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**Agroforestry Research Network
for Africa - East Africa
(AFRENA-EA)**

Interim Evaluation Report
September 1989

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GLOSSARY

A. RENA-EA	Agroforestry Research Network for Africa-Eastern Africa
A.I.D.	Agency for International Development
CIAT	International Center for Tropical Agriculture
COLLPRO	Collaborative Programs Division (ICRAF)
CRSP	Collaborative Research Program
D&D	Diagnosis and Design
F/FRED	Forestry/Fuelwood Research and Development Project
GTZ	Federal Republic of Germany Agency for Technical Cooperation
IARC	International Agricultural Research Center
IBSNAT	International Benchmark Sites Network for Agrotechnology Transfer
ICRAF	International Council for Research in Agroforestry
ICRISAT	International Crop Research Institute for Semi-Arid Tropics
IITA	International Institute for Tropical Agriculture
ILCA	International Livestock Center for Africa
ISABU	Agricultural Research Institute of Burundi
ISAR	Agronomic Research Institute of Rwanda
ISNAR	International Services for National Agricultural Research
IUFRO	International Union of Forest Research Organization
LOP	Life of Project
MPT	Multi-purpose Tree
MOU	Memorandum of Understanding
NGO	Non-Governmental Organization

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NRMP	Natural Resource Management Project
NSC	National Steering Committee
PANESA	Pasture Research Network for Eastern and Southern Africa
RDD	Research Development Division (ICRAF)
REDSO	Regional Economic Development Services Office (USAID)
RSC	Regional Steering Committee
SAAR	Strengthening African Agricultural Research
S&T/FENR	Science and Technology/ Fuel, Energy and Natural Resources
UNEP	United Nations Environmental Program

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PROJECT DESCRIPTION

1. Country: Eastern Africa (most activity in Kenya, Rwanda, Uganda and Burundi)
2. Project Title: Agroforestry Research Network for Africa-Eastern Africa
3. Project Number: DHR-5547-A-00-6041-00 *Forestry Subproject, 1986-1991*
4. Project Dates:
 - a. Life-of-Project Dates: August 29, 1986 - August 31, 1991
 - b. PACD: August 31, 1991
5. Project Funding:

S&T/FENR	US \$2,400,000
AFR/TR	US \$ 300,000
USAID bilateral mission buy-ins	US \$1,300,000
TOTAL	<hr/> US \$4,000,000
6. Mode of Implementation:

1986 A.I.D contract with International Council for Research in Agroforestry (ICRAF)
7. Project Designers: ICRAF (unsolicited proposal)
8. Responsible mission Officials:

S&T/FENR	Ian Morison
REDSO/ESA	David Gibson
9. Previous Evaluations: None

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1.0 EXECUTIVE SUMMARY

1.1 Purpose of Activity

An Interim Evaluation of ICRAF's Agroforestry Research Network for Africa-East Africa (AFRENA-EA) was conducted between July 16 and August 11, 1989, by a three-person team. During the evaluation, the independent team of consultants was assisted by two ICRAF Senior Scientists and USAID's Regional Forestry and Natural Resources Officer.

Project Goal

The project goal is to increase national capability for food self-sufficiency in Africa by improving sustainable agricultural productivity through greater adoption of agroforestry technologies which are compatible with local land use conditions.

Project Purpose

The project purpose is to select and genetically improved Multi-purpose Tree (MPT) and shrub species to integrate with agricultural food crops into productive agroforestry systems for the sub-humid, bi-modal highlands of East and Central Africa (Burundi, Kenya, Rwanda and Uganda).

The project has five specific objectives:

- * Assist in the development, establishment and coordination of and agroforestry research network focussing on MPT species and tree improvement trials for incorporation into appropriate agroforestry technologies.
- * Collaborate with and provide technical support to national and international research institutions in the ecozone in the development of MPT species adaptation, tree improvement trials, and agroforestry technologies.
- * Assist national and international institutions and agencies in the choice and acquisition of quality seed/plant material for MPT species as components for agroforestry research efforts.
- * Train national institution personnel to evaluate land use systems and to apply agroforestry technologies to improve productivity and sustainability of production.
- * Furnish technical backstopping services for improved agroforestry systems in less-developed countries (LDC).

The AFRENA-EA project is authorized by USAID through a \$4 million Cooperative Agreement which includes support from USAID's Bureau of Science and Technology (\$2.4 million), USAID's Africa Bureau (\$0.3 million), and the expected buy-ins from USAID bilateral missions in the four countries concerned (\$1.7 million).

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1.1.1 Purpose of the Evaluation

The purpose of this evaluation is to determine the level of progress the Grantee (ICRAF) has made toward achieving the project objectives and to review the progress according to the goal and purpose level statements. Ultimately, the evaluation should assist the Grantee in accomplishing the objectives during the final two years of project implementation.

The evaluation was rescheduled three times in an effort to accommodate other ICRAF work and review teams. The Team visited all member countries (Burundi, Kenya, Rwanda and Uganda) and all research sites within those countries. The Team also met with all ICRAF-sponsored National Scientists and their counterparts and conducted interviews with a wide variety of National and Regional Steering Committee (RSC) representatives. Relevant documentation was reviewed and the Team met with available ICRAF Headquarters staff in Nairobi.

1.1.2 Findings and Conclusions

Overall the Evaluation Team concluded that ICRAF has made substantial and impressive progress toward achieving most of the objectives. In the context of ICRAF's evolution from a research support service to a full partner, working closely with National Agriculture Research organizations, ICRAF should be commended. Although there were several delays in becoming operational in some countries, the administrative, training and technical support service from ICRAF has generally been good.

While much progress has been made, the evaluation's timing marks the end of AFRENA's initial institutional development activities and heralds the beginning of a new phase of research planning and implementation. Although much of the ICRAF and host country institutional policy and structure is in place, several activities need to be modified or reoriented towards a more pragmatic approach, according to the Evaluation Team.

To achieve the project goal AFRENA will need to bring a wider variety of beneficiaries into research development, although some revision of the project purpose is recommended. A greater emphasis on demand-driven technologies, based on a solid understanding of farm-level, socio-economic constraints, will be required. In addition, AFRENA will need to develop a second series of practical, skill-building exercises in support of a more iterative diagnostic and design (D&D) analysis methodology.

An increased emphasis in the production of quality nursery stock for on-station and adaptive research trials is warranted. AFRENA should also increase the attention it provides toward alternative plant production techniques.

Finally, in order to achieve the project objectives, USAID's Project Manager will need to ensure that additional resources, not presently forthcoming from bilateral missions,

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are made available to ICRAF. USAID should also reconsider the role of REDSO/ESA in overall management responsibility.

1.2 Specific Recommendations:

1.2.1 Project Goal and Purpose

- * Given the Federal Republic of Germany Agency for Technical Cooperation's (GTZ) interest in germplasm improvement and the fact that the Evaluation Team has determined that the original Project Purpose statement is unachievable during the present Life of Project (LOP) it is recommended that the Agency for International Development (A.I.D.) revise the Project Purpose and relevant portions of the project objectives accordingly ("identification and development of farmer acceptable agroforestry technologies" is suggested).
- * AFRENA-EA should be strongly urged to modify its research objectives toward increasing on-farm agroforestry research techniques, which would increase the likelihood of producing the adoptable technologies called for in the Project Goal.

1.2.2 Project Objectives

1.2.2.1 Objective 1: Institution-Building

- * Within the next three months ICRAF/AFRENA staff should produce, and A.I.D. should approve, a two-year plan for the next stage of institutional development activities for AFRENA addressing the problem of greater participation of non-researchers in Steering Committee activities and the establishment of improved linkages between these various constituency groups.
- * ICRAF must actively seek participation in development projects which rely upon linkages between formal research, operational research and extension (such as the proposed NRM project in Rwanda, where the mission buy-in activity hires AFRENA to broker top quality technical information to lower level users). This activity would be valuable in view of available funding and in developing practical skills in institutional linkage.

1.2.2.2 Objective 2: Agroforestry Research and Trials

- * AFRENA-EA's research planning and formulation procedures and priorities should be reviewed against practical realities through contacts with farmers and host-country soil conservation agencies to fine-tune and produce a more pragmatic, field-oriented focus. An iterative, practical approach to this formulation process must be developed and begin to be applied over the next six months.

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- * Of all new experiments to be undertaken, no more than one-half of them should be on-station; the rest should be placed on farm. ICRAF should experiment with all three possible on-farm trial arrangements: farmer-managed, researcher-managed, and cooperative agreements between AFRENA-EA and participating local farmers. The latter should be a joint arrangement which takes into account farmers' observations, findings and suggestions to be included in the reporting of the results.
- * Trials or experiments on species or techniques which farmers will not or can not adopt should not be undertaken. All future research efforts should be analyzed and checked against this criterion by a small, multidisciplinary team. All AFRENA research activities should be assessed to ensure that they contain at least some potentially useful elements to local, small-holder farmers. Activities not meeting this requirement should be dropped (or at least not be funded by this project).

1.2.2.3 Objective 3: Acquisition of Quality Plant Material

- * ICRAF needs to provide increasing and diversified support for improved seedling production to ensure the best quality outplanting stock of known origin is available for on-station and future on-farm trials. This should include a standardized production plan and techniques (seeding dates, pot sizes, nursery techniques, use of fertilizers and pesticides) which should be developed and distributed during the next RSC meeting in Burundi. The production plan/guidelines should also clearly outline procurement requirements and responsibilities. If necessary, ICRAF should consider hiring an experienced forestry consultant to prepare these plans.

1.2.2.4 Objective 4: Training and Evaluation of Land Use Systems

- * ICRAF must have a plan of action for post-D&D iterative research within three months which identifies researchers, presents a training outlines and sets a time frame for carrying out this work.
- * ICRAF should immediately schedule a second round of D&D research to ensure that information missed on the first D&D is picked up and that lessons learned from other agroforestry projects and the results from others' research efforts are fully incorporated in a updated set of recommendations for future AFRENA activities.
- * ICRAF must prepare a training plan to support the next stage of institution-building and research prioritization. This plan should be ready within a month of carrying out the design of the new Project Plan.

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- * It is recommended that ICRAF train a wider circle of National Steering Committee (NSC) participants in support of a new round of institutional development. Training is an integral part of AFRENA-EA's institution building activities and should support capacity building within the entire agroforestry community, fostering linkages between those concerned with research, operational research, extension development and diffusion.

1.2.2.5 Objective 5: Technical Backstopping

- * Soil sample analysis has to be streamlined in AFRENA, even if this means that samples have to be sent outside of the Region. Occasionally, soil samples should be split, with one portion sent to a U.S. approved soil laboratory for verification.
- * During the next round of D&D exercises it is recommended AFRENA staff consult the existing body of household economics information and agriculture survey data available in all countries, with the specific goal of better determining land, labor and financial constraints. It is suggested that a specific chapter be devoted to these critical limiting factors in adoption strategies.
- * It is strongly recommended ICRAF finalize standardization of all data collection by the end of 1989; it is recommended they adopt an existing and useful system which is internationally recognized. Site conditions and measurements should be described in terms of the International Benchmark Sites for Agrotechnology Transfer (IBSNAT).

1.3 Project Activities

- * ICRAF needs more support by USAID missions. This support may be generated by actively seeking out appropriate personnel in the missions and by maintaining more active discussions of areas of mutual interest and potential findings.
- * Additional funding sources will have to be found if AFRENA-EA is to complete its programs. AFRENA-EA should be monitored closely and the additional funding should be subject to specific program goals.
- * Any possibility of funding for a second phase of AFRENA-EA must be based on extensive dialogue and prior consent with the missions. While agroforestry and soil conservation are core concerns of three of the four countries involved, specific understandings regarding services must be achieved before proceeding further.

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1.3.1 Project Management

- * ICRAF needs to improve the internal linkages within its own institutional structure in order to make it easier for the Collaborative Programs Division-ICRAF (COLLPRO) to utilize the Research Development Division-ICRAF (RDD) technical capacity for AFRENA activities in a timely manner. Given the fee basis for RDD services, COLLPRO should be able to select the individual RDD scientists best suited to established needs and based upon tightly written scopes of work.
- * ICRAF should produce a comprehensive yearly workplan for the current year by the end of September and complete a LOP Plan by the end of this calendar year. In addition, annual workplans must be prepared as per the Cooperative Agreement. A.I.D. should not disperse additional funds without an approved annual plan.
- * Quarterly and Annual Reports should use activity targets, established in the annual workplans, as the benchmarks against which progress toward project purposes and goals are reported.
- * A.I.D. should consolidate its management of the AFRENA-EA network. Although recent evaluations recommended that REDSO take less of a role in project management, such activities are accepted on a case by case basis. If a single location is to be chosen, for the consolidation of management, REDSO-ESA would make a great deal of sense, as ICRAF headquarters is located in Nairobi and AFRENA-EA is a regional project. Discussions with REDSO indicate that they are willing to accept management responsibility for the project if they are compensated for the additional administrative costs.

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2.0 BACKGROUND TO PROJECT EVALUATION

2.1 Project Setting

The highlands of East and Central Africa support the highest population densities (250 to 400 people/km²) and growth rates (3.3 to 4.7 percent) on the continent. Until recently, generally fertile soils and abundant and bi-modal rainfall distribution have supported this population pressure. Unfortunately demographic pressure and agricultural productivity have not kept in step with each other resulting in stagnant or declining crop yields and accelerating deterioration of the natural resource base upon which the highland farmers depend. Declining soil fertility, the nearly complete absence of fallow, accelerating soil loss, declining water quality through erosion, and reduced availability of forest and tree products are all indicators of declining agroecological integrity.

Agroforestry, the planting of trees in conjunction with crops simultaneously or sequentially, has been consistently identified as one set of remedial technologies which can redress some of East and Central Africa's problems. Agroforestry has been a traditional component of many of the region's farming systems for generations. During the late 1970s and early 1980s the development communities began investigating opportunities to improve and diversify agricultural production through the increased use of trees. Unfortunately development practitioners and extension services had very little information how best to integrate trees and crops to maximize net production in a sustainable manner. Only recently has there been active interest in systematically improving the tree-based components of farming systems through research and improved extension. ICRAF and USAID recognized the need to better understand this relationship which has led to the present AFRENA-EA project.

2.2 ICRAF'S Structure

ICRAF was established in 1977 with the objective and mandate to initiate, stimulate and support research leading to improved land use in tropical and sub-tropical developing countries through the integration of trees and shrubs with crops/animals.

Until recently, ICRAF has interpreted this mandate rather narrowly and supported research efforts through provision of information, research methodology development, advisory services support, and training. The Five Year External Review Team (1984) recommended that ICRAF increase its direct involvement in collaborative agroforestry research programs. To facilitate this role ICRAF needed to accept a more pro-active role in the technology development to improve its service to research community clientele. This review panel also observed that participation of an ICRAF scientist in the research team in collaborating countries should not be on advisory basis, but more directly as a working partner.

In response to these recommendations, ICRAF established COLLPRO to collaborate with national research institutions in generating agroforestry technologies. This

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collaborative support has been provided through the AFRENA networks with explicit objectives to:

- * analyze existing land use systems;
- * assess technical and socio-economic feasibility;
- * design implement and evaluate on-station and on-farm research programs;
- * plan, implement and evaluate training and education program;
- * screen MPTs;
- * evaluate improved management regimes; and
- * disseminate information nationally and regionally.

2.3 The Origin of AFRENA-EA

AFRENA-EA started as an unsolicited proposal for agroforestry networking activities from ICRAF. It was funded under the global activities of Forestry/Fuelwood Research and Development Project (F/FRED), which began in 1985 as a ten-year, \$39.8 million project. F/FRED's goal is to enhance forestry/fuelwood research and development capabilities primarily through the support and development of networks of LDC scientists and institutions focused on the assessment, improvement and management of MPT species. F/FRED activities in Asia are implemented through a contract with Winrock International. The Latin American activities are implemented through a Cooperative Agreement with CATIE. AFRENA, the African activity of F/FRED is in the form of a Cooperative Agreement signed with ICRAF, which provided grants of \$2.4 million from S&T/FENR and \$0.3 million from the Africa Bureau. Another US \$1.3 million was authorized through bilateral mission buy-ins.

AFRENA is an intergovernmental program being implemented through agreements between the Governments of Kenya, Uganda, Rwanda and Burundi with ICRAF. AFRENA has no legal status and it is optional for other countries in the region to become members or collaborators.

2.4 AFRENA Research Methodology

2.4.1 Research Rationale

To achieve these stated objectives, COLLPRO created a conceptual framework which establishes agroforestry research in Africa through a network approach based on stratified agro-ecological zones. An ecological network approach was adopted because it aids in research on the basis of similarities in agroforestry potentials between countries

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within an ecozone. Such coordination between research conducted in the participating countries will lead to a more focussed approach and to a saving in scarce research resources. Four agroforestry research networks for Africa (AFRENA) have been established based on the four ecological zones. USAID supports only the East Africa or Bimodal Highland zone - AFRENA-EA.

AFRENA consists of two types of projects: (a) a zonal programme aimed at developing agroforestry technologies common to a particular ecozone; (b) the national project which covers a range of technologies which addresses location-specific problems of a prioritized land use system.

The planning and formulation procedure incorporates emphasis on short-term training of national scientists and the formulation of national research projects and/or zonal programs by national scientists in collaboration with ICRAF scientists. The major output of the planning and formulation phases was the design of zonal agroforestry research programs, and development of national agroforestry research projects.

2.4.2 Research Planning

Promotion (February - July 1987)

missions to each country are to identify institutions as potential parties in agroforestry research and hold discussions with policy makers. This leads to the establishment of an NSC and a national agroforestry research task force.

Diagnostic and Design (D&D) Exercise (March - June 1987)

A macro D&D analysis is undertaken by country within the ecozone to assess the existing production systems, agricultural policy, institutional arrangements, priority land use systems and the current status of agroforestry. This analysis leads to the preliminary identification of possible agroforestry interventions.

Zonal Planning Workshop (July 1987)

National scientists present the macro D&D exercise findings and suggest priorities for agroforestry research. From these findings, zonal research and training priorities are established. The workshop further identifies research sites and the institutional arrangements under which research will be conducted.

2.4.3 Formulation Phase

The development of the national project and training included on-the-job training, a micro D&D exercise and an in-country training course. The on-the-job training was aimed at the task force leaders from the participating countries. These task force

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leaders worked at ICRAF for a period of six months during which time they interacted with ICRAF scientists and participated in a micro D&D exercise in Western Kenya.

Research recommendations emanating from the micro D&D exercises formed the basis of the national (country-specific) projects.

The second aspect of the formulation also started at the Zonal Planning Workshop held in Burundi in July 1987. The countries decided on the priority areas of research including the technologies to be developed. This was followed by identification of a research implementing team for each site composed of a national and an ICRAF scientist who worked under the general guidance of an ICRAF zonal coordinator. The first task for the implementing team was to develop research proposals with inputs and comments coming from the relevant ICRAF scientists and national agroforestry committee. The research proposals were then discussed at the Design Workshop.

2.4.4 Research Implementation

Research recommendations were derived from both macro and micro D&Ds and research activities were planned according to those findings. These included recommendations for tree species selection, component and technology management trials and prototype research.

The research strategy included both on-station and on-farm research components although no confirmed trials have yet begun. MPT screening and component development trials were conducted exclusively on-station. On-farm research will tend to involve MPT management and prototype technologies which are fairly well understood, but require validation under farmers' conditions. Occasionally, non-experimental research such as ethnobotanical surveys, and socio-economic studies have been conducted to fine-tune the experimental research to fit the prevailing socio-economic conditions governing farmer adoption.

During implementation, continuous planning, monitoring and assessment of the program is carried out in order to ensure that research does not lose sight of the constraints identified at the D&D stage and new opportunities. This has been supplemented by two annual workshops and a study-tour designed to improve the exchange information. Methodology and approaches to AFRENA-EA research are assessed and refined as a result of workshop results and iterative evaluation.

2.4.5 Institutionalization of Agroforestry

The AFRENA approach is more than following a set of steps and phases. The objective of strengthening national institutions calls for an integrated approach where the information generated is disseminated, and the capability to conduct research strengthened. Certain aspects of the approach such as information dissemination, training and institution building are entwined within the various phases.

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Dissemination starts with the publication of the "blueprints". The zonal planning workshop affords a forum where the "blueprints" are formally discussed and the implementation of the recommendation initiated. Study tours and other annual workshops or seminars are used for information dissemination. As research results begin to accumulate, established journals will be utilized for wider dissemination.

Training is achieved both informally and formally. At the planning phase, national scientists learn by doing and by working alongside ICRAF scientists. By the end of the phase, national scientists will have acquired the know-how to conduct a Macro D&D and to derive agroforestry potentials and research needs of land use systems. The formulation phase offers a six month on-the-job fellowship at ICRAF for the task force leaders. The fellowship covers training in micro D&D and participation in a training course where the leaders are joined by other taskforce members. During research implementation, there is an aspect of on-the-job training for national scientists involved in conducting research. Furthermore, these scientists participate in specialized training courses, study tours, workshops, and seminars.

The AFRENA model is structured to incorporate post-graduate training in agroforestry. The students are expected to conduct their field research at the programme sites. This contributes to research achievements in addition to improving the capabilities of the research scientists concerned.

Agroforestry suffers from the lack of an institutional niche. Institutionalization is therefore one of the major concerns of the AFRENA approach. The formation of an NSC and the creation of multidisciplinary task forces, often drawn from different institutions, is the first major step taken towards institutionalization. The bringing together of different institutions and scientists encourages discussions across the often rigid, disciplinary barriers and promotes coordination in research approaches. Institutionalization at the regional level is achieved through the establishment of the RSC.

Another aspect of institutionalization is achieved through training as described above. More trained manpower in agroforestry will mean more attention to agroforestry, be it across institutions or within individual institutions.

Signing the Memorandum of Understanding (MOU) involves the government at a very high level of policy and decision making. This gives a boost to agroforestry in general and assists in bringing together the scientists and the institutions.

Successful implementation of the program would be expected to have an impact beyond the program boundaries. Research results should have wide applicability in the ecozone as a whole. Furthermore, trained manpower is expected to popularize agroforestry even after the funded program comes to an end.

2.5 Project Goal and Purpose

Project Goal

The Project Goal of AFRENA-EA is to improve sustainable agricultural productivity through greater adoption of agroforestry technologies compatible with local land use conditions thereby increasing national capability for food self-sufficiency in Africa.

In particular, this project will focus attention on the selection and development of the most suitable woody species for agroforestry through linking in-country research in various countries by means of networks, and by providing technical support and backstopping for the efforts.

Project Purpose

The Project Purpose is to select and genetically improve MPT and shrub species to integrate with agricultural food crops into productive agroforestry systems for the sub-humid, bi-modal highlands of East and Central Africa.

2.6 Purpose of the Evaluation and the Evaluation Methodology

The purpose of this evaluation is to review ICRAF and AFRENA's multi-country networking concept and its present validity as a research coordinating unit and the appropriateness of actual research methodologies, as they relate to strengthening of national activities.

The field evaluation spanned the period of from July 13 to August 11, 1989 and was carried out in Rwanda, Burundi, Uganda and Kenya. It was conducted in accordance with the provisions of the grant agreement which calls for a midterm evaluation during this period.

Site visits were made to all project-sponsored, on-station experiments (no on-farm experiments had begun). The team reviewed the project files at ICRAF and REDSO to familiarize themselves with the conceptualization, design and evolution of the project. The evaluation itinerary is attached as Annex 1.

The Evaluation Team interviewed the ICRAF/AFRENA field-level technical team as well as all of the current counterpart staff and met with many of the participants in AFRENA training programs to obtain their comments. The Team also visited with scholars and government officials directly involved in the National and RSCs or interested in agroforestry. Several Non-Governmental Organizations (NGO) administrators were also interviewed. The team also met with members of A.I.D. missions in all four countries to assess ICRAF's reporting performance, the missions' interest in activities and willingness to buy-in to the project.

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ICRAF made records and training materials available to the Evaluation Team, but only brief meetings were possible with senior ICRAF officials and nearly all senior ICRAF officials were unavailable for virtually the entire stay of the missions (in spite of their prior concurrence with the proposed schedule).

A Financial Analysis was also scheduled to have been part of the Evaluation mission, but USAID decided that this was unnecessary and ICRAF should be called upon to provide necessary financial data.

A list of principal contacts for the Evaluation mission is presented as Annex 5.

Members of the AFRENA Evaluation Team were Dr. Andrew Manzardo (Team Leader/Institutions Analyst), Dr. K.B. Paul (Agronomist with A.I.D./REDSO) and Mr. Fred Weber (Forester and Soil Conservationist). Mr. Dave Gibson of A.I.D./REDSO, Dr. Fred Owino and Mr. Dirk Hoekstra of ICRAF participated in the evaluation as resource persons and assisted the Evaluation Team in completing its assignment according to schedule. Two of the Evaluation Team members, Dr. Andrew Manzardo and Mr. Fred Weber were fielded by Tropical Research and Development, Inc. of Gainesville, Florida.

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3.0 REVIEW OF PROJECT OBJECTIVES

The Evaluation Team assessed the level of progress being made by ICRAF in meeting the project's goal and purpose; as well as the purpose level of the objectives of the project.

3.1 Project Goal and Purpose

3.1.1 Findings

The Evaluation Team agreed that the goal of regional linkage of in-country research can focus attention on the selection and development of suitable species for agroforestry, but the linkage between agroforestry and the improvement of sustainable agricultural productivity technologies remain unproven as yet. Research into the validity of the hypothesis that agroforestry technology is capable of improving agricultural productivity is the major value of the research carried out by AFRENA.

The Evaluation Team did not find any activities, being carried out with A.I.D. funding, which were aimed at implementing the genetic improvement portion of the Project Purpose. Present screening trials concentrate on species selection and do not yet address improvement. ICRAF, however, has received a separate grant for \$0.7 million from GTZ to fund its MPT germplasm improvement and screening program. The German-funded project's objectives are: to set breeding objectives, develop a selection methodology and to design breeding plans.

3.1.2 Conclusions

The Evaluation Team believes that the project cannot make much progress toward the project purpose of genetic improvement of tree species within its five-year life span. The Team agreed that it was never feasible to select and improve agroforestry tree species in the allotted time frame. The provenance trials could prove a source of genetic improvement if the more desirable seeds are selected. The addition of the GTZ-sponsored project to ICRAF's work in the region will help AFRENA meet the project purpose in the long term.

The Evaluation Team found that AFRENA was making progress toward the selection of agroforestry species, the linkage of research in various countries and the provision of technical backstopping. At the same time, the team felt that a basic modification of AFRENA-EA's research objectives would be necessary before they would be able to achieve the part of the project goal addressing the greater adoption of agroforestry technologies compatible with local land use conditions.

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3.1.3 Recommendations

- * Given GTZ's interest in germplasm improvement and the fact that the Evaluation Team has determined that the original Project Purpose statement is unachievable during the present LOP it is recommended that A.I.D. revise the Project Purpose and relevant portions of the project objectives accordingly ("identification and development of farmer-acceptable agroforestry technologies" is suggested).
- * AFRENA-EA should be urged to modify its research objectives toward increasing on-farm agroforestry research techniques, which would increase the likelihood of producing the adoptable systems and technologies called for in the Project Goal.

3.2 Progress toward Project Objectives

The following section reviews the success of AFRENA in carrying out the proposed level of the objectives of the AFRENA cooperative agreement.

3.2.1 Objective 1: To assist in the development, establishment, and coordination of an agroforestry research network in the ecozone focussing on multipurpose tree species, and tree improvement trials for incorporation into appropriate agroforestry technologies.

3.2.1.1 Findings

3.2.1.1.1 Administrative Instruments

The Evaluation Team found that all of the participant countries have formed NSCs. A RSC has also been formed and has met three times. ICRAF has established more formal relations with each of the governments through MOUs. These MOUs permit ICRAF scientists to legally operate the project within a country and establish the terms for cooperation. ICRAF had a prior MOU with Kenya; the Burundi agreement was signed in February, 1988; Uganda signed in July of 1988; and Rwanda signed in May of 1989.

AFRENA has made agreements with at least one lead research institution in each country. These lead institutions are: KEFRI and KARI in Kenya, National Research Council in Uganda, the Agronomic Research Institute of Rwanda (ISAR) in Rwanda and the Agricultural Research Institute of Burundi (ISABU) in Burundi. Financial reimbursement to the NSCS for local activities are often arranged through these institutions; they are supposed to provide salaries for the counterpart scientists appointed to the projects. Research facilities are provided to AFRENA through the MOUs, and generally through the lead institution as well.

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3.2.1.1.2 Steering Committees

Although AFRENA has supported the NSCs, they are considered to be independent institutions not directly connected with the network. In most cases, notably Kenya, Burundi and to some extent Rwanda, the NSCs predate AFRENA's activities. Differences exist between the structures of the NSCs. There are also differences in membership, both as to knowledge and commitment to agroforestry. This situation obviously reflects both the local political situation (who has power to participate in such committees) and variation in manpower development levels. Nevertheless the NSC is a center for many of the AFRENA activities within the countries.

The membership of each NSC is selected from various agricultural, livestock, university, and forestry research interests, and often representatives of both governmental and non-governmental diffusion organizations are included as well. The Evaluation Team found that in the NSCs, ICRAF has succeeded in forming the type of organization targeted in the Cooperative Agreement.

The Team found that the RSC was formed through AFRENA. The RSC represents a good means of fostering cooperation in agroforestry research between participant countries in the region. The Chairmanship of the RSC rotates among the National Chairmen, matched by a similar change in venue, so each country shares in the leadership. The RSC provides a basis for linking research activities. It also provides the basis for organizing a zonal agroforestry research program of common interest, as well as a forum for setting common standards, methodologies and protocols across the region. These regional linkages are further encouraged through ICRAF's Planning and Evaluation Workshops, study tours and other zonal activities.

Regional meetings have encouraged the sharing of data within the network, yet it is still premature to judge the value of the meetings as a long-term means of disseminating research results. Meetings are still taken up largely by the organizational issues which have to be sorted through, such as authorship and organization, but these will easily be taken care of as the network continues to mature. The regional meetings keep the NSC Chairmen informed of collaborative research results, while zonal workshop activities inform local scientists and their ICRAF counterparts.

The original plan presented by ICRAF and meant to run for 18 months has now been implemented. ICRAF has not yet presented an overall plan of activities aimed at institutional development for the remaining LOP.

3.2.1.1.3 Counterparts

Counterparts are provided to work in AFRENA, at least part-time, through the lead research organizations in each country. These local researchers show some general knowledge of institutions and organizations around them and provide a feel for how AFRENA activities could be combined with other near-by institutions and with neighboring farms. The counterpart scientists have little experience in agroforestry

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research. ICRAF has provided some specific training to these scientists and on-the-job training is beginning to take place now that expatriate scientists have been placed in the field.

The salaries of the counterpart scientists, for the most part, were provided locally. Burundi was found to be an exception to this and ICRAF has been unable to secure their local contribution. Rwanda is having difficulties providing its counterpart contribution. Counterpart funding, where available, comes from the national research budget of the participating country.

Some local scientists receive allowances from the AFRENA budget. Although arrangements vary from one country to another, AFRENA funds generally also provide transportation, per diem and certain other miscellaneous expenses.

3.2.1.2 Conclusions

The organizational framework of the NSCs and the RSC appears to work. In making their proposal to A.I.D., ICRAF could have selected the easier strategy of developing research by hiring consultants to carry out research planning and implementation. Instead, they chose to follow a far riskier strategy centered on institutional strengthening and network development.

The first steps of institution-building are by nature largely invisible. This gave AFRENA an apparent slow start. When fully matured, however, the institutional framework will provide a useful funding mechanism through which national and regional research and extension activities can be supported. Regional and most national activities could not survive at this time without some kind of external support.

ICRAF has done a commendable job on the mechanics of setting up the individual components of the network in each of the countries, and of carrying out institutional support through training.

ICRAF, however, may find that it has underestimated the speed with which these institutions are developing, and may find itself out of step with the policies of the governments supporting the NSCs.

The Evaluation Team found that there was a clear message in discussions with government officials, who, as a matter of policy, are more interested in more pragmatic approaches to research. This was particularly true in Rwanda and Burundi where policy favors accelerating the development of farmer-utilizable technology in agroforestry.

The NSCs represent, or potentially represent, a wide set of interests in agroforestry, more than simply agroforestry research. This range of interests can be represented as a research-to-farmer continuum, each part of which the project is intended to "serve." The agroforestry community of interest is made up of:

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1. The local farmers: it is important to realize that here, even if ICRAF extends its sphere of interest considerably toward extension design and implementation, it is not the intent of either ICRAF or the project to reach all the farmers directly through the program's network efforts alone. Regardless, however, it is the local people that are the ultimate and most important beneficiary that the AFRENA program is trying to assist. All other beneficiaries are seen as necessary intermediaries in a chain that ties ICRAF/AFRENA to the end-user.

The AFRENA Project Goal would further urge ICRAF's into on-farm experiments and technology development in AFRENA, since the cooperative agreement calls for "improving sustainable agricultural productivity through greater adoption of agroforestry technologies".

2. National research organizations/groups responsible for agroforestry research. These organizations are ICRAF's main and primary lead-contacts in the four program countries through which, at least as it was originally conceived, all input will pass and through which results will be transmitted to other intermediate users.
3. Agroforestry-related educational institutions, foremost national universities, and also schools training forestry/agricultural extension agents and, in a secondary way, schools, and colleges in general.
4. Host-country technical services that deal directly or indirectly with agroforestry activities: foremost are the Forest and Agricultural Services (Crops, Livestock, etc.), but other government agencies are included as well, including those that provide services dealing with agroforestry-related extension activities; energy, social services, financial institutions (agricultural credit), land adjudication/resettlement agencies, etc.
5. NGOs: The NGOs are too numerous and diversified to list even by major categories, except to indicate that this client group may include international or "North" NGOs (particularly those groups already involved in promoting different agroforestry techniques in the field) or local organizations with potential interest. Reaching and involving all of these groups even in a half-organized network would be an extremely tricky undertaking.
6. International or bilateral development projects, such as USAID and their personnel (expatriate or local). As with NGOs, a multitude of activities and efforts are underway or are planned in the future. All of them could profit immensely from the experience and results that AFRENA should gather in the next couple of years.

ICRAF is clear that at this stage of the development of AFRENA, its forte so far has been to foster and carry out formal on-station research. To be fair, however, there is research into on-farm and interactive techniques currently under way in the ICRAF RDD and on-farm research is underway in another AFRENA (e.g. in Cameroon). The

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D&D itself was originally proposed as a participatory technique for developing farmer-acceptable technologies. The question is when ICRAF will start to apply them.

The Evaluation Team believes that ICRAF has a responsibility for helping strengthen the capacity of participating research organizations to carry-out operational and off-station research, as well as on-station work.

The desire for research economy is a major motivation for the building of a regional research network. It is this same motivation that should inspire ICRAF to consider working to establish better linkages within the NSCs to help more effectively link research and extension. This should be done, even if ICRAF might not be interested in working in these areas outside of AFRENA. It should not be necessary to point out that extension linkages are critical to prioritizing research in a more beneficiary-oriented approach. It is likely, however, that just this sort of approach will be taken by AFRENA as the project continues to evolve.

Since the institutional development plan which ICRAF has presented in their Work Plan has now been implemented, it is now time for them to consider what needs to be done in institution-building for the next two years. This should not be left to the Zonal Coordinator, but should be a matter for deep thought for the entire ICRAF staff. Where AFRENA-EA goes in its institution-building activities should be closely watched by other AFRENA donors.

3.2.1.3 Recommendations

1. Within the next three months ICRAF/AFRENA staff should produce, and A.I.D. should approve, a two-year plan for the next stage of institutional development activities for AFRENA addressing the problem of greater participation of non-researchers in Steering Committee activities and establishment of improved linkages between these various constituency groups.
2. The plan for improving linkages between constituent groups within the NSCs should be followed within the next six months, with trainer-led activities involving all constituent groups of the NSCs meant to foster more direct interaction between these constituent groups in establishing research priorities and communicating research results in a more user-friendly manner.

Suggested activities might begin at ICRAF headquarters level, and follow with the RSC and the NSCs and their constituent groups. ICRAF could undertake a planning exercise which would involve:

- a. Charting information flow throughout the network locating each of AFRENA's participant organizations on a flowchart that links together the necessary steps from research to farmers in a logical sequence.

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- b. Defining where the function of each type organization begins and where it ends in relation to the others.
 - c. Initiating the process of compiling a list of all participants involved in each step in each country, as well as on a zonal basis.
 - d. Arranging details such as relationships, dovetailing, responsibility, information flow, and cost sharing through group meetings.
3. On the agenda of the Bujumbura meeting in February 1990, list an in-depth discussion of the recommendations of this evaluation; see to what extent these results can be used to consolidate, fine-tune and crystallize approaches and strategies to guide the program through the next two years as efficiently and directly as possible in terms of achieving the project's Purpose and Goal.
 4. ICRAF must actively seek participation in development projects which rely upon linkages between formal research, operational research and extension, such as the proposed Natural Resource Management Project (NRMP) in Rwanda, where the mission buy-in activity hires AFRENA to broker top quality, technical information to lower level users. This activity would be valuable both from the point of view of available funding and for a chance to develop practical skills in institutional linkage.
 5. ICRAF scientists must make regular, scheduled visits to other agroforestry research and extension projects within their countries with their counterparts. Information learned from these visits should be reported in writing and the reports disseminated.

3.2.2 Objective 2: To collaborate with and provide technical support to national and international research institutions in the ecozone in the development of MPT species adaptation, tree improvement trials and agroforestry technologies.

3.2.2.1 Findings

3.2.2.1.1 Research Development

Research proposals leading to country-specific research have been developed and finalized in research design workshops held at ICRAF headquarters and in Kampala (June 1989). Monitoring and evaluation of the research program is carried out by the NSCs, while the RSC mainly concerns itself with policy issues.

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3.2.2.1.2 Standardization of MPT Screening Trials and Management Experiments

Two basic types of experiments have been designed and are presently in progress at six different sites in the four countries: MPT species screening trials and agroforestry management experiments. Observations of the screening trials place major stress on measurements of stem diameter, height, biomass and tree/crop relationships (observed by measuring crop yields adjacent to trees). In the management experiments, depending on the major objectives, elements such as biomass, fodder and crop yields are of main interest. A third type, "prototype experiments" has not yet been started (see Annex 6 for a complete listing of AFRENA-EA research underway).

General MPT screening is done to observe early growth patterns. Species suitability is determined with respect to a range of agroforestry technologies on the basis of these early growth results. In addition to height & diameter, branching characteristics, canopy structure, pest and disease incidence and response to imposed management are also recorded. Thus far no uniform system for determining biomass yields has been rigorously prescribed; such a system would include such information as percentage moisture content and fixed standards for disaggregating woody and leafy components.

In the management experiments, the performance and production of trees, shrubs and grass are measured as well as adjacent crop yields. Tree cutting heights and frequency of cuts are being investigated in relation to basic objectives. These vary from site to site and include: wood or fodder biomass production, soil loss reduction and soil fertility increase. A total of 24 management trials are under way: seven on alley cropping, seven on upperstorey trees and 10 on tree/grass bunds combinations.

All experiments are carried out under conditions of controlled access, exclusively on government managed research stations. Sites with different elevations were chosen and all sites are located in different agro-ecological zones for efficiency. Most of the experimental sites are located in a setting which is quite representative of the surrounding farming areas, though some are located either in flat terrain or on relatively gentle slopes. A major thrust of the management trials seems to focus almost exclusively on alley cropping, mulch/fertilizer trials or grass/shrubs on bunds, stressing Sesbania or Leucaena species or varieties. No standardized methodology for measuring tree or crop performance is yet in place and individual researchers seem to be measuring these in a variety of ways.

Chemical fertilizers and pesticides have been used in the past for different purposes in many experiments. The effect of different application rates of fertilizers is being studied as well. A recent policy which has been adapted throughout the network curtails further use and study of chemical inputs, except for trials intended to allow comparison between the effect of commercial fertilizers and mulch from tree and shrub leaves.

3.2.2.1.3 Species Selection

Early growth of a total of 43 species was studied (See Annex 6). Several provenances were compared for sixteen of the species. A random block-pattern with three replications was used. Trees of each species were planted in straight lines; the original spacing varies between 0.75 and 2.0 m, depending on the nature of the trial. When their crowns begin to interfere with each other, they are thinned out lightly, with the process repeated as the trees get bigger. In some instances, crops are planted nearby and measured to get some data on the effect of the adjacent trees.

Compared to the rather complete first-cut species inventory documented in the D&Ds, the actual number of species used in the experiments is not yet fully synchronized with those potentially possible, or even to the mix seen on nearby farms. It would have been better if more of the locally used and appreciated species had been included from the onset, including some which can be propagated by cuttings. Project personnel is aware of this and can be expected to make the necessary adjustments accordingly.

If one looks only at the total number of species involved in all trials, the list looks impressive, but the mix and distribution over different locations and site conditions is still uneven. A careful distinction must be made between selecting those species for which additional performance data is needed and familiar species which are to allow local people to compare the performance of "new" ones with those that are already familiar.

When the exact source of tree seeds is not precisely known, it may lead to the introduction of genetically questionable material. Provenance records of exotics ordered from other research organizations or seed centers are, as is usually the case, better documented than seeds collected locally by project personnel.

Species were theoretically chosen in accordance to the priorities given to those listed in the D&D reports as being of particular interest or relevance in solving identified land use constraints. The D&D generated species list was long, but the list used in experiments was narrow, apparently limited by seed supplies. Species with fairly well known growth characteristics were included (i.e. Acrocarpus, Grevillea) as were others whose characteristics failed to respond to stated objectives (i.e. Cupressus, Tamarindus). Other well-known species were included, such as Markhamia, in order to compare performance of different provenances.

Only those species that have shown promising performance, mainly in early growth, are being used in the management experiments. This judgment is based either on screening trials or on information available from similar tests carried out by others before this project was begun.

Finally, it should be pointed out that the experiments were started only recently. The first installations were in April 1988; the last only a few months ago. Since adequate additional space is available at some sites, ICRAF intends to expand these experiments

to include other species and additional management treatments, while discontinuing or altering others that subsequent reviews may find less useful.

3.2.2.1.4 Soil Conservation and Soil Fertility

Efforts to combine soil conservation with agroforestry techniques are evident at all sites. At some (notably Burundi), infiltration ditches have been installed (even on very gentle slopes) and tree/shrub lines established along them. At other sites, these lines run straight and therefore do not always follow contours of the slope (at Kabanyolo, for instance). At some of the steeper sites, existing structures (basically what is left of old, relatively large infiltration ditches) were followed when the tree/shrub lines were marked.

It was encouraging to see that the AFRENA scientists are incorporating certain bunch-type grasses into their systems. These would definitely be more effective in arresting soil losses than with the trees alone.

Inherent soil fertility was not determined prior to establishment of trials. Most sites have now collected soil samples but difficulties in completing chemical and physical analyses have seriously delayed determination of baseline fertility.

3.2.2.3 Conclusions

It can be argued that given the generally complex analyses that were conducted during the D&D exercises, the selection of particular research topics and the design approaches that were suggested were not in complete balance with the needs and realities described in the D&D. Emphasis appears to have been placed on alley cropping and the species particularly connected to this technique while other techniques have received little, if any, attention. There seems to be a gap between the data itself and the research priorities set from that data.

A point also can be made that research priorities and design might have been quite different had the farmers' perspective been given more weight in the diagnostic phase. Had this been done arrangements and lay-outs other than alley cropping, trees on bunds or trees planted exclusively in line would have been suggested.

Analysis should go beyond species and variety performance data for early growth and weighing "biomass" where soil improvement by leaf litter is being studied. The relative soil-improving quality of the organic matter that is added from trees or shrubs should also be assessed on a species by species basis. Although it is true that crop yield increase is being measured, it is likely (if one heeds farmers) that leaf litter from one species may do more to increase crop yields than another.

Similarly, where fodder is the main objective, the final answer lays in the relative nutritional value per unit weight to animals, rather than only in the weight of palatable

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material produced by each species. This does not mean ICRAF should undertake complete nutrient analysis themselves: much information is already available from trials elsewhere.

Where erosion control is important (on all slopes steeper than 15%), much depends on the use of the grass and tree/shrub material that has been cut. If the material is collected to feed livestock, for example, the effect on erosion is entirely different than if the same material is placed horizontally immediately above the growing plants as trashlines. This type of management option has not yet been investigated. In view of the overall importance of erosion problems wherever steep slope farming is practiced in the four countries, this appears to be a priority that deserves to be addressed in the near future.

The basic objectives of different management experiments do not always seem clear in the local researchers' minds. Their descriptions of experimental focus as being on soil improvement, fodder production, erosion control or wood production are frequently interchangeable, for the same experiments.

One must keep in mind that there are limitations in what agroforestry systems can do in controlling soil erosion and/or improving soil fertility. These approaches might work in certain situations, but not in others. In some cases other low input systems to improve soil fertility, such as herbaceous, green, manuring crops, recycling of forages through livestock and adding manure back to the land, should also be considered. The problem comes when the planned solution is not the best solution overall, but rather the "best one our institution offers." ICRAF would do well to remember that agroforestry is one of several choices to be decided upon.

The time needed to use agroforestry techniques to reduce soil erosion and to improve land productivity may be too long to be an attractive or affordable proposition for the small farmers. Trees by themselves are probably not effective means of controlling soil erosion on farmland occupying steeper than 15% slopes.

Alley cropping may produce desired results under some conditions (such as flat lands or lands with milder slopes, adequate rainfall and so on) but management skills and labor could become constraints.

Some of the screening trial lines have been installed on slopes in the 40% to 50 % range, more or less along contour lines, without any additional provisions to control sheet or rill erosion. In addition, on these steep slopes trees are frequently planted between previously established infiltration ditches: not a practice which local farmers are likely to adopt.

At present, efforts to combine physical with biological soil conservation techniques leave a somewhat unbalanced impression. On one hand, where slopes are gentle and land is almost flat (Maseno and Kabanyolo), relatively massive physical digging and filling was done, while on steep slopes (Rwerere and Kanchekano) trees were planted along contour lines without any soil conservation (mini-site) improvement efforts.

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Trees/shrubs and grass planting along (mostly on top of) risers is not always consistent; in one case (Burundi) the trees were planted on top of the riser with the grass strips uphill from the trees, exactly the opposite of standard practice.

As erosion control has been chosen as one of the primary objectives of the management trials, a number of biological options in connection with alley cropping (or contour hedgerows) are being compared for their relative effectiveness, while variations or inclusion of other physical soil conservation techniques has not yet been given much consideration. There are presently no provisions for monitoring quantitative soil loss through erosion. ICRAF and AFRENA have correctly decided to rely on information from other research projects in the region due to the costs associated with such measurements.

3.2.2.3.1 Sustainability of Research

Research rarely is carried out as a profit-making private enterprise. Funds nearly always have to be provided by an outside source. It is not likely that the host-countries of AFRENA-EA will have sufficient national budget funds to take over research support, if outside donors should leave.

Neither does it seem very likely that the "ultimate end-users," the farmers, can ever be charged for extension services or to recover the high cost of research, particularly in AFRENA-EA countries' subsistence farm economics.

While ICRAF now must play the lead-role in in-country agroforestry research, this may change. Some other funding channels may eventually evolve, at which time ICRAF's role may be more in the background providing advisors and network linkages to other international organizations that work in similar fields. However, for the present, ICRAF and AFRENA have a unique responsibility in this type of research. Donor functioning levels and increasing host-country government financial and political support suggest this research will grow substantially in importance.

3.2.2.4 Recommendations

1. AFRENA-EA's research planning and formulation procedures, and priorities should be reviewed against practical realities through contacts with farmers and host-country soil conservation agencies to fine-tune and produce a more pragmatic, field-oriented focus. An iterative, practical approach to this formulation process must be developed and applied over the next six months.
2. Based on the applied research that is now underway, research activities should be expanded to include a wider range of MPTs and management trials within each country's zonal mandate. Also, adaptive research (prototype trials) should begin, as much as possible, in an on-farm setting.

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3. Non-experimental research should also be expanded in such areas as ethnobotany, reviews of others' on-going research and field project activities, socio-economic analysis for the on-going trials, farmer-oriented D&D updates and other techniques to develop a means of assessing the economics of more pragmatic means of determining technology viability and acceptability.
 4. On-farm trials should be planned within three months and implemented by the next planting cycle with a relatively wide selection of species (including fruit trees, see below). Guidelines for a basic, uniform methodology should be developed.
 5. Of all new experiments to be undertaken, no more than half should be on-station; the rest should be placed on farm. ICRAF should experiment with all three possible arrangements for on farm trials: farmer-managed, researcher-managed and cooperative agreements between AFRENA-EA and participating local farmers. The latter should be a joint arrangement which takes into account farmers' observations, findings and suggestions to be included in the reporting of the results.
 6. Trials or experiments on species or techniques which farmer will not or can not adopt should not be undertaken. All future research efforts should be analyzed and checked against this criterion by a small, multidisciplinary team. All AFRENA research activities should be assessed to ensure that they contain at least some potentially useful elements to local, small-holder farmers. Activities not meeting this requirement should be dropped (or at least not be funded by this project).
 7. The use of chemical fertilizers should be limited to a few trials to permit the comparison between such tradeoffs as fertilizer/manure/mulch from tree leaves. Other than for these cases, chemical fertilizer testing has little merit in agroforestry, since fertilizer is out of the reach of small-holder farmers.
 8. The difference between alley cropping and contour hedgerow technologies should be fully recognized by all personnel working on the project. Necessary rearrangements and changes in research design must be made immediately to reflect this distinction. This clarification should be included in the agenda of the next RSC meeting and the message disseminated as rapidly as possible.
- 3.2.3 Objective 3: To assist national and international institutions and agencies in the choice and acquisition of quality seed/plant material for multipurpose tree species as components for agroforestry research efforts.

3.2.3.1 Findings

3.2.3.1.1 Nursery Establishment and Outplanting Stock

AFRENA has either established its own nurseries or collaborated with other research projects or Host-Country agencies nurseries to produce the seedlings required for the various experiments. The late stationing of ICRAF scientists and resultant delays in nursery establishment forced the Burundi and Rwanda programs to borrow seedlings for the first trials. The Evaluation Team was able to only visit three of the AFRENA-supported nurseries.

In general outplanting material appeared to be satisfactory in quantity, quality and homogeneity. While considerable care has been exercised to ensure that the planting material is uniform and of good quality, the Evaluation Team visited two sites where nurseries were below NGO or extension service standards. Improper shading, open-ended polypots of varying lengths, and evidence of "j" rooting suggest there is considerable room for improvement in nursery techniques.

The Evaluation Team found outplanted stock was "pruned" (terminal leader removed) prior to outplanting due to inaccurate seeding schedules on two trial sites. The impact of this pruning on tree performance and branching habits is unclear but could have a significant effect on growth.

The Evaluation Team found the direct seeding establishment trials in Rwanda particularly valuable and some of the most innovative work done by AFRENA to date. The sheer numbers of seedlings which must be produced and transported to farms represent the greatest single brake to agroforestry extension. This is a logical and needed window of opportunity for AFRENA.

3.2.3.1.2 Seed Acquisition Support

ICRAF is recognized as a center of agroforestry excellence. It was surprising for the Evaluation Team to learn from three of the four ICRAF resident scientists that the choice of species used on trials was, at least to some extent, determined by seed availability and not choice. Evidently there have been some understandable delays in seed procurement from national agencies and ICRAF itself seems to have had difficulty organizing timely germplasm procurement.

The Evaluation Team was impressed with the wide variety of species under experimentation, but as stated before, felt there is a continuing need to expand the genetic base as the network evolves. Also noted was the fact that several unspecified species (Albizia and Acacia spp. for example) and provenances were under testing. There were no adequate reasons proffered for this use of questionable material. Finally, there seems to be some confusion surrounding the provenance of what has been evidently mislabelled Leucaena leucocephala which originated in Ruhunde (Rwanda)

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and which ICRAF's tree geneticist feels is probably Leucaena diversifolia or a hybrid of the two.

3.2.3.1.3 Other Nursery Inputs

At least two of the trial sites visited had been planted with leguminous trees which had not been inoculated and are not known to nodulate naturally in the zone. Leucaena and Casuarina did not receive rhizobium or actinomycete inoculation in the nursery or outplanting and observed specimens were, indeed, not nodulating. The reasons offered by some were that "farmers do not have access to inoculum so why should we test trees under un-farmlike conditions." More forthright AFRENA participants suggested these products had been requested through ICRAF but never arrived. This is interesting in light of the fact that rhizobium is commercially available through ISABU and ISAR and that Frankia can evidently be procured either from the University of Rwanda or Bamburi Farms in Mombasa.

3.2.3.2 Conclusions

The nurseries visited give an overall satisfactory impression, but there a number of details that could be improved in the immediate future. Since uniform, high-quality planting material is especially important if the stock is used for systematic observations and comparison, an extra amount of care and quality control is required.

Inadequate adherence to seeding schedules which guarantee timely availability of quality stock were evidenced. A causal attitude toward provision of inoculant was pervasive. There is, in general, great room for standardization of nursery management and seedling propagation practices throughout the network

Discussions with extension services and development partners indicate that alternative seedling propagation technologies are an extremely valuable and potentially fruitful line of research. In addition to direct seeding investigations there are other opportunities in establishment through cuttings and perhaps more sophisticated micropropagation.

3.2.3.3 Recommendations

ICRAF needs to provide increasing and diversified support for improved seedling production to ensure the best quality outplanting stock of known origin is available for on-station and future on-farm trials including:

1. A standardized production plan and techniques (seeding dates, pot sizes, nursery techniques, use of fertilizers and pesticides) should be developed and distributed during the next RSC meeting in Burundi. This production plan/guidelines should also clearly outline procurement requirements and responsibilities. If necessary,

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ICRAF should consider hiring an experienced forestry consultant to prepare these plans.

2. All species not known to nodulate naturally within the network's area should be inoculated or not used in trials. ICRAF must assure that adequate quantities of viable inoculum are available when needed.
3. At least three or four fruit tree species should be included in nursery production schedules. In many instances this implies setting up grafting capabilities (avocados and mangos).
4. AFRENA should strengthen and continue its research into alternative and appropriate propagation techniques.
5. Increased efforts must be made to fully identify all seed sources and to ensure that only seeds from healthy, better-than-average trees are collected and used. This pertains particularly to cases where seeds from indigenous species are collected locally.

3.2.4 Objective 4: To train national institution personnel to evaluate land use systems (which involves the preparation of state-of-the-art reports on agroforestry for each country), and to apply agroforestry technologies to improve productivity and sustainability of production.

3.2.4.1 Land Use Systems Analysis: Diagnosis and Design (D&D)

3.2.4.1.1 Findings

D&D is a systems analysis methodology for the diagnosis of land management problems and the design of agroforestry solutions. It was developed by ICRAF to assist agroforestry researchers and development field workers to plan and implement research and development projects. The systems approach to the D&D is a methodological recognition of the interdisciplinary nature of agroforestry.

In AFRENA, the D&D procedure has two levels: a Macro-D&D, which is meant to be a country-wide analysis of all major land use systems resulting in a plan or "blueprint" for agroforestry research and potential interventions; and a Micro-D&D which is a more in-depth study of a single priority land use system leading to a specific research design for that area. A version of these two types of D&D studies are integrated into the training and institutional development activities of AFRENA.

Theoretically the D&D methodology (as presented in the "D&D Users Manual") indicates that it is an interactive process which seeks to find local priorities through "perturbation" experiments. The process looks at farmers as experimenters and involves two-way information flow with a community-based field worker. As they have been

carried out thus far, the D&Ds were utilized more as simple rapid survey exercises, with no plan for further application of a more on-going interactive process. Farm-level information gathering in the D&D, as it was carried out, has been minimal and was based largely on non-systematic "rapid appraisal" techniques.

Much data was missed in this first survey, particularly in assessing current farming practices, the social context of agroforestry, and reviews of prior and on-going research by others.

Given ICRAF's accounting, it was not possible for the Team to determine the total cost of a D&D exercise including transportation and salary. The value of the D&D to AFRENA members would certainly be effected by these costs. ICRAF's most recent experience in Ethiopia indicates the cost is \$50,000 including a more streamlined training program.

3.2.4.1.2 Conclusions

As an initial "rapid appraisal" of the local context for agroforestry research, the D&Ds were well carried out given the time constraints of having to get a research program underway as rapidly as possible.

It is fair to ask, however, if a simpler and cheaper form of rapid appraisal might not be more useful and affordable in the AFRENA countries. The fact that the cost of the AFRENA D&D has not been calculated by ICRAF makes it difficult to assess the D&Ds potential value as survey tool.

The problem is that the D&D practiced in AFRENA is no longer the iterative methodology described in ICRAF literature. It is now a single survey with no plan for follow-up.

More disturbing, however, is that since the D&D there have been no measures of labor costs, no socio-economic analysis nor farmer interviews in the research area. Such inputs are obviously important means of assessing the viability and acceptability of technologies, especially from the farmer's point of view.

Except for an occasional visit, there are no social scientists professionally involved in AFRENA-EA at this time, either from ICRAF or from counterpart sources. The regional coordinator is an economist by profession and has been involved in agroforestry economics in the past at ICRAF. He is currently involved in institutional facilitation and has no time for research.

The danger is that in the minds of AFRENA researchers, the "one-shot" D&D survey has ended the need for further socio-economic input in AFRENA research.

The academic side of AFRENA research remains somewhat incomplete and needs to more fully incorporate existing documentary information. AFRENA scientists, both

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expatriates and counterparts, need to do more to make themselves aware of the work of others involved in agroforestry research and development.

Finally, the general matrix derived from D&D research divides research activities into zonal and country-specific efforts and distinguishes a number of different farming systems, overshadowing risks, significant information about agroforestry techniques local people are likely to adopt, and classification details.

3.2.4.1.3 Recommendations

1. Given the work which still needs to be carried out in organizing on-station research, it may be still early to begin identifying and training those to be involved in ICRAF's post D&D iterative research, but now is the time to begin the plan. ICRAF should have a plan of action for post-D&D iterative research within three months which identifies researchers, presents a training outlines and sets a timeframe for carrying out this work.
2. Although AFRENA's first reaction might be to find social scientists to carry out community-level work, it may be to ICRAF's advantage to use a social scientist as a trainer, rather than a researcher, as part of an interdisciplinary training team (social scientist, biologist and trainer) to develop training in "iterative" D&D for AFRENA-sponsored, station-based scientists to help them get into the field and refine their research approach.
3. ICRAF should immediately schedule a second round of D&D research to ensure that information missed on the first D&D is picked up and that lessons learned from other agroforestry projects and the results from others' research efforts are fully incorporated in a updated set of recommendations for future AFRENA activities.
4. The AFRENA-EA version of the D&D exercise needs to be subjected to a cost-benefit analysis of some kind to determine whether it is affordable to member countries and whether it is more cost-effective than other rapid appraisal methodologies.

3.2.4.2 Training of Institution Personnel

3.2.4.2.1 Findings

The ICRAF training program for AFRENA-EA is integrated into the overall plan for institutional development, research planning and design. It combines national activities which enable country-level projects to be formulated, with zonal level activities which concentrate trainees for on-the-job training and cooperative planning. ICRAF has produced a design methodology which also reinforces relationships between members of the zonal network at all levels of activity.

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Training activities for the first or "Planning Phase"(discussed in section one), began immediately after participating agencies were identified. A task force was selected in each country to work on a "Blueprint" (macro D&D). Task force scientists received support from ICRAF staff sent to work directly with each group, providing on the job training in carrying out the D&D methodology.

The second phase of research and training or "Formulation Phase" began with a six-month internship for task force leaders. One scientist was nominated to participate by collaborating with research institutes in each country. This participant was designated task force leader for his country.

Participants included: one from the Forest Research Institute of Uganda, one from ISAR in Rwanda, and one from ISABU in Burundi. Kenya sent a participant from KEFRI, who was replaced after four months by another who was expected to have a more permanent commitment to AFRENA-EA. The ISABU participant was not able to get released from his work to participate in the AFRENA-EA program after training was completed.

The purpose of the internship was to enable participants to carry out project formulation activities, i.e. "micro D&Ds". Course work consisted of training in sources of information, practical D&D training, seminars, a three-week training course, the research design workshop and preparation of reports. Both biological and socio-economic elements were covered. The training was given between September 1987 and March 1988.

Training materials consisted largely of ICRAF publications, books from the ICRAF library (including a published guide to its use), publications from the United Nations Environmental Program (UNEP) library and its networks, bibliographic and audio-visual materials prepared by ICRAF.

Training included joint participation of all task force leaders in work to carry out a single case study (the "micro D&D," for Kenya) from beginning to end.

During this training program (November 27 to December 10, 1987) the remaining members of each national research team joined their team leaders in ICRAF for a three-week course in D&D methodology. Course work for this level of training covered the concepts and techniques of agroforestry, the D&D methodology, evaluation of technologies and research planning. The course was evaluated positively by participants.

Including team leaders, twenty-three participants attended the classes: six from Burundi, nine from Kenya, five from Uganda and one from Zaire. International Livestock Center for Africa (ILCA) also sponsored a participant from Ethiopia as well. The Rwanda team was unable to take leave to participate in the course.

The completion of both training programs: the six-month and three-week courses, was followed by field work on the "micro D&Ds" for Uganda, Burundi and Rwanda (the one

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for Kenya having been carried out earlier as a case study by the team leaders themselves).

Training is part of the AFRENA annual workshops as well. The first workshop was held between September 10-16, 1988 in Kenya and was centered on planning and evaluation. The twenty-six participants included the task force team leaders, scientist counterparts, ICRAF staff members and a participant from A.I.D./REDSO.

A second planning and evaluation workshop was held between June 5-9, 1989 in Kampala. Forty-four participants are listed, including ICRAF resident scientists, task force leaders, counterpart scientists and A.I.D./Kampala staff. In addition, there were seventeen participants from Ugandan universities, government agencies, research centers, the National Research Council and NGOs.

Future training includes five fellowships recently negotiated with IDRC to be distributed in the four AFRENA-EA member countries and Ethiopia. The fellowships would allow awardees to enroll at Canadian Universities and will pay travel to return to their country to carry out graduate research. In addition, the head of the Forestry Department at Makerere University has been sponsored to come to ICRAF to work with ICRAF staff on an outline for a course in agroforestry.

3.2.4.2.2 Conclusions

ICRAF is to be commended for carrying out their intricate training plan in spite of many difficulties. Although some felt the plan was too rigid, it ended up being quite flexible. It was largely an economical way of organizing training on a regional level.

Discussions with the participants of the six-month training program revealed mixed feelings about the course. Six months, it should be remembered, is more than one-quarter of the time it takes to get a master's degree. Although those interviewed found that some of the training was interesting and useful, they said they often found themselves left on their own without anything to do. Classes were taught in bursts of activity, but then there were periods where things were quite slow.

The lack of structured activity was due in part to ICRAF's rather academic approach to training and an emphasis on self-motivated study. Access to ICRAF's library and training in its use were featured elements of the program. Trainees found it difficult to effectively use this study time, as they were not used to libraries as a major source of information and they were not yet able to utilize large blocks of time doing library research.

Further, trainees pointed out that the other duties of ICRAF staff sometimes made it difficult for them to get the guidance they needed. This may indicate that ICRAF training staff and the RDD scientists used as instructors and advisors may be a bit overextended to play this kind of teaching role. This is especially true when attention

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must be given to a student over a long period and six months was probably too long a period to present work at this level.

Unfortunately, in spite of the otherwise good documentation of AFRENA-EA training, the documentation for the six-month internship is the least complete. Interviews indicate that course work seemed to be overbalanced toward the academic side, but nine of the approximately twenty-four weeks were spent in the field, and trainees spent eight of these either gaining practical experience implementing or backstopping a D&D.

This impression is further supported by interviews with participants. One participant characterized the situation when he said that he learned a million facts, but nothing that he could apply in his work. The situation could have been corrected at the end of the course, but no ICRAF scientists had at that time been assigned to the field.

AFRENA-EA training has been limited by ICRAF's emphasis on formal research and all AFRENA-EA training, has been related to the planning and implementation of formal research, well within the present niche that ICRAF has assigned to itself. Those selected for this training come from research institutions. Although it is understandable that ICRAF has elected to start with this group, it is expected that the circle of trainees will grow into other areas of the agroforestry network.

There are indications that this expansion is already underway. Participants in the latest planning and evaluation workshop held this year in Uganda, for example, included both extension workers and members of the NGO community of that country. The report for that meeting has not yet been completed, so there is no indication on what kind of role these individuals played in the workshops. It is a positive indicator, however, and ICRAF needs to read the enthusiasm of the Ugandans as a signal and be prepared to encourage such participation with workshops and seminars directed to research-extension linkage in the remaining two years of the project's life.

Training programs are not available to reorient ICRAF scientists and their counterparts to enable them to utilize on-farm methodologies to expand ICRAF's agroforestry research into the more client-centered approach now being demanded by participant countries and donor agencies. A workshop is planned for this in February 1990.

3.2.4.2.3 Recommendations

1. Future training for AFRENA needs to be designed with less emphasis on academic study and more on skill-building. Although a good framework is necessary to carry out quality research; practical field skills need to be developed as well. More time must be spent in teaching field methodologies, including sociological skills that will enable AFRENA participants to carry out iterative research.

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2. ICRAF must support more frequent short-courses for AFRENA, rather than supporting long-term training. These short-courses must be followed with on-the-job training and skill reinforcement.
3. Long-term training should be provided through graduate fellowships in institutions where a full-time teaching staff is devoted to the development of student skills, rather than where other duties leave staff unavailable and students with too much unprogrammed time. Long-term teaching is not the best use of ICRAF talent.
4. ICRAF must prepare a training plan to support the next phase of institution-building activities and research prioritization. This plan should be ready within a month of carrying out activities supporting the design of the plan for the remainder of the life of the project.
5. It is recommended that ICRAF train a wider circle of NSC participants in support of the new round of institution-building activities to support capacity-building within the entire agroforestry community.
6. It is recommended that ICRAF use its communications and training skills to build a role for itself as a primary packager of research data for operational use.

3.2.5 Objective 5: To furnish technical backstopping services for improved agroforestry systems in LDCs

3.2.5.1 Site Characterization

3.2.5.1.1 Findings

In the detailed description of the various experiment packages, provision is made for describing various site-specific, physical parameters. Some of these have been analyzed and the information included in the "blueprint." A number of them, however, are still largely incomplete including soil classifications, biometeorological conditions, past land use management, and the cultural context of present land stewardship.

Although overall land use systems are well described there is also room to obtain better socio-economic information which could help guide the appropriateness of research. Land and labor relationships/constraints are not adequately described in the blueprints.

3.2.5.1.2 Conclusions

Soil fertility problems throughout the entire area hinge less on basic nutrient levels than on relative top soil acidity (and ensuing Aluminum toxicity problems), especially at elevations above 1800 meters. This is an Africa-wide phenomena and well-recognized by researchers as well as farmers. Under these circumstances, measuring relative soil

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acidity levels (pH) becomes an important element in all aspects of investigating tree/shrub-crop relationships. This is exceedingly important in the selection and testing of leguminous trees and shrubs.

Basic site description information, particularly on soils, is still lacking in AFRENA-EA participant research sites. This problem has not yet become serious, because the program is relatively new. It will become serious if the missing information is not gathered rapidly. While the land availability statistics appear to be adequate there is inadequate concern for overall and particularly seasonal labor availability. Discussions with a variety of researchers and development practitioners in Rwanda and Uganda indicate that this is a critical and poorly understood relationship which needs closer inspection.

The importance of attendant household economics has also been undervalued during site characterization. While little of this information is available in most countries, its impact on farm-level allocation of resources is critical to eventual adoption of agroforestry technologies under AFRENA testing. Investments in seedlings, amendments and labor are critically dependent on poorly understood local economics.

3.2.5.1.3 Recommendations

1. All stations should be equipped with portable pH-meters and an extra supply of reagents, in order for scientists in the field to be able to conduct their own tests without repeatedly having to send soil samples to the lab for this purpose.
2. Soil sample analysis has to be streamlined in AFRENA, even if this means that samples have to be sent outside of the region. Occasionally, soil samples should be split, with one portion sent to a U.S.-approved soil laboratory for verification.
3. During the next round of D&D exercises it is recommended AFRENA staff consult the existing body of household economics information and agriculture survey data available in all countries, with the specific goal of better determining land, labor and financial constraints. It is suggested that a specific chapter be devoted to these critical limiting factors in adoption strategies.

3.2.5.2 Exchange of Information

3.2.5.2.1 Findings

1. Reports

A large number of documents (D&Ds, workshop reports, Steering Committee proceedings and so on) have already been produced, some of them translated and all of them distributed on the project level. In addition, all research designs have

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been summarized in "fact sheets" which are periodically updated to include the latest trial observation summaries.

Internal annual reports have been prepared and final or special reports are produced and distributed to project personnel, other ICRAF projects, as well as other interested parties (including the donors) as results become known. Although the Evaluation Team found the quality and quantity of documentation to be good, distribution could be improved.

2. Data Base Development

A woody species data base is now in the final stage of preparation for its distribution to other researchers this year. It has already been under general, but limited, use by ICRAF/AFRENA staff and under close supervision by the data base developers. The data base provides general lists of species of value under certain specific ecological and land use conditions. Work on the data base design was carried out independently with no reference to compatibility with the MPTS Data base being designed under F/FRED Asia, although one meeting between ICRAF and F/FRED staff took place in Nairobi last year.

3. Exchangeability of Data Within AFRENA-EA

ICRAF has made some limited effort to standardize data acquisition from different sites. No standard protocols for agronomic performance measures, physical and chemical soil analyses, and nutrient content and weighing of tree biomass, were yet fully established.

3.2.5.2.2 Conclusions

At this early stage of experimentation, the first results of AFRENA-EA research are not yet synthesized. ICRAF's considerable communications experience allows one to anticipate that information dissemination will not be a problem. ICRAF already has procedures and outlets. It is expected that zonal reports and other special documentation will be prepared (and translated) to be sent to a wider clientele. Research data, as they accumulate, are analyzed, synthesized and packaged. If the past is an indicator, the level of these reports will be fairly sophisticated and prepared in a relatively complex format and style. One problem will be the dual language requirement. (ICRAF's policy is to publish in the language of the country being studied-summaries of pages in the other language have been requested by the RSC, but translators are hard to find in Nairobi.)

The concept of holding regional and national meetings alternatively at or near different experiment station sites makes good sense. This alone would provide an informal setting for information exchange, particularly if other players engaged in the transfer of research results to farmers are invited to participate.

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To achieve results comparable between AFRENA-EA countries and others, it is essential that a common set of measurements be established. While this is a basic tenant to the networking efficiency platform of the entire AFRENA program, it has not been adequately developed. Discussions with AFRENA and host-country scientists and REDSO personnel indicate the importance of this step appears to be recognized but must be finalized immediately and prior to implementing any new trials. It is extremely important that this standardized agronomic, forestry, and soil data set be as functional and streamlined as possible taking into account availability of laboratory facilities and the time available to researchers.

3.2.5.2.3 Recommendations

1. The Team is ambivalent about the value of a yet another newsletter. ICRAF already has one. Present plans for accumulating information, especially research results to be diffused, seem adequate and would not be particularly enhanced by yet another newsletter, but it may be of value to improve communications with A.I.D. missions and other potential AFRENA donors. Instead a column in ICRAF's existing newsletter, could be devoted to AFRENA News, including the other networks.
2. There should be two-levels of research reporting in the future: one scientific and the other distilled and somewhat simpler, easy to understand (and easier to translate) and absorbable for use of those in extension.
3. It is strongly recommended that ICRAF finalize standardization of all data collection by the end of 1989. As ICRAF and AFRENA seem to be slowly developing their own standardized data set, it is recommended that they adopt an existing and useful system which is internationally recognized. Site conditions and measurements should be described in terms of the IBSNAT.

It is suggested that ICRAF request supplementary assistance from the F/FRED Project Manager through USAID's support mechanism to IBSNAT. It is suggested that a four-to six-week consultancy by IBSNAT Principle Investigator(s) could lead to the rapid development of a standardized minimum data set which would greatly improve AFRENA's efficiency and transferability of results.

4.0 REVIEW OF PROJECT ACTIVITIES

4.1 Project Inputs

USAID provides all of the funding for project operating costs as well as 27% overhead to defray ICRAF headquarters support. Parallel funding will be required if Ethiopia and Zaire join the network. The related Germplasm Improvement Project is funded by GTZ (\$700,000) and one Dutch scientist has been supplied by the Netherlands Government.

The AFRENA project represents USAID's second substantial grant with ICRAF. The first, the Agroforestry Research and Training Project (936-5545) was a \$1 million initiative which concentrated on agroforestry training completed in September 1985. Presently USAID/Washington has another Cooperative Agreement with International Institute for Tropical Agricultural (IITA), Oregon State University and ICRAF which supports the inter-agency collaboration in Alley Farming Research Network for Africa (AFNETA). This project is based in Ibadan, Nigeria with USAID inputs supporting a scientist carrying out MPT screening for alley farming technologies.

4.1.1 Findings

4.1.1.1 Relationship with S&T Bureau's F/FRED Project

The funding for the AFRENA-EA project is provided through S&T Bureau's global F/FRED project. This project is a ten-year, \$39.8 million project, authorized in 1985 and designed to enhance forestry and fuelwood research capabilities through the support and development of networks of LDC scientists and institutions. F/FRED initiatives focus on the assessment, improvement and management of MPT species. F/FRED activities in Asia are being implemented with contractual assistance from Winrock International (\$8.9 million) while F/FRED's Latin America operations are supported by CATIE through a Cooperative Agreement.

4.1.1.2 Present Funding and mission Buy-Ins

F/FRED has provided \$2.4 million to AFRENA-EA from its Africa Component. An additional \$0.3 million has been provided by the Bureau for Africa through the Strengthening African Agricultural Research (SAAR) project. AFRENA-EA is a Cooperative Agreement with ICRAF. The full \$2.7 million from A.I.D./Washington sources has now been obligated. The only source of further funding for AFRENA-EA is through buy-ins by the four concerned USAID bilateral missions.

Both F/FRED Asia and AFRENA-EA have mission buy-in mechanisms as part of their project design. They are meant to provide additional funding for in-country research and longer term institutional development. The premise of buy-ins is that "seed money" from central A.I.D. sources will spawn a program that the missions eventually perceive

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as valuable and will subsequently undertake more direct support through their own resources.

However AFRENA-EA, unlike F/FRED-Asia which was fully funded with buy-ins indicated as "additional resources", was not fully funded. The AFRENA-EA Cooperative Agreement specifies that \$1.3 million of the \$4.0 million authorized ceiling needed to accomplish the project goal and purpose will be forthcoming through mission buy-ins. These buy-ins have been problematic for a variety of reasons and thus far no hard currency support has been obligated by the concerned missions, although USAID/Rwanda and USAID/Kenya anticipate providing \$250,000 and \$300,000 respectively, in FY 1990.

The concept of buy-ins is logically sound. However, within A.I.D.'s operational context, it is somewhat naive to expect missions to support projects that they can not call their own and who's designs they have not actively been involved with. This has been the case in AFRENA-EA where, with the exception of the USAID/Kenya mission, no missions were consulted during project design and have now been asked to commit limited resources.

4.1.1.3 Marketing Buy-Ins

Buy-in marketing has been complicated by the lack of visible results associated with AFRENA-EA's essential institutional development activities. Furthermore mission budgets are most often devoted to new projects months or years in advance and, in the case of Burundi, program assistance (general budget support in support of policy reform) obviates the support for activities outside of the core reform program.

The mission buy-in system has placed a special burden on the Grantee, which must theoretically spend time in missions reporting on the work and marketing the project. ICRAF indicates that they have made an effort to carry out this activity, at least in Uganda and Rwanda; A.I.D. Missions indicate more work needs to be done in this area. Somehow, this is indicative of a failure to communicate that makes the buy-in structure more difficult to implement. ICRAF admits they have made few visits to the Kenya and Burundi missions, and partially for this reason have received little support in return. ICRAF could have done better in Rwanda as well.

Instead, it has been S&T/FENR and REDSO that have taken the lead in brokering the buy-ins to the missions. The REDSO Forestry and Natural Resources Advisor (RF/NRA) has been able identify "windows of opportunity" for mission support in Rwanda where the buy-in is being structured as part of the new NRMP. In this instance, the mission was able to carefully define the kind of services and inter-project collaboration to be provided by AFRENA.

Although the proposed work is well within the AFRENA mandate, and would support AFRENA in developing institutional linkages within the agroforestry "community", ICRAF's reaction to this sort of program direction is still unknown. In order to secure

this "leverage" in ensuring that AFRENA-EA supports the NRMP, the USAID/Rwanda mission Director suggested that in addition to the \$200,000 buy-in it would make sense to include another 27% (\$54,000) to cover ICRAF's overhead support costs.

4.1.1.4 Local Currency Support

The Uganda mission has also obligated more than 11 million Ugandan shillings in Public Law 480 funds, with a total of 40 million allocated. These funds, owned by the Ugandan Government but jointly programmed with A.I.D., are being used by AFRENA-EA for in-country programming the contractual obligations of Local Currency support are discussed in Section V.

4.1.2 Conclusions

In spite of the willingness of missions to buy-into these activities, AFRENA-EA will still probably not have sufficient funds to satisfy its goals and objectives and additional funds will have to be sought. The essential point here is that, regardless of contractual commitments, AFRENA-EA will definitely not be able to reach the goal and purpose level objectives without additional financial support.

ICRAF should have been more active in promoting itself to several of the missions both in reporting and in proposing ways in which they could work with missions. The distance ICRAF maintains from on-farm and operational research approaches does not help them in this regard. ICRAF should also have provided itself with an alternative source position in case it was unable or unwilling to find buy-in money.

The wisdom of designing and authorizing a Cooperative Agreement which calls for mission buy-ins without prior reference to the missions' Country Development Strategies and without some prior consultation and consent by the concerned missions is dubious. Apparently the AFRENA-EA project is not unique in this regard.

4.1.3 Recommendations

1. ICRAF needs to improve the degree of support by USAID missions by maintaining more active consultation and discussing alternative ways to gain their financial interest.
2. Additional funding will have to be found if AFRENA-EA is to complete its programs. AFRENA-EA should be monitored closely and the additional funding subject to their fulfillment of specific program goals.
3. Any possibility of funding for a second phase of AFRENA-EA must be based on extensive dialog and prior consent with the missions. While agroforestry and soil

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conservation are core concerns of three of the four countries involved, specific understandings regarding services must be achieved before proceeding further.

4. Creative and flexible use of AFRENA-EA's skills and customized services, such as those proposed by the Rwanda mission should be encouraged. Such programming encourages AFRENA-EA to be involved in actively encouraging further institution building through developing linkages between formal and operational research within a development context. The idea of adding overhead to a buy-in is a good one and should be encouraged within other missions.

4.2 AFRENA Collaboration with other International Organizations

4.2.1 Findings

4.2.1.1 Collaboration with other Centers

In September 1986, delegates from IITA, ILCA and the International Crop Research Institute for Semi-Arid Tropics (ICRISAT) met with ICRAF representatives in Nairobi to exchange information on their agroforestry research programs, and to identify areas of common interest for possible collaboration. At this meeting, IITA agreed to collaborate with ILCA and ICRAF in the planning and formulation of the AFRENA East Africa Network.

A follow-up to the above meeting was organized in May 1989, in Nairobi, with representatives from the above International Agricultural Research Centers (IARC), and from Pasture Research Network for Eastern and Southern Africa (PANESA), AFNETA and the International Union of Forest Research Organization (IUFRO). The purpose of this meeting was:

- * to discuss the progress made in areas of collaboration agreed upon in the earlier meeting
- * to avoid duplication of efforts by these organizations, and
- * to assure the donors that these institutions are working together to ensure effective use of resources.

In 1988, one of ICRAF consultants visited the IARCs located in Africa, to assess their programs on teaching and on the development of training materials related to agroforestry.

In the case of international contacts specifically made by AFRENA, one ILCA scientist participated in AFRENA's D&D course in Nairobi, and in its D&D field work in Ethiopia. ILCA provided germplasm for AFRENA's MPT screening trials, and helped analyze leaf samples sent from the AFRENA/Kenya program. The International Center

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for Tropical Development (CIAT) and AFRENA are continuing their dialogue to identify opportunities for collaborative research in Uganda and Rwanda.

ICRAF/AFRENA staff has also contacted CIAT representatives in Rwanda and Uganda. An exchange of technology and information as well as some logistic cooperation is taking place.

AFRENA has had some on-going contact with the F/FRED Asia project. The zonal coordinator has attended a technical meeting in Kathmandu in 1988, there has been discussion on data base formats as well. An ICRAF scientist went to an F/FRED meeting in 1988 and there are invitations for a meeting in November 1989.

4.2.2 Conclusions

While ICRAF does have numerous connections with international research and technical organizations, AFRENA activities in the field are not yet taking full advantage of the international institutions involved in related research. Neither are AFRENA scientists interacting enough with national and non-governmental institutions involved in similar research or development near the various stations where AFRENA trials are installed. The close vicinity of other related efforts, such as the [Small Ruminant Collaborative Research Program (CKSP) in Maseno, Farming Systems Research Projects in Rwanda and Burundi, etc.] have resulted in good cooperation. ICRAF indicates these projects were instrumental in helping set up AFRENA efforts nearby.

Although there have been meetings, the inter-regional synergy described in the F/FRED Project Paper has not emerged. AFRENA-EA activities are largely isolated from the learning experiences underway in F/FRED-Asia where very complementary research is underway. Sharing of data base information has not occurred, nor has any significant interaction between sub-project implementors.

4.2.3 Recommendation

The F/FRED Project Manager should ensure that F/FRED sub-project contractors and grantees increase their collaboration in order to limit duplication and increase research efficiency. It is recommended that F/FRED partners meet at least once per year to discuss methodologies, results and means for better cooperation.

4.3 Assessment of Impact of Project Activities on National Research Policies

It is difficult to separate AFRENA's and ICRAF's roles in their impact on national research policies in the region. The combined role of these and other organizations have created a place for agroforestry in the programs of KARI, KEFRI and in ISAR. The issue is the commitment of national resources to agroforestry. The team was made aware of the role of AFRENA scientists in developing an agroforestry plan for Rwanda.

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Policy planning and agricultural research institution-building is underway in Uganda. Other opportunities may soon arise as well.

4.3.1 Conclusions

The need for ICRAF support through AFRENA for the development of agroforestry research policy is apparent. In Uganda, for example, the International Services for National Agricultural Research (ISNAR) and A.I.D. have prepared a study on the preparation of a national agricultural research organization. Under funding from the World Bank, preparation is now underway to begin a working group on research and extension under the Government of Uganda Agricultural Policy Committee. The Uganda NSC and AFRENA need to prepare themselves with a well-planned proposal to ensure that agroforestry research and extension has a place in the national agricultural research strategy.

4.3.2 Recommendation

ICRAF must actively take part in policy developments in AFRENA participant countries and assist in harnessing the NSCs to take a more active role in developing national agroforestry research plans.

4.4 Project Staffing and Implementation Responsibilities

The grantee, ICRAF has overall responsibility for project implementation. The original proposal specified that ICRAF would supply the all-AFRENA coordinator (including the other three networks), not covered in this agreement. A Zonal Research Coordinator was to provide backstopping for the overall development of research in the bi-modal highlands zone, as well as the organization of training and the establishment, maintenance and evaluation of on ground research. ICRAF core staff, from COLLPRO and RDD, was to provide specialized technical assistance in planning, establishing networks, conducting training sessions and designing research trials.

4.4.1 Personnel Management

There have been delays with recruitment and placement of ICRAF/AFRENA staff. The Zonal Coordinator position has had two turnovers. The original Coordinator was replaced by an individual seconded to ICRAF from his home country within less than one year after activities began. In spite of assurances to A.I.D. that the scientist would remain for the life of the project, he was recalled to his country and left AFRENA after just over six months. He was then replaced by the original and present Zonal Coordinator. In retrospect this was a fortunate change as the present Coordinator is a talented, institutional organizer. Nonetheless changes in research priorities occurred and valuable time was lost.

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Although it is not specified in the original Cooperative Agreement, core staff support came to be read as internationally recruited resident research scientists to be placed in three of the four participant countries. The fourth country, Kenya, has been provided an ICRAF staff member with Dutch government funding.

It is anticipated that these scientists will provide continuity in ICRAF's backstopping support at a lower cost. Core support from Nairobi non-COLLPRO sources is more expensive (\$400 per day for senior scientists and \$200 per day for junior scientists plus per diem and overhead) and the first year expenditures on core staff were quite high. It is felt that the resident scientists might provide better support for the cost. Additional core staff support could be provided as well, but a shortage of pipeline funds require that project expenditure be severely limited.

ICRAF has obviously experienced some difficulty in recruiting these resident scientists, for the last ICRAF scientist was placed in Uganda at the time of the evaluation mission. With this, the staffing pattern is finally complete.

All ICRAF scientists have had technical educations, although their field-research experience varies somewhat. On the average, they can be considered mid-level as far as their experience and background are concerned.

4.4.2 Inter-Divisional Support and Collaboration

The few discussions we could have on this matter indicate that there is an inter-divisional support problem, due in part to ICRAF's own internal structural dilemma; the institutional separation of its field programs division (COLLPRO) from its technical division (RDD) within ICRAF. This separation has made it difficult for ICRAF to carry out a satisfactory policy for providing timely and adequate technical support to AFRENA. This resulted in too many short visits to the research sites (which is both expensive and inefficient) because RDD experts could not be scheduled for longer times and there were reports of visits which were too late to be of much good. With the current placement of ICRAF field scientists, some pressure will be removed, but much technical cleaning up remains to be done and on-farm research methodologies have to be developed so RDD services will continue to be needed.

4.4.3 Counterpart Staffing

The availability and quality of seconded counterpart staff has been quite variable. Rwanda and Burundi have had difficulty in providing counterparts (and ICRAF still pays the salary of the primary forester in Burundi). Long-term trainees (6-month course) from these two countries were not available as counterparts to ICRAF scientists upon their return due to other obligations. These obligations were evident in both cases prior to the trainees' departure but ICRAF decided to select them nonetheless.

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The average experience and educational levels of counterparts are quite good, but it would be unwise to rely on these people to take unassisted decisions on more complex issues such as research planning, setting research priorities, and determining linkages with development partners. In this they will continue to need assistance from senior in-country staff as well as ICRAF headquarters.

4.4.4 Conclusions

Apparently, ICRAF scientists and, to a limited extent, national counterparts have been difficult to recruit and/or to establish in the field. The scientist assigned to Uganda, for example, moved to the field at the same time as the Evaluation Team visit; the scientist in Rwanda, where the agreement has been recently ratified, reached his post about three months earlier; the Burundi scientist had been on post only since the previous August. This is more indicative of the magnitude of difficulties encountered by ICRAF in setting up the institutional framework than of any failure of effort on their part.

On the other hand, scheduling problems and slippage have led to difficulties in obtaining timely technical support for research in AFRENA. This seems to have been a recurrent problem. This was exacerbated by the late fielding of resident ICRAF scientists on the research sites complicated further by indications of scheduling problems and difficulties in maintaining inter-divisional coordination.

In spite of difficulties in providing technical backstopping to existing network members, ICRAF has been seeking to further expand the AFRENA-EA activities into Ethiopia and Zaire under other support. Ethiopia's entry into AFRENA is scheduled for later this year and Zaire's entry is now under discussion with IRAZ, a regional agricultural research organization also made up of ISAR in Rwanda and ISABU in Burundi. A.I.D. has been reluctant to support this move either programmatically or financially.

Our brief contact with the ICRAF scientists during the evaluation field-visits shows that they are able to handle all routine work assigned to them. Several already have shown considerable initiative undertaking their own, "unofficial" trials and practical experiments. The scientist in Rwanda, for example, is recording differential seedling survival under direct seeding and transplanting methods.

Initially, core staff from ICRAF (RDD as well as COLLPRO) were sent on relatively short visits to support on-going work. These short visits further delayed work, particularly with regard to MOU development, and to some degree accounts for the poor communication between local USAID missions and AFRENA. The process of getting MOUs with some countries was delayed as well for lack of staff presence useful for walking papers through the system.

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4.4.5 Recommendations

1. Project success is largely dependent on staffing continuity and ICRAF needs to make a determined effort to ensure that no additional ruptures occur.
2. ICRAF needs to improve the internal linkages within its own institutional structure making it easier for COLLPRO to utilize RDD technical capacity for AFRENA activities in a timely manner. Given the fee-basis for RDD services COLLPRO should be able to select the individual RDD scientists best-suited to the established need, based upon tightly written scopes of work.

4.5 Coordination of Project Activities

The Zonal Coordinator reports to the AFRENA Coordinator who is the Director of COLLPRO division of ICRAF which has implementation responsibility for the grantee. The AFRENA Coordinator is also responsible for ensuring cooperation and resource transfer to AFRENA from other ICRAF divisions. The Director General of ICRAF has oversight responsibility and he is in turn responsible to ICRAF's Board.

4.6 Project Planning and Reporting

According to the Cooperative Agreement, ICRAF was to prepare a LOP Research Design and Action Plan. In addition, a yearly Work Plan was to have been prepared including a statement on commitments made. Yearly plans were to have been approved by the A.I.D. co-managers. Although the LOP Plan was not completed but instead an 18 month planning document was produced in early 1987. Although ICRAF has produced several fragmented plans for research, which are appended to their annual reports, there is no single document which outlines a comprehensive yearly plan for the entire AFRENA project. There are no means to judge accomplishments against goals in assessing yearly progress for the project as a whole.

The Zonal and AFRENA Coordinators submit quarterly reports with financial statements. The Team found these to be useful tools for monitoring project progress and problems. The yearly reporting is somewhat better and contains information about each of the project elements. Supplementary reports are included as annexes. However, the Team slights these reports for not being measurable against pre-determined benchmarks. These targets should be part and parcel of the annual workplans.

4.6.1 Recommendation

ICRAF should produce a comprehensive yearly workplan for the project as a whole for 1989-90 by the end of September and complete a LOP Plan by the end of this calendar year. In addition, annual workplans must be prepared as per the Cooperative

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Agreement. A.I.D. should not disperse additional funds without an approved annual plan.

4.7 ICRAF Project Management

ICRAF provides centralized administrative and financial management of the project and program oversight from their headquarters in Nairobi. ICRAF has delegated enough management authority to the Zonal Coordinator to enable him to effectively manage project implementation activities, with the exception of human resources outside of the COLLPRO Division. For RDD or other non-COLLPRO divisional services, the Zonal Coordinator must make a request to the COLLPRO Divisional Director who, in turn, forwards the request to the concerned division. There is no guarantee that requests will be filled by the other Division or that the individual scientist best qualified or sought will be made available.

There are coordinated workplans between COLLPRO and RDD with inter-divisional resource sharing policies mean but too often required backstopping is not available in a timely fashion because of tight schedules and slippage.

4.7.1 Recommendations

Quarterly and Annual Reports should use activity targets, established in the annual workplans, as the benchmarks against which progress toward project purpose and goal are reported.

4.8 A.I.D. Management

Communication with A.I.D./Washington is adequate, although information often arrives too late for A.I.D. to effectively maintain its rights of review of personnel, subordinate agreements and programmatic decisions standard in the Substantial Involvement clause of the Cooperative Agreement. This is partially the result of Washington maintaining oversight over a Nairobi-based project. On the other hand, ICRAF points out that A.I.D. has so far not demanded these rights.

AFRENA-EA is managed and financially controlled by S&T/FENR. The REDSO office in Nairobi supplements this management by providing additional technical oversight through site visits and monitoring by the Regional Forestry and Natural Resources Officer. REDSO also represents A.I.D. at RSC meetings. The cost of this support is borne by S&T/FENR, which has obligated funds to REDSO Nairobi for this purpose. This backstopping support is currently being provided by a trained forester with regional field agroforestry experience. This has resulted in an exceptionally active A.I.D. role in the management of AFRENA-EA.

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Although a division of labor has been worked out by the two A.I.D. offices, a situation has developed where day-to-day management remains a two-headed beast. Coordination between Washington and Nairobi is difficult to maintain given the distance, the REDSO Officer's travel schedule, and the fact that the two individuals involved get together only once a year.

4.8.1 Recommendations

1. A.I.D. should consolidate its management of the AFRENA-EA network. Although recent evaluations recommended that REDSO take less of a role in project management, such activities are accepted on a case by case basis. If one were to choose a single location for the consolidation of management, REDSO would make a great deal of sense, especially since ICRAF headquarters is located in Nairobi, and AFRENA-EA is a regional project. Discussions with REDSO indicate that they are willing to accept management responsibility for the project if they are commensurately compensated for the additional administrative costs.
2. S&T should obligate necessary funds to enable REDSO's Regional Forestry and Natural Resources Advisor to carry out this task including financial oversight. S&T and REDSO/ESA should negotiate how this transition and attendant costs can be worked out.
3. S&T should continue to make periodic visits to the project to ensure that AFRENA-EA is satisfactorily serving the Goal and Purpose of the umbrella F/FRED project.
4. ICRAF and the REDSO Project Officer should maintain closer ties with F/FRED activities in other regions. This should include attendance to important conferences of mutual interest.

5.0 FINANCIAL SUPPORT AND FINANCIAL MANAGEMENT

5.1 Project Funding

Direct financial support is provided by USAID for approximately \$2.7 million for the first phase of 1986 to 1991. In addition, as we have pointed out, there is a provision of \$1.3 million worth of buy-ins by USAID's bilateral missions. At the present time it appears that Rwanda is prepared to buy-in to the project at about \$250,000 while Kenya is contemplating a \$300,000 buy-in. It is expected these funds will be transmitted back to the project through Project Implementation Orders (PIOs).

Uganda is willing to provide local currency (see Other Funding Sources below), but is unlikely to be able to provide dollar funding. Burundi does not appear to be able to provide any type of support at this time.

As of the statement of June 1989, a total of US\$ 1,788,546 has been expended from USAID funds (Annex 2: AFRENA Operating Costs; Annex 3: Pipeline Budget). The S&T and Africa Bureau funds have now been fully obligated. The remaining funds for the LOP are uncertain. If one assumes the buy-ins are forthcoming, US\$ 2,211,454 remains for the LOP. If, on the other hand, one assumes that there will be no buy-ins, there is approximately \$900,000 remaining. If one budgets at \$200,000 per quarter, the approximate present rate of spending, sufficient funds remain to maintain the project through July 1990.

5.2 Other Funding Sources

5.2.1 Local Currency

The Uganda national program has been able to secure local currency financing (Uganda Shillings 11 million in 1988-89 with up to 40 million budgeted for the future; given the difficulties of assessing the value of these funds, we suggest the total is probably worth under \$100,000) from Public Law 480 funds. The Uganda program is like to receive addition funding from this source as well.

Informal discussions with the Regional Contract Officer in Nairobi indicated that only counterpart funds generated through U.S. Government-managed Trust Funds would qualify toward A.I.D.'s contractual commitment to ICRAF. Since the PL-480 counterpart funds are not USG-owned they also do not count toward the authorization ceiling (\$4 million); although these counterpart funds should directly support project implementation in Uganda and reduce drawdown on the hard currency portion of the grant.

More importantly than the theoretical obligations of A.I.D., the fact remains that according to the pipeline (Annex 3) the project objectives will be unachievable without additional support from A.I.D. Without these supplemental resources, A.I.D. would lose all equity in AFRENA progress to date.

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5.2.2 Other Donor Support

AFRENA has done a good job attracting funds from a variety of other donor sources. AFRENA has obtained \$700,000 from GTZ to fund its MPT germplasm improvement and screening program. The construction costs of office building and facilities at Maseno in Kenya have been paid out of this fund. The GTZ-funded MPT Germplasm Improvement project's goal is to develop a national and regional MPT tree breeding capability. It envisages selection of phenotypes, establishment of progeny tests, seed orchards and other production units, undertaking vegetative propagation and involvement in advanced generation breeding. The project has only been underway since the beginning of 1989 and initial field station and seed collection work is presently going on.

How much ICRAF/AFRENA, perhaps by its mere existence, can be credited with having induced Germany to undertake funding of these efforts, is difficult to judge.

World Bank support was provided to ICRAF largely because of the active role it was taking in AFRENA activities sponsored by A.I.D. and other donors. It also should be mentioned that, at this point, Australia has shown interest in providing ICRAF with additional funds for MPT genetic improvement efforts.

5.3 Accounting and Financial Records

The quality of financial reporting of the project has been inadequate for the purposes of monitoring. Within the grant instrument A.I.D. also has allowed ICRAF financial reporting to be handled with a simple four-line budget format. A.I.D. now realizes that tracking expenditures in this format is difficult and hampers correlation of success toward project programmatic goals with actual expenditures. Under pressure from A.I.D. and internal recognition of this problem ICRAF began tracking expenditures by country in early 1988. All expenses prior to this period were aggregated into the A.I.D.-specified budget categories and were impossible to break down accurately.

A 27% overhead rate was negotiated in the Cooperative Agreement, but the rate is supposed to be reassessed by ICRAF each year, based on their end of year audit. The rate is to be revised yearly over the life of the project reflecting actual overhead costs. This has not been done.

Although ICRAF has provided breakdowns for personnel costs which justify the daily rates charged the project for the use of ICRAF scientists. REDSO feels that some of these items in these breakdowns are already being covered by overhead charges.

6.0 PRINCIPAL SOURCES CONSULTED

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- No. 2. Burundi
- No. 3. Kenya
- No. 4. Uganda

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ANNEX 1: EVALUATION SCOPE OF WORK AND ITINERARY

Forestry/Fuelwood Research and Development (F/FRED) Project
(Project No. 936-5547, Africa Component)
Contractor: International Council for Research in Agroforestry
(ICRAF), Nairobi

MID-TERM INTERIM EVALUATION

SCOPE OF WORK

Overview

The USAID cooperative agreement with ICRAF to implement the "Agroforestry Research for Africa-Eastern Bimodal Highlands" (AFRENA) will be evaluated between July 13 and August 13, 1989. The evaluation will determine the extent to which ICRAF and Host Country National Agriculture Research Systems have made progress toward the project purpose and goals. A five person team will be fielded to visit all AFRENA countries, visit with scientists, government and USAID officials and ICRAF support staff in Nairobi.

Section One: Activity to be Evaluated

ICRAF and USAID signed Cooperative Agreement DHR-5547-A-00-6041-00 on August 29, 1986, for five years (up to August 31, 1991) at an estimated cost of US\$4,000,000 to select and improve multipurpose tree and shrub species to integrate with agricultural food crops into productive agroforestry systems for the humid, bimodal highlands of East and Central Africa. The interest of this project as well as that of ICRAF as an organization is to facilitate the strengthening of local institutions to carry out their own research and improve the availability of genetically superior agroforestry germ plasm geared toward solving local problems and needs.

Authorization Number: DHR-5547-A-00-6041-00

Title: Agroforestry Research Network for Africa-Eastern Africa

Cost: S&T/FENR US\$2,400,000; AFR/TR US\$300,000; USAID bilateral Mission buy-ins US\$1,300,000. Total Project Authorization US\$4.0 million

USAID/Uganda and USAID/Kenya are supporting AFRENA through their local currency accounts. USAID/Rwanda presently plans an approximately US\$300,000 buy-in through its new Natural Resources Management project.

Life-of-Project Dates: 8/29/86-8/31/91

PACD: August 31, 1991

Section Two: Purpose of the Evaluation

This mid-term evaluation provides a timely opportunity to review AFRENA's multi-country networking concept and its present validity as a research coordinating unit and the appropriateness of actual research methodologies particularly as they relate to strengthening of national activities. The review should produce a consensus of opinion between the evaluation team and key project collaborators on AFRENA's immediate operation needs, effectiveness, and future programing requirements. The evaluation recommendations will serve to guide project management and execution in planning for the remaining LOP, hopefully lead to greater project sustainability, and eventual growth of the AFRENA Network and its collaborating national programs.

The purpose of this mid-term evaluation is to provide A.I.D. and ICRAF project management with recommendations and strategies in the following key areas: (1) are present organizational and management configurations and working relationship with participating countries and A.I.D. Missions producing expected and needed outputs in (a) development of National and Regional collaborative forums for prioritization and coordination of agroforestry research experiments and networking of results, (b) sustainable institutional and manpower development of national programs and (c) improved genetic materials; (2) are results being effectively transmitted to A.I.D. Missions with a strategy to incorporate them into Mission programs; (3) what recurrent operation and network development support costs (financial, human, and time) will be required for the project to achieve its ultimate goal and purpose; (4) do current management arrangements provide adequate S&T, AFR/TR, and USAID Mission oversight for AFRENA; and (5) what is the relationship between the project and the ICRAF network supported by other donors?

Section Three: Background

A. Introduction

In response to an unsolicited proposal presented to A.I.D. by ICRAF, grants were made by both the Africa Bureau and S&T/FENR. Another US\$1.3 million was identified through bilateral Mission buy-ins. ICRAF efforts involve the establishment of an agroforestry research network in East and Central Africa highlands under the framework of AFRENA. AFRENA is an inter-governmental organization formed by an agreement between the Governments of Kenya, Uganda, Rwanda, Burundi, and Zaire with ICRAF. AFRENA has no legal status and it is optional for other countries in the region to become members of collaborators.

B. Project Goal and Objective

Goal: To improve sustainable agricultural productivity through greatest adoption of agroforestry technologies compatible with local land-use conditions thereby increasing national capability for food self-sufficiency in Africa. In particular, this project will focus attention on the selection and screening of the most suitable woody species for agroforestry through linking in-country research in various countries by means of networks and by providing technical support and backstopping for the efforts.

Purpose: To select, screen, and genetically improve multipurpose tree and shrub species to integrate with agricultural food crops into productive agroforestry systems for the sub-humid, bimodal highlands of East and Central Africa.

Objective: ICRAF shall build on the information previously derived for the Agency to accomplish the following:

To assist in the development, establishment, and coordination of an agroforestry research collaborative network in the ecozone focusing on multipurpose tree species, and tree improvement trials for incorporation into appropriate agroforestry technologies.

To collaborate with and provide technical support to national and international research institutions in the region in the development of multipurpose tree species adaptation, tree selection and screening trials, and agroforestry technologies.

To assist national and international institutions and agencies in the choice and acquisition of quality need/plant material for multipurpose tree species as components for agroforestry research efforts.

To train national institution personnel to evaluate land-use systems (which involves the preparation of state-of-the-art reports on agroforestry for each country) and to apply agroforestry technologies to improve the sustainability of agriculture production.

To furnish technical backstopping services for improved agroforestry systems to NARS in AFRENA countries.

Section Four: Statement of Work

The evaluation team is asked to review several priority areas to determine project progress in relationship to expected outputs of the ICRAF/AFRENA Unsolicited Proposal and National Agriculture Research Systems work plans and priorities. The analysis of this data and the Team's conclusions should lead to specific recommendations to improve AFRENA operationally and assist NARS management in improving a long-term strategy.

A. Study Areas

1. Determine the present status of the agroforestry research network by country, identify the appropriateness of staffing configurations, establish what are its management and working relationships and delineate its principle activities and accomplishments. (As a benchmark for measuring project progress, the team should review the project proposal and the baseline data established within the country-specific "Blueprints" at the outset of the project.)

2. Determine whether the existing institutional arrangements between AFRENA, ICRAF, and the National Agricultural Research Systems (NARS) are adequate and appropriate to implement the AFRENA project. Has the presence of the Network promoted and supported collaborative agroforestry on-station and on-farm research within the region?

3. Determine whether direct and in-kind (land, staff, operation costs) project inputs are being made as needed and establish whether these inputs, as well as the level of performance of all participating institutions, are consistent with the original project agreement and country-specific

capabilities. To what degree have these inputs contributed towards achievement of the stated project objectives of regional research collaboration, development of improved genetic planting materials, host-country manpower training, and institutional development?

4. Assess the impact of project activities on national policies, resource allocations for agroforestry research, and the improvement in management or organization of participating country programs. What has been the role and accomplishments of ICRAF/AFRENA relative to the institutional development of national agroforestry programs and a regional network and its eventual sustainability?

5. Assess the effectiveness of AFRENA's technology information system (reports, national and regional steering committee roles and meetings, technical workshops, etc.) and the extent to which it is being utilized to disseminate relevant project outputs to the interested parties and targeted groups in the region, including A.I.D. Missions.

6. Determine the level and quality of technical assistance, instructional materials, and administrative support provided by ICRAF and NARS to AFRENA and country-specific research conducted within AFRENA given country-specific institutional capacity.

7. Assess the technical appropriateness of on-station and on-farm research conducted within individual experiments and assess the extent to which AFRENA has taken advantage of previous agroforestry research.

8. Determine the level of commitment and constraints (funds, staffing, etc.) of the member countries, bilateral Missions, or other donors towards supporting current and future project activities in the region. The evaluators must delineate financial problems that must be addressed and recommend possible solutions. Determine the best form of project financial support for current, as well as future project activities, including coordination responsibilities.

9. Estimate the nature and extent of any further involvement of member countries, USAID (REDSO/ESA or bilateral Missions) or other donors in follow-on project activities after the completion of the current five-year regional A.I.D. grant to AFRENA. The team should also propose a strategy and organizational structure that will enhance prospects of project sustainability after the PACD.

B. Additional Project Activities to be Analyzed:

1. Assess the quality of collaborative research sub-projects that are being conducted by NARS and, in the case of those funded by AFRENA, establish what were the selection criteria and screening processes. Determine whether research objectives are consistent with those of A.I.D, ICRAF, and AFRENA as stated in the Grant Agreement and other official project documents. Establish whether these sub-projects are perceived by national programs to be relevant to their research program priority needs or only those of AFRENA.
2. Evaluate the training being offered through the project and the effectiveness and utilization of the training materials that have been developed.
3. Assess (from the beginning of the project) the direct input of ICRAF professionals and consultants and establish whether it is consistent with the grant agreement and the stated needs of the member countries.
4. Determine the progress toward production of improved agroforestry genetic materials as well as management practices that have been validated (on-station and/or on-farm) as ready for extension transfer. Establish whether these new varieties and practices can be adopted by farmers in the region.
5. Review the country specific diagnostic blueprints assembled during the early states of the project and its periodic updating in relation to the current status of the project and present levels of agroforestry practices in the region. Assess the AFRENA baseline information use by participating agencies.
6. Identify additional areas of support or resources needed by the National Agroforestry Research Programs in the future that may have resulted directly or indirectly from project activities.
7. Review level of expenditure by line item, recommend revisions if warranted. Review internal and external ICRAF system for financial audits.
8. Review ICRAF/AFRENA annual workplans and operational budgets and assess the effectiveness of these as management tools for project implementation. (Also assess compliance with grant agreement covenants.

9. Review ICRAF's policies and those of national programs concerning future agroforestry research work in the region and establish whether they are consistent with A.I.D.'s African research initiatives. Does the active participation of Research Directors in the management and direction of AFRENA detract from their national duties and obligations?
10. Determine if the National Research System in Kenya will be able to support the operational costs of the AFRENA germ plasm improvement center and what actions could be taken to insure program sustainability.

Section Five: Methods and Procedures

The evaluation will approximately span the period July 13 to August 13, 1989, in Rwanda, Burundi, Uganda, and Kenya. The evaluation will be done in accordance with the provisions of the grant agreement which calls for a midterm evaluation during this period. The evaluation will assist with regular project monitoring and oversight requirements.

The ICRAF office in Nairobi, in consultation with REDSO/ESA, will prepare a travel and study program for the evaluation team to follow. The team will follow the format and guidelines established by USAID in the supplement to Chapter 12, A.I.D. Handbook 3, Project Assistance, entitled, "A.I.D. program Design and Evaluation Methodology Report No. 7." The team will use the following data collection and interview methods:

1. Review, since the beginning of the project, all A.I.D. project documentation, the records of the AFRENA Steering Committee's deliberations, the Regional Coordinator's presentations, and the country-specific research and diagnostic reports.
2. Interviews and discussions with appropriate scientists involved in the project and an examination of their activity records, data, and conclusions. Interview trainees that have participated in formal and informal training activities.
3. If necessary, to gather further data, visits to field research sites, training facilities and farms in the participating countries; i.e., Rwanda, Burundi, Uganda, and Kenya.

4. Visits to collaborating institutions and agencies for discussions with National Research Scientists, USAID Directors, ADOs, Program Leaders, and Project Managers.

5. Visit ICRAF offices in AFRENA countries and Nairobi where financial and administrative records are maintained. Discuss procedures with staff responsible for maintaining the records.

Section Six: Evaluation Team Composition

A five-person evaluation team will be composed of representatives from (1) REDSO/ESA (Agronomist and Project Development Officer), (2) Environmental Policy and Institutional Analyst to be contracted under an A.I.D./W IQC, (3) an Agroforestry/Forestry Expert to be recruited under an A.I.D./W IQC, (4) a Financial Auditor to be contracted under a REDSO/ESA IQC and paid for by S&T/FENR. Resource personnel for the evaluation team will be available from REDSO/ESA, the ICRAF regional office, AFRENA, and participating national programs, and ADOs from participating bilateral Missions. The REDSO/ESA PDO will be designated the Team Leader responsible for producing the evaluation document. The team is expected to work on a six-day work week basis.

Section Seven: Reporting Requirements

The format of the Evaluation Report will follow A.I.D. guidelines established in "The supplement of Chapter 12 of A.I.D. Handbook 3" and will include an executive summary, a PES facesheet, a table of contents, the body of the report, and appropriate appendices (e.g., evaluation scope of work, contact list, and bibliography).

The evaluation team will specify conclusions based upon the findings of the study and prepare a set of recommendations for improving future project implementation process including designation of appropriate action officers and dates for recommendation action. The Report will be written jointly by the evaluation team under the coordination of the team leader, who will be responsible for submission of the document to the relevant institutions and in leading the debriefing sessions with USAID Missions, national AFRENA leaders, ICRAF, and REDSO/ESA. The team leader, in consultation with other team members, will assign to individuals responsibility for drafting sections of the Evaluation Report.

A draft of the Evaluation Report is due prior to the team's departure from Kenya. Fifteen copies of the Final Report are required to be passed to A.I.D. (ten to A.I.D./W and five to REDSO/ESA) by October 30, 1989.

PROPOSED ITINERARY

DATE	ACTIVITY	WORK DAY	REST DAY	TOTAL
1 day x 2	people document review	2		2
July 14	Travel to Nairobi	2		2
July 15	Travel to Nairobi	2		2
July 16	Rest		2	2
July 17	Work, Nairobi	2		2
July 18	Work, Nairobi	2		2
July 19	Work, Nairobi	2		2
July 20	Travel/Work, Kisumu	2		2
July 21	Travel to Burundi (FRI)	2		2
July 22	Write, Burundi	2		2
July 23	Rest		2	2
July 24	Work, Burundi	2		2
July 25	Work, Burundi	2		2
July 26	Work, Burundi	2		2
July 27	Travel to Kigali (THUR)	2		2
July 28	Work, Rwanda	2		2
July 29	Write, Rwanda	2		2
July 30	Rest		2	2
July 31	Work, Rwanda	2		2
Aug. 1	Travel to Kampala (TUES)	2		2
Aug. 2	Work, Uganda	2		2
Aug. 3	Work, Uganda	2		2
Aug. 4	Work, Uganda	2		2
Aug. 5	Travel to Nairobi	2		2
Aug. 6	Rest		2	2
Aug. 7	Work, Kenya	2		2
Aug. 8	Work, Kenya	2		2
Aug. 9	Work, Kenya	2		2
Aug. 10	Work, Kenya	2		2
Aug. 11	Work, Kenya	2		2
Aug. 12	Travel to USA (SUN)	2		2
Aug. 13	Travel to USA	2		2
2 days x 2	people rewrite draft	4		4
Total Days:		60	8	68

Note: both team members will be doing the same activity unless noted. Therefore, two work or rest days are listed for each date.

Itinerary for AFRENA Evaluation Team

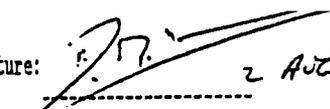
<u>Date</u>	<u>Location</u>	<u>Purpose</u>
7/17	ICRAF	Briefing by ICRAF/AFRENA TEAM
7/18	Muguga Air to Kisumu	Meeting with KEFRI
7/19	Maseno	AFRENA and CRSP research sites
7/20	Road to Kampala Kampala	Meeting with National Steering Committee
7/21	Kabayol Road to Mberere	National Agroforestry Site Visit
7/22	Road to Kabale Kabale Road to Kigale	AFRENA Zonal Research Site
7/23	Kigali	Rest day
7/24	Rwerere Kigale	AFRENA Research Site, FSRP Interviews with Government Leaders
7/25	Kigali Road to Butare Butare	Debriefing USAID mission ISAR/Rubona
7/26	Road to Gitega Mashitsi	AFRENA/IRAZ Research Site
7/27	Gitega Karuzi Road to Bujimbura	IRAZ AFRENA Research Site/SFRP trials
7/28	Bujimbura Air to Nairobi	ISABU USAID mission Debriefing
7/29- 8/12	Nairobi	Final interviews, report preparation

ANNEX 2: AFRENA-EA OPERATING COSTS

E.A.AFRICA OPERATING COST
OCTOBER 1966 TO JUNE 1969

A/C NO.	CBB - KENYA ACTUAL TO DATE \$	CBC - UGANDA ACTUAL TO DATE \$	CBD - RWANDA ACTUAL TO DATE \$	CBE- BURUNDI ACTUAL TO DATE \$	CBF- ZONAL ACTUAL TO DATE \$	CBA - TOTAL ACTUAL TO DATE \$
60210 ICRAF SCIENTIST		37,791	19,988	64,448	161,895	287,492
60220 ICRAF OTHER (Collpro Staff)	300	3,106	3,425		350,102	358,303
60225 ICRAF OTHER (ROD staff)	3,280	5,425	850		174,393	185,360
60230 LOCAL SCIENTIST	1,746			761		2,507
60240 TECHNICIANS/ASSIST.	4,385	21		2,799		7,205
60250 ADMINISTRATION	1,348		200			1,548
60260 SECRETARY				660		907
60270 CASUAL LABOUR	15,950	247	5,013	7,160		28,170
60280 DRIVER			512	313		825
60285 MESSENGER				55		55
60290 INTERPRETER			369	355		724
60295 CONSULTANT				269		269
TOTAL SALARIES & WAGES	26,709	46,590	30,357	76,820	686,390	372,397
60310 VEHICLE OPER. & MAINT.	4,544	3,321	4,390	6,562	178	19,495
60320 FIELD SUPPLIES	8,433	666	934	5,226		15,259
60330 FIELD/LAB EQUIPMENT	3,052	1,522	67	497		5,138
60340 LAB DATA ANALYSIS	14	474	61			549
60350 OFFICE RENT & UTIL.	6,991			2,868		9,859
60360 OFFICE SUPPLIES STATIONERY	1,946	2,108	1,432	1,351	221	7,058
60370 COMMUNICATIONS	566	264	525	1,101		2,456
60380 FURNITURE & EQUIPMENT	648	132		923	2,445	4,148
60390 INSURANCE	194			94		288
60395 BANK CHARGES	17		32	377		426
TOTAL OPERATIONAL COSTS	26,405	8,987	7,441	19,000	2,844	64,677
60410 PHD/MSC						0
60420 TRAINING MATERIALS/TRAMS					8,413	8,413
60430 SHORT COURSES						0
60440 STUDY TOURS						0
60450 WORKSHOPS					20,826	20,826
TOTAL TRAINING FEES	0	0	0	0	29,239	29,239
60510 ICRAF SCIENTIST-PARES	333	6,423	7,265	2,801	12,726	29,548
60520 ICRAF SCIENTIST-PER DIEM	459	13,076	15,557	6,272	68,426	103,791
60530 LOCAL SCIENTIST-PARES	653	1,057	1,339	8	6,576	9,632
60540 LOCAL SCIENTIST-PER DIEM	1,231	1,961	283	22	11,377	14,874
60550 CONSULTANT-PARES			1,034			1,034
60560 CONSULTANT-PER DIEM	128			11		139
60570 TRAINEES-PARES	23	686	434	1,096	8,603	13,752
60580 TRAINEES-PER DIEM	209	848	3,345		25,781	26,337
60585 TRAINEES-STIPEND	1,710				28,778	37,923
60590 LOCAL TRANSPORT	3,196	3,455	7,435	920	1,958	16,965
60595 LOCAL PER-DIEM	7,162	2,641	14,980	1,741	7,228	33,752
TOTAL TRAVEL	15,105	30,147	51,672	12,872	171,453	288,249

60610	PURCHASE				201		201
60620	PRODUCTION	182		811	291	2,560	3,244
	TOTAL PUBLICATION COSTS	182	0	811	492	2,560	4,045
60710	BUILDING						
60720	VEHICLES	17,320	19,555	17,320	21,903		77,199
60730	LAB/FIELD EQUIPMENT	2,139	3,465	756	3,679		10,009
60740	OFFICE EQUIPMENT	5,306	4,734		14,715	28,323	53,577
60750	FURNITURE	2,290	424		4,323		7,827
	TOTAL CAPITAL	28,045	29,277	18,576	45,220	28,323	148,449
60810	CONTEGENCY				4,378		4,378
60910	OVERHEADS 27%	26,040	30,780	29,392	41,689	248,618	376,519
	TOTAL	26,040	30,780	29,392	46,067	248,618	380,897
	GRANT TOTAL	122,486	144,731	138,249	200,471	1,169,426	1,788,546
		96,446	114,301	108,857	154,404	920,808	

Signature: 

Name

:D.S. SICKELMORE

Title

:Director of Finance and Administration

ANNEX 3: PIPELINE BUDGET FOR USAID/AFRENA-EA PROJECT

PIPELINE BUDGET FOR USAID/AFRENA EA PROJECT

EXPENSE HEADS	GRANT	RECEIVED	EXPENDED	PIPELINE	EXPENDITURE	PIPELINE
		INCEPTION TO JUNE '89	INCEPTION TO JUNE '89	AT JUNE '89	JULY '89 TO SEPT '91	AT SEPT '91
SALARIES & WAGES			872,997		975,000	
OPERATIONAL COSTS			64,677		245,000	
TRAINING COSTS			29,239		75,000	
TRAVEL COSTS			288,249		205,000	
PUBLICATION COSTS			4,045		95,000	
CAPITAL COSTS			148,442		160,000	
OVERHEADS/CONTINGENCIES			380,897		473,850	
TOTALS	\$4,000,000		\$1,788,546	\$2,211,454	\$2,228,850	(\$17,396)

Signature

D.M. Sickelmore

 2 AUGUST '89.

(D.M. Sickelmore)
 Director, Finance & Admin.

UGANDA: LOCAL CURRENCY EXPENDITURES
 ANNEX 4: ~~UGANDA LOCAL CURRENCY EXPENDITURES~~

1.	Salaries and Benefits	
	ICRAF NBO Staff Research Scientists	
	COLLPRO Staff	
	RDD Staff	
	AFRENA Zonal Coordinator	
	AFRENA National Coordinators	
	Technicians/Assistants	348,000
	Administration/Clerical Staff (Secretary)	240,000
	Casual Labour	1,092,930
	Drivers	133,200
	Interpreters	53,000
	Consultants	
	Others	
	Local Scientist(s)	2,403,000
	Sub Totals	4,270,130
2.	ICRAF & Participating Nationals Travel and Allowances	
	ICRAF Scientists (fares + per diem)	
	Zonal Coordinator (fares, per diem)	
	National Scientists (fares, per diem)	916,460
	Consultants (fares, per diem)	170,000
	Others	
	Local Transport	800
	Local per diem (Driver)	<u>55,500</u>
	Sub Totals	1,142,760
3.	Materials and Equipment	
	Building Construction	
	Vehicle Purchase	587,202
	Laboratory Equipment/Reagents	
	Office (computers, furniture, etc)	
	Other	
	Workshop	<u>1,801,735</u>
	Sub Totals	2,388,937

4.	Operations	
	Vehicles (gas, maintenance, spares)	1,807,914
	Supplies (seeds, fertilizers, tools)	238,400
	Laboratory supplies	465,475
	Soil/Vegetative analyses	
	Office rent & utilities	184,540
	Office supplies/stationary	163,781
	Communications (telephone, telex, mail)	121,398
	Insurance	
	Other	
	Furniture & Equipment	11,000
	Sub Totals	2,992,508
5.		
	RDD Staff	
	ICRAF Support Long Courses (> 3 weeks)	
	COLLPRO Staff	
	RCD Staff	
	Formal Training (PhD, MSc, etc)	
	Trainees expenses (fare, per diem)	
	Trainee Stipends	
	Local Travel/Transport	
	Training Materials/Translation	
	Other	
	Sub Totals	
6.	Network Publications	
	Publications Distribution Costs	
	Publication Production Costs	
	Other	
	Sub Totals	
7.	ICRAF Overhead Sub Total	
	Others (Reimbursement to MFAD Project and Recovery Program Support)	420,000
	Grand Total	11,214,335

ANNEX 5: PRINCIPAL CONTACTS DURING EVALUATION

Principal Contacts During Evaluation

1. KENYA

ICRAF Staff/Nairobi

Dr. Bjorn Lundgren, Director General
Mr. Bruce Scott, Director, Collaborative Programmes Division
Mr. Dirk Hoekstra, AFRENA-EA Zonal Coordinator
Dr. Fred Owino, Senior Scientist, Research Development Division
Mr. D.M. Sickelmore, Director, Finance and Administration
Dr. M. Avila, Senior Scientist, CollPro Division
Dr. E Zulberti, Principal Training Officer, CollPro Division
Mr. Richard Labelle, Head, Information & Documentation, InfoCom

AFRENA/Kenya

Dr. Jeff Odera, Director, Kenya Forest Research Institute,
*Chairman, National Agroforestry Steering Committee
Dr. Daniel Nyamai, National Agroforestry Research Coordinator
Dr. A.D. Olang, AFRENA/KARI, Maseno Team Leader
Mr. Barrack Owhor, AFRENA/KEFRI, Forester
Mr. Arne Heineman, AFRENA/ICRAF, Forester
Mr. Edward Mengich, AFRENA/KEFRI, Forester

Non-AFRENA Scientists and Administrators

Dr. I.C.R. Kamau, Assistant Director, RRC, Kenya Agriculture
Research Institute
Dr. A.M. Mailu, Assistant Director, Food Crops, Kenya
Agriculture Research Institute
Dr. Moses Onim, Director, Small Ruminant CRSP, Maseno
Dr. D. Siamba, Veterinary, Small Ruminant CRSP, Maseno
Mr. Christian Schafer, GTZ/KEFRI Forest Seed Center, Muguga

USAID/Kenya and REDSO/ESA

Mr. Eric Zallman, Deputy Director, USAID/Kenya
Mr. Jim Gingerich, Chief Agriculture Development Officer, USAID/Kenya
Mr. Jim Dunn, Agriculture Development Officer, USAID/Kenya
Mr. Cecil McFarland, Agriculture development Officer, USAID/Kenya
Mr. Dave Soroko, Agriculture Development Officer, USAID/Kenya
Mr. Satish Shah, Director, REDSO/ESA
Mr. Robert McColaugh, Chief Agriculture Development Officer, REDSO/ESA
Dr. Richard Edwards, Agriculture Economist, REDSO/ESA

2. BURUNDI

AFRENA/Burundi

Dr. Jean Ndikumana, Director General, Institut des Sciences Agronomiques du Burundi (ISABU), *NSC Chairman
Dr. Eko Akeampong, AFRENA/ICRAF, National Scientist
Mr. Jean Bosco Sabukwikopa, AFRENA/ISABU, Forest Engineer
Mr. Salvatore Kaboneka, AFRENA/ISABU, National Agroforestry Research Coordinator

Non-AFRENA Scientists and Administrators

Mr. Philippe Guizol, Cellule de Recherche Agroforesterie, ISABU
Dr. Elizabeth Adelski, Small Farming Systems Research Project, Consulting Anthropologist
Dr. Joseph Kafurera, Director General, IRAZ
Dr. Amal Chatterjee, Small Farming Systems Research Project, Agronomist

USAID/Burundi

Mr. Donald Miller, Representative USAID/Burundi
Mr. Quincy Benbow, Agriculture Development Officer

3. RWANDA

AFRENA/Rwanda

Dr. Amadou Niang, AFRENA/ICRAF, National Scientist
Mr. Anastase Gahamanyi, AFEENA/ISAR, National Agroforestry Research Coordinator
Mr. Abel Twagilimana, AFRENA/ISAR, Forester

Non-AFRENA Scientists and Administrators

Mr. Isaie Mutungirehe, Director General of Forests, Min. Agriculture
Dr. Pierre Nyabyenda, Institut des Sciences Agronomiques de Rwanda (ISAR), Directeur Adjoint
Mr. Celestin Ahimana, ISAR, Director, Dept. of Forest Research,
Dr. James Burleigh, Farming Systems Research Project, Team Leader
Dr. Serigne Ndiaye, Farming Systems Research Project, Sociologist
Dr. Charles Yamoah, Farming Systems Research Project, Soil Scientist
Dr. Bonaventure Ukiliho, ISAR, Chef de Station, Rwerere

USAID/Rwanda

Mr. James Graham, Director, USAID/Rwanda
Mr. Paul Crawford, Agriculture development Officer
Dr. Valens Ndoreyaho, Agriculture Development Officer

4. UGANDA

AFRENA/Uganda

Ms. Joyce Muwanga, AFRENA/National Research Council
Mr. John Okorio, AFRENA/Forest Department, Forester
Dr. Don Peden, AFRENA/ICRAF, National Scientist
Mr. J. Byenkya, AFRENA/Min. Livestock, Animal Scientist

Non-AFRENA Scientists and Administrators

Dr. John Mugerwa, Makerere University, Dean of the Faculty of Forestry and
Agriculture, (NSC Chairman)
Dr. John Aluma, Makerere University, Forestry Department
Dr. X.K. Ovon, National Research Council, Director
Mr. M. Kagolo, Forest Dept., Min. Environmental Protection
Mr. M. Oloya, Forest Dept. Min. of Environment
Mrs. Sandra Mebaze, Veterinary Dept. Agronomist
Dr. D.B.A. Ruyooka, Makerere University, Forestry Dept. Head
Ms. Joyce N. Kadowe, National Council of Women
Mr. Jecco Isabirye, Dept. of Agriculture
Mr. Joe Torres, CARE International, DTC Project

USAID/Uganda

Mr. Kurt Shafer, Program Officer
Mr. Ken Lyvers, Agriculture Development Officer
Mr. Isaac Aluba, Agriculture Development Officer

ANNEX 6: SUMMARY OF FIELD TRIALS ESTABLISHED TO DATE

Summary of Field Trials Established to Date

<u>Est. Date</u>	<u>Location</u>	<u>Travel Objective</u>	<u>Species and Provenance(s)</u>
May 1988	Mashitsi	Fodder production potential of different MPT's grass combination of field bounds	<u>Sesbania sesban</u> <u>Leucaena leucocephala</u> <u>Calliandra calothyrsus</u> <u>Pemisetum tripsacum</u>
Feb 89	Maseno	General MPT Screening	<u>Acacia spp.</u> (species & provenances) <u>Acrocarpus fraxinifolius</u> <u>Albizia spp.</u> (species & provenances unknown) <u>Cassia siamea</u> (3 provenances) <u>Erythrina spp.</u> (species & provenances unknown) <u>Grevillea robusta</u> (India) <u>Jacaranda mimosifolia</u> (India) <u>Prosopis juliflora</u> (India) <u>Robinia pseudoacacia</u> (India) <u>Sesbania sesban</u> (India)
		MPT observation Trials	<u>Alnus acuminata</u> (2 provenances, unknown) <u>Alnus nepalensis</u> (Nepal) <u>Ficus auriculata</u> (Nepal) <u>Grewia optiva</u> (India) <u>Melia azadarach</u> (Embu) <u>Morus alba</u> (Nepal) <u>Schima wallichii</u> (Nepal)
		Kabanyole Screening of MPTs for upperstory	<u>Alnus acuminata</u> (Mexico) <u>Alnus nepalensis</u> (Nepal) <u>Casuarina equisetifolia</u> (Kibuye) <u>Casuarina cunninghamiana</u> <u>Cordia abyssinica</u> (Kedowa) <u>Erythrina abyssinica</u> (Nandi) <u>Cupressus lusitanica</u> (Duraja) <u>Grevillea robusta</u> (Murangwe) <u>Maesopsis eminii</u> (Kakamega, Murangwe) <u>Markhamia lutea</u> (Murangwe) <u>Markhamia platycalyx</u> (provenance unknown) <u>Melia azadarach</u> (Embu)

<u>Est. Date</u>	<u>Location</u>	<u>Travel Objective</u>	<u>Species and Provenance(s)</u>
	Kabale	Observational general MPT screening	<u>Acrocarpus fraxinifolius</u> (Muringata) <u>Albizia lophantha</u> (Kijabe) <u>Tipuana tipu</u> (Nairobi) <u>Ficus auriculata</u> (Nepal) <u>Croton macrostachys</u> (Kiewu) <u>Croton megalocarpus</u> (Kikuyu) <u>Ficus nemoralis</u> (Kikuyu)
Feb. 89	Rwerere	Management trial Different cutting requires on biomass of MPT general screening	<u>Sesbania sesban</u> (provenance unknown) <u>Calliandra calothyrsus</u> (3 provenances) <u>Leucaena leucocephala</u> <u>Sesbania sesban</u> (Kiambu, Kakamega) <u>Casuarina cunninghamia</u> (Ruhande) <u>Casuarina equisetifolia</u> (Gede) <u>Cupressus lusitanica</u> (Duraja) <u>Erythrina abyssinica</u> (Nandi) <u>Grevillea robusta</u> (Namanjalalo) <u>Markhamia lutea</u> (Osorongai) <u>Markhamia platycalyx</u> (Kibuye) <u>Schima wallichii</u> (Nepal)
	Burundi	General MPT screening (both places)	<u>Melia azadarach</u> (Embu) <u>Casuarina equisetifolia</u> (Gede) <u>Cupressus lusitanica</u> (Duraja) <u>Grevillea robusta</u> (Murongwe, Namajalalo) <u>Alnus acuminata</u> (Mexico) <u>Alnus nepalesnsis</u> (Nepal) <u>Casuarina cunninghami</u> (Ruhande) <u>Cassia spectabilis</u> (Bugarama, Embu)
		Mashitsi only	<u>Acrocarpus fraxinifolius</u> (Murinyata) <u>Croton macrostachys</u> (Kiewi) <u>Cordia abyssinica</u> (Meru) <u>Erythrina abyssinica</u> (Nandi) <u>Maesopsis eminii</u> (Kakamega, Murongwe) <u>Markhamia lutea</u> (3 provenances) <u>Tipuana tipu</u> (Nairobi)

<u>Est. Date</u>	<u>Location</u>	<u>Travel Objective</u>	<u>Species and Provenance(s)</u>
Nov.88	Karaji	General MPT screening	<u>Erythrina abyssinica</u> (Nandi)
	Burundi		<u>Markhamia lutea</u> (Kakamega) <u>Acrocarpus fraxinifolius</u> (Muringata) <u>Tipuana tipu</u> (Nairobi) <u>Croton megalocarpus</u> (Kikuyu) <u>Maesopsis eminii</u> (Murongwe) <u>Croton macrostachys</u> (Kiewi)
		<u>Management trial:</u> Fodder production of different arrangement of Napier Green on Bunds	<u>Leucaena leucocephala</u> (pro. unspec.) <u>Calliandra clothysus</u> (prov. unspec.) <u>Alathyrsus</u> (prov. unspec.)
		<u>Management trial:</u> Effect of various levels of N applied through tree mulch and fertilizer and leucaena alleys.	<u>Leucaena spp.</u> (several known and unknown provenances)
	Mashitsi		<u>Cassia spectabilis</u> (4 provenances)
	Burundi		<u>Sesbania sesban</u> (3 provenances) <u>Calliandra clothysus</u> (3 provenances) <u>Leucaena leucocephala</u> (4 provenances) <u>Leucaena diversifolia</u> (provenance unknown) <u>Leucaena leucocephala</u> (4 provenances) <u>Calliandra calothyrsus</u> (Kibuye) <u>Cassia spectabilis</u> (Kibwezi, Embu)

<u>Est. Date</u>	<u>Location</u>	<u>Travel Objective</u>	<u>Species and Provenance(s)</u>
March 89		Scening MPT's for alley cropping	<u>Leucaena leucocephala</u> (2 provenances) <u>Calliandra calothyrsus</u> (Ruhande) <u>Gliricidia sepium</u> (provenances) <u>Sesbania grandiflova</u> (provenances unspec.) <u>Sesbania sesban</u> (provenances unspecified) <u>Erythrina caffra</u> (provenances unspecified) <u>Cassia siamea</u> (provenances unspecified)
March 89	Rwerere	Screening of MPTs for alley cropping	<u>Leucaena leucocephala</u> (4) <u>Calliandra cal.</u> <u>Leuc diversifolia</u> <u>Sesbania sesban</u>

Management Trials - AFRENA-EA

TRIAL	SITE/DATES
1. Tree/grass on Bunds	
(i) Tree/grass comb.	Maseno-April 88; Rwerere -April 88; Mashitsi-April 89
(ii) Tree/grass estab./spacing	Karuzi-Nov.88
2. Alley Cropping	
(i) Mulch/fertilizer	Maseno-April 88; Rwerere-April 88 Mashitsi-April 89
(ii) Cutting heights	Maseno-April 88; Rwerere March 89
(iii) Hedgerow density	Maseno Oct. 89
3. Upperstory Trees	
(i) Upperstory/Understory	Kabanyole-Nov.88 & April 89

Summary of Screening Trials

SITE	BURUNDI (Karuzi)	BURUNDI (Mashitsi)	RWANDA (Rwerere)	KENYA (Maseno)	UGANDA (Kachwe)	UGANDA (Kabanyo)	TOTAL
TRIAL							
GEN. SCREENING/OBS.							
No. of species	7	13	10	28	7	-	32
No. of species/ provenances	9	18	16	47	7	-	61
SCREENING FOR ALLEY CROP.							
No. of speceis	-	5	5	6	-	-	9
No. of species/ provenances	17	8	7	7	-	-	29
UPPERSTORY SCREENING							
No. of species	-	-	-	-	8	7	11
No of species /provenances	-	-	-	-	9	8	14