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UNIVERSITY DEVELOPMENT LINKAGES PROGRAM (UDLP)

STATE UNIVERSITY OF NEW YORK AT STONY BROOK
UDLP PROJECT 1993-1998

TITLE: ENVIRONMENT AND NATURAL RESOURCE MANAGEMENT
OF BIODIVERSITY IN MADAGASCAR

Participating Universities:

SUNY at Stony Brook (USIHE) - Lead
Eastern Michigan University (USIHE)
Duke University (USIHE)
University of Antananarivo (DCIHE, Madagascar)
University of Fianarantsoa (DCIHE, Madagascar)

Annual Report, Year 4: October 1, 1996 through September 30, 1997

Submitted by:

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List of Abbreviations

ANGAP	Association pour la Gestion des Aires Protégées, (National Association for the Management of Protected Areas)
CMB	Consortium Malgache pour la Biodiversité (Malagasy Biodiversity Consortium)
CNRE	Centre National de Recherche Environnemental
CNRP	Centre National pour la Recherche sur les Phamacuetiques
DCIHE	Developing Country Institute of Higher Education
DEF	Direction des Eaux et Forêts (Water and Forests Department)
ICTE	Institute for the Conservation of Tropical Environments (SUNY Stony Brook)
ONE	Office National de l'Environnement (National Environmental Office)
OTS	Organization for Tropical Studies
PBZT	Parc Botanique et Zoologique de Tsimbazaza
SUNY	State University of New York
TBA	Tropical Biology Association
UDLP	University Development and Linkage Program
USAID	United States Agency for International Development
USIHE	United States Institute of Higher Education
WCS	Wildlife Conservation Society
WWF	World Wildlife Fund (or World Wide Fund for Nature)

Note: Unanticipated Outcomes are italicized.

A. Objective One: Design and Establish Training and Enhancement Programs in Madagascar

A.1. Activities and Progress

a. Department of Environmental Sciences at the DCIHE Universities

As part of the objectives of this University Development and Linkage Program, the USIHE/SUNY Stony Brook and our partners have been planning the establishment of environmental sciences departments at the two DCIHEs in Madagascar.

A major goal of the UDLP has been realized by the establishment, after months of careful planning, of the Department of Environmental Sciences (“Département des Sciences et Techniques de l’Environnement”, DSTE) at the DCIHE/University of Fianarantsoa. In early 1997, a project document was presented defining the future department (Appendix 1). This document clearly states the need for such a program in Madagascar not only for the long-term concerns of environmental degradation but also as a response to the current National Environmental Action Plan (NEAP).

The Department of Environmental Sciences (DSTE) will train undergraduate majors in environmental sciences as well as students who will receive a “Diploma of Technician for the Environment”. Students will receive a broad education in both theoretical and practical aspects of environmental management. The institute will also offer courses at the undergraduate level on biodiversity field research, environmental law, and medicinal plants, which can be used as a concentration (major). This component of the Department is in the planning stage, and the Rector’s training in the US was part of this planning.

The graduates leaving with a Diploma of Technician for the Environment will be capable of working as:

- a) animators (serving as the interface between the executing agencies and the rural world),
- b) technicians for environmental protection and conservation,
- c) tourist guides for ecotourism, and
- d) technicians for ecological monitoring

This new department will play an extremely important role in future training programs in Madagascar and especially in the Fianarantsoa region.

In September, 1997, the Recteur (President) of the DCIHE/University of Fianarantsoa (Dr. Ratsimbazafy), the Doyen (Dean) of Science Faculty at the DCIHE/University of Antananarivo (Dr. Adolphe Randriantsoa), the DCIHE/UDLP Coordinator (Dr. Benjamin Andriamihaja), and USIHE Coordinator Dr. Suzanne Zeeve visited USIHE/Stony Brook, Yale University School of Forestry and Environmental Sciences, Columbia University’s CERC, University of Connecticut at Storrs, the American Museum of Natural History’s Center for Biodiversity Conservation,

USIHE/Duke University School of the Environment, and Vermont Law School Environmental Law Center to examine their Environmental Programs (see report in Appendix 2). This visit greatly improved the ability of the DCIHE officials to implement their own departments, by allowing them to observe how other universities have organized their faculty, course offerings, and curricula.

An important result of this visit was that the Doyen of Science Faculty at the DCIHE/University of Antananarivo was able to resolve many of his concerns about the logistics of establishing an Department of Environmental Sciences at his university, is now working enthusiastically to develop such a department.

b. Biodiversity Field Training Course

The UDLP Biodiversity Field Training Course was held in November and December, 1996, in Madagascar. Four US and nine Malagasy Professors participated in the course. Of the US professors, there was one professor from each of the USIHEs and one Representative from OTS (Dr. Ted Stiles). The DCIHE/ University of Antananarivo included four professors and the DCIHE/ University of Fianarantsoa sent five professors. Eight US USIHE/SUNY Stony Brook students and five advanced DCIHE students followed the course.

The course began on November 11th and concluded on December 1st, 1996. There were three main themes: Grant Writing and Publications, Research Methodology and Design, and Data Analysis and Management. Additional topics and lectures included a presentation of the OTS course by past students (DCIHE students Tiana Razafindratsita and Pascal Rabeson), ornithology (with USIHE/ Duke University Professor Steve Zack), lemur studies (USIHE/ SUNY Stony Brook Professor Dr. Patricia Wright), stream and fish studies (USIHE/ E. Michigan Professor Dr. Peter Reinthal), a presentation on the Chicago Field Museum (by Dr. Bruce Patterson, visiting scientist), and a presentation of Karyotypes and taxonomy (by Link Olson, visiting scientist).

c. 1997 Program Planning and Coordination

USIHE/ SUNY Stony Brook UDLP Professor Patricia Wright, Benjamin Andriamihaja, UDLP National Coordinator, DCIHE/University of Antananarivo UDLP Coordinator Professor Berthe Rakotosamimanana, and other DCIHE decided to conduct a short fall 1997 UDLP Evaluation Workshop as the fifth year UDLP budget and planning did not include a field course. However, demand for a 5th year field course was so great among the Malagasy students and faculty, that it was decided to reallocate funds for this purpose. *The 5th year field course is being planned and will be held in November 1997.*

In December, 1996, a workshop was held in Antananarivo entitled: "The establishment of an international training and research program on Biodiversity in Madagascar, based on the OTS model" (see Objective 5, Revise Curriculum). Topics discussed included both the creation of a longer field training program and the creation of a consortium for training and research in Madagascar. It was proposed that future field courses be expanded and parallel the semester period in the US.

In March, USIHE/ SUNY Stony Brook Professor Patricia Wright traveled to Costa Rica for the Annual OTS Member's Meeting. During the meeting, discussions continued with OTS on the subject of future collaboration on field training in Madagascar. The current approach of OTS is that they are very interested in continuing a collaboration with USIHE/ SUNY Stony Brook and the UDLP program but they are not ready to establish a new program in Madagascar at present.

The European Tropical Biology Association (TBA) is extremely interested in establishing training courses in Madagascar including a section at in Ranomafana Biological Research Station. The USIHEs SUNY Stony Brook and Duke University will be in close contact with the TBA to help organize the course.

UDLP Coordinator Professor Rakotosamimanana has been extremely busy as the General Secretary for the 1998 International Primatology Society (IPS) meetings and Conservation Congress which will take place in Madagascar. This is the first large international congress on primates in Madagascar. *The collaborating professors, US and Malagasy students of the UDLP will be integrally involved in the preparation and implementation of both the IPS Congress and the Pre-congress Conservation workshop that will be held in Ranomafana prior to the IPS Congress.* Proposals to financially support the Pre-congress Conservation Workshop at RNP have been submitted to private donors in the US.

Many of our UDLP professors and students will be giving papers and networking with international researchers during August 1998 meetings.

After many years of our working to establish email connections at the DCIHE/ University of Fianarantsoa, email is now up and running. This opens up the opportunity for DCIHE/ University of Antananarivo and the U. of Fianarantsoa colleagues to communicate without driving ten hours - a major collegial breakthrough.

On September 18, 1997, during the US training program of the officials from the DCIHE Universities, a UDLP meeting was held to discuss plans for the fall 1997 UDLP Evaluation Workshop, and the future of the linkage (see Minutes in Appendix 3).

d. Independent Research Projects

Students conducted independent research projects and presented the results of longer term independent studies as part of the Biodiversity Field Training Course. During this course, 12 presentations were given by US and Malagasy students. During the field course, each student gave a presentation on his/her independent research project. The list of all projects was provided in the 1st Quarterly report for this year.

UDLP student Serge Henri RATSIRAHONANA completed his DEA at the University of Antananarivo. His thesis is entitled: "Contribution de l'Anthropologie Nutritionnelle dans la Conservation de la Biodiversité dans Deux Aires Protégées: le Parc National de Ranomafana et le Parc National Isalo".

A.2. Problems or Barriers

Although the training session is a logistic challenge, the ICTE office in Antananarivo exhibited their competence by organizing a problem-free course. OTS's decision not to establish a new program in Madagascar at present may affect the ability to continue the field course after the completion of UDLP funding. The TBA is an alternative that the Linkage members are pursuing.

B. Objective Two: Training in the US of Malagasy Faculty and Students

B.1. Activities and Progress

a. Malagasy Students

Mr. Jonah RATSIMBAZAFY (UDLP/DCIHE student) has finished his course work in the Spring of 1997 as a USIHE/ SUNY-Stony Brook graduate student in Doctoral Program in Anthropological Sciences and received excellent grades. During the summer, he conducted field research in Madagascar for his Ph.D. dissertation at SUNY-Stony Brook. In the fall semester, 1997, he is analyzing his data and preparing his Ph.D. Dissertation proposal. He works with USIHE\SUNY-Stony Brook Professor Patricia Wright as his principal advisor.

Mr. Ratsimbazafy has been awarded a Wenner-Gren Developing Country student grant for the remaining three years of graduate work. He has also received support for his field studies from the Brookfield Zoo, Wildlife Preservation Trust International, and Primate Conservation Inc. This is an example of how we have used UDLP funds to leverage other funds to further our goals and objectives.

Mr. Jean-Claude Andrianantenaina RAZAFIMAHAIMODISON (UDLP/DCIHE student) successfully completed his Master's Degree in Spring 1997 in the Program for Biodiversity at the City University of New York. He has worked extensively with USIHE/Duke University Professor Steve Zack in Madagascar.

Lalaina RAVELOMANANTSOA (DCIHE student funded by UDLP) entered the Vermont Law School in August 1997, to pursue his studies of Environmental Law (see appendix for list of courses he is taking). The Vermont Law School is the top ranked school for Environmental Law in the US. In September, the Rector of the DCIHE/University of Fiananrantsoa and the Dean of Sciences of DCIHE/University of Antananarivo visited Lalaina at the Vermont Law School (see below). The Dean of Sciences was so impressed with Lalaina and the course of study that he is pursuing, that he offered Lalaina a teaching position at the DCIHE/University of Antananarivo upon completion of his studies.

Vololontiana RAZAFINDRATSITA (UDLP DCIHE/University of Antananarivo student) is an ornithology student chosen from the Linkage 1995 course to receive advanced training at SUNY Stony Brook, California, and Costa Rica during 1996. During this year, Tiana prepared for and has taken the TOEFL and GRE exams. Tiana is currently working full-time as a research

assistant in Madagascar for Professor Ted Stiles of Rutgers University and will be applying for a Ph.D. program at both Rutgers University and at Stony Brook for the fall of 1998.

Pascal RABESON (UDLP/DCIHE student) has worked closely with USIHE-Eastern Michigan University professor, Dr. Peter Reinthal on ichthyological studies for several years. Mr. Rabeson has studied entomology, including a systematics training session with Dr. E. O. Wilson at Harvard University. He assisted the entomology instructor during the Fall 1995 UDLP field course and continues as the Ecological Monitoring Advisor to the Ranomafana National Park Project. He has participated in the OTS Tropical Biodiversity course in Costa Rica in August, 1996. Pascal has prepared for and taken the TOEFL and GRE exams this year. Pascal has been accepted into the University of Eastern Michigan Masters program and the Institute of Ecology in Athens, Georgia Ph.D. program. He will begin in 1998.

Florent RAVONY (DCIHE/UDLP Coordinator for the Ranomafana training site) has been accepted into a paleontology program with USIHE-SUNY/Stony Brook professor, Dr. David Krause in the Department of Anatomical Sciences, and plans to enter in 1998. Dr. Krause has located funding for the first two years of graduate studies.

Ernestine RAHIMILAVO (DCIHE student and Ecological Monitoring Director of RNP), attended the Smithsonian Institute/Man and the Biosphere (SI/MAB) training course on Biodiversity Measuring, Monitoring & Research from May 15 - June 13, 1997. The course provides training in a standardized method of biodiversity inventory, monitoring and research on 1 hectare plots. The training course was held at Front Royal, Virginia, just outside of Washington, DC. Ernestine was one of 23 students from 18 countries who attended the course. Her report will be sent in the next quarterly report.

b. Malagasy Faculty

As part of the planning and preparation for establishing Departments of Environmental Sciences at the DCIHE/University of Fianarantsoa and DCIHE/University of Antananarivo, two officials from those Universities as well as the DCIHE Coordinator visited Departments of Environmental Sciences at US Universities to learn about curriculum, feasibility, and problems.

The Recteur of the DCIHE/University of Fianarantsoa (**Dr. RATSIMBAZAFY**), the Doyen of Science Faculty at the DCIHE/University of Antananarivo (**Dr. Adolphe RANDRIANTSOA**), DCIHE Coordinator (**Dr. Benjamin ANDRIAMIHAJA**), accompanied by USIHE Madagascar Programs Coordinator Dr. Suzanne Zeeve, visited USIHE/Stony Brook, Yale University School of Forestry and Environmental Sciences, Columbia University's CERC, University of Connecticut at Storrs, the American Museum of Natural History's Center for Biodiversity Conservation, USIHE/Duke University School of the Environment and the Vermont Law School Environmental Law Center. At each University, the Malagasy Faculty met with University Presidents, Deans, and/or Chairmen and Faculty of Environmental Studies. This training program is detailed in a report in the Appendix 2.

There were three major outcomes of this training program:

1) The Dean, the Rector and the UDLP/DCIHE Coordinator were able to develop, clarify, and expand their understanding of the possibilities and problems of Environmental Sciences Departments. The ability to review and discuss course offerings and curricula of established departments was particularly helpful. *A major result of the training program was their realization that the strict disciplinary nature of the French education system as inherited by Madagascar is problematic to the development of Environmental Sciences Programs. The more inter-disciplinary approach of US Universities is a better model for the new Departments of Environmental Sciences being instituted at the DCIHE Universities.*

2) The DCIHE faculty brought home a clear message of the importance of Environmental Sciences Departments at US Universities, and the international significance of Malagasy Universities establishing their own Departments of Environmental Sciences

3) All of the US Universities that the DCIHE faculty visited were extremely enthusiastic about establishing linkages with the two DCIHE universities. It was valuable to the DCIHE faculty to see the international importance of their Universities and to form relationships with US colleagues for potential collaborations.

B.2. Problems and Barrier

The barrier to success was the extremely high costs of the international travel and training programs. Unless supported by foreign funds, Malagasy students and professors have no opportunity for such experiences. We continue in our attempts to locate funded programs for students to continue on in the US in graduate programs. We feel that this is the only clear route for long-term improvement of Malagasy Higher Education in conservation and development. The September training program for the representatives of the DCIHE Universities is an excellent example of the value of such US training programs. These officials were able to see first-hand, at a number of different Universities how an interdisciplinary program like a Department of Environmental Sciences works. They could not have gotten this experience in any other way, nor would they have seen the international importance of their new departments. The UDLP funds spent on the training program were extremely well spent -- it is unfortunate that more Malagasy people cannot benefit from such an experience.

C. Training in Research Methods and Grant Writing

C.1. Activities and Progress

Training in research methods and grant writing were two of the main themes in the 1996 UDLP course held in Ranomafana during this reporting period. The following subsections were taught during the course: Introduction to Grant Writing and Publications, Research Methods and Experimental Design, Statistics (three sessions), Statistics and Computers, Computer Use, Data Analysis, and Data Analysis and Management.

The UDLP field course included field research methods training as well. USIHE/Duke University professor, Dr. Steve Zack provided a field course on ornithology (birds). USIHE/Eastern Michigan University Professor Peter Reinthal and Mr. Pascal Rabeson led practical exercises on fish sampling and study. USIHE/ Stony Brook professor Patricia Wright lectured on conservation biology and funding sources.

USIHE professors and UDLP staff assisted students in Madagascar with training on computers, data analysis and scientific writing.

USIHE Coordinator Dr. David Meyers, his replacement Dr. Fredrica van Berkum, as well as USIHE Principal Investigator Dr. Patricia C. Wright, assist DCIHE students training in the US with locating sources of additional funding and preparing and submitting proposals to funding agencies.

DCIHE/UDLP student Jonah Ratsimbazafy, a graduate student at USIHE/SUNY Stony Brook, was awarded a Wenner-Gren Developing Country student grant for the remaining three years of graduate work. He also applied for and received financial support for his field studies from the Brookfield Zoo, Wildlife Preservation Trust International, and Primate Conservation Inc.

UDLP Coordinator USIHE/SUNY Stony Brook Professor Dr. Patricia Wright and DCIHE/ University of Antananarivo Professor Lydia Rabetafika have submitted a four-year NSF grant together to research the effects of parasites on the biodiversity of Madagascar rain forests. Making these kinds of collegial linkages is an important output for this grant. *It should also be mentioned that advanced UDLP student Tiana Razafindratsita has been hired as a research assistant for Professor Ted Stiles (of Rutgers University), OTS representative and guest lecturer this UDLP field training course this past year. Another spin-off of the OTS-UDLP alliance last December is that a student of OTS representative Doyle McKey, Ambroise Dalecky, will be hired as a technical advisor for ecological monitoring for the RNP and he will play a lead role in teaching courses in GIS, biodiversity monitoring and other short training programs next year.*

C.2. Problems and Barriers

Continuing problems in terms of training students and professors in grant writing methods include the lack of available computer equipment. USIHE/ E. Michigan University Professor Peter Reinthal donated a computer to the program this year.

D. Production of Publications on Research and Development

D.1 Activities and Progress

The List of Publications Resulting from Research at Ranomafana National Park continues to grow and it is included in Appendix 5.

Some of the advanced DCIHE students have been preparing articles for publication. DCIHE

students Vololontiana Razafindratsita and Harison Randriananasolo both have papers in press. Ms. Razafindratsita has a paper entitled "Seed dispersal by the Velvet asity - *Philepitta castanea* (Muller, 1776) - in the rain forest understory of Ranomafana National Park, Madagascar" recently accepted for publication in the Journal of Tropical Ecology. Harison has a paper in "BirdLife of Madagascar".

DCIHE/University of Antananarivo UDLP student Harison Randriananasolo presented a paper at an international ornithological conference in Ghana in December based on his UDLP work at Ranomafana (see Appendix 7). The conference and part of Harison's trip was co-sponsored by Bird Life International and UDLP.

DCIHE student Richard Randrapiona was co-author on a poster presented at the American Society of Limnologists and Oceanography in Albuquerque, New Mexico in February, 1997 with UDLP teaching assistant Karen Riseng and USIHE\ Eastern Michigan professor Peter Reimthal. UDLP teaching assistant John Sparks presented a paper on the "Phylogenetic analysis of the Malagasy Cichlids" at the American Society of Ichthyologists and Herpetologist's Meeting in June, 1997 in Seattle Washington with UDLP student Karen Riseng.

Linkage Members have been discussing the establishment of an international journal called Journal of Madagascar Conservation, following the models of similar journals in Indonesia and India. The MacArthur Foundation and Liz Claiborne are possible sources of start-up funds. This journal would include not only articles about biodiversity, but also human impact on the environment. This journal would be an excellent vehicle for Malagasy students to get used to peer review and journal format. International researchers would be required to publish articles in this journal.

D.2. Problems and Barriers

Funding limitations and lack of opportunities for advanced students in Madagascar continues to be a problem for publication. Current UDLP funds are not adequate and the ICTE is continually searching for additional funding sources to expand our training program in Madagascar.

E. Revise Curriculum

E.1 Activities and Progress

a. OTS - UDLP Collaboration

In 1996, the collaborative activities of the Organization for Tropical Studies (OTS) and the UDLP Universities led to a joint program in Madagascar which culminated in a workshop entitled: "The establishment of an international training and research program on Biodiversity in Madagascar, based on the OTS model."

The Organization for Tropical Studies is a consortium of 50 universities and institutions with

administrative offices at USIHE/Duke University and in Costa Rica, devoted to curricula and courses in tropical research. They have been conducting graduate level and professional ecological field courses in Costa Rica for 25 years. An associated non-government organization, the Tropical Biology Association (TBA), based in Europe and the tropics, collaborates with OTS and is another excellent model for the international collaboration sought by Madagascar.

Three activities occurred as a result of this collaboration:

- 1) Dr. Ted Stiles, a professor at Rutgers University, Dr. Doyle McKey, professor of Biology at Montpellier University, and Dr. Harold Heatwole of North Carolina State University represented OTS at the UDLP field course. Dr. Stiles was able to assess the current conditions of field training at Ranomafana and to work with the students, professors and teaching assistants during the course.
- 2) There was a joint reconnaissance mission of Malagasy and international professors to visit potential field training sites in southern Madagascar. The team was composed of 4 international professors (including 3 representatives from OTS), 5 national professors, and 2 students who had participated in both the UDLP courses and OTS program. The Malagasy professors and scientists who participated have submitted a mission report that was included in the first quarterly report for year 4. The purpose of the reconnaissance mission was to assess the suitability of sites to be used by students to conduct comparative studies of a variety of ecological habitats. The reconnaissance team visited Ranomafana, Manombo Special Reserve (lowland littoral rain forest), Isalo National Park (forested canyons and gallery forest along rivers in the sandstone outcrops), and the forest of Ifaty (spiny desert forest along the Mozambique Channel).
- 3) A workshop entitled "The establishment of an international training and research program on Biodiversity in Madagascar, based on the OTS model" was held in Antananarivo on December 19, 1996. The reconnaissance team and the representatives from OTS presented background information and the findings of the mission to a large assembly of representatives from national and international organizations involved in research, training, and conservation in Madagascar (see quarterly report for this period for further details). The participants at the conference totaled 32 individuals representing 16 institutions. Additional Institutions were invited but could not participate. The participants then produced a detailed plan (see Appendix 6) outlining 1) the organization of an OTS-style field biology course in Madagascar and 2) the organization and possible financing of a consortium of Malagasy and International Universities.

USIHE/ SUNY Stony Brook Professor Patricia Wright traveled to Costa Rica in March 1997 for the Annual OTS Member's Meeting. During the meeting, discussions continued with OTS for future collaboration on field training in Madagascar. The current approach of OTS is that they are very interested in continuing a collaboration with USIHE/ SUNY Stony Brook and the UDLP program but they are not ready to establish a new program in Madagascar at present.

The European Tropical Biology Association (TBA) is extremely interested in establishing training courses in Madagascar including a section at in Ranomafana Biological Research Station. The USIHEs SUNY Stony Brook and Duke University will be in close contact with the TBA to help

organize the course.

b. Department of Environmental Sciences at the DCIHE Universities

The Recteur (President) of the DCIHE/University of Fianarantsoa (Dr. Ratsimbazafy), the Doyen (Dean) of Science Faculty at the DCIHE/University of Antananarivo (Dr. Adolphe Randriantsoa), and DCIHE Coordinator (Dr. Benjamin Andriamihaja), accompanied by USIHE Madagascar Programs Coordinator Dr. Suzanne Zeeve, visited USIHE/Stony Brook, Yale University School of Forestry and Environmental Sciences, Columbia University's CERC, University of Connecticut at Storrs, the American Museum of Natural History's Center for Biodiversity Conservation, USIHE/Duke University School of the Environment and the Vermont Law School Environmental Law Center. At each University, the Malagasy Faculty met with University Presidents, Deans, and/or Chairmen and Faculty of Environmental Sciences. This training program are detailed in a report in the Appendix 2. At each of these universities, the DCIHE faculty received copies of the US Universities' course offerings, specialization, training, and qualifications of their faculty, and other materials helpful in the design of the curriculum of Departments of Environmental Sciences at Malagasy Universities. Discussions with faculty and students at the Departments of Environmental Sciences at US Universities provided further insights into curriculum design for the Malagasy faculty.

Approval of the curriculum for the Department of Environmental Sciences at the University of Fianarantsoa is a major step towards our goal of incorporating the UDLP curriculum in the Malagasy National Curriculum. Many of the elements, including field research components are a direct result of UDLP programs.

E.2. Problems and Barriers

Due to last minute administrative duties, Gary Hartshorn, Director of OTS, Robert Sussman, an additional OTS representative, were unable to travel to Madagascar to participate in either the reconnaissance trip or the workshop. As a solution to this change, OTS's Don Stone in the absence of Gary Hartshorn assigned Ted Stiles, ornithologist and Doyle McKey, botanist to represent OTS along with Harold Heatwole, entomologist. Unfortunately, four important professors for the UDLP, DCIHE/University of Antananarivo professors Berthe Rakotosamimanana and Daniel Rakotondravony and USIHE professors Dr. Peter Reinthal and Dr. Steve Zack were also unable to participate in the mission.

Due to the constraints of budget and time, the training program for the officials of the DCIHE Universities was limited to 2 weeks. This time was so productive, that all parties wished that more time had been available.

F. Ensuring the Sustainability of the Linkage

The collaboration with OTS on the creation of a consortium and the establishment of higher level courses is a significant step towards long term sustainability of the linkage program. The Report

produced from the December 19, 1997 Workshop (see Appendix 6) provides a detailed outline of how such a consortium might be structured. This document should serve as an excellent starting point for establishing the consortium and for developing funding for it.

The potential for the creation of an international consortium for tropical research was further enhanced during the training program for Malagasy Faculty in September, 1997 (see sections A.1.a and E.1.b, and Appendix 2). Representatives of all the US Universities (SUNY Stony Brook, University of Connecticut, Yale University, Vermont Law School, Duke University, Columbia University, American Museum of Natural History) visited by the DCIHE faculty expressed strong interest in participating in a consortium.

Such a consortium would not only empower the existing Malagasy DCIHEs that are involved in the linkage, but also would empower the entire Malagasy research and higher education community as a force in the country's future. The next step is to identify sources for financing the creation of the consortium. As noted previously, the need for longer term financing is essential for the continued improvement of the DCIHEs programs in biodiversity and sustainable development. The creation of a consortium would provide a vehicle for the identification of funding sources and a strong support unit for requesting large scale funding.

The sustainability of a Linkage between Universities interested in environmental issues was also promoted by the development of environmental training and curricula at DCIHE universities. The establishment of a Department of Environmental Sciences at DCIHE/ University of Fianarantsoa and the planning for such a department at DCIHE/ University of Antananarivo were major accomplishments. Plans to install UDLP-style field courses in the National Curriculum are another relevant accomplishment.

G. Summary of Quantitative Outputs During Quarter 1 FY 1997

1) Design and Establish Training and Enhancement Programs in Madagascar

- 1 biodiversity research field course conducted (1996)
- 1 Master's Degree Program in Environmental Sciences established at the University of Fianarantsoa
- 4 DCIHE/ University of Antananarivo Professors involved in field course
- 5 DCIHE/ University of Fianarantsoa Professors involved in field course
- 4 Guest Lecturers contributed to course
- 3 USIHE professors primarily taught the course
- 3 OTS representatives helped with the course
- 2 Advanced DCIHE students worked as teaching assistants for field course
- 4 DCIHE/ University of Antananarivo Students participated in the field course
- 1 DCIHE/ University of Fianarantsoa Students participated in the field course
- 8 USIHE/ SUNY at Stony Brook Undergraduate Students participated in the field course
- 5 DCIHE/ Student research projects continued
- 1 DCIHE/ Student DEA completed
- 1 International Primatology Society (IPS) meeting planned
- 1 Pre-congress workshop planned for IPS, proposals for funding submitted

- 1 Email system established at the University of Fianarantsoa
- 2) Training in the US of Malagasy Faculty and Students
- 3 advanced DCIHE students are being trained in the US (in graduate programs)
 - 1 DCIHE student attended a 1 month training program at the Smithsonian Institute in the US
 - 3 DCIHE students are being aided administratively to help them join US graduate programs
 - 3 DCIHE faculty trained at US Universities
 - 2 USIHE Universities and 3 other US Universities visited by DCIHE faculty during training
- 3) Training in Research Methods and Grant Writing
- 1 field course was held which included advanced training in research methods and grant writing
 - 3 USIHE professors primarily taught the 7 sections involving research methods and grant writing
 - 1 USIHE and 2 USIHE Coordinators assisted DCIHE students with grant preparation
 - 4 grants were submitted and awarded to an advanced DCIHE student at a USIHE University
 - 1 grant proposal submitted collaboratively by USIHE and DCIHE faculty
- 4) Production of Publications on Research and Development
- 1 publication list updated
 - 2 articles submitted to journals by DCIHE Students
 - 1 Journal of Madagascar Conservation planned
 - 6 publications by USIHE participants, 2 with Malagasy colleagues
- 5) Revise Curriculum
- 1 reconnaissance trip conducted to visit contrasting habitats where OTS-like courses might be taught in the future
 - 1 USIHE/SUNY Stony Brook Professor accompanied the reconnaissance team
 - 2 OTS representatives participated in the comparative site study
 - 1 Smithsonian Institute representative participated in the comparative site study
 - 5 DCIHE professors participated in the comparative site study
 - 2 UDLP DCIHE students participated in the comparative site study
 - 4 potential training sites were visited
 - 1 large meeting for the promotion of a consortium and the establishment of advanced courses held on December 19th 1996
 - 32 individuals participated in the conference
 - 16 institutions were represented
 - 1 report was produced by ICTE
 - 2 reports were produced by OTS
 - 1 Master's Degree in Environmental Sciences planned at DCIHE/ University of Antananarivo

H. Internationalization of Malagasy and US Institutions

The discussion concerning the creation of an international consortium for biodiversity training and research in Madagascar is a major positive step taken towards the internationalization of Malagasy institutions of higher education. The USIHEs involved in the UDLP program are in an excellent position to play lead roles in the establishment and administration of such a consortium. This involvement will help internationalize the USIHEs as well as the DCIHEs associated with this UDLP grant.

The establishment of a Master's Program of Environmental Sciences at DCIHE/ University of Fianarantsoa and plans to establish such a program at DCIHE/ University of Antananarivo will give these Universities stature among international Universities that have interests in environmental issues.

The visit to US Universities by DCIHE faculty in September, 1997 resulted in major progress towards internationalization of both the Malagasy Universities represented and the US Universities visited. The DCIHE and US faculty made strong contacts with each other that should facilitate collaborations in the future. The DCIHE faculty were encouraged by the enthusiastic support for their work shown by their US colleagues.

I. Impact of the Linkage on strengthening each developing country linkage partner institution's capabilities to meet its societal development needs.

The establishment of the Department of Environmental Sciences at the DCIHE/ University of Fianarantsoa is an important and exciting accomplishment of the Linkage that will greatly enhance the ability of this developing country university to meet its development needs. Malagasy people trained in environmental sciences will be able to guide the development of their country in environmentally sound ways.

The training of three advanced DCIHE students at US institutions ensures that the developing country universities will have highly qualified people to train young Malagasy people. *DCIHE student Laliana Ravelomanantsoa, who is attending Vermont Law School, was offered a teaching position by the Dean of Science Faculty of the University of Antananarivo during the UDLP training program in September 1997.*

DCIHE/ University of Antananarivo is also planning to establish a Department of Environmental Sciences that will have the same impact on strengthening its societal development needs.

J. Conclusions

In conclusion, this 4th year has been very successful towards the main objectives of the University Development and Linkage Program. The field course was extremely well received, so much so that a 5th, unplanned field course was planned. The collaboration with OTS and the December 1996 meeting in Antananarivo were productive. The creation of a consortium, such as that

proposed during the meeting in Antananarivo and pursued during the September 1997 training program will strongly support the advances made by this University Development and Linkage Program well into the future. The establishment of a Department of Environmental Sciences at the University of Fianarantsoa, and the planning of a similar department at the University of Antananarivo major accomplishment with far-reaching affects for Madagascar.

K. Appendices

Appendix 1. Plan for Department of Environmental Sciences at the University of Fianarantsoa (in French)

Appendix 2. Report on the US Training for Officials from the Universities of Fianarantsoa and Antananarivo, September 1997

Appendix 3. Minutes of UDLP Meeting September 18, 1997

Appendix 4. List of courses taken by Lalaina Ravelomanantsoa at Vermont Law School

Appendix 5. Publications Resulting from Research at Ranomafana National Park

Appendix 6. Report from the December 1996 meeting with OTS: Consortium and Field Course

Appendix 7. Trip Report - Harison Randrianasolo to Ornithological Congress

Appendix 1.

UNIVERSITE DE FIANARANTSOA
FACULTE DES SCIENCES

PRESENTATION DU DEPARTEMENT DES SCIENCES ET TECHNIQUES DE L'ENVIRONNEMENT

1- AVANT - PROPOS

Depuis quelques décennies, Madagascar semble être aspirée dans une spirale de dégradation en matière environnementale. Actuellement, on constate au niveau des cadres et décideurs du pays, une élévation de la conscience environnementale. Cependant, ce réveil de la conscience environnementale n'est pas encore parvenue à la masse populaire et notamment paysanne qui constitue 85% de la population. D'ailleurs, c'est cette baisse de la qualité de l'environnement qui a certainement poussé les autorités Malgaches à élaborer une politique nationale de l'environnement. Aussi la loi 90-033 du 21 Décembre 1990 et son annexe constituent-ils la charte de l'environnement Malagasy. Elle fixe, en effet, le cadre général d'exécution de cette politique qui est traduite dans la pratique par le P.A.E (Plan d'action environnemental) dont la finalité est d'enrayer la spirale de la dégradation en réconciliant la population avec son environnement.

Aussi pour parvenir à cette fin, le plan d'action se donne-t-il des objectifs tels

- développer les ressources humaines
- promouvoir un développement durable en gérant mieux les ressources naturelles
- améliorer le cadre de vie des populations rurales et urbaines
- améliorer les outils de gestion de l'environnement

Mais "développer les ressources humaines" reste toutefois le pivot de la politique nationale. Pour cela, la C.E.M stipule qu'il est nécessaire, par exemple de:

- renforcer la sensibilisation et la formation des populations
- "moraliser la vie publique" par rapport à notre culture, notre législation, notre

besoin de développement

- renforcer le thème "environnement" dans les programmes d'éducation générale et développer les filières de formation et de recherche

Il s'agit donc "de mobiliser cet énorme potentiel de main d'oeuvre que constitue la population rurale, d'en réveiller les sens et la compréhension de son milieu et d'en dynamiser les actions" (C.E.M., p 23).

De ce fait, l'homme qui est l'auteur et en même temps la victime de la dégradation, reste le point focal de la résolution des problèmes de la dégradation de l'environnement. "Il est donc primordial d'axer tous les efforts sur lui afin de connaître ses besoins fondamentaux, ses motivations, sa vie sociale, sa culture et les processus qui les mènent à la pratique de dégradation de son propre environnement" (C.E.M., p 21).

Dès lors, le besoin en cadres et techniciens compétents en qualité suffisante capables de mener à bien cette mission, s'avère primordial. Aussi la création d'une structure de formation professionnalisante s'impose-t-elle, car celle-ci s'inscrit bien dans la droite ligne du plan d'action environnemental dont le développement de l'éducation, de la formation et de la sensibilisation à la gestion de l'environnement constitue l'épine dorsale de la mise en oeuvre de ce plan.

2- INTRODUCTION

L'ouverture d'un Département des Sciences et Techniques de l'Environnement, au sein de la Faculté des Sciences de l'Université de Fianarantsoa, répond donc seulement à l'esprit de la politique malgache de l'environnement, mais s'inscrit aussi dans la politique globale qu'adopte, depuis quelques temps, l'Université dans ses actions pour le développement et la protection de l'environnement, avec le concours d'autres partenaires internationaux. D'ailleurs, cette ouverture s'ajoute au projet de recherche commun élaboré par une équipe d'enseignants multidisciplinaire, à titre de contribution de l'Université, au

développement et à la protection de l'environnement autour du Parc National de Ranomafana, sans parler du Projet de partenariat pour le développement universitaire (UDLP) en collaboration avec l'Institut pour la Conservation des Environnements Tropicaux (ICTE/Stony Brook, New York)

C'est sans doute, les raisons pour lesquelles les Responsables de l'Université de Fianarantsoa ont voulu faire de cette dernière, une Université-Pilote en matière environnementale d'autant plus l'existence dans le Faritany de Fianarantsoa de plusieurs Aires Protégées tels le Parc National de Ranomafana, la Réserve Spéciale de Manombo, la Réserve Naturelle Intégrale d'Andrigitra, le Parc National d'Isalo présentant des écosystèmes différents, serait un atout majeur servant de terrains d'observations, d'études et de recherche pour les étudiants et les enseignants.

Ainsi cette formation, à caractère multidisciplinaire et multidimensionnel, d'agents qualifiés directement opérationnels, permettant d'atteindre les objectifs visés, car ils seront appelés à intervenir dans la mise en oeuvre du programme d'action environnementale. Si la population rurale est la cible privilégiée, son encadrement ne pourrait donc être que multisectoriel et pluridisciplinaire. La dégradation étant le résultat de la conjugaison de nombreux facteurs, il est nécessaire de traiter le problème de manière globale et simultanée. En effet, des "stratégies sectorielles" (développement de l'éducation, de la formation et de la sensibilisation à la protection et à la gestion de l'environnement, gestion des bassins versants, sécurité foncière, développement du tourisme écologique, assainissement du cadre de vie rural ...) sont considérées comme des étapes obligées par la réalisation des objectifs globaux du programme

En d'autres termes, les formés devraient donc être en mesure d'"aider" la population rurale en suivant ces stratégies d'approche.

Evidemment, l'orientation et le développement de telle formation pour les différentes carrières (techniciens, ingénieurs ...) dans le domaine de l'environnement seront définis en fonction des besoins, des priorités et des réelles aspirations populaires. L'important c'est de savoir procéder à une meilleure adéquation des objectifs aux réalités nationales.

3- OBJECTIFS PEDAGOGIQUES ET PROFESSIONNELS

Dans le cadre de la formation professionnalisante, le Département des Sciences et Techniques de l'Environnement délivrera le "Brevet de Technicien Supérieur en Environnement". Il s'agit donc de promouvoir une formation spécialisée, scientifique et technique sur l'environnement car les agents formés seront appelés à intervenir dans la mise en oeuvre du P A E. Aussi les objectifs seraient-ils de former des professionnels capables de :

- prendre en charge l'encadrement des populations cibles aux fins de les sensibiliser, de les conscientiser et de les responsabiliser sur les problèmes environnementaux (acquisition de réflexes, d'attitudes et comportements respectueux et responsables vis-à-vis de leurs environnements)
- mettre en oeuvre dans les zones périphériques de mini-projets d'amélioration environnementale et de développement intégré (conservation des sols et des eaux, agroforesterie et reboisement, petits aménagements des vallées, agriculture, élevage, ...)

Bref, la stratégie est de "mettre en oeuvre tout un ensemble d'opérations intégrant la conservation des Aires Protégées à la valorisation de l'écotourisme et au développement de leurs zones périphériques avec la participation active des populations riveraines, partenaires à part entière dans le processus de conservation". L'essentiel c'est de viser à améliorer des conditions de vie des populations rurales par diverses alternatives de développement pour diminuer les pressions exercées sur les AP

Il n'est donc pas question de réaliser une opération non comprise et acceptée par un terroir. Aussi, "la pratique de la communication et le dialogue" seraient-ils recommandés "plutôt que la transmission hiérarchisée des injonctions."

Pour ce faire, offrir de multiples occasions d'un apprentissage fonctionnel des connaissances, de compétences techniques professionnelles (savoir-faire dans des différents domaines de protection, conservation, production et gestion, etc ...)

Les sortants seront donc à la fois :

- des animateurs (servant d'interface entre les agences d'exécution et de monde paysan),
- des techniciens pour la protection et la conservation,

- des guides touristiques pour l'écotourisme,
- des techniciens supérieurs de suivi écologique.

Ils pourront offrir leurs compétences et savoir-faire auprès des AP des agences d'exécution du Programme Environnemental, des organismes et associations concernés par l'environnement, des collectivités territoriales décentralisées

4-CONDITIONS D'ADMISSION ET REGIME D'ETUDES

On envisage d'accueillir 100 étudiants (ce nombre ne peut s'expliquer que par la gravité et l'urgence de la situation environnementale malgache. En effet, la quasi-inexistence d'Etablissements de formation, comme il en existe dans les pays développés, touchant à la fois les divers aspects de l'environnement (naturel, socio-culturel et économique) se fait sentir énormément. Car vouloir "réconcilier la population avec son environnement en vue d'un développement durable" requiert, non seulement des compétences scientifiques et techniques mais aussi en sciences humaines, avec des stratégies d'approche et de mise en oeuvre adéquates)

L'admission se fait par concours. Peuvent faire acte de candidature, les titulaires du BAC A2, D, BAC technique, commercial (G2)

Les études durent 2 ans (1er cycle), à raison d'un seul redoublement. Le Brevet de Technicien Supérieur en Environnement est délivré aux étudiants ayant la moyenne générale 10/20.

5- PROGRAMME DE FORMATION (Contenu des modules en annexe)

La formation, d'un volume global de 1400 heures, à répartir en 2 ans (1èreA : 650 heures, 2èmeA : 750 heures) fait appel à l'éclairage de différentes sciences (naturelles, humaines et exactes), technologies et communications et s'articule autour de deux grands axes :

- des apports théoriques visant à faciliter les manipulations des concepts et connaissances,
 - des apports techniques et pratiques permettant de mettre en oeuvre les connaissances acquises.
- A cela, s'ajoutent des sorties sur terrain, des séminaires, conférences et stages

Les enseignements sont organisés sous forme modulaire et se répartissent dans 5 modules par année. Ils sont assurés par les enseignants chercheurs de l'Université de Fianarantsoa, avec la contribution de la Faculté des Sciences de l'Université d'Antananarivo et des professionnels spécialisés

Les coefficients affectés aux disciplines enseignées sont en fonction du volume horaire par module

6- COOPERATION ET PARTENARIAT avec les divers organismes publics ou privés (nationaux, internationaux).

- Optimiser les relations de partenariat avec l'ICTE.
- ne pas abandonner les autres bailleurs de fonds classiques
- contre partie obligatoire de l'Institution d'accueil (apport en ressources humaines, en logistiques, en ressources financières).

7- CONCLUSION

Afin de pouvoir affiner le dossier pédagogique, il est intéressant de

- contacter les organismes utilisateurs de ces animateurs scientifiques et écologiques
- de préparer une séminaire ou un atelier aux fins de recueillir leurs avis, leurs suggestions, leurs besoins immédiats...

Il est cependant nécessaire d'établir :

- une fiche financière
- une fiche technique pour voir l'existant (locaux, laboratoire, documentations...) et les besoins en matériels didactiques (matériels et produits).

On peut demander l'aide et l'appui du PRESUP en ce qui concerne le matériel de fonctionnement

Enfin on peut conclure, le chronogramme d'avancement des tâches à faire est le suivant

1. Fin Janvier 1997 : remise du dossier pédagogique sur les 5 modules (1ère année)

2 Février 1997 : montage financier.

3 Dernière semaine de Février (24 - 28 Février) : séminaire réunissant les agences d'exécution (DEF, ANGAP, ANAF, etc...) et les responsables de l'Université de Fianarantsoa.

4 15 Mars 1997 : remise du dossier.

Telles sont les résolutions prises par les participants à l'atelier chargés de mettre en place le Département qui se sont réunis les 14 -15 Janvier 1997 à Fianarantsoa.

LISTE DES PARTICIPANTS

- 1- Monsieur RATSIMBAZAFY, Recteur de l'Université de Fianarantsoa
- 2- Mademoiselle Annie RAKOTOMANGA, Directeur des Etudes et de la Recherche de l'Université de Fianarantsoa
- 3- Monsieur Adolphe RANDRIANTSOA, Doyen de la Faculté des Sciences, Université d'Antananarivo
- 4- Monsieur Benjamin ANDRIAMHHAJA, Coordonateur National de l'ICTE, Tsimbazaza Antananarivo
- 5- Madame Lydie RABETAFIKA, Enseignant chercheur de la Faculté des Sciences, Université d'Antananarivo
- 6- Madame Amélie RAHARISOLOLALAO, Enseignant chercheur de la Faculté des Sciences, Université d'Antananarivo
- 7- Monsieur Germain J. SPIRAL, Enseignant chercheur de la Faculté des Sciences, Université d'Antananarivo
- 8- Monsieur Roger RATOVOVONJANAHARY, Coordonateur de l'Université de Fianarantsoa auprès du Linkage Grant (PPNR)
- 9- Mademoiselle Léonie Zoéline RAJONAH, Enseignant chercheur de la Faculté des Sciences, Université de Fianarantsoa
- 11- Monsieur Pascal RATALATA, Enseignant chercheur de la Faculté des Sciences, Université de Fianarantsoa
- 12- Monsieur Jean Louis RANDRIAMAMONJIZAKA, Enseignant chercheur de la Faculté des Sciences, Université de Fianarantsoa

Fianarantsoa, le 03 Février 1997

LE COORDONATEUR CHARGE DE LA MISE EN PLACE

Roger RATOVOVONJANAHARY

ANNEXE

I. TABLEAU RECAPULATIF

I.1 Volume horaire global : 1400 H / 2 ans

1ère Année : 650 H

2ème Année : 750 H

I.2 Répartition volume horaire par module : 5 modules par année.

1er module : Technologie: 30% soit 420 H (1ère A : 195 H, 2ème A : 225 H)

2ème module: Sciences Naturelles: 30% soit 420 H (1èreA : 195 H, 2èmeA : 225 H)

3ème module: Sciences humaines: 15% soit 210 H (1èreA : 97,5 H, 2èmeA : 112,5 H)

4ème module: Sciences exactes: 20% soit 280 H (1èreA : 130 H, 2èmeA : 150 H)

5ème module: Communication: 5% soit 70 H (1èreA : 32,5 H, 2èmeA : 37,5 H)

II. MATIERES FONDAMENTALES

- Biologie végétale

- Biologie animale

Sciences du sol

- Paléontologie

En ce qui concerne la biologie végétale :

- Botanique

- Ecologie végétale

En ce qui concerne la biologie animale :

- Physiologie

- Biologie animale

- Ecologie animale

- Biochimie

En ce qui concerne la paléontologie :

- Fossile et sub fossile animale et végétale dont les huit (8) matières ci-après indiquées

III. LISTE DES MATIERES ET DISCIPLINES PAR MODULE

1er module : Technologies : agricole, élevage, pisciculture, apiculture, aviculture, secourisme médical et social, comptabilité et gestion.

2ème module : Sciences naturelles de la vie et de la terre: botanique, agroforesterie, paléontologie, écologie, biologie, physiologie, biochimie.

3ème module : Sciences humaines: droit environnemental, éducation environnementale, psychosociologie, anthropologie sociale .

4ème module : Sciences exactes: mathématiques, informatique, physique et chimie appliquées

5ème module : Communication: langues vivantes, techniques de communication .

IV. PROGRAMME DETAILLE DE LA FORMATION

APPENDIX 2:

MALAGASY DELEGATION VISITS ENVIRONMENTAL STUDIES PROGRAMS IN USA

Report prepared by Suzanne Zeeve, Ph.D., ICTE Madagascar Programs Coordinator

In September 1997, the Institute for the Conservation of Tropical Environments (ICTE) hosted three guests from Madagascar as part of the University Development and Linkage Program (UDLP). Our visitors were **Dr. Ratsimbazafy**, President of the University of Fianarantsoa; **Dr. Adolphe Randriantsoa**, Dean of the Science Faculty at the University of Antananarivo; and **Dr. Benjamin Andriamihaja**, National Coordinator, MICET. The purpose of their visit was to explore models for development of the first Environmental Studies program for Malagasy universities. Accompanied by **Dr. Suzanne Zeeve**, Madagascar Programs Coordinator at the ICTE, the group visited different US institutions with strong environmental studies programs to meet with colleagues and discuss objectives, interdisciplinary methodology, curricular options and potential collaborations.

PROGRAM DESCRIPTION

The two-week trip (9/13-9/27) began at **SUNY at Stony Brook**, where we met with Dr. Patricia Wright, Executive Director of the ICTE; Dr. William Arens, Chair, Dept. of Anthropology; SUNY at Stony Brook President Dr. Shirley Strum Kenney, Provost Rollin Richmond, Dean Paul Armstrong, and Dr. Lawrence Martin, Director of International Programs and Dean of the Graduate School. We also met with many faculty colleagues including Drs. Bill Jungers, David Krause and Cathy Forster of the Dept. of Anatomical Sciences, Dr. Arthur Grollman, Chair of the Dept. of Pharmacology, Dr. Francis Johnson, Dept. of Chemistry, and Dr. Henry Bokuniewicz of the Marine Sciences Research Center. We toured laboratories, reviewed curricula for undergraduate environmental studies, and attended lectures on environmental topics. This provided an overview of the types of options and approaches to university-based environmental studies programs. Many students were able to meet with our guests as well, including a group about to go to Madagascar for Stony Brook's Study Abroad program.

Also in the New York area, we visited the **American Museum of Natural History**, meeting with evolutionary anthropologist Dr. Ian Tattersall and with Dr. Eleanor Sterling and Meg Domroese of the AMNH Center for Biodiversity and Conservation, with whom we discussed potential collaborative projects in environmental education. We also visited **Columbia University's Center for Environmental Research and Conservation (CERC)**, hosted by Dr. Christopher Raxworthy, a long-time Madagascar field herpetologist who co-directs the CERC program. While at CERC, we also had the opportunity to meet with Director Don Melnick, Drs. Mary Pearl (WPTI) and John Robinson (WCS) and Assistant Director Anthea Brooks. Dr. Raxworthy presented an excellent overview of the CERC program, emphasizing the importance of an interdisciplinary approach to environmental studies and of the potential strategy of forming multi-institutional consortia in designing environmental programs.

Traveling to New Haven, CT, we visited **Yale University School of Forestry and Environmental Studies**. Our program there was arranged by Dr. James Bryan, Program Coordinator of the school's **Tropical Resources Institute (TRI)**, who kindly escorted us around the university to meetings with Associate Dean Gordon Geballe, Prof. Graeme Berlyn of the TRI Steering Committee, Dr. Dan Esty, Director of the **Yale Center for Environmental Law and Policy**, Dr. Bill Smith, Associate Dean of Academic Affairs and Chair of the Curriculum Committee, Prof. Steven Kellert and Dr. K. Siviramakrishnan. Again, the emphasis in all of our discussions was on the interdisciplinary nature of successful environmental studies designed to produce professional leaders in environmental research, policy and natural resources management. We also met with several Yale students planning trips to Madagascar, and enjoyed an evening at the home of former ICTE Program Officer David Meyers, who is now at Yale University.

From New Haven we traveled to the Storrs, Connecticut to participate in a special "Madagascar Day" benefit event for the ICTE, co-hosted by the ICTE, the **University of Connecticut at Storrs'** (UConn) Center for Conservation and Biodiversity, Earthwatch, the Connecticut chapter of the Sierra Club and the Connecticut State Museum. Following an opening address by Dr. Gregory Anderson, Chair of UConn's Department of Ecology and Evolution, Dr. Ratsimbazafy welcomed the large group attending the event with a short speech. Other speakers included Jonah Ratsimabazafy, a Malagasy graduate student at SUNY at Stony Brook, Dr. Patricia Wright of the ICTE, UConn Anthropology Dept. Chair Dr. Robert Dewar, and conservation biologist Dr. John Silander, Jr. of UConn's Dept. of Ecology and Evolutionary Biology. Everyone attending the event, including numerous professional colleagues, students, a delegation of Malagasy-Americans and the general public, were very pleased to have the opportunity to meet and talk with our UDLP guests from Madagascar.

Vermont Law School (VLS) was our next destination. This private law school in South Royalton, VT, has the top-ranking environmental law program in the USA. We met with **Environmental Law Center** Director Patrick Parenteau and VLS Dean L. Kinvin Wroth to discuss their interest in developing institutional accords and further collaborations between VLS and Malagasy universities. UDLP student Lalaina Ravelomanantsoa is currently attending the program for the Master of Studies of Environmental Law (M.S.E.L.), a specialized degree program at the VLS Environmental Law Center; he is the second Malagasy UDLP student to receive this training. During our visit to VLS, he had the opportunity to spend time with our guests. Upon learning more of the details of Lalaina's program, Dr. Ratsimbazafy and Dr. Randriantsoa have offered him teaching positions in Madagascar upon completion of his studies, such that the new environmental studies program under development will be able to address statutory, policy and legal aspects of environmental issues.

Our final visit was to Durham, NC, for a comprehensive program at **Duke University's Nicholas School of the Environment (NSOE)**, the **Organization for Tropical Studies (OTS)** and **Duke University Primate Center (DUPC)**. After an orientation and greeting

by NSOE Dean Dr. Norman Christensen, Jr. we were escorted by his assistant Robin Puckett to meetings with Prof. Mohamed Abou-Donia of the Depts. of Pharmacology and Neurobiology for discussions of medicinal plants and environmental toxicology; Bertie Belvin, Associate Dean for Academic Services and Charlotte Clark, Director, Center for Environmental Education for an overview of educational outreach options; Catherine Admay and Jonathan B. Weiner of Duke Univ. School of Law for consideration of the role of legal and economic studies in environmental contexts; Dr. Laura Snook, Director of the Duke/The Nature Conservancy Program in Applied Conservation Biology; Dr. Gary Hartshorn of OTS; and Dr. Randall Kramer, Prof. of Resource and Environmental Economics. We also had an informal meeting with a number of Duke graduate students interested in environmental issues in developing countries, who were very interested in hearing the perspectives of our guests. The following day we visited DUPC to see the Malagasy prosimian collection, tour anthropological laboratories and discuss projects with Scientific Director Dr. Elwyn Simons, Director Dr. Kenneth Glander, Curator of Fossils and Chief Preparator Dr. Prithijit Chatrath. We also met with Assistant Research Professor Dr. Diane K. Brockman and DUPC Operations Manager Dean Gibson while in Durham. Many of these colleagues have worked in Madagascar over the years and have assisted Malagasy colleagues and students in the past.

On returning to Long Island, NY before our visitors' departure for Madagascar, Dr. Zeeve hosted a farewell event for our guests. A number of professional colleagues and students from SUNY at Stony Brook attended, as well as several Malagasy-Americans who had met our visitors in Connecticut. The farewell event as well as other social gatherings throughout the visit were greatly appreciated by Drs. Ratsimbazafy, Randriantsoa and Andriamihaja, as it evidenced our esteem for them and our hopes for continued collegial collaborations.

SUMMARY

This visit was extremely important in helping to define the direction that will be taken in the development of Environmental Studies programs in Malagasy universities. By touring several well-established programs in the USA, members of the delegation are in a position to make more informed comparisons with their current system, with the following conclusions:

Currently, Madagascar's universities are based largely on the French educational system, which is strongly disciplinary in its approach. Because of the inherently interdisciplinary nature of environmental concerns requiring integration of many interrelated specialties (e.g., soil science, ecology, chemistry, social sciences, botany, legal aspects, etc., to name a few), an interdisciplinary approach is preferable over a strictly disciplinary academic structure. This interdisciplinary approach was emphasized at each of the institutions we visited, despite their differences in size, scope of academic activities or other parameters. Another feature of American universities which is relevant to training and developing environmental leaders is the encouragement of problem-solving by students as opposed to rote learning and repetition. All of our UDLP guests were struck by these key differences in the educational system in the USA, and have expressed a great deal of interest in basing their new program on the US system rather than on the French model.

Our visitors were also very impressed with the review process for faculty and the levels of academic competition and excellence in the institutions we toured; several new concepts such as undergraduate minors/majors and faculty/course evaluations by students made a strong impression as well. As an example of the impact made by these conceptual aspects, by the time we visited Duke University, Dr. Ratsimbazafy had begun to draft an organigramme for the new Malagasy program which reflected the interdisciplinary approach, such as by using existing faculty from relevant disciplines to form a new, integrated program for environmental studies.

During their trip, hosting institutions and individual colleagues provided our guests with a number of program descriptions, course syllabi and examples of curricula from both undergraduate and graduate programs in environmental studies. Our visitors have requested further information from a number of colleagues they met on the trip, and the ICTE is coordinating transfer of these materials.

Future collaborations may result from contacts made during the UDLP trip. Vermont Law School is now considering its own Accord of Collaboration with the two Malagasy universities represented; Yale University has expressed interest in pursuing joint projects with the ICTE in collaboration with Malagasy counterparts; and a number of faculty and research colleagues were invited to come to Madagascar as visiting faculty for the new environmental studies program. At the ICTE we will continue to facilitate these relations in hopes of developing the capacity of Malagasy academic institutions to address the serious environmental concerns which challenge the future of Madagascar.

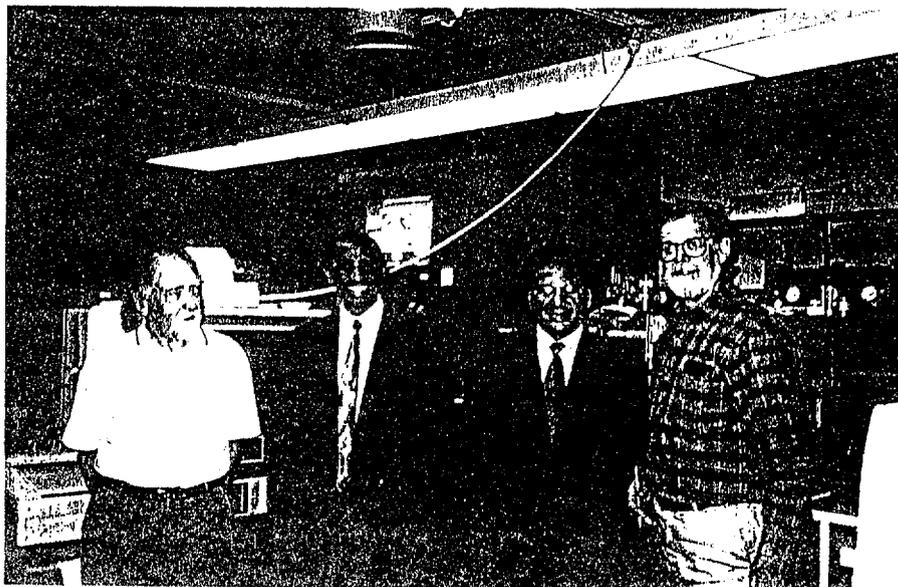
(Attachments: Photographs of Malagasy delegation on UDLP trip)



September 1997 UDLP Visit: SUNY at Stony Brook, NY
 L. R. Dr. Ratsimbazafy, SUNY/SB President Dr. Shirley Strum Kenney, IC TE Exec. Dir., Dr. Patricia Wright, Dr. A. Rundlantson, Dr. B. Andriamihaja



September 1997 UDLP Visit: Stony Brook, NY
 L. R. P. Wright (IC TE Exec. Dir.), W. Arens (SUNY/SB Chair, Anthropology Dept.), Dr. Ratsimbazafy, Dr. A. Rundlantson, Dr. B. Andriamihaja



September 1997 UDLP Visit: SUNY at Stony Brook, NY
 Lounging Chemistry Dept. Laboratories of Prof. Francis Johnson (left)



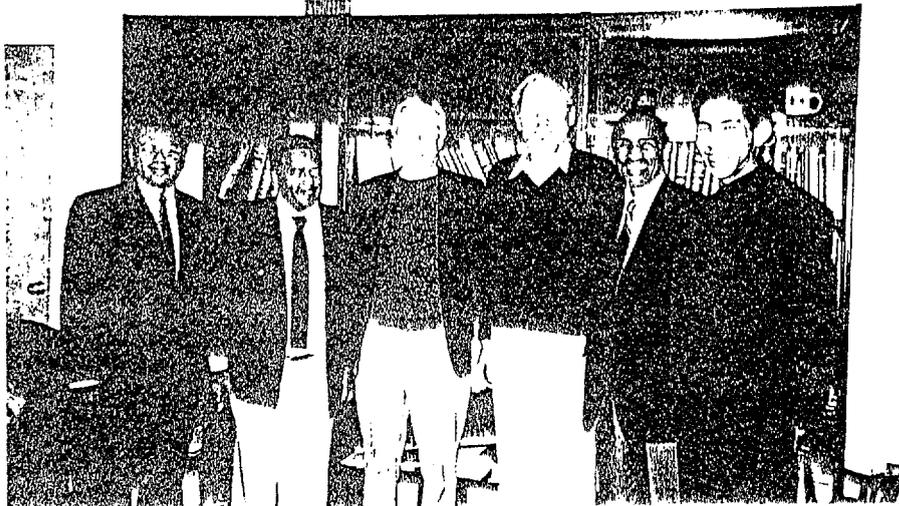
September 1997 UDLP Visit: Columbia University/CERC, New York, NY
 Standing, L. R: Dr. Ratsimbazafy, Dr. Randrianon, Dr. Chris Roxworthy, Dr. Andriamihaja



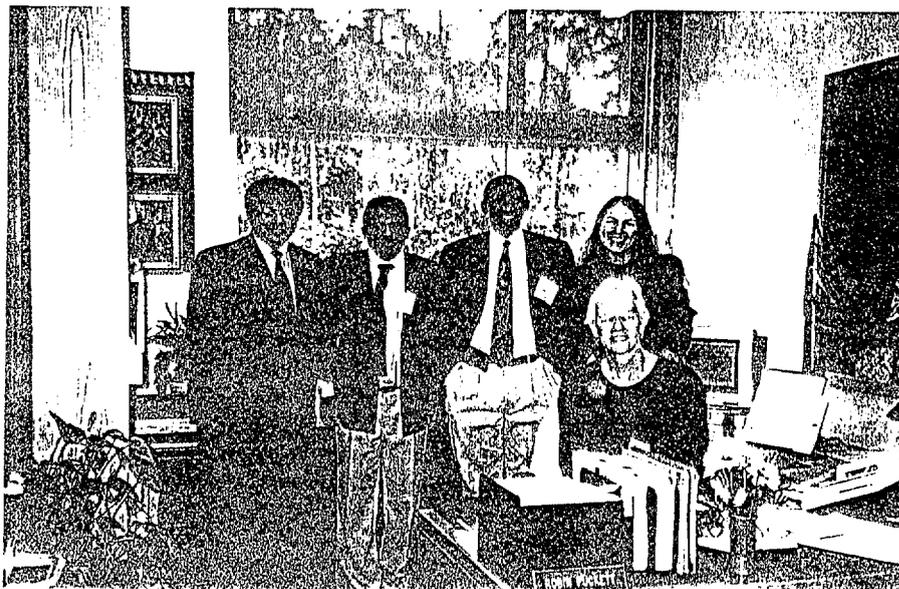
September 1997 UDLP Visit: Yale University, New Haven, CT
 L. R: Dr. Randrianon, Dr. Jim Bryan of Yale/TRI, Dr. Ratsimbazafy, Dr. Andriamihaja



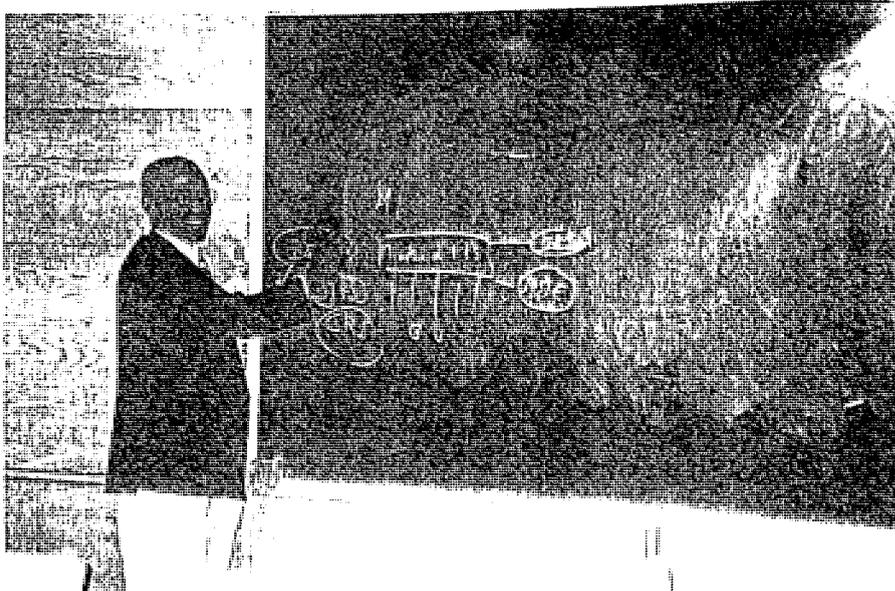
September 1997 UDLP Visit: "Madagascar Day" at Univ. of Ct. at Storrs



September 1997 UDLP Visit: Vermont Law School, South Royalton, VT
 L. R. Dr. Randrianon, Dr. Andriambaja, VLS Dean I. Kevin Wrath, Program Dir. Patrick
 Parenteau, Dr. Ratsimbazafy, UDLP student Lalaina Ravelomanantsoa



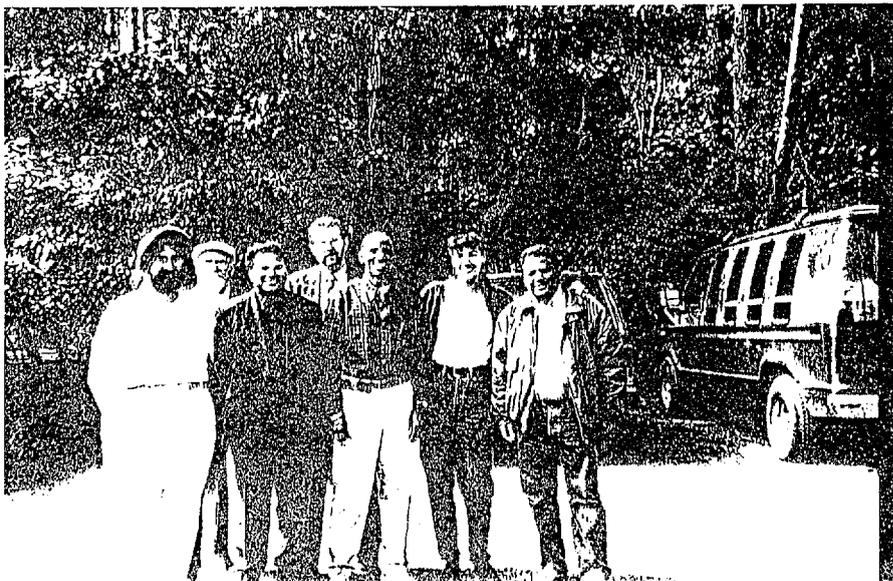
September 1997 UDLP Visit: Duke University, Durham, NC
 At the Nicholas School of the Environment: Seated: Robin Puckett, of Dean's Office;
 Standing: L. R. Dr. Randrianon, Dr. Andriambaja, Dr. Ratsimbazafy, Dr. Zeevi



September 1997 UDLP Visit: Duke Univ / The Nicholas School of the Environment
 Dr. Ratsimbazafy drafts an organigramme for new environmental program at Malagasy universities



September 1997 UDLP Visit: Duke University Primate Center, Durham, NC
 Dr. Ratsimbazafy (left) and Dr. Ramilantsona (right) viewing lemurs with Dr. Ebyn Simons (center)



September 1997 UDLP Visit: Duke Univ. Primate Center, Durham, NC
 L. R. Dr. P. Chatriati, Dr. E. Simons, Dr. A. Randrianonson, Dr. J. Glunder,
 Dr. Ratsimbazafy, Dr. Gibson, Dr. B. Andriantsoa

**Minutes of UDLP Meeting -- September 18, 1997
at the ICTE Office of the State University of New York, Stony Brook**

Attended by:

M. le Recteur of University of Fianarantsoa (DCIHE), Dr. Ratsimabazafy
M. le Doyen of Science Faculty of University of Antananarivo (DCIHE), Dr. Randriantsoa
DCIHE Coordinator, Dr. Benjamin Andriamihaja
USIHE Professor, Dr. Patricia Wright
USIHE Coordinator, Dr. Fredrica H. van Berkum

Objective: To evaluate the success of the past year of the Linkage Grant, and plan the following year

Dr. Wright (USIHE) welcomed the Malagasy visitors (DCIHE) to the University at Stony Brook, and the Malagasy visitors, in turn expressed their appreciation for the hospitality Stony Brook had offered them, and the success of their trip so far.

We reviewed the accomplishments of the previous year of Linkage funding: DCIHE students were trained to design research projects, to write proposals to fund their research and training, and to perform statistical analyses on their data; Organization for Tropical Studies (OTS) professors visited Ranomafana and other sites in Madagascar to determine the feasibility of an OTS-style field course was feasible in Madagascar, and a workshop was held in Antananarivo.

Plans were discussed for an Evaluation Workshop to be held in Madagascar in November or early December where Linkage professors and students would be invited to evaluate the success of the Linkage program and to discuss the curriculum of the new Environmental Studies Departments to be established at the DCIHE Universities of Antananarivo and Fianarantsoa. Dr. Andriamihaja suggested that the participants divide into small groups to encourage all to participate. The Rector of the University of Fianarantsoa and the Dean of the Arts and Sciences Faculty at the University of Antananarivo would decide on the representatives from their respective institutions that would attend this workshop.

M. le Recteur requested that future field courses, such as those sponsored by the Linkage program, be offered to students of all levels, not just DEA students. Dr. Andriamihaja pointed out that by only offering the program to the top students in Madagascar, Madagascar was showing the world the excellent quality of Malagasy students. He emphasized that some of the outstanding students coming out of the Linkage courses were from the University of Fianarantsoa.

The participants agreed that the next Linkage course should focus on environmental law and that DCIHE student George Rakotondrabe (SIG expert) could present a course on SIG. M. le Doyen pointed out that students are very excited about the Linkage courses.

There was a brief discussion about the Ranomafana National Park Biological Station and the roles of ANGAP and the two DCIHE Universities. It was pointed out that research stations generally

are run by Universities. ANGAP would like to encourage research at the RNP and we are in the process of clarifying the roles of the Universities and research in the RNP.

The meeting was concluded with a discussion of the desire of the DCIHE Universities to continue their relationships with interested US Universities. All participants were in favor of establishing a consortium of Universities interested in studies in Madagascar and agreed on the need to continue training both Malagasy and US scientists. Dr. Patricia Wright said that the ICTE would seek sources of funding for such a consortium.

On Sept. 20, 1997, at University of Connecticut at Storrs, the same group met again to discuss any further issues. M. le Recteur and M. le Doyen reported on the enthusiastic welcome they have received at all of the US Universities they have visited (Stony Brook, U. Conn, Yale). All the Universities have expressed an interest in joining a consortium. In addition, it was agreed that to facilitate communication among the Linkage Universities, all member institutions should receive copies of the exit reports that researchers at Ranomafana National Park Biological Station must provide to ANGAP.

Courses that Lalaina Ravlomanantsoa (UDLP/DCIHE Student)
is taking at Vermont Law School

Administrative Law:

In our government of separated and divided powers, much of the power resides in the agencies which interpret, administer, and implement the law. Therefore, it is essential to understand the legal framework governing administrative practice to effectively represent a client or influence policy. The goal of Administrative Law is to provide students with a working knowledge of the general principle of administrative law, a general knowledge of the workings of bureaucratic institutions, and an understanding of the critiques of government. In the course, we study the implementation of legislative policy through administrative agencies, including the role of administrative agencies in the governmental process, rulemaking, adjudication, and judicial review of agency actions.

Environmental Law:

The purpose of Environmental Law is to provide students with an overview of environmental law. The course addresses both the black letter law and the social forces that underlie the law. Upon completing the course, students should understand the provisions of the various environmental statutes as well as the concepts and principles underlying environmental law as a body of law. The course is organized around a separation of powers framework. Substantively, the course moves from the statutes governing extraction of natural resources (National Environmental Policy Act), through statutes governing the manufacture of resources into products (Clean Air Act, Federal Water Pollution Control Act, Toxic Substances Control Act, Federal Insecticide, Fungicide and Rodenticide Act), ending with the disposal statutes (Resource Conservation and Recovery Act, Comprehensive Environmental Response, Cost and Liability Act)

Non-Profit Organization:

A study of the lawyer's role in the organization, the obtaining and maintaining of tax exemption, the operation and the governmental operation of non-profit enterprises and their social, economic and political activities, including issues of taxation, governance, duties and liabilities of trustees and the function of the non-profit sector in the distribution of services.

Environmental Legal Research and Writing

Students are introduced to the legal system, process and reasoning: and are taught legal research skills using both traditional and electronic research techniques. The course teaches the basics of caselaw analysis and statutory interpretation, and includes a computer lab designed to help students access information on the internet and world wide web. The focus of the course is on the art and technique of effective legal writing. The course is structured as a seminar on an environmental topic and students are asked to research the issues and produce a series of writings designed to teach different aspect of policy analysis and decisionmaking rationale.

Environmental Land Use

Administrative Law:

In our government of separated and divided powers, much of the power resides in the agencies which interpret, administer, and implement the law. Therefore, it is essential to understand the legal framework governing administrative practice to effectively represent a client or influence policy. The goal of Administrative Law is to provide students with a working knowledge of the general principle of administrative law, a general knowledge of the workings of bureaucratic institutions, and an understanding of the critiques of government. In the course, we study the implementation of legislative policy through administrative agencies, including the role of administrative agencies in the governmental process, rulemaking, adjudication, and judicial review of agency actions.

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Environmental Land Use

Applied Ecology

This course seeks to provide an ecological framework analysis for those interested in environmental law and policy. Students will learn to ask the right question to evaluate the structure and function of terrestrial and aquatic ecosystems of various scales and types, using both local and international examples. Students will learn basic concepts in several scientific disciplines, for example, in geology, geomorphology, botany, soils, forestry, and climatology. These concepts will be developed through group field work, classroom lecture discussion with visual aids, a written examination, and two all day field trip.

**Publications, Reports, and Theses resulting from Research at
Ranomafana National Park, Madagascar
(updated: July 31, 1997)**

Publications

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2. Andreone, F. (1991). Conservation aspects of the herpetofauna of Malagasy rain forests. **Societa Zoologica 'La Torbiera' - Scientific Reports**, 1: 1-45.
3. Andreone, F. (1993). Two new treefrogs of the genus *Boophis* (Anura: Rhacophoridae) from central-eastern Madagascar. **Bollettino del Museo regionale di Scienze naturali - Torino**, II (2): 289-313.
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6. Anonymous (1988, September 6). Newly discovered fish. **New York Times**.
7. Anonymous (1994). Lemurs and locals. **The Economist**, p. 44, April 2nd.
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10. Atsalis, S. (1996). Feeding ecology of the brown mouse lemur, *Microcebus rufus* (family Cheirogaleidae), at Ranomafana National Park, Madagascar. **American Journal of Physical Anthropology**, Supplement 22 (Annual Meeting Issue): 64.
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population density and distribution of black-and-white ruffed lemurs (*Varecia variegata variegata*) in Ranomafana National Park, Madagascar. In B. D. Patterson, S. M. Goodman, & J. L. Sedlock (Ed.), **Environmental Change in Madagascar** (pp. 36-37). Chicago: The Field Museum of Natural History.

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16. Cadle, J. E. (1996). Snakes of the genus *Liopholidophis* (Colubridae) from eastern Madagascar: new species, revisionary notes, and an estimate of phylogeny. **Bulletin of the Museum of Comparative Zoology**, 154 (5): 369-464.

17. Cadle, J. E. (1996). Systematics of snakes of the genus *Geodipsas* (Colubridae) from Madagascar, with descriptions of new species and observations on natural history. **Bulletin of the Museum of Comparative Zoology**, 155 (2): 33-87.

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20. Dagosto, M. (1989). Locomotion of *Varecia variegata* and *Propithecus diadema* at Ranomafana National Park, Madagascar. **American Journal of Physical Anthropology**, 78 (2, Annual Meeting Issue): 209.

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22. Dagosto, M. (1994). Seasonal variation in positional behavior of Malagasy lemurs. **American Journal of Physical Anthropology**, Supplement 18 (Annual Meeting Issue): 75-76.
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24. Dagosto, M. (1995). Habitat and seasonal variation in locomotor behavior in Malagasy lemurs at Ranomafana National Park. In B. D. Patterson, S. M. Goodman, & J. L. Sedlock (Ed.), **Environmental Change in Madagascar** (pp. 29). Chicago: The Field Museum of Natural History.
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31. Dollar, L. J., Forward, Z. A., & Wright, P. C. (1997). First study of *Cryptoprocta ferox* in the rainforests of Madagascar. **American Journal of Physical Anthropology**, Supplement 24 (Annual Meeting Issue): 102.
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34. Emberton, K. C. (1995). Land-snail community morphologies of the highest-diversity sites of Madagascar, North America, and New Zealand, with recommended alternatives to height-diameter plots. **Malacologia**, 36: 43-66.
35. Emberton, K. C. (1995). On the endangered biodiversity of Madagascan land snails. In A. C. van Bruggen, S. Wells, & C. M. Kemperman (Ed.), **Biodiversity and Conservation of the Mollusca** (pp. 69-89). Oegstgeest-Leiden, The Netherlands: Backhuys Publishers.
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12. Peters, J. (1995) **Development of Ecotourism, Conservation and Sustainable Development in Madagascar**. Ph.D., North Carolina State University.
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Workshop on the establishment of an international program on training and research in biodiversity

The ICTE has held a workshop entitled "the establishment of an international program on training and research in biodiversity based on the OTS (Organization for Tropical Studies) of the United States, on December 19, 1996 at the Hotel Panorama.

Two commissions were established to discuss two questions:

- 1) Course organization
- 2) Consortium organization and financing mechanisms

1- Course Organization

Six points were discussed:

a) The course level and the level of the students recruited for the course

For the Malagasy students the level will be "Maitrise" (end of 2nd cycle) and for the American students it will be for the third year of university and higher. The level necessary for acceptance can vary based on individual cases.

b) The number and duration of the courses

- The best time of year, for the first year, is September through December.
- To begin, one course per year with a duration of 14 weeks or three and a half months (one US semester) - the students will gain credit for a fall semester.

The 14 weeks will be organized as follows:

- 4 weeks of preparation to establish all students at the same level depending on their nationalities.
- 10 weeks of work at the various sites.

c) The number of topics

The various topics will include but are not limited to ecological monitoring, environmental law, socio-economic and cultural monitoring and evaluation; and these subjects will be provided through authoritative courses, conferences, or seminars.

d) The work method or approach

The approach will be, for the time being, that of OTS.

e) Other courses

Different types of courses are foreseen especially a course for decision makers.

f) The number of students

The total number of students will be 20, ten international students and ten Malagasy students. They will be chosen by a selection committee composed of faculty.

2 - Organization and finance of a Consortium

a) **Name of the consortium**

Many names were suggested and discussed to name the new organization. The members of the committee decided on the name "Consortium Malgache pour la Biodiversité" (CMB) or in English "Malagasy Consortium for Biodiversity."

b) **Number of participating institutions**

- The six Malagasy Universities
- The concerned museums and national research centers including the PBZT, MAA, Parc d'Ivoloina, CNRP, CNRE, and others.
- ANGAP, DEF, and ONE as executing agents for the Environmental Action Plan will be on the Board of Directors ("Conseil d'Administration")
- Foreign Universities with established protocols of collaboration with the Malagasy Universities for example: SUNY at Stony Brook, Duke University, Eastern Michigan University, Yale, as well as the various Museums such as the Smithsonian Institution, the Field Museum, etc.
- The European universities with signed protocols with the University such as Strasburg, Paris, Montpellier, Gottingen, Dice, etc.
- The NGOs working on biodiversity studies in Madagascar such as Conservation International, WWF, Xerces Society (WCS), Peregrine Fund, etc.

c) **"Raison d'être" of the consortium, or Mission of the Consortium**

Seven points were suggested, specifically:

- support and unite "*environment, conservation, and research*"
- improve the coordination among the research institutions
- train and educate on biodiversity issues
- improve scientific information exchange by the creation of a journal
- improve research coordination
- involve more students in the training on research methods
- facilitate funding support

d) **Organigram**

- The General Assembly is at the highest level and is constituted by all the institutions participating in the consortium
- The Board of Directors (Conseil d'Administration) is at an intermediate level and is formed by one representative from each institution in the general assembly. It approves the budget and elects the members of the Executive Committee.
- The Executive Committee is at the executive level of the consortium and approves the Annual Work Plan and is composed of a President and his staff (as at OTS).
- Four departments will execute the program and activities:
 - 4) Communications and External Relations
 - 5) Academics, Training, and Education
 - 6) Finance and Administration
 - 7) Development and Fund Raising

The Consortium will have the statute of a non-profit Non-Governmental Organization.

e) **Establishment of a charter or procedures manual**

c.f. OTS and TBA documents

f) **Central bureau based in the United States**

It is indispensable to have the central bureau situated in the United States for the coordination of activities and for fund raising.

g) **Financing**

Potential sources of financing are the following:

- 1) USAID
- 2) Private Foundations
- 3) National Science Foundation
- 4) Membership dues for each institution
- 5) Tuition fees
- 6) Usage fees generated by the research stations

TRIP REPORT

Pan African Ornithological Congress Trip Report

by

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The 9th PAOC was held at Accra, Ghana from Dec 1st to 8th 1996. It is a meeting of all the scientists who had interest in birds in Africa. African and people world wide participate in this congress.

This PAOC provides me:
an exchange ideas and experiences with other scientists
observations of African birds

And this trip provided me with a general knowledge of National Parks in Kenya and Ghana.

For the congress, two topics were held during a plenary lecture and 11 topics during the symposia including the Birds of the Circum-African Islands.

Schedule during the trip:

- Nov 28th: Flight from Antananarivo to Nairobi/Kenya
- Nov 29th: Nakuru Lake National Park/Kenya
- Nov 30th: Naivasha Lake/ Kenya
- Dec 1st: Flight from Nairobi to Accra/Ghana
- Dec 2nd-3rd: Conference
- Dec 4th: Kakum National Park
- Dec 5th-7th: Conference
- Dec 8th: Shai Hills Resource Reserve (coastal savanna)
- Dec 9th: Kakum National Park
Flight from Accra to Addis-Ababa/Ethiopia
- Dec 10th: Flight from Addis-Ababa to Nairobi/Kenya
- Dec 11th: Stay in Nairobi because there is problem of flight
- Dec 12th: Flight from Nairobi to Antananarivo/Madagascar

First, concerning my visit at Nakuru Lake National Park/Kenya and Naivasha Lake/Kenya, it was successful because I saw an ecosystem with millions of flamingo and with other species typical for Africa like Giraffe, Rhinoceros, Hippopotamus. About the birds, Madagascar is different from Africa in the number of the species. In Madagascar there is 279 species but in Kenya for example there is about 1500 species. We try to do an inventory on the day of Nov 29th and we found around 150 species, this number is impossible to find in one day in Madagascar.

Concerning my presentation, I did it the Dec 7th under the topic Birds of the Circum-African Islands. My subject is: Foraging Ecology of Birds in the Understory Mixed-species Flocks at the Ranomafana National Park, Madagascar.

The goal of this study is to define the ecological niche of each species in the understory mixed-species flock at Ranomafana National Park, located at a mid-altitude of 1200m in the south-east of Madagascar.

The common species in this flock are: the Long-billed Greenbull *Phyllastrephus madagascariensis*, the Spectacled Greenbull *Phyllastrephus zosterops*, the Grey-crowned Greenbull *Phyllastrephus cinereiceps*, the Dusky Greenbull *Phyllastrephus tenebrosus*, the White-throated *Oxylabes Oxylabes madagascariensis*, the Wedge-tailed Jery *Hartertula flavoviridis*, the Crossley's Babbler *Mystacornis crossleyi* and the Yellow-browed *Oxylabes Crossleyia xanthophrys*. All of these species are insectivorous (Rand 1936, Benson 1985, Langrand 1990).

My research question is how these eight species forage and how they avoid competition.

For the foraging study, we follow many individuals of each species and for each individual six parameters were recorded and compared: the height of the capture, the type of substrate, the diameter of the substrate, the position and the face of the substrate and the foliage density. We made 473 observations for this.

morphometric measurement were realised for different species (bill, tarsus, toe, claw).

The ecological niche of each species are defined by the simultaneous analysis of the ecological and morphometric data.

The Chairman of this topic was Dr Michel Louette. After the fifteen minutes of presentation, the audience asked some questions about the presentation.

All of the oral or poster presentation will be published in the OSTRICH, a scientific paper especially for ornithology.

Dr Steve Zack, UDLP professor, supervised this study. Funds were provided by the United State Agency for International Development (USAID) and the University Development Linkage Project (UDLP). All materials are furnished by the Institute for the Conservation on Tropical Environments (ICTE) and the Ranomafana National Park Project (RNPP).

For the trip, UDLP provide me an equivalent of 2000000 Fmg (US\$ 444,44) for the hotel, registration fee and visa. Birdlife International paid for the tickets, foods and the excursions fees.

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