CEPF FINAL PROJECT COMPLETION REPORT

I. BASIC DATA

Organization Legal Name: Missouri Botanical Garden

Project Title: Assessment of Priority Areas for Plant Conservation

Implementation Partners for This Project:

Project Dates: January 1, 2002- December 31, 2004

Date of Report (month/year): August 2005

II. OPENING REMARKS

Provide any opening remarks that may assist in the review of this report.

The Assessment of Priority Areas for Plant Conservation project or APAPC project that started in January 2002 and ended in December 2004 was conceived on the basis of Missouri Botanical Garden's findings from the assessment performed within the Endemic Families project. The finding demonstrates the inadequacy of the current protected area network to ensure the overall conservation of the Malagasy flora. APAPC is thus an expansion of this pilot project to include a representative sample of the entire Malagasy flora comprising ca. 1,200 plants species. The sample has served as an objective basis for identifying by means of GIS analysis Priority Areas for Plant Conservation (PAPCs), assessing their contribution to plant conservation, and guiding national and regional conservation planning and management. Such analysis enabled us to identify many additional species of critical conservation concern and to make recommendations for their protection.

Thus the project proposed a) to delimit Madagascar's major floristic regions and to identify PAPCs within each region , b) then to evaluate the effectiveness of the existing network of Protected Areas for conserving plant diversity, c) to identify key sites/areas whose protection fills important gaps in the coverage of the current protected areas network, d) to evaluate the threat status of Malagasy plant species and identify those for which coordinated *in situ* and *ex-situ* conservation measures are mot urgently required.

The project through its overall goal responds to the Global Strategy for Plant Conservation (GSPC) a CDB decision which aims to "*halt the current and continuing loss of plant diversity*". Effectively identifying priority areas for plant conservation meets the target five of the GSPC which provision is to "*assure the protection of 50% of the most important areas for plant diversity*".

On September 2003, at the World Parks Congress in Durban, South Africa, Madagascar's President, Marc Ravalomanana, declared his engagement to triple the total land area to protect from 1,7 millions to up to 6 millions ha that represents 10% of the country's surfaces . This

mandate poses a great challenge to the national and international biodiversity and conservation communities. APAPC's guiding principle matches that set by President Ravalomana for Madagascar. The national initiative called Durban Vision Initiative (DVI) was created to delivery needed actions in response to the President's declaration. This initiative is fortuitous for the project as it represents an opportunity to incorporate/validate the project's results. The involvement of MBG in this process has facilitated the project leader's responsibility in ensuring awareness to conservation managers and decision makers of the ways in which project outputs can be used to improve plant conservation and their own activities. Thus some changes and adjustments according to the DVI's timing and objectives have been observed on some aspects of the project implementation, in particular those relating to outputs 1 and 2.

Late last year the 77 identified PAPCs were formally presented to the Durban Vision Group, charged with meeting the President's mandate, and were adopted for integration into the process of recommending priority sites to the Government. Some of the sites identified by the APAPC project coincide with priorities set for vertebrate groups, and are already the focus of international NGO conservation efforts. Other sites are relatively well known and/or are the focus of ongoing MBG-led inventories and efforts to develop or implement conservation management plans. However, many potential conservation areas are essentially unknown with regard to their biodiversity, but nevertheless possess intact forest (as revealed by satellite imagery) and a combination of environmental characteristics (climate, underlying substrate, and elevation) that strongly suggests they constitute "habitat gaps" with respect to the existing protected areas network, and may thus harbor locally endemic species (many as yet undescribed).

For the future, as a continuation of the APAPC project, MBG proposes to conduct intensive surveys of these key orphan sites and will focus on sites/complexes that present an exceptionally promising combination of eco-geographic conditions, and thus offer the best opportunities to complement and expand the biodiversity coverage of the existing network of PAs. Nearly all of these sites are already recognized as Forêts Classées, thus coming under the management responsibility of Waters and Forestry, although this status provides little or no real protection. Besides, for some key sites MBG envisages to prepare a conservation management plans that form the critical first step for catalyzing the political process that leads to government involvement and commitment – at local, regional and national levels. These conservation management plans synthesize information on biodiversity along with local and regional sociological data, including on land tenure, natural resource exploitation patterns, population migration patterns, and economic structures and needs. The intensive survey and inventory work we propose to carry out at selected orphan sites will generate the information necessary to develop comprehensive conservation management plans for these important areas, thus establishing them as legitimate candidates for inclusion in Madagascar's expanding network of protected areas.

Parts of this present final project completion report are consolidation of what have been reported in the twelve quarterly reports produced in the course of the project implementation.

III. ACHIEVEMENT OF PROJECT PURPOSE

Project Purpose: **Conservation of Madagascar's flora strengthened by improved Government and NGO actions to expand the existing Protected Area (PA) network and to implement in-situ and ex-situ conservation of highly threatened plant species.**

Planned vs. Actual Performance

1. Indicator	Actual at Completion
Purpose-level: Conservation of Madagascar's flora strengthened by improved Government and NGO actions to expand the existing Protected Area (PA) network and to implement in-situ and ex-situ conservation of highly threatened plant species.	Seventy-seven priority sites have been identified using about the targeted 10% of the malagasy flora. The analysis of the sample combined two complementary methods: 1) using the GIS analysis methods with the botanical data available into TROPICOS botanical database. Using two software such as WorldMap and ArcView, we were able to map all the species distribution and to analyze the species richness, the rarity and the cells of irreplaceability. 2) In general environmental factors influence the species distributions and the second method has overlaid the most important environmental factors such as substrate, bioclimate and elevation. The results of these analyses have been combined with the knowledge and experiences in the field from plant specialists of each species targeted. The combinations of these analyses lead the project to identify the 77 priority sites for plant conservation that includes potential priority sites with probable high botanical importance. These potential sites are additional results for the project and constitute a priority for research at national level, especially for botanical inventory. The integration of these 77 Priority sites for plant conservation into the potential conservation sites map produced by the Durban Vision Group fully meets the spirit of the Malagasy President's unique and timely mandate, ie a comprehensive network of Malagasy protected areas. The project APAPC were able to identify some irreplaceable sites which contain in most cases threatened species. These later are now the subject of different conservation projects undertaking by NGOs/institutions in collaboration with local authorities. The case of the species *Schizolaena tampoketsana* (EN classified by IUCN), that occurs only in very fragmented forest of Ankazobe can illustrate a complete commitment of the local population to protect the remaining forest, to establish nurseries and elaborate an educational

	program at different level.
Indicator 1 *: Sites proposed within 4 years for at least 10 new PAs that will increase the number of plant species included with in PA network.*	Within the Durban Vision process the identification of priority sites identified many potential priority sites within the sensitive areas. Among these potential priority sites, thirty-six sites have been selected to be included in the conservation sites system which will be assessed and transferred progressively to the protected areas system to achieve the Durban Vision objective within the next 5 years **. Three** sites of APAPC project have been included among the DVI prioritized sites to be established as protected area in 2006 and others will likely be added later.
Indicator 2 *: In-situ and/or ex-situ conservation measures implemented within 4 years for at least 50 highly threatened species.*	To date about **30 threatened endemic plant species** identified by the project are covered by conservation actions (*ex-situ and in-situ* measures have been applied according to the Conservation action plan established for each species. As described in the indicator 1, these projects are established by conservation NGOs in collaboration of the local population and local authorities in addition to many other partners such as the Universities and the Park Botanic and Zoology of Antananarivo.

Describe the success of the project in terms of achieving its intended impact objective and performance indicators

Success of the project in achieving its intended impact objective.

On September 2003, at the World Parks Congress in Durban, South Africa, Madagascar's President, Marc Ravalomanana, declared his intention to triple the total land area (up to 6 M ha, represent 10% of the country's surfaces) managed for conservation purposes. To help to meet this challenge, non-governmental organizations and governmental agencies representing a broad range of stakeholder groups have joined efforts to assist the Ministry of the Environment, Water and Forests.

2. Initially, a precursor restricted group named "Palissandre" has been created in August 2003 composed by representatives of the Ministry of the Environment – Water and Forest and some non-governmental organizations. Later, in considering a national dimension of the issue, they have decided to enlarge the expertise of the initial group. A more flexible, inclusive, multidisciplinary group (Durban Vision Group) was formed. The mandate of the group was to assist the Ministry of Environment, Water and Forest to the delivery of the different excepted outputs related to creation of new conservation sites. From the beginning of the process, MBG has been fully involved to the implementation of the process, participated to the most of weekly working sessions. APAPC contributions were mainly focused on the technical and scientific aspects of the process (priority setting). As APAPC was the only active botanical institution within the group, MBG through the

APAPC project is the leader of the flora subgroup. From that time, lobbying and sometimes advocacy are necessary to get the interest of the others institutions or botanical associations for the process.

From the start of the process, MBG through the APAPC project was seeing the Durban Vision process as a great opportunity to integrate the Assessment of Priority Areas for Plant Conservation project's results in a conservation zone as a whole. This declaration then offers a unique opportunity to address Madagascar's critical plant conservation issues.

The "Madagascar's Vision Durban Group" comprises ca. 35 national and international organisations active within the five different subdivisions (legal issue, categorisation issue, communication issue, financial issue and priority setting issue). About 15 organisations working on biodiversity conservation have been proposing their priority sites to be put together. MBG through the APAPC has ensured botanical data and information compilation to put the Durban Vision Priority setting –subgroup especially the flora group. The botanical data for the 1256 targeted species verified and compiled for the APAPC have been used and served a point to start for the flora priority setting subgroup to produce several priority maps. Then, GIS technicians from different institutions, also Tantely who is the responsible of the APAPC data analysis, together they produced conservation priority maps. The GIS team produced two maps that represent a consolidation of most of the previous priority setting within each intervening institutions. Later, to refine these two maps, the methods that APAPC has used for the plant analysis have been guiding the process for the other taxa within the Durban Vision GIS analysis. Directly, the APAPC data set and the APAPC maps from the analysis were taken into account for the establishment of the potential terrestrial sites of Conservation APAPC have pushed 3 sites to be included among the Durban Vision sites. As this first selection of priority sites within Durban Vision is essentially based on biodiversity importance, the results of APAPC analysis that demonstrated the existence of some sites that have botanical importance for richness and high endemism, such as Ibity and Itremo areas, are accepted by the Durban Vision even the importance of other taxa are not at the same importance level as the local flora.

The Durban Vision Initiative's goal is to cover the proposed surface of 6.000.000 ha till 2010 and there is a determined annual surface to cover. For this year 2005, the goal is 1.000.000 ha. The initial set of priority areas identified through the APAPC project will be used in the future rounds of new protected area selection, which may ultimately include half or more of the 77 sites initially identified. These 77 sites have been selected by two processes, 1) some of them have been indicated from the results of the APAPC analysis that used the existing and available botanical data on the 1256 species targeted by the project. 2) some sites were demonstrated by the analysis of the environmental parameters which suggested the importance of specific eco-geographic parameters of the area. In most of the case, botanical data are missing for these sites designated as "orphan sites" and they could not be among the sites included within the first rounds proposed for the protected areas establishment for year 1. Theses "orphan sites" represent about 32% (25 out 77) of the APAPC sites and several of them will be subject of inventories to confirm their importance and will thus probably be included in future rounds of protected areas selection.

In others words, the project has successfully met the aim of contributing to the conservation planning and implementation process by making the project outputs and interpretations available to conservation community so that effective protection can be provided for the largest possible portion of the Malagasy flora. The APAPC project has significantly exceeded the initial goals described in the project document. In addition to put available the project outputs and the results for the conservation community, the project as a

whole becomes a basic part of the process of the achievement of the Durban vision. The data compiled and verified for the selected plant species within the target taxa of the project have been used at national level for the Durban Vision process of identification of conservation priority sites. The APAPC analysis methods have served to guide the some aspects of the analysis of the Durban Vision process at national level.

Therefore, considering the project five performance, the project has accomplished the following:

1- Identification of the mostly highly threatened native Malagasy Plant species, providing a basis for coordinated *in-situ* and *ex-situ* conservation actions.

The project selected about 1250 species as target taxa that represent about 10% of the Malagasy flora. The selection of these target taxa was essentially based on the following criteria: having reliable taxonomic framework, having collections well represented at the two national herbaria, being endemic taxa and species with restricted distribution. First the project analysis of these target taxa identified rare species. The GIS analysis using Worldmap demonstrated that there species occurring only within irreplaceable sites or they are a highly restricted-range species or represented by one or two or few individuals at their sites. Then a complementary analysis from consulting the TROPICOS database in addition to the consultation of the existing botanical collections at the two national herbaria, we were able to identify some species known only from one collection either designated as the type specimen or one unique old collection known so far. With these two methods the project was able to identify a basic list of 60 species that need in-*situ* or *ex-situ* conservation plan. This information have been put available and presented for the conservation community:

- the APAPC project has 4 students and collaborates the with the University of Antananarivo to conduct species assessment within the selected key priority sites (see output 3)
- Internally, within MBG Madagascar Program, the project "Last Chance to Save" is focused on the species conservation targeted 30 threatened species , and one of them is the Endangered Species *Schizolaena tampoketsana* known only from one unique threatened habitat Ankazobe (more details below). Also a project "Twilight Species" has the objective to re-discover these unique collections known from very old collections.
- In particular, the APAPC presented these results within the Durban Vision large group which includes the most divers participants at different levels for large categories and gathered different scales : NGOs and Institution working on biodiversity conservation, conservation funding agencies, institutions doing researches, institutions for development of local sites.

*LCS project illustrates the possible coordinated conservations actions (ex-situ or in situ) of some threatened endemic plants identified in the course of the project***.**

The MBG" Last Chance to Save" project funded by the National Geographic Society was conceived to reduce the lost of critically endangered endemic species. For this project, ca. 30 endemic threatened species have been targeted for conservation actions. The conservation action plan defined for each species has been implemented either by *ex-situ* conservation or by *in-situ* conservation.
In situ conservation has been implemented with local populations surrounding the targeted sites in particular those over exploited or highly degraded. They are sensitized about the importance of the species to conserve. Concrete conservation measures have been executed in collaboration with these local communities.

Regarding the *ex-situ* conservation, seeds and/or seedlings have been collected to be grown the FJKM Agricultural College Ivato before their transplantation at the Botanical and Zoological of Tsimbazaza or their reintroduction in their natural habitat.

In total 9 of intervention zones of the Last Chance to Save project are among APAPC priority sites namely: Itremo, Ibity, Ambatofinandrahana, Ambila Lemaitso, Vohibola, Baie de Rigny, Sahafary, Tampolo and Analalava.

*As some of the identified threatened species do not yet have IUCN conservation status, these species have been integrated to the working list for Malagasy Plant Specialists Group (GSPM is the plant red list authority in Madagascar). Further researches are recommended for them***.**

Some Malagasy threatened plant species have been assessed and are included with the IUCN red list 2004. For the remaining species the GSPM need to gather the data of species analysis and evaluate the preliminary assessment of the conservation status of these species. The APAPC project contributes in different areas to help the GSPM to complete its mission:

- APAPC project collaborates with the GSPM to identify priority plant groups that have reliable taxonomic frameworks. APAPC project decided to give priority of some data entries into TROPICOS database among the project target taxa which are the priority genus for GSPM to focus on first, such as the data on *Pachypodium, Euphorbia, Dypsis*, Malagasy endemic families…..
- Then, the APAPC work with the plant specialists for the species conservation analysis. This part has been recently stated by the project following the request from the GSPM. So, Tantely in collaboration with Trisha, the GIS specialist in Saint-Louis, are the two responsible of the calculation of Area of Occupancy (AOO) and Extent of Occurrence (EOO) for each species. Then, the species conservation status will be suggested following the IUCN criteria. The APAPC project started this activity with the genus *Pachypodium* and will continue with other taxa

2- Recognition of Priority areas for Plant Conservation coupled with an evaluation of the conservation effectiveness of the current network of protected areas.

With the identification of the priority sites for plant conservation which are presented in a map of priority areas for plant conservation, the APAPC project has been contributed to the attainment of the output of the Environmental Action Plan phase III.

The fundamental principle for the identification of these priority sites was sites represent the maximum representatveness of species and habitats. For that, two complementary methods have been adopted: 1) the use of GIS for plant species spatial analysis, and 2) the use of specific ecological parameters to make inference on the importance of the site for plant conservation. Seventy-seven sites including forest, non forest areas and mangroves were identified as priority sites for plant conservation. In total, they occupied a surface of ca. 3.000.000 ha (half of the objective in Durban Vision Initiative) and are distributed all over the island. These sites cover a diverse range size; the minimum surface is about 248.ha for Ambanitazana (table basaltique). Some of these sites cover very large surfaces especially those representing a corridor. The Summit Tsaratanana - Ambohimirahavavy - Corridor Marojejy Anjanaharibe Sud is about 353779 ha, the Makira - Corridor Anjanaharibe Sud Masoala cover about 538499 ha, the Lower Mandrare corridor Andohahela cover about 201391 ha, the Andohahela corridor Midongy du Sud is about 122361 ha. These corridors have very important function in ensuring the genetic flux and to maintain the viable surface for the existing population of some species. An important criterion

of the selection of some of these sites is also the concept of important habitat. In fact some of these sites cover different types of habitat that are not forest but integrated terrestrial and freshwater habitat such as as the complex Onilahy that cover 202346 ha
Middle Mangoky cover 54878 ha, some areas integrated terrestrial and mangrove part, example Antsangabe - Baie Mahajamba mangrove about 119212 ha and the very large intact mangrove in the North eastern part of Madagascar near the Baie de Rigny 9751 ha.

These 77 sites are in addition to the existing network of the Protected areas, they are new sites and none of which is currently protected.
The assessment of the effectiveness of the current protected areas in ensuring the overall protection of plant diversity in Madagascar is currently ongoing. The results from this analysis will be available over the next few months.

3. Identification of key gaps in the PA coverage of total plant species diversity, where effective protection is most urgently needed.

The APAPC project has conducted habitat gap analysis and species gap analysis. The objective of these gaps analysis is to identify important habitats and species that are not yet encompassed within the current network of protected areas.

The APAPC has used the GIS analysis to identify these gaps.

First, all the different types of habitat present within the existing protected areas are mapped and compared with the different types of habitat present within the 77 priority sites identified by the APAPC project. This method allows us to identify the gap in habitat that are not yet protected within the current network of protected areas.

Once we obtain such areas we were able to identify species gap species which distribution is encompassed within Protected Areas network and those not represented in any protected areas. The last category of species especially in case they are rare (restricted-range species) or threatened must be taken into account while setting priority in conservation in term of creation or extension of protected areas network that is designed to ensure the complete protection of the plant diversity.

Practically, the species gap has been conducted in 2 ways:

-First by querying the locality and the vicinity of each species. This gave all species mentioned as being encompassed within Protected Areas.
-Second by querying the spatial location of each species. This let us to have all species collections that are geographically inside Protected Areas.

Plant species distribution depends mainly on bioclimate, geology and elevation parameters. The project advisor George Schatz with the GIS specialist and technician are going to overlay layers corresponding to the above physical parameters. The product, in an ESRI grid and shape formats, will constitute a useful tool to quickly identify “unique habitat”, an area that present combinations of parameters not yet encompassed within any protected areas. As the basic unit of the biodiversity is the species, one of the objectives of this project is to protection the maximum of the species as possible. The protection of “unique habitat” is important because they are likely to contain species found only there. Therefore, the identification of these “unique habitats” that have

unique combinations of environmental parameters constitute tool to protect maximum gap species.

The results of this gap analysis will be available in the next few months.

4**. Improved national capacity to apply botanical data to conservation work.**

Regarding the implementation aspect of APAPC project, emphasis has been placed on promotion of the Malagasy leadership and professional responsibility even though the team project is formed by locally and overseas based staffs.

The Malagasy APAPC staff has received capacity building in many different field interests:
Botanical knowledge: APAPC members take advantages and learn the species while doing verification of data, description, distribution, ecological preferences and endemicity. Also, the two Pls and the two project assistants are now undertaking taxonomic work on different taxa. Besides, the staff strengthened their capacity in herbarium curation and management.
Data analysis: in particular the GIS responsible received training in Saint Louis on the project data analysis methods and on the ARCGIS. Also he attended many local workshops on the biodiversity data analysis within the conservation community and participated at the workshop organized by GBIF in Mexico. The entire APAPC staff members received some internal lessons and practices on GIS basic uses by the project GIS responsible.

Communication: The APAPC have been presented at many workshops at regional, national and international levels. In addition to these talks, poster has been produced and the team learned the technic of doing posters. Also many articles have been published within the botanical newsletter RAVINTSARA produced by MBG. The two project assistants received English courses and got diplomas.
Project management: The two Project leaders (Pls) have learned to lead a project and a team, to manage the project plan and to write report.

APAPC project is a contribution towards the improvement of the national capacity to apply information on the country's native flora as a part of the national effort to conserve biodiversity. As mentioned elsewhere in this document, the Durban Vision Initiative has represented a great opportunity for MBG through the APAPC project to make use of botanical information or data in for conservation purposes if flora issue has been before underestimated by the conservation community in Madagascar. At a national level, MBG through APAPC project has shift the plant profile in general by valorizing information on plants in order to guide process of conservation planning and priority-setting. MBG is the leader of the flora subgroup within the Vision Durban Initiative.

APAPC project by its overall goal of expanding the current protected areas network has a direct link to the target 5 of the global strategy of plant conservation. APAPC staff member were invited to the African Regional Course in Plant Conservation Strategies that was organised by the Secretariat of the Convention on Biological Diversity. The aim of the course was to build capacity of the plant conservation experts in Africa to contribute to the delivery of the aims of the Convention on Biological Diversity and the Global Strategy for Plant Conservation (GSPC). Pl Sylvie attended these courses and upon her return from the course, she shared the knowledge to the APAPC team and start together to initiate the process towards the elaboration of a strategy of plant conservation for Madagascar.

5. **Dissemination of project findings to government agencies and NGOs involved in conservation planning and implementation, with technical assistance for interpreting and utilizing the findings**.

Different forms of dissemination of project findings have been produced during the project implementation:

"Ravintsara": the quarterly plant conservation newsletter has been periodically produced within the project. The edition is now at its third volume and the first issue was published in March 2005.In each issue, the newsletter contains articles about one of the APAPC priority areas and one of the plants at risk.

Posters: two posters have been elaborated on the project and also on TROPICOS/ Malagasy Plant Conservation Database. These posters have been served to present APAPC project national Scientific Forum and events**.**

Booklet: a booklet has been designed to present the overall goal and outcomes of the Projects and the most significant results (draft)

Data Compilation Sheet prepared for each priority sites for plant conservation identified by the project to sum up botanical importance of the sites in addition to different eco-geographic information on the site. This sheet contains also a map (blow-up) or photo of the site.

Maps: APAPC priority sites are mapped on three different layers: ANGAP protected areas, Simplified geology of Justin and Moat and the Durban Vision potential sites.

The **electronic version** of map of priority areas in **(CD Rom)** with associated data has been widely distributed to institutions working on conservation especially those that are interested in priority setting.

Presentations (on power point) on APAPC project at different symposia, congresses, workshops and local regular meetings. On December 23d, 2004, a big workshop to which most of the key partners, key stakeholders and representatives of the conservation community were invited was held to present the project as a whole and its relevant results. The workshop was widely given a media coverage because the many journalists present at the event gave broadcasting on TV and Radio, or wrote an article on APAPC project with emphasis on its integration within the national priority of tripling the protected areas :

Were there any unexpected impacts (positive or negative)?
No.

IV. PROJECT OUTPUTS

Project outputs: Enter the project outputs from the Logical Framework for the project

Planned vs. Actual Performance

Output	**cators**	**COMPLETION TO DATE**
1	1. The MPCD established in 1 year and data on a representative sample of the flora compiled in 2.5 years	MPCD : a subset of TROPICOS with improved structure established on ca. 1200 species

	2. Feedback obtained from at least 5 potential users at the end of year 2 and used to refine PCD	Inputs/suggestions from the main potential users cited below used for TROPICOS structure improvement in terms of adequacies as Conservation Database (Field card, NOE, REBIOMA, BRET, ARSIE and the Information system on the Crop wild relatives program) The Year one of the project's implementation was marked by an intensive meetings and visits to the potential stakeholders to get inputs/suggestions for the improvement of the MPCD structure in terms of adequacies as conservation database. Starting the year two, the forum for getting feed-back changed because the project has been fully involved in the national initiative of Durban Vision that gathered most of the concerned stakeholders. Consequently the project received from all the Durban Vision Initiative's participants many more feed-backs than the original target.
	3. PCD distributed to potential users	-Part of MPCD is available on web and used in various conservation projects either within MBG itself or for its partners
2	1. A report (in hard copy and Web formats) prepared and distributed within 3 years to all interested parties identifying floristic regions and presenting an analysis of their conservation	A Maps of 77 PAPCs has been produced during the July 2004 workshop in Saint-Louis distributed in electronic version to different users. For each identified site: a map of the site, data sheet compilation and species table are established and distributed to potential users according to their needs. One aspect of the eventual use of the project findings is MBG's participation through APAPC projects to many workshops aiming to scientifically characterize some Durban Vision's potential conservation sites in order to initiate their establishment that needs site delimitation and zoning process. In such case, APAPC's representatives integrated the project findings if the project sites are encompassed in the area of the workshop study. In other case, it happens that the project analysis method is extended to other national conservation work. This is the case of the Crop Wild Relative program. Conservation priority sites for CWR will be identified using the concept of center of diversity and concentration of the threatened of CWR. In addition to this, the project's results find their use within the MBG itself for management conservation plan of selected sites or site botanical characterization.

3	Reports (in hard copy and Web formats) prepared and distributed to all interested parties that assess at least 10 key PAPCs regarding estimated extent of primary vegetation, presence of critical species, and other relevant information	All of the priority sites identified have been assessed to allow the elaboration of the corresponding data sheet compilation. For 6 key PAPCs cited below, the Conservation Management Strategy has been produced or is underway: Ibity – Itremo , Mahabo, Analalava, Analabe , Montagne des Français. Others key sites have been also assessed within the frame of vegetation mapping project during the required ground-thruthing.
4	1. At least 4 workshops held with conservation managers and decision-makers to present project outputs (preliminary and final) and to identify appropriate ways to use them	The project has held many workshops within the Durban Vision Group, the Malagasy Plant Specialist Group, the ARSIE (the association of environmental information system networks). In most of the cases, the need for these workshops was totally predicted by DV. One big workshop late in December seeing the participation of most of the key partners, key stakeholders and representatives of the conservation community.
	2. Regular meetings (at least 1 per quarter) held with 10 or more key partners in the conservation sectors	Several meetings (more than one per quarter) with key partners and stakeholders and decision makers were done- In the beginning, meetings were done to present the project, then in the course of the project to gather inputs from stakeholders.
5	1. The two Malagasy assistants trained in first quarter of year 1 in methods of data compilation, verification and capture.	-Skill acquisition in botanical database management: data entry process and output system, in herbarium management : species verification processes using literatures and specimens, in taxonomic and systematic issue (species concept and ICBN system)
	2. The two Malagasy Project Leaders trained by end of Year 1 in basic GIS analysis	- Training in St Louis at the MO GIS unit : on line training course with the assistance of the GIS specialists (Initiation in ArcView) - on the job training on ArcView and Worldmap

	3. The project GIS technician trained in methods of spatial analysis using botanical data.	The GIS technician hired in the beginning of the project received a World Bank grant and decided to leave definitively the project. The project was thus obliged to recruit a new GIS technician The first GIS technician has been trained in Saint-Louis from August – October in 2003. He used preliminary data set to test methodology for the APA analysis and got training in some GIS software. The GIS replacement also got some trainings: ---- At the GIS unit in Saint Louis (July- August 2004) on APA analysis with the GIS specialist, on some GIS software (ARCGIS….) ---- in Madagascar on the Generalized Dissimilarities Modeling organized by WWF that aimed to identify priority sites for conservation within the Vision Durban Analysis process using the modeling techniques (June 2004)
	4. DEA studies successfully completed by two Malagasy students focusing on selected taxonomic groups	- Two students from Botany Department of Antananarivo University in preparation of their DEA (themes: respectively "Contribution to the study of 5 target species of the forest of Analabe. Vohémar district" and "Contribution to the study of 5 target species of the forest of Montagne des Francais. Antsiranana II district"
	5. DEA studies successfully by four Malagasy students focusing on selected PAPCs	- Two students from the Forest Department of the : Agronomic University in Antananarivo in preparation of engineer diplomas (themes: respectively " Contribution to the conservation and sustainable use of Analabe forest natural resources and "Contribution to the conservation and sustainable use of Montagne des Français forest natural resources")

Describe the success of the project in terms of delivering the intended outputs.

OUTPUT 1: *a widely available, user-friendly Madagascar Plant Conservation Database*

At the first stage of the establishment of the PCD, Project Leaders conducted a needs assessment by meeting with selected partners to determine what data/information they felt should be included in a Plant Conservation Database. Inputs in terms of suggestions and feed-back from them served to build the PCD.

With respect to the project's goal to improve the utility of data in TROPICOS to meet the need for project-wide standards for data accuracy and to make the database possible to include a broader set of ecological data in various analysis, MPCD includes new fields for elevation and coordinate accuracy, as well as the new "value-added" fields for Habit/Life Form, Specialized Habitat, Vegetation, Seasonality, Condition, Substrate, and

specimen condition. These “value-added” components into TROPICOS extends its capacity to serve the specific needs of conservation assessments, by extending their relevance for non-taxonomic users (conservation purposes), by designing a summary profile page of accepted taxa, up-to-date for conservation analysis, with specimen-associated information for species as well as species-associated fields such as extent of occurrence, CITES listing, number of sub-population, risk of extinction using the IUCN classification, etc.

MPCD has been established on ca. 1200 species which have been selected with consultation with many Malagasy plant specialists and according to the following criteria: endemic species first, then with a reliable taxonomic framework , well presented in collections at the two national herbaria and also species wit restricted-range. For each selected species with the most accepted name, available and verified ecological and locality data on the most of corresponding collections have been compiled into the improved TROPICOS. Thus a species responding to the above criteria with a comprehensive data entry using herbarium specimen data at the five herbaria holding the largest collections originating from Madagascar and data from literature is member of the Conservation Assessment Ready Taxa or CART. Such species form the core of the MPCD.

The opportunity offered by the Durban Vision process (DVP) has lead to some changes in some of the project’s expected outputs. This is the case of this indicator which is no longer relevant. The project has slightly changed the objective with respect to the choice in putting some efforts to help and assist the DVP. Thus the creation of the MPCd has been affected by the urgency that the DVI is facing to in providing products/outputs. As a consequence of the rush in completing the database, only part of the data is presently available on line. However, each identified site has a checklist of occurring species and a mention on important species. A master table of the data used for the APAPC analysis is kept in an Excel format and usable for internal and external requests. The MPCD in this format is available for various direct or indirect users working on conservation issue. The database is profitable for students and researchers undertaking a conservation study either on specific plant taxa (rare or threatened plants) or on a given habitat. Besides the project has received several requests from conservation managers of particular sites as well as from various national initiatives implementing/responding to the Convention on Biologic Diversity.

The MPCD was initially supposed to be widely available on web. Practically into the TROPICOS with improved structure have been incorporated some of the data relating to MPCD. Consequently, at the end of the project, only a part of MPCD data is thus available on line on the following address www.mobot.org. However the ongoing Catalog project that aims to to enumerate all native and naturalized vascular plant species in Madagascar represents another source to access to the same data. In fact, the Catalog database database enables the generation of species lists based on a search for multiple search criteria, for example, all of the endemic tree species classed as endangered or critically endangered that occur in a particular protected areas among of which the 77 PAPC ‘s sites.

OUTPUT 2: *Identification of Madagascar PAPCs within a newly established framework of floristic regions*

Chorology is generally defined as the science of areas and their development. Hence for some extent, it refers to the study of the distribution of taxa and floristic regions.

APAPC original plan proposed to use the MPCD to identify Madagascar's major floristic regions or phytochoria defined as an ensemble of areas with similar floristic composition. Then within each of the provisional floristic regions are identified the priority areas that might be centers of either plant diversity or local endemism.

When the DVI process began creating an opportunity for the project to contribute directly to the identification of a new set of protected areas, it was decided that the chorological analysis become less urgent than the other outputs initially envisioned. This stage is skipped and the project passes directly in the identification of priority areas.

Hence, the mid- July meeting in Saint Louis was held in the aim of identifying important plants areas. Two complementary methodologies were adopted for that purpose.

- The first methodology consisted on examining distribution patterns for some CART by using Worldmap software conceived to measuring the variety of nature and selecting priority areas for conservations. Each species has been analyzed and the maps of richness and range size rarity of cart species are produced giving a first category of site
- The second methodology is the integration of botanical experts' knowledge on some sites substrate, climate and elevation specificity predicting/indicating a botanical importance. Hence, some sites were demonstrated by the analysis of the environmental parameters which suggested the importance of specific eco-geographic parameters of the area. Such sites form a second category sites.

The map of PAPCs is though a combination of the categories of sites. The available "forest cover map" was used to draw the polygons of these 77 sites following the boundaries of the existing remaining natural habitat.
It would be necessary to note that the Durban Vision Initiative has been shifting emphasis to identification of priority areas at national level, rather than within a chorological framework. The project has thus changed its strategy in order to respond to DVI's expectations. However the project still plans to complete the PA analysis from the chorological analysis.

OUTPUT 3: *Assessment of key PAPCs and formulation of conservation recommendations for each.*
From the 77 identified PAPCs, the project selected **6** PAPCs of particular importance for assessment on the basis of following criteria: a) presence of potential actors that would manage the site (montagne des Français-Analabe for example), b) the contribution they make to increasing overall plant conservation especially with regard to how their species composition would complement that of existing protected areas (Analalava harboring many local endemic families-Analabe a littoral forest-littoral forest is not well represented in the current protected areas network) , and finally c) logistical considerations that might significantly impact accessibility .

In light of the delivery of output 3 about assessing key PAPCs and formulating conservation recommendations for each key sites, 6 key sites has been under consideration at the present stage of the project implementation. The table below summarizes the current situation of conservation

implementation at each site including the elaboration of the conservation management plan for the first set of sites. The document of conservation strategy was assumed to develop a) activities within PAPc with estimation of their intensity plus perception of land management, resource, use and b) information along with a map on population and existing infrastructure, data on fauna and socio-economic and cultural context that prevails in the area and has been taken into consideration during the elaboration of the conservation strategy of the key sites. Therefore a key site assessment concretely comprises three study teams: floristic, faunistic and socio-economic and cultural study teams.

Table summarizing the current situation of the conservation within each key site

KEY PAPCs	CURRENT situation of conservation	Types of assessments undertaken so far	RESPONSIBLE	PLANS FOR THE FUTURE	
Ibity – Itremo	- Conservation strategy for Itremo and Ibity massifs completed.	Biological and socio-cultural assessments	MBG –faunal and socio-cultural consultants	Proposed among the Conservation sites eligible for the year 2006 within DVI	
Mahabo-Mananivo	Conservation strategy elaboration completed- A community based conservation is now implemented by the MBG local staff recently based there. Conservation actions are reconciled with development ones. A local office is established there.	Biological and socio-cultural assessments	MBG –faunal and socio-cultural	The site is also proposed among the eligible conservation site for the year of 2006 within DVI- MBG is seeking funds for some isolated projects concerning the site (social project and conservation project	
Analalava	- Workshop held in Analalava with local population and decision makers to decide on the future of Analalava and its conservation A local office is established in Foulpointe the closest town from the forest.	Biological and socio-cultural assessments	MBG –faunal and socio-cultural	The site is also proposed among the eligible conservation site for the year of 2006 within DVI- A zoning of the forest will be shortly	
Analabe	- Reports from different fields of investigations (flora, fauna and socio-	Biological and socio-cultural assessments	. MBG (APAPC project DEA students) –faunal	With respect to the	

OUTPUT 4: *a series of meetings and workshops held to present and encourage use of outputs by conservation managers and others stakeholders*

For the attainment of the two outcomes Pls has actively worked on developing and maintaining close collaborative relationships with key members of the conservation community. Workshops and regular meetings have been held to present the project, to seek inputs from key stakeholders and to inform/present on project findings/products. Potential institutions/NGOs working on conservation were identified then classified according to their likely type and level of involvement within the APAPC project, as follows:

Partner institutions that work directly with MBG, such as the herbaria participating in or contributing to the project: Parc Botanique an Zoologique de Tananarivo (PBZT), where TAN is located; Foibe Fikarohana momba ny Fambolena (FoFiFa), which houses TEF; MNHN; Royal Botanical Gardens, Kew; and the Université d'Antananarivo.

Possible contributors/users of data/ideas/analyses, or prospective users of APAPC outputs, which are regarded as key stakeholders. These institutions are biodiversity database holders, field operators, executing agencies and national institutions working on conservation issues. Within this group, we have identified many institutions and NGOs, including ANAE, ANGAP, FTM, IMRA, IRD, PACT, QMM, SNGF, and WWF. Consulted plants specialists are part of this category. Consulted plant specialists, students and researchers requesting data either on APAPC taxa or APAPC sites are part of this category.

Observers, defined as institutions that may have influence on decision making on conservation issues in Madagascar, such as USAID, the World Bank and other donors organizations active in the conservation sector (CI/CBC for example).

Government Ministries that, for political and/or administrative reasons, must be kept informed of project activities, such as the Ministries of Water and Forest, Environment, Scientific Research, and Higher Education.

Regional and local stakeholders at key assessed sites: they were involved in the process of the conservation action plan for the site.

The Durban Vision Group that groups together at central level most of the actors in conservation from decision makers to conservation organizations, research community and ensures experience exchange between its members in conservation issue provides an opportunistic frame for the project to deliver this output. Two workshops have been held within this group: If the first workshop was an introductory presentation of the project as a whole (overall goal and expected outcomes), the second one was rather a presentation of the project results. In fact in December 23 d, 2005, the map of priority sites for plant conservation was presented in the scope of Durban Vision Process. As reported elsewhere in this document, this workshop represented a great opportunity to widely disseminate the results to the project analysis as it gathered most of the key partners, key stakeholders representing the conservation community in Madagascar.

In the same line of objectives, a workshop was also held within the ARSIE of which MBG is a member. ARSIE as it is related to the Environment as a whole has many members working in conservation issue. Holding a workshop within this entity ensured a large target to introduce the project.

The Malagasy Plant Specialist Group is the official authority mandated by IUCN for the elaboration of plant red list. As one of the project long-term goals consists on evaluating the threat status of Malagasy plant species along with identification of appropriate conservation measures, working closely with the group has been a great opportunity for the project. In the beginning Pls during a workshop gave a presentation on the project and were able to discuss with the group on the best way of integrating project's finding into the plant red listing process in Madagascar.
In addition to these workshops, numerous regular meetings have been done with same objectives as for the workshops. The average number of meetings exceeds largely the proposed objective of at least one meeting per quarter. This activity has been actively undertaken during the first two years of the project implementation in the aims of having inputs for the PCD establishment, data on either plant species to integrate to the analysis or layers to use for the analysis or simply presenting/introducing the project to decision makers.

The table below represents a summarized data on APAPC stakeholders, and the type of collaboration or contribution they have with APAPC project.

OUTPUT 5: *Malagasy trained in applied conservation research.*

APAPC project was designed to enhance the national capacity in applied conservation all over its implementation. Not only national MBG personnel contributed to the conception of the project but also the task of leading the project was entirely assigned to national staff members. Throughout the project implementation, national project staff members have acquired news skills in accordance to their responsibilities within the project either from academic training or on-the job-training.
The two data entry persons who just got their DEA degree and entered the project with no experience in botanical data management are now ones of the leaders on data entry within MBG program. Besides, they acquired skills in herbarium management as being seconded at each of two national herbaria. When the project was nearing to completion each of them choose taxa that need taxonomic revisions to work out with the guidance of the Catalogue project investigator.

- Before leading the APAPC project, the Pls had been used to work on botanical data and herbarium management. The project offered them the opportunity to acquire some basic training in GIS to help them firstly to understand interpretation of the results of the analysis. This facilitated sometimes the discussion with the GIS technician during the data analysis.
- The GIS technician had the opportunity to follow some GIS training on spatial analysis based on data of species primary occurrence. In addition, he acquired some basic skills in botany and plant diversity in general that allow him to better understand and then to direct the analysis.
- The project field supervisor was at his first experience in supervising students. He was ensuring all the necessary activities prior to the field works inherent to the students' studies. That included among other subactivities herbarium works, technique for the fields, bibliographic work, field planning.
- Four students are now preparing their degree within the project (cf table). Results from their thesis will be integrated in the conservation strategy of the two sites of their study (Analabe and Montagne des Français forests). They will defense their thesis over the coming months.

Were any outputs unrealized? If so, how has this affected the overall impact of the project?

No. However some activities requested to for the complete delivery of some outputs are still currently underway. That suggests a revision of the initial project timetable.

VI. LESSONS LEARNED FROM THE PROJECT

Describe any lessons learned during the various phases of the project. Consider lessons both for future projects, as well as for CEPF's future performance.

Project Design Process: (aspects of the project design that contributed to its success/failure)

Project Execution: (aspects of the project execution that contributed to its success/failure)

Important lessons learned during this period

Lessons learned from output 1

Lacuna

- The project was not sheltered from the problem generating by the lacuna of availability of new literatures. The refinement of the target taxa and the verification of species identification are the two main activities affected by this problem.The important skill needed to achieve this output 1 relays 1) on the plant taxonomic expertise and 2) availability of recent revision and treatment of systematic research in plant taxonomy. Most of the time, the verification of literatures depend on the collaboration with herbaria outside of Madagascar such as MNHN, Saint Louis which are the two main partners of the project.

Some lacunas were out of our control:

- One of important parameter that influences the speed of the data entry here in Madagascar is the quality of the Internet connection. Since we are working entering data directly on line the project suffer from the inefficiency of the existing services in Madagascar.
- The lack of Standardization of the existing database in Madagascar and the data accuracy did not help the project in term of exchange data with local partners within the biodiversity conservation community.

Opportunity

- The Duban Vision process has given an opportunity to the APAPC project to increase of use of the TROPICOS database/MPCD ensuring different and large categories of partner of the ways in which the TROPICOS data base can assist. The plant checklists downloaded directly from TROPICOS were used within different conservation research activities.
- TROPICOS users request more than a floristic list of a given area. APAPC team created the MBG's database team to add interpretations and synthetic analysis to the initial floristic lists to respond to the users' requests especially for data related to the current Protected Areas.

- Improvement of the knowledge of plant taxonomy for the APAPC project staff while entering data into TROPICOS and doing verifications of species identification.
- APAPC activities at the herbarium on specimen verification and data transfer have strengthened the herbarium management skill in the two herbaria by identifying new names and new combination also by finding many type specimens.
- TROPICOS structure does not cease to be improved by making link with different new plant taxonomic related project. Namely 1) catalogue project 2) API project 3) Vegetation mapping project and 4) APA project are all some how related to each others, it is evident that TROPICOS/MPCD will benefit from these collaborations as well as the different projects, such as having access to images of types specimen that exist in Paris and not represented at the two Malagasy national herbaria.
- Also, consultation of different institutions/Malagasy plant specialists which hold database lead the team to outlined a number of suggestions for an exchange data between TROPICOS and other plant database such as SONNERAT Database in Paris, Palms database, Ferns database and Rubiaceae database. Also, an Exchange experience with the MO database specialist has brought a better understanding of how Tropicos database works.

Lessons learned from output 2

Lacuna

- The two Project Leaders and the two project assistants do not master the GIS, which is recognized as important skill to move forward on the species distribution verification and to have a better understanding on the different steps of the project. In order to solve the situation, Project leaders have organized the weekly discussion on GIS and its application on biology conservation with “article summary session” which have involved the whole project team.
- Malagasy biologists do not master GIS process and most of the GIS technicians are from other fields than biology.Project team members agree that to master the GIS system is among the first importance knowledge to scientists working conservation biology research. The science of Conservation is a perfect place for young scientists to combine the primary data from the field and the new technology of GIS.

Opportunities

- The APAPC GIS responsible is member of the GIS unit of the Durban Vision Group and he is fully involved within the prioritization process. Also, the project data analysis methods have been adopted for other taxa during the initial step of priority setting process.
- The APAPC GIS responsible who did his study at the University of Polytechnic got familiarity with botanical data and botanical collections. Also he got acquisition of appropriate methodology for the project analysis, in addition of getting familiar with different software that the project will use for the analysis
- APAPC has enlarged the MBGs services by producing botanical data analysis for conservation community. In considering the importance of the use of GIS for botanical data analysis within different conservation projects, MBG plan to create a separate and independent GIS Unit for the Madagascar Program. This unit could ensure botanical analysis using GIS (red listing of identified threatened plants, center of taxa diversity…)
- The APAPC project represents a bridge between various projects, linking basic research on plants to conservation actions, which has become a major theme of MBG’s work throughout the Program.

Lessons learned from output 3

Lacuna

- Needs of field ground truthing for priority sites botanically poorly known: Botanical inventories would be priority for some sites proposed by expert as important areas for plant conservation in considering many reasons such as the existence of a unique habitat but not botanically explored. Also, some sites were known for the existence of "Type collection" only or for few old collections.
- Among important activities to achieve the assessment of key priority areas is the dialogue with potential manager of the future conservation site. Many proposed site have the strong recommendation from local people but it is difficult to find potential key stakeholder group to lead the future conservation action. This lack of professional conservation manager will handicap the final report because recommendations will not include the input from any existing conservation manager for the key site (case of Montagne des Français forest)

Opportunities

- During the workshop in Saint-Louis to identify the priority sites for plant conservation, in order to respond to the urgency request by the Durban Vision Group, the concept of priority plant area for conservation has been widening by taking in account large important unique habitat. This concept gives importance for area not only composed by forest but it integrates terrestrial and marine areas, terrestrial and fresh-water, including mangroves.
-To respond to the request of the Durban Vision group requests, the APAPC have produced Data Compilation sheets for priority sites which are under the process of creation as new Protected Areas. A Data Compilation Sheet (DCS) is a botanical file that contains information on the location of the site, the environmental conditions, botanical knowledge plus other consideration (threats, potential for tourism, current conservation activities …). These information would be essential for users and conservation managers to help them making decision for zoning and delimiting the boundaries, defining priority habitats, and identifying species conservation plan within the development plan of the commune.

Lessons learned from output 4

Opportunities

- The Durban Vision process at National level to identify priority sites were initially based o the importance of the biodiversity. The Durban Vision group gathered institutions and people already agreed by the importance of the use of floristic and faunal data for the biodiversity conservation management in Madagascar. The initial effort made by the APAPC team to inform conservation manager about the use of the plant data within the conservation management plan was already over addressed by the existing Durban Vision group. In most of the case APAPC is always consulted for Botanical issues and the APAPC leadership in the field of botanic research is confirmed by its position as leader of the flora subgroup within the Durban Vision Process.
- Therefore, there are definite shifts in the interests of APAPC toward the integration of tthe botanical research within conservation management plan and in Madagascar. The project gives importance to the requests on plant data and their analysis for the Durban Vision group according to the national priority
- Exchanges experiences are possible with many ongoing conservation projects in Madagascar on threatened plant species. In particular the project "Threatened Plants of Madagascar"at

RBG Kew and PBZT expressed an interest in exchanging information and possible joint action with the APAPC project

- it is noticed that there are several interactions of the project with the conservation community in Madagascar either within the Durban Vision group on not, at central level, regional and local level. The project has fully developed the partnership all over the project implementation to allow the promotion of data and expertises exchange.

Partners interests with regards of the use of the project outcomes:

- Vision Durban group gathered large categories of APAPC users and the REBIOMA is a data base network adopted by Durban Vision process that use directly the outcomes of APAPC
- The identification of a broader clients for Ravintsara Newsletter obliged the Communication Department at MBG to increase the number of Newsletter produced
- APAPC plant species, habitats and corridors data have been used at the workshop organized by the Eastern Ecoregion program at WWF on the outcomes monitoring relative to the decision made from the seventh meeting of the Conference of the Parties to the Convention on Biodiversity (COP-7).

Establishment of agreements between MBG and other institution working on research and conservation

- Specifically to achieve the output 3 (Assessment of key priority areas) many agreements have been established between MBG and national institutions, NGO working on conservation in Madagascar and Universities. The lesson drawn from this is that for any given conservation actions, a consensual agreement could resolve the lacks of expertise and competency for one institution.
- This partnership and collaboration have been extended with partners at assessed sites. The project emphasized the respect of the principle of integrating local groups in conservation planning and biodiversity value issue.
- As for the elaboration of the policy on data/information exchange in Madagascar, APAPC through the agreement MBG-ARSIE, had the opportunity to enlarge the panel of users of MPCD/TROPICOS including conservation communities and sustainable development operators.
- Project reviews and discussions meeting have been held at different period in Madagascar and in Saint Louis in order to evaluate the effort done and to define priority activities for the next step in considering the existing progress of the project and to improve the coordination of our works.

Lessons learned from output 5

Communication and relationship

- increase of capacity and experience in managing project : finding the right level of flexibility in carrying out the project activities, and making adjustments to the project timetable as dictated by circumstances, reinforce their awareness, knowledge on Biodiversity and Environment issues in Madagascar and identify new potential stakeholders for the project.
- Improvement of the English knowledge by English course taken by the two project assistants. Also, the MBG staff received training on public communication, in particular about “protocol” for workshop.
- Through many international workshop and posters sessions staff members got skills and experience on writing and presenting talk for international Symposium and Congress,

strengthen relationship with plant taxonomists within the world and enlarged knowledge on the taxonomic/botanical researches/works in the world. Namely these meetings are : AETFAT, Linnean Symposium, Saint Louis visit, MNHN visit,

- doing articles summary Resumes Improve and develop communication within the team, widen knowledge on what was done for plants in terms of taxonomic researches and data analysis To understand the use of the different tools such as GIS, Worldmap for plant diversity analysis already used in others country
- The distribution of newsletters to different partners has given the opportunities to botanists, especially those of MBG, to show their writing abilities and to share experiences and knowledge among plant scientists of Madagascar

INCREASE OF MALAGASY BOTANISTS TRAINED IN APPLIED CONSERVATION RESEARCH

- Hiring Malagasy staff to supervise DEA students and to ensure full time field work for four students. This option has the advantage of strengthen the Malagasy participation inside the project.
- API/MSIP training: large panel of botanists from TAN TEF and MBG received the training. Many related training topics have been given to the trainees essentially about scanning – imaging treatment – the Types and Typification codes.
- Two Students from Agronomic University and Two students from the University of Antananarivo have started their training on botany applied for conservation. The training plan was focused the training on different activities related to the herbaria in order to get the student familiar with the process.
- Training in Taxonomy methods: APAPC participated at the training in molecular biology that was organised by the University and the CIRAD. This technology could find its use in the taxonomic/systematic revisions for taxa with unreliable taxonomic frame.

Lessons learned from the project implementation context

- The project timetable was subject to eventual objective changes according to some imperative need at national level for the Durban Vision purpose. The project activities could be adapted at the pace that allows the attainment of the short time goal – Effort could be concentrated in one or more prioritised activities. Majors causes of the changes were: 1) the delay from the strike during the crises 2002, 2)the analysis requirements (include leave of the first GIS technician and a second GIS technician hiring, software acquisition, data captured needed,..) and 3) the urgent requirement from the President's declaration at the WPC in Durban

Lessons learned from CEPF evaluation team site visit in Madagascar

- It is undeniable that the site visit evaluation is beneficial not only for donor but particularly for local project staff which were able to a) meet CEPF people to whom regular correspondences were made, b) discuss face to face about the project implementation progress, c) show and demonstrate the interaction between several current MBG projects. Besides, the evaluation team were able to see how the project team functions. Each project team member was able to participate to the evaluation session.

Lessons learned from establishment of conservation management plan in Madagascar: From Vision Durban process

- During the staring period the administration procedures have slowed down activities of the implementation of the Vision Durban process. Also some lacunas have been identified within the two sub groups dealing with conservation categorization and legal framework. To solve the problem the members of these sub groups decided to ask help from people at the IUCN. Conservation community in Madagascar has learned a lot from the IUCN people about the categorization of protected area and the different potential management for them.
- Identifying sites and delimiting them are important processes, but the management plan of the site should be discussed during the creation of the site in taking in account the specificity of the region and having high involvement of local people.

VII. ADDITIONAL FUNDING

Provide details of any additional donors who supported this project and any funding secured for the project as a result of the CEPF grant or success of the project.

Related projects	**Donors**	**TYPE OF FUNDING**	**IMPORTANCE**
Ravintsara Newsletter	CIMAD/ CEPF	A	Tool of dissemination of the APAPC project results and approaches
API (MPCD),	Mellon Fundation	B	Contribute to the finalization of the TROPICOS/MPCD structure
Tampoketsa (*Schizolaena tampoketsana*)	CIMAD	B	Contribute to the conservation *ex-situ* and *in-situ* of threatened species within a specific habitat identified by the APAPC process
Last Chance to Save Project	CI MAD	B	Contribute to the conservation *ex-situ* and *in-situ* of threatened species
Conservation on the ground at Mahabo	Beneficia	B	Conservation Management Plan
Littoral project	NGS	B	KEYS PAPCs

**Additional funding should be reported using the following categories:*

A *Project co-financing (Other donors contribute to the direct costs of this CEPF project)*

B *Complementary funding (Other donors contribute to partner organizations that are working on a project linked with this CEPF project*

C *Grantee and Partner leveraging (Other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF project.)*

D *Regional/Portfolio leveraging (Other donors make large investments in a region because of CEPF investment or successes related to this project.)*

VIII. ADDITIONAL COMMENTS AND RECOMMENDATIONS

I. PROBLEMS AND CONSTRAINTS ENCOUNTERED

The problems identified below are mostly out of our control:

Political instability in Madagascar has lasted almost seven months (From the beginning of the project until July 2001). Difficulty resulting from the political situation in Madagascar has led to lack of stability within many National Institutions that represent project partners and collaborators. There was a definite lack of interest on the part of civil servants who had other worries during these initial periods.

One of the important and time-consuming project tasks has been the preliminary activities (preparatory phase). For example, the activity related to data capture and inventory of specimen within the two herbaria TAN and TEF was slowed considerably because it was discovered that many specimens were misidentified and a careful search was required to locate them.

We have received many propositions for partnership/collaboration, often accompanied by an offer to sign a collaborative agreement. It was necessary to make a distinction between institutions that can and should use our outputs/interpretations (with which formal collaboration is not required) and direct partners that will help us accomplish the APA goals.

II. General comments

In this section we describe unplanned activities directly on indirectly linked to the project and have been completed within the project term. Theses activities have been accomplished with the opportunity opened from the project implementation.

1- Document compiling Recommendations for conservation strategy: important tools for implementation of Priority sites for plant conservation in Madagascar

The project's ultimate long-term goal is to provide an objective framework for conservation planning so that government agencies and NGOs can incorporate botanical information to make informed decisions on identifying priorities for conservation action. Implementations of effective conservation measures at key sites ensure adequate protection of a greater proportion of the Malagasy flora. Field works conducted within selected key priority sites aimed to assess the current extent of primary vegetation and to confirm the floristic importance of the site. Students and consultants have carried out inventory survey with three components including botany, fauna and socio-economy investigation. This information was compiled into a single document for each site. Important additional section in the document will be the recommendations formulated for the conservation strategy. This section will include proposition of zoning of the conservation area, specific objectives and action plan. The entire document will help the conservation managers in preparing the conservation management plan for the commune and will be submitted to the responsible at Water and Forest services at different level (region, province, central direction and

the Minister of the Environment, Water and Forest), to the local authorities (Mayors and traditional authorities).

- *Ibity and Itremo:* including Ambakomitehaka (Itremo massif) - Beampombo (Ibity Mountain) are among the priority protected areas identified by APAPC and integrated within the Vision Durban priority sites. Studies on site assessment have been carried out at Ibity with an additional funding from CI MAD. The success of the methodology has been replicated within the other key priority sites.

- *Mahabo Mananivo forest:* MBG conducts one pilot project on conservation on the ground at Mahabo, littoral priority site for conservation located near Farafangana. Information have been compiled and used for the elaboration of the conservation strategy document. This later includes scenarios for management plan in which the type of governance proposed is a co-management with the local people and the responsible of the Water and Forest Services but involve fully the local people within the process of conserving important primary habitat and managing natural resources sustainable.

- *Montagne des Français and Analabe forest Lac Sahaka* : The methodologies applied for the site assessment that have been experimented at Ibity and Mahabo are duplicated for these two selected priority sites for plant conservation. In addition to the information compiled from the field works at these two key priority sites, we are preparing recommendations for conservation strategies.
The process for Analabe has been done in collaboration with Fanamby (NGO operating for conservation of the Daraina complex). Thus, since its start the project has received input from them and the results include recommendations for the implementation of conservation site in this area. These recommendations were requested by Fanamby to help them in the preparation of conservation management plan for the entire Daraina complex.
As for Montage des Français, SAGE is our partners on the ground but they are essentially active in sustainable development sector. The compilation of the information from field works and recommendation for conservation strategies for Montagne des Français will be submitted directly to the Vision Durban Group and to the local authorities in addition to the regional and local administration of Water and Forest services.

- Analalava Forest: APAPC project has been strongly suggested to consider as priority site for more detailed study leading to the production of a conservation strategy. This forest is worth saving and can be saved using the two-pronged approach of controlling felling and promoting the site for tourism. People who actually live close to the forest manifest strongly their interest to contribute to the conservation project with the local authority. MBG plan to conduct an intensive inventory of the flora and fauna in the site in addition to some investigation on socio-cultural aspect.
- - *Tampolo Forestry Station*: this area is among the priority site for plant conservation where we can find the species *Tina tampoloensis* restricted to this site. Results of field mission justify the existence of population composed by few individuals. Some immediate conservation measures have been taken such the conservation an *ex-situ* decided on the collaboration between MBG and PBZT.

1. *2- Strengthen key partner supports (TAN and TEF herbaria)*

In accordance with MBG's long-term commitment to assist the two national herbaria, priority has been given to ensuring that project key partner TAN and TEF continue to receive technical and scientific assistance through MBG Madagascar program including the APAPC.

- *Pest control and herbarium mounting papers*
MBG continues to provide once a year the chemical for pest control at the two national herbaria, in addition to equipments everyday pest control such as the microwave and freezer.
As for mounting papers and the red folders for types specimens, MBG provides the totality of the needed quantity for the two national herbaria.

- *Improvement of botanical collections facilities and documentation*
MBG has incessantly provided TAN herbarium library reprints related to Malagasy flora. They are now ca. 4000 reprints. To facilitate their consultation by different users, the APAPC data entry persons have helped the herbarium and the librarian in the establishment of reprints database at TAN. The database is now available and helps in identifying lack in reprints that the Library received so far.

It is worthy to mention that the TEF herbarium receives some literatures and books from MBG when duplicates are available.

2. - *Herbarium extension*

This year the herbarium extension project got funded from NGS and Winslow foundation. The work of extension has been completed in December and the new herbarium room was inaugurated in December. Some metallic cupboards have been also provided for the new room. The about 25000 non-mounted specimens could be mounted and valorised as specimen of reference for plant identification.

3-Strengthen technical capacity of Malagasy botanists on GIS method: capacity Master the GIS system is among first importance knowledge and strongly recommended to scientists working conservation biology research. GIS tools provide botanists and managers the ability to rapidly assess landscape attributes and link these attributes with species-habitat information. The user also has the ability to interactively make polygon-specific changes to the landscape and re-examine species-habitat relations. The development of these tools has given scientists and managers the means to evaluate the merits of species conservation and proposed landscape management.

4- Visiting priority plant conservation sites is recommended: Many sites have been identified as priority site for plant conservation relay on experts opinions combined with the presence of unique habitat which is the result of the combination of specific environmental factors and predict high local endemism for plants. Further field investigations are recommended for theses sites in order to verify the reality on the ground, to conduct botanical survey, especially on rare species or locally endemic. to identify threats in order to better understand the overall concept for conservation within the site.

5-Communication: presentation and integration of the project results within international meetings and initiatives

In addition to put the project outputs and interpretations available to the conservation community in-country initiatives, we have tried to generate a robust set of communication within international conservation initiatives and conventions that would be of exceptional value for conservation of the earth's biologically hotspots.

- AETFAT symposium: The 17th Association for the Taxonomic Study of the Flora of Tropical Africa was organized by the National Herbarium, Department of Biology, Faculty of Science, on the 21 – 26th September 2003, in Addis Ababa, Ethiopia. The theme of the Congress is "Taxonomy and Ecology of African Plants for their Conservation and Sustainable Use. Jeannie Raharimampionona has presented the APAPC project within the Symposium 5 on Conservation and sustainable use of African plants. The feed-backs received from some participants who wanted to know more about the APAPC project, demonstrates their interests of the project's possible replicability in other countries.
- This year Japan Organized an Orchid festival held in Tokyo from 17 – 3 March. Madagascar has been invited to attend the festival through the PBZT (TAN) which is one of the project APAPC's key partner and the herbaria held a large collection of Malagasy endemic orchids which is among the APAPC initial list of target taxa. Sylvie Andriambololonera (MBG/ APAPC) has provided an oral presentation titled "Manerinerina: a fragile habitat for some Malagasy orchid species ».
- Contribution to the implementation of the Convention on Biological Diversity (CDB): As a signatory to the CBD, Madagascar has continuously attempted to fulfil its obligations as a party. MBG through the PLs has been involved to the implementation of two CBD decisions

- *The Global Taxonomy Initiative application.*

Madagascar has participated to the implementation of the priority actions identified for this decision. GEF/PNUE funded Taxonomy Initial Assessment part of the CBD enabling activities. MBG is the reference institution on taxomonic work on malagasy flora. Therefore through Pls contribution in collaboration with the University, MBG is directly involved in this enabling activity.

- **The Global Strategy for Plant Conservation**

An African Regional Course in Plant Conservation Strategies is being co-organised by the Makerere University, the Royal Botanic Gardens Kew- UK and the Secretariat of the Convention on Biological Diversity in November at Makerere University, Uganda. The aim of the course is to build capacity of the plant conservation experts in Africa to contribute to the delivery of the aims of the CBD and the GSPC. The APAPC project was presented there and it was emphasized that its directly inform target 5 of GSPC "Identifying and conserving important plant areas- Protection of 50% of the most important areas fro plant diversity assured"

- .*Important Plant Area (IPA*):

Madagascar has expressed its interest in a pilot phase for IPA achievement. This initiative will help Madagascar to meet its commitments under the GSPC. As for methodology APAPC has developed criteria outside of those established by IPA (criteria A, B and C) but uses of herbarium location data by identifying centre of plant diversity.

6- Communication: presentation and integration of the project results within National initiatives

Project findings have been presented to government agencies and NGOs involved in conservation planning and implementation. We have tried to ensure that botanical data are integrated in a broad range of conservation applications in Madagascar by assessing how the project outputs and findings relate to each stakeholder's mandate, priorities and objectives.

- APAPC is an important tool towards the achievement of the Vision Durban process: There is real urgency for APAPC to produce results that can help the achievement of the vision Durban process, to help decision makers in identifying conservation sites. The result has combined the species based GIS analysis and plant expert analysis. The project approaches are duplicated for different studies and the MPCD/TROPICOS database is now first consulted to search for Malagasy botanical information. So far, the map had already used for two national purposes: 1) during the workshop on identification of priority areas for

conservation for the Eastern Ecoregion organized by WWF, 2) attached to the ministerial decree in the frame of the conservation site implementation within the Vision Durban process.

- One of important activities within the PE3 in Madagascar is the elaboration of the "tableau de bord environnemental" at national level as well as for each of the 22 regions. The TBE is a compilation of environmental indicators that give a general survey on the environment status at given period. The objective of TBE is to produce capitalized information and widely communicate them to conservations actors at different levels. Many current project aim to define and assess priority areas but APA is the only project that is based on plant data. MBG has extensive expertise on plants and solicited for data advice and interpretations to complete the TBE national and regional.
- Wild Crop Relatives/IPGRI progra: MBG is one of the institutions partners working on the CWR data compilation (distribution, location, biology, ecology, nomenclature). APAPC analysis methodology is adapted to this program to identify center of species richness of CWR in order to set priority for the fieldwork for data completion and species conservation.
- The GSPM validated the work of Malagasy plant specialist on the new IUCN categories of Malagasy species, and recommendation have been made to use APAPC data for elaboration of species map distribution for species among APAPC target taxa and calculation area measurement. GSPM is considering a strategy that would focus on threat analyses of 50 highly threatened species selected among APAPC results.

VIII. INFORMATION SHARING

CEPF aims to increase sharing of experiences, lessons learned and results among our grant recipients and the wider conservation and donor communities. One way we do this is by making the text of final project completion reports available on our Web site, www.cepf.net, and by marketing these reports in our newsletter and other communications. Please indicate whether you would agree to publicly sharing your final project report with others in this way.
Yes __X_
No _____

If yes, please also complete the following:

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