive from Diego, we arrived at the humble dwellings of Mr. Beravoana (see photo), a representative of the Taratra Poultry Association. This farmer was able to speak with us directly in French - an unusual situation.

Each association keeps a notebook in which is supposed to be written all the transactions taking place with this association - receipt of chickens, purchases of supplies, sales of eggs, other expenses. We were disappointed not to be able to see this notebook. Mr. Beravoana said that the association person holding this was back in Diego. It took the ICDP staff over a month to be able to successfully locate the person with this notebook and to consult it. From this come some of the details below.



The Taratra Poultry Association is actually made up on only three families, Mr. Beravoana whom we met, Mr. Soavazaha, and Mrs. Rasoamanana Jeannette. Orientated towards production of eggs for the Diego market, the association was formed in December 1995 and initially received 80 pullets. The WWF ICDP provided these chickens on credit for 861,250 Fmg. (\$210), with a grace period of 10 months, permitting the members to begin realizing some benefits from the sale of eggs. Included with this credit was a further loan for the 40 meters of nylon netting given to enclose the chicken pen - costing 1000 Fmg/meter, or a total cost of 40,000 (\$9.75) - highly subsidized! Feed is costly! In December 1993 the cost of 1 kg of feed went from 900 Fmg to 1,300 Fmg.

At the time of our interview in August, the association had already been selling eggs to Diego. As of the end of October, 1996, the association had been able to reimburse the project 580,000 Fmg. (\$142), in two separate payments of 450,000 Fmg. and 130,000 Fmg. A balance of 281, 250 remains to be paid. A review of their accounts show that they have 928,350 Fmg. (\$226) credit in their cash box!

The hens delivered in December began to lay eggs at the beginning of April, 1996, with 13% of the hens laying each day. By May, this had increased to 80%. June 80%. July 64%. August 72%.

Total cost of this business, through the end of October include:

(1) Feed, purchased in Diego:	2,123,175 Fmg. (\$518.00)	
(2) Transport to Diego and back to purchase feed:	34,000 Fmg. (\$8.29)	
(3) Medications for Chickens:	58,000 Fmg. (\$14.14)	
(4) Other Misc. Expenses:	130,700 Fmg. (\$31.88)	
Total:		2,345,175 Fmg.
Add to this cost of chickens and netting:		901,250 Fmg.
Grand Total Cost (less labor):		3,246,425 Fmg (\$792)

Total Income Generated from this business, through end of October:

(1) Total number of eggs laid to date:	8,632 eggs		
(2) Eggs sold at 500 Fmg/each	7,343 eggs	for income of:	3,671,500 Fmg. (\$895.49)
(3) Loss (eggs broken or not paid for	1,289 eggs	for a loss of:	664,500 Fmg. (\$162)

Subtracting total estimated costs from revenue earned, we have a profit of \$103.50 (424,350 Fmg.) earned over the 10 months since project initiation. These benefits in turn must be divided by the three households concerned, giving about \$34.50 or about 141,450 Fmg. each. New expenses will soon be incurred as the chicken coop needs repairing and upkeep.



Without doubt, many of the eggs for which there was a loss were in fact consumed by one of the three households concerned (eg. cracked eggs). Part of the expenses above include the cost of a daily market ticket for 1,000 Fmg. for the right to sell eggs in the market. Therefore expenses include the cost of taking eggs in to Diego, the cost of purchase and transport of feed for the chickens, and the cost of medications.

Mr. Beravoana has estimated that it takes about one hour a day to

care for the chickens in this hen house. Over and above this, it was the association which built the small hen house seen in the photo below - using natural resources from the area of grass (roof) and wooden poles from the forest (park?).

Conclusions:

One of the most serious issues faced by this association is that of a regular supply of feed. Frequently a member has paid (in time and cash) the expense of traveling to Diego for feed to only find that the supply is out. The solution, being currently explored, is the building of a small mill in Sakaramy which will permit purchase nearby.

This will not only eliminate the expense of back and forth trips to Diego, but will, it is hoped, assure a more continuous supply of feed.

Another issue has been competition faced by these small enterprises from the commercial producers around Diego. One commercial producer has 3,000 laying hens, as well as chickens for consumption under the "Dambell" tradename. The price per egg has stabilized for the time being at 500 Fmg/egg (\$0.12) or \$1.44 a dozen!

It is not clear at this time that this venture will succeed in the long run. The project furnished the initial delivery of young pullets? Who will do this when the project is gone? The project helps to furnish the various vaccinations needed - without which all the chickens will die. Who will do this later? There is not an assured source of feed for these small farmers, and the cost and time involved in getting it reduces the little income earned. Travel increases loss in broken eggs as well, which has not been resolved. Farmers involved in this and other similar small enterprises will probably need to find a way of organizing themselves into some form of cooperative which is capable of purchasing the supplies they need on a larger basis, as to have more leverage in terms of sales of their products. One suggestion has been made to approach the large commercial egg producer in Diego (Antsiranana) and have these small producers serve as a supplier to him, with the large producer therefore helping in acquiring feed, medications, and pick-up of eggs. In this way the producer might in fact be able to enlarge his market. However, should the unit price of eggs drop below 500 Fmg., it is likely that this venture will become economically unprofitable.

A good feasibility study should probably have been made about the economic profitability of this venture before undertaking the costly (in terms of ICDP project resources and personnel) support system this effort needs. Several associations, with a number of households each, have had their expectations increased.

It is not evident that the one hour a day this activity takes from one person, with the small income earned, is meaningful in terms of "increases to income" suggested in the opening hypothesis statement. Nor is there any evidence that this activity is undertaken at a scale which might have any impact on reducing pressures upon the natural resources of the adjacent park. Without some kind of significant change in the cost-benefits ratio, it is unlikely this activity will have any long term impact on these farmer's incomes, much less the pressures upon the National Park.

Mr. Andriamampiray Fanomezantsoa Jaona, GIS and Ecological Monitoring
Park Entrance Fee Micro-Projects Coordinator
Mrs. Barivelo Patricia Tiana, Socio-Economic Monitoring
Mr. Alphonse, ANGAP, Program Monitoring
Dr. Richard Swanson, TR&D Monitoring Advisor

3.0 Andasibe-Mantadia National Park and the Special Reserve of Perinet

Two protected areas make up the Andasibe-Mantadia complex: the special reserve of Perinet and the national park of Mantadia. The principal operator, under ANGAP coordination since May 1, 1994, is VITA, working in collaboration with TFMT and Cornell University, and SAF/FJKM.- a Malagasy Protestant church NGO.

The principal strategic approach of the VITA led ICDP is "to put into place an improved, sustainable management and administrative system for the protected areas which will integrate the surrounding communities and offer to them real opportunities for social and economic development so as to progressively reduce the abusive and irrational use of natural resources, leading to a decrease or even removal of the human pressures on the protected areas, thus conserving their biodiversity."¹

This strategy includes creating an effective and efficient operational unit to protect and manage the protected areas themselves. As expressed by the program, "success in setting up this unit will have a direct impact on ecotourism and relationships with the surrounding communities" (Ibid. 13). On the other hand, pressures upon the protected areas themselves must be reduced or eliminated - and this will be done through a community centered approach to rural development where the private sector will play an important role.

3.1 Pressures

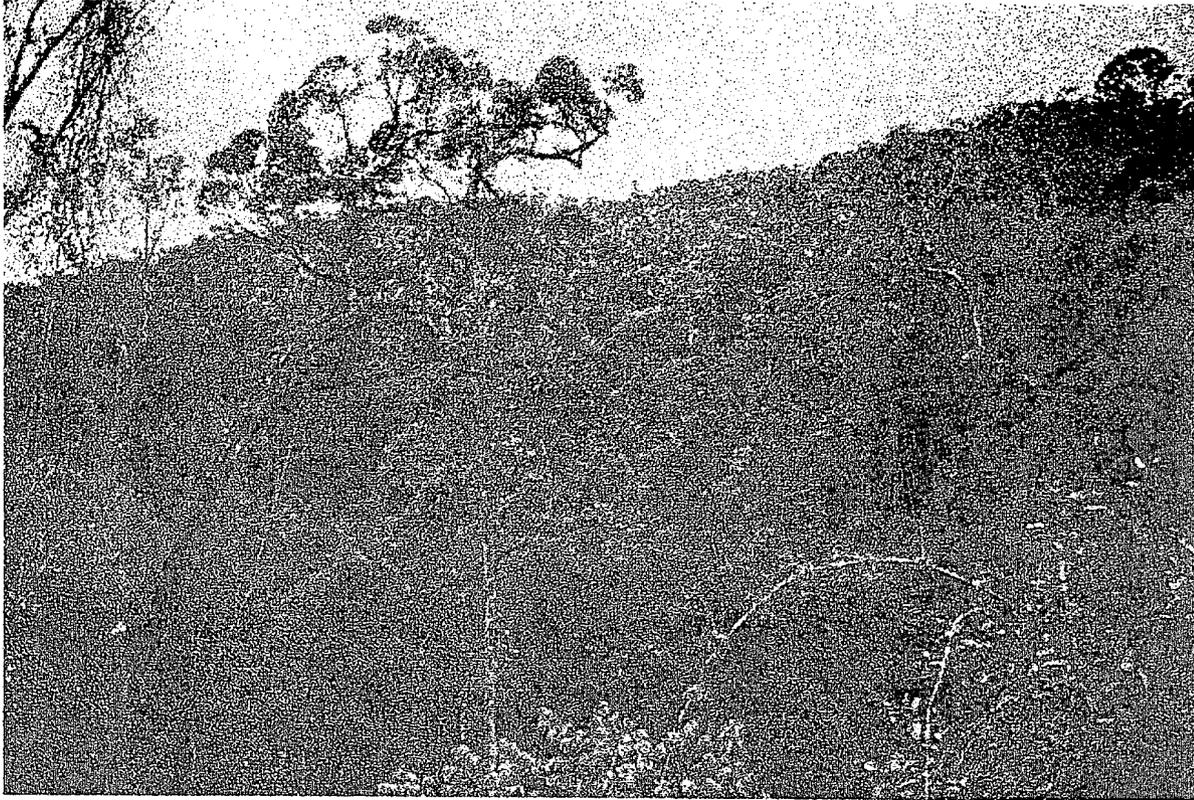
In 1994, personnel of the Andasibe-Mantadia program determined and prioritized through a participatory approach, the human principal pressures being exerted upon the protected areas. The list of pressures below were prioritized according to the weightings given by a group of field program staff. The first listed pressure was considered the most serious and threatening to the park, the second the next most serious, and so on.

- (1) Slash and burn agriculture within the park
- (2) Illegal use of timber within the park
- (3) Hunting (lemur, birds, etc.)
- (4) Collection of animals
- (5) Collection of various food products (vegetative)
- (6) Collection of wood for home construction
- (7) Collection of fern pots (roots of fern trees)
- (8) Collection of wood (for fuel)
- (9) Collection of orchids (for sale)
- (10) Honey hunting within forest
- (11) Collection of construction materials
- (12) Fishing within the streams of park
- (13) Crossing of park with diverse trails
- (14) Collection of Medicinal Plants
- (15) Un-controlled Intrusion of park by visitors
- (16) Mining of precious stones
- (17) Human habitation within park
- (18) Grazing of cattle within park
- (19) Construction of work huts within park



¹ Andasibe-Mantadia Annual Report, 1995:13.

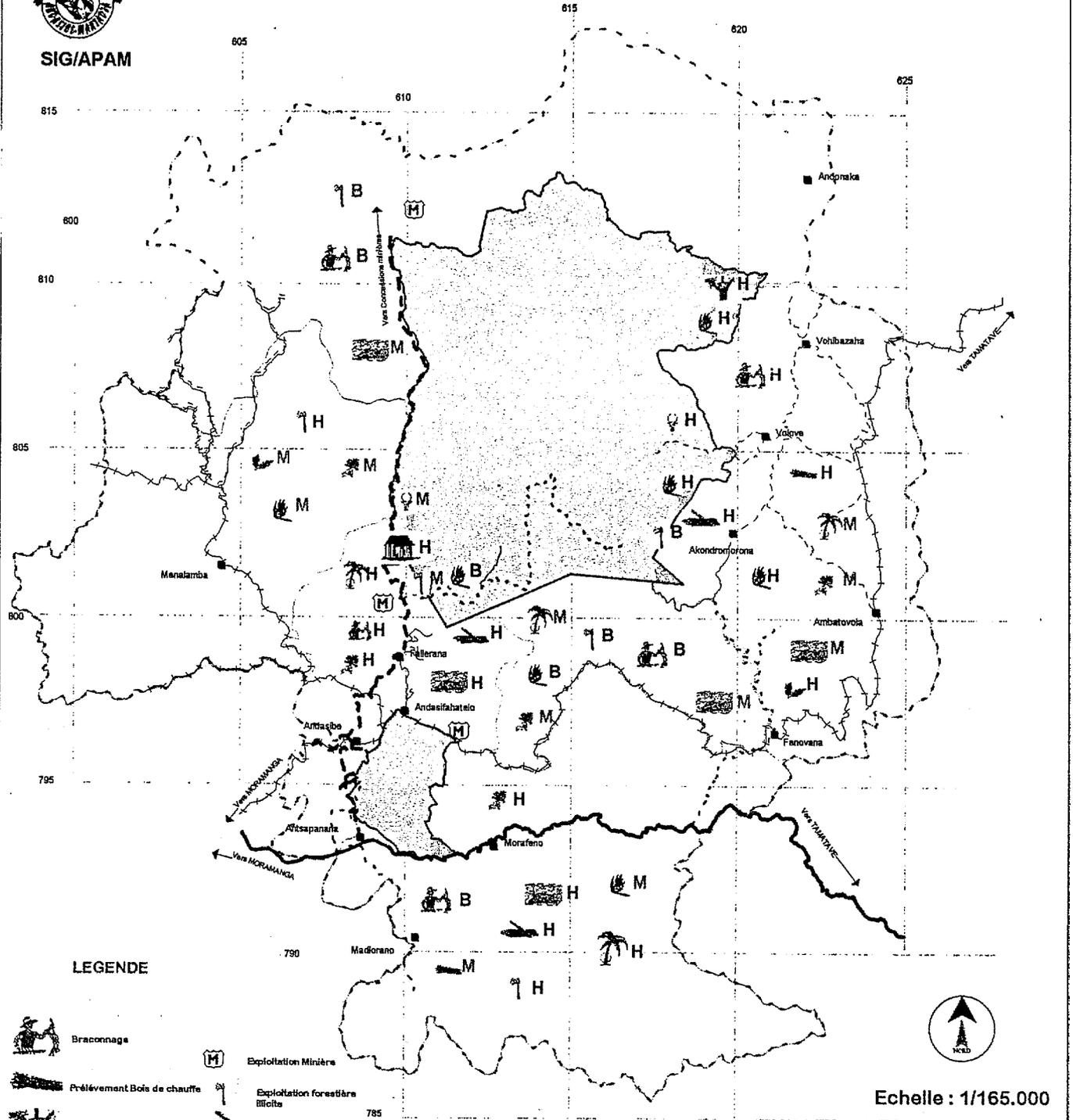
- (20) Graphite mineral exploitation
 - (21) Construction of a road at edge of park
 - (22) Excess tourist visits to special reserve
- (Andasibe-Mantadia Annual Work Plan, 1996:27)





CARTE DE PRESSION DE LA ZONE PERIPHERIQUE DU PARC NATIONAL ANDASIBE - MANTADIA

SIG/APAM



LEGENDE

- | | | | | | | | | | |
|--|-----------------------------|--|------------------------------------|--|-------------------------------------|--|-------------------------------|--|---------------------------------|
| | Braconnage | | Exploitation Minière | | Collecte plantes médicinales | | Autres Protégées | | Route vers concessions minières |
| | Prélèvement Bois de chauffe | | Exploitation forestière
Billets | | Prélèvement bois
de construction | | Chemin de fer | | Route Nationale |
| | Apiculture dans PN | | Cases Ouvrières | | Collecte Fangon | | Route carrossable | | Groupe de villages |
| | Collecte Orchidées | | Collecte Fangeon | | Collecte Animaux | | Ancienne piste d'exploitation | | Sentiers |
| | Tavy | | | | | | | | |
| | Parcage Animaux | | | | | | | | |



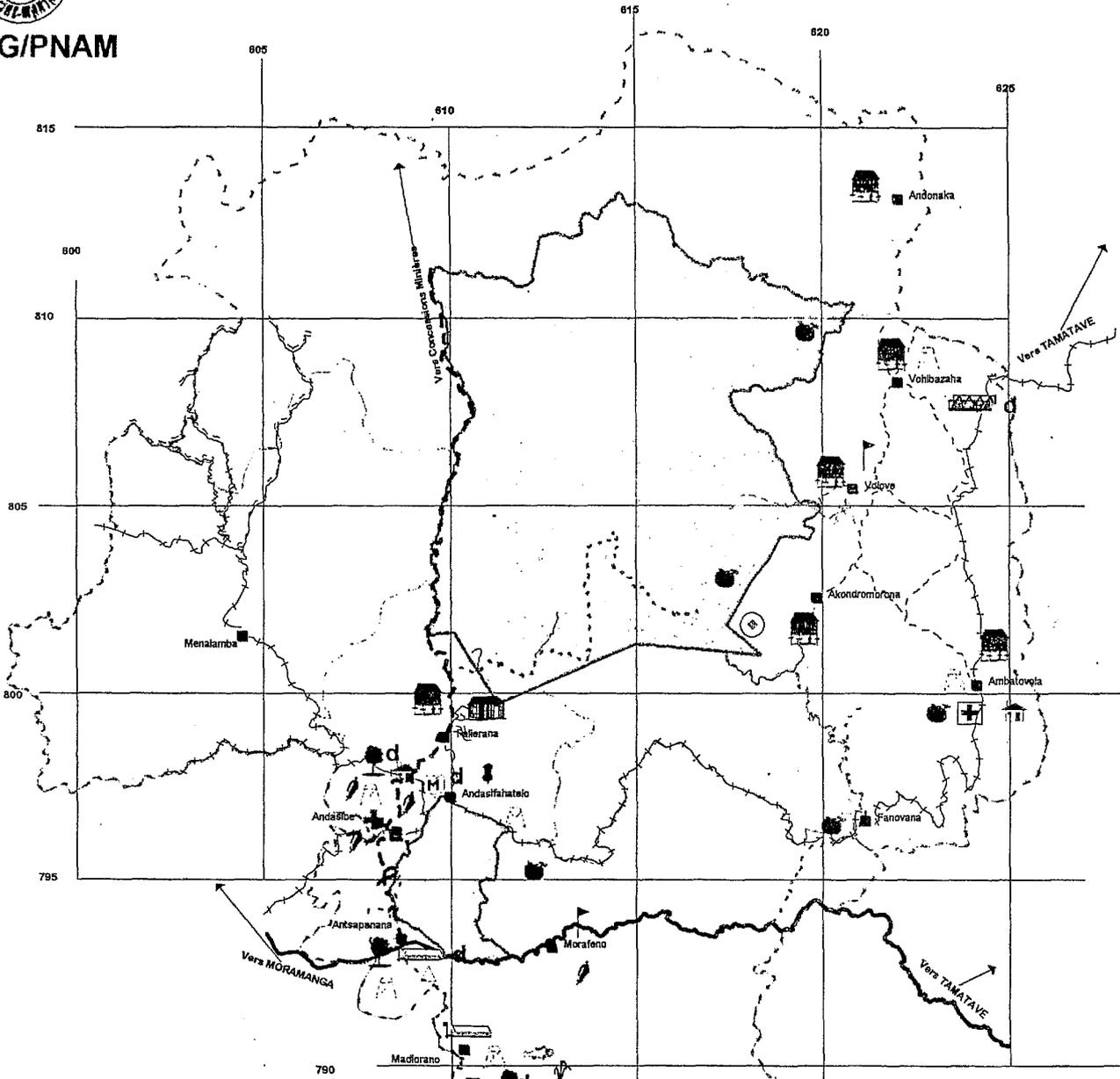
Echelle : 1/165.000

Zone Périphérique : 43115 Ha



CARTE DE LOCALISATION DES ACTIVITES DU PARC NATIONAL D' ANDASIBE MANTADIA

SIG/PNAM

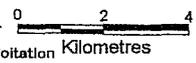


LEGENDE

- | | | | | | |
|--|---------------------------|--|-----------------------|--|---------------------------------|
| | Construction Ecole | | Financement DEAP | | Route Nationale |
| | Centre de santé | | Passerelle | | Chemin de fer |
| | Reboisement | | MS2 | | Route carrossable |
| | Boutique villageoise | | Puit | | Ancienne piste d'exploitation |
| | Pharmacie communautaire | | Groupement féminin | | Route vers concessions minières |
| | Maison communautaire | | Bosquet communautaire | | Zone Peripherique : 43115 Ha |
| | Grenier communautaire | | Mairie et Musée | | |
| | Parcelle de démonstration | | | | |
| | | | Culture améliorée | | |
| | | | Riziculture irriguée | | |
| | | | Bassins piscicoles | | |
| | | | Groupe de villages | | |
| | | | Sentiers | | |



Echelle : 1/165.000



Réalisation Août 1996

3.2 Causes

Study of the reasons for the above pressures led the Andasibe-Mantadia field team to come up with the following prioritized listing of causes for pressures.

- (1) Lack of education and information for the peripheral zone communities
- (2) Lack of sufficient surveillance and patrolling by park rangers
- (3) Limits of park either not known or (purposely) not recognized
- (4) High population increase peripheral zone
- (5) Need for a better life
- (6) Lack of any other alternative to exploiting forest natural resources
- (7) In-migration to peripheral zone
- (8) Lack of understanding about the potential benefits which could come from tourism
- (9) Lack of money, and insufficient salaries
- (10) Difficulty in the adoption of new activities for local populations
- (11) Difficulty of access of the peripheral zone (east of Mantadia)
- (12) Lack of confidence or respect towards authorities
- (13) Local traditions
- (14) Lack of organization among peripheral zone communities
- (15) Usurous tactics of local merchants
- (16) Lack of sufficient land for cultivation
- (17) Lack of motivation (flightiness) of young people
- (18) Poor soils
- (19) Lack of sufficient forests resources outside of park
- (20) Mantadia park not yet open to tourists
- (21) Lack of coordination between Ministries
- (22) Wasteful practices of many local industries (eg. wood cutting)
- (23) Insufficient extension activities with local communities
- (24) Bad management of land attribution
- (25) national development



(Andasibe-Mantadia 1995 Annual Work Plan: 27)

3.3 Development Activities Proposed as Alternatives

Any number of pressures may share a group of causes for which a number of targeted development activities can be proposed to permit the program to have an impact on a number of the pressures - as a group. A great many activities were developed by the personnel of the Andasibe-Mantadia ICDP in response to these pressures. Over the course of the past few

years, some of these were found to have limited success², or could not be initiated for various reasons. Others have been slow in starting up. A potentially interesting activity raising chickens has been delayed for lack of project expertise in this area and lack of source for chicks. The project has helped prepare a number of households to receive chickens, building appropriate shelters, etc. Delivery of the first chickens is expected in next months. Ultimate impact of activity can not yet be judged.

The ICDP program has attempted to collect objective data on the impact of these activities upon reducing pressures upon the park and reserve. Significant survey work was conducted early in the project and more recently within the Mantadia National Park adjacent to the Vohibazaha area from which the three case studies of this report come. The map on the next page shows concrete evidence that *tavy* slash and burn farming within the park has been sharply reduced, if not stopped, since the realization of these development programs last year.

The three case studies below represent development areas of action considered by project personnel to be their most successful programs to date below.



² Examples: A village "community" pharmacy in Andasibe, though established, does not appear to have had its intended impact, or to be sustainable. The Catholic Sisters have for many years provided low cost medical supplies in Andasibe and this pharmacy almost appears to be competition (without the normal overhead). Yet it is the project which helps provide and transport the materials needed - when the project is gone, it is questionable that the activity can continue. The same situation exists for a community store for "low cost" goods. The store was created to bring in lower cost goods, thereby undercutting local merchants essentially selling the same products. If the local merchants sold at a higher rate, it probably was because they had to cost in the cost of transport, risk in bringing in outside products - while the project supported community store had the help of project vehicles, etc. to bring in things.

3.4 Andasibe-Mantadia Case Studies

3.4.1 The Sahatandra Bridge:³ A Study in Community Participation and the use of Park Entrance Fees for Development

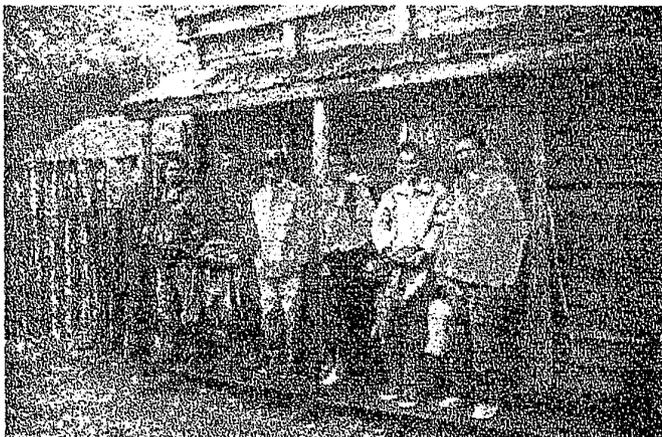
The Hypothesis: *If these activities (micro-projects financed from park entrance fees) are successfully realized, local (peripheral zone) communities (of Andasibe-Mantadia National Park) will have begun to realize the benefits of tourism for their own development and negative attitudes towards the park will diminish* (Andasibe-Mantadia Annual Work Plan, 1994:1.6)

The Issue:

Most of the eastern peripheral zone of the Mantadia National Park is isolated between the Mantadia protected area and Sahatandra river - no roads and, because of isolation, few government services are available. There are four villages in this area (Vohibazaha, Volove, Antsiramihanana, Andonaka). Unfortunately, because of the geomorphology of the area, very little irrigated rice cultivation is possible. This situation forces farmers to slash and burn agriculture on the only remaining forest land near them: the national park. Wide spaces of former forest land now lay uncultivable because of rapid loss of fertility characteristic of these soils. A minimum of seven years is needed for some cultivation to return to such land.

The Sahatandra river, due to its size, its rocky stream and capacity to produce incredible floods - particularly with the passage of a cyclone, has always limited the improvement of the way of life of the villagers in this enclave. The villagers from within this area (cf. map) had resigned themselves to lack of services. Children went without schooling, medical emergencies lead to unnecessary loss of life, outlets could not be found for farming products. Government personnel and others, including park management personnel responsible to provide patrolling of park boundaries and social services to communities, usually rebelled against the hardships involved in getting into the area. The Sahatandra river must be crossed on poor grass rafts, or bridges or makeshift boats which never last on the Sahatandra. It took our team seven and a half hours to walk in to the village of Vohibazaha, over slippery, sometimes dangerously steep paths or log bridges, across many streams and the Sahatandra river.

The village of Vohibazaha, to which our team went to develop this case study, is one of five located in this remote area and is characteristic of so many communities living within the peripheral zones surrounding protected areas in Madagascar. Back in February 1993, as the VITA led ICDP initiated activities in the area, residents from the central village of Andasibe, located just off the paved road from Tana near the park, informed program personnel that communities of the eastern peripheral zone of Mantadia, such as in Vohibazaha, were hostile to newcomers. As it turned out, respect for these people through dialogue and genuine concern proved otherwise. Hardships generated by such difficult living conditions usually also leads to a special willingness of communities to work together to improve their collective well-being - if their needs are seriously listened to and concrete action initiated. Isolation has also permitted strong traditional values to be maintained, including respect for traditional leaders and elders - attributes which strongly support community mobilization for worthy causes.



³ This case study used, with permission, some background information and text from a short paper entitled "Les Fruits de l'Analyse Participative: Le cas de Vohibazaha" by Ndranto Razakamanarina in 1996 (5 pp.), who is also an author of this piece.

Development activities were led by the Malagasy local NGO partner, SAFF/FJKM. This NGO has as a program working strategy that states:

"Financial assistance can only be temporary and must be cleverly invested in order to increase a community's capacity to solve its own development problems. However development starts when a group needs less and less external assistance and is able to decide on its own for its own interest. Indeed, external assistance can only be an incentive to inner self-sufficiency dynamics, or self-reliance, and must never be a substitute for such dynamics" (SAFF/FJKM Community Development Plan Strategy, Article 10).

A Potential Solution:

Andasibe has the highest visitation rate of all Malagasy parks and reserves, with over 9000 visitors in 1995, of which 5490 were expatriate non-resident visitors; 50% of the revenue generated is returned to peripheral zone communities living around the park. The Andasibe-Mantadia National Park program began to distribute these funds in 1995 through targeted micro-projects. Among the micro-projects financed to date is that which financed the Vohibazaha Bridge Project for a total of \$11,177.

One action, judged by the Vohibazaha population to be of great assistance to their collective well-being, was the

building of a more sustainable bridge to cross the Sahatandra river, on foot. Such an activity has been a top priority for several isolated villages for many years. Crossing this river was either done by small dugout or grass raft, or a tied together bunch of wooden poles, precariously perched between two outcroppings of rock above the



raging current below (cf. photograph). Last year a mother and child lost their lives making this crossing. Agricultural produce is frequently lost when farmers are trying to get it across to the other side - from where it can be taken to market. A rising river after a major storm frequently sweeps away these temporary bridges, requiring days of effort by the community to put something back in place again when the river level goes back down. Vohibazaha is the largest (and closest) of the four communities who would benefit most from this bridge.

Activity Review and History:

First contacts with the population of the village of Vohibazaha began in late November 1993 through a participatory approach which led to the creation of a Community Development Plan for the village. Early analysis of pressures upon the park from this area quickly showed that the progression of slash and burn agriculture (*tavy*) in the nearby park was the most serious issue to address. Besides this, it was clear that the community used various products from the park forest. Clearly, park agent's message to stop slash and burn farming within the park, as well as illegal exploitation of natural resources was not a message people liked to hear in this isolated area where they do pretty much what they want to do, when they want to do it. Building a positive working relationship with this community as conservation measures began to take effect was therefore important. The bridge project was judged by the program to be important in both reducing the negative image of suppression of certain actions, while helping the community with a major problem which could better their way of life. Other activities within the community development plan sought to provide alternatives to environmentally harmful activities.

People from Vohibazaha interviewed during our visit noted a number of reasons why they felt so strongly about this project:

- (1) It has been a priority activity need for many years
- (2) It will greatly enhance their ability to get their agricultural and other produce to market
- (3) It will greatly increase their ability to communicate with the outside world
- (4) It will motivate the population to greater efforts in production (now that they can get to market)
- (5) One woman said that in the past they (women) had to wait until a man could help them get across the river (rafting); now they can get across by themselves and get to market more often to sell and buy.

Other benefits seemed evident. Vohibazaha had built a fairly large building (at least three times size of their own homes) for a school for their children. The town fairly swarmed with children. However, their last teacher left earlier this year - partly because of isolation. Hopefully better access will make the village more attractive for outside teachers to live in, as well as increased access of other government services so desperately lacking in this area.

The bridge that was subsequently built is 66 meters (215 feet) long, with two poured concrete supports, and a metal structure (see photograph above). Funding from tourist revenues paid for an engineer, cement and metal framework, transport. Almost all the labor was provided by the community, as shown in the table below:

Materials	Source of Funding or Effort	Quantity or Duration	Cost in FMG
Work for Metal framework Work for poured concrete Broken Rock Iron grids Cement Transport Contractor (engineer)	Park Entrance Fees (DEAP)	Four months	44,709,710 (\$11,177)
Sub-Total	Vohibazaha Community		44,709,710 (75.8%)
Labor for metal work Labor for pouring concrete Labor for construction Framework for Poured cement Wooden boards (walkway) Sand Gravel Broken Rock Guarding constr. Site Construction Transport		417 man days (MD) 300 MD 90 MD 186 80 boards 4.8 cubic meters 9.6 cubic meters 200 pieces 360 MD 450 MD 300 MD	2,085,000 1,500,000 450,000 2,232,000 560,000 96,000 384,000 1,000,000 1,800,000 2,250,000 1,500,000
Sub-Total		1,917 MDs of work	13,857,000 (24.2%)
TOTAL			58,566,710 Fmg.

MD = Man Days

(\$14,614)

Vohibazaha community members were not the only ones who helped in this effort. People from the other three villages of Volove, Antsiramihanana, and Andonaka also participated actively, as shown below.

Participation (Man Days of Work)	Other Villages Contributing to Bridge Construction		
	Volove	Antsiramihanana	Andonaka
Day One	Delivery of	4 WD	10 WD
Day Two	materials (sand),	20 WD	18 WD
Day Three	boards, etc.	30 WD	22 WD
TOTAL		54 WD	50 WD

WD = Work Days

Construction began in April, 1996 and was largely completed by the time of our visit August 14, 1996. What remained were the boards which would need to be laid out along the bridge track. The community had provided them (cut by hand from the forest, hopefully not from the park), and these were carried to the point just above the bridge where the train track runs. Here, the project had them picked up on the freight train and taken into Andasibe to be trimmed and cut to equal lengths for laying upon the bridge (the train tracks lay just behind the small hut in the picture below). Final completion is expected by end of September 1996.⁴ These communities have agreed to be responsible for the upkeep and maintenance of the bridge. This will consist of occasionally painting it (anti-rust), and upkeep of the boards upon which people will walk.

It is clear from the table above, as well as from an observation of the sheer labor that had to be involved to accomplish this task, that the communities contributed a great deal of their own time to this task - at least 240 person days. Community leaders laid out the duties of each man who was to contribute - if a person did not show up on a particular day, his time was doubled.



Conclusions

Spatial monitoring of the advance of slash and burn *tavy* agriculture in this area has shown concrete evidence that the combined efforts being made through implementation of the community development plan, which included this bridge program, with the increased surveillance of the park by rangers has completely stopped further *tavy* progress during the 1995-1996 season. Future monitoring will establish how permanent this will be. This may be especially important as the new bridge could just as well lead to increased pressures as reducing pre-existing pressures upon the Mantadia National Park.

⁴ VITA, with ANGAP, and many distinguished representatives from both public and private sectors took a special train from Andasibe on September 25, 1996 to celebrate with representatives of Vohibazaha and other communities the completion and official opening of this foot bridge to use. The village leader of Vohibazaha, at this event, noted that "if we had not participated in the conservation of the Park, tourists would not have come; without these tourists we would not be today celebrating the inauguration we are today" (ANGAP-FLASH-INFO, September 1996:3).

Beginning in 1996, communities from Andasibe-Mantadia peripheral zones have begun to systematically use Community Conservation Plans to organize various activities. Implementation of such activities will include a community work component in natural resources conservation (e.g. reforestation, soil protection and reconstitution, ecotourism, protected area surveillance and control, marking to show the change in their attitude towards the protected areas, protected area boundaries, etc.).

The community effort put into action by the Vohibazaha bridge is a tangible example of what can happen when a participative approach is used to development intervention. If natural resource conservation activities are to succeed, they should always start from a process where the experience, knowledge, and points of view of village people is sought out through open dialogue, and is understood. Upon this foundation can come activities initiated with the full support and enthusiasm and energy of a local population.

During an evening talk, under the stars, with a large gathering of the Vohibazaha community, including women, children, and men), several children (teens) were called up to the porch where our team was sitting, and asked, in front of everyone, where they thought the money for the bridge project had come from. They did not appear nervous to respond. They said: "We don't know." Then we asked for any volunteer from among the women who could answer the question. The leader of the woman's village crafts program said she didn't know either. We asked the men if anyone could tell us the answer. Silence for a while. Finally one man said it was "the project". Another pause, and someone else said "ANGAP". We said this was not the answer. Finally one man, who appeared to be a community leader, stood up and said that it was from "the visitors to the park".

It was not, therefore, evident that the people in this community, who put so much effort into this bridge project, actually knew the source of the funds or made any distinction from this source of funding and any of the other project funded by this ICDP. This is an issue which ANGAP is very concerned about. It is important that peripheral zone recipients of these funds be told clearly by field operators the origin of these funds. Park entrance funds returned to communities are the only real funds which are sustainable for these people. Project funds which are much larger will end. It is therefore essential that high priority be given by all field agents to express over and over again the sources of funds of this kind. For here the linkage of the park and tourism with the economic welfare of these people is most direct. Here ANGAP hopes to gain advocates for conservation. This situation gave the team the opportunity to explain to the community gathered that night how the money came to build this bridge. We pointed out that it took about 4,471 expatriate visitors coming to the park to pay for this.⁵

Ramanankirija Herinirina (M&E)
Rakontondravony Fanja (GIS)
Ndranto Razakamanarina (Head of Development)
Randriamampandry Manampisoa Gershom-Etienne (Agro)
Rakotobe Tovondriaka, ANGAP/M&E (ICDP Zahamena)
Dr. Richard Swanson (TR&D/ANGAP)

⁵ 44,709,710 fmg. / 10,000 fmg. (50% of one 20,000 Fmg. expatriate tourist visit) = 4,471 expatriate visitors.

3.4.2 The Manasoa Woman's Craft Program

The Hypothesis: *If this activity is successfully realized, village people will participate more concretely in the benefits of tourism, their respect for the park and their confidence in the personnel managing the program will increase. The communities will benefit directly from the arrival of visitors to the park and will (in their turn) be more likely to protect the park (Andasibe-Mantadia 1995 Annual Work Plan: 42).*

The Issue:

Households in the peripheral zone of the Mantadia National Park and the Perinet Special Reserve frequently seek out animal and plant products from these forests to augment their incomes. These activities are not sustainable, and are rapidly leading to the deforestation of the area. People in the peripheral zone naturally have resented aggressive protection policies of these protected areas since they see their own livelihood and well-being linked to their ability to continue to use the biodiversity of the park and reserve. The Andasibe-Mantadia ICDP initiated a program whereby alternatives might be found to these non-sustainable practices. A conscious objective of the park's program has been to lead these neighbors of the park into a true, mutually beneficial, partnership for conservation.

A Potential Solution:

One way of contributing to the creation of sustainable, and non-exploitative sources of revenue is to help households develop new alternatives of raising money. A very important way of doing this would be to build upon the knowledge of local women in the creation of various domestic products through hand weaving of baskets, hats, raffia clothes, mats, sewing and embroidery. Women of this region are particularly adept in the unusual art of weaving various types of clothing from raffia, a plant fiber growing wild in river and stream beds of the region. Improvement of techniques, styles, colors, etc. can generate considerable revenue from not only the tourist market but a young and rapidly developing apparel industry in Tana. Promotion of such crafts, among women, will raise household incomes and could have a direct impact on reducing many of the pressures, listed in 3.1 above, upon the protected areas. Doing so would also free women from non-sustainable agricultural activities. From an ecological point of view, promotion of such crafts could also allow for better use of natural resources and could stimulate the cultivation of raffia as an important raw material.

Activity Description and History:

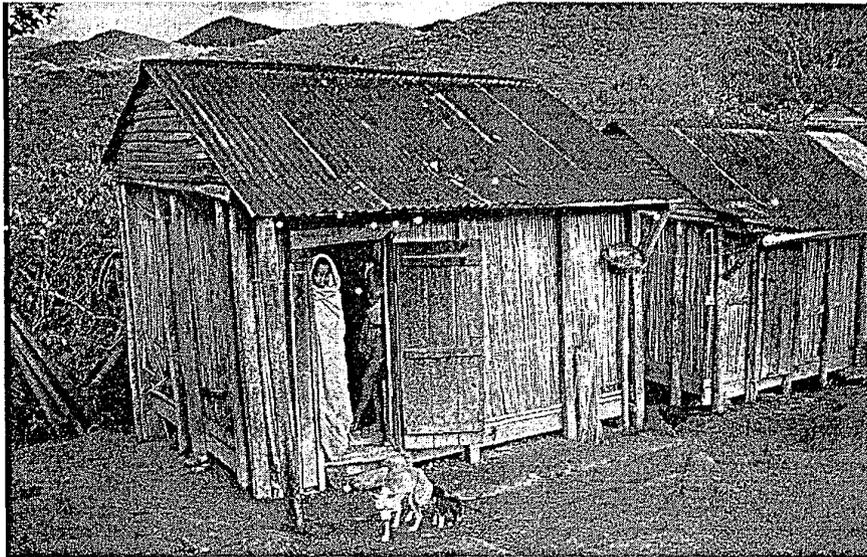
A field team made up of ANGAP and Andasibe-Mantadia representatives took the long hike to the enclave village of Vohibazaha on September 4 (cf.



3.4.1), where we spent the night in order to meet with representatives of one group of 25 women who have formed for weaving and basketry crafts. We met with the leader of this group, in her small, one-room house, where she was in the process of weaving the materials for a hat. As we talked with her, she worked. We noticed several other women, in nearby houses, also involved in a similar activity. In the picture I took of her working, one may see a portion of her wall covered with a raffia mat, while the mattress upon which her blanket (and child) rests is also made of raffia. A large, beautiful raffia mat was spread out upon the entire floor of her dwelling - extending under her bed.. At one corner (not visible), she had a chest high stack of golden paddy rice. At the other corner of her room, was a small table upon which rested the prize possession of the village women's group - a sewing machine obtained through the Park outreach program. She was the only woman in the village who knew how to use it, and was teaching the other women of the village its use. She told us that

she is frequently asked to do the clothes mending (shirts, trousers) for various people in the village - another remunerative activity for her. While speaking to her, this talented women got up and drew out from under her bed another piece of what looked like cloth material, beautiful, soft, pliable - but it was actually finely woven raffia of the kind one frequently sees being used by fancy boutiques in Tana to produce women's fine clothing, vests, and unique covers for all sorts of odds and ends of gift items. The piece she showed us, about 3 feet by 5 feet in length, takes her a day and a half to weave. The only cost for the materials is in the collecting, dividing up into long thin strips, and dyeing in various colors. She was prepared to sell me the one she held up for 15,000 Fmg.

(\$3.75), but noted she could get twice this amount in Andasibe - through the shop set up by the Park to sell such items.



Her major observation was that "it takes too long to sell things". The Park representative collects the various products created by the women and takes them to Andasibe to sell in the park shop.

Since the initiation of this program with the Park, no one has received any return on any sales - though many items have been taken. This is why "it takes too long" was observed. During the week of our field visit to this village, the Park representative responsible for the crafts program was in Tamatave at a crafts sale - to which many of these products were taken. Village women have been assured that they would be receiving the money from what ever sales took place with a week or so. Of the cost of sales, each craft's women receives 1/3 for herself - paid immediately when an item is picked up, while the balance is split into two equal portions - 1/2 for the group treasury for repayment of the sewing machine, and the balance to the person who made the particular item sold - added to that already received.

Another observation this leader of the Vohebazaha's women's crafts association made was that the Parks program should hold its training for the women in the village, not at Andasibe. After having just walked over seven hours, representing only part of the way, we could well understand her point of view. She also pointed out that it was almost impossible for a woman to be gone from home, over night, because of her children. And again, this village literally swarmed with children everywhere. The village was full of child mothers, girls who could not be more than 15 years of age, with babies on their hips. The young girl in the picture above had such a baby in the small house next to the similar one in which we spent that night. In the picture above, the distant dark blue mountain peak which is visible is the beginning of the Mantadia National Park. Between this village and this mountain, all the hillsides resemble that in the immediate background to the village below - completely denuded from slash-and-burn *tavy* farming practiced by all the families of this farming village.

When we got up in the morning, September 5, many women were laying out colored strips of pink, green, and tan raffia strips in front of their houses to dry, for the day's weaving activity. We had a chance to speak with several more of them about the history of their activity.

The crafts association in Vohabazaha has been operating since November 1995. The women had been sensitized by the project and become aware of and willing to improve their sources of revenue through craft products and to diversify their activities in order to free themselves from their usual activities (slash and burn *tavy*).

At the beginning of the project, they were given:

- one sewing machine
- dye
- zippers (for *raffia* bags)
- cotton threads

Many of their products are currently being sold in Andasibe and even at the ANGAP office in Tana. Most of these women



have, to date, only produced an average of one product, for sale at the Park shop. Yet they are eager to improve their work with training, and to continue to collaborate with the Park's ICDP. Prices received there are four times higher than what they can get on the local market. However, they again complained that apart from the money they have received in advance, payment by the project manager of the balance is delayed. (The project manager should not be personally blamed, as these products do not always move quickly - particularly during the low tourist months we have just passed.)

Conclusions:

When no dye is available, or they run out, women collect natural dyes from a plant in the forest. We were not able to determine the nature of this plant, but study should be made about the feasibility of cultivating it, and possibly other similar plants, near the village. We observed no fields anywhere near the village, on its mountain ridge. Fields are clearly located far away - near and possibly within the national park. Any activity which can lead the people back to the land around their own homes, though currently low in fertility, will have a direct impact on reducing pressure on the not too distant park. An interesting, and new development, is that women are planting *raffia* around their villages to obtain the necessary raw materials for their weaving (fibers). This is truly a sustainable, alternative, and very productive venture!

The women's association of Vohibazaha hopes to begin cultivating improved ginger for the next season. We also encouraged them to plant vegetable crops in order to improve and diversify their diet. These women have also expressed eagerness to actively take part in the ethnotourism (welcome committee) program that the Park's program hopes to implement through a new, several day hiking circuit, passing through this picturesque village.

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3.4.3 Vohibazaha Community Granary

The Hypothesis: *If this activity is successfully realized, the (concerned) communities will have more confidence in the program (park management), their aspirations will be realized, their level of living increased, and (as a result), the park will be better protected. (Andasibe-Mantadia Annual Work Plan: 45)*

The Issue:

Rice has always been the staple food of the Malagasy people. However, for most farmers, and particularly "tavy" farmers, harvests never seem to cover their yearly needs for both food and other essentials of life. Thus, when a farmer must purchase other needed products (clothing, basic home and farm implements), or spend money for some ceremony required by tradition (marriages, funerals, turning-of-the-bones, etc.), he will sell his most liquid asset: rice. Should an urgent purchase need to be made before harvests, this farmer may be forced to take out a loan at high interest (over 100%) - to be paid back at harvest. Other crops as well experience the same up and down of prices. A persisting vicious circle is established.

During the harvest period, most farmers are forced to sell a significant portion of their production on the market to pay their outstanding debts, or to buy household items which have probably been postponed for months for lack of funds. This selling period disrupts the balance between supply and demand, resulting in a dramatic decrease in the price. Those who sell during this time are poor farmers desperate for funds. Those who buy, in most cases, are people from outside the area, and who will take the rice out of the area entirely - for some distant market, such as Antananarivo. Local farmers, of course, are the ones most affected by the increase in prices which always takes place some 4-5 months later. At this time, whatever the farmer may have saved has been consumed, perhaps even the seed grain, and he is forced to go to the open market to find a new supply for both consumption and seed. Business being business, merchants will go for the best price they can get.

Data from across the country (Swanson, 1996: 31) show that the average difference between high and low periods averages about 70%, though the highs and lows are much greater than this. The more remote the area, the greater the problem. Looking at this from a farmer's point of view, with a family of 5, eating an estimated 9 kapoaka of rice a day (1 kg of rice equals about 3.5 kapoaka of rice), a week's supply of rice (18 kilograms of rice) will cost 37,800 fmg. This farmer probably sold the same amount of rice for about 26,460 a few months earlier in order to get some urgent money. This 70% variation could be considered a form of short term loan of 3-4 months - certainly in keeping with the real cost of money. Comparing this against the average daily wage for a man working the fields (3000 Fmg/day), this 11,340 Fmg. loss represents about 4 days of hard labor. In summary, such circumstances mean that such farmers have difficulty to get ahead. Just to complicate things more, should this farmer actually have had a really great harvest, he will still probably sell a lot of rice, and take the money and invest in a cow which he will never sell, unless under the very worst of circumstances.

In all these cases, when hard times come around, any farmer, who knows a way to get in to the nearby Mantadia National Park will first try to harvest for himself some lumber, fern pots, strangler figs, or trap birds or lemurs or other wildlife which he may sell. Thus appear the pressures upon the protected areas. This is without doubt better than going into debt - or selling at the very lowest period.

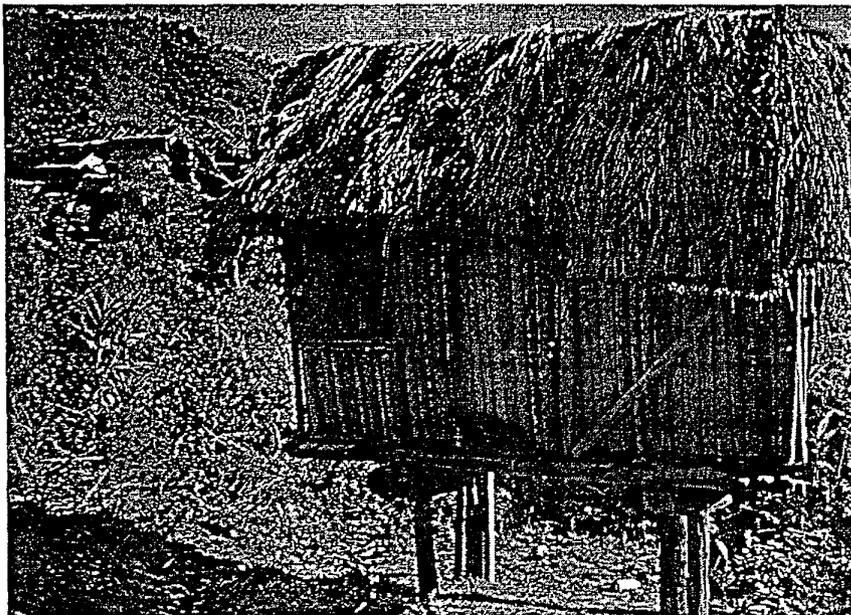
A Potential Solution

Villagers themselves feel they are suffering from the sell and buy cycle which makes them poorer and poorer. This is why, during the Participative Rural Appraisal (PRA) exercise held in Vohibazaha by ICDP program personnel, they decided to seek a way of protect themselves from this cycle. The creation of a community granary was at the top of the list of actions which the community requested be undertaken in Vohibazaha. A community action plan was immediately prepared. It was decided that the granary's principal purpose would be to supply the population with rice at a reasonable price during the shortage period. It would also secure their rice supply within the village - rather than having to look in some distant village for supplies. Other advantages which were seen was that the rice in the granary would also represent a source of revenue for the community (not selling short). Village people's capacity to save would be increased because of the difference between the price on the local market and the price of the granary rice. This would in turn reduce their dependence on park resources. Infractions in protected areas will thus considerably diminish. In this way development would be linked with conservation.

As it would turn out, many communities within the peripheral zone of the Andasibe-Mantadia National Park were drawn to this activity. Our team decided to meet with the members of one of these groups, in Vohibazaha, to illustrate what is taking place.

Activity Review and History

Our interview team, having spent the night in Vohibazaha, spent part of the morning of Thursday, August 15, with Mr. Rafaliarimanana, president of the MIHANTRA group, who manage the granary. The granary has been operational since June, 13, 1994. It was built as the initial contribution of its members, supplying both materials and labor. The granary is managed by a committee elected by the members of the group. This committee is made up of a president, secretary, treasurer, granary manager, a and 4 controllers. The Vohibazaha granary is represented by 67 households.



In the beginning, there were 44 members, representing different households. This has grown to 67 by this year. All decisions concerning the management of the granary are taken during the group's general assembly meeting.

Paddy rice is purchased and collected between May and July. It is stored in the community built granary (see photo) and resold beginning in December through January. Before the rice is purchased, it is necessary to have a control system in place to avoid desiccation and losses. The following table summarizes the results obtained by the group since its creation:

Year (season)	Paddy rice purchased by group			Paddy rice sold by group			Open market price for paddy rice
	Quantity		Price (Fmg)	Quantity		Price (Fmg)	
	Vata	Kg		Vata	Kg		
1994/1995	80	1600	12,000 Fmg/vata	80	1600	15,000 Fmg/vata	17,000 to 20,000 Fmg/vata
1995/1996	187	3740	15,000 Fmg/vata	187	3740	17,500 Fmg/vata	25,000 Fmg/vata
1996/1997	192	3840	20,000 Fmg/vata			22,500 Fmg/vata	

Prices are set during the assembly and are determined according to local market prices. When initiating purchasing of rice during harvest from its members, the principle is that the price should be slightly higher than the market price. This allows villagers to sell their rice at a reasonable price. However, the granary rice stock is sold at a lower price than on the market (2000 to 3000 Fmg less). We must keep in mind that there must be a profit during the re-sale otherwise the activity would not be sustainable. There are costs associated to managing this rice.

⁶ One vata = about 20 kilograms. One vata is also equal to 100 of the small nestle cans of milk.

Costs of managing the granary include the following. The manager and the treasurer receive an indemnity during the harvesting period of 4000 Fmg per day until the granary is full. This payment began with the second year of the project - in 1995. Transport fees for those sent by the group to pick up the rice purchased are also paid for out of the treasury. One requirement of joining the group is a "contribution" of 750 Fmg to help towards purchase of the mats used to cover the granary floor. The rice is not stored in sacks, but simply poured out into a large pile on the granary floor.

Sales from the granary follow clear guidelines.

1. Members are given first priority over a period of several weeks.
2. If there is some stock left, others (non-members) can buy.
3. Speculation on the rice is not permitted. Should someone who is known to have enough rice in the community presents themselves to buy this less expensive rice, they will be turned away (even if a member). Villagers know one another well, and who has how much of what. Household granaries are in public view of everyone in the community. If someone should somehow get away with purchasing rice anyhow for resale, we were told that the group would quickly apply sanctions.
4. Membership to the group is limited to one representative per family in order to avoid unfair distribution of stocks and to avoid any form of abuse

Sale days are fixed and villagers are informed in advance. Every Thursday and Sunday, members can buy between 1 *vata* (about 20 kgs) and 3 (maximum limit). If at the end of the period of sales there should be any rice left, the remainder is shared out equally between the members.

The granary is now very much appreciated by the population. Members of the group are praised for initiating this community service, and to continue on with it.

Every year, the quantity of collected rice has increased. For the future, the president intends to expand the storage room to contain 250 *vata* (5 tons of paddy) in order to be able to satisfy the whole community's potential need during the "hunger season". With the 192 *vata* now in storage, they are already 77% of the way to their goal. The group is now talking about applying this same principal to collect other crops (corn, beans, ginger....).

Because Vohibazaha is situated along the ridge of a small mountain, its houses are very bunched together. Household granaries are usually constructed next to each household. In Vohibazaha however, the granaries are all located at the outskirts of the village, or even across a small valley on top of another hill. The reason for this given was that the danger of fire was too great in this village, and the granaries were more secure located outside the village in this way. There have been no theft problems to date.

Compared to family granaries (see photo to right), the group's granary is slightly smaller as it is only designed to contain the security stock needed for the 6-8 weeks of the "hunger period". Systems of protection from rodents have been invented by the villagers. They use carved, round, wooden platters and put them at the top of each pillar holding the granary. We observed that every granary in the village used as the base beams along the sides of each granary a long piece of wood which turned out to be taken from the fern trees. Community members explained to us that this wood is easy to work, and make hole in (upright supports fit into this base), and also this wood does not rot quickly.



What has been the contribution of the Park program to this enterprise, other than helping to get it organized and underway? During our visit, the manager and the treasurer were not in the village. We were not able to actually see the inside of the granary (which was already stocked), nor could we see the group's books. However, documents at the project office provided us with the following details concerning this community granary.

Year	Number of Vata Purchased	Local input	Program Subsidy	Group's Profit
1994/1995	44	488,400 Fmg	1 000 000 Fmg (\$250)	408 000 Fmg (\$102)
1995/1996	65	200,000 Fmg	3 480 000 Fmg (\$870)	426 250 Fmg (\$107)
1996/1997	67	?	3 900 000 Fmg (\$975) -	?

\$1 = 4000 Fmg.

Conclusions:

We were very impressed with the real spirit of community concern evidenced by those with whom we met on this activity. It clearly is working and filling an important need. The Andasibe-Mantadia Park program has been able to obtain objective data which indicate that slash and burn farming not far from this community has definitely stabilized over the past two years. The evidence of the good will generated towards the park program as the result of this and other community development activities in Vohibazaha do appear to be reaping some tangible rewards. There is hope that this situation will continue to become even better as the program continues to develop new ideas with community involvement.

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4.0 Andohahela

The World Wide Fund has been the principal operator in Andohahela, near the southern town of Ft. Dauphin, since 1990, when USAID supported the program for two years to put into place program infrastructure, recruiting and training of staff, acquisition of materials, and base-line socio-economic and ecological base line surveys. Andohahela became one of the SAVEM ICDPs, under ANGAP's coordinating umbrella in 1992. The program had to pass through a reformulation phase between October 1993 and March 1994. Beginning in 1994, WWF began to work with new program partners FAFAFI and ASOS. The special reserve with which the program was working became the focus of work which would eventually lead to redelimitation and reclassification into a national park. One of the special characteristics of this wonderful reserve is that the forests at the summit of its mountain chain straddle two major ecological zones: to the south - dry spiny forests, to the north - humid rain forests. The transition between these two ecological systems has given rise to unique forms of life.

Five major objectives have been set out for the program:

- (1) "To bring the local population an appreciation of the linkages which should exist between conservation and development, and especially the importance of the rational management of natural resources, so as to benefit from this;
- (2) To find sustainable alternatives to destructive exploitation of natural resources in the forested regions;
- (3) To reinforce the capacity of local institutions (government and non-government) and village associations in implementing sustainable conservation and development related activities, and in the conceptualization and realization of new projects;
- (4) To cause the new laws governing the protected area to be respected at all levels, including respect for the limits of the park, in order that its value to the socio-economic development of the region be recognized;
- (5) to gain the confidence and collaboration of the peripheral zone populations of the protected area in conservation programs through support to the perceived socio-economic needs of the people of the region."¹

The strategy of the ICDP program has been described as "focusing on the inclusion of the various actors (population, NGOs, public services) (of the region) in all the stages of the program so as to increase awareness of each group of its role in reducing pressures which are menacing the protected area" (1995 Annual Report, p. 4). Added to this was the understanding that the program would have to provide logistic and training support to the local institutions of the area in order to increase their capacity to effectively support local population through alternative activities (livestock, agriculture, forestry) which would reduce pressures upon the park. Also, at the village level, programs for watershed management and protection have been aggressively addressed - and the theme of the protected area mountains being the "water tower" of the region has been widely communicated.

¹ WWF Andohahela Annual Report, 1995: 4.

A major contribution of the project has been in the delimitation, out of remaining forests in the mountains west of Ft. Dauphin, the principal "water tower" of the entire region, the limits of the future Andohahela National Park - expected to legally set up before the end of 1996.

4.1 Pressures

Beginning in 1994, with assistance from ANGAP's monitoring and planning unit, the program began an analysis of the principal pressures upon the protected areas of the Andohahela region. This was done both in the field with community members in the peripheral zone, as well as with the program staff who had come to know this region well. These pressures were spatially located as well, with sixteen sub-zones eventually being identified around the peripheral zone of the protected area. Pressures were subsequently prioritized as to the degree of seriousness of each. This prioritized list is provided below.

1. Slash & burn farming, crop cultivation within PA
2. Bush fires
3. Pasturing of cattle within the PA
4. Wood cutting for PZ house construction
5. Wood cutting for charcoal making
6. Hunting
7. Human settlements within the PA
8. Harvesting of wild tubers within the PA
9. Honey harvesting and collection of other forest products.
10. Fishing

(WWF, Andohahela Annual Work Plan, 1994:2)

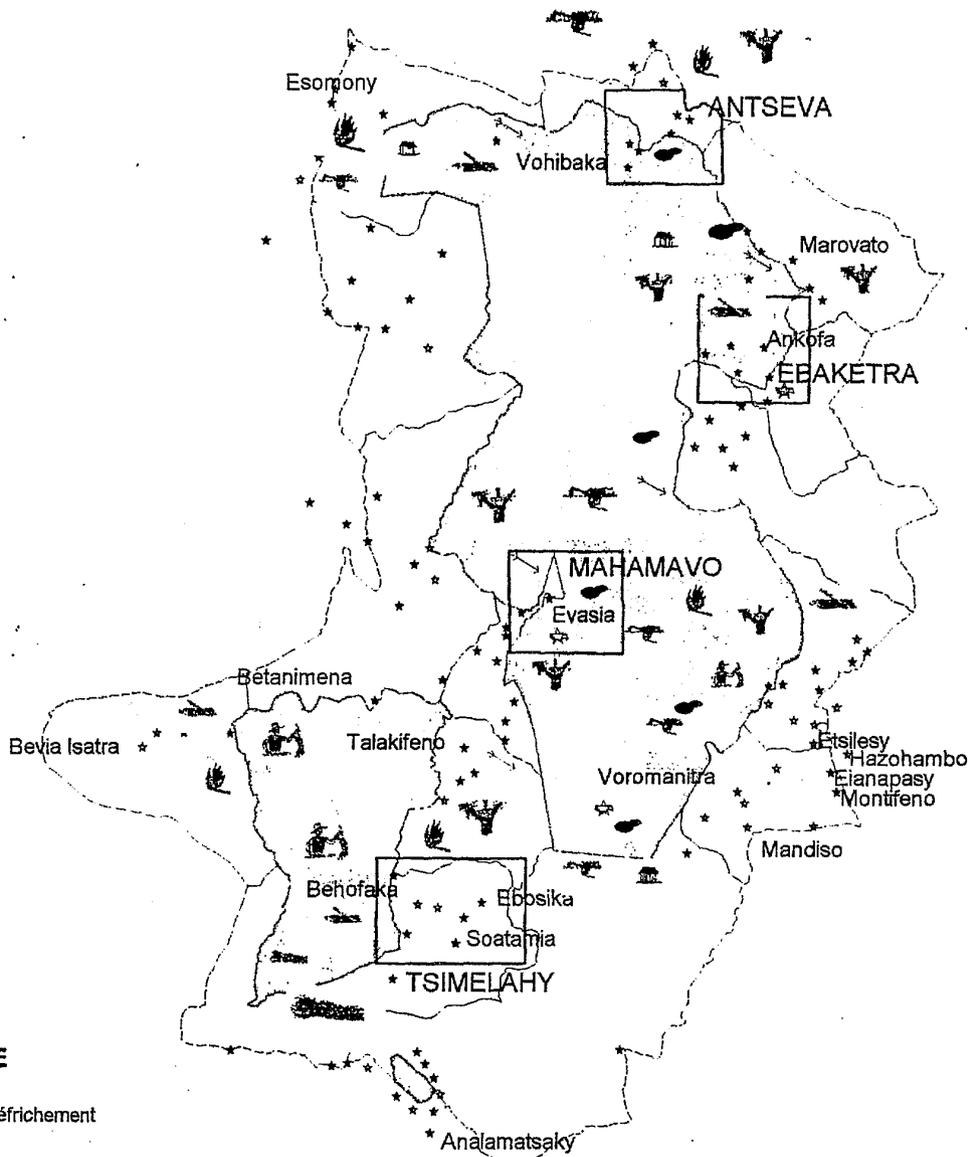
4.2 Causes

With the definition of pressures, the field team, with ANGAP's monitoring assistance team, reviewed the reason for these pressures. How could the program expect to reduce these pressures within identifying their root causes, and those most responsible for them.

1. Lack of sufficient land (for cultivation)
2. Rapidly increasing population (reproduction and in-migration)
3. Decrease in soil fertility within the peripheral zones
4. Lack of security within the peripheral zone
5. Strong demand by PZ residents for protected area forest products
6. Need for money
7. Traditional livestock (cattle) production system
8. Social conflicts
9. Need for food
10. Lack of sufficiently developed commercialization structures
11. Insufficient number of forest agents and surveillance of PA
12. Lack of any kind of forest management plans for PZ forests
13. Need to survey crops within the PA
14. Human habitations within the PA boundaries
15. Poor (initial) delimitation of the PA boundaries

(WWF, Andohahela Annual Work Plan, 1994:2)

RESERVE NATURELLE INTEGRALE D' ANDOHAHELA CARTE DE PRESSION DE LA ZONE PERIPHERIQUE.



LEGENDE

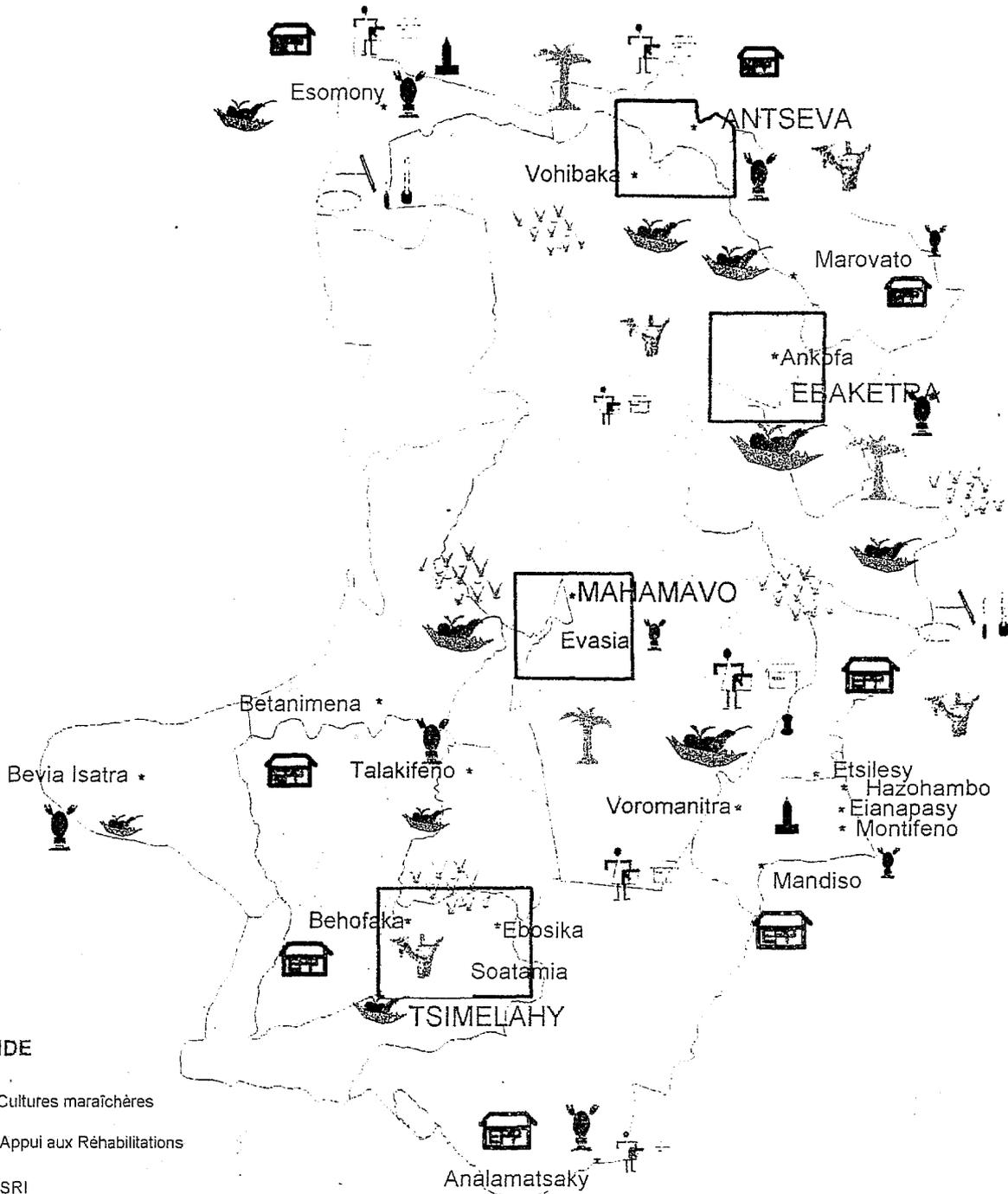
- | | | | |
|--|----------------------------------|--|--------------------------------|
| | Défrichement | | Pêche |
| | Collecte de bois de construction | | Habitation dans la Réserve |
| | Prélèvement de bois de chauffe | | Piste et Enclavement |
| | Collecte de miel | | Collecte de tubercules |
| | Chasse | | Villages |
| | Feu de brousse | | Limite de la Zone Périphérique |
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PCDI ANDOHAHELA
Edité en collaboration avec DIVBIANGAP

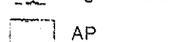
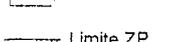
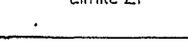
RESERVE NATURELLE INTEGRALE D' ANDOHAHELA

CARTE DES ACTIVITES



LEGENDE

-  Cultures maraichères
-  Appui aux Réhabilitations
-  SRI
-  Ecole prioritaire
-  Apiculture
-  Education des Adultes

-  Agroforesterie
-  AUE
-  ASOS
-  GCV
-  AP
-  Limite ZP


 PCDI - ANDOHAHELA
 Edite en collaboration avec SIG/DIVB/ANGAP

4.3 Development Activities Proposed as Alternatives

While many pressures were identified effecting the different parts of the special reserve (cf. map of pressures), the ICDP program quickly learned that many of these could be attributed to one of three principal groups: (1) young, newly married couples who are very poor, and are starting of by looking for new land to cultivate; (2) the particularly poor households found in all villages, and (3) in-migrants looking for new land and resources. These migrants themselves are extremely poor and bring in systems of land use developed in other areas not appropriate to local uses. Addressing the specific needs of these groups of people has been extremely difficult.

Having identified both the pressures and causes of these, the program selected 10 (out of the 16) of the most important sub-zones into which all development related activities would be concentrated so as to have the greatest potential impact on identified pressures areas over the life of the program.

Like many other ICDP programs in Madagascar, the Anohahela ICDP has been extremely ambitious in terms of the number and kinds of activities it has attempted to address. To cite major categories for its education and rural development program alone, activities have been developed for each of the following:

- Adult literacy
 - Public relations
 - Setting up of environmental education center
 - water management
 - animal husbandry (livestock, fire management, herd health)
 - alternative activities (vegetable gardening, small animal husbandry, fish breeding)
 - rural credit systems
 - improvement of roads
 - support to community health care
 - agro-forestry research, field trials
- (WWF, Andohahela Phase II Proposal, 1994:16-18)

The ANGAP M&E advisor returned to Andohahela to review with the field team which activities of the program, since its conception, would appear to merit the most the development of a series of case studies. Which activities represented the best of what the program had developed in linking development to conservation? A number of households have been monitored for the past year for socio-economic impact of such targeted activities. What has been their impact? The three case studies were selected by the Andohahela field team, with the assistance of their national director. During the week of September 9, 1996, a team of five went into the field to interview communities and farmers who had participated in these activities.

4.4 Andohahela Case Studies

4.4.1 Improved Beekeeping

The Hypothesis: *If this activity is developed, beekeeping will permit farmers to both increase their income and diversify their income sources. This will diminish pressures upon the reserve through a reduction of both their penetration into the Reserve, looking for honey and other products, and will lessen the sources of uncontrolled fires in the dry region of Andohahela. (WWF Andohahela Annual Report, 1995: 62).*

The Issue:

"The lack of land, the harsh dry climate, and the lack of agricultural knowledge, all make it difficult for Andohahela region (farmers) to maintain self-sufficient production systems. In order to make up for these deficiencies, villagers in the peripheral zone of the reserve gather honey, tubers, and hunt lemurs. While gathering honey, for example, they burn or chop down trees; to hunt lemur, they clear a large area of forest" (WWF Andohahela: Phase II Proposal, 1994:9). So wrote an Andohahela staff member in an appraisal mission several years ago. Bee products have been linked to the life of farmers living around the Reserve for generations. Such products are used for food, medicine, in wood processing, and during traditional ceremonies.

When the Andohahela Project was started in 1990, studies conducted on the causes of pressures on the Reserve revealed that wild honey harvesting was among the reasons for the penetration into this reserve by neighboring farmers. Large trees in the reserve are frequently chopped down to get at a bee colony in the trunk cavity. Falling trees destroy the natural habitats of other wildlife. Working to get at bee colonies (and their honey) in natural cavities within rocks, embankments, and dead tree trunks also leads to other pressures on forest biodiversity, such as undergrowth change caused when opening up the forest canopy to direct sunlight (when tree is downed). More destruction takes place from careless fire caused when smoking out a colony.

A Potential Solution:

In the face of such threats, the Andohahela project organized meetings with the villagers to explain the need to find an alternative to these practices. Such incursions into the reserve would have to be stopped, but the program would like to help the communities find an alternative. Interest was expressed by some traditional beekeepers to develop improved beekeeping - and farmers not currently keeping bees also expressed an interest to become involved.

To promote a beekeeping program, one is required to take into consideration several factors which will cause delays. These include the schedules of the beekeepers themselves (they have other activities), the beekeeping calendar, and the changing needs of community members during a season.

Activity Review and History:

In November 1995, two villages, Ihazoambo in the wet zone, and Tsimelahy, in the dry zone, were selected for the initial training for improved or semi-improved hives. This included use of top bars placed on open tradition hives and in techniques for transferring of bee colonies from a traditional hive to the new, improved hives. Swarm catcher boxes were introduced. Products to induce bees to swarm into hives were promoted (aromatic plants such as wild lemon trees or citronella). The objective was to initially gain farmers' confidence in the new techniques, to train future trainers, and to create two observation centers as demonstration for others. Eight improved hives and two semi-improved ones were populated with bees and twenty farmers came to attend the first training session in April 1996.

After this initial workshop, requests began to come in from a number of other villages for similar support. Of particular interest was the number of people who had never kept bees who became interested.

This led to 6 additional villages being helped with setting up hives and in the harvesting of honey. The original 2 villages continue to receive support, but of an advanced nature. This particularly had to do with showing farmers how one's own colony of bees could be divided to provide the nucleus for a second colony. Assistance was given in hive upkeep. Consideration has also been given to identifying the flowering trees in the area of particular importance to beekeeping and in how their numbers might be increased. Eucalyptus trees, though an exotic tree in Madagascar, are widespread in the peripheral zone of one of the program regions, and is an important source of nectar. Farmers are being encouraged to plant their own trees for supplies.

Given the success and the demands from the farmers of some villages and failure in others, the Andohahela has decided to hold the next training with members of some 23 villages, instead of gathering villagers in 2 or 3 places only. The plan is for the trained beekeepers of the initial two pilot villages to do the training. This is expected to be more relevant, and to also lead to the sustainability of the activity.

During our visit to the village of Ihazoambo, we met with Mr. Fernandson, an important man of the village and an experienced beekeeper - among the first to become involved with the project.

He has practiced traditional beekeeping since he was young, having learned from his own father. He currently has 5 traditional hives (hollow tree trunks) located in the very center of town, right behind his house under a tree (see photo). I asked him from where and how he had managed to transport one particularly large



log hive to its current location. He said it came from "the forest" (ie. the reserve) and that it took four men to carry it down to the village. These log hives, some 50 to 60 cm of diameter (inside) and 1 meter to 1 meter 50 cm. long rest directly on the ground. He also possesses 2 Langstroth type hives, with supers. Mr. Fernandson has observed that the local market is not saturated yet and that much more honey could be sold even locally. He sells honey over a period 6 months, from September to February, at a rate of about 3 kilograms per week and earns between 25,000 to 30,000 Fmg (\$6-\$7.50) each week during this time. When taking honey, he alternates from one hive to another - meaning he only touches each hive every 5 to 6 weeks, a period during which the colony stores honey. Mr. Fernandson earns a total amount of 600,000 - 700,000 Fmg. (\$150 - \$175) per year. A very good income. And why others would like to emulate him.

Given the cost of an improved hive, which varies between 20,000 and 25,000 Fmg. each (\$6.00), and given the fact that one can get started by using bees from pre-existing colonies, farmers have no problem refunding the cost of their new hives. Mr. Fernand has already given combs and bees to four neighbors interested in starting beekeeping - splits from his own two Langstroth-type hives.

We observed with Mr. Fernandson a traditional form of bee management that is rare among traditional beekeepers. In order to create a new colony of bees, one colony of bees in a log hive were joined end to end with an empty log hive. The main entrance of the log hive with bees was sealed, forcing the bees to travel outside by passing through the opening in the new hive. In a few months, the colony of bees will have built their combs with brood and honey into this new hive. When sufficient brood had been developed in the new hive, the beekeeper would separate the two log hives, and would thereby have two

colonies. The beekeepers here know this works but not why. What happens is that when there is brood in the separated log hive that is less than 5 days from the eggs having been laid by the queen, worker bees can create a new queen after the separation takes place. One of the separated hives will have had the old queen, the other would not have a queen. In whatever section had no queen, the bees will immediately try to raise their own queen. This is the same principal used when taking 4-5 frames or bars of comb with brood, with bees, when starting a new colony from a modern hive. There must be brood of less than 5 days of age or there will be no queen, and the colony will perish.

Problems Encountered:

Experience of the past year has helped the program to identify two principal problem areas.

(1) Marketing:

There is considerable variation in the price of honey. The villages where the beekeepers are located are found far from marketing centers and cities. Beekeepers in these villages do not know what they should be selling their honey or beeswax for. They don't know how to properly package (bottle) it to produce an attractive product. Honey is currently being sold as pieces of comb honey (small pieces) or as "honey cakes" at the weekly market. It is all consumed locally.

(2) People still collect honey in the Reserve

There are still farmers who continue to collect honey within the Reserve. In the priority sub-zones where the Anohahela program has been developing beekeeping, traces of destroyed natural habitats are



still being observed in places of honey collection.. by farmers. Honey is brought to the village and the market by farmers not associated with the beekeeping activities. Some of the places where honey hunters have been in the Reserve have been delimited by the M&E team, and set up as "pressure monitoring plots".

(3) Fire

Late last year (1995), our park rangers identified several major fires within the park caused by honey hunters. One case, in one of the program priority sub-zones of Tsimelahy, some 20 hectares of forest were destroyed to the honey collection of one wild bee colony.

Conclusions

Since the implementation of beekeeping in the villages of the peripheral zone of the Andohahela Special Reserve, the true actors who collect honey, "the target farmers" of the Reserve, have been identified and many have become involved in improved beekeeping management. Because some honey collectors in the reserve of Andohahela are reluctant to practice beekeeping, the project took the approach of interesting them by first of all introducing improved hive and bee management to farmers who had already practiced beekeeping traditionally, either in their villages or along the edge of the surrounding forests. We should note that among these model farmers, there are farmers, cattle breeders, civil servants and traders, and almost 70% of them do not practice wild honey collecting. However, the results of the initial efforts is positive. There are increasing numbers being drawn to the activity. Like a spreading oil

stain, farmers who copy our improved hives and who ask for technical assistance will in a matter of time themselves become beekeepers and managers. In November 1995, 7 farmers practiced improved beekeeping, 5 in the eastern wet region, and 2 in the dry western region. Following the second training in April-May 1996, this number has almost tripled, to 14 in the east and 6 in the west). Currently, in August 1996 as a new training begins, about thirty farmers will be engaged.

The development of the beekeeping in peripheral zones is one of the options having a direct link to the reduction of pressures which weigh on the Andohahela reserve. The program is beginning to really take off, though objectives are far from being reached. On the one hand, the Andohahela Special Reserve and ICDP staff still need time to transmit their technical knowledge. On the other hand, beekeepers are going to have to join into some kind of association if they are going to be able to surmount some of their problems - particularly in terms of commercialization.

A year has elapsed since the first training took place. At least another year will be required before a core of experienced beekeepers will have developed. It will take longer than this to form a stable association - made up of people who realize they can only move ahead by joining together. It will take many years for this nucleus of beekeepers to become influential and to begin, themselves, exerting pressures upon their neighbors in terms of the pressures upon the natural resources of the park. Such pressures ultimately will diminish the impressive yields to be had by beekeeping in the region.

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4.4.2 Adult Education

The Hypothesis: *If a successful literacy campaign, and associated village libraries, can be launched among the people in the peripheral zone of the Andohahela Special Reserve, people currently largely illiterate, then it will be easier to transmit educational messages from the Parks program to these people, and raise their awareness of conservation issues.*

The Issue:

During the first years of the ICDP activity in this region, a major problem became evident in the transmission of conservation and technical messages from the program to rural peoples. From a socio-economic study conducted in 1993, during the Andohahela project's reformulation phase, we learned that illiteracy rates were as high as 90% among adults. This gave evidence to a real need and helped to explain the slow growth of planned activities in the area. During a village level workshop held in January 1994 in southern Amboasary for the peripheral zone people of the Andohahala reserve, most village representatives asked for the introduction of literacy in their villages. They themselves pointed to many problems they were experiencing in their inability to read or write. The need was not only for children in the schools, but for adults as well. The public service in charge of population issues in the two *fi vondronana* of Fort-Dauphin and Amboasary-Sud also encouraged the project to select literacy as one of its main activities. Therefore the Andohahela ICDP included a significant literacy program as one of its activity areas.

A Potential Solution:

Adults in the villages surrounding the Andohahela special reserve were therefore provided the means of learning how to read and write in Malagasy. The project works in close collaboration with population delegates from Fort-Dauphin and Amboasary-Sud. Public school teachers in many of the concerned villages were assisted not only in improving the materials available to children in the schools, but encourage these teachers to also hold classes for adults as well.

Initially, four adult educational centers were created, and were located in parcels I and III of the reserve (cf. Map of Activities). A number of hamlets and other villages near these centers are involved with literacy campaign.

- The Ankazofotsy/Mangibe Center (Parcel III)
- The Angavo Center (Parcel I)
- The Etsilesy Center (Parcel I)
- The Esomony Center (Parcel I)

Implementation:

For places of instruction, existing school infrastructure was used wherever possible. An agreement is made between the project and the Ministry of Education (*circonscription scolaire*). In other cases, training is held in the home of a villager. Educators are usually volunteers from the village itself and must have had a minimum of four years of secondary school. They are nominated by village leaders and receive preliminary training from the technicians of the population service in Fort-Dauphin and Amboasary-Sud. Volunteer educators are assisted by project rural development staff based in these villages. Teaching aids are provided at no cost by the project and the population service center.

The local hiring of educators and the voluntary system applied by the population services caused a problem in 1995. The system was revised so that the project now only provides supplies (chalk, notebooks, erasers, etc.) while the population center technicians coordinate teaching. In 1996, because of the real interest of the population in this program, the number of centers grew to eight. Three of these are located in an area where land clearing is the main pressure upon the protected area.

There are three stages through which the adult education program seeks to move the interested non-literate population.

Year One: Referred to as level A, students learn the alphabet and learn to put letters together to form words (eg. r,a,n,o = *rano*). People also learn how to do write the numbers 0,1,2.....to 10.

Year Two: Referred to as level B, students begin to read and write groups of words, with one or more simple sentences. They have dictation. They start learning how to write basic math for their daily lives: adding, subtracting, multiplication, division. Their knowledge is further expanded by the transmission of messages using teaching aids such as the local "ZAVA" newspaper, texts on project activities, etc. Students must be able to write and count from 0-100 before they can start math lessons. They also learn to tell short stories of their daily lives. By the end of the second year, students should be able to read, write, and count in their own language.

Year Three: To maintain the acquired knowledge and memorization skills gained in earlier classes, village libraries or "reading rooms" are considered essential. Each project department writes an article on their results which are shared with the communities through these "libraries" for the newly literate people. Village libraries are needed to further develop knowledge of students, with orientation towards the rational and sustainable use of natural resources.

Student from the original four centers have completed level B classes. For the Mandiso area, a small village called Etsilesy was taken for this case study. Here we learned that 14 adult students had registered at the beginning of the level B classes. Thirteen of the 14 students sat for the final test and 12 passed. The success rate for the program reaches 92%.

The tables below detail results obtained in this center when compared to the other centers around the reserve. Training results from the initial four centers and the four new ones are provided below. Training results (TR) seem to be satisfactory and seem to be reaching a fairly large number of adults (PAR). For the Level A classes, while the number of students diminished over time, the success rate varied between 60 - 90%. There is a big decrease in the number of students sitting for the test who want to move to a higher level. Here the perceptions of a few villagers from Etsilesy, taken during our visit to this village, are useful. One adult student stressed the importance of being able to read and write. He said those who learn to read and write will succeed in life.

One adult who was not a student was very frank and told us that "I am illiterate and do not have time to follow the course given at the center because I am busy with my farm work". However, now that the school is repaired, he is able to send his children to attend classes.

The village elder with whom we met said that "the creation of the literacy program responds well to the villager's needs". He added that the government currently does not tolerate people who sign with their fingerprints. It is thus necessary to be able to read and write.

A newly literate mother expressed her ideas and suggestions "we notice that village elders now dare represent their village at government meetings, or at meetings with organizations like the project. It used to be very difficult to find literate people to represent the village because the old people were afraid of being elected by the community and having to deal directly with the government.

The project rural development staff stressed the ease with which the villagers understood their lessons, while the local schoolteacher underlined the positive results through the attendance of school children.

LEVEL A RESULTS

CA	PT	PA	PAR	PAI	MBF	NS	Course starting date	NAA	PR	TP	NAP	NAR	TR
Vohibaka	505	106	70	70	01	02	16/8/95	54	25 S	77.14%	32	15	46.87%
Maroaly	58	30	41	41	01	03	14/8/95	32	21 S	78.04%	11	07	63.63%
Ebaketra	-	-	135	78	03	02	12/8/95	34	21 S	43.58%	18	12	66.66%
Voromanitra	150	98	73	27	02	07	21/8/95	13	21 S	48.14%	10	06	60.00%
Ankazofotsy/Mangibe	-	49	49	49	01	01	20/12/95	17	06 S	38.77%	13	10	76.92%
Analamatsaky	60	46	46	46	01	01	13/9/95	17	06 S	36.95%	-	-	-
Bevia/Esatra	229	110	76	41	01	02	28/8/95	20	16 S	48.78%	16	13	81.25%
TOTAL			490	352	10	02S aver.		189	20 S aver.	53.69%	100	63	63,00%

LEVEL B RESULTS

CA	PT	PA	PAR	PAI	MBF	NS	Course starting date	NAA	PR	TP	NAP	NAR	TR
Esomony	968	557	423	08	02	02	06/10/96	05	04	62.50%	07	06	85.71%
Etsilesy	179	79	100	14	02	02	Nov.95	11	04	78.57%	13	12	92.30%
Angavo	179	105	146	18	01	02	18/08/95	11	04	61.11%	09	06	66.66%
Ankazofotsy	267	195	227	22	01	03	Sept 95	18	08	81.81%	17	16	94.11%
Androangabe	620	484	499	31	03	02	19/11/95	11	08	94.11%	-	-	-
TOTAL	2213	1420	1395	93	09	2 aver.		56	5.6 aver.	60.21%	46	30	65.21%

Note: There are only eight centers. Some of the names above represent location of hamlet of village in which a Level A class may meet, versus a level B class.

Children under 15 who are too old to go to school are also taught in literacy centers. This is why the number of illiterate adults is far lower than the number of the censused illiterate population.

Key to Codes used in Tables:

CA: literacy centers

PA: adult population

PAI: Illiterate population registered for the course

NS : number of sessions per week

PR : completed syllabus

NAP : number of attending learners

TR: success rate

PT: total population

PAR : Censused illiterate population

MBF: operational voluntary educators

NAA : number of regular learners

TP : participation rates

NAR : number of learners having passed the test

S : week

TABLE SYNTHESIZING THE LITERACY CENTERS (Two Year Achievements)

YEAR	Nb registered illiterate pop.	Nb of regular attendants	Planned course duration	Course starting date	Nb learners sitting for test	Nb literate adults having passed test	Success rate	Participation rate	illiterate vs. literate rate
1994	286	118	21 weeks	Sept 94	97	62	63.91%	41.25%	4.91%
1995	503	198	22 weeks	Aug. 95			54.36%	38.97%	in process

YEAR	Nb of opened centers	Nb of operational centers	Nb. of educators	Nb. Operational voluntary educators	Nb censused adult pop.	Nb. censused illiterate pop.
1994	04	03	07	06	1668	1262
1995	09	07	12	09	1457	1128

Problems Encountered:

Problems have been encountered in several areas:

- As the training course proceeds, the numbers of adult learners diminishes dramatically.

- The voluntary educators system does not work very well. In many cases the age of the students is much higher than that of the teachers, which causes problems
- The project staff responsible for overseeing development of activity have no training in making of brochures and in creating publications of interest to these rural people.
- There is a lack of adult teaching skills among those providing training.
- The training course stops periodically; it is not regular.
- Lack of teaching aids and materials appropriate to the Andohahela region.

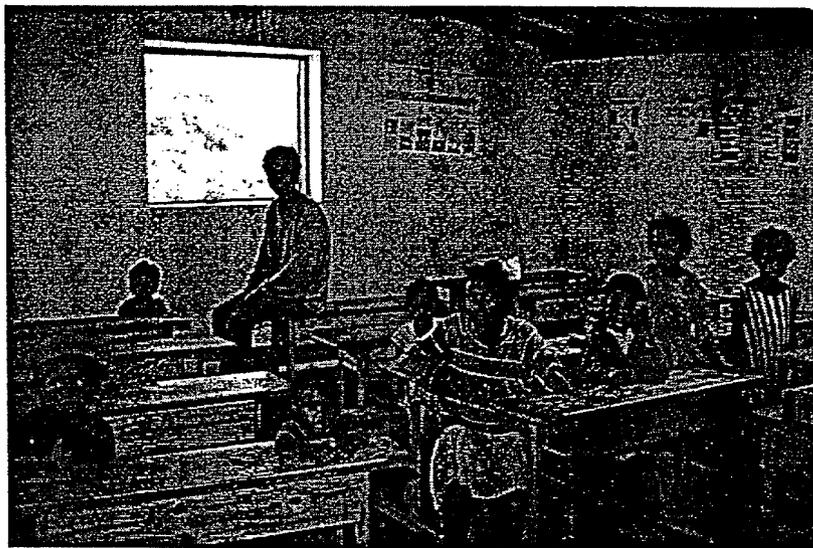
These problems have had a negative impact on the activities main objective which was to facilitate the transmission of educational messages from the project to target populations. The frequent absence of the adult students, especially during the periods of heavy agricultural labor, is largely due to (1) the lack of perception of the immediate use of the learning, (2) the agricultural calendar, and (3) cultural ceremonies which frequently coincide with the class periods.

The burden of daily work, and the project's limited resources to pay the teachers results in lack of real motivation among the adult learners. Volunteer teachers want to be paid by the project, not from the contributions of the adult learners. The project rural development staff living in the peripheral zone were asked to provide adult literacy classes on top of their own other project tasks, and find that they ended up doing poorly in their other project tasks as a result.

Conclusions

Adult education classes have been placed in areas from which high pressures are being exerted upon the adjacent protected area. Literacy rates have been halved in a villages located in high pressure areas. The eight

literacy centers are distributed in fourteen villages with a total illiterate population of about 1,885 people. Of these, 445 have been registered in adult education classes - about a quarter of the illiterate group. During the past two and a half years, fifteen volunteer educators, seven project staff, and four public school teachers have been trained in adult education teaching techniques.



When parents begin learning, they suddenly realize how important it is for their children to learn too. Rather than sending their sons to guard cattle and daughters helping their mothers in daily housework, they are increasingly being sent to classes. More regular attendance and more children have been attending classes since the adult education program has begun according to local schoolteachers we interviewed. In Etsilesy alone, 40 children used to attend classes in the elementary school, but once the literacy program started, this figure doubled to the 80 currently attending.

Those who have passed Level B instruction are now able to read the brochures and signs within and around the reserve, and can transmit messages to those who do not read. They have also become a support in the organization and leadership of villages for other program activities.

To maximize the results already achieved, it is necessary to better train the trainers in adult teaching techniques and in providing production of more relevant teaching materials. The creation of village reading rooms (libraries) will also stimulate ideas and communication.

It is not possible yet to judge whether or not these activities will in fact reduce the pressures identified. We believe that a better informed population will be in a better position to understand the harmful effects of some activities upon the biodiversity of the reserve which will lead to not only changing their own behavior, but influencing the behavior of (extended) family members. Increased environmental education of the area children will also be preparing a more informed generation which we hope will be more conscious of conservation of the forest water reserves of their region.

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4.4.3 The Ianapasy Community Granary

The Hypothesis: *If peripheral zone farmers can be helped to better manage their production, and enhance their revenue through selling of their products when prices are more advantageous (as during times of shortage), then these people will be encouraged to reduce a number of selected pressures upon the park (collecting of wild tubers, honey).*

The Issue:

First contact with WWF in the area of the following case study began between 1989 and 1991 when Shiela O'Connor was the leading technical advisor during the program formulation phase. Several years of studies, reforestation activities, reserve patrolling and delimitation activities were followed with another program evaluation and reformulation period between late 1992 and 1994. Andohahela field personnel did not know until early 1994 that they were working in an "ICDP mode", or what this meant. Development activities were not looked at, before this time, as "linked to conservation" as such.

Between October 1992 and March 1994, a reformulation of the Andohahela ICDP program took place. During this time, socio-economic, cultural, and demographic surveys were conducted, and analysis of pressures upon the reserve and their causes took place. This was done in order to help prioritize intervention zones and to better target activities for the program.

In December 1994, a workshop was organized in Fort Dauphin with 80 representatives of farmers representing the peripheral zone of the protected areas. The purpose was to evaluate, with them, the successes and failures of the 1990-1992 period of activities, and to reprogram (SAVEM) activities for 1995 and beyond. Many new activities were proposed by the local populations, while others were put forward by the WWF ICDP team based on the reformulation surveys. During this workshop, it became very clear that, for some activities, farmers refused to work together; for others, they were willing to organize. Among these was the suggestion to support communities with village granaries - requiring farmers to work together.

During harvest time (*tsipala*), many farmers 'waste' produce by selling off their produce at low costs. Not because they want to do so, but because they have to - needing money to purchase supplies or to pay off debts. Several months later, during the 'hunger months' between October and December, these same farmers run out of food supplies, and have to find money to buy necessities. Such farmers are tempted to exert pressures upon the protected area's biodiversity, looking for food (honey, wild yams and fruit). Wood would be cut for charcoal or construction wood to sell in the market to obtain the money needed to purchase household needs. Or some farmers would even open up illegal *tavy* slash and burn fields within the reserve boundaries. People's savings are in the form of cattle, fields, ox-carts, ploughs, and when difficult times come, these will be sold off.

"Why did you choose this activity?", our interview team asked members of the Ianapasy village granary. One reason given is the large variability in prices for rice over the year - low at harvests - high during 'hunger months' before new harvest. "Rice is the principal food here" we were told, "unlike other areas further South where manioc is consumed". "When rice is lacking, people will go into the forest to look for wild yams and other things." "When the WWF first came here in 1991-92, everybody was afraid of them - we thought the white people would steal our hearts, our brains." That is all changed now. People, we were told, know WWF is here because of the forests, to stop the forest fires - they are "helping our children"; they explain "the importance of water"; they "work for associations".

A Potential Solution:

The Andohahela ICDP, with urgings of peripheral zone communities, therefore undertook to initiate a program of village granaries (cf. activities map). Basic principals of this program included:

- (1) training program rural development staff on how to lead discussions with farmers on how to go about creating community groups;
- (2) an extension program to increase village people's awareness of the need for and importance of creating community groups;
- (3) training on how to establish a proposal to receive credit, and how it would be used;

- (4) training on the roles and responsibilities of various members of an established group, with transfer of management responsibility to the group;
- (5) training to local groups by helping them to meet other established NGO groups in southern Madagascar to learn from their experience

According to the members of the Ianapasy Village Granary interviewed by our team, the idea of "village granary" actually came from the WWF ICDP project itself - based on the studies mentioned above. A local NGO, FAFAFI was also active in the rural development side of the program. Five farmers initially agreed that "we want to chose this project for ourselves". Other options considered were vegetable gardening, bee-keeping, community pharmacy, pasture management, agro-forestry.

For the initial rural credit test, in association with a Fort-Dauphin bank (BTM), with ICDP guarantees, a cash credit of 10,375,000 Fmg. (\$2,530) was given to two separate, newly created, groups located at Ianapasy and Ihazoambo. Both groups established village granaries with their money, building upon the previous year's initial test with project funds. These sites were selected because of their nearness to the protected area boundary, and also their access to a market to facilitate sale of produce. Members of both groups received special training on the "Enterprising Mind" conducted by Entreprenre Association of Madagascar to improve the knowledge of participants in the creation and management of a small firm. Members of the boards of both groups also received training in Fort-Dauphin from the Service of Rural Animation on building responsibility and management of a group.

Activity Review and History:

For this case study, our team visited with members of the village granary committee of the village of Ianapasy, during September 11, 1996. The village is located between 5-7 kilometers from the closest border of the Andohahela Reserve - soon to be declared a National Park. Their president began by outlining a number of the problems that they had encountered since initiation of this activity last year. Factors which they found which had limited the expected participation of farmers in the area were:

- (1) the low household budgets of families, and
- (2) the low production of rice this year. People could not set aside what they had 'promised' to do.

The president attributed this to the following facts:

- (1) loss in soil fertility, therefore lower production of rice;
- (2) inadequate number of technical personnel capable of providing training in improved agricultural production techniques;
- (3) growing demographic pressure on the cultivateable land which exists.

Consequently, they pointed out, this situation continues to provoke illegal exploitation of forest products and soil overuse.

The Ianapasy village granary, which calls itself *Miana-mandeha* ("learn to walk"), was created April 4, 1995 with five members. This has grown to seven members this year - most recently increasing to 9. Its board is constituted of a president, vice president, secretary, and treasurer. The group borrowed the empty granary of one of its members to store their stocks. Plans are to eventually build their own 'group' granary. Each member had to pay a 10,000 Fmg. (\$2.44) membership fee. The first no interest loan of 1,000,000 Fmg. from the WWF ICDP permitted them to purchase their first stocks. This first year, they didn't actually purchase their rice from the market place, but 'bought' a portion of their own stocks. Each member (original five) contributed between 10 and 14 *vaha* or *subik*, resulting in 57 *vaha* in their granary this first year. They sold their first stock on the open village market September 9, 1995. The profit (see below), after repaying the loan, was divided up equally among the five members. Each person used the money for whatever needs they might have. *They did not save it as an investment for the next year!!*

The second year cycle began with a Fort-Dauphin BTM bank loan, actually arranged by and given through WWF, to two community granary groups. Interest fees were set at 30% year, but were

prorated for the number of months actually used. The members of the Ianapasy village granary grew to seven members, who equally divided the 5,375,000 Fmg. loan into seven portions of 767,857 Fmg. (\$187) each! *Rather than considering the capital as the 'group capital', they divided it!* They have succeeded in purchasing a new stock of rice - though at a higher initial cost because of late arrival of loan funds. Presumably, members will sell "their" rice, and pocket, once again, the profits!

Examination of their records of purchases and sales of rice in and out of their granary to date shows the following:

Year	Credit Provided by WWF	Date of Storage of Rice	Quantity Stored	Date of Sale of Rice	Price at Purchase	Price at Sale	Profits FMG
1995	1,000,000	June 15, 1995	57 Vaha or 5,700 kapoaka ²	Dec. 9, '95	400 Fmg. per kapoaka	700 Fmg.	1,710,000

Year	Credit Provided by BTM Bank	Date of Storage of Rice	Quantity Stored	Date of Sale of Rice	Price at Purchase	Price at Sale	Profits FMG
1996	5,375,000	July 5, 1996	189 Vaha or 18,900kapoaka	Nov 5, '96	600 Fmg.	899 Fmg.	3,780,000

As seen in the table above, the village granary was able to reimburse the 1,000,000 Fmg. (\$244) loan following the first year's sales - leaving a positive balance of 710,000 Fmg. (\$173) in their account, after deducting their expenses. This experience was sufficient to convince, with WWF project support, a local Fort-Dauphin bank (BTM) to provide a first formal bank loan to this group of 5,375,000 Fmg. or (\$1,311). WWF officially held the loan however, not the group! This too has been repaid! Repayment of this loan is a positive indicator for future success and for hopefully, direct loans. The ICDP might well explore creating a local savings and loan program similar to the MEC described in a Zahamena case study of this report to get around this problem.

In terms of the management of the granary itself, in spite of the training sessions conducted, the Ianapasy (*Miana-mandeha*) group has experienced problems in management. Records are poorly kept. Management of stock within granary was not always vigilant, leading to a theft from the bottom side of the granary of a small amount of rice.

The credit received in the second year was a little late in reaching the farmers, which meant that the price that they had hoped to purchase the rice was higher than expected. This reduced profits during the second year and points to the urgency for timeliness in loans.

During our interview with these farmers, it became evident that they were very dependent on the project for the operation of this activity. When asked to see their group's granary record book, the president noted that this was "kept in Fort-Dauphin" by the project's activity monitor. Nor did the president seem able to provide any precise figures on the quantity of rice were in the granary at the time. Figures given were quite different from what had been recorded in the "book" we had access to later.

Conclusions:

In spite of the difficulties, the over-all consensus of the ICDP and the village households concerned is that this is a worthwhile activity whose further support is justified. The ICDP in fact is in the process of establishing more of these village granaries in other communities expressing their interest. The ICDP run by WWF considers that support to the creation and to the organization of such groups is a step towards strengthening community capacity to overcome other problems which face them in an autonomous and responsible way. For each such activity, the ICDP expects *positive and material*

² One 'vaha' is a standard basket size used in this area to measure produce. One 'vaha' = 100 Kapoaka of paddy rice, or 50 Kapoaka of 'white rice', or about 14.28 kg. of hulled rice.

involvement by the community itself in the activity - that everything must not be '*top-down imposition*' in assistance. Without a clear idea of the economic potential of the activity however, and without the full participation of the concerned farmers, it is certain that such a activity can not be sustainable. The ICDP sees their challenge as a matter of organizing and strengthening the capacity of farmers to act together to resolve common problems. The population should be put into a position to collectively improve their living conditions and to gradually grow apart from the project.

This Andohahela village granary was created for the purpose of price speculation and profits for its members. Not everyone is able to be a member - because of the initial fee to join and because of the minimum amount of rice one must put aside into the granary each year. Members buy rice from themselves and their own communities (in market) and sell back to their own community market for the best price they can receive. While this is perhaps making money for members, and helping them during times of shortages, it is not helping the community in the same way that the community security granaries do - where members receive money for their rice at harvest, but can also buy back during the hunger months at a reduced rate from going market prices. One wonders if the name "Ianapasy Village Granary" is not mis-named - as it does not seem to represent very many people within this village. This might be compared to some 105 households of the Ranomafana community security grain bank, or the 67 members of the Vohibazaha (Andasibe) community in other case studies of this report.

It is still too early to notice any impact on illicit natural resource exploitation in the adjacent reserve. One might venture to suggest, however, that there will not be any impact given the scale (number of people) with whom the program is actually working - when considering the total number of people concerned in the peripheral zone of this future national park. Nor is there a convincing case here that these people really consider this "their granary" considering how they both handle the purchase, sales, and final distribution of the benefits of the activity. It is not sustainable. Every year they start again at zero in terms of the group's own resources dedicated to this venture!

5.0 Zahamena

Between 1992 and April 1994, the ICDP of Zahamena was funded by the UNDP as part of the PE-1 program. As in other ICDPs of this time, the program spent this time in beginning to establish long term relationships with communities living around (and in some cases within) the protected areas. Socio-economic and biological studies were undertaken during this time to prepare for more long term involvement in both the conservation and activities of subsequent phases. Beginning in April 1994, Zahamena became one of the six USAID funded SAVEM ICDPs - in which both development and conservation orientated activities intensified.

The approach of the project was "to work directly with villagers, leaving them the choice and the control of the activities to be undertaken" (Conservation International, Annual Report, 1994:1). The project prioritized its support based on degree of community cooperation in activities. Significant involvement of a community in any program was considered essential to long term sustainability of the program.

The strategy of the program was described as putting:

"into place a model of participation, of sustainable conservation of Malagasy biological diversity together with the economic development of local communities. The project will support the initiatives...for the conservation of the protected areas and will furnish a model of long term development of the peripheral zone communities of the reserve" (CI, Annual Report, 1994:2). The beginning of this second phase of the ICDP program began with the identification of priority zones for program intervention in collaboration with ANGAP and TR&D. This was done through analysis of the major pressures upon the protected areas, and the authors and causes for these pressures. Project activities were orientated towards lessening of the impact of these through development activities which would help the population to meet their needs in other ways.

5.1 Pressures

The major pressures being placed on the protected area were identified, and subsequently prioritized. Given in their order of priority, these were:

1. Slash and burn farming
2. Bush fires
3. Harvesting of "kotofia"
4. Wood cutting for PZ construction needs
5. Hunting of lemurs
6. Commercial forest logging
7. Collection of medicinal plants within the PA
8. Pasturing of cattle within the PA
9. Honey harvesting (cutting down large honey trees)
10. Trails within the PA (leading to casual collection of various natural resources)
11. Mineral prospecting/exploitation

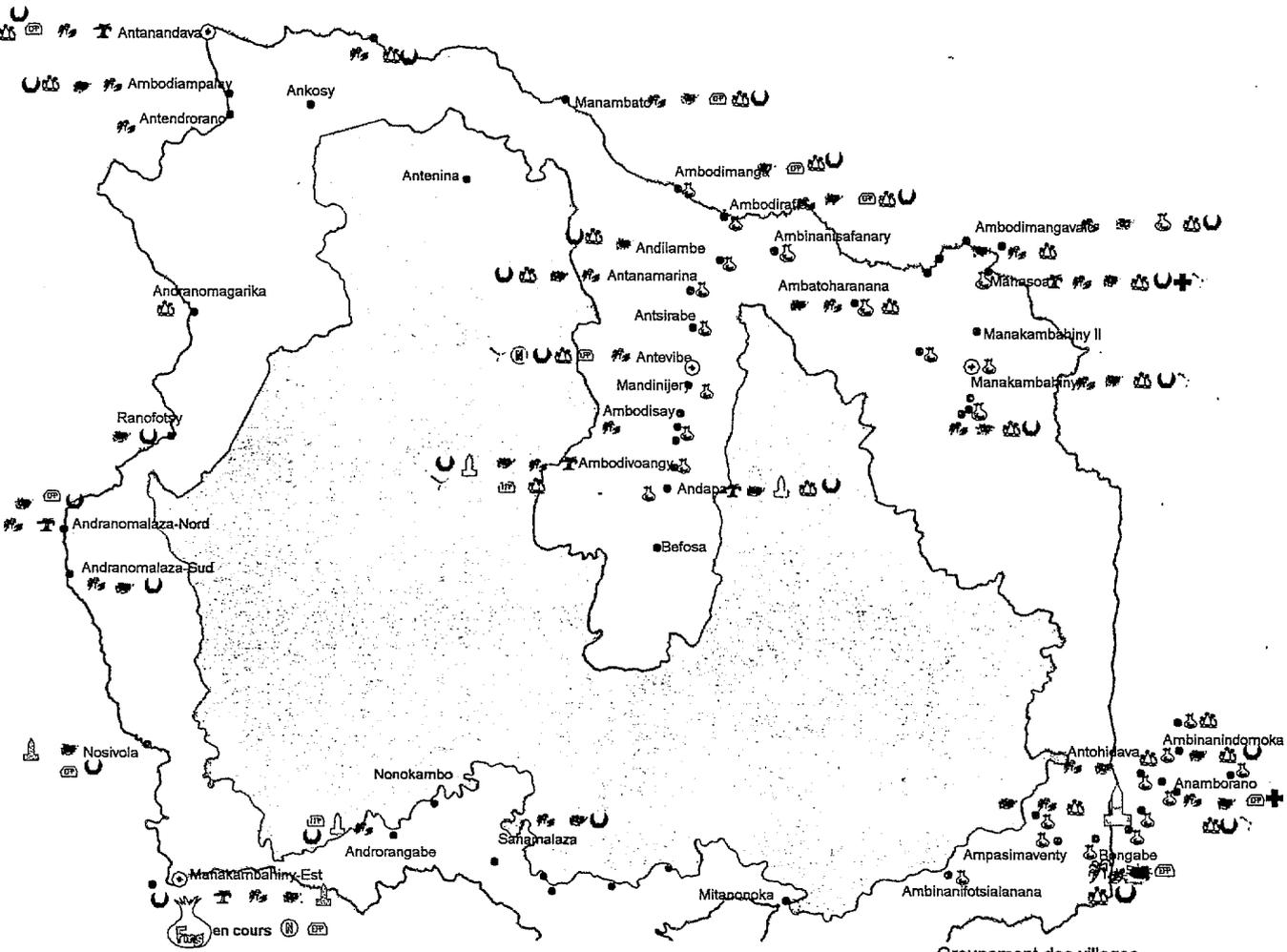
5.2 Causes

Following the identification of these pressures, the following causes for these pressures were also identified and subsequently prioritized.

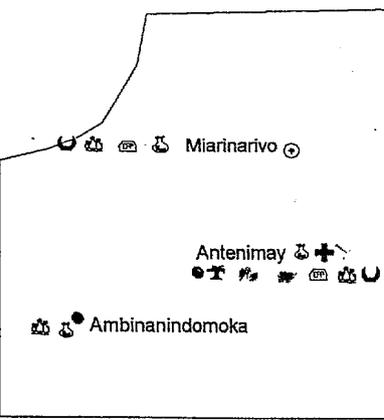
1. Lack of sufficient land (for cultivation), lack of sufficient bas fonds
2. Poor system of attributing forest harvesting permits, lack of sufficient PA surveillance or systems for control (of encroachment/illicit exploitation)
3. Population growth (reproduction), combined with migration
4. Need for money
5. Low (crop) productivity

PROJET DE CONSERVATION ET DE DEVELOPPEMENT INTEGRE DE LA RESERVE NATURELLE N°III "ZAHAMENA" ACTIVITES DE DEVELOPPEMENT DANS LA ZONE PERIPHERIQUE

Echelle : 1/275000 é



Groupement des villages



Zone Sud-Est de la reserve

<ul style="list-style-type: none"> Culture maraichère Mutuelle d'Epargne et Credit (MEC) Elevage et/ou Apiculture Rehabilitation des Infrastructures Culture vivriere Agroforesterie Vaccination et Sante maternelle Pharmacie Communautaire villageois Promotion du Planning familial 	<ul style="list-style-type: none"> Structuration des communautes Amenagement hydro-agricole Residence permanent de chef secteur Village Aire protegee Cultures maraichères concernées par MEC
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<ul style="list-style-type: none"> Miarinarivo Antanimay Anamborano Ambodimangavalo Antevibe Manakambahiny-Est Antananadava 	<ul style="list-style-type: none"> Antemava, Bongabe-Est, Ampasimpoty Ambohinindrina, Ambodirotra, Voharalana Ambatoharanana, Ambatobe, Anosibe Ambodifara, Andianaomby Ambohinindomoka, Andonaka, Antohivava Ambohinoraka, Antanambao, Bongabe, Andranantsoty, Manirenja, Lohanrangy, Ambodivoangy, Ambodihintsia Manakambahiny I, Manakambahiny II, Mahasoa, Amabatabe, Ambalarongana, Ambodivoara, Morafeno, Ambatoharanana, Ambatofoty, Anjalamarina Ambodivoangy, Andapa, Antsirabe, Antanamarina, Ambodifara, Ambodirafa, Ambodimanga, Ambodisaina, Mandinijery, Andiambe, Ambatosaidy Ambohitantsiala, Nonokambo, Nosivola, Andranomalaza-Sud et Nord, Sahamalaza, Ambohitantsiala, Androrangabe Mahatsiro, Ambodipaiso, Ambodiampatay, Antendorano, Manambato, Antsabobe, Andranomiktra Ambatromby, Andranomangarika,
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Dessinée et publiée par SIG/PCDI ZAHAMENA en collaboration avec DIVE/ANGAP
Septembre 1985

6. Traditional land tenure system
7. Low investment in work
8. Lack of appreciation for the national park
9. Need for additional sources of food
10. Tradition
11. Isolation, poor health infrastructure
12. Confusion on exact limits of the protected area
13. There no longer exists sufficient construction lumber within the peripheral zone
14. There no longer exists any "kotofia" in within the peripheral zone
15. Free (uncontrolled) circulation of PZ residents within the protected area (resulting in illicit exploitation of natural resources)
16. Uncontrolled fires (lack of control by PZ farmers)

With an understanding of the nature of the pressures being exerted on the protected areas, and their causes, the Zahamena field team began the difficult task of considering the wide range of possible development activities they could pursue in this region, and to determine which ones might have the greatest potential impact on the conservation objectives being sought, while at the same time being considerate of the immediate socio-economic needs of the people.

5.3 Development Activities Proposed as Alternatives

Development activities initiated in 1994 and expanded or fine-tuned in the years to follow included the following:

(1) Structuring the rural population

One can not assist every single person in a region, but one can hope to assist a maximum of people if they can be encouraged to organize themselves into groups with common interests. The program has spent a great deal of effort in encouraging this kind of community organization. Scores of various kinds of groups have been formed at their own initiative over the past couple years.

(2) Various kinds of agricultural and livestock initiatives were begun: village granaries, vegetable gardening, small irrigation dams, agro-forestry, beekeeping...

(3) Support to infrastructure rehabilitation of rural schools and public health clinics damaged in the 1994 GERALDA cyclone (and again in 1995)!

(4) Savings and rural credit

(5) Improvement in public health in remote villages

For the case studies reported below, Zahamena field team was asked to consider all that they had accomplished over the past years and to suggest what they believed to be examples of some of their program achievements. The team was asked to consider how this results had a relationship to the overall program objectives of reducing pressures upon the protected areas. The author spent a week with the Zahamena team in the field visiting with some of the communities involved in the kinds of activities selected below. These are but representatives of what the program has achieved in other parts of the peripheral zone.

5.4 Zahamena Case Studies

5.4.1 THE MUTUAL SAVINGS AND CREDIT ASSOCIATION OF MIARINARIVO (Mutuelle d'Epargne et de Credit)(MEC)

The Hypothesis: *If a financial institution that would meet rural area needs is operational within the peripheral zone of the Zahamena Special Reserve, it will widely contribute to the economic improvement and stabilization in the peripheral zone and thus develop ways for self-financing development activities initiated by farmers. This will in turn contribute to the sustainable conservation of the natural resources of the Reserve.*

The Issue:

The initial financing of productive activities, particularly in rural regions of Madagascar, has always been a problematic. Whereas savings exists in rural areas, and giving out of loans is commonly practiced, particularly in the larger villages, these loans are given out at very high interest rates and therefore do not contribute to poverty reduction. The formal banking sector in Madagascar traditionally considers the rural poor as economically unproductive and as high credit risks.

On the other hand, when the principle of activity sustainability is taken into account, ICDPs must search for a structure and a mechanism which both contributes to poverty reduction and stops the impoverishment of the peripheral zone population, while at the same time supporting economic activities initiated by farmers and community groups themselves. The people of this region are economically active, though under financed and extremely poor.

A solution is consequently vital to overcome these two needs, all the more so since the project is not capable of continuously subsidizing activities it has initiated at the farmer level. The involvement and building of responsibility among farmers must also take into account this reality for financial investments.

A Potential Solution:

Facing the two-fold problem of the financing of activities important to the socio-economic development of the peripheral zone, and the integration of development activities towards protected area conservation objectives, the Zahamena ICDP has chosen to put into place of a mutual savings and credit (MEC) association as a financial institution which will be within easy access to the needs of both individuals and established groups in the peripheral zone. The savings and loan association of Miarinarivo is probably one of the best examples in Madagascar of community ownership and management of their own financial resources.

Activity review

At its early stage, a feasibility study was conducted concerning the establishment of a mutual savings and credit company focusing on the current problems faced by rural households, taking into consideration household income sources, basic expenses, and savings potential. A member of the project staff conducted the study in 1994. The existence of two active groups in the village of Miarinarivo facilitated the first steps in establishing this program. One was an association of 25 women, the other a men's led group, supported by the project, for a village granary. The project also was able to find an excellent field person to lead in initiating the Savings and Credit program.

Moreover, since putting into place a financial institution requires a financial expert's guidance, which the project did not have, a draft agreement was established with the Tamatave SDID Rural Finances program (Societe de Developpement International Des Jardins). The objections of this latter group was the inaccessibility to the zone under consideration. However, with the ICDP's encouragement and support, this group was willing to accept the village of Miarinarivo for the establishment of the MEC. A major concern was the high risks involved in transferring funds from the village to Tamatave. Before the agreement could be finalized, the Zahamena ICDP had to stand in as the guarantee for funds deposited, for training, and for the construction of the new organization's headquarters within the village. That is how the OMBON-TAHIRY IFAMPISAMBORANA VOLA - OTIV FITARATRA - MIARINARIVO was created.

Activity description

The MEC (Mutuelle d'Epargne et de Credit) consists of putting into place a financial institution in rural areas that is accessible to the rural poor, appropriate, and liable to bring support to socioeconomic activities of individuals and groups. Its principal role is to contribute to the mobilization of savings, to provide security for such savings, and to redistribute such savings through small loans to various members and groups in the community. This activity fosters economic stabilization and the self-financing of micro development projects in the regions it serves.

Individuals or groups can establish accounts at the "Savings and Credit Association" through an initial membership fee of 2000 Fmg. per person, and a one time, 10,000 Fmg. reimbursable "cotisation social". Savings accounts do not earn interest, but are given security - being stored in a large steel safe at the MEC office in Miarinarivo. When the amount in the safe reaches a certain amount, it is transferred to Tamatave to a central bank for safety. People can remove the funds in the account at any time during office hours during the week day. Our inspection of the association's records of member transactions showed a tremendous amount of small deposits and withdrawals. Rather than holding their own money, people are depositing it with the association and withdrawing again weeks or even days later. Loans can be secured by members who have such savings accounts in this Savings and Credit Association. The way it works is that one can take out a loan for four times what one has deposited into a savings account within the Association. The maximum loan given out by the Miarinarivo MEC is 250,000 fmg!

We met with the MEC's advisory board, made up of a local school teacher, the director of the local health clinic, the village leader, a woman merchant. There were also members of the committees of management of funds, and the loan evaluation committee - all local people.

Target Case

This case study was conducted in the region of Miarinarivo, which was taken as the first pilot region for this activity. The success of the initial program has led the Zahamena ICDP to plan two additional MECs in two other remote areas of the peripheral zone of the Reserve.

Miarinarivo is a district located south-west of Vavatenina. Twenty two *fokontany* make up the district. The district has a public secondary school, a health center, and 3 operational primary schools. During the colonization period, this region had known important economic activity. This included graphite mining and the production of export products such as coffee and cloves. Several large concessions of clove and coffee trees can still be seen in this district, most of which date back to colonial times. Only one service road passes through the area for 25 kilometers, linking Miarinarivo with the town of Vavatenina. This road can only be used during the dry season months. Until only recently, this road could only be used by giant 6 wheel drive trucks, like the UNIMOG Mercedes-Benz, used to bring out produce. The 25 km. could take as long as two to three hours. Zahamena project field staff would regularly have to do a five-hour walk to reach Miarinarivo from Vavatenina, the last leg of a tarred road coming out of Fenerive-Est. This year, the Zahamena project in conjunction with CARE INTERNATIONAL/Projet URGENCE were able to rehabilitate a good section of the road.

Our team was dropped off by car at Miarinarivo, where we walked two hours to reach the town of Miarinarivo in which the MEC was located. A first night was spent in the village, meeting with members of the community involved in the saving and loan association. The next day we walked a further three hours to the town of Antenimay, where we were able to meet with members of two groups who had formed and who had placed their funds with the MEC. Both the village granary and the community pharmacy had obtained the loans through the MEC which made it possible for them to function.

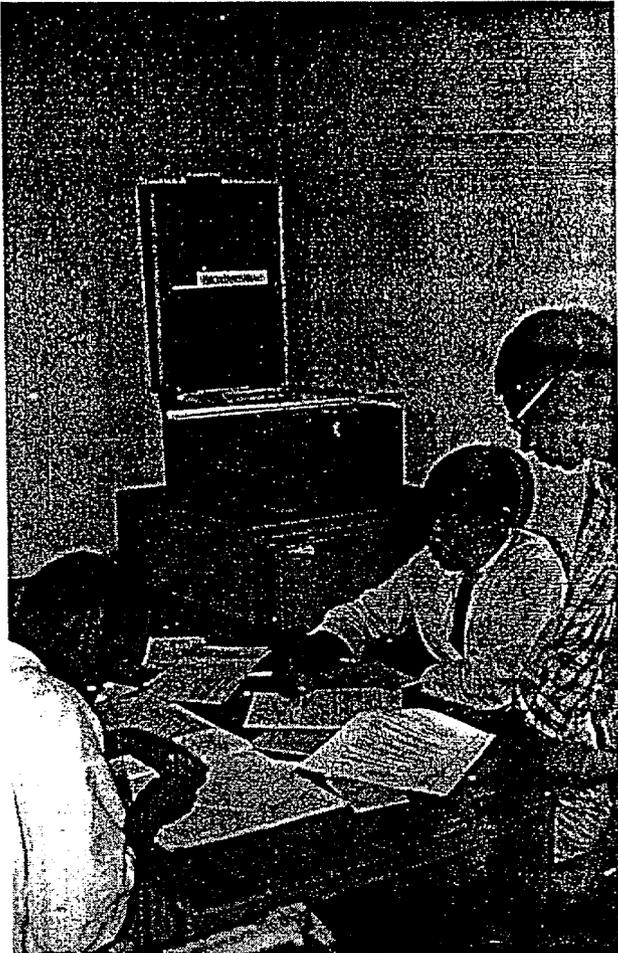
While Miarinarivo is actually located just outside the defined peripheral zone of the Reserve, its importance as the regional center for the villages immediately around the reserve led the program to include it as a hub of activities into the interior. To actually reach the first tree within the Reserve from Miarinarivo, it takes two full days of walking, crossing several rivers and the hills of the Betsimisaraka cliffs. The major ethnic group of the areas is the Betsimisaraka.

Before the arrival of the ICDP project, the village had a women's group called "EZAKA" which still operates. This association was created in April 05, 1993. Their activity consisted of preparing receptions and food services for visiting dignitaries. Their long term objective is the construction of a building designed as an office and a small restaurant. The group had already gained some experience in operating as an association. Each member of the group has to pay a membership fee of 1000 Fmg. A cattle breeders association of exclusively men was also created in this village in 1994, called "KINTANA". These two groups were the first to join and to deposit their association savings with the MEC.

Evolution of the saving and loan association

From only a few members in early 1994, the MEC of Miarinarivo has grown to 181 members scattered over 22 *fokontany* of the district. A few members actually come from as far away as Tamatave II, south-east of the Reserve. The village pharmacy of Antenimay, visited by our team, another aspect of the ICDP initiated activity, has opened an account at the MEC. This village is located south-west of Miarinarivo, three hours walk away.

The savings of the women's EZAKA group mentioned above, made up the OTIV - FITARATRA's initial start-up funds. Since its creation, twenty three loans have been given out to members of the association. More than 75% of these loans are destined to finance rice-growing schemes. Most loans given out by the MEC vary between 150 000 to 250 000 Fmg. (\$37 - \$62). The Zahamena ICDP provides a fund to guarantee the loans, thus providing a measure of initial security and guarantee to the population that their funds are safe. In 1994, the project provided



\$2000 (8 million Fmg) for this purpose. This year, the MEC of Miarinarivo has been able to deposit in Tamatave a total of 30 million Fmg. (\$7,500) representing funds deposited as savings by the association members. In addition to this service, the MEC program provides support to its members in terms of accounting and management of their various ventures.

When the MEC started in 1994, the ICDP turned over to the MEC the management of seven community granary projects which they had initiated earlier. Combined, these 7 groups had been loaned 7 million Fmg (\$1,750) from the Zahamena ICDP. These loans were entirely repaid to the MEC. After taking out the operating costs for these loans, a balance of 6 million remains with the MEC for future loans. In 1995, the ICDP provided a further 8 million in loans through the MEC for a wide variety of activities. Of these loans 7.5 million have returned to the treasury for future loans, on top of that gained in 1994. In 1996, the ICDP has given out an additional 30 million in loans through the MEC. This year the MEC has received this 30 million Fmg. from the ICDP, plus 10 million from members savings accounts, plus an additional 10 million which they hold in their bank account in Tamatave. In this way, the savings and loan association has achieved its capitalization and with good management, should be sustainable into the future. It belongs to the local community and is providing a major economic incentive to small, undercapitalized, economic ventures.

At the time of our visit in September 4, 1996, the MEC FITARATRA had taken in , since its creation in November 1994, a total of 35,931,340 Fmg (\$8,983) in the form of membership fees, and savings deposits. Of this amount, Mr. Mananjara, the treasurer explained to us, they had given out a total of 32,978,529 Fmg (\$8,245) in small loans. This figure includes the loans passed through the MEC by the ICDP (some of which were for amounts exceeding the MEC's own ceiling of 250,000 fmg.) The president of the MEC, Mr. Abel informed us proudly that, as of September 4, they had 2,952,811 Fmg. (\$738) in its safe in Miarinarivo, 8,700,525 Fmg. (\$2,175) deposited in Tamatave, plus all their outstanding loans.

We randomly picked out a member's file from the associations wooden file box (see photo) to review a specific case. Maria Therese, from the town of Miarinarivo, on June 11, 1996, took out a loan for 250,000 Fmg (\$62). She wanted to borrow this for a period of six months on renting rice a piece of land to cultivate rice, so the interest rate calculated was 18% (3% X 6 months), or 45,000 Fmg. (\$11.25). On August 23 she paid in 45,000 fmg. which was payment for the interest charge. She now still owes the 250,000 Fmg., due by December 11, 1996. Group members always pay off their interest charges first. There is a 2%/month fee on top of the regular monthly charge for late payment. The MEC will give a 2 month grace period (during which the borrower will pay the 2% plus 3% monthly interest rate). Should there be default, the MEC will seize the property given as guarantee 10 days later.

Summary of Key Events in the MEC FITARATRA's evolution:

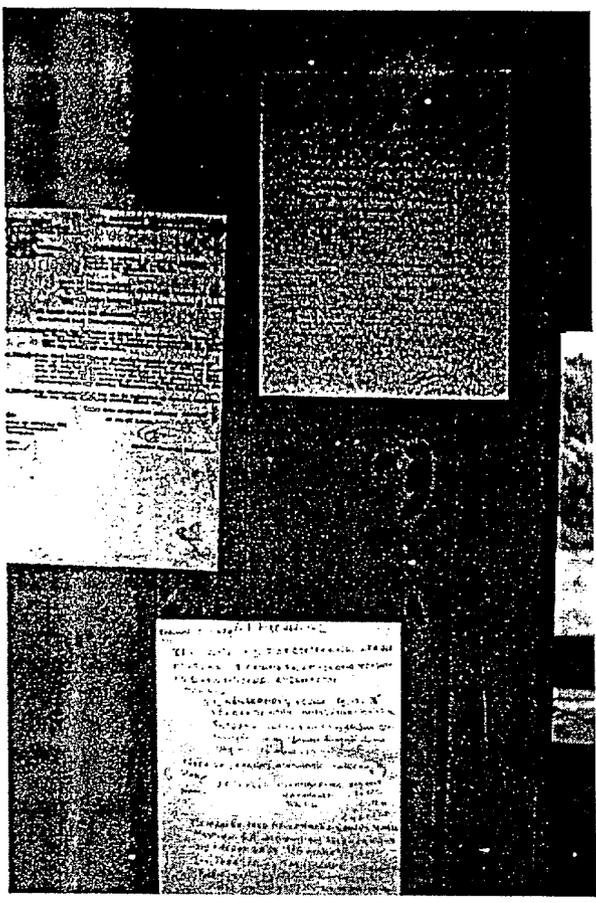
Date	Existing structure	Target population	Activity	Observations
1993	Women's group	Miarinarivo, dynamic women	Reception, food services	Initiative of local women
1994	Village granary	Miarinarivo village people and some peripheral villages	* A few members (village people) among whom all EZAKA group members * First contact with DID * Agreement with the fokolonona on the establishment of MEC	Initiated by the project, exploitation of local structure
1995	OTIV	Part of the INR peripheral zone population	* Board of management created Loan committee, Control committee named * Awareness campaign by the project agent * Official opening of the OTIV MEC of FITARATRA and opening of operations in the District	
1996	OTIV	All PZ population having access to Miarinarivo	* 181 members for whom 23 are granted loans	Training and assistance needs

Feedback from the population

The members of the OTIV association expressed to us how highly they regarded the importance of this savings and credit association in their midst. This can be also seen in the way they proudly refer to it. In speaking of it, they were constantly saying "... ny BANKY MEC..." (... the MEC BANK...). They consider the MEC as a bank where they can get a loan or take one's their deposit for security. They liked the fact that this was "their own money" which was financing their own development through loans to their own members. They stated that it was "a privilege" to have "their own" MEC. One member of the MEC with whom we spoke said that they would be able to begin dealing with "their own problems" now with the MEC, because they would have the ability of taking out (loan) funds to start up new activities.

An interesting example of the ownership of this savings and loan association can be given with two cases of (near) default experienced to date - out of the total of 23 loans given out to date by the MEC committee itself (not including ICDP loans passed through MEC). To receive a loan, the recipient must place something of value as collateral in case of default - not paying back either the principal or interest on time. Two men did not pay back their three month loans on time and had placed as guarantees a rice field and a field of coffee trees. They had a grace period of one month, in which another 3% fee was tacked on what was already due. When this date passed without payment, the MEC committee met to decide what to do. They really agonized about enforcing sanctions on people who were members of good standing within the community. One woman on this committee told us that this was "my money" which was effectively "stolen from us" and we "had to do something about it".

Last year, one of the men defaulting, a Mr. Babosy, took out a year loan for 200,000 Fmg. (\$50). With the 36,000 interest fee, he then owed the MEC 236,000. He paid back 36,000 Fmg on August 27, 1996, plus 56,000 Fmg. towards the principal, leaving 144,000 Fmg. But he defaulted and the committee went after him and the field of coffee trees he had put down as guarantee. His case was posted on the MEC office door (see photo), announcing the date, next Wednesday, when the community was invited to come to an auction of the land. Mr. Babosy came in to the MEC and pleaded for more time, putting down 8000 fmg. towards his late fees, saying that he would regularize his account within the week. Review of his account shows that he actually has 50,000 Fmg. still deposited in the savings portion of his account with the MEC.



The MEC committee said their notices had not been up for two days before both men who had defaulted, came to the MEC office and begged them to give them a couple weeks to pay their debts. They paid their interest fees, and have begun a serious repayment schedule. This is all business, and regular penalty interest fees are paid off before any funds are applied against the principal. We reviewed the books on several loans and saw that this rule was carefully followed. The committee said they were serious about selling off the rice fields, and will do so if the owner does not come forward with the money by the end of the new grace period.

So, to date, it seems the social pressure of simply placing a community member on notice of default is enough to initiate the action by the delinquent to repay the debt.

The presence of the MEC is an advantage for the zone because there is no limit to what a person or group can put into the "bank", nor are there any limits on what loans can be used for. Actually the interest loan charged by the MEC of 3% per month is exceptionally reasonable when one compares this with the normal informal loan servicing of the region which amounts to 100%! One borrows \$50, and pays back \$100 a few months later!

Is the MEC sustainable? The members fear the lack of insurance for their deposits in case of theft or other reasons. However, they feel reassured by the fact that the MEC has already helped them through some difficult periods of hardship, the 1995 cyclone as an example. This has led more people to join. As for the sustainability of MEC activities, members are confident that they will soon have the ability to manage this without continuing ICDP support. The nature of the support now given is that when funds are transferred to Tamatave, the ICDP helps in this transfer. Efforts are being made this year to help local MEC leaders to resolve the problem of security in transferring funds on their own. The last time they took their funds in to the ICDP office, they sent 4 men with the money - which cost them 56,000 Fmg. out of their treasury for expenses.

The community took great efforts in hiring a treasurer whom they trust. This person, who comes to the MEC office each day, earns \$40 month for his services (taking in new savings, payments on loans, starting new saving accounts, etc.). The materials prepared for the MEC are of excellent quality, from the loan application, to the saving application forms, to the daily log of all transactions made by the MEC by the treasurer. Truly impressive!

5.4.2 COMMUNITY REFORESTATION ACTIVITIES OF ANTENIMAY

The Hypothesis: *If communities' common needs in construction and fire wood can be met without destroying natural forests, human pressures on the Zahamena Special Reserve will diminish. Providing alternative wood sources will be all the more viable if it also generates additional revenues for the population.*

The Issue:

Wood is very much used in this part of the country for every day life (construction, household activities, furniture,...). The need for wood increases proportionally to population growth. Natural population growth is doubled by migration. The forest generally offers enough to satisfy these needs.

But these forests are limited and it takes decades for species to recover. Thus, indigenous and rare species are destroyed for low potential and/or value added use. Rare and/or insufficiently known species disappear each year with huge patches of forests. As do the living creatures of rare and even unique ecosystems.

A solution had to be found to both meet the growing demands of the people in the peripheral zone of the Zahamena Special Reserve for wood and to preserve the remaining forest and its biodiversity. This has to be done by involving the population towards better management of these resources. A change in behaviour is necessary so that those who used to clear the land will return to reforest it and become partners in the conservation of their own ecosystems.

A Potential Solution:

One of the solutions suggested by the Zahamena ICDP, after consulting the population, was reforestation of rapid growth species to cover the need in firewood and construction wood. Soil improving species to reduce fallow periods between cropping seasons are also needed.

Development of Activity:

Reforestation has always been practiced to some extent in this area. The Forestry Department (DEF) used to have nurseries to produce young trees that were planted by those fined for illegal land clearing. This approach has been kept unchanged despite the implementation of the Debt for Nature program of DEF and its system of field agents (APNs). At the program level, apart from being mentioned in annual work plans, reforestation was not perceived as a unique activity but rather as one element of a whole, designed to preserve patches of existing forests outside the Zahamena Special Reserve, and as an important means of community forest management and reducing fallow to improve soils.

Our team walked to the village of Antenimay to meet with those active in one such community reforestation activity. Community reforestation in Antenimay started in 1993. The implementation of this activity has been accomplished at community and group levels. Reforestation of rapid growth species has been carried out by the community with leadership of a local administrative authority - who is also the head of the local Health Care Center. This activity included land clearing, digging holes, preparing young trees at the nursery and transferring and maintaining them. For soil improving species, the various tasks were undertaken by a local group of youths under the leadership of Zahamena senior staff. A nursery was put into place in Antenimay with community participation.

This reforestation activity was undertaken on a site of about 1 hectare along the watershed of a steep hill (almost 100% slope). *Eucalyptus rostrata* were planted every 2 meters or so and are now between 60 cm and 3 meters high. Leguminous plant reforestation was done on a 2 hectares area with various species: *Cajanus cajan*, *Tephrosia candida*, *Grevillea banksii*. First tests have revealed the existence of nodules on roots, which means that they are fixing nitrogen, which was the expected result.

Population Awareness:

Community participation in this reforestation activity has been remarkable and should serve as an example. A major reason for success is probably due to the important contribution of the local administrative official. Participation was equally important when the group implemented the soil protection and improvement site with the planting of leguminous species. The community of Antenimay is always ready when young trees area ready for planting out of the village nursery.

In Antenimay, the land ownership issue can be perceived at two different levels. On the one hand, the land used for reforestation had been given by its owner to the whole community to serve as a reforestation demonstration site. The wood produced from this site will belong to the whole community who planted it for their joint use (building/revamping schools or health centers, other uses, sale...). Another aspect of land ownership can be perceived by the fact that regular maintenance is done at least once a year on the site, under the authority of local leadership. The

existence of many private reforestation activities by villagers and the fact the current village nursery can no longer satisfy the demand for seedlings are good indicators of the interest that has been raised by this activity.

There is now another village called Antenina, located two hours walk from Antenimay, which has begun to receive support from Antenimay community members to begin a similar program - without the Zahamena ICDP support!! Antenina is located in the peripheral zone of the Zahamena Special Reserve. The Antenimay group's president and a few members go to Antenina periodically to hold public awareness sessions and provide technical support on reforestation.

Sustainability: What does the Future Hold?

Antenimay has reached the stage where individual members of the community want their own reforestation activities on their own land for rapid growth tree species. This guarantees some kind of sustainability of the activity as the wood produced will generate extra revenue for these people and will allow them to begin to meet their own individual needs. Seen in this way, the community group reforestation stage and forums proved to be the first steps in the transfer of messages and knowledge to the household and individual. It is at this level that we see the pressures upon the protected areas taking place. It is at this level that we see the current degradation of the surrounding ecosystems taking place and again at this level that we will eventually find considerable profits coming to households through their own reforestation efforts.

From Antenimay to other sites?

This community reforestation activity has been undertaken in several Zahamena reserve peripheral zone sites with a fair degree of success. The current approach adopted by the ICDP consists of putting into place village reforestation nurseries with villagers taking part in some of the tasks. This makes reforestation more accessible to the population and at the same time offers on-site training to a few people.

There will not always be a local authority interested in putting his or her weight behind the project, as we have experienced in this case study village. Such a person is needed to leading the population to take care of the trees. Nor will there always be generous people to donate land for community reforestation. But this appears to be the kind of community involvement required if success is to be realized.

Is There Behavioral Change?

The principal person we interviewed was a long-term resident of Antenimay. In fact, he was a "native son" and proud of the fact that all the land around us used to be his ancestors'. Even the site where the village now stands was donated by his grandfather to a few families. When he was a child, he was told that all this land used to be covered by forest. But he had to walk one hour to collect fire wood in the forest, two hours to find construction wood and a whole day to find rare medicinal plants. When he was young and strong, he used to practice land clearing as do all the others, to cultivate rice, cassava and other food crops for his family. He used to go into the "forbidden forest" (the Zahamena Special Reserve) - which took him two days - to collect medicinal plants and food during the shortage period.

As an adult, it took him four hours walk to collect construction wood and at least two hours to find firewood. It is as though the forest were "fleeing" from him, he said. And even the seasons are no longer seem to be what they used to be. Even the water level in his "horaka" has lowered.¹ He has been aware of this problem for some time and has been wondering about the reasons for it.

He is now the main leader of reforestation and soil improvement activities in his village. It was he who donated part of his land (about one hectare) for community reforestation. It was he who gave another hectare for soil improvement and fertilization trials. And another part of his land for the village nursery and the vegetable garden. And a whole hill for a future integrated agriculture and applied agroforestry demonstrations pilot activity. He is a man with a vision for the future - to bring back the trees - to return the moisture to the soils. He does not always understand what a change in behavior means. But he can very well understand what striving to survive and preserving the environment means and he even shares these values.

Conclusions and Lessons Learned:

The community reforestation activity, as it is now being developed in Antenimay and a few other sites within the peripheral zone has permitted the following:

¹ A farmer will have a plot of land upon which he cultivates rice during the rainy season - which is self-irrigated. During the dry season, this plot of land is called a "horaka". Farmers sometimes create bricks for houses from such places. The farmer seems to be saying that the moisture level or water level when one digs into this area during the dry season seems to have gone down or dropped considerably. There is less moisture moving down through the soils, underground than there used to be.

- (1) A first change in the behavior of the population surrounding the protected area. The fact of planting a tree to provide for future needs and thus preserve the remaining natural ecosystems is changed behavior.
- (2) Community activities are now underway. Common interest activities were identified and have led to more motivating and economically more viable individual interests in reforestation.
- (3) There has been an increase, however small, in the local forested area.
- (4) The population has been provided with potential new sources of revenue.

The main lessons learned from the implementation of this activity are :

- (1) For revenue generating activities, only individual commitment can ensure long term viability of the activity;
- (2) "Group" and "community" commitment approaches are way to begin to raise awareness and to spread new messages and techniques.
- (3) It is important to involve local authorities. This allows for quick diffusion of techniques and rallies people to a cause.
- (4) A local population is generally aware of the problems of environmental degradation. But without external help, they cannot find the solutions/alternatives needed to destructive practices which have become traditional. The outside point-of-view is essential for the initiation of the new ideas.

The populations surrounding protected areas are the first actors and concerned parties in the conservation of the natural ecosystems represented by the protected areas. Not only are they the "target population", but they are also the first, and principal, partners in conservation. Community reforestation provides a model for this kind of approach based on partnership, participation, and empowerment. These are key words in the integrated conservation and development approach.

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5.4.3 Community Village Pharmacy of Antenimay

The Hypothesis: *If a community pharmacy can be successfully established in Antenimay, this will permit health conditions to improve within this part of the peripheral zone of the Zahamena Reserve. This will also increase the availability of productive working time since it will reduce the comings and goings to distant villages looking for medicine. This will also result in a reduction of illegal exploitation of medicinal plants from within the Reserve, hence a reduction of infringements within the protected area during which time other biodiversity resources are harvested.*

Background to the Zahamena ICDP's Involvement in a Community Pharmacy Establishment:

At the very beginning of the Conservation International led Zahamena ICDP, the project's mobile health unit's activities were essentially based on basic data collection, health education, consultations, and health care in the peripheral villages of the strict natural reserve of Zahamena - a portion of which is in the process of being reclassified into a national park (cf. Zahamena activity map). Multiple visits within this region over a number of years permitted project personnel to better understand:

- that the state of public health infrastructure and equipment was extremely poor or non-existent. At the site of this case study, people were obligated, in the case of emergency or serious illness, to travel to Vavatenina, 40 kilometers away, to buy medicines or seek assistance.
- the tremendous need and area covered by the public medical sector of this region and the lack of a vaccination program;
- the low use rate of the public health services by local people;
- the lack of sufficient medical supplies and the lack of field medical visits by state medical personnel within region;
- the nature of the prevalent diseases within the region and their causes, and the categories of people most vulnerable;
- the rate of medical evacuations toward large centers along permanent roads.

Contrary to the records of the public health sector field notebooks consulted, the number of public sector mobile field unit consultations (checked-and-treated patients) was particularly high. The understanding gained through these public records pointed to a clear need for the establishment of village pharmacies in target areas. Timely medical treatments or medicines were often the difference between life and death. Medical evacuations are difficult and costly and usually too late to save the patient. And many of the medical urgencies linked to these evacuations could have been dealt with, early-on, had there been minimal medications available for the trained rural health workers to provide. What emerged from all the initial surveys in this region was that support to community pharmacies was considered by all as a first priority. This includes reinforcement of the existing public health infrastructure. The Zahamena ICDP therefore provided early support to rehabilitation of such infrastructure, provision of basic medical equipment, and assistance in training of field medical personnel.

The Issue:

The inadequacy of basic equipment and medicines is a national problem - particularly severe in remote regions similar to the peripheral zone of this Reserve. Visits by public sector health agents are severely limited, given the geographical location and the difficulty of access to most of the villages of this region. Public sector field agents of such regions also seem to be ignored or even forgotten by their superiors in the medical hierarchy. Most of the health care units were in an appalling state. Patients have to be evacuated toward distant medical centers, located near permanent roads, carried on men's backs or on roughly made stretchers carried by several men. Since health evacuations cannot be avoided, they are arranged through mutual aid between villagers. Many of these evacuees die in the process of this evacuation. The costs in time and fees associated with use of such assistance, the high cost of the diverse medicines prescribed once a medical center is reached create further burdens on the rural poor.

Epidemics are common-place and cannot be stopped without external assistance. When such help is finally sent, it usually arrives too late, because of the time and distance to be negotiated.

With the exception for assistance with child deliveries, public sector clinics which do exist in these rural areas are rarely visited. The public health agent has no medications to offer or sell! The population's only recourse is through self-medication, thereby falling prey to unscrupulous, itinerant, door-to-door salesmen, who deliver questionable or dated products at exorbitant prices. The excessive use of such medicines often causes more harm than good to the patient. Fatal accidents due to the ingestion of these products have been documented.

The most destitute of the population use medicinal plants they are able to collect (illegally) in the distant Reserve. In the process of searching for these plants, other forest products are taken.

The mobilization of people to assist during a medical evacuation toward the big centers as well as the purchase of medicines results in both lost time and money for both the patient's family and helpers involved.

A Potential Solution:

"No development without health care!" All rural populations are aware of this basic fact of life. These rural health issues are problems common to all remote areas of Madagascar and common to most of the peripheral zones of the protected areas being coordinated or managed by ANGAP. Working with public service health providers, ICDP health personnel selected the village of Antenimay as a high priority to test support and strengthening of health delivery programs.

During initial contacts by the Zahamena ICDP in 1993 and following contacts made during the aftermath of the particularly destructive Cyclone Geralda of 1994, at which time corrugated iron roofing sheets were donated to the community for their clinic, community members were encouraged to form an association to manage a village pharmacy.

A public health care center without any medicines amounts to nothing. This was the situation of Antenimay when the ICDP staff first visited the area. Antenimay, particularly since receiving refurbished public health clinic in their village in 1994, has wanted to have a community pharmacy. Community members did not know how they could afford it or go about setting one up.

Activity Review and History

Antenimay is located about 25 kilometers from the Reserve boundary, and a long, 40 kilometers hike, from Vavatenina, the closest access by 4-wheel vehicle, where we were dropped off. We spent two days reaching the village, spending the first night in the village of Miarinarivo, where the project supported local savings and loan union (MEC) is located. A further six hour hike, through several streams, over pole bridges, brought us to Antenimay. The return trip the following day was through heavy rain, making for an interesting hike! Without the assistance of local paid porters to carry our supplies, this hike would have been almost impossible (cf. page).

Our case study team met with Mr. Milisata, a public sector health agent and advisor to the Antenimay community pharmacy committee. All the principal members of this committee also participated in our interviews proudly showing us later their pharmacy, their books which they kept meticulously, their stock of medicines. The public health doctor who has been assigned to this village to run the adjacent clinic, and who writes prescriptions for some of the medications, was unfortunately away at the time of our visit. According to the committee members interviewed, the establishment of the community pharmacy had as its primary objectives the desire to:

- help avoid long medical evacuations toward big centers, to save money and time, and lives
- stop epidemics in time
- reduce the illegal exploitation of medicinal plants within the SNR
- fight self-medication as well as medicine peddlers

The Antenimay community pharmacy is run by a Managing Committee of 8 members, namely:

- 1 President
- 1 Vice-President
- 1 Secretary
- 1 Manager
- 1 Treasurer
- 3 Advisors (ICDP project representative, local public health agent, general assembly member)

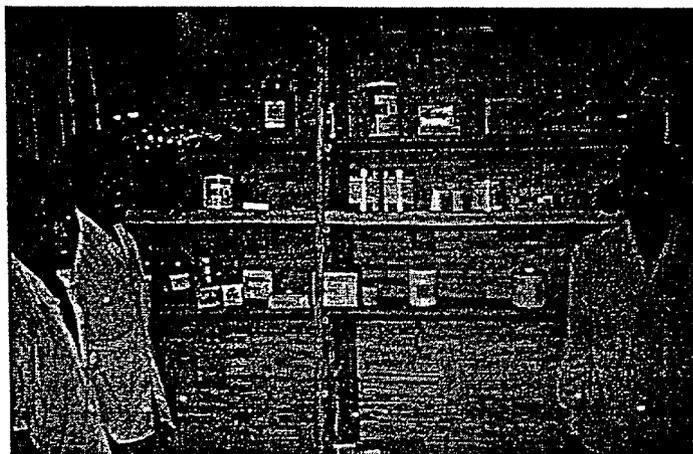
At the administrative level in this region (*fokonolona*), there is a General Assembly made up of members from various other villages near Antanimay. Some members of this assembly can also be elected to this Pharmacy Managing Committee.

The Antanimay Pharmacy Managing Committee watches over the good running of the pharmacy. Their main activities include the control of basic medicine inventory, sales, and income monitoring. It is their job to monitor the stock of medicines and reordering when supplies are low. The ICDP has established a list of the numbers of each unit of medicine which should be on hand, so that a drop below this number will initiate a new order. Currently, the Zahamena ICDP's mobile health unit representative in this region is in charge of replenishing this supply, a task that will fall later to the Managing Committee.

Medicine prices have been analyzed by the population themselves, so that they can afford them, yet be able to maintain a constant stock within the pharmacy. When the ICDP project suggested a markup, over cost, of 30%, the community members suggested 40%. Really expensive, life saving medications, which are not too frequently used (eg. inducing contractions during labor) are not marked up very much as a service to community. Two examples are given to illustrate the different prices in FMG that one can expect to pay, using different sources available to local villagers. Note that the door-to-door salesmen were charging between twice and four times prices that the pharmacy can sell for!

Medication:	Community Pharmacy	Public Health Agents in Vavatenina (40 km.away!)	Door-to-Door Peddlers
Extencilline-penicillin	3,300	7,000	12,000
Cotrim A	230	350	500

For the supplies sold in the community pharmacy, there is a price markup of between 35%-40%. All members of the managing committee are convinced of the importance of this pharmacy for their communities and provide their time at no cost! Only the young man actually selling the medications receives 30,000 Fmg/month (\$7.32). He is paid by the Committee out of the population's membership fees. Pharmacy operating costs come from profits realized on medicine sales as well as the membership fees which all members must pay.



The pharmacy is useful to all strata and age classes of the population. The village of Antanimay with its public health clinic (with doctor) provides services to 6 villages and surrounding hamlets with a total population of about 1,437 people. The majority of people who come to the pharmacy live in the region (85%), but it often happens that people from more distant areas without health services come here to get treatment. Most of these people come from Toamasina II. Health being for all, the pharmacy welcomes, without distinction, all patients with a valid prescription.

It is expected that profits from the sales of medicines will permit this pharmacy to become self-supporting in a year or so. The pharmacy Manager regularly deposits revenue exceeding 100,000 Fmg. (\$25) in the local savings and credit union (MEC) in Miarinarivo - leaving a small balance in the safe for change. Through such deposits, the pharmacy committee has a safe place to leave their money and profits, and can also take out loans worth four times the value of their total deposits at low interest rates!

This community pharmacy began with a 2,200,000 Fmg. (\$537) loan from the Zahamena ICDP. This loan was passed to the pharmacy through the Miarinarivo savings and credit union MEC. Therefore, even though the original capital came from the project, it became part of the operating capital of the local MEC - to whom the pharmacy committee has to pay regular interest fees and to whom the principal loan is paid back. The money is then available to this MEC for new loans of this kind or for other opportunities.

- | | | |
|--|----------------|------------|
| (1) Gross receipts from medications, as of August 23, 1996, are: | 2,173,985 Fmg. | (\$530.24) |
| (2) The Pharmacy Committee has deposited into their MEC savings account: | 975,000 Fmg. | (\$237.80) |
| (3) This leaves them, in their Antanimay account a sum of: | 1,198,985 Fmg. | (\$292.44) |

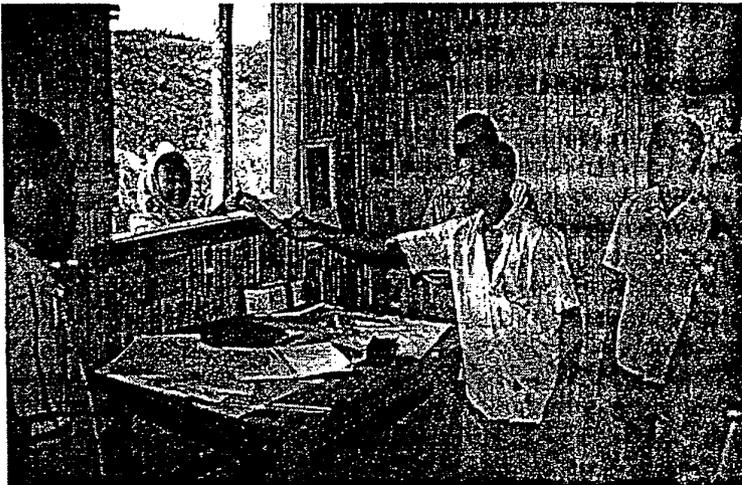
When asked why they hadn't put more into the MEC, they said they planned to do so. They fear carrying so much money between the villages and sometimes ask the project personnel to do this for them.

Of the money they have in the MEC savings account, they have already removed 600,000 Fmg (\$146.34) for the purchase of new drug supplies. These are purchased, with Zahamena ICDP assistance, at REDIPHARM, Office de Representation et de Distribution, Pharmaceutique, in Toamasina (Tamatave). With the large amount of savings this community pharmacy could now have within the MEC (i.e. over 1 million Fmg.), they could take out 4 times this value for loans on more medications or other health related ventures. Committee members spoke to us about the possible purchase of a kerosine refrigerator for perishable medications!

Moving towards sustainability, the pharmacy committee drew its first profits from the sales of the first batch of medications which the above loan permitted them to acquire. Initial profits amounted to 300,000 Fmg. (\$73). The creation of this pharmacy, though it is profit-making, has begun to provide real advantages to local communities. Lower cost drugs! Accessible drugs - greatly reducing the loss in time to look for them in a village 40 kilometers away

- or purchasing questionable drugs from traveling salesmen! The recent slowdown in recorded revenues for the pharmacy can be directly attributed to a significant and progressive decline of medical cases. The fact that people are taking anti-malarial drugs when ill prevents conditions from becoming worse.

The young pharmacy clerk, Taliana Simon, keeps accurate and daily records of the amount and nature of all medications sold. Money is kept in a small safe. A review of the impressively well kept books, showed the following flow of revenue during the dates given. When one considers that most of the sales are for single pills, the aggregate sums are impressive.



October 18, 1995 to October 30, 1995:	261,000 Fmg
October 30 to November 14:	250,000 Fmg
November 15 to February 23, 1996:	355,000 Fmg
February 23 to April 30:	120,000 Fmg
April 30 to August 20:	131,000 Fmg

At the end of this case study we have provided a complete list of the medications provided in this pharmacy. They are few in number, but carefully and strategically selected for impact and importance (Chart 1). The chart also shows the unit (pill by pill, or cap-full if a liquid) price! No one purchases a whole bottle of anything! For additional information, we randomly selected four dates in the pharmacy's register to illustrate what people had bought during these days (Chart 2)! It is hard for urban people and Westerners in particular to conceive of pharmacy purchases in amounts of 8 cents, 9 cents, 15 cents - all people can afford. One photograph above shows the spare shelves of this pharmacy!

We asked the pharmacy clerk what were the top four medications sold to people of the community. Referring to Chart 1 below, the #1 medication sold is #15 'Ofaquine' - a form of nivaquine, an anti-malarial medication. The second most sold medication is #5 'Calci-D', taken in combination with the nivaquine. The third ranking medication is #4 'Cotrim A', a full spectrum anti-biotic (20 pills, 4 times a day). The fourth ranking medication is #18 'penicillin I M'. This comes in small vials which must be injected - used principally for venereal diseases. For this, one must also purchase a vial of distilled water to mix the dry powder in the first vial, prior to injection. A life saver for the two women mentioned below was #13 'Methergin', a uterine anti-hemorrhage drug.

Since the establishment of the community pharmacy, the number of people coming to the adjacent Antenimay health clinic has risen! Monthly records kept by the local doctor show a definite decrease in infectious diseases and intestinal parasitosis. Some of the testimonials our case study team heard include the following:

Mrs. Zoly came from the village of Ambodiara, 15 Km from Antenimay, to receive assistance. She tells of the case of her husband Mr. Indretsa who was recently self-inflicted a serious, deep cut to his foot when using an ax to cut wood. Because of the closeness of the community pharmacy, help could be rapidly organized. In spite of heavy bleeding, Mrs. Zole gratefully acknowledges that her husband's life was saved because of drugs available to stem bleeding.

The lives of two new mothers were saved a few months ago. Giving birth in their homes, both experienced heavy hemorrhaging. Once again, because they were able to obtain anti-hemorrhage drugs from the local pharmacy, delivered to them directly by the pharmacy clerk, they were saved.

Conclusion:

Data collection carried out at the beginning of the Zahamena ICDP program established the creation of community pharmacies as a priority - responding directly to stated population wishes. Results obtained through a well implemented program were beyond expectations.

Since the creation of the Antenimay community pharmacy, the number of people coming there has noticeably decreased as shown by the medical reports from the health care unit. The survey completed on visits to the health center shows that people - formerly used to frequent moving - have become more sedentary. They don't want to move too far away from these medical resources!

Since 1995, apart from a few sporadic and rapidly terminated epidemics, no serious epidemics have been recorded. It is increasingly rare to hear about medical evacuations - except for cases that are beyond the health care personnel's competence. Traveling salesmen selling questionable drugs seem to have disappeared from the region.

People from the town of Antenimay that we visited September 4 -5, 1996, for this case study, told us that they believed that, in the long term, revenue earned from a pharmacy could eventually also help improve the adjacent public health clinic - and that the cost of medical subscriptions would be reduced.

It is too early to say whether or not the opening hypothesis given at the beginning of this case study will be proven true or not. There is no question that the village pharmacy has become very important to the people of the communities living in and around the village of Antanemay. It has given the personnel of the Zahamena Reserve high respect and generated goodwill. It is likely that it will take other similar community pharmacies to have a real impact on lowering illicit collection of medicinal plants within the reserve - and the accompanying other 'pressures' generated when people wander through the forest looking for things. However, with the goodwill established, it would appear that local communities will be in a much better position to respect the council and advice of the Reserve staff concerning their general and long-term well-being - including better use of the environment and diminishing biodiversity of the region.

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6.0 Masoala

As part of the Madagascar National Environmental Action Plan (NEAP), the Masoala peninsula was classified among the top priorities for conservation because of the uniqueness of the biodiversity found both within the forests of the region and the adjacent marine resources. A first attempt to launch an ICDP was initiated in 1989 with the Missouri Botanical Gardens (MBG) and a local development NGO called SAFAFI. Principal objectives were to create a National Park in the region and to implement a program of rural development (family planning, education, improved agricultural production, development of ecotourism) in the parks peripheral zone to assure the long term preservation of the park (CARE, Masoala 1995 Annual Report, 1996:6). This program did not succeed and was suspended in 1991.

In 1992, CARE International assisted in relaunching this ICDP under the SAVEM project funded by USAID. In this process, the program was able to begin to analyze the key pressures upon the natural biodiversity of the future proposed park, and to identify the principal causes and actors. Programs were initiated in 1994 and 1995 to begin to address these pressures and causes. The major goal of the program is to guarantee the long term sustainability of biodiversity while addressing socio-economic needs populations on the Masoala peninsula. To achieve this four major strategies have been identified:

- (1) The improvement of the National Park of Masoala
 - (2) Sustainable use of the natural resources of the peripheral zone
 - (3) Organization of the rural population so as to be able to better help themselves improve their socio-economic well-being.
 - (4) Institutional development at different levels.
- (CARE, 1996 Annual Work Plan, 1996:9)

The Masoala peninsula is found between two provinces: Toamasina and Antiranana, and specifically within the *fvondronana of Maroantsetra and Antalaha*. This peninsula represents the largest remaining expanse of primary forest in the eastern half of Madagascar. Key statistics for this area include:

- It is a peninsula of 520,000 hectares
 - From this peninsula come eleven major rivers
 - It has a population of about 40,000 people
 - The national park in creation will have 210,000 hectares of forest, and a marine component an additional 10,000 hectares
 - Within the peripheral zone of the future park, one finds 100,000 hectares of primary forest!
 - The peninsula has a border of some 40 kilometers of littorial forests
 - The peninsula has 200 km. of coastline!
- (CARE, Annual Report, 1995:5)

6.1 Pressures

1. Slash and burn farming (*tavy*)
2. Commercial forest logging
3. Cash crops (forest products)
4. Construction wood
5. Fishing in the lagoon
6. Secondary products harvested within PA (plant products)
7. Pasturing of cattle within PA
8. Hunting (lemur, crocodile, etc.)
9. Mineral prospecting

10. Freshwater harvest of eels, shrimp, crabs within PA

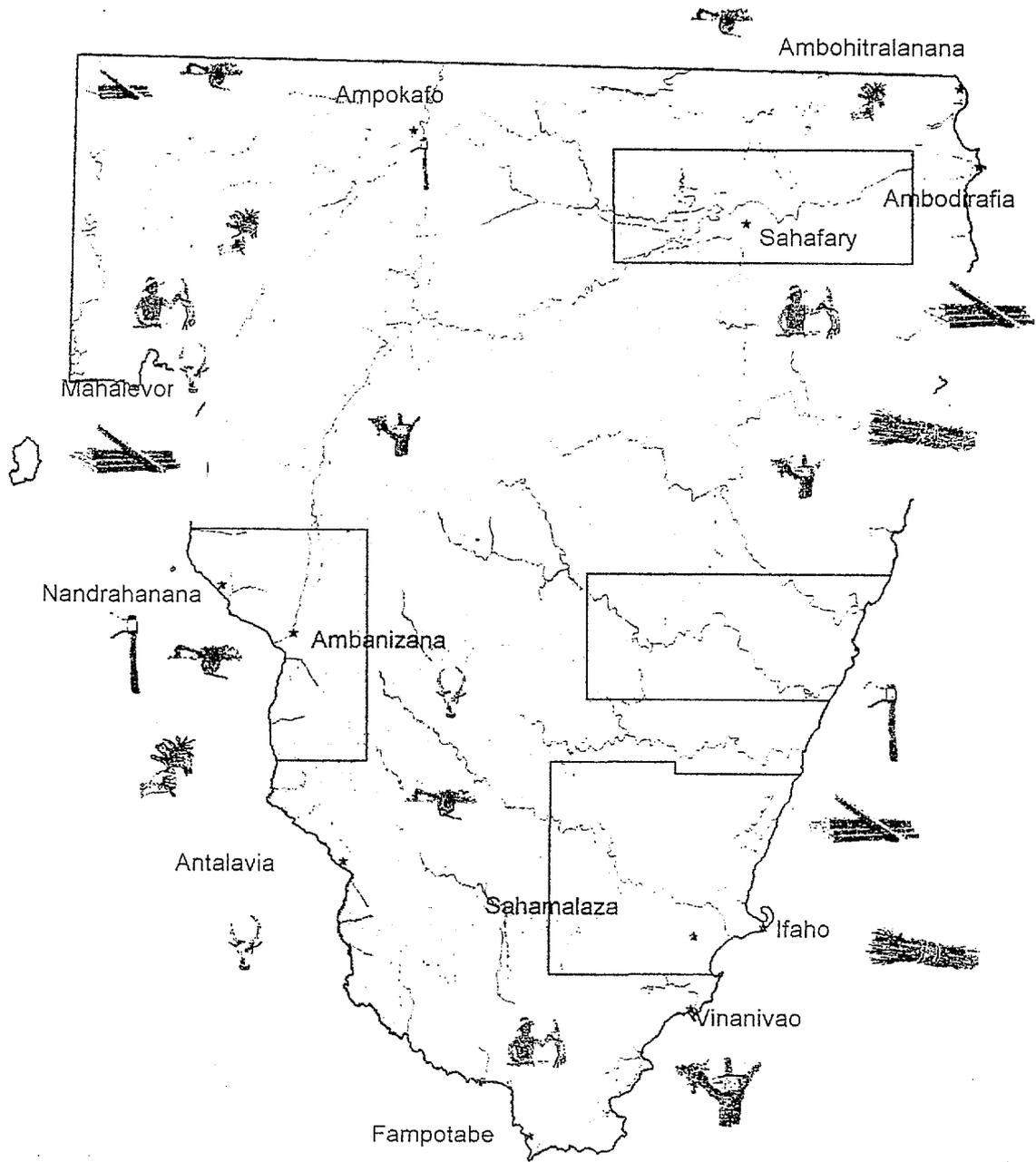
6.2 Causes

1. Demographic Pressure (Migration & Reproductive Growth)
2. Lack of community structures and impossibility of protecting local natural resources
3. Need to satisfy food needs
4. The traditional land tenure system
5. The tradition & custom of slash and burn agriculture, combined with the lack of knowledge or a desire to practice irrigated agriculture
6. Lack of sufficient protected area surveillance/patrols
7. The need for income by peripheral zone residents (thus leading to exploitation of PA resources)
8. Lack of sufficient suitable low-lands for cultivation (intensive rice cultivation)
9. The traditional system of raising livestock (where they are permitted to graze freely within forests)
10. Over-exploitation of certain types of plant material in areas around existing villages (leading to need to search for these within the protected areas where they can still be found).

6.3 Development Activities Proposed as Alternatives

Principal development alternatives targeted include an alternative cropping system for fields which were recently hacked out of the primary forest (*tavy*). Normally, these fields are only cultivated for 3-4 years at the most, and are abandoned, with farmers moving on like locusts to new, adjacent, primary forests. Systems must be developed to not only make a more sedentary farming system possible, but to discourage the continual desire, and ease, of moving on to new areas. Alternative activities are being sought for better management of the forests which are exploited. There is tremendous waste in current harvest techniques - even of very rare and precious hardwoods like ebony, rosewood, and polisandra. Vegetable gardening has been identified as an important new agricultural system for people of this region. Improved fishing on the open sea, which is rich in many species, will also lead to reduction in pressures upon reef and coral fishing reserves, and will also help stem the flow of fishermen becoming *tavy* farmers.

LE PCDI MASOALA CARTE DE PRESSION



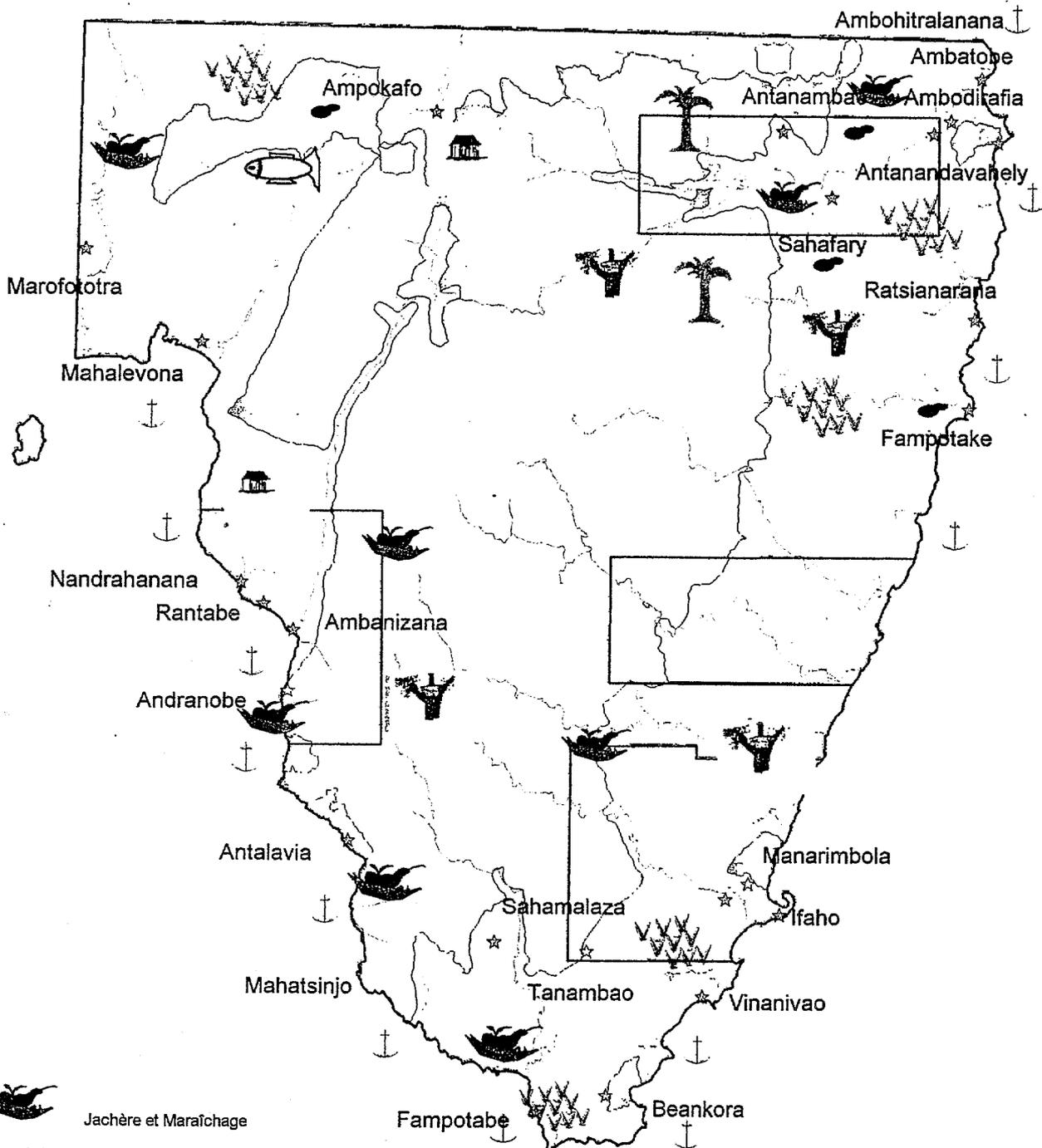
LEGENDE

- | | | | | | |
|--|-------------------------------|--|--|--|----------------------------------|
| | Tavy | | Exploitation de produits forestière secondaire | | Exploitation forestière illicite |
| | Braconnage | | Prélèvement de bois de construction | | Parcage d' animaux |
| | Collecte de miel dans le Parc | | Prélèvement de bois de chauffe | | |



PCDI- MASOALA
Édité en collaboration avec SIG/DIVB/ANGAP

Le PCDI MASOALA ET LES ACTIVITES DE DEVELOPPEMENT



Jachère et Maraîchage

SCT Système de culture sur Tanety

Pisciculture

Grenier villageois

Pêche Pélagique

Apiculture

Artisanat

FD Foresterie durable

PAPAT Projet d'appui aux plantes à tubercules



PCDI MASOALA
Edité en collaboration avec SIG/DIVB/ANGAP

6.4 Masoala Case Studies

6.4.1 FISHING AND TAVY

The Hypothesis : *If marine resources are rationally exploited, they will become sustainable because pressures on breeding stock and young fish will be reduced. Fishermen will not be forced to convert themselves into farmers and therefore slash and burn tavy on park forest lands will be prevented. Fishermen will receive increased revenue through improved fishing management and will be motivated to preserve marine resources.*

The Issue:

Over fishing in lagoons is among the principal pressures on the future Masoala National Park. The lagoon plays a major role for fish survival. It contains coral reefs upon which fish lay their eggs. The lagoon therefore plays an important role in fish reproduction. Young fish first develop in the lagoon before moving out to the open sea when mature.

Small scale fishermen, which is what almost all the fishermen along the Masoala coast are, usually fish in the lagoon because of their limited resources and rudimentary equipment. Because of daily and non-sustainable exploitation of the existing fish populations, the lagoon can no longer provide the required conditions for fish reproduction. The quantity of fish taken by fishermen has considerably diminished. In response to this situation, fishermen use nets with very small holes. This makes matters much worse because they end up taking up everything - destroying the whole lagoon, corals, and young immature fish. Reproductive fish stock are also removed. By trying to increase his catch, the fisherman has actually accelerated the depletion of his future marine resources.

All the villagers on the Masoala coast used to fish for a living. However, after repeated poor catches, they have begun to move, in increasing numbers, to alternative ways of making a living. Given the large areas of unused forest land around them, many have decided to become farmers. When fishing can no longer support them, people move to the land and agriculture for their livelihood. This is how most of the coastal forest of Masoala have disappeared.

From this, we see that poor management of marine resources leads directly to tavy slash and burn agriculture in the nearby forests. This problem will only become more serious if these issues are not addressed in time.

A Potential Solution:

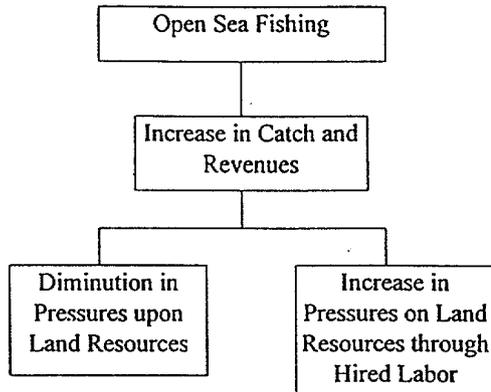
Confronted with this problem, the Masoala ICDP has encouraged pelagic fishing in order to spare the lagoon. All fishermen are encouraged to get out of the lagoon and exploit the open sea. Villagers are very much aware of their diminishing catch. But they think the reason for this is because the fish "have become clever" and have learned how to get away from their nets. So they think it is reasonable to get more sophisticated weapons - nets with smaller and smaller mesh. Unfortunately this will not solve the problem. It only makes the situation worse. The Masoala ICDP therefore began to recommend ways of using these marine resources in a more sound manner. Key strategies in this program include using appropriate nets, respecting a fishing season and a non-fishing season, and open sea fishing.

Eight fishermen associations were initially created after several awareness building sessions. Open sea fishing is usually practiced in small groups of 2 to 6 people, in several small boats, (more if the situation merits), because fishing is difficult and accidents may happen. This has facilitated the creation of fishing associations. Members are usually linked by the possession of a common net. Progress is being made, some associations are developing well, others are inactive.

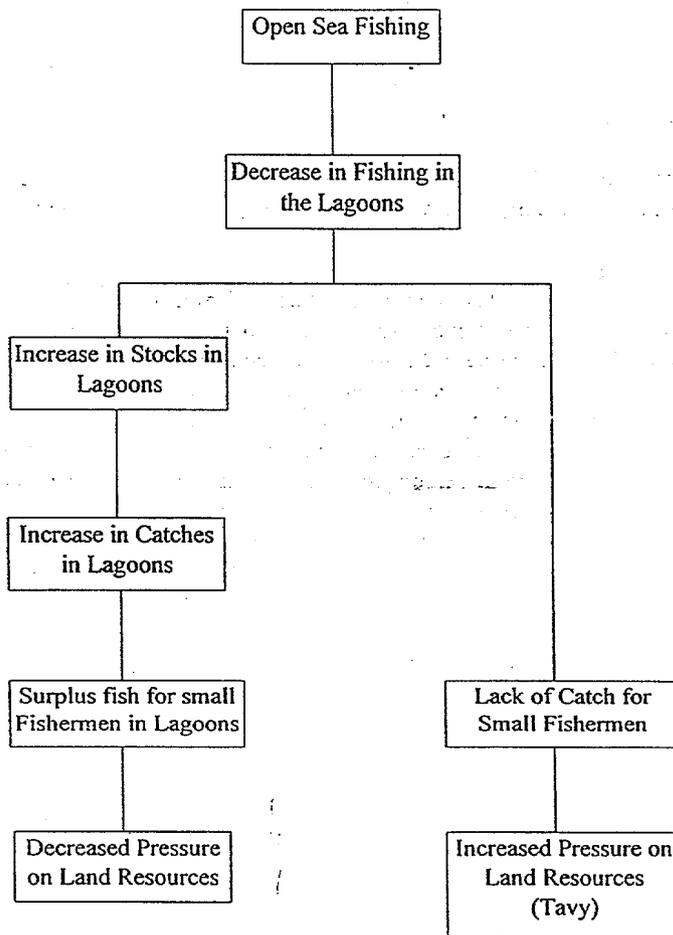
For this case study, we have taken as an example the "Fikambanan'ny Mpanjono" FMC Association (fishermen from Cap EST), based in Ambodirafia, a coastal village along the Ianobe river (BV2). At the beginning of its creation in September 1994, the FMC association had 24 members. Now there are only 17 left. This was due to disagreement between members. Some ended up going off and becoming salaried sailors. Like all associations, there is a president, a vice president, a secretary, a treasurer, advisors, auditors, i.e. office members and simple members. It must be noted that all associations supported by the Project are legal, and have a statute or internal regulations.

FMC fishermen organize themselves in teams of 4 people, in two boats, to fish for 4 days when the weather is good. When they return, they keep 2/3 of the value in money of their catch and pay 1/3 to the association fund. In 1995, a team from the Fishing Training Center in Nosy Be visited Ambodirafia. An evaluation of the area's fishing potential was made, based on surveys conducted by the Project. After having training several fishermen within one fishing association, the team left 6 100m nets, costing 7,200,000 Fmg (\$1,800), to be refunded within 3 years. To date, the association has reimbursed 691,000 Fmg to the owner of the net and its bank credit is of 1,050,000 Fmg. From the information we have gathered by GTZ who provided the initial funds for these nets, the Fishing Training

HYPOTHESES CONCERNING REVENUE GENERATION



HYPOTHESIS CONCERNING STAGES FOR IMPROVEMENT



Center in Nosy Be is not really interested in the reimbursement of the total amount but rather in the association's loyalty. The association has now paid back over 600,000 Fmg. This association was one of the first to receive nets in this region in this manner. All catch files for this association, between March 95 to April 96, are presented below. The charts show the number, location, and approximate weight of the fish taken on each day. March 25, for example, appears to have been a great day! Using 5 of their nets, the association member caught 10 tuna, each weighing about 22 pounds each, four rays of about 50 pounds each, and 2 other fish weighing about 14 pounds. Fishermen must update these files after each catch to enable the association to keep the records it needs to function properly.

Problems encountered :

Appropriate equipment is needed for open sea fishing. The association has asked the Masoala ICDP to provide them with a motor boat. But the ICDP does not have the funding for this. The request was submitted to other donors such as PACT/GMU small projects program, but there has been no progress to date. The nets offered by GTZ were special nets for the open sea and need special equipment (boats) to make the best use of them. Masoala fisherman are forced to use their small traditional boats which reduces their catch in spite of the great potential which exists in the open sea.

Current Situation:

Fishermen have once again become completely engaged in their fishing. They no longer have time to exploit new forests. The lagoon resources are now more or less spared despite the unavailability of equipment for open sea fishing. Thanks to the awareness building campaign led by ICDP staff, the use of small mesh nets is now disappearing. Fishermen are taking greater pride in being what they are: fishermen. Fishermen are no longer changing into farmers - particularly evident in Ambodiarafia. It is our hope that this attitude will be shared by many more fishermen in the future, particularly the young.

Conclusions:

Awareness building campaigns are not enough to accelerate the movement towards more sound marine resources management. Other measures are required. One such measure includes the ability of local fishermen to be able to acquire the right kind of nets and the kind of motorized boats needed to do open sea fishing more successfully. The sea off the Masoala coasts have tremendous fishing potential. But because of the lack of material, fishermen have to fish in turns. If they had enough of the right kinds of equipment, they could go out to sea together. Perhaps the Masoala ICDP might consider a MEC savings and loan program adjusted to the scale which would permit local populations to exploit their rich sea resources.

In order to verify if our initial hypothesis has been confirmed, or in other words, if open sea fishing has effectively decreased fishing pressures upon the lagoon fish - and by extension of farmers leaving fishing for farming, we will need greater time for the interest of greater numbers of fishermen to increase and have their impact.

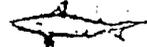
GROUPE ① Pierref - Rabarison - Rajafoanandimby - Rutenon S.
 ② P. ratorakivelo - Bena - Rabison - Rutenon - Rutenon S.
 ③ P. ratorakivelo - Bena - Rabison - Rutenon - Rutenon S.

FICHE DE CAPTURE
 FISIN'NY VOKATRA HAZO

DATE HEURE	NOMBRE DE FILETS EN OPERATION ISAN'NY HARATO/ JARIFA NAVARIGNY AN-DRANO	LOCALITE TOERAGNA	CHANOS VANGO		CARANGUE KIKAO		SCOMB. ANGO		REQUIN AKIO		BONITE JAODARY		RAIE MAKOA/ GOAKABE		AUTRES HAFA	
			isa	lanja	isa	lanja	isa	lanja	isa	lanja	isa	lanja	isa	lanja	isa	lanja
23/05	5	Ambodirafica													46	390,5 kg
25/05	5	- 1 -			10	50 kg			3	18 kg			20 kg	21	38,05 kg	
27/05	5	- 1 -			1	5 kg								15	30,5 kg	
28/05	5	- 1 -							1	5 kg			1	10 kg	6	16 kg
16/05	5	- 1 -			31	228 kg										

① Pierre A. PAULIN-F. - RAZAFINANJIMBY - RALISON.
 GROUPE ② RABRY - RAZAFIMANKIBY - NOBESTER. - RANBATAHANJININA
 ③ PIERRE-A. RATOVELONA. NOBESTER. THIOÏNE N. FICHE DE CAPTURE

FISIN'NY VOKATRA HAZO

DATE	NOMBRE DE FILETS EN OPERATION ISAN'NY HARATO/JARIFA NAVARIGNY AN-DRANO	LOCALITE TOERAGNA	CHANOS VANGO		CARANGUE KIKAO		SCOMB. ANCO		REQUIN AKIO		BONITE JAODARY		RAIE MAKOBA/COAKABE		AUTRES HAFA	
			isa	lanja	isa	lanja	isa	lanja	isa	lanja	isa	lanja	isa	lanja	isa	lanja
																
20/01/96	5	Ambodiarafia	-	-	60	297kg	-	-	-	-	-	-	-	-	-	-
24/03/96	5	- " -	10	100kg									4	20kg	2	6kg
25/03/96	5		6	60kg	1	6kg										
26/03/96	5		5	40kg									8	40kg	2	6kg
28/03/96	5		5	45kg									7	42kg		
5/06/96	5		1	5kg									5	15kg	2	2kg
6/06/96	5				1	5kg							2	42kg	1	6kg
2/04/96	5		2	14kg									1	8kg	7	21kg
2/02/96	5								3	108kg			3	21kg	26	90kg
6/04/96	5												17	31,15kg	20	30kg
7/01/96	5												1	30kg	17	31,25kg
2/06/96	5														8	19,8kg

7.0 Other Integrated Conservation and Development Projects (ICDPs)

Several non-SAVEM ICDPs were also visited by the principal author in an effort to understand better some of the development initiatives these had undertaken and the initial results which might be communicated. Case studies below summarize some of these findings.

7.1 Case Studies

At the Andranomena Special Reserve, a Peace Corps volunteer has been working for two years with beekeeping activities which show promise. The World Heritage site at Bemaraha has followed a separate evolution from the SAVEM ICDPs and has gained some interesting experience with appropriate development. ANGAP's first fully managed National Park at Isalo has used its park entrance fees to provide support for special community identified priority activities. A case study looks at one of these.

7.2 Pressures

Because neither Andranomena, Bemaraha, or Isalo have yet had the opportunity of undertaking intensive study of the various pressures upon these three reserves, we are not able here to present the same detail of specific pressures, ranked by priority, as achieved in SAVEM ICDPs. This is not to say that these programs have not considered pressures. They have as will be seen in the case studies themselves.

7.3 Causes

As with the study of pressures, no reserve wide studies have been made in either Andranomena, Bemaraha, or Isalo on the causes of various pressures, by identifying the authors of these pressures and trying to analyze reasons behind actions so as to link development activities to responding more closely to resolving these problems. However, the case studies given do show a sensitivity to this issue in that a segment of the population has been targeted in each case in hopes of reducing specific pressures upon the reserves and in generally moving towards more sustainable exploitation of natural resources both within and outside these reserves.

7.4 Andranomena Beekeeping Initiative

The Hypothesis: *Beekeepers in the peripheral zone around the Andranomena Special Reserve will better protect and conserve the forest environment as they become aware that their potential for sustainable and increased income generated from honey and beeswax sales depends on the forest's health and diversity.*

Case Study of Improved Beekeeping Management and Conservation

Background:

Peace Corps placed a Volunteer in the village of Marofandilia in December 1994. As part of the Peace Corps Forest Management Project, the volunteer was to implement community based projects in and around the Andranomena Special Reserve as well as work with forestry agents assigned to this reserve. This is the Madagascar region with the most beautiful forests of baobabs (*Adansonia grandidieri*) - but they too are under increasing pressure as more uses are being found for its fibrous trunk. Dense dry forests in the adjacent Reserve, the wide diversity of flowering trees, bushes, and grasses this forest ecosystem provides, the very size (volume) of the traditional log hives, the long established practice of honey collection in the area, and the existence of a preliminary honey flow in August - November and the more important flow in April-June all were strong indicators for a potentially successful effort for beekeeping management.



The Issue:

The PCV started by identifying villagers in Marofandilia who collected honey from wild colonies located in the trunks of trees in the surrounding forests. In the process of taking this honey, the forest is degraded either directly because trees are often cut down or severely damaged, fires set, or indirectly because other forest animal and plant products are gathered while hunting for the bees and honey.

It would be more accurate to say that people of this area are bee-hunters and honey gatherers than beekeepers as such. Hive and bee management does not exist beyond limited ownership of log hives placed near the village. It was found that many log hives stood empty because of over harvesting, or perhaps killing the queen in the process of harvesting. Harvesting was basically a matter of opening one end (or both) of the hive and cutting out combs of both honey, brood, and pollen. Nor did anyone know how to recolonize log hives once abandoned. The majority of the honey was sold to people passing by on the road to Morondava, with some eaten during time of harvest or soon after by the family. Those involved in this activity cited problems associated with the depressed price of honey, difficulty in finding buyers while living at the site of their fields through the rainy season, lack of storage containers for both storage and sales, the problem of

transporting honey, and the vulnerability of log hives from thieves. The PCV and community members set out to devise a solution to these problems.

A Potential Solution:

Before beginning to deal with the issue of bee management and improved hives, it was initially believed important by community members to immediately address the issue of honey sales. Those interested in commercialization of honey and (eventually) beeswax would form a cooperative, establish an account using Peace Corps PASA funds to match members fees (75% PASA, 25% fees). With this money the group would begin to

Corps PASA funds to match members fees (75% PASA, 25% fees). With this money the group would begin to purchase honey at the next honey flow and sell later as prices rose. The cooperative would then seek an outside buyer willing to pay a higher price for an improved quality and quantity of honey. The agreement was that, after recovering the original funds for purchase, 2/3 rds of the profit would return to the original seller, and the other 1/3 would go into the group's treasury.

At the same time, the PCV sought technical support for introducing bee keeping management as a substitute for honey hunting. The Kenya Top Bar Hive (KTBH) was suggested by Dr. Richard Swanson as an appropriate intermediate hive design. The woodshop of Mr. Mohamed Abas in Morondava kindly produced in February 1995, at no cost, two KTBHs and two (swarm) catcher boxes. An equipment failure prevented the construction of six other KTBHs. In March, 1995, the first hive was colonized from a swarm captured in a catcher box and transferred to the KTBH. The PCVs lack of beekeeping experience resulted in slow progress over the next months.



In Marofandilia, a list of 18 men who were regular honey hunters was established during a meeting in November 1994. Timed to anticipate the upcoming honey season, the meeting did not produce an organization. Although a president, vice-president, secretary, and treasurer were named, and a 2,500 FMG (\$.60) membership due was agreed upon, the men preferred to wait until the honey was in hand to organize a cooperative. A first lesson learned was the clear need to see the activity in progress before investing in it should be taken into account in project planning - especially when access to funds demands a community contribution.

In late March 1996, when the major yearly annual honey flow begins, the PCV asked ANGAP¹ for 500,000 fmg. to establish the initial group treasury - an amount which would be paid back at some time in the future. Of the 18 original men, only 5 remained who were willing to make the a contribution of two liters of honey as an investment into their cooperative - illustrating a reticence to invest in an unproven venture. Of the 500,000 fmg. received, 400,000 was actually used to purchase honey from anyone who would sell, from whatever source, at a price of 3000 fmg./liter. The cooperative stored the honey in a 150 liter container loaned (and eventually given) to it by the Deutchen Primaten Zentrum (DPZ), and used the Centre de Formation Professionnel Forestier (CFPF) nursery's storehouse as the point of buying and selling. Mr. Alpha Fohavelo, the original elected president of the association, and his wife, bought and sold the honey as they reside permanently in the village. The unexpected absence of the PCV during the month of April undermined the attempt to establish a system of accounting. Consequently accurate records of honey bought and sold began only on May 19th 1996. The organization raised the buying price from 3000 fmg./liter to 4000 fmg./liter at some point in April to match a rising market price. The selling price later increased from 6000 fmg. to 7000 fmg./liter.

Surprisingly, eight of the original 12 honey collectors initially interested in belonging to the group (but not willing to pay the dues) were willing to sell their honey to the organization with no interest in joining the association - thus forgoing their profit which all went back into the group treasury. The group quickly used up the 400,000 designated for purchasing honey and had to stop buying honey for two weeks in late April until some of the honey could be sold and treasury replenished so they could once again purchase honey. Group members subsequently agreed that from that point on they would only purchase from members. The group purchased their last honey in June and sold their last honey in August. Most members, anxious to have their profits right away, did not really hold the honey until the price had gone up as much as it could have - they rather insisted on early sale and quick realization of profits.

¹ ANGAP had, this year, begun to directly manage the Andranomena Special Reserve itself. Some World Bank funds were available for development activities within the peripheral zone of the reserve.

1996

Initial Capital: 500,000 fmg. (from ANGAP)

Disbursement: 400,000 fmg for 151 liters honey; 13,000 fmg. spent for a bucket, pencil, and eraser

Unspent contingency: 87,000 fmg.

Profit: (above initial 400,000): 452,500 fmg, of which

238,000 fmg. paid back to 5 due-paying members

103,000 fmg. reinvested to group treasury

106,500 fmg. paid to association member who bought and sold honey for group

The group will enter the 1997 honey purchasing season in April with 590,000 in their treasury
(400,000+87,000+103,000)

Improved hives, such as the Kenya Top Bar hives, and the improved management of a colony of bees this will allow, is expected to help the evolving beekeepers of the communities around the Andranomena Special Reserve to substantially increase both honey and the perhaps even more valuable beeswax production. These hives permit removal of honey without destroying larval. They permit easy inspection of the hives for the optimal time to harvest honey. They permit easy creation of new colonies by moving 5-6 bars of brood and honey from an existing colony in a KTBH to a new KTBH with a small mass of bees. The hives can be kept near homes for security purposes. Honey harvested is cleaner, increasing consumer confidence in the product. In August 1996, Dr. Richard Swanson led a training effort with the and four group members in how to successfully transfer bees and brood from a log hive to a KTBH - providing a number of pointers in how to open and manage the one existing colony in a KTBH (cf. photos next page). The importance of a smoker for colony manipulation was shown clearly. At this time, the program has two KTBH with colonies, and should be able to gain many more colonies with the addition of additional KTBHs. Ways of reducing the initial investment cost of such hives were discussed.

We opened one log hive which had a very strong colony (cf. photos next page). Actually the cavity of the log, about 5 feet long and 14 inches in diameter, was completely full. Most of the brood removed was transferred into the KTBH by attaching the comb to bars using baobab fiber strips to bind the combs. A small pail of honey was also harvested in addition to the honey combs given to the new hive - showing the importance of this honey flow during August and September. This KTBH next year should produce at least two similar pails of honey at this time of year, and substantially more in May-June. A conservative estimate for one KTBH, with a strong colony, to produce in one year is between 20-30 liters of honey. It will take a strong transferred colony only six months to get to this strength for maximum production. A captured swarm will take as long as one year to build up to this level. But production should be fairly high for years after this point. If sold when prices are high (10,000 fmg/liter), this would represent an average of 250,000 fmg. - a very significant amount which would not only pay for the entire cost of such a hive, but also produce a strong profit.



Log Hive Prior to Transfer



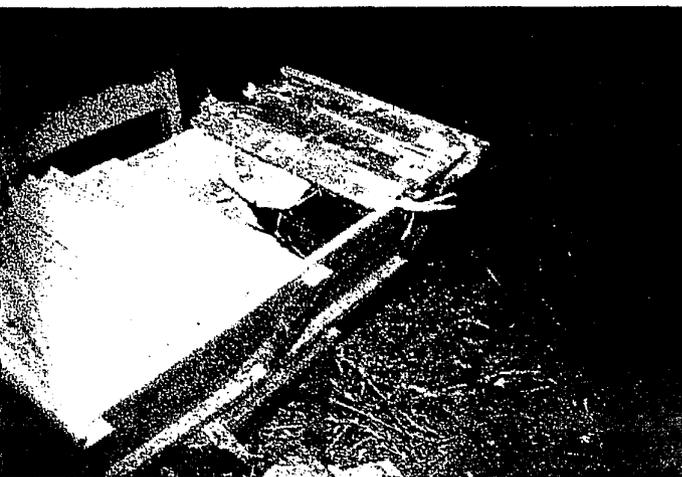
Log Hive Split Open for Comb Transfer



Attaching Combs to Top Bars



Comb Attached to Top Bar



Transferred Top Bars with Combs



Kenya Top Bar, with Transferred Bees, Back in Original Position

Conclusions:

The first complete year's experience has provided a number of valuable lessons to build upon in the future.

- (1) There exists a great reticence to invest in an unproven idea. This is clear from the initial group's unwillingness to come up with even 2,500 fmg. cash dues and the willingness of the 5 actual members to "donate" 2 liters as their group due payment.
- (2) There is a desire for immediate returns. Men were willing to sell their honey to the organization for 3000 fmg and forego a profit (by being members, paying dues, and receiving the 3000 fmg. + a share of eventual profit). This could also point to an apparent distrust in cooperatives or such groups. The lesson learned is that it is probably better to design activities around individual or family group interests and not communal or cooperative structures. Common interests may develop later. The 5 group members who initially (in March) had agreed to wait until as long as August before taking their profits, thus allowing for a higher per liter sale price, ended up insisting on selling out in June so as to get their profits right away. One reason honey sales were pushed more quickly than was probably best (profit wise) was members were testing the system to see if they would *really* earn back this extra amount - over and above the initial sale price received when honey (in many cases their own) was purchased in April-May-June. The next year may give members more confidence to risk going for a higher profit by waiting a little longer.
- (3) There exists a strong distrust of cooperatives or any form of village or community collective organization. Trying to push this from the onset does not work. Only 5 of the original 18 honey collectors in Marofandilia actually joined the organization.
- (4) There exists great discomfort in handling any sum of money for a group of this kind. Members unanimously agreed that only someone with an outside source of income (ie. SAFCO extension agent, school teacher, village health worker, or Peace Corps volunteer) could be entrusted to handle the group's money or serve as treasurer. Their logic was that immediate (and anticipatable) needs such a sick child, death of a family member, etc. would inevitably force the person to "borrow" the groups funds - if at hand. The lack of a salary would make it impossible for them to repay the debt. So better not give rise to the temptation. What is really needed is a rural savings and loan association similar to that in operation at Zahamena.

It is not realistic to expect change of behavior of the kind expected in the above hypothesis statement any time in the near future - it may take a generation. Environmental education in the form of day-to-day discussion, over months and years, will be needed before community members whom we hope will become beekeepers see the linkage between bee management, improved hives, and conservation of the forest resources around them - particularly in the nearby Reserve.

Mr. Jeremy Gulley, Peace Corps Volunteer
Richard Swanson, TR&D M&E Advisor

7.5 Bemaraha Strict Nature Reserve

The strict nature reserve of the Bemaraha *Tsingi* was classified as a World Heritage Site by UNESCO in 1990 because of its special biological, geological, and archeological characteristics. This is the only Madagascar site with this label. Unique biological characteristics include unusual vegetation growing on a limestone sub-stratum, serving as shelter for numerous creatures, including the famous aye-aye (*Daubentonia madagascariensis*), once thought to be extinct. Archeological ruins and artifacts exist, in caves and elsewhere, of the first inhabitants of Madagascar - the long disappeared *Vazimba* people. For geological fascination, no-where in Madagascar, including the Ankarna special reserve to the north, can one find the extensive systems of caves, deep canyons with *tsingi* cliffs, and fossils existing within Bemaraha.

With an official area of 152,000 hectares, it is by far the largest protected area within Madagascar's protected area network of 39 established parks and reserves. Recent boundary adjustments, to become official soon, are expected to increase this to 172,100 hectares. With 210,260 hectares, Masoala, will take first place in size when a long-awaited decree establishes it as a new national park - putting Bemaraha in second place. The Bemaraha ICDP program has completed a proposal to change the southern portion of the reserve, with a further southern extension, into a national park.

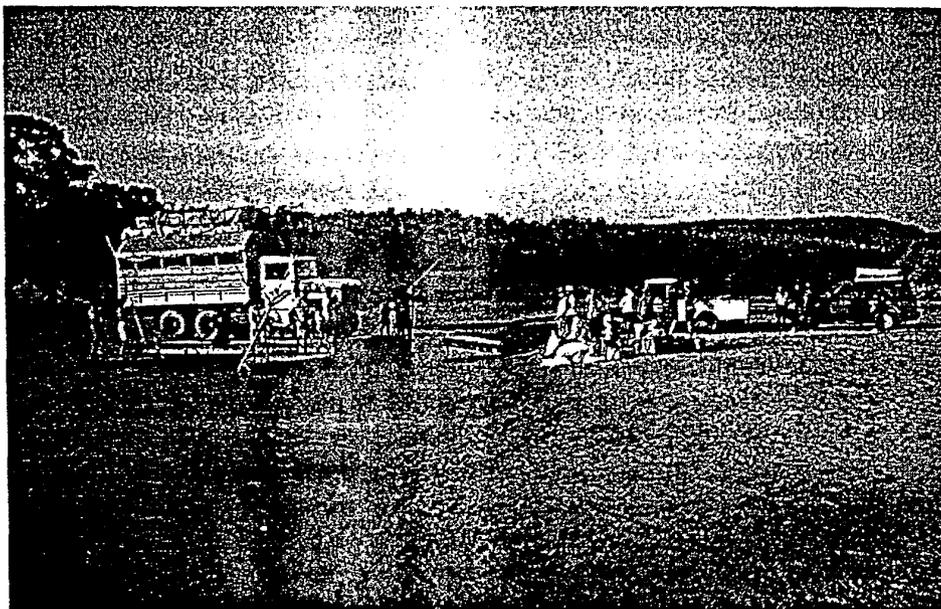
The Bemaraha region is a stronghold of the Sakalava people, largely cattle raising. The peripheral zone of the protected area is extremely isolated. In fact, some areas to the north are considered dangerous to go into by project staff - it is a lawless area. The only way of patrolling this region is by using a small 4 person aircraft which UNESCO operates on behalf of this reserve and the Mananara Biosphere. Though it began in 1992 with over \$1 million in program development funds, the ICDP at Bemaraha has operated under severe financial and material constraints. With an area larger than some of the SAVEM ICDPs, it currently has only 1 old 4-wheel vehicle and 4 motorbikes for its staff. As with other EP-1 ICDPs, they began in 1991 by initiating a wide range of development activities over a wide area - but unlike SAVEM ICDPs, quickly withdrew from this approach to a concentration on those activities which the population came to them for support.

We found that getting to Bemaraha, and the town of Bekopaka, is not an easy affair. Most people coming to visit the reserve today come by road from Morondava. After a two and a half hour drive from Morondava, over a fairly good dirt road, through the beautiful "baobab alley" near the Andranomena Special Reserve, past the "Swiss Forest" with additional sight seeing possibilities, one arrives at a dingy group of huts and buildings on the banks of the large Tsiribihina River. Here one must wait for a ferry to take one across to the town of Belo. The ferry, run by the State and theoretically "free", runs by its own rules and is totally unpredictable. It can only take three cars at one time, and we were the fourth. Having tried to arrive early, we got to the river at 9 am. only to find that there were three cars in front of us - also waiting for the first ferry of the day to arrive. After a wait of about an hour the ferry showed up with two cars and about 30 people. Another hour later, the ferry started off down river. The ferryman could not promise when they would be back to collect us. They might, he said, take lunch before returning. So we continued to wait until about 1 pm when we were pleased to see the ferry on its way back up river. It docked and we were quickly loaded, with two other cars and were off down the river. The mouth of the river into the Mozambique Channel was only about 15 miles downstream, and we could see that the tide was going down. The trip down took about 45 minutes, and upon several occasions the ferry,

with its one diesel motor thundering, had to force its way across sand banks, still unseen under the water. With the final destination in sight, the ferry managed to get itself firmly grounded on yet another sand bank - this one not less than two feet below the surface of the water. We all sat there, for about two hours waiting for the tide to rise again. We finally made the other bank at about 4 pm. The return trip several days longer took even longer.

Without stopping to eat, we made our way out of Belo, a rather interesting town with a distinct colonial times feeling to it. Two more hours over a dirt road, which was clearly impassable during the rainy

season - without passing any village or town - we finally came to the smaller Manambolo river with yet another ferry. And two cars waiting in front of us to pass. But the ferry was visible and the distance across not greater than 100 meters. But this ferry could only take one car at a



time. The sun was beginning to reach the level of the tree tops, sinking quickly, but the river was beautiful, and we could see our destination on the other bank. The ferry was operated by 8 men with long polls which they used to push the ferry across the river. They clearly had this down to a science, and were able to move across the river fairly quickly, unload a truck on to the sand bank, and then begin moving the two cars ahead of us, one at a time, across. It was almost completely dark by the time the ferry came back to get us. Had it not been for the fact that the Bemaraha Park Director was with us, and knew these men very well, we would probably have spent the night on the wrong side of the river. But we did get across without a mishap, and arrived tired, at the Park office where we spent the next several days between August 26-29 in guest quarters, with outside latrine, bath from a pail under the bright stars - and cold nights.

Pressures:

The field program has conducted a study of the various pressures upon this protected area. Because of the nature of the *tsingi* cliffs, the reserve in some areas is 'self-protecting' because access is very difficult, if not impossible. However, notwithstanding a low population density (7 people/km²) within the peripheral zones, there are pressures, and these are linked to the existence of trails crossing the reserve, and the easier access into the reserve from its eastern side. Forest reserves of wood are completely non-existent in some areas of the peripheral zone which has caused rising pressure of this kind, as well as continuing extraction of certain biodiversity unique to the park for various commercial and traditional purposes. A list of pressures would therefore include:

(1) Trails Crossing the Reserve

Trails make entry and removal of biodiversity easier. The *tsingi* does constitute a barrier. Yet, in order to reach the regional capital, inhabitants of the eastern part of the reserve must find trails to cross the reserve, of which the longest and widest is that blasted through the *tsingi* by the oil company Geosource. Are the users of such roads committing illegal entry into the park? Because of the north-south length of this reserve, merchants taking their cattle to market in find no other road or trail to reach Tsiroanomandidy on the western side of the reserve.

(2) Fire on Trails within Reserve

Fire is often applied to grass and brush by people walking along the trails crossing the dozens of kilometers of reserve. This clears a larger area for walking. People also feel this removes places for robbers to hide, from which to attack those passing by. This is an outlaw region! This has led to an ever widening corridor where fire has destroyed the natural plant cover.

The eastern part of the reserve is also threatened by fires originating from the peripheral zone, which each year penetrates further and further into the reserve, destroying vegetation.

(3) Collection of Reserve's Special Biodiversity (for consumption, sale)

Peripheral zone populations extract a number of products from the reserve, including honey, collection of medicinal plants, hunting of birds and lemurs, and removal of wood for firewood and home construction. This is part of the traditional life of the *Sakalava* people of the region. Others are encouraged by well-connected people from outside the region hoping for financial gain from the high prices many plant species can fetch in urban areas - including export. The most destructive of such collection is from the cutting of firewood and for construction.

(4) Rice Farming within Reserve

There is water within the reserve, and this means there are areas ideal for rice cultivation. Farmers are attracted to these sites as areas outside the reserve are used up or dry out. Because of certain rice plant parasites (eg. *poux de riz*), common in areas of many rice fields, farmers avoid this problem by finding isolated areas for cultivation. Because this is a major livestock region, cattle encroachment in fields can also be a problem on the savanna outside the reserve - making the protection of the *tsingi* cliffs attractive to those who find cultivateable land within the reserve.

(5) Livestock Grazing within Reserve

Livestock graze within the park, particularly in the northern areas, and herders can be a cause of fires started for this reason too. Herds passing from the eastern to the western side of the reserve to reach the regional cattle market also cause problems.

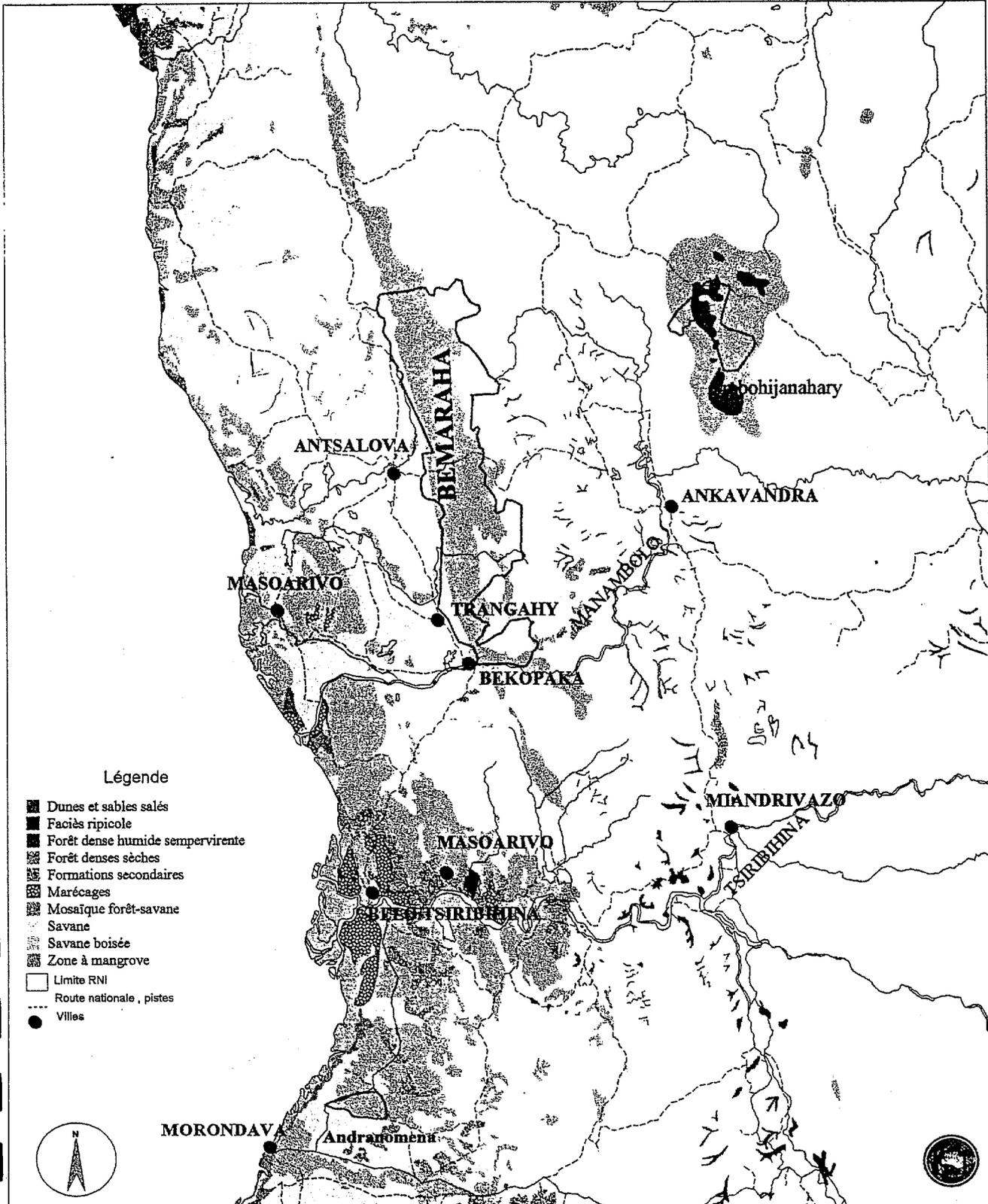
(6) Human Settlement

People have begun penetrating from the eastern portion of the reserve to live within the boundaries of the reserve itself. This is a serious problem which only strong surveillance can control.

For most of these pressures, the program has not yet been able to quantify the seriousness or how widespread these threats might be. But the general agreement among field agents is that the problems are highly localized and not of a serious nature. (Bemaraha Annual Report, 1995:9).

RESERVE NATURELLE INTEGRALE DE BEMARAHA CARTE DE SITUATION GENERALE - FORMATION VEGETALE

Echelle: 1 / 900 000



Document réalisé par SIG/DIVB/ANGAP - Decembre 1996

Extrait de données sur les Formations Végétales de Madagascar, 1972-1979.

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7.5.1 Development Activities Proposed as Alternatives

The Bemaraha ICDP program very quickly learned that the Sakalava people of this region were not people who "could be organized" into associations or village groups as a first step towards rural development. With a big project in the region, people would certainly (and did) form into "groups", if this were the condition for them to get something they wanted from the project. And they did so by forming the first year over 60 such groups. But these disappeared as quickly as the money or assistance had been received.

Now, the Bemaraha ICDP has changed its focus. It will continue to support some of the development activities already initiated or promoted in earlier years only if people come forward with their own desire to establish something or where there is a very strong common interest in uniting together for some venture. Examples of activities which are proving successful include village granaries, vaccination of cattle and pigs. But all this has tended towards a more individualistic approach.

The efforts to improve pig raising provide an example. One quickly realizes that the small black pigs running around every village of this region represent an important part of the local cash crop economy. Rather than trying to create an association for raising pigs (which did not work), the program is helping several individual farmers by providing boars of an improved race. A special contract is prepared and signed between the farmer and the park's program in which the roles and obligations of each are clearly outlined. The farmer must pay back the cost of the boar to the program. Local farmers will bring their local race sows to him to be bred. The deal is that the boar owner can select one of the piglets as his fee. This has worked fairly well. The only problem is that the Sakalava pig raisers don't spend the time keeping track of whether the pigs are in heat or not, so they bring a sow and want to leave it with the boar owner. The boar owner becomes liable for the pig and for feeding it. The boar owners have quickly put a stop to this practice. Now, unless the sow is in heat and bred immediately, the boar owner will no longer accept lodging other people's pigs.

Actually, one improved boar owner with whom we met stated that he has learned that what actually works best is breeding his own local pigs with his own improved boar, and selling the piglets to people in the community. They raise them for sale in the local market. In this way, the project, by helping one individual, becomes the focus point of improved pigs within this community. The program has had an impact on an entire community of pig owners. It is not always necessary to have an association or a village group to have the same impact on a community. It is necessary to understand how human interactions take place in a community - and build upon this. A community need for a rice thresher is in the process of being solved - which will in turn have a major impact in providing excellent feed for pig production.

In the case of cattle vaccination, everyone wants their cattle vaccinated - usually their young cattle. While it would be difficult, if not impossible, to create a cattle association to organize people to gather their cattle for vaccination, the project has taken the approach of being willing to help out if certain conditions are met. Those who want their cattle vaccinated must build a cattle chute and corral. They must agree upon when they want their cattle vaccinated and gather them. If they can do this, the Park's program will help in acquiring the vaccine and in training people to do the vaccination. This approach has worked and will lead eventually to training local people who will be able to obtain the vaccine themselves. In the end, the cattle owners, out of collective

personnel interest and need, organize to get this job done. They do so because it is really something they want to do.

Development activities have continued in efforts for reforestation, controlling fires in the wide pasture regions surrounding the reserve, and to a lesser extent in community health. But the activity identified by the program as having the greatest potential impact on changing people's perception of the Reserve and its protection is associated with ecotourism development. Many different activities have been joined to promote development of tourism within the region. These include not only providing employment for various people as park personnel and tourist guides, but through providing goods and services which tourists will consume through local bars, restaurants, hotels.

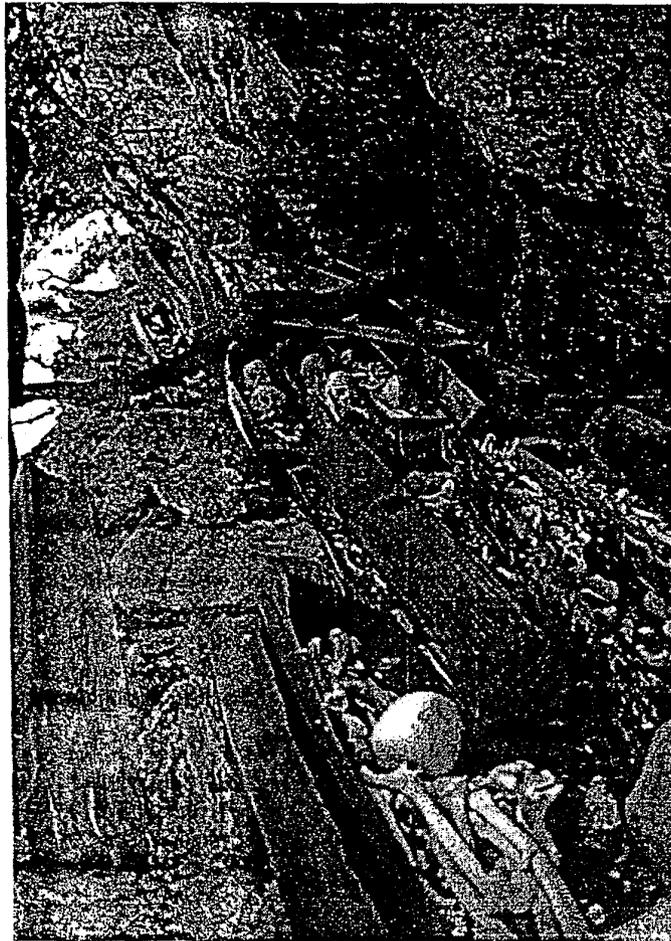
7.5.2 Ecotourism Development

The Hypothesis: of "If this activity is successfully established, we will have made it clear to peripheral zone residents the importance of the protected area for their own economic welfare. New sources income will have been created which will lead to a diminution of pressures upon the reserve" (Bemaraha Annual Report: 1995:37).

The Issue:

What has become increasingly evident to the Bemaraha parks program is the fact that tourism is going to have an important impact on the economy of this region. The program has begun putting into place the groundwork for this by involving the local community from the very outset in benefits and support to the conservation program of the reserve. While the reserve can not be legally visited under its current classification as a strict nature reserve, the fact is that an ever increasing number of tourists have been braving the difficult roads and conditions to get to this remote site for the adventure of seeing the *tsingi* and special vegetation and many other attractions of this region. Starting with only 150 tourists in 1992, there has been an annual increase of visitors, with some 514 coming in 1995, and more than 300 by our visit in August.

The personnel of the Bemaraha ICDP, under the leadership of Vonjjisoa Rasoloarison, took the initiative, with the local population of Bekopaka, to define a large area to the south of the present reserve, across the river, as a future extension of the park - but with a classification as "national park" which would permit tourist visitors. They set their own rates for tourist visits with the community - including what local boat men would charge for taking their wood canoes up river. This area also has *tsingi*, is still untouched and natural. By including this region, the park protects both sides of the Manambolo river passing many miles through the park. The effect of going up this river, from the village of Bekopaka, which is located at its very edge, is of entering a canyon, with cliffs of *tsingi* rising directly out of the water along both sides of the river. The walls of the cliffs are handing with various species of pachypodium and other exotic vegetation. At some places one can enter by foot into the *tsingi* to see caves with stalagmites and stalagmites. At another site along the river one climbs up to see the ancient skeletal remains of the graves of a forgotten race of people - the *Vazimba*. Though no longer existing, the local Sakalava still visit such sites to perform traditional ceremonies. Many of their own tombs are located within the cliffs of the Bemaraha *Tsingi*, not unlike Isalo National Park. With the possibility of walking into the gorges at the base of *tsingi* outcrops, and even walking up to view these from the top, with the possibility of exploring many kilometers of caves and gorges, the future Bemaraha National Park can be expected to move into position among the most visited parks in Madagascar. The remoteness of the access, and the limited periods for visiting (April - November) will limit such visits to the more adventurous and hardy. July, August, and September are the high seasons for this reserve.



A Potential Solution:

The Bemaraha staff has focused on several development activities which they believe will lay the foundation for future tourism growth.

- (1) creating good tourist guides (employees of park)
- (2) organizing the boatmen of Bekopaka to take tourists safely to view the tsingi cliffs, caves, and other sites from a log canoe trip up the river.
- (3) organizing people to grow vegetables for both themselves and the one hotel at Bekopaka
- (4) assisting the growth of private shopkeepers to sell products to tourists
- (5) creating new trails, including areas to explore caves

The Shop Keeper

We met with one young woman of Bekopaka whom the parks program has encouraged in her trade. She was interviewed about the growth of her business during the past three years as this relates to tourism's growth. Njary was a rice cultivator at the end of 1992, when she started her business, working the lands of her parents. She had had a first child when very young, but the father ran off and she has continued on her own - independent. She is not married, though she has two small children, one boy and one girl. During the years up to 1992, every year she was able to save some of her harvested rice and wait to sell it when prices rose several months later - making a tidy profit each time. During this time she benefited from technical advice from the ICDP in improving rice cultivation, and in cultivation of peanuts - a new crop for the region. She saved money from her profits, until, at the end of 1992, she was able to build and stock, with about 1 million FMG (\$250) she had saved, a small, one room, store, facing the one street passing through Bekopaka. Here, she began to sell a few products (soap, biscuits, matches, various spices and herbs, and other needed small household items. She also continued to buy and sell rice and added a new product: peanuts which she cultivated herself and sold.

Her best business, however, has come from selling soft drinks and beer. With the help of her father-in-law, the local Pakistani who owns the only tiny hotel in town, she was able to get the only legal beer license in town. Her Pakistani relative, being Muslim, does not sell alcoholic beverages. By 1994 she had added a small beer stall next to her shop, with tables and chairs, where people could come and sit and drink beer.

We asked Njary if she hired local people to help her in her expanding business. She noted that one could not hire local women to help, because they all knew her as a child growing up, and wouldn't respect her authority. She had already hired, and fired, two women from the town of Belo, and one from as far away as Morondava - who didn't work out. She paid them 20,000 Fmg/month (\$4.00), plus free sleeping quarters and food. Her mother is now helping her, and her daughter (maybe 6 years old) is old enough to begin helping her too.

Her little business is clearly a growing success - with new expansion planned. What were the reasons for her success. First of all, she said that she worked very hard. She noted that she was leaving at 5:30 the next day to go to Belo to buy new provisions, and look into the possibility of purchasing a used kerosine refrigerator from a business acquaintance there. She also explained that "people were buying more and more" and she goes more frequently this year to Belo to get new supplies. Tourists, and the drivers and guides who bring them, are her biggest group of clients now - drinking lots of beer, rum, and lemonade. By getting a fridge, she said, she will better sell items like coca-cola cold - which can only now be purchased at the hotel.

This young self-made business woman was very positive about her future and what she saw as expanding opportunities as more people pass through Bekopaka. The existence of the Bemaraha reserve was seen as a clear opportunity for her to build her trade and she was a vocal advocate of the reserve. With her own expanding business, she is also creating new employment opportunities for people within this village and providing a service as well.

Park Guides

Bemaraha is the only park within ANGAP's current network of parks which has from the beginning employed its own park guides. Salaries for these guides are paid for out of the revenue generated from the tourists fees paid, since 1992, to visit the river and areas of the "new park area" open to visitation. 50% of the revenue from tourists are returned to communities for activities which they define themselves. To date this has included the complete renovation of the Bekopaka elementary school which serves children from the entire area (it is the only school in this region).

The local boatmen, who take tourists up the river to see the cliffs, caves, and simply enjoy the beauty of the river ride, are themselves a form of park guide - though independent. The parks program organized their efforts and jointly came to an agreement of service fees. For a price of 10,000 Fmg a log canoe, a boatman will pole his way up the river for half a day with two people per boat. What frequently take place is that two canoes will be lashed together to provide greater stability. This means two men will be moving the boats along with their long polls, usually accompanied by a park guide. Local rides on ox-carts can also be arranged at a cost of 25,000 FMG/day.

The park is also in the process of training new local residents to become park guides - to be employed by the park. To acquire training, prospective new guides will work with the one full time guide, Charles, when he takes people out. Charles is probably among the best guides I have seen in parks I have visited since I have been in Madagascar. Friendly and courteous. Cleanly dressed. He could speak French very well, and tried out a little English as well. He was not always trying to spout out the Latin name of every plant we saw. He carried a flashlight, fully charged, to show us the caves along the river. New guides receive training by being paid 2,500 Fmg/day for a period of four weeks to accompany Charles when he takes people out -learning from him how to behave and interact with tourists. The 2,500 basically covers the cost of one meal during the day. This money comes from the money generated by tourist fees - the 50% retained by the parks program for its own operations.

Every local person engaged in the parks program, in one way or another, becomes one more local person who will advocate to his or her family and acquaintances the benefits of having this Reserve and the need to protect these resources which are bringing in the paying tourists.

These examples are indicators of the penetration the parks program is beginning to have in the local communities around the reserve and of the increasing economic opportunities being created. The small local hotel of Bekopaka had only 4 rooms last year. They have added three new ones this year, and plan to add four more next year. This is also an indicator of expanding opportunities. Conversations with the hotel owner showed clear interest in obtaining food products from local communities, rather than looking for supplies in the distant Belo. The program's activities in vegetable gardening has already found a steady customer with the hotel.

Conclusions:

With the good will being established between the Bemaraha parks program and the local communities, there is reason to believe that many of the pressures being exerted will be reduced. The ICDP is the only active project in this entire region, and as such, has a great deal of leverage on influential people in the area as well. Discussions with the mayor during our visit about the poor services received from the public run ferry out of Belo, for instance, could have an impact on improving this service for the good of the communities concerned, as well as the tourists who are increasingly making their way to this region. Tourism is bringing money into this isolated region. Local people are increasingly proud of the natural resources making this possible. They are becoming attached to their unique environment.



7.6 Isalo National Park

Created by decree July 19, 1962, with an area of 81,540 hectares, the national park of Isalo is one of Madagascar's oldest and best known. It is located in the south-central arid portion of the country, within the province of Fianarantsoa. Driving south from the regional town of Ioussi, one has the impression of vast, fairly flat, grasslands. Only a few small settlements are found. There is a general absence of life - unlike the bustling, crowded highlands around Fianarantsoa. One may pass a cattle herd or two moving north to markets. Within some 50 kilometers of Isalo, travelers begin to see Isalo seeming to literally rise out of the flat land before them. This impression grows as one nears the Park.

This region is the home of the *Bara* people, many of whom depend on cattle for their living. Isolated from the rest of the country, areas to the west of the reserve are still considered beyond the law. Cattle thieves are known to live and operate out of this area - driving stolen cattle into the western canyons of the park to hide. Wild cattle and boars freely wander through this area. Researchers have come back with reports of lemur populations with no fear at all of humans. The park's landscape is wild, desolate, fully of deep sandstone canyons, where one may find icy cold streams and lush vegetation.

Isalo national park was among the first to be directly managed by ANGAP in 1995 - as opposed to being managed by an international NGO operator under ANGAP coordination. The peripheral zone around the park is lowly populated - villages are few and far between. Yet these people are increasingly exerting pressures upon the park which could cause irreparable loss to the country's unique biodiversity. The park has an interesting history. Among the interesting features of the park are the Bara tombs located in small crevices high up cliff walls. These are sacred sites which local people fear may be desecrated by visitors.

Park personnel have begun to study the pressures upon this park and their causes. Ranked by order in importance, pressures include:

7.6.1 Pressures & Their Causes

- Fire
- Illegal trespassing (people cross the park on footpaths)
- Stealing of park resources (plants, rocks, some hunting)
- Tourist visitors (and their pressures - waste materials, graffiti)

Causes for these pressures include:

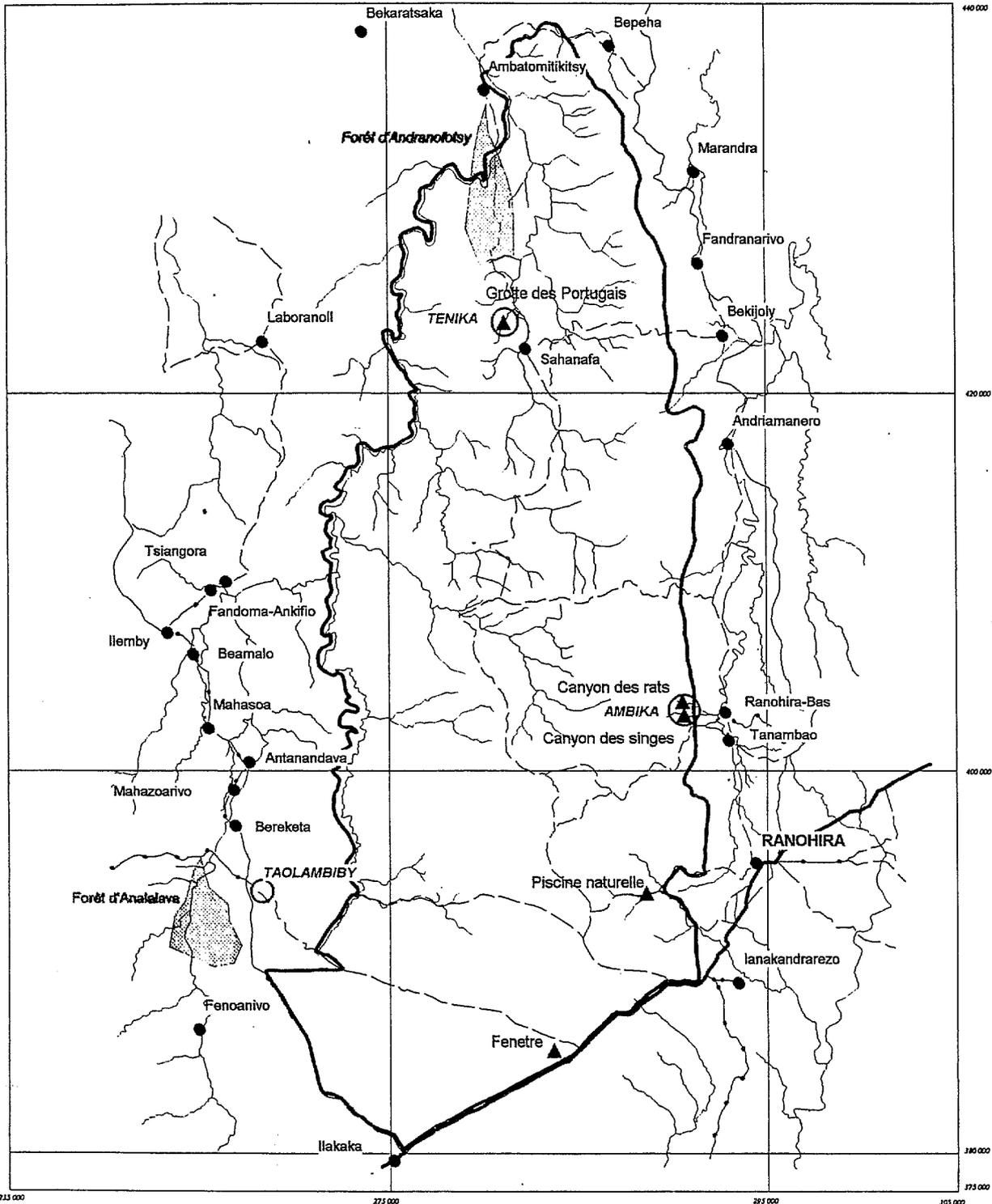
- The need to burn grasslands for new feed for cattle
- Insecurity of local villagers
- Some people start fires in protest to perceived wrongs by the State or other civil authorities
- Discontent
- Poverty
- Traditional Medicine (supplies from within park)
- Lack of firewood & home construction wood in the peripheral zone of park
- Traditional ways of doing things
- Non-respect for the Park or lack of understanding of why it Exists
- Growing Population

The park staff have begun to attempt to address these issues both through their own activities as well as by encouraging development partners into the area for support.

PARC NATIONAL ISALO

Carte de situation

ECHELLE 1:300 000



LEGENDE:

●	Village	—●—	Piste jeepable
▲	Site touristique	- - -	Sentier
▬	Limite Parc	—	Route carrossable
▨	Forêt	—	Route Nationale
○	Ancien site	—	Hydrographie



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7.6.2 Isalo National Park Case Study: Hospital Rest House in Ranohira

The Hypothesis: *Health is a person's first important possession. Placing this building in Ranohira for the care of the sick of the region will be a "door-opener" to the population to raise their consciousness and understanding concerning the existence of Isalo National Park, of its conservation and development activities, many orientated through ecotourism. Many within the population, thus served, will become partners with the park's staff in preserving the health of the park.*

The Issue:

The isolation of the 32 villages in the peripheral zone of the Isalo National Park represents a serious constraint in serving the population's health needs. Only Ranohira, located on the paved Fianarantsoa to Tuliar highway, possesses a medical health center and doctor. This center has neither the means or personnel needed to travel to the outlying villages to provide needed help. People must travel long distances to Ranohira for medical care. This situation requires seriously sick people or those needing help (eg. for child delivery) to travel great distances - as much as 70-80 miles, by foot or ox-drawn cart. Such people travel with their food for an extended period of time, cooking pots, cooking wood, sleeping gear, and family support members - to arrive in Ranohira without any place to stay once there.

Faced with such a trek, and the uncertainties that would confront them once in Ranohira, these strongly traditional Bara wilderness people often elect to stay home and take their chances with their traditional medicines (found within the Park). Given complications, they do not survive. While the actual search for specific medicinal plants, within the Park, might not in itself necessarily pose a problem (though illegal), the real problem arises in that this is not all that is "exploited" when the search is on. Park personnel have also observed that such incursions seem to increase during times of increased bilharzia attacks, diarrhea, and other recurring epidemics.

A Potential Solution:

In seeking some means of helping these people with these medical issues, while at the same time seeking a means of reducing illegal incursions into the Park, Ranohira villagers and others in the area suggested that some kind of lodging within the town to shelter those families coming in for help might be one way to influence both problems at once. Such a shelter would encourage the Park's remote peripheral zone populations to evacuate their short and long term sick to Ranohira. There they could receive the help needed from the public medical clinic.

Activity Development:

During a trip by the Director General of ANGAP to Ranohira and the National Park in August 23, 1993, the DG introduced to a gathering of the town notables and others the new presence of ANGAP in the region. ANGAP's mission was explained. ANGAP was responsible for the management of Madagascar's protected areas, including the adjacent Isalo National Park. He went on to explain that, conscious of the need to integrate the population in the long term conservation of the Park, ANGAP had decided to share 50% of all tourist park entrance fees with the peripheral zone populations. These funds would be managed by an independent association charged to propose to ANGAP micro-projects which would have a socio-economic impact on the well-being of the people and draw them in as partners with ANGAP for the conservation and protection of the Park's biodiversity.

It was for this reason that on March 19, 1994, the Development Committee for Isalo (CDI) was created for the purpose of managing these park entrance fee funds on behalf of the peripheral zone population. Members of this committee studied the various needs of the population. Various suggestions were made: construction or repair of public schools, repair of the market at Ranohira, construction of a pipe line to receive water (from the Park) in Ranohira. But it was the hospital guest house which caught everyone's imagination. Here was something that would help everyone - not just the people in Ranohira (who made up most of the first committee). Everyone was aware of the growing death rate among small children and infants in the surrounding communities - a condition due to the lack of medical care and opportunity to receive such help.

Construction on the medical center guest house began November 1994. What was eventually built was a building with 3 separate rooms, a communal kitchen with two divisions, and a latrine. The building was built with sun-baked bricks. Interior and exterior walls were covered with a cement plaster. Wooden rafters and doors, a galvanized aluminum roof were contributed from the Park funds. With the exception of the construction manager and his men, much of the manual labor was performed (free) by members of the community. They carried and mixed the

carried the bricks to the masons, brought water, cleaned. The final total cost of the venture cost 14,324,439 Fmg. (\$3,494). The guest house has a splendid view of the cliffs of Isalo.

Expenses-Materials	Financing or Effort	Duration	Cost in FMG
Bricks, Cement, Paint, nails, wood, Services	Park Entrance Fees DEAP	14 months	13,894,439 97% of cost
Local Labor	Village committee, with population	14 months	430,000 3% of cost
Grand Total			14,324,439

The official delivery of the keys of the building to the Public Health Service of Ranohira was scheduled for World Environment Day, June 5, 1996. People were invited from each of the villages in the peripheral zone of the Park to the event. Through the speeches and activities that day, the reasons for the need to protect the Park were clearly communicated. The roles and responsibilities of ANGAP to manage this park were also explained. The purpose of the hospital guest house was re-explained and people had a chance to visit it.

From this date, the guest house has been open to use. From the records of the Medical Administrator of the medical center who manages the use of the building, the past four months use are noted and compared with hospital visits in months prior to this time. There is objective evidence that this guest house is in fact playing its intended role. There has been a significant increase in medical visits from the peripheral zone villages!

Month	January	February	March	April	May	June	July	August	Sept.
# of Childbirths	10	5	6	11	10	3	15	20	14
# of Hospitalizations	0	4	2	3	0	3	6	1	0
# of Users of Guest House	NA	NA	NA	NA	NA	3 families	8 families	9 families	8 families

An average of two families per week occupy the guest house. Most of these are families who accompany a woman delivering a child.

Conclusion:

All those using the guest house come from the peripheral zone of the Isalo National Park. Each family knows that it was ANGAP and the 'protectors of Isalo' who made it possible to have this shelter - rent free! The number of women delivering their babies in distant villages has decreased - reducing child mortality. Births at the medical center permit medical personnel to more easily keep track of new births and to provide timely vaccinations.

Since the establishment of the medical center guest house in Ranohira, the people in the peripheral zone of the Park have begun to understand the kind of benefits they may receive because of the existence of the National Park and the tourists who come to visit it. Many of the young people of the area are already engaged as park guides or as employees of the park or various hotels which have sprung up in the past couple years. Park personnel have noted more effective participation of this population in various conservation orientated activities. Examples include use of fire breaks, reforestation, and active efforts to put out bush fires which threaten the Park. The Development Committee of Isalo plays an increasingly important role in efforts to communicate conservation messages. This committee will be restructured at the end of 1996 by including representatives from each of the 32 villages of the peripheral zone. Each village will have its own local committee which will send representatives to the general assembly of the Development Committee of Isalo. In this way, ANGAP hopes to involve the community as partners in the conservation of the spectacular Isalo National Park, while also supporting the socio-economic development of the local population.

Charles Rakotondrainibe, Isalo National Park Director
Parfait Randriamanpianina, Isalo National Park Conservation Chief
Dr. Richard Swanson, TR&D Monitoring Advisor

8.0 Conclusions with Recommendations

Changing human behavior is always a very long term process, full of unexpected pitfalls. Madagascar traditions, such as slash and burn farming (*tavy*) - the #1 pressure upon protected areas, or end-of-dry-season burning, are still very strong in the rural areas in which ICDPs operate. Even after five years, and sometimes longer (!), it is still too early to demonstrate significant change in behavior vis-a-vis targeted pressures upon the parks and reserves. In most cases, program activities, in spite of their cost, represent a 'drop in the bucket' towards having real impact on reducing the most serious pressures. The case studies of this report demonstrate that there are hopeful trends underway but the scale of these activities are so small that one must ask how significant impact can be expected in the long term. This is particularly true as EP-2 development funding will be with less funds available in EP-1, and intended for much larger regions (in regional program approach) - not "just" targeted towards defined peripheral zones of protected areas.

Case study material was obtained through on site interviews with members of peripheral zone communities engaged in those activities selected by the ICDPs themselves as promising or showing some positive results. I was surprised by how difficult it was for most ICDP development personnel, after years of development efforts, to make a selection of even three or four activities of this kind. Most activities were still "just starting", or had been "abandoned, as unsuccessful", or were still in the "research phase" - not yet ready for extension.

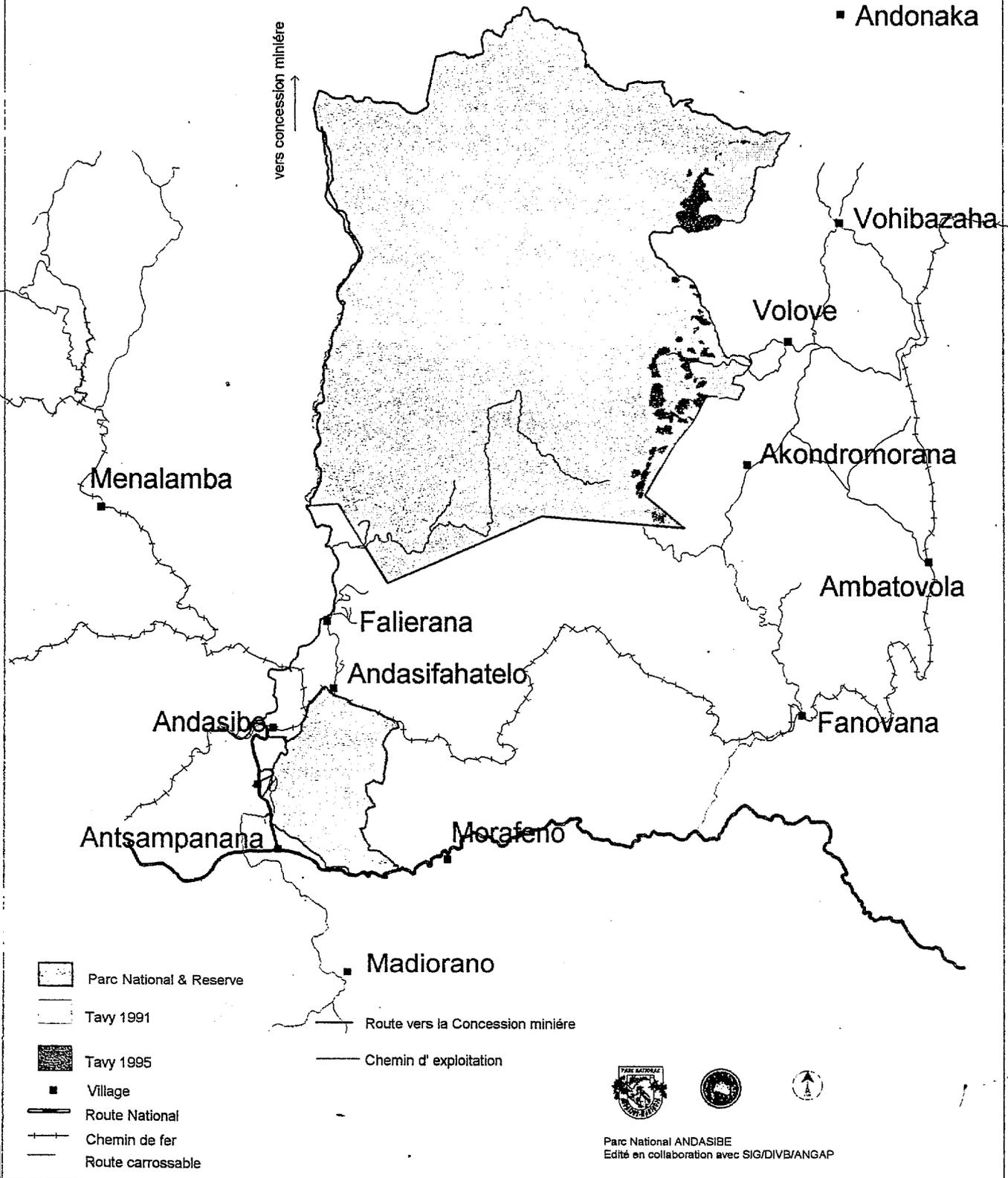
No one development activity can be given sole credit to "reducing pressures of a specific threat" on a protected area. Intuitively, we know that it will be the synergy developed among a range of successful efforts which may lead to these results. The SAVEM ICDP program has not been able to prove, in a scientifically controlled manner, either of these objectives however. With the exception of what may be a (temporary?) end to *tavy* cultivation in the Mantadia National Park near Vohibazaha (VITA ICDP) due to a set of well received development actions, no program can point to clear changes in pressures (cf. map next page showing *tavy* reduction in Andasibe).

8.1 Too Short - Linked to Lack of Focus

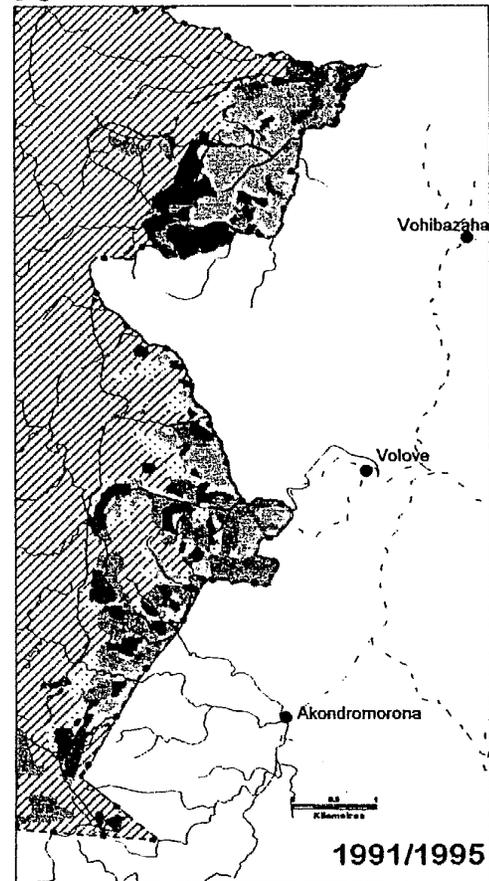
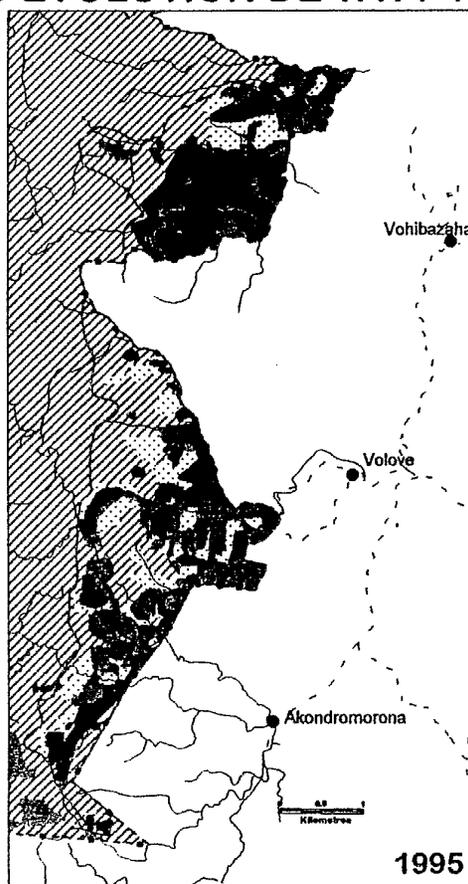
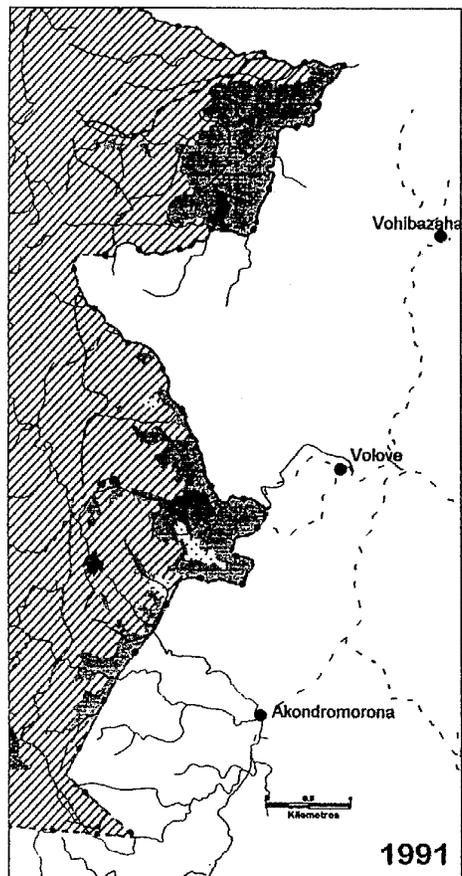
One general theme which came up everywhere I visited was the fact that it takes a great deal of time and effort to launch any kind of development activity. It is often extremely difficult to reach, by foot, the communities in the areas most in need of the development assistance being provided through this program. It can take an entire day or more to reach one distant community, where one must live in either tents or community supplied shelters for days on end to begin to work with people in a participative process. Nothing starts with only one visit. It may take two or three visits or more - using Land Rovers, motor bikes, often walking long distances - to achieve nothing more than to identify one activity in one remote community. The actual activity may not end up costing more than a couple hundred dollars, but the effort in project time and materials to get to the point of actually launching an activity, and then in follow-up technical support, is great indeed. And usually not appreciated by donors or those in central urban offices in charge of a program.

Linked to the inherent difficulty of the task set out for ICDP programs has been the problem of focus and scale. Most ICDP have never been truly focused. All began with a very large menu of development activities - health, livestock, literacy, family planning, fish farming, various income generating activities, agricultural development, infrastructure development, etc. - saying that these

Evolution du TAVY au Parc National ANDASIBE - MANTADIA



CARTE D'EVOLUTION DE TAVY 1991 ET 1995



LEGENDE

-  Tavy (1991) : 393 Ha
-  Tavy(1995): 366 Ha
-  Forêt secondaire
-  Forêt Primaire
-  Autres

-  Limite Parc National
-  Hydrographie
-  Villages
-  Limite Zone Tampon
-  Chemin d'exploitation
-  Sentiers



SIG/PNAM



ANGAP/DIVB

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activities were "door openers". The "project" had to develop an "image" with the population to be taken seriously - the argument went. Once started, few projects could turn back on what had been started - in fact they grew and grew in both numbers and types of activities.¹ Nor did expertise exist within the program for all these various activities - resulting in much ad hoc experimentation by non-trained personnel. Programs were often the only source of rural development assistance within the region - with government social programs dysfunctional or non-existent.

Can focused development have an impact on conservation? To date we can not give a positive answer to this question. This is because there has not been enough focus. There has probably been too much experimentation. There has been too much "re-inventing the wheel" everywhere all over again. There has not been enough time given for learning to take place, and then to be diffused in a widespread manner. One SAVEM tenet was that ICDP NGOs should be permitted to "experiment" in any way they wished. They should be encouraged to develop 'their own unique strategies'. At one point, there was almost a religious zeal among some SAVEM program leaders that one had to leave the ICDP's "pure", so as not to contaminate the special approach which one or another might be developing. Cross-fertilization of ideas between projects was not initially encouraged. This was all in the "hypothesis testing" mode to be discussed below.

Therefore, while some promising approaches have begun to become apparent, the five year life of an ICDP under SAVEM I was not long enough. Its goals were not realistic given the time frame available to achieve results. SAVEM development efforts have not yet had the solid achievements on the ground for even the peripheral zone communities concerned - with the hoped for significant impact on biodiversity conservation. One must question the wisdom of USAID funding for EP-2 which hopes to expand SAVEM development efforts and "lessons learned" to the regional approach. This is premature and will probably not lead to much in the long term for either the people concerned or the country. Given past track records, it is not at all certain that future "development partners" of ANGAP, who may carry on programs in the peripheral zones and elsewhere, will be able to do so successfully or with any more focus or expertise than current programs.

I believe too much money was spent for too many development experiments (by poorly focused and managed field personnel) in too short a time under the SAVEM ICDP program. Greater focus on fewer activities, with professional guidance, over a longer period of time would have had much greater and lasting impact. While it is true that the US Congress is always said to want to have results "in the short term", US foreign technical assistance seems to insist on selling itself short everywhere by a short term attention span to issues which everyone knows, including the US taxpayer and congress, takes time. If we want results, we must show the necessary commitment long term.

8.2 Too Long, Too Much

Because of what I consider to be the lack of focus and narrowed professional attention to a few good long term development issues, it is also probably true that some SAVEM ICDPs have lasted too long. An added two or four years will not necessarily improve upon anything as the

¹ An exception was the ICDP of Bemaraha, whose program funding was drastically cut during the middle of EP-1. Forced to retrench, the program was able to redefine its priorities. With new money, it has been cautious in expansion.

basic approach itself is flawed. Therefore, whether such ICDPs terminate this year or in two years will not make a great difference on their long term impact on the development of these areas.

Related to "too long" is the "too much" issue. One of the best known facts about rural development is that it actually takes very little money to have a big impact at the rural level. It is actually very difficult to spend a great deal of money, in a short period of time, in remote rural communities. Big spending can in fact have very negative impacts on these areas in that it creates dependency - bad in these circumstances because projects are not intended to be sustainable. National organizations also become dependent when such large flows of money are seen over short periods of time. Projects end - usually far too soon. Many of the case studies described in this document were done with very little money.

One of the most serious problems that ANGAP is beginning to face, as a new institution beginning to take over control of the management of the "big C" (conservation and park management) of SAVEM ICDPs, are the big staffs employed by these NGO projects, the numerous development activities underway (at all stages of development). Many will not continue beyond the end of SAVEM funding. ANGAP, as the principal local institution remaining in such areas, is then held accountable for the major drop in funding to development activities, to loss of employment by many ICDP personnel. Recently Ranomafana development staff, fearful of losing their future employment, have threatened to stir up the farmers of the peripheral zone to increase their pressures upon the park in retribution against ANGAP and the protected area program. Andohahela ICDP development staff are on strike (November 1996) for a similar reason - saying that they do not support the way the transition is being handled during EP-2. Staff at the Amber Mountain Complex have for years been criticised for lack of performance, professionalism and suggestions have been made for a clean sweep of the staff - and a new start - again. Such problems have their roots in non-sustainable levels of spending, lack of vision and focus, poor management skills, with the often false expectations this has created in rural areas.

A SAVEM ICDP has had to figure out how to spend close to \$ 1.5 million/year - when many of these community ventures cost less than \$200... So the money is poured into expatriate and national salaries, buildings, vehicles, expensive international travel, endless workshops and conferences ---- and overhead. Infrastructure and equipment are important - but they tend to get the attention when it comes to the budget. And, as pointed out above, it does cost a great deal to simply reach these rural communities where little money can go a very long way indeed. Local communities can only absorb so much, so quickly. But they do need continued and long term support and this costs money. It would be far better to have significantly less money consistently over a long period of time than much money over a short period of time. It is important that at least a short list of the most successful activities identified receive continued and expanded support within the peripheral zones of SAVEM protected areas during EP-2. If such a commitment can not be made, it would probably have been much better that these ICDPs never been initiated. The long term impact may turn out to be exactly the opposite desired by the program - increased pressures upon the protected area as an act of protest and resentment.

8.3 Transversality

When reviewing the various case studies of this report, and when considering the many other activities considered during the course of this study, it has become clear that one lesson

learned is that many activities should be dealt with in a more systematic "transversal" way. Rather than every ICDP, in its isolated region, trying to deal with a range of issues, trying to learn "how to do it" in a new site on their own. Examples are given below.

8.3.1 Beekeeping

Almost every ICDP has independently "discovered" that beekeeping is a non-exploitative, potentially profitable activity, which can be initiated in the peripheral zones of protected areas. The protected areas themselves are targets of honey and beeswax hunters and represent a fairly serious threat to most protected areas. However the success in implementing improved beekeeping management among existing beekeepers, and involving new people, has been inefficient and has had little impact. ICDPs have worked with as few as twelve farmers, with one or two hives each - and the impact of such a group is hardly worth the effort. A critical mass of beekeepers and improved hives are needed to begin to justify the project costs involved in such an activity. The author is a tropical beekeeping specialist himself, and would have to say that in many cases the wrong kind of hives have been introduced, and that the commercialization factor has usually been ignored. It would be far more efficient use of time and limited expertise to have one overall program for beekeeping development among the rural poor of the peripheral zones of protected areas - in which expertise, scale, and volume can be addressed.

8.3.2 Raffia Weaving and Other Crafts

Using this beekeeping activity as an example, the same thing could be said for such activities as *raffia* weaving for commercial and tourist products, or wood carving for sale to tourists - (where new ideas and quality are so important). People with proven skills in training and commercialization should be taking the lead in assisting rural community groups which have been established, or will be established in the future, in improving their products, in seeking commercial outlets for them, etc. These skills have usually been lacking in ICDPs, and when provided, the training has been too brief and not sustained over time.

8.3.3 The Rural Savings and Credit Union

The rural savings and credit program (MEC) underway in the Zahamena ICDP should be something of primary importance in every ICDP program in the country. Access to credit has been a recurring theme of almost every case study of this report - but only in Zahamena has this problem been addressed at its roots. Major pressures upon forest biodiversity take place during times of economic stress - such as during the annual "hunger months" before new harvests are in. One should not be surprised that the rural poor will seek out the "free" resources of adjacent park to sell before considering taking out high interest loans or selling off some remaining family resource. Locally run savings and credit unions provide the most sustainable promise of future growth within these rural communities long after the departure of projects. Projects, and ANGAP itself where tourism receipts exist, can provide the initial capital guarantees needed by local communities to launch their savings and loan associations. They can also channel the funds for small projects through such associations so as to build up, in effect, a large revolving capital fund for future development needs of these communities. Such an action, again, should be approached in a transversal manner. One private sector entity or more should be contracted to set these up around the peripheral zones of protected areas, and later expand elsewhere. This would use limited professional technical assistance in a most efficient manner.

8.3.4 Improved hillside agro-forestry systems

One is disappointed to see so little success among ICDPs in addressing the most important pressure of all - *tavy* slash and burn farming. This issue is so important that it merits a coordinated effort by one or more private sector groups to tackle this issue alone. Agro-forestry, contour cropping, these and other applied research efforts have been initiated in an ad hoc manner by various ICDPs with no results to date. This is a long term, applied research, issue. Large scale, on-farm trials are needed in most of the peripheral zones of protected areas - with long term professional support, financial commitment and monitoring. Major extension efforts would need to follow efforts which have been proven successful. A major problem is that as long as farmers are permitted to cut down primary forest for *tavy* farming, it will probably be more economical, in terms of the farmer's effort and yields received, to continue this until all forests have been successfully removed. Such a field can only be cultivated for two or three years at the most. Then it is easier to find new land to clear than to apply more intensive farming methods. Farmers will be forced eventually to modify their farming systems when the forests are gone. Therefore, the problem is also linked with a national resolve to enforce controls on land use. This again is an effort to be addressed in a concerted fashion by a professional organization - not by the fragmented, non-continuous, efforts of NGOs dependent on year to year funding levels.

8.3.5 Community Food Security Granaries

A very popular activity developed in most ICDPs was community granaries. Three case studies selected by ICDPs in this report chose this activity as one they wished to tell about. Yet, review of these activities shows considerable variations in the theme. Every one was approached differently. Three basic types of community granaries were supported: community food security granaries, commercial grain banks, and seed banks. Each has very different purposes. The first seeks to create a rice reserve within the community for members, and others, to benefit from food supplies within the community at reduced prices during times of the "hunger season". People are not forced to take out ruinous loans just before harvest, or sell off harvests at steep discounts at harvest times - because they have no money. The community food security granary purchases a member's rice at going rates at harvest - but the rice doesn't leave the community. It can be repurchased later at lower than market rates. The commercial grain banks organize to speculate on these prices - buying low and selling as high as they can. They are profit motivated - not service or food security motivated. Seed bank granaries serve the purpose of keeping high quality seed available within the community for a next season's planting. This protects households from risk of selling off most of their grain stocks for economic emergency purposes - but then having to look to the open market for whatever rice one can find for planting - not necessarily the best varieties for the area concerned. Considering these options, it would seem that the community food security granaries are the first and most important category of "community granary" to initiate, if requested by households. Using project funds to support commercial speculation granaries is more dubious in that one segment of a community is in fact exploiting another (poorer) segment of the community. Seed banks can be a complement of food security granaries.

Given their importance to local communities, I was surprised that programs had not given even more support than they had to community food security granaries. A reason given is that these were not highest priorities given by community members when activities were being determined for program support. Yet the way project activities are in fact selected gives some question to this argument. While "community participation" is always claimed by projects in determining activities, the reality is that, when all is said and done, there is a menu of activities

which communities end up choosing among which project field agents "suggest" and which community members "choose". Some organizations, using PRA (participatory rural appraisals) manage to find that communities always "choose" two or three stock activities - which that organization has developed skills in. PRA interviewees might say they would like a new hospital, or a new road to market, or a bridge across a river, or a new school building, etc. The project then says "Well, we don't do those kind of activities". So the communities members ask, "Well, then, what can you support, what do you do?" So development agent give out the menu of suggestions and communities make a choice. This is called "community participation" in selection of activities. While this might seem a perverse turn of a noble conception, yet it is in fact what usually takes place. Nor is this necessarily wrong. What is wrong is that project field staff are placed in the position of calling what they have been doing by a name "community participation" which will please the development philosophy approach of program leaders. It would be more honest to simply say up front that this is what an organization can competently help a community to do, and will be willing to provide such support if the community will organize itself in a manner which will permit program support. When the organization has been put into place, by the community-itself, then the program will provide its support.

8.4 Village Groups

Another recurring theme in many ICDPs has been the difficulty of initiating "village associations or groups" with whom the program could develop development efforts. Development agencies around the world in recent years have pursued this philosophy with zeal. There is sometimes reaction and mistrust of any such groups at the local level. Most ICDPs, in early years, were able to create many such groups, based on the recipients perceived belief that this was the way to receive the benefits of the project. Project develop staff pushed this because it is of course easier to work with one group of 30 members, than individually 30 individual households. But such groups, once the money was distributed, often quickly disappear. It is one thing to actively create groups to receive assistance, and quite another for community members to organize themselves to be able to receive assistance. The short life span of many "village associations or groups" can be attributed to the fact that someone else organized them to become recipients of aid.

It makes no sense, in Madagascar or elsewhere, to create a group in the absence of a real need which would draw a group together. One must rather create the incentives for people to want to organize themselves. In some of the case studies, it was only after individual households had found that a specific need could not be met in any other way that they began to show interest in collective need to solve this specific need. One does not create the group first, and then look for needs to fulfill. It is community initiated needs which require a collective response which leads to the formation of a group which might become sustainable. Such need draws the right kind of people together. Both the case studies in Andranomena (beekeeping) and Bemaraha (cattle vaccination) illustrate this principal.

8.5 The Hypothesis Testing Approach

Hypothesis testing was definitely carried too far - to the point that some actually discouraged professional directed change from outside - even when it could be evident to anyone observing what was taking place that an ICDP program did not actually have the expertise or vision to change or evolve in different directions. At one point, taking good ideas of "what seemed to be working in one ICDP" and transferring it to another was discouraged. The argument was that we should give ICDP's the time to develop their approaches to see "which hypothesis work". At the end of the program, we could share with others 'what worked'. The problem is that doing this in fact tended to discredit the entire ICDP approach which in itself had great potential - but needed time and as I have argued, needed some professional directed change as well.

8.6 Commitment

Over the past three years, I have worked with field staff of over 12 ICDP projects all over Madagascar, including the 6 SAVEM ICDP - as well as personnel working in at some 6 other reserves. Two aspects of field work continually made an impression on me as I traveled around.

- (1) The hardships which many expatriate and national personnel faced, willingly and eagerly, to accomplish the work they were undertaking. One often had to walk for days, sometimes even weeks, into the field, with backpacks, wading rivers and streams, sleeping in uncomfortable quarters, eating unfamiliar food. Many of these field partners really believe in what they are doing - it is not just a job for them. They believe that what they are doing is important. They want what they are doing to have an impact on improving the lives and well-being of some of Madagascar's most disadvantaged people. They also really hope that by doing so they will also help in protecting some of the natural forests and biodiversity which many have come to love and respect.
- (2) I say all this because of the second fact which becomes equally evident and which I have found to be incompatible with successful implementation. This is the lack of real support given to these people from some central offices and from ANGAP and its donor community itself. While having the power to facilitate the efforts of field personnel - making them more efficient - what usually takes place is that central offices usually make life more difficult with endless petty rules or procedures. Money is not delegated to the field where it is most needed in a timely manner. The authority to spend is often lacking if not previously cleared by the central office. Field programs must be kept on an endless shoestring.

A recent example comes from the Bemaraha project where ANGAP insisted (because they say of World Bank procedures) that the receipts which were sent for a past quarter's billings were not acceptable. What is needed are "purchase orders" from the client which can be accepted and subsequently billed for. So an already understaffed project, having already run out of money, must run around looking for the people from whom they previously purchased services (and received a receipt) and redo their receipts into purchase orders. The project won't have any money until they can take care of this and clear all these outstanding bills.

One way to move towards improvement in this situation would be through the staffing of central Tana and regional posts with people who have had real long term field experience within the program. This is a definite weakness within ANGAP. ANGAP is

now fortunate to have a large cadre of potential good field staff trained through the ICDP program of the past few years who should be assisted to move up within the system - into ANGAP mid and senior positions. This will encourage a career track within the national parks system of Madagascar. ANGAP should see that field compensation in fact encourages good people to stay and function adequately in the field. Their salaries should be higher, not lower, than central Tana or regional office salaries. They are no less professional - just out of the view of decision makers and powerful people who hold the purse strings. This is but one example which can be given over and over again.

ANGAP and its operators have many expatriate and national staff who are living and working under conditions which no-one in Tana would consider living for one day, much less years. Many are spending months and years of their lives in areas of difficult access; they are eager and motivated in their work - but are frequently left without the financial and logistic resources needed to accomplish many of their efforts. How are these people being helped? In an environment where we seem more concerned about having enough computers for the office, or getting some more project vehicles so that office personnel don't have to take a taxi to work, too many field staff are living in impossible situations without adequate support and encouragement. This is unacceptable. Donors funding should not encourage this situation.

8.7 Concluding Remarks

Having visited most of the integrated conservation and development programs in Madagascar at least once, and some as many over ten times over the course of the last three years, I am sometimes asked how the different ICDP programs compare with each other - in a general sense. Which ones could be said to have achieved more than others. While very subjective, my response has been that both the Zahamena and Ranomafana programs have been fairly well run and are beginning to have some very promising results. Andasibe, though seeming to have had a slow start also begins to show achievements in the development sector. Masoala development activities have been initiated too recently to draw any comments. The programs which appear to have had the greatest problems and also seem to have the least results must be Andohahela and Amber Mountain. Quality of program management, local politics, lack of focus, these and other reasons would explain this situation.

ICDP's are difficult if not impossible to implement. This is particularly true when programs cannot be developed with long term assurance of continuity. Madagascar protected area experience with ICDPs is not over. Some non-SAVEM programs will continue into the EP-2 (1997-2002). Even among SAVEM ICDPs, while who will be doing 'development' and who will be doing 'conservation' will be different, the ICDP philosophy will continue to some degree. The socio-economic needs of rural populations around protected areas will need to be addressed. However, at no time has anyone claimed that this alone will protect the biodiversity within parks and reserves. Without effective measures for sanctioning illegal activity within parks and reserves, without clear boundaries to patrol, protection can not be assured.