

Final Report of
Activities

November 1991-
December 1996

with special focus on
1994-1996



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Return to NRO

Submitted to
United States Agency for International Development
Contract number 623-0110-C-00-1040-00

Submitted by
Tropical Research and Development, Inc.
Gainesville, Florida, USA

January 1997



Association Nationale pour la Gestion des Aires Protégées
National Association for the Management of Protected Areas

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Submitted to:

United States Agency for International Development, Madagascar
Contract No. 623-0110-C-00-1041-00

Submitted by:

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Acronyms

AGERAS	Regional Spatial Approach Program
ANGAP	Association Nationale pour la Gestion des Aires Protegees (National Association for the Management of Protected Areas)
DAF	Department of Administration and Finance
DEF	Department of Water and Forests
DIVB	Department of Information and Valorization of Biodiversity
DSEP	Department of Monitoring, Evaluation, and Planning
GELOSE	Secured Land Management Program
GIS	Geographic Information System
ICDP	integrated conservation and development project
NGO	nongovernmental organization
ONE	National Office of the Environment
PACT	Private Agencies Cooperating Together
PRA	participatory rural appraisal
SAVEM	Sustainable Approach for Viable Environment Management
TFMT	Tropical Forest Management Trust
TR&D	Tropical Research and Development, Inc.
USAID	United States Agency for International Development
USGS	U.S. Geological Survey
ZOC	Zone of Human Occupation (Zone d'Occupation Humaine)
ZUC	Zone of Controlled Natural Resource (Zone d'Utilisation Controllee)

Section I: Tropical Research and Development, Inc. – Final Contract Report

A. Executive Summary with Key Achievements

In closing this institutional support contract with the United States Agency for International Development (USAID), we share, through this report, some of the reasons why we are so proud of the achievements over the past years and our insights on needs and directions for the future. The final contract report and three supplemental reports¹ document in detail the results and specific products delivered. USAID has invested nearly \$6 million in a 5-year effort to ensure a viable institution, environmentally positive results, and achievable goals for the next 5 years. In securing future support for protected areas, Association Nationale Pour la Gestion des Aires Protégées (ANGAP) program activities have become essential components of four USAID strategic results packages for Madagascar's environment. We believe the strongest testimony to the success of the program is the fact that ANGAP exists today as Madagascar's national park service.

While our contribution ends here, the foundations have been laid for continuing professional support to Madagascar's protected areas and to the needs of populations living in their environs. Whether the efforts of USAID Madagascar, the Tropical Research and Development, Inc. (TR&D) team, and their partners to the protected area program will prove to be sustainable depends directly on continuing support of USAID and other donors during the coming critical transition period between Environmental Program 1 and Environmental Program 2, and through the next 5 years of Environmental Program 2.

When reviewing achievements, it is helpful to consider where we started. In TR&D's first quarterly report (November 1991 - March 1992), Mr. Roy Hagen wrote: "The ANGAP institutional contract is the third component of SAVEM, and the most critical to the long-term objective of improving Madagascar's institutional capacity for protected areas management." ANGAP was recently created as a Malagasy NGO and is an essential component of Environmental Program 1. ... The Ministry of Waters and Forests is transferring most responsibilities for implementing government policies concerning protected areas management to ANGAP.... As of October 1, 1991, ANGAP had a core of three - the Director, the Head of the Department of Administration and Finance, and an executive secretary ... In February 1992, ANGAP assumed responsibility for coordinating production of all technical documents for 9 protected areas... The ANGAP contract was awarded competitively as a 3-year contract to

¹ (1) National Parks and Reserves, Madagascar's New Model for Biodiversity Conservation: Lessons Learned through Integrated Conservation and Development Projects, TR&D Technical Report # 99, December 1996; (2) Hypothesis Testing: Do Targeted Development Activities Reduce Pressures on Parks/Reserves through Changed Human Behavior?, TR&D Technical Report # 90, December 1996; (3) Baseline Data: ICDP Protected Area Program (1994-1996), TR&D Technical Report # 91, December 1996.

TR&D in September 1991...." (TR&D Technical Report #1, 1992:1,2,3.) Roy Hagen, ANGAP's first technical advisor, arrived at post November 5, 1991.

Five long-term advisors have served with this program: Mr. Roy Hagen was natural resource advisor and chief of party between November 1991 and September 1994. Mr. Peter Robinson was project administrator and accounting advisor between February 1992 and June 1994. Mr. Jean-Michel Dufils served as Geographic Information System (GIS) advisor to ANGAP's new Department of Information and Valorization of Biodiversity (DIVB) between November 1993 and December 1996. Dr. Richard Swanson began work with ANGAP in February 1994 as monitoring and evaluation advisor, becoming chief of party and principal technical advisor to ANGAP between July 1994 and December 1996. Between 1994 and early 1996, Dr. Swanson assisted ANGAP in developing its park's network focus, initiated program-wide development of park management plans and ecotourism with a focus on four priority parks, and worked with ANGAP on financial sustainability considerations. Mr. Roger Collinson joined the team in February 1996 to provide ANGAP professional parks management experience guidance.

This record of results represents the culmination of 5 years of institutional support to ANGAP through USAID and TR&D. A strong Malagasy government commitment to protected area management, continued USAID and other donor support to an ambitious program of integrated conservation and development projects (ICDPs), strong growth in the tourist industry within Madagascar following years of decline under the former Marxist regime, and the effective commitment of long- and short-term advisors are key elements in this success story.

As TR&D and its subcontractor, Tropical Forest Management Trust (TFMT), close this institutional contract, we recognize our tremendous privilege at having participated in the early evolution of an exciting new institution leading Madagascar forward to institutionalized protection of some of the world's unique biodiversity. This process has been achieved through the following key results:

Key Results:

Institutional strengthening:

- The September 1996 recognition of ANGAP as the appropriate agency for the strategic and operational management of Madagascar's network of 39 national parks and reserves - by the Government of Madagascar and the donors at the Paris multi-donor meetings on Environmental Program 2.

This recognition signals that the Government of Madagascar will assign to ANGAP increased authority for administration of sanctions and power to modify and fully manage park entrance fees. Institutional oversight will be moved from the Department of Water and Forests (DEF) in the

Ministry of Agriculture and Rural Development to the Ministry of the Environment. ANGAP serves as a private association managing State assets on behalf of the people of Madagascar.

• The development of a mission statement in September 1995 which subsequently gave focus and direction to each of ANGAP's departments and program personnel. Carried on the back of senior staff business cards, ANGAP staff defined its mission:

"To establish, conserve, and manage in a sustainable manner a network of National Parks and Reserves representative of the biological diversity and the natural environment unique to Madagascar. These protected areas, sources of national pride for both present and future generations, should be places of preservation, education, recreation and contribute to the development of peripheral zone communities and to regional and national economies."

• An internal process to monitor the institutional evolution of ANGAP and the protected area program during the next 5-year Environmental Program 2 program is also functioning.

• ANGAP's use of *Platinum*, an integrated professional accounting system with a comprehensive chart of accounts. This system will enable ANGAP to link individual parks (budgets, inventory and accounts) and the regional and national offices of ANGAP, as they respond to the Government of Madagascar and donors for funds granted and used. A user-friendly software system, *Quickbooks*, was installed for use at the park/reserve level. Information is importable into the central system, which provides ongoing support for effective and transparent accounting.

• Assistance to ANGAP in organizational management, resulting in rationalizing departmental functions; developing job descriptions; implementing annual manpower training plans; initiating actions for performance reviews, job grading and remuneration; effective annual strategic planning by the senior staff; and groundwork for developing a plan for financial sustainability of the institution.

• Completion of an energetic training program for ANGAP Tana staff and ICDF national partners in the various elements of professional park management. The fields of parks management and ecotourism were new concepts for most Malagasy as recently as 3 years ago, so this exposure has been essential in developing a vision of possibilities and actual processes. In all, some \$700,000 were spent, resulting in 9,440 person days of training. Of this, 11% was spent offshore, 40% was spent on training of personnel within ANGAP's four departments (current staff of 52 persons), 55% was spent training ICDF (primarily SAVEM) staff, and a

further 6% for non-ICDP individuals [DEF, private sector partners, some nongovernmental organization (NGO) personnel, National Office of the Environment (ONE), regional administrators].

From an initial staff of three persons in February 1991, ANGAP has grown to a group of 52 in December 1996. This number is poised to increase dramatically in 1997 as ANGAP progressively takes on the direct management of the network of Madagascar national parks and reserves. The ANGAP staff is highly motivated, eager to fulfill their mandate, and impatient to prove their management capabilities.

- Heightened awareness of the importance of financial sustainability for the new institution has led ANGAP senior staff to define ways of achieving self sufficiency through ecotourism development, including park entrance fees and other services; development of fee systems for filming and research permits within protected areas; royalties and concession fees; and development of a trust fund for the protected area program within the Malagasy Tany Meva foundation. TR&D provided ANGAP with an introduction to the MacArthur Foundation, which subsequently made a first foundation award to the institution.

ANGAP has a growing budget for marketing products. Using a nest egg provided through a \$90,000 USAID grant managed by TR&D, this marketing fund has continued to grow through profits of sales of such income-generating ventures as a series of six spectacular color posters, French and English videos of the four priority parks, a calendar, color maps of the protected areas, and park brochures. ANGAP has plowed this income back into identifying and creating new articles for sale.

Information for making management decisions:

- ANGAP has provided leadership to give new meaning within Madagascar to the concept of "sharing information." Through DIVB, ANGAP has become the hub for many private and public institutions using an outstanding, and ever growing, georeferenced database. Each partner using this information system leaves it enriched for future sharing and information management.

Elements of the database include the most recent census information and digitized imagery from satellites, videography, and historical research findings from such internationally known institutions as Kew Gardens.

The staff produces a quarterly catalog on available data; has produced new maps on key national parks (now available for sale); used the georeferenced data to assist in defining needed research in the ICDPs; established norms and standards for classification, collection and entry of all vegetation information (now accepted and used nationally); and linked

the ANGAP documentation unit to national (CIDST) and international (IBISCUS) networks.

- ANGAP has a well-managed protected area documentation center, which has been computerized for cataloging. Wide distribution of its reports inform interested partners of documentation held by ANGAP in its growing library on the protected areas of Madagascar.

Part of this collection has been formed by the contributions of professionals providing 40 person months of short-term technical assistance over the past 5 years. Overall contract contributions to this documentation center includes well over 100 professional articles and documents on the protected area program, various protected areas, community and park relationships, monitoring techniques, and a broad array of information on Madagascar's biodiversity and environmental issues. Most exist in French and English.

- An established, functioning network-wide protected area socio-economic and ecological monitoring program. Baseline data date from 1994, a significant resource for future protected area program managers and those concerned with socio-economic trends in rural regions around protected areas, as they make decisions based on knowledge of short- and long-term impact on human populations and biological and geological diversity.

Parks management - local and national: This component of the institutional strengthening project was originally carried out by NGOs operating ICDPs. A transition is underway toward direct management of parks by ANGAP. Four priority parks are now under ANGAP's leadership. The following progress has been made toward accomplishing the new objective over the past 11 months.

- Completion of park management plans for the four priority parks. New park managers have been trained and posted. Plans include infrastructure development and maintenance; monitoring and evaluation; visitor control, guards, and guides; budget and annual work plans; and management processes.
- Park boundaries have been clearly defined and a series of peripheral zones described. Specific zoning plans for four priority parks have been completed.
- Tourism facility plans have been completed for four priority parks (Isalo is under review because of a discussion of compatibility of location of camping areas and private lodge).

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- Ecotourism master plans have been completed for four priority parks, including trails, roads, interpretation centers, living sites, park entrance, signage, and service areas.
- Initial work has begun with the private tourism sector to develop partnerships for coordinated activity in park regions. Studies have been conducted in tourism, target markets, craft product identification and quality assessment.
- Ways to work in partnership with neighboring communities have been considered. Studies have been conducted with senior staff for policy review and drafting.
- Interpretation center architectural plans have been completed for two of the priority parks.
- A park pricing study has been completed and decisions made on new entrance and park use fee structure.

1. Background

The goal of ANGAP's institutional contract was to establish an entity with sufficient authority and capability to perform its management functions. Achieving this objective has required the creation of a biodiversity information unit, an ICDP, and protected-area monitoring and evaluation capability within ANGAP. TR&D and its subcontractor TFMT have provided assistance to the Association (ANGAP) in defining the following:

- An overall ICDP strategy for the protected-area program,
- An approach to hypothesis testing within integrated conservation and development projects working in Madagascar,
- A monitoring and evaluation system for ANGAP and the protected area program,
- The need for long-term sustainability of the protected-area program, and
- A needs assessment and implementation strategy for georeferenced database management systems for biodiversity data.

Contract obligations extended through December 31, 1996, for a total cost of \$6,069,175,000. The level of effort included 138 person-months of long-term technical assistance and 40 person-months of short-term technical assistance.

2. Expected Results

This section's organization reflects the evolution of the contract from the Sustainable Approach for Viable Environment Management (SAVEM) project to specific results packages under Strategic Objective 3—reduction of natural resource depletion in target areas. Over the life of this project, the contractual responsibilities of TR&D's ANGAP institutional contract can be categorized into four results packages. Results package objectives are restated in this section, and the process, activities, and final achievements are provided in Table 1.

Table 1 serves two purposes for this report. First, information therein completes the quarterly reporting requirements for USAID for the October -December 1996 reporting period. Second, under Contract Achievements, we have indicated the final status of each of these principal results and final achievements. In Section 4.0 of this report, we provide recommendations for future assistance to ANGAP.

2.1. Results Package 1

Support to the production and circulation of information and the evaluation of natural resource management impact.

A biodiversity planning service was initially intended to be the third component of the SAVEM project. In July 1992, USAID decided to redesign the planning service and amend the SAVEM project paper so that the biodiversity planning service would be directly integrated into ANGAP as a new department. In September 1992, the redesign team decided that a GIS specialist should be added to the ANGAP institutional contract. Subcontracted to TFMT, this department was implemented in late 1993 with the recruitment of the head of department (September 1993) and the GIS technical advisor, Mr. Jean-Michel Dufils (November 15, 1993). Another long-term advisor was added to the program at this time to provide protected area program monitoring and evaluation support. Dr. Richard Swanson started work in November 1993. Initially, monitoring and evaluation support was linked to the ANGAP Department of Monitoring, Evaluation, and Planning (DSEP). In mid-1996, this unit was transferred to the DIVB as a new section.

During USAID re-engineering activities in which the TR&D team participated, Jean-Michel Dufils served as the leader and member of the USAID results package 1 core team. Dr. Richard Swanson served as a member of this team. Support to this results package started with the 1994 creation of the DIVB, the development of its information system, and establishment of partnerships with other institutions through the end of this contract.

Through 1996, DIVB identified ANGAP's information needs for the transition toward park management activities and developed a capacity to analyze and disseminate relevant data/information. TR&D and TFMT supported the DIVB through long- and short-term technical assistance, hardware and software acquisition, and development of activities in compliance with results package 1 objectives, results, and means. At the end of 1996, the DIVB has three sub-departments (1) biodiversity and applied research, (2) monitoring and evaluation, and (3) spatial GIS data analysis. Key results included:

- Establishment of ANGAP as a source of information and hub of an education and communication network on biodiversity conservation;
- Development within ANGAP of a capacity in biodiversity and socio-economic planning and analysis, monitoring and evaluation;
- Development of the capacity for ANGAP to shape biodiversity and planning on behalf of the government; and
- Professional development for ANGAP and ICDP staff in appropriate technical fields.

2.2. Results Package 2

Financial sustainability

ANGAP is attempting to do something that few national park services in the world have ever achieved—to become, in large part, financially sustainable. Lack of sufficient funding directly impacts an organization's ability to protect the biodiversity found within the borders of parks and reserves—the ultimate reason for an organization's existence. Other than exemption of value-added tax on items purchased, the Government of Madagascar provides little financial support to ANGAP. ANGAP cannot perpetually count on donor funds to operate, although we believe that conservation of the biodiversity of Madagascar merits a contribution from the outside world. Recognition of this reality has led ANGAP to take an aggressive look at operation costs and ways of securing sustainable financing. It includes the ability to support the recurrent costs of park and reserve employee salaries for park operations (conservation) activities, depreciation, and basic operating costs. Currently, training funds and capital expenditures are covered in large part by grants and donor funds. Results package 2 (Table 1) describes the means and objectives for achieving these financial sustainability objectives and the support this contract has provided during the past year to achieve this. Dr. Richard Swanson has participated in this USAID results package 2 team, continuing efforts initiated by Mr. Peter Robinson between 1992-1994.

2.3. Results Package 5

Park management and biodiversity conservation

At the beginning of the TR&D institutional contract in 1991, technical support for this objective was oriented to creating a new institution that would coordinate a certain number of protected areas being managed by several international NGOs through ICDPs. Of all the objectives initially set for the TR&D institutional contract, this one changed the most. ANGAP evolved into a national parks service. Over the years, Mr. Roy Hagen, Dr. Richard Swanson, and Mr. Roger Collinson provided technical support to ANGAP's Director General and four department directors in defining new roles and responsibilities and new training programs and partnerships. Training programs were refocused, and short-term support provided specific help in a diverse range of programs from ecotourism, development of park concessions, site selection and construction of interpretation centers, park management planning, uniforms, standardized signs, park fee revisions, financial sustainability and appropriate accounting procedures. In January 1996, Mr. Roger Collinson joined the TR&D team as the park management advisor.

Results package 5 was focused to achieve ANGAP's mission of establishing and managing a national parks system to ensure effective biodiversity conservation. ANGAP has determined that the following objectives are essential for achieving these goals:

- Develop an efficient, effective, and highly respected professional institution;
- Compile short-, medium-, and long-term plans for conserving and managing national parks and reserves;
- Develop strategic and business plans for ecotourism, marketing, and public relations; and
- Develop appropriately trained staff for central and field park programs.

2.4. Results Package 6

<i>Forest resource management</i>

ANGAP has realized the importance of establishing compatible development activities in areas peripheral to protected areas. Buffer zones will initially be created outside park boundaries. With new legislation, the boundaries of current parks will be extended to include the buffer zones. In this way, ANGAP can exert management over these areas. We envision a process of joint management by communities surrounding the parks and ANGAP. As conceived, any one park buffer zone may have any number of four basic sub-zones:

- Service zones for ANGAP-controlled visitor and ecotourism activities such as a park offices and interpretation centers.
- Zones of human occupation (ZOC = Zone d'Occupation Humaine) managed under jointly agreed conditions with communities (e.g., no new expansion or additional buildings).
- Zones of controlled natural resource use (ZUC = Zone d'Utilisation Contrôlée) where traditional tenure systems for harvesting certain resources such as freshwater shrimp or raffia and for the protection of burial and other cultural sites will be recognized.
- Natural areas within buffer zones must remain as natural as possible. Existing limited community activities, such as rice farming and pasturing of livestock, would be allowed to continue in a controlled manner. No new activities or permanent buildings will be permitted in this zone.

TR&D provided short-term assistance to facilitate institutional recognition of the need for community use rights to selected natural resources found in buffer zones in or around the priority parks.

3. Contract Accomplishments by Task/Result Package Tables

The various sections of Table 1 provide final achievements for the October - December 1996 quarter (Fifth Project Year, First Quarter). The final column has been added for this final contract report to indicate the status of this result package activity. In many cases, activities will be continued beyond the life of this project through continuing technical support to ANGAP from USAID through Mr. Roger Collinson, Mr. Jean Michel Dufils, and short-term advisors. These are indicated as "ongoing" or "deferred" activities.

4. Performance Highlights

During the final quarter of this contract there was increased personnel training and ongoing assistance in several key areas: accounting, videographic monitoring, and management of institutional documentation. Efforts were made to document the lessons learned over the course of this contract and to extract the effects of 5 years of USAID support.

4.1. Results Package 1

Information Management: Geographic Information System and Program Monitoring and Evaluation

4.1.1. General Background

With the technical assistance of GIS advisor Mr. Jean Michel Dufils and monitoring and evaluation advisor Dr. Richard Swanson, the DIVB has become a center of high-performance expertise essential to ANGAP. Its importance in biodiversity and information management has been recognized nationally.

ANGAP has four operational information systems, developed for different purposes:

- ANGAP's GIS manages the entire georeferenced data system. It also groups together a network of about 10 GIS units established at the level of ICDPs and central operators. Its design is closely linked to the SAVEM philosophy of information sharing and partnerships.
- The Documentary Information System meets ANGAP's specific needs for documentary and bibliographic data.

- The Biodiversity Information System manages national biodiversity data. It is developing a national monograph, funded by the Global Environmental Facility, and collaborates with other institutions under the International Convention on Biodiversity.
- The Protected Area Program monitoring and evaluation system. Three years of data (1994, 1995, 1996) now exist for a growing network of national parks and reserves and their peripheral zones. These data are socio-economic and ecological information needed to manage progress made in different sectors of the program and to assess impact of program activities. Thirteen of these protected areas have more extensive databases, having benefited from the efforts of ICDP investments.

This report's annexes contain a summary of available data in the first three systems. For the ANGAP baseline data for the protected area program, a separate document has been prepared (ANGAP Baseline Data Report, 1994-1996).

4.1.2. Implementation Strategies

The strategies used to achieve an information management capability are:

- Progressive implementation of defined activities,
- Utilization of technology adapted to the protected area program,
- Decentralization of collection, management and processing of primary data to the field level of the ICDPs,
- Development of human resources through appropriate training,
- Nonduplication of activities carried out by the major national institutions, and
- Collaborative efforts with other institutions and support to establish networks (including major national and international organizations) in charge of the data on Madagascar's biodiversity.

4.1.3. Establishment of ANGAP as a Source of Information and Hub of an Education and Communication Network on Biodiversity Conservation

- ANGAP's DIVB has earned an excellent reputation in mastering GIS management. This expertise, combined with an approach based on collaboration and an open relationship with other institutions, has helped constitute the best georeferenced database to be found in Madagascar today and has made ANGAP an essential source of information on most fields relating to biodiversity in the country.

- The Geographic Information System, Documentary Information System, Biodiversity Information System, and monitoring and evaluation technical units are operational and have competent staff. Available data through these four systems enable ANGAP to be a well-known source of information for several institutions, government agencies, NGOs and private companies.
- The Information and Documentation Unit is now operational; 1,500 documents have been indexed, and 555 references have been computerized. 330 references refer to dissertations, reports, thesis and bibliographies, and 225 refer to magazine articles. ANGAP is a member of IBISCUS, a network of national and international documentation centers.
- Regular working relationships have been established with many national and international institutions.
- Priority areas for conservation and research have been identified at the national level. The choice of these areas was validated during an international scientific workshop last year. Another workshop in 1996, jointly led with the National Academy of Madagascar, helped specify priority areas for bird conservation and research.
- The first version of a national monograph on biodiversity is nearing completion.
- A geographic information unit network is operational at the level of ICDPs. Ten GIS units have been installed and are supported by DIVB, within field based ICDPs and central operators. Others are being established.
- ANGAP/DIVB has a set of satellite images and aerial photos that covers the whole protected areas network. This information is essential for the vegetation spatial monitoring program for national parks and reserves and their peripheral zones.
- The GIS unit implemented the first georeferenced database of the administrative boundaries used for the 1993 National Census at a *Firaisana* (district) level. Madagascar's 1,253 *Firaisana* are now stored in spatial coherence with all other GIS/ANGAP data and are available for spatial analysis.
- Standards developed by ANGAP's DIVB for spatial data are used by all the protected area program operators and several national institutions.
- The first ecotourism map (Isalo National Park), based on a satellite image, is near completion. It has been created by national experts from Isalo National Park and ANGAP with USGS assistance.

4.1.4. Development Within ANGAP of a Capacity in Biodiversity and Socio-Economic Planning and Analysis, Monitoring and Evaluation

A major achievement of the past 3 years has been putting into place a protected area-wide monitoring and evaluation system. While originally conceived to serve the needs of the six SAVEM ICDPs, ANGAP broadened this to include the entire protected area program - some 13 ICDPs as the focus, with information gathering for the entire 39 protected areas - most recently expanding to 44. Highlights of this program include:

- A spatial monitoring system was designed in 1994 to follow five broad vegetation classes in three distinct areas in and around protected areas. Macro-monitoring using satellite imagery was used for monitoring the entire protected area and its peripheral zones. Separate spatial map series were completed for all six SAVEM ICDP for the protected areas and the peripheral zones. For more intensive vegetative monitoring, aerial photography and, most recently, videography, have been used to monitor between three and four target zones located in a section of land which includes a piece of the protected area and peripheral zone. For the complete database and maps of existing spatial data for these protected areas, see the ANGAP Baseline Data Report, 1994-1996.

- Each ANGAP department was assisted in assessing its operational information needs. With input from field programs, data sets have been established for tourism statistics, park revenue distribution, sale of various ANGAP products, monitoring effects of park management plans, and other monitoring needs.

- A system was put into place in the 13 ANGAP coordinated ICDPs to analyze pressures on protected areas (prioritize and spatially locate them), identify the causes for these pressures, and identify development activities which were believed to have the potential to address these issues. A system to monitor the impact of these activities was put into place among some 60-80 households in each ICDP.

- ANGAP's monitoring team assisted ICDPs in establishing a system of developing hypothesis statements for each major development activity, stating "If X activity were successfully implemented among Y number of people/households, then we might expect to have Z impact." Because changing behavior takes time, it will be necessary to permit the passage of at least 4-5 years to assess the ultimate impact, if any, of these ICDP activities.

- Because of the time factor mentioned previously and the need for earlier assessment of initial impacts, encouraging signs, or specific activities providing positive impact, an ICDP-wide series of case studies was conducted by ANGAP, its advisors, and ICDP field personnel. Twenty case studies were completed for Amber Mountain/Ankarana, Andasibe/Mantadia, Ranamafana, Andohahela, Masoala, Zahamena, Isalo, Andranomana,

and Bemaraha. The results are reported in the report: Hypothesis Testing: Do Targeted Development Activities Reduce Pressures on Parks/Reserves Through Changed Human Behavior?.

4.1.5. Development of the Capacity for ANGAP to Shape Biodiversity and Planning on Behalf of the Government

The national and international community now recognizes ANGAP as an essential organization in protected area network management and all other fields related to biodiversity management in Madagascar. DIVB often gives technical and scientific support to the main national institutions in charge of setting biodiversity policy. Through DIVB, ANGAP is a member of the following organizations:

- The Tripartate Commission, which also includes the DEF, Ministry of Research and Ministry of Higher Education. The role of this committee is to approve and follow up biodiversity research in Madagascar.
- The Malagasy delegation to the CITES international meetings.
- The Commission for National Forest and Ecological Inventory (Commission d'Approbation et de Suivi pour l'Inventaire Ecologique et Forestier National) led by DEF.
- The Scientific Steering Committee of the National Center for Pharmaceutical Research (CNRP).

Other important activities should be mentioned:

- Implementation of the International Convention on Biodiversity, as a technical and scientific entity. ANGAP's DIVB staff attend and participate in the annual convention meetings and supervise the implementation of the Madagascar National Biodiversity Monograph.
- A considerable contribution to designing a regional approach to conservation for Environmental Program 2 (AGERAS).
- Initiation and supervision of a study on the possibility of protecting biodiversity-related national interests by applying an intellectual property rights policy.
- Active participation in important international conferences (African Mountains, Primatology, Biogéographie de Madagascar, and others).

4.1.6. Professional Development for ANGAP and ICDP's Staff in Appropriate Technical Fields

Throughout the past 5 years, TR&D has given high priority to training national staff in ANGAP and among ICDP staff. Achievements include:

- ANGAP DIVB staff have adopted a training plan promoting the use of GIS as an essential tool for biodiversity management. Training has taken place abroad or locally according to levels of competence and available resources. All assistance provided under this contract also offered specific training to ANGAP personal or ICDP field personnel. Short-term specialists were always linked with a counterpart to further benefit from this training by association opportunity.
- DIVB staff competence in biodiversity and spatial information is widely recognized. For instance, they often give technical support to ICDP operators and other institutions.
- DIVB staff now have the ability to handle all spatial data collection, quality control, management and analysis operations.
- DIVB staff are capable of assisting colleagues within ANGAP, as well as park and reserve field units, in monitoring and evaluation techniques and analysis.
- All ICDPs and central operators have competent staff, trained by ANGAP's DIVB in spatial data collection, management and analysis techniques.
- Field staff of some reserves, conservation agents, and some DEF staff members have been trained in biodiversity data collection.
- In line with the strategy of national competence development, ANGAP, through the DIVB, has made a specific effort to identify and hire capable Malagasy consultants and firms. Geographic Information System format, set up for the database, vegetation classification, aerial videography and assistance to the Documentary Information System are all recent examples of technical assistance provided by Malagasy professionals.

4.2. Results Package 2

Financial Sustainability

Support for ANGAP's initiative to develop financial self sufficiency to manage Madagascar's protected areas has occurred across a wide range of activities. Experience in other countries in promoting program sustainability, particularly the National Parks Board of South Africa, has

shown that four or five major parks can generate income which can carry much of the expenses of an entire network of parks and reserves. Within ANGAP, greatest progress toward this objective has taken place during the past 3 years with the development of entrance fees and other paying visitor services within the priority parks of Isalo, Mantadia, Ranomafana, and Amber Mountain/Ankarana. It is estimated that these fees might eventually cover a high percentage of ANGAP's core salary and operating costs; perhaps as much as 87%. Efforts have also included developing a small number of tourist-oriented products which have sold very well and with a good profit margin. Proactive efforts to grant concessions to the private sector in prize sites near park boundaries have been initiated. Finally, a new law permitting the creation of private foundations within Madagascar was passed in 1996, opening the way for ANGAP to consider using this management tool.

During the last quarter of 1996, TR&D assisted ANGAP to prepare the program's strategy for creating an endowment fund.² We do not believe park entrance and service fees and rents will cover all of ANGAP's budget - even the lean, streamlined ANGAP that could result from good planning and management. A major cost to be covered is depreciation on all equipment (vehicles, boats, computers, copy machines), and personnel costs are certain to rise dramatically over the next few years as salaries increase. Thus, a modest endowment is considered essential. Ellsworth's study of ANGAP financial data suggests that a \$28 million endowment would probably cover all of ANGAP's capital needs and any possible budget deficit, but that a smaller endowment of \$10 million would provide ANGAP with enough resources to fill its budget gap in core operating costs not covered by external revenue and also provide some funds to renew aging capital stock.

While there are some risks to creating endowments, CEOs and Boards of Directors everywhere seek endowments for their organizations and for good reason. A well-managed endowment produces a regular income after its first few years. The benefits of this steady income are substantial:

- If the endowment is large enough and the investment of it wise, the revenue stream can protect an organization from the inefficiency and incoherence of unstable budgets that change dramatically from year to year and cause an unhealthy cycle of staff and program reductions and expansions.
- The senior staff of unendowed organizations spend excessive time fund-raising instead of planning how to improve their institutions. With the stable revenue of an endowment, the staff can pay more attention to the core business of the institution and the quality of its programs.

²Much of this section is drawn from the recent report on endowments by Lyn Ellsworth (November 1996).

- Since the revenue from the endowment is usually perpetual, the organization is free to make long-term, inter-generational plans and programs.
- Endowment income partially frees organizations from the fads and fancies and impositions of short-term donors. The degree of freedom depends on the size of the endowment and must be balanced with the need to court new donors.

The three variables donors usually consider when planning who should receive an endowment are: merit and general appropriateness of the requesting institution, relative financial need and usefulness of the endowment, and the readiness and maturity of the institution. ANGAP does very well on the first two variables.

In terms of merit, ANGAP's mission of biodiversity protection is likely to predispose donors to endow ANGAP. The cause is held dear by many articulate spokespersons throughout the world, and conservation and protection of natural resources should happen in perpetuity. Also, since ANGAP has received its mandate from the Malagasy state and parliamentary institutions, ANGAP is the most appropriate institution to endow.

ANGAP can also make a case for a financial need for an endowment. Despite ANGAP's favorable position in the tourist industry, an endowment may be necessary. Budget projections indicate that if all goes well, ANGAP might be able to cover most, but not all, of its basic core operating costs (salaries, office administration, transport and training) from entry fees and concessionaire contracts.

In terms of readiness for an endowment, ANGAP still has some work to do. ANGAP has no track record (yet) of managing the parks over a long period of time. Neither does ANGAP yet have the financial and accounting systems in place to give donors the confidence and trust they need. Much of ANGAP's fund-raising strategy has to do with building its own effectiveness as a park manager. This will result in an increase in donor "willingness to endow" (Ellsworth, 1996).

4.3. Results Package 5

Administrative capacity building: Parks Management and Biodiversity Conservation

4.3.1. Institutional Capacity Building

When Environmental Program 1 was initiated, the disciplines and principles of park management, ecotourism and biodiversity conservation were not well known to the government and people of Madagascar. Consequently, when ANGAP was established, its embryonic staff complement was confronted with a multitude of new concepts, ethics and disciplines. This meant that the first step

in institutional capacity building was to equip the staff with appropriate knowledge, skills, ethics and attitudes.

Today, the Director General of ANGAP and his staff are well acquainted with the disciplines of park management, ecotourism and biodiversity conservation. It is especially pleasing to report that their development has progressed way beyond a conceptual understanding of these disciplines to a sincere appreciation of Madagascar's national heritage and dedication to conserve it. Above all, the staff are confident of their abilities, enthusiastic about their work, determined to succeed and proud of their organization and its mission. The foundations have been laid for an efficient, effective and highly respected organization.

USAID and TR&D assisted this development in the following ways:

- Provided long-term technical assistance and introduced new ideas.
- Provided short-term technical assistance from experts visiting Madagascar from many parts of the world. These experts, linked to an ANGAP counterpart, passed on their knowledge and ideas through written reports, debriefing sessions and informal interaction with ANGAP staff.
- Facilitated study visits abroad by ANGAP staff to park systems and conservation projects in several countries, including South Africa, the Philippines, France, Arkansas in the United States, and to the U.S. Offices of the U.S. Geological Survey.
- Facilitated the attendance by ANGAP staff in local and international training courses, international seminars, congresses and symposia.
- Implemented in-country seminars and workshops attended by donors, NGOs, ANGAP and other agencies executing elements of Madagascar's environmental program.
- Assisted with study tours from Uganda, the Ivory Coast, and other countries interested in learning from ANGAP's experience.
- Established a documentation center at the ANGAP head office which provides staff access to a wide range of up-to-date books, journals and periodicals on biodiversity, park management and ecotourism.

4.3.2. Establishing a Malagasy National Parks System

When TR&D was awarded the ANGAP institutional contract, ANGAP had been formed to coordinate ICDPs.

As ANGAP gained in knowledge and confidence, it began to outgrow its inaugural role of coordinating a limited number of ICDPs. The organization reached a level of maturity where it formulated the bold vision of becoming a fully fledged National Parks Service. This vision was then expanded into a mission statement at the 1995 senior staff strategic planning retreat. Once this mission was formulated, the Director General and his staff pursued this vision and mission with such determination and passion that the following was agreed to at the Environmental Program 2 meeting held in Paris during September 1996:

- ANGAP be given the mandate to strategically and operationally manage the protected areas of Madagascar, including marine parks.
- ANGAP be moved from the Ministry of Agriculture and Rural Development to the Ministry of Environment.
- ANGAP will stand alone as a not-for-profit institution organized under the laws of an Association and will no longer operate under DEF's wing.

This agreement, although not yet ratified by the National Assembly, is the major highlight of the past 5 years. The ability to formulate a bold yet realistic vision and mission statement and then pursue it with determination and passion is an essential ingredient for a winning organization. ANGAP has demonstrated this capacity.

The challenge now facing ANGAP is to acquire the other abilities that are necessary for successfully managing a national parks system. In the next 5 years, ANGAP must turn its bold vision into successful reality.

4.3.3. Park Planning and Management

The protected areas existing in Madagascar prior to the launch of Environmental Program 1 were proclaimed more than 30 years ago during the French colonial administration. In reality, their existence was no more than demarcated areas on outdated maps supported by legislation documented in seldom-referred-to legal texts. Furthermore, their boundaries were ill defined in terms of both the ecosystems and demographics. Consequently, protected area boundaries and controlling legislation were neither understood nor accepted by the neighboring communities, entrepreneurs exploiting forest resources and government officials. It is therefore not surprising that the government of the day gave these areas little support both morally and materially (in the form of funding and trained manpower). Consequently, management plans, monitoring programs, long-range strategic planning, and infrastructure for administration and tourism were virtually nonexistent.

Considerable progress has been made since the launch of the SAVEM ICDPs. Park boundaries for all six SAVEM ICDPs have been clearly demarcated and peripheral zones around each park

have been defined. Before demarcation, agreement on their location was reached with local communities and the government land authority. These boundaries are now understood by all parties concerned and they are largely accepted and respected.

A baseline information system for monitoring, research and planning needs has been established in all 13 protected areas benefiting from ICDP programs during Environmental Program I. A substantial amount of data, accumulated over the years from research, surveys, ad hoc inventories, serial photography and Landsat images, have already been entered onto this system.

For each priority park, organizational structures and job descriptions have been established. A full complement of staff has been recruited and is fully operational. Although the staff lack some skills and knowledge required to plan and manage these parks successfully, training plans have been formulated and implemented. A highlight of this training was a series of study visits by prospective park managers to the South African national parks system.

Considerable progress has also been made with park planning. Master plans for tourism facilities and tourism usage of parks have been completed for all four priority parks. Park management plans for Isalo and Ranomafana have also been completed. Although not yet completed, park management plans for Andasibe and the Amber Mountain complex are nearing finalization.

All these achievements cannot be easily attributed to any one organization, operator or contractor. They should be seen as the products of a joint effort by ANGAP, TR&D, TFMT, ICDP operators (CARE, VITA, WWF, CI, and the State University of New York at Stony Brook), PACT and USAID Madagascar.

4.3.4. Ecotourism

Ecotourism was perhaps the most foreign of the concepts introduced to ANGAP. When first introduced, the concept was met with apathy, skepticism and even some resistance. While apathy and scepticism are a common reaction to new concepts, the resistant attitude was a consequence of the colonial legislation and a resulting ethic that regarded protected areas as untouchable sanctuaries. Any form of use of protected areas, even nonconsumptive activities such as tourism activities, was regarded as taboo.

Ecotourism has now become an integral part of ANGAP's vision and mission. Several studies have identified the areas of product development and marketing where ANGAP should focus. In response to the recommendations from these studies, ANGAP and the ICDPs have become enthusiastic about providing visitor facilities and services in the parks. Significant progress has been made toward constructing interpretation centers in the four priority parks. Another achievement has been the definition of a policy framework for forming partnerships with the private sector to provide ecolodges.

The challenge for the next 5 years is to develop sufficient institutional capacity for stimulating and meeting the needs of the potential significant tourism increases.

4.4. Results Package 6

Sustainable forest management

During the last quarter of 1996, Mr. Mario Gauthier, a forestry economics specialist, assisted ANGAP, USAID, and other Environmental Program 2 planners in drafting a strategy for developing community natural resource management contracts. His work followed on from earlier studies in 1995 in the Zahamena ICDP, where squatters within the reserve boundaries have increased dramatically. As part of this program, a workshop was held to which were invited all known interested government and donor programs involved in this sector. Most of these individuals are part of the local resource management initiative (GELOSE) of the Environmental Program 2 program for the next 5 years. The workshop proceedings have been collated, forming a document which will be a useful reference on progress made in recent years on this challenging and important topic.

5. Lessons Learned and Recommendations for the Future by Results Package

5.1. Results Package 1

Information Management

5.1.1. Lessons Learned

The positive results obtained by ANGAP/DIVB in data management have illuminated the following lessons learned:

- It is important to provide widespread training in such complex techniques as GIS, remote sensing and documentary databases using modern computer tools to provide a basis for management decisions.
- Madagascar has exceptional human resources. With highly selective recruitment and ongoing and well-adapted training, it is possible to quickly form a competent operational team.
- Decentralized data management is essential for sustaining any information system. Working with operators has permitted ANGAP to limit cost and facilitate timely

management of these centralized databases. It is important to set standards in advance to allow the use of data located among various bases.

- Information systems and data collected over the past years are immediately available and usable at ANGAP. There is now an institutional memory, which is one of the major SAVEM achievements.
- It is necessary to introduce new technologies progressively to avoid a rejection response. Taking time to understand the context and providing ongoing training are the best guarantees for activity sustainability. Specialists for projects with limited duration might be tempted to substitute themselves for their counterparts to speed activity implementation. Such substitution, although it can help meet deadlines in the short term, is not compatible with sustainability objectives.
- Once convinced as to the reciprocal benefits to be gained from information exchange, all partners participated in the information system development. Presentations made by various operators during the last monitoring and evaluation workshop in Antsirabe showed that the level of understanding of pressures on protected areas has greatly improved due to spatial information based analysis. These presentations, which could never have been done 2 years ago, are now common even among operators who once resented ANGAP/DIVB recommendations concerning spatial information.
- USGS technical support in GIS and remote sensing technology has been relevant. As techniques, material and supplies are evolving, it is important to have the support of specialized and reliable institutions whose professionalism is well known. However, needs should be assessed in collaboration with local experts as often as possible.
- Participating in information networks and interacting with other institutions is important. External contacts established by ANGAP/DIVB personnel while producing the monograph have enabled them to be identified by such organizations as Kew Gardens as the focal point in Madagascar for a future international project to enter biological data into the network.

Remaining weaknesses include:

- The narrow base of trained personnel results in an excessive workload for the staff. There is a lack of personnel depth in ANGAP departments.
- Data collection is satisfactory, but analysis capacity is still weak. Reasons for this include lack of trained human resources and unavailability of relevant data. This weakness is not alarming, as priority has been given to building a sustainable information system and the

recruitment of a monitoring and evaluation specialist has considerably reinforced the analysis capacity.

- Cumbersome U.S. government procurement procedures have delayed the acquisition of equipment and products by USGS. These delays made the planning and implementation of those activities for which the expected products were essential difficult.
- Several national institutions are in charge of activities related to biodiversity and research. There is some confusion concerning the respective mandates of such institutions, a situation exacerbated by the lack of coordination among bilateral programs of international institutions. In such a case, it is difficult to precisely define the specific biodiversity role of ANGAP/DIVB as opposed to the roles of other national institutions.

5.1.2. GIS Issues

Introducing new concepts and technologies, such as GIS, is always delicate because it implies changes in attitudes and habits and the use of new expertise. GIS has only been recently introduced in ANGAP. It is useful to evaluate of the contribution of this tool in ANGAP.

- *Has GIS improved the general functioning of the Protected Area Program?*

In general, the answer would be positive. Information systems have improved the functioning of ICDPs by reducing the isolation of each program component (e.g., conservation, development, education). GIS units have helped integrate data from various activities and made them understandable for all users and actors.

In some cases, such as creating new protected areas, GIS has been essential for preliminary studies. Examples of such studies are those led by CARE/WCS (Masoala) and Orgasys (Baly Bay). It is now taken for granted that management and development plans cannot be properly done without a GIS.

It does not seem that GIS has improved ANGAP's internal functioning and communications. However, ANGAP's image of technical competence achieved through this system has greatly facilitated its relationships with its main partners (operators, national and international institutions, donors). ANGAP will be able to contribute significantly to Environmental Program 2 through the use of its GIS.

- *Has there been any progress in the general understanding of the correlation between conservation and development?*

The spatial integration of pressure-linked phenomena is essential for understanding the correlation of conservation and development. All study cases and socio-economic and

ecological monitoring results presented at the monitoring and evaluation workshop in Antsirabe were supported by spatial analysis. ICDP GIS units have become basic tools for better understanding pressures and the linkage between conservation and development.

- *Has the use of the information produced helped decision making?*

The process of basing decision making on spatial criteria is evolving at national and local levels. For instance, at the national level, spatial analysis of priority conservation areas in the protected area network has revealed interesting features of category B or C protected areas which are usually neglected because of their low ecotourism potential and the lack of resources. Demonstrating these features has raised interest in these protected areas and helped mobilize Global Environmental Facility funding needed for their operational management. At the ICDP level, prioritization of areas for intervention and activity selection were the main areas for spatial information based decisions.

5.1.3. Major Recommendations

5.1.3.1 DIVB Evolution

DIVB should soon evolve into a Scientific Information and Monitoring Department (SIMD). The role of this department within ANGAP would be basically the same as that of the current DIVB (i.e., to implement the necessary techniques to improve knowledge of various aspects of national biodiversity to better manage protected areas). This role will require a good command of the scientific aspects of biodiversity and data processing. Research, monitoring and evaluation, data collection/management/analysis and scientific information distribution should be the main tasks of the SIMD.

It is essential to continue to improve the professionalism of the technical staff. Competent staff should be hired, in appropriate quantity, and be given specific tasks and the opportunity to improve their work through ongoing training.

5.1.3.2 Multi-Local Analysis Capacity Building

It will be necessary to develop analysis capacity and ability to produce spatialized strategic plans at all levels (national, regional, local). Designing such plans is a complex process requiring multi-disciplinary expertise. Technical command of cross-section data integration and good collaboration between institutions will be essential for producing quality products.

This multi-local approach is an extension of the ICDP concept in that it considers all development and conservation activities at local, regional and national levels. Given the complexity of the process, spatial integration of information is a key element for designing coherent strategies. During Environmental Program 2, ANGAP will be one of those institutions having the required

data and expertise for spatial information integration. ANGAP data and analysis mainly concern local (ICDP, protected area) and national levels. There is an information gap at the regional level. Data and analysis for regions (ecological, economic, socio-cultural) in which each protected area is located are virtually nonexistent.

The Environmental Program 2 AGERAS component is a remarkable opportunity for support to ANGAP in developing multi-local strategies in close collaboration with the main national, regional and local partners/actors.

Using spatial analysis, ANGAP should seek answers to the following kinds of questions:

- *National level: What is the role of a national network of protected areas? Is this in accordance with ANGAP's objective as the representative of the nation's ecosystems and national goals for economic improvement?*

To answer these questions, ANGAP must understand the correlation between the protected areas system and the national natural environment (e.g., biodiversity, ecosystems, vegetation, geology) and the socioeconomic environment (e.g., infrastructure, transportation, ecotourism, population and migration statistics, rainfall data, soils). To maintain close collaboration with institutions in charge of collecting these data at the national level is essential and will be a major challenge for the future.

- *Regional level: Which regional approach (e.g., ecological and socioeconomic) is each protected area working with? Are there any links between protected areas of the same region (e.g., biological corridor)? What are the major causes of human pressures within the region?*

ANGAP must understand the links between each protected area or group of protected areas and all aspects of the regional environment. Close collaboration with the regional institutions and stakeholders is essential to obtain the information necessary to understand what is occurring within the region.

- *Local level: What are the characteristics of a specific protected area? What is its biological capital? What are the pressures being exerted upon it? How do we prioritize different development interventions?*

To answer these questions, one must have the ability to shape management plans and set monitoring and evaluation indicators. GIS units are now operational within some priority parks and are being used for support to operations of the most important protected areas. For the others, local data collection and analysis could be supported by a regional GIS unit. For example, the GIS-trained staff of the Ranomafana National Park could also manage Manombo or Fianarantsoa regional data. Or a central operator, such as WWF

could assist in managing information for Zombitse. ANGAP will itself manage data in some parks and reserves: Isalo is such an example. ANGAP will have the entire network of data centralized within its DIVB information system. It will be updated from time to time with field input.

5.1.3.3 The ANGAP Biodiversity Unit or Biological Information Service

The technical staff for this service should include at least three members:

- A head of unit in charge of technical assistance to ANGAP for all biodiversity-related activities, coordinating all aspects of biodiversity information system activities with other institutions, and supervising various projects such as the national monograph;
- A biologist; and
- One person in charge of maintaining equipment, software and the biodiversity database.

Priority activities include maintaining the existing biodiversity inventory and establishing an ecological monitoring system for protected areas under the direct control of ANGAP. Other important activities include:

- Put into place within protected areas a structure for research in collaboration with ANGAP's Biodiversity Unit goals and activities.
- Clarify roles, responsibilities and expertise of ANGAP and DEF staff on protected area research execution to reduce the administrative procedures for researchers.
- Provide support to officials to develop relevant regulations by accumulating and sharing information from research within protected areas.
- Finalize the first phase of the national monograph (first quarter of 1997) and negotiate with the Global Environment Facility and the United Nations Environment Program for the second phase, as well as production of the National Report required from each country under contract under the International Convention on Biodiversity. Initiate the biodiversity economic evaluation for this second phase, and plan training workshops.
- Shape an action plan for aquatic, mangroves, and wetlands biodiversity in collaboration with concerned national institutions (e.g., CNRE, ONE).

5.1.3.4 The ANGAP Geographic Information System

The technical staff appointed to the section should include at least three members:

- One person in charge of the maintenance of equipment, software and database;
- A spatial analysis specialist; and
- One person in charge of the current production activities.

The team, under the leadership of the Head of the Information Unit, will also have to support and train protected areas GIS staff members to ensure information network coherence. The leader for spatial analysis could possibly be posted under the Head of the Monitoring and Evaluation Unit.

As in the past, ANGAP's DIVB should be seen as a service center for ANGAP departments and all conservation partners. GIS activities provide information support for the DIVB. Priority must be given to developing an overall standardized system for information management in collaboration with the major national and international partners, namely the USGS.

5.1.3.5 ANGAP's Information and Documentation Service

The staff of the Information and Documentation Unit should be composed of the leader and an assistant. The unit is operational, and the following tasks are to be executed in priority:

- Simplify the filing method;
- Plan the capture of references for the management of multi-media aids (photos, films, CD) and the capture of about 30 to 40 bibliographical references per month;
- Add key words in English;
- Regularly consult the Textow technical cards of the IBISCUS network;
- Regularly update new Textow versions, complete with GED module and plan the acquisition of a new key; and
- Support development of a mini-UID network in the main national parks prioritizing category A protected areas with the highest ecotourism potential.

It is essential to acquire or renew certain equipment (a well adapted computer, a printer, a photocopier, shelves).

5.1.3.6 ANGAP's Monitoring and Evaluation Service Unit

The following sections summarize lessons learned during the past 3 years in establishing and implementing a program-wide monitoring program. These sections are drawn directly from the

concluding sections of two reports recently completed by TR&D monitoring and evaluation advisor Richard Swanson, one on the now-existing ANGAP baseline data and data sets for 1994, 1995, and 1996, and the hypothesis testing document.

Changing human behavior is at best a long-term process, full of unexpected pitfalls. Madagascar traditions, such as slash and burn farming (*tavy* - the main pressure on protected areas) or end-of-dry-season burning, are still very strong in the rural areas in which ICDPs operate. Even after 5 years, 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 toward reducing the most serious pressures. The case studies of this report demonstrate that hopeful trends are underway, but the scale of these activities is small. This is particularly true as Environmental Program 2 development (with less funds than Environmental Program 1) is intended for much larger regions (in regional program approach), and not just targeted toward defined peripheral zones of protected areas.

Case study materials established for the program were obtained through onsite interviews with members of peripheral zone communities engaged in those activities selected by the ICDPs as promising or showing some positive results. It was difficult for most ICDP development personnel, after years of development efforts, to select even three or four activities of this kind. Most activities were still just starting, had been abandoned as unsuccessful, or were still in the research phase - not yet ready for extension. It is strongly recommended that ANGAP or one of its development partners repeat each of the 20 case studies completed in 1996 with an update by around the year 2000. This will help establish the local impact of these excellent development activities initiated as well as assess their more regional impact.

No one development activity can be given sole credit for "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. However, the SAVEM ICDP program has not been able to prove, in a scientifically controlled manner, either of these objectives. Except for what may be a temporary end to tavy cultivation in the Mantadia National Park near Vohibazaha due to a set of well-received development actions, no program can point to clear changes in pressures.

- **Too Short - Linked to Lack of Focus**

One general problem is 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 many days 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 cost more than \$200, 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 and often 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 large menu of development activities (e.g., health, livestock, literacy, family planning, fish farming, various income generating activities, agricultural development, and infrastructure development), believing that these 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 numbers and types of activities.³ Expertise did not exist within the program for all these various activities, resulting in much ad hoc experimentation by untrained personnel. Programs were often the only source of rural development assistance within the region, with government social programs dysfunctional or nonexistent.

Can focused development have an impact on conservation? To date we cannot give a positive answer to this question, because there has not been enough focus and probably too much experimentation. There has been too much re-inventing the wheel everywhere. 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, some SAVEM program leaders strongly believed that one had to leave the ICDPs 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 in the following paragraphs.

Therefore, while some promising approaches are apparent, the 5-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 channeling USAID funding for Environmental Program 2 to expand SAVEM development efforts and lessons learned to the regional approach. This is premature and

³An exception was the ICDP of Bemaraha, whose program funding was drastically cut during the middle of Environmental Program 1. Forced to retrench, the program was able to redefine its priorities. With new money, it has been cautious in expansion.

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.

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. U.S. foreign technical assistance planning seems to sell itself short by establishing unrealistic time frames for results. Sustainable results require a longer-term commitment.

- **Too Long, Too Much**

Because of what might be considered to be the lack of focus or a lack of 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 2 or 4 years will not necessarily improve anything if the basic approach itself is flawed. Therefore, whether such ICDPs terminate this year or in 2 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 difficult to spend a great deal of money, in a short period of time, in remote rural communities. Big spending can have negative impacts on these areas in that it creates dependency. 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.

The most serious problems that ANGAP is beginning to face, as a new institution taking over management of the conservation and park management of SAVEM ICDPs, are the large staffs employed by NGO projects and 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 and 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 on 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 Environmental Program 2. Staff at the Amber Mountain Complex have for years been criticized for lack of performance and professionalism. Suggestions have been

made for a clean sweep of the staff - and a new start - again. Such problems have their roots in unsustainable levels of spending, lack of vision and focus and poor management skills, with the often false expectations these have created.

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. 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. As mentioned previously, it costs 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 distributed over a long period of time than much money over a short period of time. It is important that at least the most successful activities receive continued and expanded support within the peripheral zones of SAVEM protected areas during Environmental Program 2. If such a commitment cannot 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 acts of protest and resentment.

- **Transversality**

When reviewing the various case studies of this report and others, a standard strategy for general replication of successful initiatives makes sense. These activities would be more systematic or transversal. Examples follow.

- (1) **Beekeeping**

Almost every ICDP has independently discovered that beekeeping is a nonexploitative, 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 12 farmers, with 1 or 2 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. In many cases, the wrong kind of hives have been introduced, and 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.

(2) Rattia Weaving and Other Crafts

Using this beekeeping activity as an example, the same thing could be said for such activities as *rattia* 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 assisting rural community groups which have been established, or will be established in the future, in improving their products and seeking commercial outlets for them. These skills have usually been lacking in ICDPs, and when provided, the training has been too brief and not sustained over time.

(3) The Rural Savings and Credit Union

The rural savings and credit program (MBC) underway in the Zahamena ICDP should be 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. The rural poor will often seek out the free resources of adjacent parks 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 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 up savings and loans around the peripheral zones of protected areas, and later expand elsewhere. This would use limited professional technical assistance in a most efficient manner.

(4) Improved Hillside Agro-Forestry Systems

ICDPs have had little success in addressing the most important pressure of all - *lavay* slash and burn farming. This issue is so important that it merits a coordinated effort by one or more private sector groups. Agro-forestry, contour cropping, 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 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 2 or 3 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, noncontinuous, efforts of NGOs dependent on year to year funding levels.

(5) Community Food Security Granaries

Community granaries were a popular activity developed in most ICDPs. 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 on 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 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 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 keep 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 rice 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 exploiting another (poorer) segment of the community. Seed banks can be a complement of food security granaries.

Given their importance to local communities, it was surprising that programs had not given even more support 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 selected gives some question to this argument. While community participation is always claimed by projects in determining activities, the reality is that project field agents suggest a menu of activities from which communities choose. Some organizations, using participatory rural appraisals (PRAs), 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 kinds of activities." So the communities members ask, "Well, then, what can you support, what do you do?" The development agent gives the menu of suggestions and communities make a choice. This is called community participation in selection of activities. 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 say 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.

- **Village Groups**

Another recurring theme in many ICDPs has been the difficulty of initiating village associations or groups with which the program could pursue 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 easier to work with one group of 30 members, than 30 individual households. But such groups, once the money was distributed, often tended to 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 solution to this specific need. Community-initiated needs require a collective response that leads to the formation of a group that might become sustainable. Such need draws the right kind of people together. The case studies in Andranomena (beekeeping) and Bemaraha (cattle vaccination) illustrate this principle.

The Hypothesis Testing Approach

Many SAVEM ICDPs field teams seemed to think that ANGAP, perhaps through DSEP and its monitoring and evaluation program, was trying to force ICDPs into a hypothesis testing mode of operation, rather than letting them develop their own independent mode of operation and monitoring. Yet the SAVEM project and the TR&D and Grants Management Unit contracts with USAID were clear about the central role of hypothesis testing and the need to monitor this aspect of the program. The cooperative agreements established between PACT and the Grants Management Unit were not documents reviewed by either ANGAP or TR&D directly, and may not have carried language sufficiently clear to operators about the need, and USAID's expectations, for the development of a system wide monitoring and evaluation system, ANGAP's coordination role, and what this implied. ANGAP is the national institution responsible to the Government of Madagascar for its field operations. ANGAP is the principal client for international NGOs of these ICDP programs, providing services to local communities and regional partners. The lack of clarity about relationships between ANGAP and field operators was responsible for some of the tension that the Environmental Program I SAVEM ICDPs encountered. It has also led to what seems to be ANGAP's lack of enthusiasm for NGO capacity for field management and partnerships.

Hypothesis testing was carried too far. Some hypotheses actually discouraged professionally directed change from outside, even when an ICDP program did not actually have the expertise or vision to promote change or assist communities to try something new. 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 ICDPs the time to develop their approaches to see which hypothesis works; at the end of the program, ICDPs could share with others what worked. The problem was that the level of raw experimentation tended to discredit the entire ICDP approach, which in itself had great potential but needed time and some professionally directed change.

Commitment

Over the past 3 years, we have worked with field staff of over 12 ICDP projects all over Madagascar, including the 6 SAVEM ICDP, and personnel in 6 other reserves. Two aspects of field work stood out:

- (1) The hardships which many national and expatriate personnel willingly face 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, and eating unfamiliar food. Many of these field partners really believe in what they are doing; it is not just a job for them. 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 hope that, by doing so, they will also help protect some of the natural forests and biodiversity which many have come to love and respect.
- (2) However, these people often receive little or no support from some central offices, ANGAP, and the donor community. While they have the power to facilitate the efforts of field personnel, what often 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 (reportedly because 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 look for the people from whom they previously purchased services (and received a receipt) and redo their receipts into purchase orders. The project will not have any money until its staff can take care of this and clear all these outstanding bills.

One way to improve this situation would be to staff central Tana and regional posts with people with long-term field experience within the program. ANGAP lacks this wealth of onsite experience. By taking over direct management of parks, ANGAP has a large cadre of potential good field staff trained through the ICDF 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 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 who hold the purse strings.

ANGAP and its operators have many expatriate and national staff who are living and working under conditions which no one in Tana would consider 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 logistical resources needed to accomplish many of their efforts. Too many field staff are living in impossible situations without adequate support and encouragement. This is unacceptable, and donor funding should not encourage this situation.

- **Problems Experienced and Lessons Learned from Monitoring and Evaluation Experience in SAVEM ICDPs**

- (1) **Start Early**

It is important to establish an monitoring and evaluation system early in the life of a program and not midway through, as was the case with the SAVEM project in Environmental Program 1. This monitoring system and the department charged for its implementation must also be given the financial and personnel resources needed to implement such a system. While such a system must be created in partnership with various groups specialized in different domains, there comes a point when a decision has to be made about the indicators to be monitored. After this time, only small changes can be made to the existing indicators, if they are not eliminated altogether, and only a few new indicators should be added. Without such discipline, it is impossible to initiate and put into place a system with any hope of results 2, 3, or more years later.

Indicators mean something is being monitored over time. A baseline is created which will be monitored. If this baseline were to change from year to year, monitoring could not be achieved. One implication of this is that, once a monitoring and evaluation system is established, for better or for worse, one must wholeheartedly implement it. In a program as complex as the ICDPs in Madagascar, and within the SAVEM project in particular, this means that someone has the authority to require compliance. ICDPs should be evaluated on the basis of their respecting the engagements made. One of the roles of coordinating this program is to ensure that this engagement is respected. One of the problems encountered during Environmental Program 1 was that, in spite of its coordinating role of NGO ICDP programs, ANGAP had little ability to take action when programs were slow to implement the monitoring and protected area information system.

- (2) **Selection of Indicators for Behavioral Impact Monitoring**

The monitoring and evaluation system, with its field ICDP partners, identified activities to select for monitoring impact on local populations as a result of program activities. Field programs during early years seemed to have difficulty in developing well-thought-out hypotheses for the activities for which they expected to monitor

impact. In many cases, there was uncertainty as to what kind of measurable effects the activities selected for specific impact monitoring could be expected to have in reducing pressures. For example, what kind of behavioral impact (whether short *or* long term) could one reasonably expect intensified rice farming (new varieties, water management) to have on reducing tavy slash and burn farming? How does one realistically measure this?

(3) **Time**

Another issue is the life expectancy of projects. Behavioral change takes a great deal of time, and the full impact of many ICDP activities may take years, even decades, to realize, if given the support needed, long enough, to succeed. But this is rarely the case. Activities start and are dropped the next year. Field personnel change frequently, and newcomers start new activities in line with their own interests or experience and then are changed again. A departing employee rarely passes on what he or she has been doing to the person replacing him or her. The period between leaving and the arrival of a new person can be months. Yet this does not diminish the need to identify and monitor indicators (steps in the process of change) for the kind of positive change we hope to see as a result of program activities. Change can also be negative, and the potential impact of this also needs to be known. Thus, it is even more important that the linkage between development activities and the conservation of the protected area be as direct and clear as possible. It also underlines the importance of institutional commitment to the indicators developed and for which baselines have already been established.

(4) **The Baseline Data**

In spite of the difficulties encountered in creating a protected area baseline information system, ANGAP and its field NGO partners have accomplished a great deal. This document is the fruit of their commitment. Significant sets of information, organized into many separate databases found within ANGAP's DIVB and the individual ICDP programs exist and are increasingly used to improve program management.

• **Concluding Remarks**

ICDPs are difficult if not impossible to implement, particularly 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 Environmental Program 2 (1997-2002). Even among SAVEM ICDPs under organizational and personnel changes, the ICDP philosophy will continue to some degree. The socio-economic needs of rural populations around protected areas will need to be addressed. At

no time has anyone claimed that this alone will protect the biodiversity within parks and reserves. Without effective authorized measures for sanctioning illegal activity within parks and reserves and without clear boundaries to patrol, protection cannot be ensured. ANGAP's monitoring and evaluation unit within the DIVB must continue to furnish ANGAP and its partners with the updated tables initiated in the baseline data provided at the end of Environmental Program 1. We recommend that the same series of tables be used to provide continuity with past achievements and data sets. ANGAP's monitoring unit possesses these data sets which will permit this continuity.

As part of the annual work plans of continuing ICDP programs and future park and reserve annual reports, the series of monitoring and evaluation socio-economic and ecological indicators reported on, reviewed, and recommended for continuation into Environmental Program 2 at the October 1996 Antsirabe monitoring and evaluation workshop should be continued. The minutes of this workshop have been distributed to all partners and form a basis for action by monitoring and evaluation field units and ANGAP Tana.

A set of socio-economic and development indicators monitored during Environmental Program 1 was also evaluated. ANGAP and the workshop delegates recommended that the most important of these be continued by ANGAP's development partners during Environmental Program 2 in ICDP programs or programs working in peripheral zones of parks and reserves. ANGAP will no longer have the means to continue this set of data. However the baseline exists and continuation will be valuable to development partners. ANGAP's monitoring and evaluation unit also has the baseline data established for the past 3 years, for the 10 indicators which the Environmental Program 2 program, through ONE, will monitor for ANGAP's program impact and progress.

The annual ANGAP monitoring and evaluation workshop should be continued during Environmental Program 2. Because of the costs involved in such a workshop, and because of the close links that exist between ecological, GIS, and socio-economic personnel of the protected area program, it is strongly recommended that the socio-economic and ecological personnel meet during the same annual workshop, and not separately, as is traditional.

In terms of personnel for monitoring and evaluation units in the field during Environmental Program 2, a minimum of two people should be engaged and supported for each category A park. Skills should include a socio-economic background for database management and an ecological monitoring person. If the ecological monitoring person does not have strong GIS manipulation and analysis skills, then a third position in GIS is essential. Most SAVEM ICDPs during Environmental Program 1 had all three positions;

this is the ideal mix. For category B and C parks, ANGAP's central GIS unit should be sufficient to provide continuing spatial analysis support needed, including vegetation coverage mapping, assuming the four personnel currently within ANGAP continue working for ANGAP beyond January 1997. Ecological monitoring support should be provided from ANGAP's DIVB biodiversity and research unit.

5.2. Results Package 2

Financial Sustainability

There are several apparent options for establishing an endowment fund for ANGAP. One is through a window in the umbrella organization, Tany Meva Foundation. Another would be for ANGAP to establish its own fund. With money granted to ANGAP by the MacArthur Foundation, Lyn Ellsworth was hired to assist ANGAP to consider various options and provide information and counsel on how to proceed. Most of this section is drawn from her report.

Funding for sustainability of ANGAP can come from a variety of sources (e.g., park entrance and other visitor fees, concessions to private operators, and sale of products developed by ANGAP).

The Ellsworth report recommends that donors should help ANGAP to move fairly quickly during the next couple of years to establish at least a minimum endowment of \$10 million; the disadvantage of the slow and cautious approach is that in 5 years' time when more complete data are available, it is not clear that Global Environmental Facility and USAID funds will be available to fund an endowment.

The report also states that a trust fund based in the United States is ANGAP's best option for endowment management. This minimizes the risks which potential donors to an ANGAP endowment are most concerned about: long-term safety of capital assets, protection from the various risks of loss, waste, tax invasion of the capital, and attachment of the capital by governments and creditors. Further advantages include:

- U.S. trust law is predictable. If a trust is challenged, the outcome is fairly predictable.
- The court system is (largely) free of government interference and (mostly) above private influence concerning routine trust matters.
- The U.S. financial markets are the biggest in the world, with easy access to all international (including emerging market) investments. The size of the market is such that more high-quality investment advice is found in the U.S. than anywhere else.

- The Securities and Exchange Commission provides greater security to investors than can be found in offshore havens and European markets, particularly concerning reporting requirements and regulations on the transparency and behavior of investment advisors
- The records and total return results of asset managers are tracked and ranked by several independent firms, usually with more data than are available even in European markets. Trustees of a U.S.-based trust have better information than elsewhere from which to choose asset managers.
- Equity investments in the U.S. have given investors total returns that average about 12% a year for more than 40 years. Few other financial markets have that record. Of course, the record is no guarantee of future performance, but it is the only bit of information that gives any confidence at all. Profits are possible everywhere, but long-term total return in excess of 6% above inflation, in a stable currency no less, is hard to get anywhere in the world.
- A variety of neutral, third-party trustees are available, ranging from nonprofit to international institutions to private sector trustees.

5.2.1. Summary of Suggested Actions from the Ellsworth Report

- ANGAP should position itself to be eligible for an endowment from the Global Environmental Facility, USAID, and other donors active in Madagascar. Endowment income might need to cover anywhere from 15% -50 % of ANGAP's budget gap. The actual dollar amount will depend on how ANGAP's true operating and capital costs add up relative to its revenue in the next few years.
- As a first step, ANGAP should undertake as soon as possible a comprehensive strategic planning process and involve its key-donors (USAID, World Bank, UNDP, NORAD, Global Environmental Facility) in that process.
- The results of the strategic plan should include a 3-5 year institutional strengthening and capacity-building component for ANGAP. This period is called Phase One in Ellsworth's November 1996 report and corresponds to the period of Environmental Program 2.
- Phase One should also include a multi-faceted program to plan for and build ANGAP's financial sustainability--streamlining core operating costs, improving revenue generation, building up donor-partnerships, and testing cost-effective park management models.
- As part of the strategic planning process, ANGAP's key donors should form an inter-donor working group. This group would need to agree on a technical assistance, training, and overall organizational development strategy designed to strengthen ANGAP's

institutional effectiveness and build up ANGAP's capacity to carry out its mandate. The donor group should also develop a plan to enhance ANGAP's financial sustainability. Such a plan should include an endowment. Last, the donor group needs to assist ANGAP in developing a long-term capital investment plan for each park and protected area. The method of work should be that of partnership rather than the classic donor-grantee relationship.

- During Phase One of the proposed strategy, ANGAP would test models of park management and develop its internal operating and governance systems with a goal of bringing them up to international best practice. The legal instruments for a trust would be established during Phase One. During Phase Two, a modest endowment would be put into place and ANGAP would receive bridge financing if necessary. In Phase Three, bridge financing would end and ANGAP would be able to cover its costs from endowment income, entry fees, and connection contracts with hotel and restaurant owners.
- The proposed endowment should be in dollars and managed in a U.S.-based trust with third-party, neutral trustees responsible for adhering to a detailed trust agreement that includes the conditions for releasing income from the trust each year. The assets should be invested by a professional third-party asset manager based in the U.S. (such as Neuberger and Berman or The Investment Fund for Foundations).
- To enhance its financial sustainability, ANGAP should retain all park entry fees instead of using 50% to finance projects in communities adjacent to parks. Only when entry and concession fees cover all of ANGAP's operating costs, should ANGAP share its revenue with local communities. The goals behind the current revenue-sharing practice can be reached with other means.
- A foreign currency "Green Tax" collected through airline tickets should finance a Tany-Meva managed grant fund for communities living in zones peripheral to parks and protected areas. ANGAP park managers might participate in grant selection out of this fund, but should not be unduly involved in the design of the funded projects or their execution.

In the Ellsworth scenario, use of the Tany Meva Foundation is not recommended. While a subaccount could be created, there appears to be no advantage in doing so. "Tany Meva would charge for its largely passive service some 5-7%, which would reduce ANGAP's income. Tany Meva has no track record or significant experience in investing dollar assets in northern capital markets... Tany Meva is an ideal intermediary institution for smaller NGOs and to manage grant making within Madagascar. It is also a good vehicle to encourage philanthropy in Madagascar. It is not the ideal manager of large endowments for single institutions" at this time.

5.3. Results Package 5

<i>Administrative Capacity Building: Parks Management and Biodiversity Conservation</i>

5.3.1. Institutional Capacity Building

We noted earlier that the foundations have been laid to build an efficient, effective and highly respected organization. Nevertheless, there remain certain needs if ANGAP is to continue to build on its successes and achievements of the past few years.

In our last two quarterly reports we have emphasized the following:

- During 1997 and beyond, ANGAP will be assuming many new functions that require new skills as it moves from a coordinator of ICDPs to a direct manager of protected areas;
- ANGAP's responsibilities will expand dramatically as it moves from direct management of four protected areas to the direct management of more than 40 protected areas;
- ANGAP will grow from a small organization, located in Tana, to one that is geographically widely dispersed, with many more staff; and
- Since much of the transition is planned for completion by June 30, 1997, this growth will not only be substantial, but extremely rapid.

This scenario has all the ingredients for serious organizational trauma and even failure if strong organizational support is not provided for 1997 and through the next 5 years.

ANGAP does not have a strategic plan for taking on its new role and responsibilities. The bold vision and mission, so ably developed at the Ile Ste Marie strategic workshop last year, does not constitute a strategic plan. It is only the beginning of one. ANGAP must formulate and balance the answers to the following questions:

- *What are the biodiversity conservation goals and objectives for the protected areas?
What management practices are critical to achieving these stated goals and objectives?*
- *What kind of partnership/relationship should be formed with neighboring communities, the private sector, related executing agencies and donors to maximize their support for ANGAP's mission?*

- *How should all the potential funding sources (donors, tourism income, foundations and government) be optimized in the short, medium and long term to meet ANGAP's financial sustainability needs?*
- *What kind of organizational structure and administrative/management systems should ANGAP put in place as it moves from centralized to decentralized management?*
- *How should the chosen structure be staffed - how many people, what kinds of jobs and what skill levels are required?*
- *What is the gap between the available skill levels and the required skill levels and what training programs are required for closing the gaps?*
- *How should responsibility and authority be delegated by the Director General? What are the targeted achievements for each department and staff member? How should the performance of each staff member be measured?*

The proposed World Bank-funded institutional capacity building exercise planned for early 1997 should help ANGAP provide answers to these and other questions.

5.3.2. Establishing a Madagascar National Parks System

The vision of becoming a fully fledged National Parks system is undoubtedly the right path for ANGAP. When the mission statement was established, a great deal of attention was given to the issue of how ANGAP should coordinate or manage an entire network of parks and reserves. A system of classification between A, B, and C parks was established. Initially, it was agreed that ANGAP would only concentrate on its 10 or 11 category A priority parks, those with ecotourism potential. The rest, category B and C parks, would be sub-contracted out for management, under guidance by ANGAP. However, during 1996, ANGAP has broadened the definition of what it will manage and what it will delegate to others. Furthermore, phasing of this transition was not given the importance it should have received during 1996.

The present plan of ultimately taking over all of Madagascar's protected areas needs to be questioned. Successful organizations are those that focus and consolidate. It is therefore recommended that ANGAP consider slowing down the takeover phasing and focus on those areas with a combination of spectacular scenery, unique biodiversity and high tourism potential (true national parks or category A protected areas). The category B and C protected areas should then be managed by some other organizations, NGOs or even regional governments.

Attention must also be given to ensuring that ANGAP's new mandate be ratified by Parliament. Subsequently, this ratification must be followed by enacting the necessary legislative amendments. We recommend pursuing a Madagascar National Parks Act as a top priority for 1997.

5.3.3. Park Planning and Management

We have discussed earlier the recent achievements of our institutional development assistance to ANGAP, including the park management plans which have been completed or are nearing completion for the priority parks, the organizational structure and staff job descriptions for these parks, and subsequent staff recruitment which has been completed over the past 2 years.

To build on these achievements and ensure that these parks are sustainable for the medium and long term, we believe the following should be addressed during the next 5 years:

- The existing management plans need to be reviewed and revamped in accordance with a participative planning process involving the staff, neighboring stakeholders and other beneficiaries such as tour operators.
- In this planning process, greater attention must be given to arriving at a more accurate estimate of the short-, medium- and long-term operating costs of each park.
- A 5-year training plan for all park staff must be designed and implemented. These training plans should include a blend of overseas study visits, extended study at overseas training institutions, participative planning workshops facilitated by technical advisors and on-the-ground practical day-to-day instruction by technical advisors. Consideration should be given to establishing a park management training institution in Madagascar.

To achieve all of these objectives, it is important to strengthen the long-term technical assistance at the park level. Ideally, one park specialist advisor should be provided and based in each of the four regions of Madagascar.

5.3.4. Ecotourism and Marketing

Due to the high potential of the category A parks, ecotourism should be given priority support during the next 5 years. A lesson learned during the first 5 years was that plans to promote and market the parks were premature as the parks still lack basic facilities and services for tourism. Marketing in these circumstances risks negative feedback. The focus during 1997 should therefore be given to establishing good campground facilities (cooking, toilet and washing facilities) in all the category A Parks. Improved trails, signage and interpretative material should also be provided. The guide service must be improved substantially. This will require that ANGAP seek feedback on park services and take disciplinary action when tourists register qualified complaints.

Accommodation facilities more sophisticated than campgrounds and trail huts should be provided by the private sector. Although a policy framework is already in place for this, ANGAP must take on a more active role to attract private investors. At the same time, ANGAP must ensure that

concession fees are maximized through a process of bidding (tendering) and qualification. Such a process should ensure that the available opportunities for investment in parks are fairly allocated.

ANGAP's proposal to operate ecoshops as a source of self-financing needs review. While ANGAP does not yet have a chain of small shops in each of the various category A parks, it is considering establishing such small shops when tourist interpretation centers are completed. This will demand a great deal of administration and management at the central and park level. It is not certain that ANGAP has the ability to manage and administer such a chain. It is also unclear whether this activity would be financially profitable: would the cost of this management and administration be more or less than the actual income generated? Consequently, we recommend that ecoshops should not be regarded as income-generating operations but instead be viewed as an essential part of the facilities and services that need to be in place if the parks are to successfully contribute to the growth of the country's tourism industry. To keep costs and administration to a minimum, ecoshops should carry a narrow range of stock and concentrate mainly on providing tourists with good information (e.g., maps, brochures, biodiversity check lists, and books), and basic essentials (e.g., film and insect repellent). Wherever possible, ANGAP might consider giving the private sector the paid concession rights to manage the ecoshops, while making a special effort to help members of neighboring communities set up such businesses.

The partnership relationship among the tour operators, travel agents and ANGAP needs to be more clearly defined, communicated and nurtured during the next 5 years.

Finally, the Ecotourism and Marketing Department is currently understaffed in accordance with the ecotourism potential that needs to be realized over the next 5 years. Existing staff still require a great deal more exposure to the industry and specialized training to improve their skills. To achieve this training, we recommend that a long-term technical advisor be provided for the department.

5.4. Results Package 6

<i>Sustainable Forest Management</i>

While this activity was not originally intended to be a major part of the program activities of this contract, several significant achievements were realized during the past few years. The first major effort started in 1994 when USAID financed and led the Mahajanga Conference to which over a hundred development program leaders were invited. They discussed the problems of human pressures upon protected areas, including the presence of squatters, and explored strategies to address these problems. The 10 points of the Mahajanga Declaration provided, for the first time in Madagascar, a common focus and basis for agreement on how to proceed (see TR&D technical report # 28).

During the next 2 years, ANGAP, TR&D, several ICDP operators, and other donor programs began to experiment with different approaches toward the issues identified during the Mahajanga conference. ANGAP was more concerned with human settlements already existing within its park and reserve boundaries and possible alternatives for these people (e.g., forced removal, re-delimitation, and special use authorizations for natural resource utilization). Other programs focused on forestry management techniques which could be managed by local villages or communities under contractual agreement.

Short-term technical assistance to the Zahamena ICDP by Ms. Nadia Rabesahala and Mr. Mario Gauthier explored contractual agreements which might be developed with local communities in the high-pressure area of the Zahamena special reserve (TR&D technical report # 48). Mr. Gauthier returned twice in 1996 to the peripheral zone of the Ankarana special reserve (TR&D technical report # 78) and for the Environmental Program 2's GELOSE program in general, with special work done in Manombo (TR&D technical report # 102).

Several lessons have been learned.

- There does not yet exist, in Madagascar, any conclusive example of how natural resource management principles may be effectively delegated by a government department to village or community groups. This is true whether we are speaking about managing forest timber products or successfully and sustainably harvesting selected products in protected areas. There has been much discussion, much talk about decentralization of decision making, but no actual successful implementation. Studies by Rabesahala and Gauthier laid the foundation for continued work. The donor community appears to think the task much easier than it actually is. They believe it is too expensive to use a few expensive professional advisors out in a few remote communities when the problem is so big and needs to be addressed more widely.
- However, until we have gained experience in understanding a specific community context, and propose and begin to implement real contracts, all discussion and applied research only remains theory, not practice. It is by actually undertaking the time-consuming and difficult task of bringing all partners together and drawing up realistic contractual agreements that ANGAP will understand where the bottlenecks are, what laws have to be changed or which local and regional government agencies must be drawn into the collaborative effort. This is a process which may take years for any specific target area. Will donors have the patience to support such a process?
- Environmental Program 2 intentions with GELOSE have been exceedingly ambitious, based more on idealism than on the real-life experience and a successful track record of pilot programs which could inform a program such as GELOSE.

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- We believe ANGAP needs to find a donor willing to provide several years of support to develop needed pilot programs. There will be a trial and error process, but lessons can be learned from the few which succeed. One long-term advisor could probably support initiatives in two or three different community areas in different geographical locations. We believe the Ankarana, Ranomafana, and Isalo peripheral zone studies initiated during Environmental Program 1 should be given stronger and more sustained support, until successful pilot cases can be developed to model future programs within Madagascar.

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Section II. Project Officer's Comments

Section III. Contract Officer's Comments

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Strategic Objective #3: Reduce natural resource depletion in target areas							
Results Package #1: Information management: support to the production and circulation of information and the evaluation of NRM impact (Page 2 of 7)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Production of a high quality tourist image map for Isalo (a new product for sale)	Completed map	Draft completed. Satellite images received from USGS in Sept 96 (6 months late). Isalo and DIVB staff trained. All data collected and reported. Draft version with comments sent to USGS for final printing	JMD, USGS	June-Dec.	Ongoing
		Satellite images and derived products. Monitoring of vegetative data. About 10 satellite images will be purchased from the private sector (EOSAT and SPOT)	10 images purchased	List annexed.	JMD	May-Sept.	Completed
		Digital cartographic products. Acquisition of digital cartographic products: 5 maps at 1:100,000 scale	5 digital maps acquired	Andasite digital maps acquired and quality controlled. 9 Maps were ordered but FTM delivered only 3 maps.	JMD	May-Sept.	Ongoing. 3 maps available. 6 to be delivered.
		Map products. Acquisition of maps for all ANGAP protected areas	Base maps of all 6 SAVEM ICDPs available	Maps acquired and available at ANGAP	JMD	May-Sept.	Completed 150 paper maps
		Provide technical support to produce management plans for park management	Trip reports to ICDPs, first version complete for 4 parks	No activity	RC + ICDPs	April-Dec.	Cancelled
		Provide technical support to ANGAP in designing research plan for the main protected areas	Research plan exists in 4 Parks	Research plans for Andohahela, Amber Mountain, Zahamena	JMD + ICDPs	June, August, Oct.	Completed

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TABLE 1. RESULTS PACKAGE TABLES WITH ACTIVITY, TASK LEADERS, AND TIMING

Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #1: Information management: support to the production and circulation of information and the evaluation of NRM impact (Page 1 of 7)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
Access to basic information to improve natural resource management	Information acquisition on natural resources in Madagascar	Extend technical support at the request of non-SAVEM field operators for data collection and management (e.g., Andringitra, Zombitse, Ambohitantely, Baie de Baly, Manombo)	Requests received, then support/training given	Field technical support given by DIVB personnel at the request of the following non-SAVEM protected areas: Cap Ste. Marie, Andranomena, Tsaratanana, Marojejy, Anjanaharibe, Andringitra-Pic Ivohibe, Ankarafantsika, Mananara	JMD, RS	Jan.-Dec.	Completed
		Training operator M&E staff for data collection and management	2 field training visits (each SAVEM ICDP)	Staff trained for field data gathering (GPS), photo-interpretation and data management using standardized methods. In addition, field training has been given to Isalo staff in data collection to produce tourist map.	JMD, RS, local STTA Abel Ratovo	July-Dec.	Completed
		Production of a quarterly catalogue on available GIS/ANGAP data	Quarterly catalogue	Quarterly catalog produced. Latest version annexed to this report.	JMD	Jan.-Dec.	Completed
		Pilot project to produce CD-ROM with georeferenced data on 6 protected areas	CD-ROM finished	Georeferenced data on SAVEM ICDPs archived on CD-ROM	JMD	June-Aug.	Completed
		Training-modeling and development for CD-ROM production	Training completed	Ongoing. Training under DIVB supervision.	JMD	June	Completed
		Elaboration of a national monograph on Madagascar biodiversity	Monograph completed	Draft completed, according to GEF requirements. Should be finalized in Feb. 97. 11,000 species entered into database.	JMD	Jan.-Dec.	Ongoing

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Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #1: Information management: support to the production and circulation of information and the evaluation of NRM impact (Page 4 of 7)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Training workshop: Elaboration of standards for vegetation classification to be used by all field operators (collaboration with University/department of Agronomy)	Vegetation standard defined	Standards defined and draft reference document completed. A final version should be published and disseminated later.	JMD, Univ of Tana	May-Aug.	Completed
		Supervision of the Integration of digitized FTM 1:500,000 topo map from USGS within GIS/ ANGAP	Integration file complete	Waiting for data from USGS (6 months late)	JMD	May-June	Ongoing
	Development of appropriate political and judicial policy	National workshop on biodiversity research	Workshop	Included with M&E Workshop 10/7/96 10/11/96	JMD	October	Completed
		Biodiversity Regional Convention	Convention	Not considered a priority. ANGAP/DIVB attended the International Biodiversity Convention in the Seychelles	JMD + UNEP	Aug.-Sept.	Participation cancelled
		Annual International Biodiversity Convention	Convention	Completed (1-15 November)	JMD + UNEP, Argentina	Nov.	Completed
		Annual CITES meeting	CITES Meeting	Meeting delayed until 1997	JMD, CITES, Zimbabwe	Oct.	Postponed
Systematic monitoring and evaluation of NRM impact	Development of socio-economic and ecological information network	Extension of DIVB computer network to other ANGAP departments	3 ANGAP departments using network	Awaiting network server, operating equipment ordered through USGS in 1995	JMD	April-Nov.	Ongoing
		Training DIVB staff in network maintenance	Training completed	No activity	JMD	Aug.-Sept.	Completed

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Strategic Objective #3: Reduce natural resource depletion in target areas							
Results Package #1: Information management: support to the production and circulation of information and the evaluation of NRM impact (Page 3 of 7)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Aerial videography. Plans are to continue this work for all SAVEM ICDP's for the impact monitoring studies of 1996	Videography for 6 SAVEM ICDPs completed	Aerial video/photos taken over Zahamena, Amber Mountain, Andohahela, Andasibe	JMD with support of Slaymaker	May-Dec.	Completed
Decisions made based on data/information objectives	Creation of framework, policy and standards for biodiversity data collection	Definition of priority areas for research at national level	Priority areas defined	Map annexed	JMD, RS	Jul, Aug, Sept.	Completed
		Assist in the establishment of procedures for identifying and evaluating various systems used to manage protected areas. Lessons learned study.	Lessons learned study in 6 SAVEM ICDPs	Steering committee determined best use of TR&D monitoring advisor's time through end of 1997. Two draft reports completed on lessons learned	RS	January-Dec.	Completed
		Establishment of norms on the collection, management and transfer of data and information	Norms written and distributed	Norms for vegetation classification defined	JMD	April-Dec.	Completed
		STTA: Biodiversity Data Design (5 weeks)	Data design	Database design was defined by DIVB technical staff working on the monograph	JMD	May-June	Completed. STTA cancelled
		Quality control of FTM digital data for Zombitse, Vohibasia, Andringitra, Andohahela, Isalo	FTM completes digitization + quality control	No activity	JMD	Jan.-Dec.	Completed
		Updating of technical specifications for digital data quality control assessment	Specifications Updated	No activity	JMD + ICDPs	Ongoing	Completed

Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task* leader*	Schedule	End of contract achievements
Strategic Objective #3: Reduce natural resource depletion in target areas	Results Package #1: Information management support to the production and circulation of information and the evaluation of NRM impact (Page 6 of 7)	Design and implementation of data collection and analysis and the integration of SAVEM project level socioeconomic and biological data into ANGAP's GIS system	ICDP M&E system integrated into ANGAP GIS	Vegetative data on SAVEM target areas integrated into ANGAP GIS and indicators produced. Vegetative data for protected areas and peripheral zones also completed.	RS, JMD	Mar.-Dec.	Completed
		Training ICDP staff in digitized data quality control, CFSIGET/ana	10 staff trained	No activity	JMD	Ongoing	Completed
		Training ICDP staff in relational data base management (SAVEM ICDP)	6 staff trained	No activity	JMD	July-Dec.	Completed
		Training in documentation data management, STTA support to documentation unit	Doc. center information system operational	Third training phase with STTA Gasmi.	JMD	May-June-Sept.	Completed
Systematic M&E of natural resource management and access to basic information to improve natural resource management	Support of parks, reserves and ICDP M&E System implementation	Georeferenced aerial videography to monitor land use changes in 6 protected areas and priority areas in peripheral zones	Videographic data for 6 parks acquired	Aerial video/photo data available over Amber Mountain, Zahamena, Andasibe, Andohahela	JMD, RS	Jun, Aug, Oct.	Completed
		Progressive transfer of M&E activities from ANGAP's DSEP department to DIVB	DIVB coordinates M&E system	Transfer completed.	RS, JMD	Jan.-Aug.	Completed
		Restructure the DIVB to incorporate the new socioeconomic and ecological monitoring activities	DIVB restructured	M&E unit added to DIVB and	RS, JMD	Jan.-Aug.	Completed

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Strategic Objective #3: Reduce natural resource depletion in target areas							
Results Package #1: Information management: support to the production and circulation of information and the evaluation of NRM impact (Page 5 of 7)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Integration of ANGAP's documentation unit to national (CIDST) and international (IBISCUS) networks STTA: Documentation Training	Indexing integration complete	STTA Gasmi	JMD with CIDST	May-July	Completed
		Providing socioeconomic and ecological and program information to users, including USAID's API indicators	API indicators provided to users	Completed	RS	Jan.-Dec.	Completed
		Participation in annual reviews and monitoring of ICDP activities, COS meeting, etc.	COS completed	Annual Protected Areas Program Meeting in Sambava.	JMD, RC	Feb.-Mar.	Completed
		Review of M&E indicators to respond to ANGAP's needs in 1996 and beyond.	Revised list of indicators finalized at Antsi-rabe (10/96)	M&E advisor prepared proposals for ANGAP and development partners for EP-2 indicators for M&E workshop early October	RS	Jan.-Oct.	Completed
Better understanding, knowledge of the Madagascar's environmental situation	Development of ANGAP institutional capacity to manage and analyze data	Development of DIVB capacity for analysis and information production. Increased DIVB staff size. Local STTA to assist data input	1 DIVB person recruited	No activity	JMD	Jan.-Dec.	Completed
		Train ANGAP and operators staff in GIS/remote sensing; photo-interpretation CFSIGE/ICDPs; basics in remote sensing CFSIGE/Tana	10 staff trained	ICDP technical staff were continuously trained at DIVB/Tana	JMD	Apr.-Aug.	Completed

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TABLE I. RESULTS PACKAGE TABLES WITH ACTIVITY, TASK LEADERS, AND TIMING

Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #2: Financial sustainability (Page 1 of 2)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
Foundation and Trust Fund		Trust Fund and Tany Meva Foundation assistance STTA	MacArthur Foundation support initiated funding received	Funding received. Work plan prepared. SOW for Investment STTA completed. Lyn Ellsworth support on 2 STTAs	RS, Lyn Ellsworth	May October December	Completed
	Better management of funds already in existence such as park entrance fees, sales of products and services, research and filming fees, etc.	Study tour to Indonesia (observe TF in action)	ANGAP account in Tany Meva opened	Pending DAF/ANGAP decision on MacArthur Foundation-funded STTA assistance. Lyn Ellsworth advised on endowment creation.	RC, RS - STTA MacArthur Foundation Grant RC	(several visits)	Ongoing in EP-2
	Review potential for generation of new funds within Madagascar	Study tour to France (observe TF in action)	Evaluation of potential for fund raising in Madagascar completed;	Await advice of Lyn Ellsworth on best approach to follow.	RS	October December	Ongoing in EP-2
	Initiate review of international fund raising process		Trip reports and recommendations	No results this quarter.	RC	TBD	Ongoing in EP-2
		Review sustainability issues for ANGAP		No results this quarter.	RC	TBD	Ongoing in EP-2
	Seek funds	Review the current strategy for financial sustainability.	Reviewed strategy accepted by ANGAP	No results this quarter.	RC	Oct.-Dec.	Ongoing in EP-2
Monitoring for sustainability	Support to parks and reserves in preparing financial income/expense statements	Support ICDP DAFs in preparing parks sustainability M&E worksheet which will be used to determine the income/expenses of various parks of network to estimate financial needs for program sustainability. Priority : 6 SAVEM ICDPs plus Isalo	Worksheets completed for 6 SAVEM ICDPs + Isalo	Worksheets were reviewed at M&E workshop in October to engage support of field program. Commitment by EP-2 partners to determine actual costs of running parks and reserves.	RS, RC, DAF, and ICDP DAFs	Jan.-Dec.	Completed Ongoing in EP-2

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Strategic Objective #3: Reduce natural resource depletion in target areas							
Results Package #1: Information management: support to the production and circulation of information and the evaluation of NRM impact (Page 7 of 7)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Annual M&E ICDP workshop in October, 1996	M&E workshop held	Scheduled for 4 th quarter. Will focus on EP-2 needs for monitoring and transition.	RS	Oct.	Completed
		More direct technical support to socioeconomic and ecological monitoring staff of SAVEM ICDPs and the DIVB	Eight field visits to SAVEM ICDPs	Programmatic support visit to Nosy Be.	RS	Apr.-Nov.	Completed
		Analysis of SAVEM program case studies of socioeconomic impact an hypothesis testing	Impact case study	Steering committee confirmed the need to select case studies for evaluating hypothesis testing program of ICDPs. Twenty case studies in 9 ICDPs completed.	RS	Apr.-Nov.	Completed
		Case studies on lessons learned in SAVEM ICDPs	Lessons learned study	Steering committee selected Lynn McCoy to conduct this study under a USAID contract.	STTA	June-Dec.	Cancelled
		Analysis of spatial data on priority parks: Ranomafana, Isalo, Ankarana, Andasibe	Analysis maps complete	Maps indicating pressures completed. Vegetative time series completed on target areas for 6 SAVEM ICDPs.	JMD, RS	Apr.-Nov.	Completed

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TABLE 1. RESULTS PACKAGE TABLES WITH ACTIVITY, TASK LEADERS, AND TIMING

Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #5: Park management and biodiversity conservation (Page 1 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
The development of an efficient, effective and highly respected national parks institution	ANGAP internal organization and functioning	Weekly ANGAP senior staff meetings, strategic retreats, joint field trips, special meetings, one-on-one discussions, etc. Specifically on:	Formal meeting reports	Ongoing to end of Dec 1996 One day strategic retreat for corporate communications strategy (10/22). GELOSE workshop organized by TR&D (11/8). Special meeting with DG on ANGAP's future legal status (11/12). Special meeting with DG on ANGAP's ability to directly manage the protected area network in 1997 (11/15). ANGAP strategic planning retreat at Tuliar (11/26-11/30).	RS, RC, JMD	Apr.-Dec.	Completed
		Support the change of personnel management from DRHC to DAF	DAF Managing	Completed	RS, DAF	Jan.-June	Completed
		Support for the change of socioeconomic and ecological monitoring from DSEP to DIVB	DIVB Monitoring	Completed	RS, JMD, relevant ANGAP directors	Jan.-June	Completed
		Support for moving park entrance fee management from DAF to Department of Ecotourism	DRHC Managing DEAP	Completed	RS, DG, DRHC	Jan.-June	Completed
		Support to the Director General and senior staff in determining new roles and responsibilities of all staff, at different levels, particularly in what is delegated to lower levels	Clarified lines of authority	Major topic of discussion at Strategic Planning Retreat at Tuliar but will need to be finalized by the ANGAP institutional audit/strategic review to be done by international consultants early in 1997.	RC, RS, JMD, RC, DG, ANGAP directors	Jan.-Dec.	Ongoing

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Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #2: Financial sustainability (Page 2 of 2)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
	Support in software training at the central office level in DACEASY for the ANGAP ecoshop using point of sales software	ANGAP central office training	ANGAP shop point of sales operational	Completed Upon advice of PACT/GMU, change made by ANGAP to Quick Books for field operators	RS, Benjamin	Jan.-July	Completed
	Support to ANGAP DAF in DACEASY and PLATINUM software	Platinum Training (2 wks. STTA) Support in use of Platinum Accounting	Platinum operational for ANGAP/DAF	ANGAP in process on completing entry of 1996 data into Platinum. Slow. Priority for EP-2 to master this and complete links with Quickbooks at field park level	RS, Leboutte, Benjamin, RC	May-Dec.	Ongoing in EP-2
	Support to the Isalo National Park installing DACEASY as their accounting system	On site training	Isalo using DACEASY; ANGAP DAF importing data	Isalo will no longer use DACEASY but will be trained for Quick Books by ANGAP - Recommendation by PACT/GMU	Benjamin	Apr.-Dec.	Ongoing in EP-2
	Support to strengthen the DAF financial section through training program	Tana central office; support to ICDP DAF operators, as needed	Training report	Cabinet Fivoarana accounting firm completes training program and accounting audit with recommendations for improvement.	Cabinet Fivoarana accounting firm in Tana	Sept.-Oct.	Completed

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Strategic Objective #3: Reduce natural resource depletion in target areas							
Results Package #5: Park management and biodiversity conservation (Page 2 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Support to the new operational Department of Park Operations and Management in moving from the old DSEP task manager model to one of support to a network of park managers	DPOM has become functional	The structure, staffing and management systems for DPOM need to be reviewed by the institutional audit/strategic review in early 1997.	RC, DG, DSEP	Jan.-Dec.	Ongoing
		Support to the new operational Department of Ecotourism and Marketing in moving from the old DRHC division to focusing on international marketing and publicity	DEM has become functional, 2-day workshop, business plan	Completed	RC, DG, Director DRHC	Jan.-June	Completed
		Support to the Director General in plans for ANGAP's own Park Headquarters in Tana.	New building under construction	Contractor selected ended up turning down job for a bigger bid elsewhere. Looking at runner-up.	RS with DG	Jan.-May	Ongoing
	Development of appropriate policy and legislation	Support for the review and understanding of the legislation governing ANGAP and the National Parks and Reserves	Proposal for actions to be taken	Review <u>completed</u> by national consultant and report on proposed actions submitted by him this quarter.	RC	Jan.-June	Ongoing
		Advise ANGAP on any amendment an/or new legislation that will be required for them to carry out their mission.	Policy document	National consultant's legislation review report provides recommendations on required amendments and new legislation. Support activity now <u>completed</u> .	RC	July-Dec.	Completed
		Move authority for park entrance fees from DEF to ANGAP	ANGAP has updated park entrance fees	Completed	RS with DG, Director DRHC	July-Dec.	Completed

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Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #5: Park management and biodiversity conservation (Page 3 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Support to the preparation of draft statements/legislation, or National Parks Act, for action by the National Assembly Legal expertise in the form of STTA may be required for this task. Draft Legislation.	Legal advice obtained from STTA	The DG has accepted an offer from Conservation International to provide funding and legal expertise for the drafting of a National Parks Act for ANGAP. The SOW has been completed and the study will start early next year.	RC, STTA (Parks Board)	Oct.-Dec.	Ongoing
	Manpower plans and procedures developed	Organizational audit for DAF/ANGAP	Audit report (STTA)	The terms of reference and RFP for the institutional audit/strategic review were completed this quarter. Proposals were received from three of the Big 6 international consulting companies for this World Bank-funded project.	RC, RS	Apr.-Dec.	Ongoing
		Assist to develop an organization structure with specific emphasis on investigation the degree to which decentralized structuring at park level is appropriate at this early stage of the organization's development	ANGAP policy on decentralization. defined	Activity deferred till completion of institutional audit/strategic review next year.	RC	Await outcome of institutional audit.	Ongoing
		Determining staff needs both in the short term and over the next 5 to 10 years	Future projected staff needs defined	See above	RC, RS, Team	Apr.-Dec.	Ongoing-

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Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #5: Park management and biodiversity conservation (Page 4 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Designing a manpower development/ training plan to meet the projected staff needs over the next 5 to 10 years.	Manpower plan	See above	RC, Team	Apr.-Dec.	Ongoing
		Performance appraisals for determining training needs and evaluating promotion potential. Job grading for determining remuneration packages. Recruitment of new staff. ANGAP personnel job description and evaluation review.	ANGAP personnel TOR review complete. New staff recruitment.	See above	ANGAP with TA input		Delayed
The compilation of short-, medium-, and long-term plans for developing and managing national parks and reserves	Strategic planning	Strategic plan for long-term sustainability of ANGAP national parks	Strategic plan	This was partially completed this quarter by the MacArthur Foundation-funded STTA (Lyn Ellsworth). It will be addressed further by the ANGAP institutional audit/strategic review to be conducted early in 1997.	RC	Apr.-June	Completed
		Give strategic and long-term planning advice on an ongoing basis to the Director General and Directors of ANGAP	Report on recommendations given.	Meeting held with DG and Directors to review private sector lodge policy and strategies 11/6.	RC, RS, JMD	Apr.-Dec.	Completed
		Hold smaller strategic planning sessions to develop lower strategies and goals, objectives, and action plans for ANGAP's various divisions.	Report on recommendations given.	Ongoing until end of Dec 1996.	RC, RS, JMD	Apr.-Dec.	Completed
		Accompany the DG and ANGAP Directors on a follow-up study tour of parks and reserves in South Africa	Schedule and trip report	Completed	RC	Sept.	Completed

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Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #5: Park management and biodiversity conservation (Page 5 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Study trip (3 people) to Uganda to see DIVB and parks and people projects.	Schedule and trip report.	Canceled	RS		Canceled
		Isalo senior personnel study trip to S. Africa	Trip Report	Canceled	RC		Canceled
	Developing park management systems	Assigning authority and accounting together with delegating responsibility and decision making to all the various levels of the organization.	ANGAP procedures document	Discussed at Tuliari strategic planning retreat but must be fully addressed by ANGAP institutional audit/strategic review planned for early 1997.	RC, ANGAP with TA support	Dec.	Ongoing
		Establish internal communication system to close potential communications gap (upwards and downwards) between ANGAP head office, parks, and parks countrywide	System proposed and adopted	See above	RC, ANGAP, RC, local STTA	Apr.-Dec.	Ongoing
		Review current administration and financial systems	Report	See above	RS, RC	Apr.-Dec.	Ongoing
Park operations and management planning; ecotourism, marketing, and public relations planning (priority parks of Isalo, Ranomafana, Andasibe, Ankarana)	Support and guidance of ICDP M&E field staff in implementing monitoring and baseline information system. When ICDP unable to furnish information, DIVB will take leadership in implementation.	All baseline data acquired for monitoring and planning needs (data inventory accumulated over the years from ad hoc research surveys, serial photography, Landsat images acquired for appropriate periods.	Baseline data established	Completed	ICDPs with JMD, RS, DIVB	Apr.-Dec.	Completed
		Park boundaries clearly defined, peripheral zones defined	Completed for 6 SAVEM ICDPs	Completed	ICDPs with JMD and DIVB	Apr.-Dec.	Completed

ANGAP Final Report of Activities

Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #5: Park management and biodiversity conservation (Page 6 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Park zonation emphasizing peripheral zones, buffer zones, and service zones	Plans for four priority parks	Identification and agreement on service zone boundaries for Ankarana, Isalo, Ranomafana and Andasibe completed. Land tenure for Isalo and Ranomafana completed.	RC, JMD, RS, with DSEP and DIVB	Apr.-Dec.	Completed
		Layout plans for tourism facilities and management infrastructure in service zones in four priority parks	Tourism plans for 1 SZ in four priority parks completed	Service zone layout plans for Ankarana, Ranomafana, and Andasibe completed. Layout plan for Isalo under review because of incompatibility of camping grounds and private sector lodge site.	ICDPs with RC and DRHC, Robinson and Grenfell	Jan.-Dec.	Completed
		An ecotourism master plan (short and long term) including trails, roads, campsites, interpretation centers, entrance gates, lodge sites, bush camps, etc., which are related to estimated visitor carrying capacity in four priority parks	Master plan in place for four priority parks. Policy study completed.	A framework for ecotourism masterplanning completed. Master plans for Ranomafana, Andasibe and Ankarana completed. Although a master plan for Isalo was completed by Landell Mills in 1995 it must be reviewed in early 1997.	ICDPs with RC, DRHC	Jan.-Dec.	Completed
		Develop a neighboring community policy for ANGAP for EP-2	Policy adopted	Policy recommendations completed in STTA study of Francois Odendaal. Policy not yet formally adopted by ANGAP.	ICDPs with ANGAP, RC	Apr.-Dec.	Ongoing
		Business plans relating income and expenditure to achieving set objectives	DRHC business plan exists	This planned support activity was premature due to the inadequacy or, in many cases, a total lack of tourism facilities and services in the protected areas.	DHRC, RC	Deferred to 1997	Deferred

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Strategic Objective #3: Reduce natural resource depletion in target areas							
Results Package #5: Park management and biodiversity conservation (Page 7 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Manual laying out procedures for ongoing park management and maintenance tasks	Manual drafted	Identification of manuals required for construction and maintenance in parks completed. Compilation of manuals must be given priority on the STTA planning for 1997.	DSEP, RC, STTA	Deferred to 1997	Deferred
		South African National Parks Board support	Training sessions and STTA reports	Completed	RC	Jul.-Dec.	Completed
	Support to park managers of four priority parks	Planning, leading, organizing, and controlling park operations: Budgets, AWPs, infrastructure maintenance, research and monitoring, visitor control, trail design/maintenance, ecotourism facility development (e.g., trails and campsites), fire control, law enforcement	Completed park management plans for four priority parks	Agreement reached that ICDP park managers will complete their management plans before the handover to ANGAP on 1 July 1997. This is part of the ongoing transition between ICDP control and ANGAP management	RC, STTA	Jul.-Dec. 1996	Ongoing
	Transition from ICDP to ANGAP management	Advice, assistance, and mediation inputs will be given to ANGAP on an ongoing basis	Responsibilities and obligations of ANGAP and ICDPs defined	Definition of responsibilities and obligations completed. Ongoing advice given on the transition process up until the end of Dec 1996.	RC, RS, JMD	Apr.-Dec.	Completed
	Interpretation Centers	Support in siting studies, architectural internal and external design of interpretation centers for Isalo, Ranomafana	Documentation prepared for WB supported bids and contracts	Completed.	RC, RS, MSAADA firm	Jan.-June	Completed
		Draft of Isalo, Ranomafana, provide detailed specifications for bid, and construction supervision	Architectural plans	Completed.	RS, MSAADA	Jan.-June	Completed

ANGAP Final Report of Activities

Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #5: Park management and biodiversity conservation (Page 8 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Support with georeferenced data to prepare legal documents for gaining title to the land on which these centers will be built along the border on these parks (service zone).	Map products	Completed.	JMD	Jan.-May	Completed
		Support to prepare for the displays, storylines, etc., to place into these centers once they are built. Goal of buildouts by end of 1996.	Ranomafana, Isalo plans made for centers	Completion of centers delayed to early 1997 due to land tenure and tendering problems. Ranomafana display plans in the process of being completed by Lynn Robinson. Isalo display plans completed by Peace Corps.	RC with Lynn Robinson, DRHC, Peace Corps	July-Dec.	Delayed
		Support to personnel working in interpretation centers (which include park offices, park entrance fee counter, small store).	Training sessions (6 people) in priority parks	This support activity is premature as the interpretation centers will not be completed before the end of the first quarter 1997.	RC	4 th Quarter	Deferred
		Interpretation Center Seminar in Ranomafana	Seminar and report	Completed but venue changed from Ranomafana to Moramanga.	DHRC, RC		Completed
	Ecotourism and marketing in Madagascar's four priority parks	Support in developing a thorough understanding of the ecotourism market (domestic and international)	Recommendation for targeting marketing	Although this support activity was partially addressed by the Odendaal STTA report it was concluded in retrospect that it is premature to be concerned with serious marketing at this stage. The priority to focus on is to improve the facilities and services in the parks. This first step is essential to cope with the rapidly increasing number of visitors that is taking place spontaneously, without marketing.	RC, Odendaal	July	Deferred

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Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #5: Park management and biodiversity conservation (Page 9 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Pricing study	Recommend for pricing	Completed	RC	July	Completed
		Planning for appropriate infrastructure development for parks	Plan for priority parks infrastructure	Planning completed but the challenge for 1997 is to implement these plans.	RC	July	Completed
		Developing an appropriate framework to foster private sector involvement in ecotourism	Model contracts for ANGAP/PS partnerships	Completed	RC, Davies	May	Completed
		Developing marketing and park products	New products developed	STTA study completed by Odendaal	RC, Odendaal	July	Completed
		Assessment of local crafts and product quality	Recommendation and implementation plan	STTA study completed by Odendaal	RC, Odendaal	July	Completed
	Strategic Marketing and Business Planning	Identification of target markets (marketing)	Workshop proceedings	South African National Parks Board were unable to help in this regard. The STTA study by Odendaal partially addressed this planned support activity.	RC, Odendaal	July	Completed
		Management/marketing workshop		Workshop canceled due to National Parks Board not being available. Agreement reached with Tour operators, Maison du Tourisme and ANGAP to hold a joint workshop in 1997.	RC		Postponed
		Identification of potential tourism circuits and packages (marketing study)	Tourist circuits being defined	The STTA by Odendaal partially addressed this activity. The joint workshop to be held next year will address it further.	DHRC, RC, Odendaal	July-Dec.	Deferred

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TABLE 1. RESULTS PACKAGE TABLES WITH ACTIVITY, TASK LEADERS, AND TIMING

Strategic Objective #3: Reduce natural resource depletion in target areas Result Package #6: Sustainable management of forest ecosystems (Page 1 of 1)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
Institutional support	Institutional strengthening of community forest management, especially in relation to the 9 category A protected areas; ZOC/ZUC ANGAP and community management	Park-community management of selected ZOC/ZUC in Isalo	Process initiated	Canceled activity. Richard Swanson's terms of reference realigned	RS	Apr.-Dec.	Canceled
		STTA: Community management of natural resources in Ankarana special reserve buffer zone ZOCs and/or ZUCs	Quarterly reports and consultant reports	Mario Gauthier consultancy with GELOSE component for EP-2 planning completed. Workshop held and report completed.	RC	Oct.-Nov.	Completed
	Neighboring communities policy	Support to SAVEM ICDPs in sharing entry fees	Quarterly reports and consultant reports. Recommendations given on how to proceed	No activity this quarter	RC, DSEP with SAVEM ICDPs and Isalo	Apr.-Dec.	To be Continued under EP-2 with Collinson support
		Controlled use of resources within park buffer zones (ZUC, ZOC). Restrictions in buffer zones	Study and recommendations	Mario Gauthier arrived at the end of September to begin an overview of this question with GELOSE. Continued through November.	RC, Gauthier	October-November	Completed
		Facilitating community involvement in ecotourism opportunities including crafts	Study and recommendations	Addressed in Odendaal study.	RC	July	Completed

*JMD = DG = Director General, Jean-Michel Dufils, RC = Roger Collinson, and RS = Richard Swanson.

k/afr_east.cen/madagasc/angap/1996/final/result6.wpd/01/15/97

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Strategic Objective #3: Reduce natural resource depletion in target areas Results Package #5: Park management and biodiversity conservation (Page 10 of 10)							
Result	Means	Support activities to ANGAP	Indicator	October to December 1996 achievements	Task leader*	Schedule	End of contract achievements
		Identification of key travel media, travel agents, and travel operators in relation to these markets for the four priority national parks	Partnership plan	See above	RC, Odendaal	July-Dec.	Deferred
		Identification of the balance of tourism facilities and services to be provided in and around the four priority parks	Master plan for parks created	See above	RC, Odendaal	July-Dec.	Deferred
	Public relations strategy	Workshop on PR with the objective of gaining a local, national, and international PR plan	Training report	Workshop canceled due to the unavailability of the South Africa Parks Board. Deferred until 1997 and will hopefully be supported by both a national and international public relations company.	RC, DHRC, STTA	Deferred to 1997	Deferred
		Identify strategies and mechanisms for communicating a constantly positive message about ANGAP to each of the key stakeholders	Strategy report	This study was completed by Image Making Co., a national consulting company.	RC, DHRC, Image Making	Sept.	Completed

k/afr_cast.cen/tnadagasc/angap/1996/final/result5.wpd/01/15/97

ANNEX 1: Training Activity Report: January - December 1999

DATE: 15-Jan-97
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Depart.	Topic	Dates planned	Dates held	# of Participants	# of Days	Person/Days Training	Leader	Intended for Whom	Total Budgeted	Total Obligated	Balance in \$
Park	1. Study visit to South Africa by park managers	Sept-Oct	09/21-10/13	5	12	60	Collinson & SANPB	Mamison & PM of Andohahelo, Bemaraha, Masoala, Ambar Mountain, Manombo	15,000	10,000	5,000
Operations	2. Annual national directors meeting		June 10-15	21	5	105	ANGAP/DSEP	ANGAP staff attending the meeting	9,000	8,886	114
Management	3. Annual IUCN meeting in Montreal		Oct 15-24	1	5	5	IUCN	DG's per diem only	1,500	1,320	180
	4. Construction and engineering guidelines		Aug28-Sep	1	24	24	Normand Dicaire/Coll.	ANGAP DG, directors, engineer, administrator of tenders & PMs	15,400	14,485	915
	5. Community management of natural resources in zones of human occupation and controlled use in the buffer zone Ankarana		Sept-Oct	1	48	93	Mario Gauthier	DSEP staff and Ankarana staff	18,800	13,035	5,765
								Subtotal	\$59,700	\$47,706	\$11,994
Ecotourism	1. Training of tourist guides		Jul-Aug-Sep	15		225	Harizo	Guides of priority parks	5,500	6,245	(745)
Marketing	2. Seminar on regulating guides		Apr 15-20	54	5	270	Jackie	ANGAP/guides/private sector/ICDP	7,500	7,480	20
	3. Supervising interpretation center construction		Oct-Dec	1	20	20	Collinson	ANGAP engineer & park managers	2,500	3,213	(713)
	4. Field trips for children into parks		Apr 15-June			57	Harizo	Children in communities around parks	1,000	815	185
	5. World Environment Day		June 2-7	1	4	4	Jackie	Urban communities	500	483	7
	6. Interpretation center exposition seminar in Moramanga		July 29-Aug	32	5	160	Jackie	Ecotourism, communication & education staff of ANGAP & ICDPs	3,000	2,664	336
	7. Study trip to South Africa		Aug 31-Sep	5	6	30	Collinson	DG and tour directors	9,000	7,270	1,730
	8. Training for documentation center personnel	May & Sep	May 20-27	2	7	14	Gasmi STTA	ANGAP Documentation Center staff	12,000	11,814	186
	9. Documentation indexing		April-June	1	228	228	CIDST Local Consultants	ANGAP Documentation Center staff	5,800	4,651	1,149
	10. ECOTOURISM MARKETING								22,000		(8,906)
	- DRHC to La Reunion		May 21-24	1	4	4	Jackie	Jackie		1,805	
	- INDABA tourism exhibit in Durban		May 8-14	2	4	8	Collinson	Jackie & Eugene		3,077	
	- English training ECOT	May-June	May-June	1	10	10	E.L.I.	Eugene		200	
	- Communication plan for DG		Sep-Oct	1	36	36	DG	DG		10,404	
	- International meeting on tourism		Aug-Sept C	1	51	51	Local Consultant	DRHC Dept.		1,820	
	- Study trip to South Africa		Nov. 9-24	1	12	12	Francois Odeendaal	Samuel		2,597	
	- Study tour to South Africa		Oct 29-Nov	4	10	40	Collinson	Henry Zo, Mac Gordon, Lorette, Rabenandrasana Rene		11,000	
								Subtotal	\$68,800	\$75,552	(\$6,752)

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Depart	Topic	Dates planned	Dates held	# of Participants	# of Days	Persons/ Days Training	Leader Trainers/Firm	Intended for Whom	Total	Total	Balance
									Budgeted	Obligated	In \$
DAF	1. Training of trainers			25	4		ANGAP	Parks and Reserve staff	1,250	1,046	204
	2. Training of financial staff of parks and reserves			15	1	15	ANGAP	Finance staff of parks and reserves	1,500	446	1,054
	3. Misc. meetings (usually 1 day length)		May 7			34	ANGAP	ANGAP staff	1,500	271	1,229
	4. Management des moyens financiers (FORHOM)			1	20	20	FORHOM	Valerien AJ	12,700	15,318	(2,618)
	5. Planification operationnelle et controle des projets (FORHOM)			1	20		FORHOM	Rabodo CAM NOT APPROVED BY USAID			
	6. Senior staff retreat (DG, Directors, Chefs Cellule, TA)			21	4	84	DG	ANGAP senior staff	7,500	8,923	577
	7. Office staff retreat (all other staff)			15	5	75	DAF	Other ANGAP staff	5,700	5,675	25
	8. Senior staff strategic retreat		Apr-July	22	3	66	DG	ANGAP senior staff	2,000	8,748	(6,748)
	9. Training of DAF staff			5		66	Cabinet Fivoarana	DAF Chefs de Cellule	10,800	10,483	317
	10. English training		Aug-Nov.	3		12	E.L.I.	Valerien, Rabodo, Hanitra	700	739	(39)
	11. Platinum training		Sep-Oct	4	14	56	Yves Leboutte	DAF staff & parks financial staff	12,500	12,153	347
							Subtotal	\$56,150	\$61,798	(\$5,648)	
DIVB	1. Annual M&E workshop (socio-economic/ecological)	Oct 7-11		65	5	325	DIVB/DSEP	M&E parks & reserves staff, ICDPs	6,000	40,706	(34,706)
	2. M&E field training for impact surveys	Mar.-Dec.	Feb-March	1	31	31	Abel (local consultant)	ICDP M&E field staff	2,250	2,212	38
	3. Photo interpretation	April	Ap-May-Jur	2		653	Two local consultants	DIVB staff	4,500	7,507	(3,007)
	4. Aerial videography for M&E impact (two visits)	April-Sept.					ANGAP/TR&D	Park/reserve/ICDP staff	500		500
	5. Vegetative classification/interpretation/impact monitoring	Sept.		2	30	25	University of Tana	DIVB & park/reserve/ICDP staff	1,000	3,990	(2,990)
	6. GIS training	Oct.		1	10	10	CISR/SA	Lanto, Assistant GIS	6,000	8,000	
	7. GIS mapping & modelling	Oct.		1	20	20	ESRI/USGS	Alain, GIS	8,000	7,586	414
	8. Workshop on biodiversity research			30	3		ANGAP/TR&D	DIVB & park/reserve/ICDP staff	3,000		3,000
	9. Data quality control	June	Jun-July-Au	2	22	44	Local consultants	DIVB staff	3,500	4,553	(1,053)
	10. Modelling and development of CD ROM production	June		3	10		Da Vinci, Tana	DIVB & DRHC	2,000		2,000
	11. Taxonomy		Sept 23-27	19	5	95	ANGAP/Univ. Tana	DIVB staff, ACE Manombo & Andranomena, APN Morond.	3,000	2,763	237
	12. Annual International Biodiversity Convention	Nov. 1-15		1	13	13	UNEP/Argentina	Chantal	14,000	9,313	4,687
								Subtotal	26,300		81
DIVB	- English training, Alain		Apr-May-Ju	1	6	6	A.C.C.	Alain SIG		249	
	- Aerial Videography		Sep-Oct	1	48	98	Dana Slavmaker	Alain & SIG staff of ICDPs		25,970	
							Subtotal	\$80,050	\$110,849	(\$30,799)	
							Subtotal	\$264,700	\$295,905	(\$31,205)	

3,204 or
146 person month

Imprvnu
Total balance \$43,283

About \$48,000 not spent in 1994, with another \$25,000 returned from Ministers visit
\$91,000 left unspent in 1995. Budgeted for 1998: \$143,000. Remaining Training Budget: \$307,983
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Annex 2 ANGAP/TR&D USAID-Financed Marketing Development Product Inventory

ANGAP BANK ACCOUNT: MKTG

ANGAP PRODUCTS FOR SALE	PRODUCTION					SALES FROM 07/01/96 TO 09/30/96				INVENTORY AS OF 09/30/96		
	TOTAL COST OF PRODUCTION	NUMBER ORDERED	UNIT COST	COMPLIMENTARY COPIES	TOTAL RECEIVED	QUANTITY SOLD	SALE PRICE fmg	TOTAL in fmg	REMARKS	TOTAL QUANTITY OF INVENTORY	UNIT VALUE	TOTAL VALUE OF INVENTORY
1-POSTER: LEMUR #1	\$2,495.00	2,000	\$1.25	80	2,080	5 141 26 9	50,000 20,000 23,775 0	250,000 2,820,000 618,142 0	0 sold by TR&D given gratis by TR&D			
TOTAL LEMUR #1	\$2,495.00	2,000		80	2,080	181		3,688,142		1,899	20,000	37,980,000
2-POSTER: DRY FOREST	\$2,495.00	2,000	\$1.25	62	2,062	4 84 0 0	50,000 20,000 23,775 0	200,000 1,680,000 0 0	0 sold by TR&D given gratis by TR&D			0
TOTAL DRY FOREST	\$2,495.00	2,000		62	2,062	88		1,880,000		1,974	20,000	39,480,000
3-POSTER: ANDASIBE	\$2,495.00	2,000	\$1.25	121	2,121	4 83 33 8	50,000 20,000 23,775 0	200,000 1,660,000 784,565 0	800,000 sold by TR&D given gratis by TR&D			
TOTAL ANDASIBE	\$2,495.00	2,000		121	2,121	128		2,644,565		1,993	20,000	39,860,000
4-POSTER: BAOBAB	\$2,495.00	2,000	\$1.25	152	2,152	5 129 9 9	50,000 20,000 23,775 0	250,000 2,580,000 213,972 0	0 sold by TR&D given gratis by TR&D			
TOTAL BAOBAB	\$2,495.00	2,000		152	2,152	152		3,043,972		2,000	20,000	40,000,000
5-POSTER: Mother Lemur & infant	\$2,310.00	3,000	\$0.77	0	3,000	37	20,000	740,000		2,963	20,000	59,260,000
6-POSTER: Diademed Sifaka	\$2,310.00	3,000	\$0.77	0	3,000	44	20,000	880,000		2,956	20,000	59,120,000
TOTAL POSTERS	\$14,600.00	14,000		415	14,415	630		12,876,680		13,785		275,700,000
5-CALENDAR	\$37,836.00	2,000	\$18.92 88,000 Fmg		1,999	10 192 35 130 49 70	75,000 100,000 80,000 0 40,000 100,000	750,000 19,200,000 2,800,000 0 1,960,000 7,000,000	0 Sample & for ANGAP Staff Sold by TR&D			
TOTAL CALENDARS	\$37,836.00	2,000			1,999	486		31,710,000		1,513	10,000	15,130,000
6-PAMPHLETS: ISALO	\$2,258.00	3,000	\$0.75	0	3,000	255 6	7,500 0	1,912,500 0	0 gratis or used by ANGAP	2,739	7,500	20,542,500
7-PAMPHLETS: RANOMAFANA	\$2,258.00	3,000	\$0.75	0	3,000	177 9	7,500 0	1,327,500 0	0 gratis or used by ANGAP	2,814	7,500	21,105,000
8-PAMPHLETS: ANDASIBE	\$2,258.00	3,000	\$0.75	0	3,000	239 6	7,500 0	1,792,500 0	0 gratis or used by ANGAP	2,755	7,500	20,662,500
9-PAMPHLETS: AMBER MOUNTAIN	\$2,258.00	3,000	\$0.75	0	3,000	87 6	7,500 0	652,500 0	0 gratis or used by ANGAP	2,907	7,500	21,802,500
TOTAL PAMPHLETS	\$9,032.00	12,000			12,000	786		5,686,000		11,215		84,112,500
10-VIDEO: CMA & PPNR	\$1,900.71	50	\$38.01	0	50	1 14	160,000 175,000	160,000 2,450,000		35	175,000	6,125,000
11-VIDEO: ISALO & ANDASIBE	\$1,900.71	50	\$38.01	0	50	1 10	160,000 175,000	160,000 1,750,000		39	175,000	6,825,000
12-VIDEO: ENGLISH VERSION	\$3,801.41											
TOTAL VIDEO	\$7,602.82	100			100	26		4,620,000		302,969		12,950,000
12-OTHER ITEMS PURCHASED WITH PROCEEDS OF SALES												
GRAND TOTAL	\$70,971.53							54,791,680				387,892,600

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Annex 3: TR&D Technical Reports, Publications, and Deliverables Through December 31, 1996

No	Name	Title	Month	Year	Eng.	Fr.	Pages
1992							
1	TR&D	Quarterly Report #1, November 1991 - March 1992 (Project year One, First/Second Quarter)	April	1992	x		17
2	TR&D	Quarterly Report #2, April - June 1992 (Project year One, Third Quarter)	July	1992	x		35
3	TR&D	Quarterly Report #3, July - September 1992 (Project year One, Fourth Quarter)	October	1992	x		18
4E - 4F	Brusberg, Frederick	Monitoring & evaluation system for development of integrated conservation & development project	November	1992	x	x	25
5	Peters, Joe	Ecotourism development in protected areas in Madagascar	November	1992	x		104
6	TR&D	Quarterly Report #4, October - December 1992 (Project year two, First Quarter)	December	1992	x		
1993							
7E - 7F	MacGregor, James	PLANE GAP, Planification de l'Ecotourisme & Gestion des Aires Potentiels	February	1993	x	x	30
8	TR&D	Quarterly Report #5, January - March 1993 (Project Year Two, Second Quarter)	April	1993	x		
9	TR&D	Quarterly Report #6, April - June 1993 (Project Year Two, Third Quarter)	July	1993	x		
10	TR&D	Quarterly Report #7, July - September 1993 (Project Year Two, Fourth Quarter)	November	1993	x		
1994							
11E - 11F	Swanson, Richard	Conservation and socio-economic development: monitoring & evaluation	December	1994	x	x	55
12E - 12F	Jenkins, Martin	Export trade in Madagascar's plants and animals: consequences for species survival	January	1994	x	x	100
13	TR&D	Annual work plan, 1994 (third)	January	1994	x		
14	TR&D	Programme annuel de travail & projet de budget 1994	January	1994		x	
15	Dufls, Jean Michel	Objectif et strategie de mise en oeuvre du Systeme d'Information sur la Biodiversite	February	1994		x	17
16	Dufls, Jean Michel	SIG/ANGAP, Analyse de Besoins (document de reference pour USGS)	March	1994		x	30
17E - 17F	Jenkins, Martin	Export trade in Madagascar's wildlife: an aid in conservation	March	1994	x	x	32
18	ANGAP	Elaboration d'un PAT au niveau des PCDI	April	1994		x	
19	Training Report	Acte du Premier Atelier sur le Suivi Ecologique	May	1994		x	48
20	MacGregor, James	Tourisme Regional a Madagascar: un manuel de travail pour la planification du tourisme et de	June	1994		x	105
21	Training Report	Actes de la reunion annuelle des PCDI - Operateurs ANGAP - DEF - Toamasina du 30 Mai - 2 Juin	June	1994		x	
22E - 22F	Robinson, Peter	ANGAP's long term financial sustainability (final report)	July	1994	x	x	63
23	ANGAP	Etude sur le systeme de gestion des DEAP	August	1994		x	
24E - 24F	Leeds, Mary	Communication & consultation: un cadre de travail pour un plan de communication pour l'ANGAP	August	1994	x	x	88
25E - 25F	MacGregor, James	Ecotourism mission, Tulear & Nosy be ecotourism workshops	August	1994	x	x	130
26E - 26F	Swanson, Richard	Development for conservation: monitoring & evaluation	August	1994	x	x	57
27	Training Report	Formation organisee par le CFSIGE pour ANGAP: compte rendu de la formation (version 94)	August	1994		x	180
27 bis	Training Report	Formation organisee par le CFSIGE pour ANGAP: compte rendu de la formation (version 95)	August	1994		x	180
28	Training Report	Occupations humaines de aires protegees	August	1994		x	
29E - 29F	MacGregor, James	Planification et formation en ecotourisme et aires protegees	September	1994	x	x	43
30E - 30F	Memenus, Marianne	Valorisation de la diversite biologique a travers les droits de la propriete industrielle	September	1994	x	x	114
31	Training Report	Planification et Gestion des Projets de Development (Moramanga)	September	1994		x	107
32	Training Report	Les methodes de management moderne de la planification et le management du projet (Moramanga)	September	1994		x	153
33	Training Report	Final report: planning and management: environmental conservation project (Univ. of Pittsburgh)	September	1994	x		54
34E - 34F	Hagen, Roy	Vision a long terme des programmes pour les Aires Protegees de Madagascar	October	1994	x	x	22
35	TR&D	Semi-Annual Report #1 October 1, 1993 - March 31, 1994	October	1994	x		

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No	Name	Title	Month	Year	Eng.	Fr.	Pages
36	Training Report	Acte de l'atelier sur le système de suivi du programme Aires Protégées (Antsirabe)	October	1994	x		71
37E-37F	TR&D	Semi-Annual Report #2 ANGAP April 1, 1994 through Sept 31, 1994	November	1994	x	x	55
38E-38F	Cloutier, Antoine	National park system development in Madagascar: potential role of ANGAP in its management	December	1994	x	x	115
		1995					
39E-39F	TR&D	Annual work plan, 1995 (fourth)	February	1995	x	x	72
39 bis	TR&D	First quarterly report, third project year Oct - Dec 1994	February	1995	x		10
40E-40F	Miller, Jay	Development of a national park system in the Republic of Madagascar	March	1995	x		
41	Training Report	Occupations humaines des aires protegees: actes du colloque de Mahajanga (SEDRIC)	April	1995		x	117
42	Faramalala, Miadana	Rapport de mission sur l'atelier "Prospection de la Biodiversité" (INBio / Costa Rica)	May	1995		x	36
43	TR&D	Second quarterly report, third project year, January - March 1995	May	1995	x		26
44	ORGASYS	Etude sur les droits d'entrée, de recherche et de filmage et de redevance dans les A.P (préliminaire)	July	1995		x	39
44 bis	ORGASYS	Etude sur les droits d'entrée, de recherche et de filmage et de redevance dans les A.P (final)	July	1995		x	
45	TR&D	Third quarterly report, third project year, April - June 1995	July	1995	x		18
46	Training Report	Actes de la réunion annuelle de coordination du programme ANGAP (Morondava - DirNat Annual)	July	1995		x	85
47	Training Report	Réunion Annuelle des Formateurs, 24, 28 Juillet 1995 à Toamasina	July	1995	x		80
48E-48F	Nadia, Rabesahala	Conception et mise en oeuvre d'un contrat d'accord pour l'utilisation durable des ressources - communauté du terroir d'Ambodivoahangy (Zahamena) (with color plates)	August	1995	x	x	80
49	Gasmi, Mabrouka	Mise en place d'un Systeme d'Information Documentaire a UID de l'ANGAP	September	1995		x	14
50	Training Report	Retraite staff 1995, Moramanga du 18 - 25 Septembre 1995	September	1995		x	23
51E-51F	Swanson, Richard	Antsirabe monitoring & evaluation: general orientations	September	1995	x	x	4
52	Dufils, Jean Michel	Reflections on reorientations for ANGAP's DIVB Department	September	1995		x	8
53E-53F	Botha, Herman	Actions that should be taken to ensure efficient future functioning of ANGAP	September	1995	x	x	26
54E-54F	Havenga, I.J.J	Feasability study for Isalo National Park	September	1995	x	x	18
55	Training Report	Rapport de mission sur la gestion des parcs en Afrique du Sud (Ravelomantsoa Zézé de PPNR)	September	1995		x	26
56	Training Report	Rapport de mission préliminaire sur la gestion des parcs en Afrique du Sud (DirNat)	September	1995		x	8
56 bis	Training Report	Rapport de mission préliminaire sur la gestion des parcs en Afrique du Sud (Jacquie + Eliane)	September	1995		x	8
57E-57F	TR&D	Fourth quarterly report, third project year, July - September 1995 (with color plates)	October	1995	x	x	73
58E-58F	Swanson, Richard	National parks and reserves of Madagascar: where do ICDP....	October	1995	x	x	38
59	Training Report	Actes de l'atelier suivi-evaluation, Antsirabe du 09-13 Octobre 1995	October	1995		x	69
60	Training Report	Convention sur la Diversité Biologique: Deuxième réunion de la conférence des parties (Djakarta)	November	1995		x	13
61	Training Report	Formation de perfectionnement à l'utilisation des logiciels ARC/INFO, ARCVIEW et AVENUE	December	1995		x	
		1996					
		Ist QUARTER					
62	TR&D	SAVEM Institutional Contract, 1996 annual work plan	February	1996	x		126
62 bis	ORGASYS	Etude & formalisation du statut des zones périphériques des A.P (final)	Jan	1996		x	70
63	TR&D	First quarterly report, fourth project year, October - December 1995	February	1996	x		29
64	Voahanginirina, R.	Rapport d'évaluation de données géographiques numérisées par FTM: Zombitse - Vohibasia	February	1996		x	29
65E-65F	Swanson, Richard	Les Projets de Conservation et de Développement Intégrés: Les leçons à tirer, Hanitriniala pp2-6	Jan/March	1996	x	x	44 / 5
66	Voahanginirina, R.	Rapport d'évaluation de données géographiques numérisées par FTM: PCDI Andringitra	March	1996		x	24
67	Voahanginirina, R.	Mise en cohérence géométrique de banque de données	March	1996		x	8
68	Voahanginirina, R.	Manuel de procédure de contrôle de qualité de données géographiques numérisées version 1	March	1996		x	21
		2nd QUARTER					
69E-69F	TR&D	Second quarterly report, fourth project year, Jan-March 1996	April	1996	x	x	90

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No	Name	Title	Month	Year	Eng.	Fr.	Pages
70E-70F	Wynter, Pauline	Financial sustainability of ANGAP - establishing an ANGAP long term capital investment account with Tany Meva Foundation	April	1996	x	x	15
71E-71F	Collinson, Roger	Proposition de politique et principes pour la participation du secteur privé à l'industrie écotouristique dans les parcs nationaux	April	1996	x	x	6
71Bis	Collinson, Roger	Planning and regulating ecotourism in Madagascar's four priority parks	April	1996	x	x	20
72	Andrianiarison, Simon Grattepanche, Gérard	Atelier sur la stratégie de gestion des guides écotouristiques (Fianarantsoa 16, 19 Avril 1996)	April	1996		x	182
73E-73F	Wynter, Pauline	Towards a management plan for the protection of Tany Kely Island and Lokobe Coral Reef, Nosy Be Madagascar	May	1996	x	x	39
74E-74F	Davies, Richard	Developing an appropriate framework to foster private sector involvement in ANGAP's national parks	May	1996	x	x	28
75	Abel Ratovo, Henri	Appui-Suivi Evaluation socio-économique	May	1996		x	49
76E-76F	Leboutte, Yves	Technical support in use of Platinum accounting software		1996	x	x	36
77	Gasmi, Mabrouka	Mise en place d'un système d'Information de l'UID de l'ANGAP à Antananarivo: Conception	June	1996		x	14
78E-78F	Gauthier, Mario	Methodology and schedule for negotiation of a contract for renewable natural resources	June	1996	x	x	38
79	Rajohnson, L. Joseph	Bulletin bibliographique No1 "Les Aires Protégées"	June	1996		x	68
80	Dufils, Jean Michel	Comité de pilotage SAVEM: Projets de conservation développement intégré USAID/SAVEM Etude sur le suivi de la végétation des zones-cibles Version # 1	June	1996		x	101
81	Rakotoarisoa, Jacquie	Manuel des Guides Niveau A	June	1996		x	98
82	Rakotoarisoa, Jacquie	Manuel des Guides Niveau B	June	1996		x	75
83	Leboutte, Yves	Platinum (2 nd manual)	July	1996		x	62
84	Rakotoarisoa, Jacquie	Marché du tourisme d'Afrique du Sud à Durban	August	1996		x	10
85	TR&D	Third quarterly report - fourth project year April - June 1996	August	1996	x		65
86	SIG/DIVB/ANGAP	Aires Protégées des parties Nord & Nord-Est de Madagascar	June	1996		x	17
87	Rajohnson, L. Joseph	Bulletin bibliographique No2 "Dépouillement des Périodiques"	August	1996		x	35
88E-88F	Collinson, Roger	The role of a national parks organization	June	1996	x		4
89E-89F	Collinson, Roger	Saving the environment can be good business sense	October	1996	x	x	85
90E-90F	Swanson, Richard	Hypothesis testing: Do targeted development activities reduce pressures on parks reserves through changed human behaviour	December	1996	x	x	123
91E-91F	Swanson, Richard	Base line data: ICDP Protected Area program (1994-1996)	December	1996	x	x	114
92	Cabinet FIVOARANA	Compte rendu No2 se rapportant aux phases 2 & 3 de la mission assistance en gestion de la DAF	August	1996		x	67
93	Odendaal, François	Community Support for ecotourism and marketing report	October	1996	x	x	94
94	Leboutte, Yves	Manuel résumé	October	1996		x	40
95	Leboutte, Yves	Procédures & conventions - Platinum quick books	October	1996		x	41
96	Leboutte, Yves	Rapport de mission Platinum	October	1996		x	13
97	TR&D	Fourth quarterly report - fourth project year - July/September 1996	October	1996	x		100
98	Dicaire, Normand	Identification des besoins techniques et organisationnels pour la préparation et la gestion des projets d'aménagement dans les aires protégées de Madagascar	September	1996		x	97
99E-99F	Swanson, Richard	National parks & reserves, Madagascar new model for biodiversity: Lessons learned through ICDP	December	1996	x	x	42
100	Andrianiarison, Simon	Plan de communication	November	1996		x	52
101	Gasmi, Mabrouka	Mise en place d'un système d'information documentaire informatisé à l'UID de l'ANGAP à Antananarivo (actions correctives - formation avancée sur textow - communication)	November	1996		x	4
102	Mario Gauthier	Appui à l'établissement des contrats locaux dans le cadre de GELOSE	November	1996		x	73
103	Slaymaker, Dana	Videography	December	1996	x		
104	TR&D	Final report of activities November 1991-December 1996	December	1996	x		80
105	Training Report	Rapport de mission d'information en Afrique du Sud du 21 Septembre au 13 Octobre 1996	Octobre	1996		x	26

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No	Name	Title	Month	Year	Eng.	Fr.	Pages
106	Cabinet Fivoarana	Assistance en Gestion de la Direction Administrative et Financière	November	1996		x	86
107	Training Report	Acte de l'Atelier Suivi-Evaluation - Hotel des Thermes, Antsirabe	Octobre	1996		x	82

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Annex 4. 1996 Short-Term Technical Assistance														
Total STTA in contract = 40 pm														
TR&D Budget Line Item 45-21														
Title of Scope of Work	# Weeks Programmed	Weeks Used	Dates Planned	SOW Done	Mission Clearance	Date Arrived	Date Departed	Date Draft	Date Final	Transl.?	Budgeted	Actual Cost	Balance	Name
Aerial videographic monitoring	6 + 2 weeks extension	6 + 2	Sept.-Nov.	Y	Y	Sept. 19	Nov. 21				Training			D. Slaymaker
Trust fund (March, Sept., Dec.)	2	2	March, S	Y	Y	Mar. 20	Apr. 21	Mar. 29	June	N	\$3,360	\$1,555	\$6,845	P. Wynter
Ecotourism and marketing (four priority parks, interpretation center planning)	10	51.5	Jan.-Dec.	Y	Y	Jan. 7	*	Mar. 22		N	\$16,800	\$19,935	-	R. Collinson
Platinum training	2	2.7	May Jul. 2-12	Y	Y	Apr. 28 Jul. 2	May 5 Jul. 13	May 7 Jul. 12	May 15 Jul. 20	Y	\$3,360			Y. Leboutte
Platinum-DacEasy field interconnection	3	3	Oct.		Y	Oct. 1	Oct. 18		Nov. 15		\$5,040			Y. Leboutte
Appropriate framework to foster private sector	2.8	2.3	May	Y	Y	Mar. 19	Apr. 4	Apr. 4	Apr. 10	Y	\$4,704	\$5,600	-	R. Davies
Madagascar domestic ecotourism market (private sector) (15 wd remaining)	4.8	2.3	3rd quarter	Y	Y	June 4 Jul. 15	June 19 Jul. 31	Jul. 2	Sept. 7		\$4,704			F. Odendaal

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Annex 4. 1996 Short-Term Technical Assistance Total STTA in contract = 40 pm TR&D Budget Line Item 45-21														
Title of Scope of Work	# Weeks Programmed	Weeks Used	Dates Planned	SOW Done	Mission Clearance	Date Arrived	Date Departed	Date Draft	Date Final	Transl.?	Budgeted	Actual Cost	Balance	Name
Community support for ecotourism/ marketing/ product development. Combined with Madagascar domestic ecotourism STTA	0	2	3rd quarter	Y	Y	June 4 Jul. 15	June 19 Jul. 31	Jul. 2	Sept. 7		\$6,720			F. Odendaal
Community management of NR (ZOC/ZUC) (Ankarana) Manumbo squaterization management	2 4 7	2 4 7	May- June Sept.- Nov.	Y	Y	May 7 Sept. 24	May 21 Nov. 10	June 1 Nov. 25	June 15	Y	\$10,080 training \$11,760			M. Gauthier
Support to drawing up ANGAP's legal legislation national parks act	3	3	4th quarter	Y	Y	Oct. 15	Nov. 2	Nov. 8			Data acquis.			J. Ramahalivony
Support to ANGAP marketing	14	14	Aug.- Nov.			Aug. 5	Nov. 8		Nov. 15		Training			Toky Rabeson

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Annex 4. 1996 Short-Term Technical Assistance														
Total STTA in contract = 40 pm														
TR&D Budget Line Item 45-21														
Title of Scope of Work	# Weeks Programmed	Weeks Used	Dates Planned	SOW Done	Mission Clearance	Date Arrived	Date Departed	Date Draft	Date Final	Transl.?	Budgeted	Actual Cost	Balance	Name
Support to ANGAP documentation unit	2	2	May Sept.	Y	Y	May 19 Sept. 29	May 27 Oct. 12		June	Y	Training			M. Gasmí
Communication study	4	6	3rd quarter	Y	Y	Sept. 2	Oct. 14	Oct. 8			Training			Simon, HeryZo
Engineering & construction policy study	3	3	3rd quarter	Y	Y	Aug. 26	Sept. 25	Sept. 30	Oct. 4	Y	Training			N. Dicaire
Support to ANGAP administration and finances department	16	16	June-Nov.	Y	Y	June 1	Nov. 1				Training			Fivoarana
Support to ANGAP documentation unit staff	35	31	May-Dec.			May 9	Dec. 24				Training			Razafindranaivo
Biodiversity Information Systems	30	27	June-Dec.			June 1	Dec. 24				Training			Razafindrakoto
Assistance to the DIVB biodiversity valorization section	31	28	May-Dec.			May 23	Dec. 24				Training			Rahagalala

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Annex 4. 1996 Short-Term Technical Assistance

Total STTA in contract = 40 pm

TR&D Budget Line Item 45-21

Title of Scope of Work	# Weeks Programmed	Weeks Used	Dates Planned	SOW Done	Mission Clearance	Date Arrived	Date Departed	Date Draft	Date Final	Transl.?	Budgeted	Actual Cost	Balance	Name
Vegetal classification	3	3	4th quarter			Oct. 1	Oct. 21				Training			Rajeriarison
Support to documentation unit for document indexing	12 12	12 12	1st quarter 3rd quarter			Jan. 1 Aug. 5	Mar. 29 Oct. 11				Training			CIDST
Aerial photo interpretation for Zahamena in collaboration with Conservation International	3	3	2nd quarter			Apr. 15	May 3				Training			Rahantamalala
Synthesis of ecological monitoring	3	1	4th quarter			Nov. 27	Dec. 20				Training			Ramanakasina
Synthesis of research done in protected areas	4 2	4 1	4th quarter			Oct. 3 Nov. 27	Oct. 31 Dec. 13				Training			Andriantsiferan
Investigators for DIVB biodiversity valorization section	4	4	2nd quarter			Apr. 11	Apr. 30				Training			Ranaivo Jaona Rabarison

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Annex 4. 1996 Short-Term Technical Assistance Total STTA in contract = 40 pm TR&D Budget Line Item 45-21														
Title of Scope of Work	# Weeks Programmed	Weeks Used	Dates Planned	SOW Done	Mission Clearance	Date Arrived	Date Departed	Date Draft	Date Final	Transl.?	Budgeted	Actual Cost	Balance	Name
Photo interpretation for ANGAP DIVB	80	74	Apr.-Dec.			Apr. 1	Dec. 24				Training			Rasoarinoro Andriamanga

Budgeted figures are based on the following:

- International STTA @ \$280/day plus per diem.
- Local STTA @ 100/day (all exp.).
- Man weeks are calculated at \$280/day * 6 days/week, or \$6,160/month.
- Man weeks for STTA for expatriate and local consultants are combined in table (local expertise employed was approximately 1/3 that of expatriate specialists).
- Actual costs to date are give as: daily rate * number of days (does not include per diem or other associated costs).

*STTA contract extended beyond the 10 weeks programmed.

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ANNEX 5: ANGAP INFORMATION SYSTEM CATALOG

INTRODUCTION

Ce document a pour objet de donner un aperçu des données disponibles à l'ANGAP. Ces données sont issues des trois systèmes d'informations de l'ANGAP (SID, SIB, SIG).

- **Système d'Information Documentaire (SID)**

Ce système d'information est rattaché au Département de la Valorisation des Ressources Humaines et Communication. Le SID a pour objet de gérer les données bibliographiques et documentaires de l'ANGAP.

- **Système d'Information sur la Biodiversité (SIB)**

Ce système d'information est implanté dans le cadre de l'élaboration d'une monographie nationale de la biodiversité. Supervisé par ANGAP/DIVB, le SIB est le résultat d'une collaboration inter-institutionnelle regroupant les principales institutions nationales et internationales disposant de données sur la biodiversité de Madagascar.

- **Système d'Information Géographique (SIG)**

Ce système d'information est rattaché au Département Information et Valorisation de la Biodiversité (DIVB). Le SIG gère tout type de données géoréférencées, à divers niveaux de résolution. Le SIG correspond à un réseau d'une dizaine d'unités techniques installées au niveau de l'ANGAP et au niveau des principales aires protégées.

Synthèse des données du SIB
Synthèse des données du SID
Synthèse des données du SIG

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SYSTEME D'INFORMATION SUR LA BIODIVERSITE
 LISTE DES DONNEES : FAMILLES, GENRES, ESPECES
 DATE: 07 Décembre 1996

STATISTIQUES SUR LA FLORE

Nombre de familles, de genres et d'espèces par groupe

Groupe	Nombre de famille	Nombre de genres	Nombre d'especes
ANGIOSPERME	181	1 277	6 313
BRIOPHYTE	3	30	59
CHAMPIGNON	12	52	130
GYMNOSPERME	6	9	22
PTERIDOPHYTE	25	70	249
TOTAL	227	1,438	6,773

Nombre de genres et d'espèces par famille

Groupe	Famille	Nombre de genres	Nombre d'especes
ANGIOSPERME	ASCLEPIADACEAE	32	167
	BALANOPHORACEAE	1	1
	BALSAMINACEAE	1	21
	BASELLACEAE	1	3
	BEGONIACEAE	1	45
	BETULACEAE	1	1
	BIGNONIACEAE	14	58
	BIXACEAE	1	1
	BOMBACACEAE	5	26
	BORAGINACEAE	7	28
	BROMELIACEAE	2	3
	BURSERACEAE	4	38
	BUXACEAE	1	1
	CACTACEAE	5	20
	CAMPANULACEAE	4	14
	CANELLACEAE	1	4
	CANNABIDACEAE	1	2
	CANNACEAE	1	1
	CAPPARIDACEAE	9	38
	CARICACEAE	1	1
	CARYOPHYLLACEAE	5	8
	CASUARINACEAE	1	3
	CELASTOMATAACEAE	1	1
	CELASTRACEAE	16	65
	CHENOPODIACEAE	5	15
	CHRYSOBALANACEAE	3	7

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Groupe	Famille	Nombre de genres	Nombre d'especes
	CLUSIACEAE	2	24
	COMBRETACEAE	8	48
	COMMELINACEAE	4	11
	COMPOSITAE	76	327
	CONNARACEAE	4	10
	CONVOLVULACEAE	8	37
	CORNACEAE	2	10
	CRASSULACEAE	4	86
	CRUCIFERAE	8	20
	CUCURBITACEAE	21	46
	CUNONIACEAE	1	27
	CYMODOCEACEAE	1	1
	CYPERACEAE	16	124
	DICHAPETALACEAE	1	9
	DIDIEREACEAE	4	16
	DIDYMELACEAE	1	2
	DILLENIAEAE	4	7
	DIOSCOREACEAE	2	38
	DROSERACEAE	1	4
	EBENACEAE	2	90
	ELAEOCARPACEAE	2	14
	ERICACEAE	3	23
	ERIOCAULACEAE	3	8
	ERYTHROXYLACEAE	1	32
	EUPHORBIACEAE	51	435
	FAGACEAE	1	4
	FLACOURTIACEAE	13	72
	FLAGELLARIACEAE	1	1
	GENTIANACEAE	7	21
	GERANIACEAE	3	6
	GESNERIACEAE	1	6
	GLOBULARIACEAE	1	1
	GOODENIACEAE	1	4
	GRAMINEAE	123	410
	GROSSULARIACEAE	2	5
	GUNNERACEAE	1	1
	GUTTIFERAE	8	86
	HALORAGIDACEAE	2	3
	HAMAMELIDACEAE	2	9
	HERNANDIACEAE	3	6
	HYDNORACEAE	1	1
	HYDROCHARITACEAE	5	6
	HYDROSTACHYDACEAE	1	7
	ICACINACEAE	6	11
	IRIDACEAE	7	12
	IXONANTHACEAE	1	1

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Groupe	Famille	Nombre de genres	Nombre d'especes
	LABIATAE	22	66
	LAURACEAE	11	145
	LECYTHIDACEAE	2	10
	LEEACEAE	1	3
	LEGUMINOSAE I	32	127
	LEGUMINOSAE II	15	119
	LEGUMINOSAE III	63	368
	LEMNACEAE	1	2
	LENTIBULARIACEAE	2	16
	LILIACEAE	18	47
	LINACEAE	2	6
	LOGANIACEAE	5	37
	LORANTHACEAE	3	17
	LYTHRACEAE	6	10
	MAGNOLIACEAE	1	1
	MALPIGHIACEAE	5	14
	MALVACEAE	17	83
	MARANTACEAE	2	2
	MELASTOMATACEAE	12	71
	MELIACEAE	20	61
	MENDONCIACEAE	1	4
	MENISPERMACEAE	8	15
	MENYANTHACEAE	1	3
	MOLLUGINACEAE	1	4
	MONIMIACEAE	3	37
	MORACEAE	16	76
	MORINGACEAE	1	6
	MUSACEAE	2	7
	MYOPORACEAE	1	1
	MYRICACEAE	1	5
	MYRISTICACEAE	5	20
	MYROTHAMNACEAE	1	1
	MYRSINACEAE	6	38
	MYRTACEAE	7	96
	NAJADACEAE	1	2
	NEPENTHACEAE	1	3
	NYCTAGINACEAE	5	11
	NYMPHAEACEAE	1	3
	OCHNACEAE	8	25
	OLACACEAE	5	16
	OLEACEAE	8	38
	ONAGRACEAE	3	20
	OPHIOGLOSSACEAE	2	5
	ORCHIDACEAE	61	429
	OXALIDACEAE	2	11

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Groupe	Famille	Nombre de genres	Nombre d'especes
	PALMAE	21	188
	PANDANACEAE	1	25
	PAPAVERACEAE	2	3
	PASSIFLORACEAE	4	19
	PEDALIACEAE	4	13
	PHYTOLACCACEAE	3	5
	PIPERACEAE	2	13
	PITTIOSPORACEAE	1	12
	PLANTAGINACEAE	1	3
	PLUMBAGINACEAE	1	3
	PODOSTEMACEAE	5	5
	POLYGALACEAE	1	6
	POLYGONACEAE	6	24
	PONTEDERIACEAE	1	2
	PORTULACACEAE	3	5
	POTAMOGETONACEAE	2	8
	PRIMULACEAE	2	4
	PROTEACEAE	4	6
	PTAEROXYLACEAE	1	8
	PUNICACEAE	1	1
	RANUNCULACEAE	4	18
	RHAMNACEAE	12	26
	RHIZOPHORACEAE	7	21
	ROSACEAE	11	32
	RUBIACEAE	63	283
	RUTACEAE	15	73
	SALICACEAE	1	2
	SALVADORACEAE	2	2
	SANTALACEAE	3	3
	SAPINDACEAE	31	105
	SAPOTACEAE	11	112
	SARCOLAENACEAE	8	37
	SCROPHULARIACEAE	17	28
	SIMAROUBACEAE	4	7
	SMILACACEAE	1	3
	SOLANACEAE	12	62
	SONNERATIACEAE	1	1
	SPHAEROSEPALACEAE	2	18
	STERCULIACEAE	18	175
	STRELITZIACEAE	2	3
	TACCACEAE	1	4
	THEACEAE	2	9
	THYMELAEACEAE	5	13
	TILIACEAE	6	56
	TREMELLACEAE	1	1

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Groupe	Famille	Nombre de genres	Nombre d'especes
	TRIGONIACEAE	1	1
	TROPAEOLACEAE	1	1
	TURNERACEAE	1	1
	TYPHACEAE	1	3
	ULMACEAE	4	13
	UMBELLIFERAE	16	31
	URTICACEAE	8	22
	VELLOZIACEAE	2	6
	VERBENACEAE	16	85
	VIOLACEAE	3	17
	VISCACEAE	1	11
	VITACEAE	5	40
	WINTERACEAE	1	1
	XYRIDACEAE	1	3
	ZINGIBERACEAE	5	9
	ZYGOPHYLLACEAE	2	4
BRIOPHYTE	HEPATIQUES	12	18
	LICHENS	2	16
	MOUSSES	16	25
CHAMPIGNON	AGARICACEAE	19	54
	ALEURIACEAE	1	3
	APHYLLOPHORACEAE	4	9
	ASCOBOLACEAE	3	4
	ASCOMYCETES	1	1
	AURICULARIACEAE	2	6
	BOLETACEAE	2	5
	CALOCERACEAE	3	5
	CANTHARELLACEAE	1	3
	HELIOTIACEAE	4	9
	HUMARIACEAE	8	17
	HYALOSCYPHACEAE	2	6
	MORCHELLACEAE	1	1
	POROHYDNEAE	23	66
	RUSSULACEAE	1	3
	SARCOSCYPHACEAE	2	5
	SCLEROTINIACE	3	4
GYMNOSPERME	CUPRESSACEAE	1	1
	CYCADACEAE	1	2
	PINACEAE	1	7
	PODOCARPACEAE	2	7
	ZAMIACEA	4	4
	ADIANTAEAE	6	23
	ASPIDIACEAE	3	7
	ASPLENIACEAE	9	62
	ATHYRIACEAE	2	4

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Groupe	Famille	Nombre de genres	Nombre d'especes
	AZOLLACEAE	1	1
	BLECHNACEAE	2	7
	CYATHEACEAE	1	45
	DAVALLIACEAE	7	19
	DENNSTAEDTIACEAE	12	24
	DERMATEACEAE	2	5
	DICKSONIACEAE	1	1
	EQUISETACEAE	1	1
	GLEICHENIACEAE	3	6
	GRAMMITIDACEA	2	3
	HYMENOPHYLLACEAE	2	23
	LOMARIOPSIDACEAE	1	3
	LYCOPODIACEAE	3	25
	MARATTIACEAE	2	4
	MARSILEACEAE	1	4
	OSMUNDACEAE	1	1
	PARKERIACEAE	1	2
	POLYPODIACEAE	12	24
	PTERIDACEAE	3	10
	PTERIDOPHYTA	2	2
	SALVINIACEAE	1	1
	SCHIZAEACEAE	4	13
	SELAGINELLACEAE	1	8
	THELYPTERIDACEAE	4	16

SYSTEME D'INFORMATION SUR LA BIODIVERSITE

LISTE DES DONNEES : FAMILLE, GENRE, ESPECES

DATE: 03 Décembre 1996

STATISTIQUES SUR LA FAUNE

Nombre de familles, de genre et d'espèces par groupe

Groupe	Nombre de familles	Nombre de genres	Nombre d'espèces
ACARIEN	4	8	9
AMPHIBIEN	4	20	190
ARACHNIDE	1	5	25
ARACHNIDE ARANEOMORPHE	12	48	71
CRUSTACEE	3	5	13
CRUSTACEE DECAPODE	2	4	16
CRUSTACEE EAU DOUCE	2	5	8
CRUSTACEE TERRESTRE	1	1	1
GASTEROPODES BASOMMATOPHORES	4	7	13
GASTEROPODES MESOGASTROPODES	3	10	19
INSECTE	21	185	846
INSECTES DIPTERES	2	15	124
INSECTES EPHEMERES	10	32	119
INSECTES MEGALOPTERES	1	2	3
INSECTES ODNATES	9	62	231
INSECTES PLECOPTERES	1	2	10
INSECTES TRICHOPTERES	17	45	298
MAMMIFERE	1	1	1
MAMMIFERE CARNIVORE	2	7	14
MAMMIFERE CETACEA	1	1	1
MAMMIFERE CHIROPTERE	5	15	22
MAMMIFERE INSECTIVORE	2	9	40
MAMMIFERE PRIMATE	6	14	59
MAMMIFERE RODENTIA	1	10	29
MAMMIFERE SIRENIEN	1	1	1
MOLLUSQUE TERRESTRE	22	50	355
OISEAU	68	171	271
POISSON	64	114	215
PSEUDOSCORPIONIDES	1	8	13
REPTILE	13	68	363
SCORPIONIDES	2	7	17
TOTAL	286	932	3397

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Nombre de genres et d'espèces par famille

Groupe	Famille	Nombre de genres	Nombre d'espèces
ACARIEN	ANALGESIDAE	1	1
	HYDRACARIENS	1	1
	IXODOIDEA	6	6
	ORIBATES	1	1
AMPHIBIEN	HYPEROLIIDAE	1	10
	MANTELLIDAE	3	77
	MICROHYLIDAE	12	55
	RANIDAE	5	48
ARACHNIDE	SCOLOPENDRIDAE	5	25
ARACHNIDE ARANEOMORPHE	AGELENIDAE	2	2
	ARANEIDAE	14	26
	ARCHAEIDAE	1	8
	CLUBIONIDAE	3	3
	GALLIENIELLIDAE	3	3
	OXYOPIDAE	1	1
	PHOLCIDAE	2	2
	PISAUROIDAE	2	2
	SALTICIDAE	4	4
	TETRAGNATHIDAE	6	6
	THERIDIIDAE	9	11
	ZODARIIDAE	3	3
CRUSTACEE	ATYIDAE	3	11
	GAMMARIDAE	1	1
	POMATIASIDAE	1	1
	POMATIASIDAE	2	1
CRUSTACEE DECAPODE	PARASTACIDAE	1	7
	POTAMONIDAE	3	9
CRUSTACEE EAU DOUCE	CYCLOPIDAE	4	7
	CYCLOPINIDAE	1	1
	CIROLANIDAE	1	1
GASTEROPODES BASOMMATOPHORES	ANCYLIDAE	1	1
	LYMNAEIDAE	1	1
	PHYSIDAE	1	1
	PLANORBIDAE	4	10
	AMPULLARIIDAE	2	2
	NERITIDAE	4	9
	THIARIDAE	4	8
INSECTE	AULONOCNEMIDAE	3	50
	CERAMBYCIDAE	25	174
	CICINDELIDAE	5	18
	DEROPLATYIDAE	1	3
	EMPUSIDAE	2	2
	EROTYLIDAE	4	63

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Groupe	Famille	Nombre de genres	Nombre d'espèces
	HESPERIIDAE	19	61
	HYDROPHIIDAE	2	2
	HYMENOPODIDAE	1	1
	ICHNEUMONIDAE	7	51
	LYCAENIDAE	18	30
	MACRODIPLACTIDAE	1	1
	MANTIDAE	20	43
	MANTISPIDAE	4	6
	NYMPHALIDAE	36	182
	PAPILIONIDAE	4	15
	PIERIDAE	13	27
	RIODINIDAE	1	7
	SCARABAEIDAE	19	107
	THESPIDAE	1	2
	VATIDAE	1	1
INSECTES DIPTERES	CULICIDAE	14	87
	SIMULIIDAE	1	37
INSECTES EPHEMERES	BAETIDAE	8	39
	CAENIDAE	2	8
	EPHEMERELLIDAE	2	2
	EPHEMERIDAE	2	7
	HEPTAGENIIDAE	3	7
	LEPTOPHLEBIIDAE	6	36
	OLIGONEURIIDAE	3	4
	PALINGENIDAE	1	2
	PROSOPISTOMATIDAE	1	2
	TRICORYTHIDAE	4	12
INSECTES MEGALOPTERES	SIALIDAE	2	3
INSECTES ODONATES	AESHNIDAE	4	13
	CALOPTERYGIDAE	1	2
	COENAGRIONIDAE	9	59
	CORDULIIDAE	4	10
	GOMPHIDAE	4	9
	LESTIDAE	5	7
	LIBELLULIDAE	32	86
	MEGAPODAGRIONIDAE	3	32
	PLATYCNEMIDIDAE	3	13
INSECTES PLECOPTERES	NEONEMOURIDAE	2	10
INSECTES TRICHOPTERES	BARBAROCHTHONIDAE	1	3
	CALAMOCERATIDAE	1	3
	DIPSEUDOPSIDAE	1	16
	ECNOMIDAE	2	14
	GOERIDAE	1	3
	HELICOPSYCHIDAE	1	3
	HYALOPSYCHIDAE	1	1

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Groupe	Famille	Nombre de genres	Nombre d'espèces
	HYDROPSYCHIDAE	8	68
	HYDROPTILIDAE	4	12
	LEPIDOSTOMATIDAE	1	15
	LEPTOCERIDAE	9	76
	ODONTOCERIDAE	1	3
	PETROTHRINCIDAE	3	6
	PHILOPOTAMIDAE	4	45
	PISULIDAE	2	14
	POLYCENTROPODIDAE	2	8
	PSYCHOMYIIDAE	3	9
MAMMIFERE	EMBALLONURIDAE	1	1
MAMMIFERE CARNIVORE	HERPESTIDAE	4	5
	VIVERRIDAE	7	9
MAMMIFERE CETACEA	DELPHINIDAE	1	1
MAMMIFERE CHIROPTERE	HIPPOSIDERIDAE	2	3
	MOLOSSIDAE	4	7
MAMMIFERE CHIROPTERE	MYZOPODIDAE	1	1
	PTEROPODIDAE	3	4
	VESPERTILIONIDAE	6	7
MAMMIFERE INSECTIVORE	SORICIDAE	1	2
	TENRECIDAE	8	38
MAMMIFERE PRIMATE	CHEIROGALEIDAE	6	15
	DAUBENTONIDAE	1	1
	INDRIDAE	3	13
	LEMURIDAE	4	22
	MEGALADAPIDAE	1	7
	PHANERIDAE	1	1
MAMMIFERE RODENTIA	MURIDAE	10	29
MAMMIFERE SIRENIEN	DUGONGIDAE	1	1
MOLLUSQUE TERRESTRE	ACAVIDAE	3	92
	ACHATINIDAE	1	7
	ARIOPHANTIDAE	3	66
	ASSIMINEIDAE	3	5
	CHAROPIDAE	1	2
	CHONDRINIDAE	1	1
	CYCLOPHORIDAE	6	26
	DIPLOMMATINIDAE	2	2
	ENIDAE	2	5
	EUCONILIDAE	2	5
	FERRUSSACIIDAE	1	1
	HELICARIONIDAE	5	7
	HYDROCENIDAE	1	3
	ORCULIDAE	1	1
	POMATIASIDAE	1	85
	POMATIASIDAE	2	85

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Groupe	Famille	Nombre de genres	Nombre d'espèces
	PUPINIDAE	1	2
	STREPTAXIDAE	3	17
	SUBULINIDAE	2	3
	UROCYCLIDAE	2	3
	VALLONIDAE	1	1
	VERONICELLIDAE	6	17
	VERTIGINIDAE	1	4
OISEAU	ACCIPITRIDAE	9	11
	ALAUDIDAE	1	1
	ALCEDINIDAE	2	2
	ANATIDAE	6	10
	ANHINGIDAE	1	1
	APODIDAE	4	5
	ARDEIDAE	8	14
	BRACHYPTERACIIDAE	3	5
	CAMPEPHAGIDAE	1	1
	CAPRIMULGIDAE	1	2
	CHARADRIIDAE	2	8
	CICONIIDAE	2	2
	COLUMBIDAE	5	5
	CORACIIDAE	1	1
	CORVIDAE	2	2
	CUCULIDAE	3	12
	DICRURIDAE	1	1
	DIOMEDEIDAE	1	1
	ESTRILDIDAE	2	2
	FALCONIDAE	1	5
	FREGATIDAE	1	2
	GLAREOLIDAE	1	1
	HIRUNDINIDAE	3	4
	HYDROBATIDAE	2	2
	JACANIDAE	1	1
	LARIDAE	1	2
	LEPTOSOMATIDAE	1	1
	MEROPIDAE	1	1
	MESITORNITHIDAE	2	3
	MONARCHIDAE	2	2
	MOTACILLIDAE	1	1
	MUSCICAPIDAE	4	6
	NECTARINIIDAE	1	2
	NUMIDIDAE	1	2
	ORIOIDAE	1	1
	PASSERIDAE	1	1
	PELECANIDAE	1	1
	PHAETHONIDAE	1	3

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Group	Famille	Nombre de genres	Nombre d'espèces
	PHALACROCORACIDAE	1	1
	PHASIANIDAE	2	3
	PHILEPITTIDAE	2	4
	PHOENICOPTERIDAE	2	2
	PLOCEIDAE	3	5
	PODICIPEDIDAE	1	3
	PROCELLARIDAE	4	5
	PSITTACIDAE	2	3
	PYCNONOTIDAE	2	6
	RALLIDAE	12	12
	RECURVIROSTRIDAE	2	2
	ROSTRATULIDAE	1	1
	SCOLOPACIDAE	9	16
	SCOPIIDAE	1	1
	SPHENISCIDAE	1	1
	STERCORARIIDAE	1	1
	STERCORARIIDAE	1	1
	STERNIDAE	4	15
	STRIGIDAE	3	4
	STURNIDAE	2	2
	SULIDAE	1	2
	SYLVIDAE	11	20
	THRESKIORNITHIDAE	4	4
	TIMALIDAE	3	3
	TURDIDAE	3	6
	TURNICIDAE	1	1
	TYTONIDAE	1	2
	UPUPIDAE	1	1
	VANGIDAE	13	16
	ZOSTEROPIDAE	1	1
POISSON	ALBULIDAE	1	1
	AMBASSIDAE	1	3
	ANABANTIDAE	1	1
	ANGUILLIDAE	1	5
	APLOCHEILIDAE	1	2
	ARIIDAE	2	4
	ATHERINIDAE	6	16
	BAGRIDAE	2	2
	BATRACHOIDA	1	1
	BLENNIDAE	1	2
	BOTHIDAE	2	2
	CARANGIDAE	4	12
	CENTRARCHIDAE	3	6
	CHAEDONTIDAE	3	4
	CHANIDAE	1	1

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Groupe	Famille	Nombre de genres	Nombre d'espèces
	CHARCHARINIDAE	1	1
	CHIROCENTRI	1	1
	CICHLIDAE	6	19
	CLUPEIDAE	3	3
	CYNOGLOSSIDAE	1	1
	CYPRINIDAE	4	4
	CYPRINODONTIDAE	3	3
	DASYATIDAE	2	2
	DREPANIDAE	1	1
	DUSSUMIERIDAE	1	1
	ELEOTRIDAE	3	13
	ELOPIDAE	2	2
	ENGRAULIDAE	1	1
	EPINEPHELIDAE	1	2
	ESOCIDAE	1	1
	GERRIDAE	1	4
	GOBIIDAE	12	22
	HEMIRAMPHIDAE	2	2
	KRAEMERIIDAE	1	1
	KUHLIDAE	1	1
	LEIOGNATHIDAE	2	2
	LETHRINIDAE	1	2
	LOBOTIDAE	1	1
	LUTJANIDAE	1	7
	MONODACTYLIDAE	1	2
	MUGILIDAE	3	9
	MULLIDAE	1	1
	MURAENIDAE	1	1
	OPHICTIDAE	2	2
	OSTEOGLOSSIDAE	1	1
	PERIOPHTALMIDAE	1	1
	PLATYCEPHALIDAE	1	1
	PLECTORHYNCHIDAE	3	4
	PLOTOSIDAE	1	1
	POECILIDAE	4	4
	POLYDACTYLIDAE	1	1
	POLYNEMIDAE	1	2
	POMADASYDAE	1	5
	PRISTIDAE	1	1
	SALMONIDAE	2	3
	SCOMBEROIDE	1	3
	SERRANIDAE	2	4
	SIGANIDAE	1	1
	SILLAGINIDAE	1	1
	SPARIDAE	2	2

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Groupe	Famille	Nombre de genres	Nombre d'espèces
	SPHYRAENIDAE	1	1
	SYNGNATHIDAE	1	3
	TERAPONIDAE	1	1
	TYPHLOPIDAE	2	10
	TETRAODONTIDAE	1	1
SCORPIONIDES	BUTHINIDAE	5	14
	SCORPIONIDAE	2	3
PSEUDOSCORPIONIDES	PSEUDOSCORPIONIDAE	8	13
REPTILE	BOIDAE	2	4
	CHAMAELEONIDAE	4	90
	CHELONIIDAE	4	4
	COLUBRIDAE	19	68
	CROCODYLIDAE	1	1
	DERMOCHELYIDAE	1	1
	GEKKONIDAE	13	89
	GERRHOSAURIDAE	2	14
	IGUANIDAE	2	9
	PELOMEDUSIDAE	3	4
	SCINCIDAE	12	63
	TESTUDINIDAE	4	6

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N°	AUTEUR	TITRE. (DATE)
1	PARAMALALA MIADANA HARISOA, E.	Etude de la végétation de Madagascar à l'aide des données spatiales. (1981)
2	RAHAJASOA, Grâce Monique	Analyse de la diversité des ptéridophytes dans le Parc National de Ranomafana : inventaire et mode de repartition. (1993)
3	RANARIJAONA, Hery Lisy Tiana	L'Exploitation des fougères arborescentes (Cyathacées) du parc national de Ranomafana. Taxonomie et biologie des espèces. Aspects socio-économiques. (1993)
4	RASAMOELINA A. S.	Inventaire des légumineuses à nodosités dans le parc national de Ranomafana. (1993)
5	RAKOTOARISOA, Bernadette	La Famille et l'éducation à l'environnement au sein du parc national de Ranomafana. (1996)
6	RAZAFINDRATSIRA, Vololontiana Rivo	Etude biologique et écologique de <i>Philepitta castanea</i> (Muller, 1776). Son rôle dans la régénération du sous-bois forestier du parc national de Ranomafana. (1995)
7	RALIMANANA, Hélène	Contribution à la connaissance de l'apiculture et à la méliissopalynologie dans le parc national de Ranomafana. (1994)
8	RAKOTOSON, Lalaina Norohanta E.	La Rencontre du décret de création du parc national de Ranomafana avec les coutumes et traditions locales. (1994)
9	RAKOTONIAINA, Soafaramalala N.	Contribution à l'étude des impacts des troupeaux bovins sur l'écosystème forestier du parc national de Ranomafana. (1994)
010	KIGHLINGER, Lon Kent	Mechanisms of <i>Ascaris lumbricoides</i> overdispersion in human communities in the Malagasy rainforest. (1993**)
011	RATVOHERY ANDRIAMAHEFA, A.T.	Etudes des utilisations des Bambuseae dans la région du parc national de Ranomafana. (1993)
012	RAHARIJAONA, Lantonirina	L'Education à l'environnement dans les EPP autour du projet parc national de Ranomafana. (1995)
013	RAVONIANDRO, Mahitsy R.	Récupération et valorisation des essences précieuses abattues dans les zones forestières de Ranomafana. (1993)
014	PETERS, Dai	Social impact assessment of the Ranomafana national park project of Madagascar. (1994)
015	HARDENBERGH, Sabrina H. B.	Behavioral quality, caloric intake and an evaluation of the international child growth standards : an example from Madagascar. (1994)
016	JOHNSON, B. K.; BUOL, S. W.	Soil survey and characterization of the Ranomafana national park area. (1994)
017	PETERS, Dai	Indigenous healing and its role in health care in the Ranomafana national park periphery of Madagascar. (1994)
018	RAZAFIMAMONJY, D.; FERRARO, P.	Alternatives to destruction : steps toward sustainable use of the Malagasy Rain Forest. (1992)
019	HARDENBERGH, Sabrina H. B.	Nutrition and the Forest. (1993)
020	RATSIFANDRIAHAMANANA, F. N.	Contribution à l'étude des ressources piscicoles marines du littoral Est de la presqu'île de Masoala en 1993. (1995)
021	ODENDAAL, F. J.; JAOMANANA	Plan stratégique pour la Gestion des zones côtières de la presqu'île de Masoala. (1995)
022		Additif rapport annuel 1994. (1995)
023		Masoala. Projet de Conservation et de Développement Intégré. (1993)
024		Appendices. Masoala integrated conservation and développement projet.. (1993)
025	MERELENDER, Adina	Planning for a national park : humans and their relatives the lemurs. (1995)
026	KREMEN, C.; RAHARITSIMBA, T.	The Butterfly fauna of the Masoala peninsula. Preliminary report. (1995)
027	WOOLDRIDGE, T.; ANDRIAMPARANY	Mangroves in Masoala. (1994)
028	STERLING, E. RAKOTOARISON, N.	Preliminary Report of Primate faunal survey expedition to the East Coast of the Masoala Peninsula. February-April 1994. (1995)
029	WATSON, R.T.; STRZALKOWSKA, S.	Avian biodiversity monitoring on Masoala Peninsula. (1995)
030	ODENDAAL, F. J.; JAOMANANA	Délimitation de réserves marines sur la péninsule de Masoala - Madagascar. (1995)
031	ANDRIAMAMPINANINA, L.	Contribution à l'étude de la répartition et de la structure des peuplements des insectes Scarabéidac (coléoptères) de la Presqu'île de Masoala.
032		Proposition des limites du Parc National Masoala. (1995)
033	RAKOTONDRAINIBE, France	Recherche sur les fougères à Masoala. (1994)
034	RAYMOND, Isaia	Approche phytoécologique sur l'évaluation qualitative et quantitative des utilisations villageoises des ressources naturelles en forêt dense humide sempervirente. Cas du village d'Ambanizana - Presqu'île de Masoala.. (1995)
035	RAZAFIMAHATRATRA, Emilienne	Inventaire et étude des petits mammifères de la Peninsule de Masoala. (1994)

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N°	AUTEUR	TITRE. (DATE)
036	RAZAFINDRAKOTO, Yvette	Contribution à l'étude des rongeurs et insectivores de la Presqu'île de Masoala. (1995)
037	ODENDAAL, François J.	Ecotourisme à Masoala. (1994)
038		Etude et mise en place de structure opérationnelle au niveau de la Réserve Naturelle Intégrale de Tsaratanana et de la Réserve Spéciale de Manongarivo. Offre technique. (1995)
039		Offre technique pour la conduite des activités de développement au niveau des zones périphériques de la RNI de Betampona.
040	HAWKINS, A. F. A.	Etude sur la faune et la flore dans le parc national de l'Isalo. (1995)
041		Plan de gestion d'une aire protégée. Phase IV. (1995)
042		Rapport d'activités phase I + Complément ; Rapport d'activités phase II + Plan de travail. (1995)
043		Botanical checklist of réserve naturelle intégrale Andohahela. (1993)
044		Etude pour la préparation d'un plan d'aménagement pour la réserve naturelle intégrale de Namoroka. (1994)
045		Conduite des activités de développement au niveau des zones périphériques de la RNI de Betampona. Proposition technique. (1994)
046		Programme de Travail 1995. (1995)
047		Conduite des activités de développement au niveau des zones périphériques de la RNI de Betampona. (1994)
048	RASOANANDRASANA, Emmanuel	Conception et mise en place d'une banque de données informatisées sur l'environnement d'Andohahela. (1994)
049		Rapport annuel 1994. PCDI No. de Zahamena. (1995)
050	GOODMAN, Steven M.	Floral and faunal inventory of the Eastern side of the Réserve Naturelle Intégrale d'Andringitra, Madagascar : with refernce to elevational variation.
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Courbes de niveau		1958	Carte FTM 1/100 000	ArcInfo-Mapinfo
Végétation	Ocupation du sol	1988-1990		ArcInfo-Mapinfo
Limite	Aire Protégée	1995		ArcInfo-Mapinfo
ANDASIBE - MANTADIA				
Limite	Aire Protégée & Zone périphérique	1995	PCDI- ANDASIBE	Mapinfo
Hydrographie	Rivières principales -secondaires	1958	Carte FTM	Arcinfo-Mapinfo
Routes		1958	Carte FTM,PCDI-Andasibe	ArcInfo-Mapinfo
Végétation	Ocupation du sol	1957-91-94	Carte Forestière,Photos interprétées,Image TM	Mapinfo
Villages		1958	Carte FTM, PCDI-Andasibe	Arcinfo-Mapinfo
Limite	Sous-zones - Zones cibles	1995-1996	PCDI-Andasibe	Arcinfo-Mapinfo
Image	Satellite TM - MSS	1973-1994	USGS	Tif
ANDOHAELELA				
Limite	Aire Protégée & Zone périphérique	1995	PCDI Andohahela	ArcInfo-Mapinfo
Hydrographie	Rivières principales	1958	Carte FTM	ArcInfo-Mapinfo
Routes		1958	Carte FTM	ArcInfo-Mapinfo
Végétation	Ocupation du sol	1956-1991	Photos interprétées	Arcinfo-Mapinfo

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THEME	SOUS THEME	DATE	SOURCE	FORMAT FICHER
Villages		1958	Carte FTM	Arcinfo-Mapinfo
Limite	Bassin versant	1995	PCDI Andohahela	Arcinfo-Mapinfo
Image	Satellite TM - MSS	1973-1994	USGS	Tif
ANDRINGITRA - IVOHIBE				
Végétation	Occupation du sol	1991	Cartes FTM & WWF 1:40 000 + Photo aérienne	ArcInfo
Limite	Aires Protégées	1995	Cartes FTM & WWF 1:40 000 + Photo aérienne	ArcInfo
Hydrographie		1958	Cartes FTM & WWF 1:40 000 + Photo aérienne	ArcInfo
Village		1958	Cartes FTM & WWF 1:40 000 + Photo aérienne	ArcInfo
Routes		1958	Cartes FTM & WWF 1:40 000 + Photo aérienne	ArcInfo
Images	Satellite	1983-1990	USGS	PCI
BAIE DE BALY				
Routes	Principales, secondaires, sentiers	1958	ORGASYS (Carte FTM)	Mapinfo
Limites	Aires Protégées, Administratives	1995	ORGASYS	Mapinfo
Hydrographie		1958	ORGASYS: carte FTM	Mapinfo
Village		1958	ORGASYS: Carte FTM	Mapinfo
Population	Répartition de la population par village		ORGASYS	Mapinfo
Activité économique:	Flux des principales denrées			Mapinfo
Infrastructures	Ecoles, aérodrome, centre de soin, bac		ORGASYS	Mapinfo
Végétation	Occupation de sol	1991	ORGASYS: FTM-Photo aérienne	Mapinfo
BELO SUR MER				
Hydrographie	Rivières principales	1958	ORGASYS : Carte FTM	Mapinfo
Routes	Routés principales, secondaires, sentiers	1958	ORGASYS : Carte FTM	Mapinfo
Village		1958	ORGASYS : Carte FTM	Mapinfo
Limites	Aires Protégées (proposition)	1995	ORGASYS	Mapinfo
Population	Répartition de la population par village		ORGASYS	Mapinfo
Végétation	Occupation de sol	1991	ORGASYS : Photo aérienne	Mapinfo
Géologie			ORGASYS	Mapinfo
Pédologie			ORGASYS	Mapinfo
Infrastructure			ORGASYS	Mapinfo
COMPLEXE MONTAGNE D'AMBRE				
Village		1958	Carte FTM 1:100 000	ArcInfo, Roots
Hydrographie	Rivières principales	1958	Carte FTM 1:100 000	ArcInfo, Roots
Végétation	Forêt, autres...	1950	Carte	ArcInfo
Limite	AP + Administratives	1995	Carte FTM 1:100 000	Arcinfo, Roots
Massif calcaire	de l'Ankarana	1958	Carte FTM 1:100 000 + Carte PCDI APMA	Mapinfo
Routes	(partie de l'Ankarana)	1995	Carte FTM 1:100 000 + Carte PCDI APMA	
ISALO				

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THEME	SOUS THEME	DATE	SOURCE	FORMAT FICHER
Limite	Aire Protégée	1995		ArcInfo-Mapinfo
Hydrographie	Rivières principales	1958	Carte FTM 1:100 000	ArcInfo-Mapinfo
Routes	Nationale, secondaire, piste, sentier	1958	carte FTM 1:100 000	ArcInfo-Mapinfo
Sites	touristiques et anciens sites	1958	Carte FTM 1:100 000	ArcInfo-Mapinfo
Villages		1958	Carte FTM 1:100 000	ArcInfo-Mapinfo
Images	Satellite	1990	USGS	Tif
MANOMBO				
Routes	Route Nationale, Piste, Sentier	1996	Carte MINAGRI 1/100 000	Mapinfo & Roots
Végétation	Classification de la forêt	1996	Carte MINAGRI 1/100 000	Mapinfo & Roots
Villages		1996	Carte MINAGRI 1/100 000	Mapinfo & Roots
Limite	Aire Protégée	1996	Carte MINAGRI 1/100 000	Mapinfo & Roots
MANONGARIYO - TSARATANANA				
Population	Répartition de la population par village	1995	ORGASYS	Mapinfo
Limites	Proposition limite de l'AP		ORGASYS	Mapinfo
Géologie	Occupation du sol		ORGASYS	Mapinfo
Végétation			ORGASYS	Mapinfo
Pédologie		1958	ORGASYS: Carte FTM	Mapinfo
Village		1958	ORGASYS: Carte FTM	Mapinfo
Routes		1958	ORGASYS: Carte FTM	Mapinfo
Hydrographie		1958	ORGASYS: Carte FTM	Mapinfo
MARQIEIY				
Hydrographie	AP	1958	Carte FTM 1/50 000	ArcInfo
Limite		1995	Sur terrain + xarte DEF	ArcInfo
Routes		1958	Carte FTM 1/50 000	ArcInfo
Végétation		1991	Carte FTM 1/50 000 & Photo aérienne 1995	ArcInfo
Village		1958	Carte FTM 1/50 000 - sur terrain 1995	ArcInfo
MASOALA				
Biodiversité	Zone de suivi écologique, lémurien, aigle...	1992	Carte Masoala+sur terrain	ArcInfo
Géologie		1958	Carte FTM	ArcInfo
Hydrographie	Rivières principales, navigables	1958	Carte FTM	ArcInfo
Limite	Aire Protégée y compris les parcs marins	1995	PCDI Masoala	ArcInfo
Village		1958	Carte FTM	ArcInfo
Infrastructure	Port	1958	Carte FTM	ArcInfo
Topo	Elévation	1958	Carte FTM	ArcInfo
Végétation	Occupation du sol	1957-1991	Photo aérienne & interprétation images	ArcInfo
Courbes de niveau		1958	Carte FTM	ArcInfo
Image	Spot	1994-1995	USGS	Tif - Sig

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THEME	SOUS THEME	DATE	SOURCE	FORMAT FICHER
Limite	Zones cibles, zone périphérique	1995	PCDI Masoala	Arcinfo
MIDONGY DU SUD				
Végétation	Occupation du sol	1991	ORGASYS: Photo aérienne FTM	Mapinfo
Routes		1958	Carte FTM	Mapinfo
Hydrologie		1958	Carte FTM	Mapinfo
Villages		1958	ORGASYS (Carte FTM)	Mapinfo
Limite	Aire Protégée (proposition)	1995	Données ORGASYS	Mapinfo
Géologie			Données ORGASYS	Mapinfo
Activités économiques	Localisation et flux des principales productions	1995	Visite & enquête sur terrain (ORGASYS)	Mapinfo
Altitude	Classes d'altitude (en 5 classes)	1958	Données ORGASYS	Mapinfo
Pédologie		1958	Données ORGASYS	Mapinfo
Population	Répartition de la population par village	1995	Données ORGASYS	
RANOMAFANA				
Végétation	AP + ZP : Forêt, Culture	1950	Cartes FTM & DEF: 1/100 000 - 1950	Roots, Mapinfo
Limite	AP & Zone Périphérique	1995	Carte DEF 1950	Mapinfo, Roots
Village		1958	Carte FTM 1958	Mapinfo
Images	Satellite TM	1989-1990	USGS	Tif & Pix
ZAHAMENA				
Limites	AP & Zone périphérique	1995	Données CI	Roots & Mapinfo
Village	Données originales : CI	1958	Carte FTM	Roots & Mapinfo
Limite	Zones aménageables et Enclave	1995	Données CI	Roots & Mapinfo
Pistes	Données originales: CI	1958	Carte FTM	Roots & Mapinfo
Végétation	Forêt, culture, tavy, savoka...	1993	Carte MINAGRI	Roots & Mapinfo
ZOMBITSE - VOHIBASIA				
Végétation	Occupation du sol - Zombitse	1957-1991	Carte FTM 1/50 000 & Photo aérienne 1995	ArcInfo
Végétation	Occupation du sol - Vohibasia	1991	Carte FTM 1/50 000 & Photo aérienne 1995	ArcInfo
Sites	Touristiques y compris les sites sacrés	1995	Photo aérienne 1995 & Visite sur terrain	ArcInfo
Village		1958	Carte FTM 1/50 000 - sur terrain 1995	ArcInfo
Hydrographie	Rivières principales et secondaires	1958	Carte FTM 1/50 000	ArcInfo
Routes		1958	Carte FTM 1/50 000	ArcInfo
Limite	Parcs Zombitse & Vohibasia	1995		ArcInfo
Layon	du à l'essai d'exploitation pétrolière	1995	Photo aérienne + visite sur terrain	ArcInfo
Pressions	Exploitation forestière et divagation des boeufs	1995	Visite sur terrain	ArcInfo
Orographie	Courbe de niveau, talus, ...	1958	Carte FTM 1/100 000	ArcInfo
Planimétrie	Voie de communication, ponts...	1958	Carte FTM 1/100 000	ArcInfo

SYSTEME D'INFORMATION GEOGRAPHIQUE

LISTE DES COMPACTS DISQUES A LA SALLE INFORMATIQUE DE L' ANGAP

DATE: 07 Décembre 1996

Code	Date de création	Titre	Région	Format	Origine	Remarques
I-1	26 Oct 95 (dernière modification)	Dted (Digital Data Elevation Terrain	Isalo	LAS BSQ	USGS-EDC	Scène 160.075 Laborde 3 fichiers *.ddr, img, prt
I-2						Pas encore de CD
I-3	Juin - Juillet 1996	Images par provinces et pour les Ap SAVEM	Antananarivo Fianarantsoa Toliara Cma Masoala Andasibe Ranomafana Isalo Andohahela	LANDSAT MSS PCI	USGS-EDC(Eros Data Center)	Existe en 3 copies Images à 60 m Laborde
I-4	Juillet 96	Images pour 3 provinces	Antsiranana Mahajanga Toamasina	LANDSAT MSS PCI		Existe en 2 copies Images à 60 m Laborde
I-5	Décembre 1996	Landsat TM 159.069	CMA	LANDSAT TM -BSQ LGSOWG	SAC- CSIR	159. 069 du 28/11/94 Bandes 1,2,3,4,5,6,7
I-6	Février 1996	Landsat TM 158.073	Andasibe	LANDSAT TM-BSQ LGSOWG	SAC- CSIR	158.073 du 15/09/93 Bandes 1,2,3,4,5,6,7
I-7	Octobre 1995	TM 159.077 940925	Andohahela	LANDSAT TM-BSQ LGSOWG	SAC- CSIR	159.077 du 25/09/94 Bandes 1,2,3,4,5,6,7 UTM
I-8	Juillet 1996	Tm 158.071 09/07/90	Masoala	LANDSAT TM-BSQ	SAC-CSIR	158.071 du 07/09/90 Landsat 5 Coordonnées à revoir car impossible que S : 46 et E : 49

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Code	Date de création	Titre	Région	Format	Origine	Remarques
I-9	Juillet 1996	Image TM 160.075	Ranomafana	LANDSAT TM-BSQ	SAC-CSIR	160.075 du 28/06/94 UTM
I-10	Mai 1995	TM 158.077 Q3	Andohahela	LANDSAT TM - BSQ	USGS-EDC	Existe en 2 copies 158.077. Q3 du 11/21/94 . LABORDE Bandes 1-7 à 30m Taille: 3510x3860 Des données vecteurs de 80Mo sur Andohahela sont encore à y rajouter.
I-11	Nov 1996	Ranomafana 07/21/90 P158R75	Ranomafana	LANDSAT TM - BSQ	SAC-CSIR PCDI Ranomafana	Existe en 3 copies -Image : 158.075 du 21/07/90 à 7 bandes LABORDE Image à 30 m - Backup Données vecteurs et images mais qui ne suivent pas du tout les conventions d'archivage et nomination de données. En plus, ce Cd présente un problème de session de transfert. Aussi, les données des deux sessions ne peuvent être visualisées en même temps dans le File manager.
I-11	Sept 1996	Ranomafana 07/21/90	Ranomafana	LANDSAT MSS	SAC-CSIR	Original des copies de 158.075 du 21/07/90 à 7 bandes

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Code	Date de création	Titre	Région	Format	Origine	Remarques
I-16	Sept-Oct 1995		Isalo	LANDSAT TM LAS		-Scène 160.075 de 19/11/94 Bandes 1,2,3,4,5,6,7 -Fichiers DTED : Digital Terrain Elevation Data (voisin du MNT) - Résolution 28.5m Apparemment I-16 et I-17 sont les mêmes sauf par le nombre de fichiers (23 pour I-16)
I-17	Sept-Oct 1996		Isalo	LANDSAT TM LAS		-Scène 160.075 de 19/11/94 Bandes 1,2,3,4,5,6,7 -Fichiers DTED : Digital Terrain Elevation Data (voisin du MNT) - Résolution 28.5m Apparemment I-16 et I-17 sont les mêmes sauf par le nombre de fichiers (24 pour I-17)
I-18	30 Jan 1996	Madagascar	Andringitra	LANDSAT MSS LAS BSQ LANDSAT TM	USGS-EDC	MSS : 159.075 de 11/17/90; bandes 1, 2, 3, 4; résolution 57 m, Laborde Scène 159.075 de 05/10/83; bandes 1,2, 3, 4, 5, 6, 7; laborde. Les dates pour ces deux scènes sont inversées sur la couverture du CD par rapport aux renseignements intrinsèques
I-19	24/04/96	Madagascar	Isalo	LANDSAT TM LAS	USGS-EDC	Mosaïque de 160.075 et 160.076 Bandes 1,2,3,4 Laborde

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Code	Date de création	Titre	Région	Format	Origine	Remarques
I-13	Mai 1995	Landsat MSS -CD1	Madagascar (Mosaïque nationale)	LANDSAT MSS -BSQ	SAC-CSIR USGS-EDC	12 Scènes 158.073 de 15/09/93 158.074 de 15/09/93 158.075 de 30/08/93 158.076 de 15/09/93 158.077 de 15/09/93 159.073 de 22/09/93 159.074 de 06/09/93 159.075 de 06/09/93 159.076 de 06/09/93 159.077 de 05/08/93 159.070 de 27/07/93 161.072 de 03/08/93 Images à l'origine de la mosaïque MSS nationale Bandes 1,2,3,4 Correction niveau 5
I-14		Landsat TM CD3	Madagascar Mosaïque nationale	LANDSAT TM -EOSAT FAST FORMAT	USGS-EDC	Scènes 158.069 de 02/09/94 3 bandes 158.075 de 21/07/90 7 bandes 159.068 de 24/08/90 3 bandes Traitement niveau 5 Ce sont les scènes TM utilisées pour combler les images manquantes dans la mosaïque MSS nationale
I-15	Sept-Oct 1995		Ranomafana	LANDSAT TM LAS et vecteurs *.E00	USGS-EDC DCW	Existe en 2 copies Contenant 2 répertoires : -MADAG2 : images TM à 7 bandes en Laborde et fichiers MNT en format BIL - MADAG : Fichiers vecteurs origines des MNT

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Code	Date de création	Titre	Région	Format	Origine	Remarques
I-25	24/04/96	Madagascar	Isalo Sud	LANDSAT TM LAS BSQ	USGS-EDC	Scène 160.076 de 03/11/94 7 bandes Laborde.Résolution 28.5m
I-26	25/10/95	Madagascar Band 1	Madagascar (Mosaïque nationale)	LANDSAT MSS LAS BSQ	USGS-EDC	Bande 1 Laborde Mosaïque version 1
I-27	26/06/96		Andohahela	LANDSAT MSS en PCI	WRS1	Scène 170.077 de 01/01/73 LABORDE Image à 30 m Il y a beaucoup d'incertitudes quant aux informations (par exemple, la résolution avec MSS n'atteint pas la précision de 30m; on ne sait pas non plus si c'est Landsat 123 ou Landsat 5; on doit revoir la projection sur Sun)
I-28	13/11/96		Andasibe Andohahela Montagne d'ambre Masoala Ranomafana	LANDSAT LGSOWG TM avec PCI	Origine SAC-CSIR et DEF Géorectification chez DIVB/ANGAP	15/09/93 à 7 bandes Bandes 1,2,3,4,5,6,7 28/11/94 à 7 bandes Bandes 1,2,3 7 Bandes Toutes sont des images Landsat 5 mais certaines de leurs dates sont inconnues
I-29	19/04/96	Madagascar band 1	Madagascar (Mosaïque nationale)	LANDSAT MSS LAS BSQ	USGS-EDC	Mosaïque nationale version 2 (Il y a moins de nuages car certaines photo dans la version 1 sont remplacées) Bande 1

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Code	Date de création	Titre	Région	Format	Origine	Remarques
I-20	24/04/94		Isalo Madagascar (Mosaique Nationale)	LANDSAT TM Vecteurs Arcinfo export et couvertures	USGS-EDC	-Mosaique de 160.075 et 160.076 Bandes 5,6,7 - Couvertures MSS Vecteurs Image Info (càd couvertures qui contiennent les informations sur les scènes constituants la mosaique comme la date, type de capteur, bandes, référence de la scène...) MAD31c : 1ere version MADMASK2 : 2eme version (moins de nuages, et plus d'informations) Mais ces deux couvertures sont actuellement impossibles à lire sur Pc ARCINFO du fait qu'ils sont peut être en format UNIX.
I-21	25/10/95	Madagascar band 3	Madagascar (Mosaique Nationale)	LANDSAT MSS LAS BSQ		Bande 4 de MSS Laborde 60 m
I-22	19/04/96	Madagascar	Zahamena Mosaique Nationale	Images LANDSAT MSS LAS BSQ Vecteur Arcinfo export	SAC-CSIR USGS-EDC	Scène 159.071 MAD31F : Couverture MSS Vecteur Image Info identique à MAD31e (I- 20). Celui ci est lisible sur Pc
I-23	25/10/95	Madagascar Band 2	Madagascar (Mosaique nationale)	LANDSAT MSS		Bande 2
I-24	18/04/96	Madagascar	Madagascar (Mosaique nationale)	LANDSAT TM LAS BSQ	USGS-EDC	Images à 7 bandes mises à 60 m pour mettre à jour la mosaique MSS 158.073 de 21/10/94 159.069 de 28/10/94 159.070 de 25/06/84 159.071 de 04/07/87

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Code	Date de création	Titre	Région	Format	Origine	Remarques
I-30	19/04/96	Madagascar band 2	Madagascar (Mosaïque nationale)	LANDSAT MSS	USGS-EDC	Mosaïque nationale version 2 (Il y a moins de nuages car certaines photo dans la version 1 sont remplacées) Bande 2
I-31	19/04/96	Madagascar band 3	Madagascar (Mosaïque nationale)	LANDSAT MSS	USGS-EDC	Mosaïque nationale version 2 (Il y a moins de nuages car certaines photo dans la version 1 sont remplacées) Bande 3
I-32	27/06/96	Image 100m niveau national	Madagascar (mosaïque nationale)	LANDSAT MSS en PCI	USGS-EDC	Mosaïque nationale 100m en version 1 découpée en trois parties avec plusieurs recouvrements. Les parties nord et centre sont comprises dans ces CD. Existe en 4 copies pas exactement les mêmes mais pour chaque copie il y a 4 fichiers de format *.pix et *.prj Il y a eu trois types de traitements effectués pour essayer la meilleure combinaison de bandes(ratio, merge, filter) ce qui différencie les CD.
I-33	1996			LANDSAT MSS en PCI		Cmaroot.aux, tab,tif (21/05/96) MSS_Mada.aux (15/11/96) MSS_Mada.tab (17/05/96) MSS_Mada.tif (16/11/96) Rel500m.aux (28/05/96) Vegr1500.tab (17/06/96) Vegr1500.tif (28/05/96) Ces fichiers sont encore à revoir car personne n'a d'information dessus
I-34	01/08/96	Madagascar Ratio	Isalo	LANDSAT et SPOT en BSQ - LAS	USGS-EDC	Existe en 3 copies Mosaïque d'images à trois bandes La région est divisée en parties Nord et Sud. Chaque partie a deux images avec 10 ou 5 m de résolution.

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Code	Date de création	Titre	Région	Format	Origine	Remarques
I-35			Marojejy			158.70
IV-01	01/07/96	Vidéographie	Ranomafana	MIPS	Dana SLAYMAKER	Prises de vue de Novembre 1995
D-01	Nov 96	Angap A1 Digital Imagery		Text, arc-view,...	Dana SLAYMAKER	Répertoire ANGAP_1 S/Rep : Aor_file Readme Shoebox Slides_1 World
D-02	11/06/96	Data store Madagas		Text, arc-view, excel,...	Dana SLAYMAKER	Plusieurs répertoires et sous-répertoires
D-03	10/25/96	Masoala data	Masoala	Vecteur Arcinfo, Arcview, Mapinfo Images	PCDI Masoala	Existe en 3 copies Backup de données
D-04	Juillet 1994	DCW - USGS Pc Arcinfo-Laborde	Madagascar	Vecteur Pc-Arcinfo - Export	DCW - USGS	Données thématiques en Projection Laborde Les thèmes sont courbes de niveau, routes, chemins de fer, cours d'eau, villages...
D-05	Juillet 1994	DCW - USGS Unix-Arcinfo - Laborde	Madagascar	Vecteur Unix-Arcinfo - Export	DCW - USGS	Juillet 1994 Données thématiques en Projection Laborde Les thèmes sont courbes de niveau, routes, chemins de fer, cours d'eau, villages...

REMARQUES

- Les dates sont écrites telles que: MOIS/JOUR/ANNEE
- I signifie données Images ou à majorité Image
- IV signifie données venant de vidéographie en format Image

k/afr_east.cen/madagasc/angap/1996/fina/annex5.wpd

Annex 5: ANGAP's Information Database

THEME		SOURCE	FORMAT
<u>MADAGASCAR</u>			
Aires protégées	(localisation, limites, type)	Données COEFOR	ArcInfo
Géologie			Idrisi
Hydrographie		Données COEFOR	ArcInfo
Limites	Cote, Provinces, Firaiana	Données COEFOR	ArcInfo
Relief	Image satellite	Données COEFOR	ArcInfo
Routes		Données COEFOR	ArcInfo
Végétation	Image MS et vecteurs	Données COEFOR	ArcInfo-PCI
Villes	(Provinces et Fivondronana)	Données COEFOR	ArcInfo
<u>AMBOHITANTELY</u>			
Hydrologie		Carte FTM 1/100 000	ArcInfo
Routes		Carte FTM 1/100 000	ArcInfo
Village		Carte FTM 1/100 000	ArcInfo
<u>ANDOHAHELA</u>			
Hydrographie	Rivières principales	Carte FTM	ArcInfo-Mapinfo
Limite		AP	ArcInfo-Mapinfo
Limite	Bassin versant		ArcInfo-Mapinfo
Routes		Carte FTM	ArcInfo-Mapinfo
Végétation	Image raster et vecteurs	Photo satellite & carte	PCI and Mapinfo
Villages	Principaux et petits villages	Carte FM	ArcInfo-Mapinfo
<u>ANDRINGITRA</u>			
Limite AP			ArcInfo
Végétation			ArcInfo
<u>BAIE DE BALLY</u>			
Activité économique	Flux des principales denrées		Mapinfo
Hydrologie			Mapinfo
Limite AP			Mapinfo
Population	(Répartition de la population)		Mapinfo
Routes			Mapinfo
Village			Mapinfo
Occupation du sol			Mapinfo
<u>BELO SUR MER</u>			
Activité économique	Flux des principales denrées		Mapinfo
Géologie			Mapinfo
Hydrologie			Mapinfo
Limite AP			Mapinfo
Population	(Répartition de la population)		Mapinfo
Routes			Mapinfo
Village			Mapinfo
Occupation du sol			Mapinfo

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ISALO

Hydrographie		Carte FTM	ArcInfo-Mapinfo
Limite AP			ArcInfo-Mapinfo
Routes		Carte FTM	ArcInfo-Mapinfo
Sites touristiques		Carte FTM	ArcInfo-Mapinfo
Végétation		Photo satellite MSS	ArcInfo-Mapinfo
Villages		Carte FTM	ArcInfo-Mapinfo

MANOMBO

Limite AP		Carte MINAGRI 1/100000- -1966	Mapinfo & Roots
Routes		Carte MINAGRI 1/100000- -1966	Mapinfo & Roots
Végétation	Classification de la forêt		Mapinfo & Roots
Villages			Mapinfo & Roots

MANONGARIVO

Activité économique	Flux des principales denrées		Mapinfo
Géologie			Mapinfo
Hydrologie			Mapinfo
Limite AP			Mapinfo
Pédologie			Mapinfo
Population	(Répartition de la population)		Mapinfo
Routes			Mapinfo
Village			Mapinfo

MIDONGY DU SUD

Hydrologie			Mapinfo
Limite AP			Mapinfo
Routes			Mapinfo
Village			Mapinfo

MASOALA

Biodiversité	Piste de suivi de lémuriens		ArcInfo
Biodiversité	Pistes de suivi des zones éco.		ArcInfo
Biodiversité	Sites de suivi		ArcInfo
Biodiversité	Zone de recherche		ArcInfo
Biodiversité	Zone de suivi aigles		ArcInfo
Biodiversité	Zone de suivi de lémuriens		ArcInfo
Biodiversité	Zone de suivi écologique		ArcInfo
Géologie			ArcInfo
Hydrographie	Rivières principales	Carte FTM	ArcInfo
Infrastructure	Port	Carte FTM	ArcInfo
Limite	Administrative		ArcInfo
Limite AP	y compris les parcs marins		ArcInfo
Topo	courbes de niveau	Carte FTM	ArcInfo
Végétation	Photo aérienne	Photo aérienne	PCI
Végétation	Forêt, culture ...		ArcInfo
Village		Carte FTM	ArcInfo

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MIDONGY DU SUD

Géologie			Mapinfo
Hydrologie			Mapinfo
Limite AP	(limite proposée)		Mapinfo
Routes			
Végétation			Mapinfo
Villages			Mapinfo

MONTAGNE D'AMBRE

Hydrographie	Administrative	Carte FTM	ArcInfo, Roots
Limite	Ancienne & actuelle		ArcInfo, Roots
Limite AP	Classification Forêt		ArcInfo, Roots
Végétation			ArcInfo
Village		Carte FTM	ArcInfo, Roots

RANOMAFANA

Images	TM		
Limite	Zones périphériques	Carte DEF 1950	Mapinfo, Roots
Limite AP	Ancienne et nouvelle limite	Carte DEF 1950	Mapinfo, Roots
Végétation	Forêt et culture - 1950	Photo Satellitaire TM	PCI & TIF
Végétation	Classification forêt	Cartes FTM & DEF: 1950	Roots, Mapinfo
Village		Carte FTM 1950	Mapinfo

TSARATANANA

Activité économique	Flux des principales denrées		Mapinfo
Géologie			Mapinfo
Hydrologie			Mapinfo
Limite AP			Mapinfo
Pédologie			
Population	(Répartition de la population)		Mapinfo
Routes			Mapinfo
Village			Mapinfo

ZAHAMENA

Enclave	Données originales: Format ARC	C.I.	
Limites	Limite AP & zone périphérique	Données CI	
Pistes	Données originales: Format ARC	C.I.	
Végétation	Forêt, culture, tavy, savoka...		
Villages	Données originales: Format ARC	Données CI	
Zones aménageables	y compris les zones tampons	Carte DEF 1/50 000	

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ZOMBITSE & VOHIBASIA

Hydrographie	Source: FTM	Carte	ArcInfo
Layon	(essai d'exploitation pétrolière)	Photo	ArcInfo
Limites	Parcs Zombitse & Vohibasia		ArcInfo
Orographie	Courbe de niveau, talus, ...	Carte	ArcInfo
Planimétrie	Voie de communication, ponts	Carte	ArcInfo
Pressions constatées	Exploitation forestière et Devation de boeufs et sites sacrés	Surc	ArcInfo
Routes		Carte	ArcInfo
Sites touristiques		Carte	ArcInfo
Végétation	Agriculture Vohibasia - 1991	Carte	ArcInfo
Végétation	Occupation du sol-Vohibasia- 1991	Carte	ArcInfo
Végétation	Occupation du sol de Zombitse- 1957-91	Carte	ArcInfo
Village		Carte	ArcInfo

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