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FINAL EVALUATION

STRENGTHENING AFRICAN AGRICULTURAL RESEARCH AND FACULTIES OF AGRICULTURE

SAARFA: 698-0435

Lane E. Holdcroft

Godbertha K. Kinyondo

Melvin G. Blase – Team Leader

**Division of Food, Agriculture, and Resources Analysis
Office of Analysis, Research, and Technical Support
Bureau for Africa
United States Agency for International Development
Washington, DC 20523**

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We wish to extend special thanks to Dr. John T. Steele, AFR/ARTS/FARA, who provided continuing logistical, managerial and subject matter support during the evaluation period. His commitment to assisting the team in finding needed information and arranging meetings and interviews is much appreciated.

Lane E. Holdcroft
Godbertha K. Kinyondo
Melvin G. Blase -- Team Leader

LIST OF ACRONYMS

ACCESS	Access to Land and Other Natural Resources Project
ADO	Agricultural Development Officer
AFR	Africa Bureau (AID)
AFR/ARTS/FARA	Africa Bureau/Analysis Research and Technical Support/Food, Agriculture and Resources Analysis (AID)
AFR/TR/ANR	Africa Bureau/Technical Resources/Agriculture and Natural Resources (AID)
AID	Agency for International Development
AID/R&D	Agency for International Development/Research and Development Bureau
AID/S&T	Agency for International Development/Science and Technology Bureau
ARRAS	Agricultural Research Resources Assessments
CDA	Cooperation for Development for Africa
CIAT	International Center for Tropical Agriculture
CIDA	Canadian International Development Agency
CIMMYT	International Center for Wheat and Maize Improvement
CIP	Center for International Potato Research
CRSP	Collaborative Research Support Program
CSRS	Cooperative States Research Service (USDA)
DFA	Development Fund for Africa
FSA	Food Security in Africa Project
IARCS	International Agricultural Research Centers
ICIPE	The International Center of Insect Physiology and Ecology
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICRAF	International Council for Research in Agroforestry
IDRC	International Development Research Center (Canada)
IFDC	International Fertilizer Development Center
IFPRI	International Food Policy Research Institute
IITA	International Institute for Tropical Agriculture
ILCA	International Livestock Center for Tropical Agriculture
IQC	Indefinite Quantity Contract
ISNAR	International Center for National Agricultural Research
LTC	Land Tenure Center
M&E	Monitoring and Evaluation
MOA	Ministry of Agriculture
MSU	Michigan State University
NARSS	National Agricultural Research Systems
NRMS	Natural Resource Management Project
OAU	Organization for African Unity
OFDA	Office of U.S. Foreign Disaster Assistance
OICD	Office of International Cooperation and Development (USDA)

PACD	Project Assistance Completion Date
PARTS	Policy, Analysis, Research and Technical Support Project
PASA	Participating Agency Service Agreement
PSC	Personnel Services Contract
REDSO/ESA	Regional Economic Development Services Office for East and Southern Africa (AID)
REDSO/WCA	Regional Economic Development Services Office for West and Central Africa
ROR	Rate of Return
RSSA	Resource Support Service Agreement
SAAR	Strengthening African Agricultural Research
SAARFA	Strengthening African Agricultural Research and Faculties of Agriculture
SADCC	Southern Africa Development Coordinating Conference
SACCAR	Southern Africa Center for Coordinating Agricultural Research
SAFGRAD	Semi-Arid Foodgrain Research and Development
SIDA	Swedish International Development Agency
SIS	SPAAR Information System
SPAAR	Special Programs for African Agricultural Research
TDT	Technology Development and Transfer
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USDH	U.S. Government Direct Hire Employee
WARDA	West African Rice Development Association
WID	Women in Development

PROJECT IDENTIFICATION DATA SHEET

1. Country: Africa Regional
 2. Project Title: Strengthening African Agricultural Research and Faculties of Agriculture (SAARFA)
 3. Project Number: 698-0435
 4. Project Dates:
 - a. First Project Agreement: July 21, 1982
 - b. Final Obligation Date: December 9, 1992
 - c. Most Recent Project Assistance Completion Date: July 31, 1993
 5. Project Funding (amounts obligated to date):
 - a. Core Activities: \$ 7,709,000
 - b. Sub-Projects: \$31,983,000
 - c. Total: \$39,692,000
 6. Most of Implementation:
 - a. USAID Direct Contracts: 7 activities - \$ 4,238,989
 - b. RSSA (USDA): 1 activity - \$ 1,600,000
 - c. PASA (USDA): 1 activity - \$ 1,046,817
 - d. Grant Instruments 18 activities - \$28,513,194
 - e. Buy-ins R&D Projects: 4 activities - \$ 4,293,000
 7. Project Designers: USAID in collaboration with other donors
 8. Responsible USAID Officials:
 - a. USAID/Washington: Director, AFR/ARTS
Food, Agriculture and Resources Analysis Division
Division Chief, AFR/ARTS/FARA
Technology Development and Transfer Unit Leader,
AFR/ARTS/FARA/TDT
 - b. Project Officers: John Slattery 6/82--8/85
Arlo McSwain 9/85--3/88
Richard Newburg 4/88--3/91
Larry Abel 3/91--10/91
Mikchael Fuchs-Carsch 10/91--3/93
Curt Reintsma 3/93--7/93
- Previous Evaluation: Report of the Evaluation of the SAARFA Project, August 1989

MAP OF SUB-SAHARAN AFRICA

EXECUTIVE SUMMARY

The Past:

- SAARFA has been highly successful overall in strengthening African NARSSs -- both in terms of capacity building and technology development and transfer, albeit the mix of the two varies widely from sub-project to sub-project.
- The return on the modest investment in SAARFA has been impressive, and its people-impact has been very great. SAARFA has been relatively inexpensive, e.g., this ten year project for all of sub-Saharan Africa costs less than the annual budget of the Iowa Agricultural Experiment Station.
- Most of the on-going SAARFA sub-projects, both in the natural and social sciences, have demonstrated their effectiveness in reaching their stated objectives and need continued funding that is uninterrupted.
- The U.S. should continue to encourage donor cooperation and collaboration through the SPAAR initiative. At this time it is especially important that the U.S. help SPAAR further clarify its mission and build consensus for it. The U.S. should be more assertive, given its international advantage in agricultural research.
- Regional networks are numerous in Africa, with various degrees of effectiveness. Those most effective have clearly focused research objectives. These have been and can be expected to continue to be an effective method of strengthening NARSSs to conduct improved research. The NARSSs are and should be assuming increasing leadership of the regional research networks. These networks offer the U.S. a cost effective manner to provide support to much agricultural research in sub-Saharan Africa. For those reasons they deserve attention and support.
- Primarily due to the small pool of women B.S. graduates in agriculture, relatively few were involved in the sub-projects. A deliberate program is needed to train more agricultural scientists at the graduate level, especially women.
- Future research projects -- like some of the present sub-projects -- should be designed, whenever possible, to provide technology for U.S. agriculture as well as the agricultural sector in the host country(ies).

The Future:

- A new Africa Bureau-funded regional agricultural technology development and transfer project for sub-Saharan Africa should

be designed and initiated as soon as possible. It should be designed to play a major role in implementing the Bureau's new "Strategic Framework." A well funded, long-term, umbrella-type project focused on regional priority problems is needed. Each of these characteristics is worthy of elaboration.

- The project should be adequately funded. Certainly, the U.S. has resources to adequately fund such research. By way of comparison, at least two U.S. state universities spend more for agricultural research in one year than SAARFA spent in a decade. Clearly, even allowing for other donors' contributions and host institutions' inputs, additional funding is appropriate. One approach to budget determination is to array high priority problems that appear to be amenable to research both with regard to probability of success and magnitude of impact (payoff). Funding would then apply to those projects which promise high returns on investments until the available funds are allocated.
- Research tends to be long term both in terms of time to payoff and duration of payoff. The latter is the means for justifying projects with the former. The biological nature of agricultural phenomena necessitates that considerable time is required to attain the number of replications to insure that results are not due to chance. Further, much agricultural research is location specific and requires that adaptive research be done in specific locales which lengthens the time needed. Added to this are the time requirements of technology transfer programs that persuade farmers to forego technology with which they feel secure for new technology with which they are unfamiliar. Everything considered, this suggests a 10 to 20 year planning horizon for a realistic future project if new problems are to be addressed.
- The last characteristic of the new initiative should be an umbrella-type project. SAARFA has served well as a rapid response mechanism. It also has served as a model for other projects in the Africa Bureau, e.g., NRMS and PARTS. It has enabled felt needs to be manifested in research proposals. As a result, an unusually productive set of projects has resulted. This successful aspect of the project should be built into the new initiative. The only suggested change in this regard is that a panel of experts should be convened to evaluate proposals, thereby providing more rigor to the project selection process.
- Follow-on activities to SAARFA should continue to support a balanced mix of physical and social science research activities. They should continue to focus on technical as well as policy, institutional, and economic issues. The economic feasibility of both input and output marketing should be emphasized. This is illustrative of the need for continued

social science research relative to the physical science emphasis of SAARFA sub-projects. In many African countries, agricultural markets are thin and, especially in the case of output markets, are characterized by very inelastic demand curves. Hence, such things as market development (especially for exports) and input market efficiencies, largely in the private sector, should be built into a set of sub-projects with systems orientations.

- In the process of creating the initiative, USAID would be well advised to use the good offices of SPAAR in coordinating with other donors. SPAAR can play a unique role in fostering donor coordination to ensure a long term initiative that is complementary to, not in competition with, other donor efforts. Likewise, SPAAR can assist USAID and other donors validate features of the program among the NARSSs.
- Immediate action is needed with regard to several matters. First, USAID should not let effective SAARFA sub-projects die. Bridge financing is needed immediately for the soil fertility restoration, fertilizer policy, and rice research projects. Note is made of the fact that support for four of the crop network research projects, the rinderpest vaccine effort, the heartwater research project, and the Food Security and ACCESS projects is being provided from other sources. Second, training programs, as a means of institution building, should be expanded. Long term training, especially for women, at the B.S. level is needed to expand the pool of potential M.S. candidates. A scholarship program for women at both levels is needed. Third, the search for ways the research results can apply to other countries, especially U.S. agriculture, should be continued. For example, the heartwater project's results have potential, immense value for the US and other countries outside of Africa where the bont tick infests ruminant livestock. Finally, training in financial management should be initiated immediately in order to further prepare Africans NARSSs to play the leadership roles in the future envisioned for them. This is illustrative of the supporting roles that universities can play for NARSSs.

FINAL EVALUATION REPORT

STRENGTHENING AFRICAN AGRICULTURAL RESEARCH AND FACULTIES OF AGRICULTURE (SAARFA: 698-0435)

1. Introduction

1.1 Overview

The Strengthening African Agricultural Research and Faculties of Agriculture (SAARFA) project is an African Bureau regional project authorized at \$49 million. The project began in August 1982 and the Project Assistance Completion Date (PACD) is July 31, 1993.

The project purpose is to strengthen national and regional African agricultural research systems and programs to address research priorities identified within the various agro-ecological zones of Africa.

It has been implemented through grants and cooperative agreements with International Agricultural Research Centers (IARCs) and U.S. universities; contracts with consulting firms and individuals; and Resource Support Service Agreements (RSSA) and Participating Agency Service Agreements (PASA) with the United States Department of Agriculture, Office of International Cooperation and Development, (USDA/OICD). It has been managed by the United States Agency for International Development (USAID)/Washington, the REDSOs, and, in some instances, by bilateral missions.

The SAARFA project has been the largest activity funded by the Africa Bureau to strengthen African national and regional research institutions. It has had two components: a) core project activities which provide technical assistance for designing, monitoring, evaluating and coordinating project activities, plus support for donor and African technical planning and coordination meetings; and b) discrete sub-projects which are authorized on an individual basis to support priority agricultural research needs, usually on a transnational scale.

The project has fulfilled its objectives. All 15 sub-projects have been operational and, perhaps with two exceptions, have made significant contributions to achieving the project purpose. Also, several of the sub-projects have been funded in collaboration with other Special Programs for African Agricultural Research (SPAAR) donors.

1.2 Background

In the Fall of 1980, the U.S. was designated by the Cooperation for Development of Africa (CDA) group of bilateral donors to take the lead in developing an approach to strengthen agricultural research in Africa, including guidelines for program implementation which

CDA members could support. This approach emphasized undertaking research especially in food crops, upgrading and reorienting National Agricultural Research Systems (NARSS), research management on the basis of the five major agro-climatic zones, and on-farm research of small-scale systems. A CDA donor took the lead in each agro-climatic zone; the U.S. in Southern Africa, and the U.S. and France together in the Sahel.

In 1982, the SAARFA predecessor project, the Strengthening African Agricultural Research (SAAR) project was authorized to finance the U.S. commitment to CDA. This included initially financing Southern Africa and Sahel research inventory/assessments (needed as the basis for new programs), and getting selected IARCs, U.S. universities and other U.S. contractors to bring their expertise to bear on sub-Saharan African agricultural problems. In some, but not all, cases the research was organized in regional networks. When the CDA initiative ended in 1986, the U.S. joined the newly created Special Program for African Agricultural Research (SPAAR) led by the World Bank.

The SAAR project was intended to provide a mechanism to secure greater and more effective donor collaboration and coordination in programs to help strengthen sub-Saharan African NARSSs. It was seen as part of a multi-donor, Africa-wide project. In 1985, support for faculties of agriculture was added, the name changed to Strengthening African Agricultural Research and Faculties of Agriculture (SAARFA), and authorized funding was increased from \$19.5 million to \$41 million. Then in 1989, authorized funding was increased to \$49 million, although to date only \$39.7 million has been obligated and about \$38 million expended.

Thus, the original project evolved into a substantial, regional, "umbrella" project to promote and achieve U.S. interests related to African agricultural research. Furthermore, it implemented the Africa Bureau strategies, i.e., the 1981 "Food Sector Assistance Strategy," the 1983 "Agricultural Research Strategy," and the 1985 "Plan for Supporting Agricultural Research and Faculties of Agriculture in Africa."

With SAARFA as a catalyst, USAID and other donors made major investments in agricultural research and extension or technology development and transfer (TDT) activities in sub-Saharan Africa in the early 1980s. However, obligations for TDT under the Development Fund for Africa (DFA) declined steadily from \$55 million in 1986 to \$35 million in 1991. This decline reflected a decrease in the proportion of the DFA allocated to agricultural TDT from 34 percent of the allocation to all agricultural activities in 1986 to 14 percent in 1991 (Oehmke and Crawford 1992).

This was partly the result of the perception that TDT activities were not producing significant results in terms of increases in farm yields or incomes, as indicated by per capita food production. This was ironic because, as stated on page 1, the objective of the

project was to strengthen national and regional African agricultural research systems. While it became obvious that African TDT organizations' budgetary and staffing problems precluded them from implementing extensive research programs immediately, impatience in strengthening them so they could increase yields or incomes resulted in disenchantment with these investments.

Perhaps equally important, the DFA guidelines discouraged funding activities that might not have short-term impact, e.g., TDT institution building and capacity building initiatives, the very objective of SAARFA. Although some senior Africa Bureau personnel maintain now that the door is open for activities with longer term pay-offs, field personnel in management positions are leery. Furthermore, USAID field mission directors understand that their work performance will be rated on the short-term impact of their programs, so they are reluctant to become involved in host country institution and capacity building efforts. Field missions must focus on a small number (usually three) of strategic objectives. They tend to select projects that can show short-term impact, and have earmarked funds available, e.g., child survival, health and population. Projects requiring time to develop capacity so that they, in turn, can have a development impact tend to be in disfavor.¹

In spite of unrealistic time pressures in a number of cases, several recent rate of return (ROR) studies have shown positive RORs for some African research investments. These findings are in direct contrast to the negative comments about African agricultural research which are reported to have permeated discussions at times during the SAARFA project. They support the proposition that much African agricultural research has positive impacts. Further, they indicate that these impacts are large enough to justify the level of investment that led to the impacts (Oehmke and Crawford 1992).

1.3 Purpose of Evaluation

The purpose of this evaluation is to assist in determining how the Africa Bureau can improve its strategy for promoting agricultural technology development and transfer in Africa.

¹This is mindful of the fable about the mother cat who wanted to move her kittens to a far off mountain. The story says she consulted the wise old owl before making the journey. He advised that if she moved slowly she could reach her destination with her wee kittens before the dreaded nightfall. The next day she proceeded to make the journey but failed to heed the wise old owl's advice. Her fast pace exhausted the kittens long before they reached their destination and they had to spend the dreaded night in a strange and foreign land. Indeed, haste does make waste in more areas than just fables.

It has focused mostly on the past three and a half years since the last SAARFA external evaluation. The detailed Scope of Work for this evaluation is attached as Annex A.

1.4 Evaluation Methodology and Team Composition

Over a three week period, the three evaluation team members reviewed the SAARFA project publications and other pertinent publications, reports, and documents listed in Annex B. Another three weeks were spent meeting and conducting interviews with appropriate former and current project and sub-project personnel, (both African and U.S.), other donor personnel, and USAID staff in both the U.S. and Africa. The individuals contacted by the team are listed in Annex C. The last four weeks of the evaluation period were devoted to the preparation of the first draft of this report, which was submitted to the Africa Bureau on April 15th.

The team was composed of a university professor who has specialized as a research institutional specialist (team leader/lead team member for overall evaluation and programmatic issues) with 30 years of experience in agricultural research and institution building; an agricultural economist (lead team member for implementation and management issues) with 34 years of experience in project design, implementation and evaluation; and a research planner economist (lead team member for technical and Women in Development (WID) issues) with several years of agricultural research experience in Africa. In addition to the three team members, an agricultural economist and former Regional Economic Development Services Office for East and Southern Africa (USAID) (REDSO/ESA) Agricultural Development Officer (ADO), prepared the paper on agricultural research networks in Africa, Annex E of this report.

1.5 A Theoretical Perspective on Complementary and Competitive Outputs

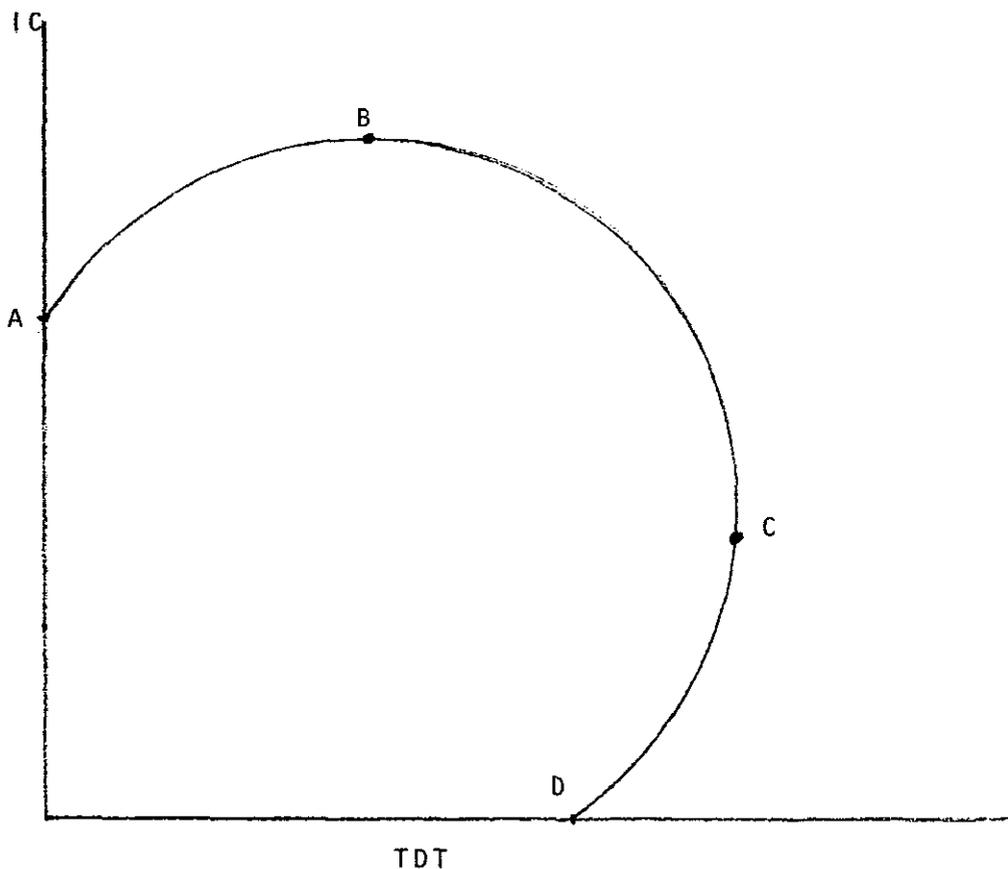
Earlier reference was made to the dual project objectives of capacity building and technology development and transfer. Both need to be considered in an evaluation. To use one or the other only would suggest the use of double standards, i.e., TDT impact on production in contrast to the stated project purpose of strengthening African research institutions. From a theoretical perspective such a dichotomy does not have to exist for all projects. For some, if not most, projects in agricultural research there are ranges of complementarity as well as ranges of competitiveness. This can be seen with the aid of a production possibility curve. In some respects the entire SAARFA project is analogous to a multi-product firm for which such curves can be developed.

Assume for a moment that SAARFA can be viewed as having two outputs -- building institutional capacity (its stated purpose) and TDT which is frequently used in terms of impact on production (yields

or income) in impact studies. From this point of view the SAARFA production possibility curve can be depicted as in Figure A, where IC indicates capacity development in research institutions and TDT measures technology developed and transferred to farmers, measured in terms of increased production.

Figure A shows two ranges of complementarily -- AB and CD. The preferred points in these two ranges are B and C because more of both outputs will be obtained by moving from the axes to those points.²

FIGURE A. A PRODUCTION POSSIBILITY CURVE FOR A HYPOTHETICAL AGRICULTURAL RESEARCH AND DEVELOPMENT PROJECT SIMILAR TO SAARFA



Fortunately, several of the SAARFA sub-projects exploited the range of complementarily. For example, several of the research networks increased the capacity of their members via training while at the

²Production possibility curves assume that all of the producing entity's resources can be devoted to either product. This is frequently discussed in the literature as the "guns vs. butter" dilemma of national economies.

same time increasing the technology output for farmers to use. One of the objects of project design efforts should be to take advantage of these ranges of complementarity.

For most projects there also is a range of competitiveness -- more of one output means less of the other. Since non-market goods are being produced, price ratios are not available to identify the point of optimality. Instead, the indifference curves of the decision makers can be superimposed on Figure A to identify that point between B and C.

This is not to say that projects should not emphasize one output or the other. Some of the SAARFA sub-projects emphasized institution building almost to the exclusion of technology generation and vice versa. Both have their advantages, given the demands placed upon them and should not be caught in the "crossfire" of double standards, i.e., use of only one output as the evaluating criterion.

2. Issues

2.1 Technical

2.1.1 Donor Coordination and Support

Under the CDA agricultural initiative, the U.S. demonstrated its commitment in carrying on agricultural research in Africa, through SAAR and then the SAARFA project. This was done through technical coordination done by CDA, up to 1986, when it was succeeded by SPAAR. SPAAR has taken the role of leadership in donor coordination and resource mobilization. Part of the success of SAARFA sub-projects can be attributed to the existence of multilateral donor coordination.

Donor coordination, at the most basic level, involves the sharing of information so that development assistance initiatives do not work at cross-purposes. SPAAR has established the SPAAR Information System (SIS) for the Africa region. This will help to prevent donor duplication of programs and enable cooperation. The data keeps track of donor contributions in countries where it operates and collects a detailed listing of all technical assistance and capital assistance projects, including the name and description of the project, its budget cost, the amount disbursed during the year and the estimated project completion date. This information is for the use and benefit of the NARSS, as well as the donors.

A.I.D. can assist SPAAR by fostering the use of the SIS database in the countries in which it operates. This will also help AID/W and the REDSO offices to have information on other donor activities. Currently, people wanting to use the SIS database have to attend a special training course. SPAAR needs to make this database readily accessible to its audience, e.g., use the West African Rice

Development Association (WARDA) information dissemination system to scientists.

In order to attract additional external financing, SPAAR can help host governments organize defined units or functions to focus on the mobilization of potential sources, have trained personnel to prepare proposals, and obtain current knowledge of potential funding sources. This is important because it is really the recipient country's responsibility to pull donors together and persuade them to fund what the country wants. This can be accomplished through the host nation developing strategies and action plans which are well conceived, i.e., in alignment with budget realities and NARSS capacity to implement. Meetings and conferences convened to encourage donor collaboration will only be effective when there is something convincing on which to collaborate.

2.1.2 The U.S. Role in SPAAR

The team found widely varying views of the role of SPAAR. Hence, that role needs to be clarified. The U.S. should assume leadership in helping clarify the primary mission of SPAAR. The upcoming SPAAR External Management and Program Review, the first in SPAAR's history, should provide an opportunity for the role of SPAAR to be further debated and agreement reached with regard to what is its appropriate role. Thus, prior to proceeding further, the U.S. at the highest level of leadership should assume responsibilities for building consensus concerning this basic mission among both donors and recipient nations.

2.1.3 Efforts to Assess Research Priorities

Through SAARFA and its predecessor SAAR, the U.S. has satisfactorily fulfilled its commitment under the CDA and SPAAR initiatives. The ARRA's guided the U.S. and other donors in setting benchmarks, as well as identifying investments in priority research in the agro-climatic zones.

National program scientists have participated in setting the research priorities for the SAARFA networks. These priorities have emphasized 1) major, common physical constraints found in agro-climatic zones; 2) importance of the crops, proxied by calories; and 3) acreage planted. In addition, SAARFA included farming systems research (e.g., the International Center for Wheat and Maize Improvement (CIMMYT) lead network) which was designed to help identify TDT constraints.

Priority setting needs a stronger inclusion of economic analyses. Analyses should involve agribusiness policy, input supply and marketing, and commodity market improvements. Attention is also needed for building-block research on non-commodity phenomena such as soils and water management. These are crucial for the sustainability of agricultural development.

In many NARSS resources are allocated based on judgement, prior knowledge and other information provided by scientists. Therefore, in order to make changes in the system, the increased use of quantitative methods, at least as sophisticated as scoring techniques, may be necessary to improve the objectivity of those judgements. The aim of this activity is to improve the consistency of research priority-setting in a transparent manner consistent with goals and objectives. Overall, this should improve the efficiency of the research systems in meeting producer and consumer needs.

SPAAR has developed a Framework for Action (FFA) for some ecological zones which recommend institutional and management reforms. USAID is helping SPAAR by providing technical and financial support to enable it, in turn, to provide necessary advisory and analytical support to the NARSS and regional institutions. The reforms are expected to lead to demand-driven national and regional research agenda. This will provide links between scientists and clients which will lead to faster rates of TDT, as demonstrated by the success of cotton research in the Sahel.

2.1.4 Networks and Other Support of Bilateral Research Efforts

There are five SAARFA networks in East and Southern Africa which were managed by REDSO/ESA. The Mangrove Swamp Rice Network has been managed by the Regional Economic Development Services Office for West and Central Africa (REDSO/WCA).

There is evidence from the documents reviewed, people interviewed and selected site visits that the SAARFA networks have been successful in fulfilling their objectives. To a remarkable degree, they have facilitated regional collaboration in removing agricultural constraints in their agro-climatic zones.

Although it takes a long time for the result of agricultural research to be reflected in on-farm production, some intermediate results are obvious. An illustrative list is found in 2.2.1. and a comprehensive enumeration can be found in Annex D, and recent sub-project evaluations. Suffice it to say, a flow of technology has come from the project.

Networks have contributed greatly to breaking the isolation among scientists through the sharing of information and the working together on common research tasks. Also, the enhancement of human skills through short- and long-term training, workshops, monitoring tours, and exchange of scientific materials has been a major component of capacity building in NARSS which has enhanced their ability to do quality research.

In a participatory network like that coordinated by WARDA, both strong and weak NARSS have had the opportunity to share their

expertise through the regional programs, by performing tasks in which they possess comparative advantage. This also has enabled the entire network to be more productive than the sum of its parts would have been.

Exchange of germ plasm has been the traditional cornerstone of conventional networks. Experience is demonstrating, however, that networks need to expand far beyond that starting point. Each production enterprise needs to be viewed as a system and constraints for the entire system need to be addressed in the network research priorities. For example, both input and output markets need to be addressed when this approach is taken.

Networks have displayed additional advantages, both in the areas of cooperative funding. First, when funded by multiple donors they enable scientists to continue to function in the research community when bilateral aid would terminate for political reasons, as was the case in Zaire. Maintaining this international community of scholars is important as a force for stability in the world. Second, bilateral assistance tends to be organized by projects with discrete beginning and ending points. Biological research needs to be a continuous, block-building process which networks can sustain between projects. It is especially important when missions are limited to a few focal programs, usually three as indicated elsewhere in the report. Hence, over time bilateral approaches to research can be expected to come and go. Networks both represent a stabilizing force and enable USAID to invest relatively small amounts of resources in possible high payoff activities whose potential should be explored in a balanced portfolio.

The SAARFA networks have supported the bilateral research efforts of USAID missions in Burundi, Rwanda, Uganda and Zaire who, in turn, gave funds for either buy-ins to the regional projects (e.g. PRAPAC, ESARRN) or local currency grants for the operation of potato research and extension work in their respective countries.

2.1.5 The International Agricultural Research Centers -- National Agricultural Research Systems (and NARS - NARS) Collaborative Relationships

SAARFA networks have enabled NARSs scientists to participate in setting priorities for the networks, as well as provided ways for communication among scientists through workshops, monitoring tours, and exchanging scientific materials. These have enhanced the collaboration of NARS to NARS.

The SAARFA networks have been an effective means for linking NARSs and IARCs. In some instances, research agendas of both NARSs and IARCs have changed in order to match the research priorities of the network. A good example is WARDA, and its rice networks. Although the priority of IARCs has been to conduct research and to develop technologies, improving NARSs is essential because it is through

NARSS that the technologies developed by IARCs can be tested, modified through a process of locally conducted adaptive research, and transferred to farmers. In the process, SAARFA has made NARSS more active participants in the research system. Still care needs to be taken by the NARSS so that they will not be enticed to participate, for fear of missing a chance at additional resources, in some IARC activities which are not appropriate for their own national benefit.

2.2 Programmatic

2.2.1 Major Inputs and Outputs Relative to Project Purpose

The project has been far more productive than its designers anticipated. The \$40 million invested has resulted in 1) increased institutional capacity and 2) people-level impacts, that would require pages if enumerated in detail. In this section the focus will be on the types of outputs, an illustrative listing of outputs and the outputs of one sub-project that deserve special attention. But before doing so, the project needs to be put in perspective with respect to budget.

USAID spent \$40 million over ten years for these 15 sub-projects plus a set of supporting core projects. They were focused on an entire continent. By comparison, the budget of the Iowa Agricultural Experiment Station currently is \$50+ million per year. Even allowing for inputs from the host African institutions and other donors, this project needs to be recognized as a very small investment by almost any realistic standard.

As suggested above, the project exceeded its purpose of strengthening African agricultural research capacity and faculties of agriculture. This capacity-building was supplemented by the appreciable technology development and transfer that occurred. Evidence of the former is that the NARS are increasingly taking command of the networks in which they are involved. Evidence of the latter is the list of selected outputs of the sub-projects that follow. While more details about the outputs and inputs of the sub-projects are given in Annex D and recent sub-project evaluations, this list illustrates the variety of technology produced.

Although much of the output is presented in terms of crop varieties developed which are superior to those previously used, other types of output are obvious as well. Illustrative of the former is the fact that International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has been involved in the release of 42 improved sorghum varieties and 23 improved millet varieties. Illustrative of the latter is the fact that International Institute for Tropical Agriculture (IITA) has used a network approach to coordinate national research programs via Semi-Arid Foodgrain Research and Development (SAFGRAD) maize and cowpea programs. With regard to

details, SAFGRAD contributed to the release of 30 improved maize varieties and 24 improved cowpea varieties. International Council for Research in Agroforestry (ICRAF) and the Burundi, Kenya, Rwanda, and Uganda NARSSs initiated the Agroforestry Research network for the highlands of East and Central Africa in 1986. This network has developed and released seven new techniques for East Africa, including two dealing with soil fertility and four with soil conservation. WARDA's work in mangrove swamp ecosystems shows that improved rice varieties out-yield the best local varieties by 25 to 32 percent. International Center for Tropical Agriculture (CIAT) networking led to the development and release since 1986 of over 25 new varieties in nine countries, including some countries that had never previously released an improved bean variety. An impact study of the variety Umubano, introduced into southern Rwanda from the CIAT germ plasm bank in 1987, now shows that it is being grown by 70,000 farmers on 10,800 hectares. The positive effects of Center for International Potato Research (CIP) efforts and the negative effects of blight on traditional varieties contributed to a nearly complete replacement of East African potato varieties over the past ten years. CIP estimates the ROR to potato research and production and extension in Burundi, Rwanda and Zaire to be 91 percent. International Fertilizer Development Center (IFDC) has published 18 reports of results concerning 1) crop response and 2) obstacles to fertilizer use. It and the International Food Policy Research Institute (IFPRI) have published 15 reports giving results of the fertilizer policy project -- results that are quite useful in connection with the structural adjustments taking place in many African countries. The Food Security in Africa project of Michigan State University has provided policy advice to many African governments that has been held in high regard by both those governments and USAID Missions. Likewise, the Access to Land and Other Natural Resources (ACCESS) I and II sub-project of the University of Wisconsin's Land Tenure Center has been very well received, especially by USAID missions.

One sub-project's accomplishments are noteworthy. The heartwater activity addressed one of the most formidable diseases in the world that affect ruminant livestock. Prior to the accomplishments of this activity, the infected animal had to die before the disease could be diagnosed. Further, efforts to reduce the population of the transmission vector, the bont tick, involved repeated, expensive dipping of the animals at risk. Prior to the project, a vaccine for the blood parasite did not exist.

The sub-project midterm evaluation stated that this research effort had made more advancement in its short life than the entire profession had made in the previous 30 years in dealing with the disease. The end of sub-project evaluation reported that 1) via biotechnology techniques a diagnostic procedure had been developed that can be used on live animals; 2) a tail patch to attract ticks via a pheromone was nearly ready for commercialization; and 3) a first generation vaccine had been developed that showed promise for commercial use.

Not only is heartwater a problem in Africa but also it has infected herds in islands in the Caribbean, a bird's flight from the U.S. If an infected tick were to be transported into the U.S., e.g., on a bird, and introduced the disease into the wild game population, the entire ruminant population of the U.S. would be at risk where the bont tick is prevalent.

Clearly, this sub-project, for which the University of Florida has provided technical assistance, has produced results of immense value.

2.2.2 Addressing Priority Research Needs

SAARFA has addressed the priority research areas commensurate with the needs of the agro-climatic zones under the aegis of CDA and SPAAR. USAID should continue to assist host countries in identifying regional and national priority research needs in the context of the SPAAR initiative. The U.S. has a distinct advantage in providing agricultural expertise knowledgeable about the world stock of knowledge. Access to this knowledge is essential for NARSs to identify a research project mix that has a reasonable probability of success. As the NARSs increasingly place demands on assistance providers, this information is mandatory if a respectable success rate is to characterize the research output.

2.2.3 Diversification of SAARFA Activities

The project has funded a diverse set of sub-projects -- but the physical science-oriented ones still predominate. More important than to change the sub-project mix is the need to continue to move the physical science efforts to a systems perspective. Especially important in doing so would be work starting with input markets, carrying through output markets and extending into environmental considerations. (See Food Security Project description in Annex D for an example of this approach.) To break out of the semi-subsistence agricultural maze will require the development of value-added export markets. For example, the USAID assisted export market development for snow peas and broccoli from Guatemala to the U.S. has created a domino effect impacting the entire agricultural sector of the country. Similar further development of European markets for African produce could be expected to help break the semi-subsistence stranglehold. Meanwhile, technology needs to be developed that will take into consideration the fact that farmers minimize purchased inputs if they are semi-subsistence producers. This is a much more difficult task than formulating technology for a fully monetized agricultural economy.

2.2.4 Agricultural Universities' Role in Research

Agricultural universities have played two roles directly in the project. First, the Faculty of Agriculture was the host institution in Rwanda. Second, university professors were actively involved in the fertilizer policy study in Ghana, the numerous food

security analyses, and many of the ACCESS sub-project studies, among others. The unstated roles of universities, of course, has been to train the researchers in the Ministries, at least at the B.S. level.

In many developing countries, a significant amount of the agricultural expertise that might make a substantial contribution in a collaborative research effort is in the teaching faculty of universities. If joint research programs were fashioned, this substantial potential could be realized. Obviously, institutional innovations will be required for this to happen in many countries. Given the historical competitive relationships between universities and research organizations in ministries, this will be difficult. Nevertheless, at least one pilot country should be selected for a project where the funding would be shared by the two institutions. This should be done in an effort to develop an African model somewhat analogous to the collaborative relationship between the Agricultural Research Service (ARS) and Land Grant Universities in the U.S..

2.2.5 Women in Development Issues

Because women comprise a high percentage of subsistence farmers in Africa, their needs ought to be taken into consideration when designing agricultural research projects. An example of the need to consider women is the WARDA produced high yielding rice variety which was rejected by women farmers because it was a short variety. Because women harvest rice panicle by panicle, tall varieties ease their harvesting job.

Both men and women agricultural scientists need to redouble their efforts to ensure that the needs of women farmers are met, starting with the design of research and extension projects. Research has shown that male extension workers can be accepted by women farmers if they are first introduced by female colleagues.³ This highlights the importance of having some minimal number of women employed in extension and research systems in order to conduct programs that are demand-driven by the needs of women farmers.

Very few agricultural women scientists or leaders were observed on the site visits. The under-representation of women in NARS is understandable. Very few women have acquired Ph.D. degrees in agriculture, thus making it difficult for them to secure positions of leadership. By way of comparison, some countries, such as Tanzania, actively recruited women into the agricultural system by permitting female Form Six leavers who passed with high grades to enroll in the university immediately rather than having to work for two years, as was the general requirement before going on for

³See, for example, Spring, A. 1986. "Men and Women Participants in a Stall Feeder Livestock Program in Malawi." Human Organization 45(1): 154-62.

advanced education. This allowed greater numbers of women to be trained in agriculture and to advance more quickly in the NARS.

Thus, USAID should provide opportunities for more women to attain an education in agriculture so that, among other reasons, a larger pool of women agricultural scientists and leaders can be developed. USAID should establish scholarship programs for women to study at local universities. For example, USAID/Malawi has effectively used a women's scholarship program to increase the number of women enrolled in fields not traditionally accepted as appropriate for women. The program has been used as a way of preparing them for graduate studies in the U.S. immediately upon attaining their first degree.

Finally, the Agency might consider a spouse scholarship program. In such a program USAID/Indonesia found that resistance from husbands deterred qualified women from enrolling in graduate programs in the United States. However, funds were set aside under a bilateral project that permitted male spouses to enroll in training programs in the U.S. (sometimes an A.A. degree) at the same time. This kind of program has to be used judiciously as the costs, if applied Agency-wide, could be prohibitive. Tandem scholarships, if carefully programmed and justified by how both spouses would apply their education after graduation, ought to be considered as one way of advancing the careers of promising women scientists.

Education is the key to getting into leadership positions, especially policy and decision making positions. However, there is little evidence that any of the 15 SAARFA sub-projects placed the funding of higher education for women scientists as a priority. Perhaps if USAID revised some of its training policies and aggressively promoted the training of women, future projects would avoid this shortcoming of SAARFA. Development of an Africa Bureau WID Action Plan would provide a context for these changes to be made.

2.3 Implementation

The SAARFA project has been USAID's largest agricultural research project in sub-Saharan Africa. From its initiation in 1982, it evolved into a very substantial regional "umbrella" project composed of diverse activities in terms of size, nature, modes of implementation, and management. SAARFA, per se, had no firmly categorized inputs or outputs, but rather depended on the submission of unsolicited proposals for the development of sub-projects and some core activities. Most of the sub-projects did have clearly identified inputs and outputs -- even though the "log frame" project design methodology was not always used in preparing sub-project proposals. Never the less, an unusually productive set of sub-projects surfaced as a result of this process.

2.3.1 The Flexible "Umbrella" Project Design

The SAARFA project was designed to be flexible, simple, and entail low design costs. It was intended to address needs fast, and have the flexibility to respond to changing conditions and environments in a timely manner. Without exception, USAID staff interviewed believe that this flexible "umbrella" project design/structure worked well and facilitated the achievement of SAARFA's objectives, as well as the Africa Bureau's strategic objectives. These are outlined in the 1981 "Food Sector Assistance Strategy," the 1983 "Agricultural Research Faculties of Agriculture in Africa," and the 1992 "Strategic Framework for Agricultural Technology Development and Transfer in Sub-Saharan Africa."

2.3.2 Core Activities

The SAARFA project funded 17 discrete core activities over the life of the project. These were diverse in terms of size, nature and modes of implementation and management. They included a range of activities, e.g., research on farmer-built dikes in the Sahel by a U.S. graduate student; technical assistance for managing, monitoring, designing, evaluating and coordinating SAARFA project activities; and support for donor and African technical planning and coordination meetings. Also various studies, e.g., the effects of selected policies and programs on consumption patterns; and private sector agricultural TDT efforts, were funded.

The documents reviewed and the persons interviewed indicated that most of the core activities had been adequately planned or designed. However, many of the activities funded were completed prior to the beginning of the last three and one-half years on which this evaluation concentrates. Furthermore, some of the documentation was no longer available. Nevertheless, some generalizations are possible. Most respondents felt that most of these core activities were supportive of the sub-projects. In particular, the Devres reports were considered to be of value in southern Africa as reference documents. Specifically, they contain benchmark data concerning African research institutions that can now be used to evaluate institution building progress. These data should be shared with SPAAR which should be urged to make this evaluation of institutional changes. The other major user of these funds, the USDA-OICD RSSA and PASA, provided support for the general program.

2.3.3 Sub-project Selection

Of the 15 sub-projects, 13 clearly contributed to achieving the SAARFA project purpose and also addressed research priorities identified within agro-ecological zones. These sub-projects were designed by capable agricultural scientists who understood how to respond to sub-Saharan Africa's changing conditions and environment in a timely manner.

The International Center of Insect Physiology and Ecology (ICIPE) sub-project did not live up to all its expectations. Its goal was

to contribute to increased sustainable food crop production through better integrated pest management by resource-limited farmers. After several years of sub-project implementation, an audit and end-of-project evaluation were conducted. These indicated some irregularities and deficiencies in sub-project implementation. Therefore, no funds were disbursed after February 1992, and the sub-project ended in August 1992 (\$1.6 of the \$2.3 million planned were disbursed). Although scientists were employed and trained, and some new technologies developed, the new technologies were shared only to a limited extent with the NARSSs.

The rinderpest sub-project appears to fall in the commercialization gap between 1) conventionally defined research and development and 2) traditional private sector production and distribution. While some in the field of veterinary medicine would categorize the sub-project as applied research, a number of USAID personnel seriously question whether it is sufficiently research-oriented to have been included in the SAARFA project. Its second phase was funded in 1992 by the Office of U.S. Foreign Disaster Assistance (OFDA). This appears to be an appropriate source of support for this type of activity.

This activity illustrates both a challenge and an opportunity with regard to research projects that result in commercializable products for registering their people-level impacts. The challenge is to expand the inclusiveness of the research and development (R&D) continuum. Increasingly, recognition is being given to the fact that by being defined too narrowly, product development stops too soon and the product/technology falls into the commercialization gap. There it remains because it is considered to be too high a risk for a private firm to initiate production. In the U.S. both states and the federal government are beginning to address the commercialization gap as an extension of the R&D continuum. The opportunity illustrated by the project is the possibility that by addressing the commercialization gap directly, people-level impacts may be registered much more quickly in Africa than in the past. Clearly, USAID would do well to address this issue especially in Africa where the private sector may be more reluctant to take agribusiness risks than in the U.S..

Nonetheless, with the exception noted above, the SAARFA selection mechanism of encouraging the submission of unsolicited proposals for the development of sub-projects and some core activities has worked well. It has been flexible, simple, and entailed low design costs. It has addressed needs quickly, and has been able to respond to changing conditions and environments in a timely manner.

The evaluation team recommends that any future regional agricultural research project consider using a competitive grants system. This mechanism might be patterned on the system that is currently being employed by the USDA Cooperative States Research Service (USDA/CSRS). Proposals for funding would be reviewed and selected by a highly competent technical board comprised of five

senior agricultural research scientists. The proposals would be submitted to the board by public and private research institutions, i.e., IARCs, NARSS, universities, individually or jointly, having been prepared by their competent professional staffs. By basing the selection of activities to be funded on the decision of an objective and technically competent board, the quality of the proposals should be improved.

2.3.4 Monitoring and Reporting Systems

SAARFA management recognized from the beginning that, in general, designing and implementing similar Monitoring and Evaluation (M&E) components for each core activity and sub-project would not be very useful or cost effective. Therefore, the SAARFA project monitoring, evaluation and reporting activities have varied with the size, nature, mode of implementation and management of the core activity or sub-project. The monitoring and reporting related to the core activities has been less rigorous than that related to the sub-projects. Also, the monitoring and reporting of sub-projects managed and monitored by REDSO/ESA appears to have been more rigorous than those managed by other USAID entities.

After the last SAARFA project external evaluation (Christensen, et al, 1989), a two year effort to develop criteria for core activity and sub-project selection, and M&E systems for the SAARFA project and its sub-projects was undertaken with the assistance of Management Systems International. It was expected that this effort would improve the quality of SAARFA core activities and sub-projects. Also, it was expected to provide technical benchmarks (output-level indicators) to assist in reporting the household-level impact of agricultural research programs to Congress under the DFA guidelines. However, by the time the work was completed in 1991, the SAARFA project was winding down, and plans for a SAARFA II project had been dropped. So the decision was made not to pursue the M&E effort further. A number of those interviewed in the U.S. and Africa who were associated with this effort considered it to be too complex, labor intensive and expensive. Nonetheless, parts of it were used in the sub-projects and some field mission bilateral projects have strengthened M&E systems due to this effort.

Overall, the monitoring and reporting systems for the SAARFA project have been adequate, although in some sub-projects more management resources should have been productively invested. Over time systems were put in place to adequately monitor SAARFA project progress, at least roughly, at the input, output and purpose levels. Washington and field reviews served to track some core activities and most sub-project implementation. Recently, sub-projects and some other activities have included technical benchmarks (output-level indicators) for monitoring progress toward the achievement of the overall project purpose. Increasingly, sub-projects and core activities have had accountability built into their reporting systems. Sub-project evaluation reports and

interviews indicate that financial management, accounting and auditing services for the sub-projects by regional accounting and audit staffs were adequate. Although the reporting systems for the Bureau-managed sub-projects were different, they also appear to have been adequate on balance.

2.4 Management

2.4.1 Field Mission -- REDSO -- USAID/W Division of Management Responsibilities

Most of the 15 sub-projects were managed from Washington. The Washington-managed projects were the three "buy-ins" to R&D Bureau's ICRAF, Food Security in Africa Project (FSA) and ACCESS projects; two IFDC activities; International Center for National Agricultural Research's (ISNAR) training activity; the University of Florida's heartwater (with USAID/Zimbabwe); Tuft's rinderpest activity; and the University of Minnesota's faculty development activity (with USAID/ Rwanda). At this time, REDSO/WCA manages the WARDA sub-project, and REDSO/ESA monitors the networking sub-projects being implemented by CIAT, IITA, ICRAF, and CIP. Until recently, REDSO/ESA managed CIAT, IITA, CIMMYT, ICRAF, and CIP and the crop pest research activity of ICIPE.

From the 1982 beginning of the SAARFA project, REDSO/ESA established a system that resulted in successful management of from four to six SAARFA sub-projects. The assignment of a capable Personnel Services Contract (PSC) SAARFA Project Manager to REDSO/ESA in September 1986 eased the REDSO's management burden, and provided for continuing adequate management of those sub-projects. REDSO/ESA undertook periodic reviews and prepared semi-annual implementation reports for each sub-project. With the exception of ICIPE, the end of sub-project evaluations indicated that they were well managed and implemented over the past decade and that the sub-project outputs were achieved. The evaluation of the ICIPE grant noted that there were deficiencies in performance and oversight, mostly prior to the posting of the PSC Project Manager.

The end of project evaluations for grants to CIP, CIAT, IITA, and ICRAF indicated that the expected project outputs were achieved. Hence, the Africa Bureau decided to continue to build on these earlier achievements. Also, it felt that these research network activities could be useful in its analytical work. So the four sub-projects were funded in 1992 for another year through the Policy, Analysis, Research and Technical Support (PARTS) project. The Africa Bureau decided that funding and management of these follow-on activities would no longer be the responsibility of REDSO/ESA -- to allow the limited manpower of REDSO to be more effectively used in field monitoring activities. The management responsibilities for the additional phase under the PARTS project was transferred to R&D/AGR/IARC in Washington.

This new arrangement has been formalized recently through a Memorandum of Understanding (MOU) between AFR/ARTS, REDSO/ESA, and R&D/AGR; grants have been made by the R&D Bureau to four IARCs to continue work initiated under the SAARFA project. The MOU specifies that REDSO/ESA, because of its advantageous field-based location, would undertake a monitoring and information exchange function. The primary change in REDSO/ESA's role is the ending of responsibility for financial and technical grant management which included approving grant proposals and managing the grant funds. However, REDSO/ESA's monitoring of network performance and network impact should be somewhat enhanced and expanded under the terms of this MOU.

The REDSO/WCA has managed the WARDA sub-project with a paucity of staff in recent years. Its Agricultural Development Officer (and only agriculturalist) also has been the Acting Assistant Director for Productive Sector Development, managing a nine person office since arriving at post about two years ago. Also, he has been the only "in-house" agriculturalist available to provide technical services to client posts. Given this rather onerous workload, he has been unable to give the WARDA sub-project as much attention as he desired. Nonetheless, it appears that this sub-project has been successful in achieving its purpose.

Additional agricultural personnel, particularly production scientists, are needed on the REDSO/WCA staff. Recruitment efforts have been unsuccessful, at least over the past two years. Therefore, most technical expertise for client posts is provided by a REDSO/WCA agriculture and rural development Indefinite Quantity Contract (IQC) with a private firm. It is clear that any additional Washington-funded project management or monitoring responsibilities would require additional agricultural expertise. Given the U.S. Government Direct Hire Employee (USDH) ceiling issue, probably the employment of a capable PSC agriculturalist, as was done in REDSO/ESA, holds the most promise.

2.4.2 REDSO ADOs Perception of SAARFA

Current and former REDSO Agricultural Development Officers stated that the SAARFA sub-projects were an important tool, not a burden, to be used to address regional and country-level research problems. They state that the sub-projects gave them entry to some countries, and helped keep USAID field missions interested in agricultural research. The REDSO ADOs believe that, to the extent feasible, they have integrated the SAARFA sub-projects with the other services being provided to their client USAID field missions. However, this added to the heavy workload in REDSO/WCA. The SAARFA project would have been more of a tool for addressing regional research problems there if personnel had been made available, again as in the case of REDSO/ESA.

2.4.3 Field Missions' "Buy-ins"

Those interviewed opine that USAID field mission interest in buying into Bureau-funded projects at this time is low. However, they indicated that a well designed new agricultural technology development and transfer initiative might attract more field mission interest than in the past. Given the current program guidelines, however, field mission "buy-ins" are unlikely to be a major source of funds for regional projects. Therefore, any new initiative should encourage "buy-ins," but not depend heavily upon them.

In the past, an advantage has been that many SAARFA "buy-ins" by USAID field missions have given missions the opportunity to be associated with low-risk successful activities without having any significant management responsibilities. Numerous examples of successful field mission buy-ins are found in the FSA and ACCESS projects.

3. Summary of Findings

3.1 Overall Impact

The impact of the SAARFA project has been far greater than was expected when the project was designed. An essential part of the TDT process is the development of improved technologies for transfer to farmers and other participants in the food system. Over the past five years, substantial progress has been made in developing such technologies, as indicated by Oehmke and Crawford (1992). Much of this progress can be attributed directly to the SAARFA project.

4. Major Lessons Learned

4.1 Essential Lessons

- 4.1.1. Successful networks have clearly identified, common problems shared by network members.
- 4.1.2. The Africa Bureau has been well rewarded for investing in SAARFA.
- 4.1.3. The umbrella design of SAARFA is an efficient, innovative, rapid response approach that has made the Bureau program relevant to African needs.
- 4.1.4. SAARFA has aided in reducing the gap between weak and strong NARS.
- 4.1.5. Management, especially the model in REDSO/ESA, has been effective for Bureau-funded regional projects.
- 4.1.6. Although the project lasted for 11 years, the more recently started sub-projects need additional time to be fully effective.
- 4.1.7. Unless special efforts are made, the pool of women available for graduate school preparation for research careers will be

- inadequately small.
- 4.1.8. Market analyses need to be further integrated into technology development and transfer sub-projects.
 - 4.1.9. Several sub-projects demonstrate the possible benefits of research in developing countries for U.S. agriculture.
 - 4.1.10. This regional project complemented the bilateral programs of Missions.
 - 4.1.11. The Africa Bureau has benefitted from "buy-ins" to Research & Development Bureau-managed projects.

5. Recommendations/Implications for Future Activities

5.1 The Need for a Follow-on Regional Agricultural Technology Development and Transfer Project

The team recommends that a follow-on regional agricultural technology development and transfer project be designed and implemented.

This evaluation confirms that the SAARFA project has made a major contribution toward strengthening African agricultural systems and programs. Given the SAARFA project accomplishments, the paucity of African and other donor resources, and the high potential returns to such an investment, an African Bureau-funded follow-on project is recommended.

It should have as its objective increased development and use of more profitable, sustainable technology in sub-Saharan Africa by improving donor coordination and implementing activities that address priority needs of NARSSs. It should be designed to play a major role in implementing the Africa Bureau's new "Strategic Framework for Agricultural TDT in Sub-Saharan Africa" (USAID 1992). It should help revitalize agricultural research in sub-Saharan Africa by helping to strengthen on-going regional programs; helping them become more NARS-driven, managed, and funded. It should recognize that the products of research are technologies, policies and institutional changes that modify the behavior of farmers, consumers, and others in the production-to-consumption chain. If the NARSSs are the hardware, the new project should be the software. It should also include activities to strengthen African faculties of agriculture, to involve them in on-going TDT activities, as these faculties must be increasingly the source of personnel to staff African NARSSs.

The team understands the means used to continue several sub-projects and urges that the three active projects scheduled for termination in 1993 be continued while a new initiative is being activated. The current management arrangement as spelled out in the recently signed MOU to support agricultural networking projects (March 1993) between the AFR/ARTS, R&D/AG, and REDSO/ESA should be

tested over the next year, then reviewed and amended or terminated as appropriate. It might provide a useful model for future support for other activities, e.g., the four networks that to date have been operated under SAFGRAD in West Africa. Both REDSOs should provide monitoring and/or management assistance, depending on the nature of the activity. A capable PSC agriculturalist would need to be recruited for the REDSO/WCA staff, and the current arrangements continued at REDSO/ESA.

The team recommends that a direct hire project manager, preferably with research management experience, located in ARTS (or possibly ONI) act as overall project coordinator. The new project would use "grant" and "buy-in" mechanisms so management responsibilities of the AFR Bureau are minimized and are delegated to the implementors to the extent possible. The overall project coordinator would be encouraged not to micro-manage project activities. The usual "modus operandi" would be to require each activity to schedule only one annual review and planning session of implementing scientists and USAID technical personnel. The selection of activities to be funded would be based on a competitive grants system, as outlined in section 2.3.3, above.

The issue of whether field missions would fill in the funding gap left by the SAARFA project has been raised. Probably it is not realistic to expect field missions with their country-specific and current "short-term impact" orientation, already strapped for funds and personnel, to "buy-in" to or otherwise fund a long-term regional project in a significant way. Still there are and will continue to be a few exceptions where regional activities clearly "fit" or otherwise complement a field mission's program.

ANNEX A
SAARFA FINAL EVALUATION - SCOPE OF WORK

STRENGTHENING AFRICAN AGRICULTURAL RESEARCH
AND FACULTIES OF AGRICULTURE
(SAARFA: 698-0435)

1. Activity to be Evaluated:

The Strengthening African Agricultural Research and Faculties of Agriculture (SAARFA) project (698-0435) is an Africa Bureau Regional Project authorized at \$49 million. The Project began in August 1982 and the Project Assistance Completion Date (PACD) is July 31, 1993. The project purpose is to strengthen African agricultural research systems and programs to address research priorities identified within the various agro-ecological zones of Africa by 1) improving donor coordination and 2) developing national and regional agricultural research programs and implementing sub-projects that address priority needs of these systems and programs.

2. Purpose of the Evaluation:

The SAARFA project has been one of the major regional activities funded by the Africa Bureau to strengthen African national and regional research and teaching institutions. The purpose of the evaluation is to assist in determining how the Africa Bureau can improve its strategy for promoting agricultural technology development and transfer in Africa.

The specific objectives of the overall evaluation are:

- a) to review progress towards the achievement of SAARFA's goals by the discrete sub-projects not yet evaluated (see section 3 below);
- b) to assess SAARFA's contribution and effectiveness in achieving donor coordination in identifying and addressing the research priorities for different agro-ecological zones through the initiative of the Special Program for African Agricultural Research (SPAAR) to revitalize agricultural research in Africa;
- c) to develop guidelines and recommendations for U.S. assistance regarding donor coordination and strengthening selected NARS in agroecological (ecoregional) contexts through the SPAAR Initiative;

- e) a study of the effects of farmer-built dikes for improving water infiltration rates, increasing soil fertility and reversing soil degradation in the Sahel.

In addition to the direct activities, there are fifteen (15) authorized and discrete sub-project activities:

- a) East Africa Bean Research Network being implemented by the Centro Internacional de Agricultura Tropical (CIAT) and jointly funded with the Canadian International Development Agency (CIDA);
- b) Bases to Plant Resistance to Insect Attack being implemented by the International Center for Insect Physiology and Ecology (ICIPE) and jointly funded with a number of other bi- and multi-lateral donors;
- c) Farming Systems Research being implemented by the Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT) and jointly funded by Canadian International Development Agency (CIDA);
- d) Potato Improvement for Central Africa being implemented by the Centro Internacional de la Papa (CIP);
- e) Africa Bureau buy-in to S&Ts Forestry/Fuelwood Research and Development project being implemented by the International Council for Research in Agroforestry (ICRAF);
- f) Southern Africa Agricultural Research Management Training being implemented by the International Service for National Agricultural Research (ISNAR) and jointly funded with CIDA and ODA of Great Britain;
- g) East and Southern Africa Rootcrops Research Network being implemented by the International Institute for Tropical Agriculture (IITA) and jointly funded with the International Development Research Center (IDRC) of Canada;
- h) Africa Bureau's buy-in to S&Ts Food Security in Africa project being implemented by Michigan State University;
- i) Africa Bureau's buy-in to S&T Access to Land, Water, and Natural Resources (ACCESS) project being implemented by the University of Wisconsin;
- j) Fertilizer Investment for Soil Fertility Restoration in Western Africa being implemented by the International Fertilizer Development Center (IFDC) and jointly funded with the World Bank;

The Framework has targeted Agency support to NARS based on the capacity of a country to assume lead responsibility for key research themes within regions. How have SAARFA Networking activities supported the bilateral research efforts of USAID in both technology producing and adapting countries? What examples can be cited of good collaboration? Have the International Agricultural Research Centers (IARCS) been effective in building collaborative research relationships between themselves and NARS, as well as between the NARS? What additional measures are recommended to ensure technology generation, dissemination and the provision of adequate technical support to USAID bilateral projects?

b. Programmatic:

This evaluation should measure project performance at the input, output and purpose levels against criteria taken from SAARFA project documentation, including sub-projects. Each sub-project has its own project paper and stands by itself. What have been SAARFA's major inputs and outputs, and how do these relate to the project purpose? Are they effective in contributing to the achievement of the project purpose? What factors have contributed to, or constrained progress in achieving the project purpose? Do SAARFA activities address the priority research needs as defined by our assessments?

The SAARFA project has funded a number of significant, diverse activities; including crop research and research methodology development conducted by IARCS, a fertilizer policy study, economic research to support the basis of policies related to food security, and a study of the effects of selected policies and programs on consumption patterns and child survival. The project has moved away somewhat from funding strictly agronomic research into areas of policy reform, agricultural economics and nutrition, in recognition of the fact that research in these other areas will be important to the successful dissemination of improved technologies. What are the advantages and disadvantages of diversifying SAARFA research activities? Has this phenomenon contributed to strengthening of a multi-disciplinary approach to research, especially at the level of NARS? Do these areas need to be more fully integrated? Is there need for additional analytical work?

The project has only one sub-project which is designed to strengthen a faculty of agriculture. What can be done to strengthen agricultural research through support to an agricultural college on a regional or national basis? What role can or should agricultural universities play in technology production, adaptation and dissemination vis-a-vis the NARS?

What role can they play in support of agronomic, economic and nutrition research that influences policy decisions?

In order to transfer more project management responsibility to the field, another approach or way to fund SAARFA activities would be for Mission's to buy in to a regional project. What would be the advantages and disadvantages of this approach? Would it fundamentally change the types of activities which are currently being funded and how? From AID/W's point of view, would "buy-ins" pose a problem in ensuring that the objectives and priorities of the Bureau's "Plan" are achieved? Could it achieve better integration into bilateral programs without sacrificing the benefits of a regional approach?

Note: The evaluation team will provide empirical evidence to support their responses to the questions listed above. The team will also provide a summary discussion of major lessons learned and recommendations for the future, based on the assessment of the design and performance of SAARFA and its sub-projects.

5. Methods and Procedures:

This final evaluation will be conducted in Washington, D.C., with field visits to several project sites in Africa. The suggested methods for collecting data for this evaluation consist of: (a) review of relevant documents such as project and sub-project papers, zonal and country research assessment, project implementation reports, sub-project evaluations, other project-related reports and cables, A.I.D. strategy papers and technical reports from IARCs funded under SAARFA; (b) personal and telephone interviews involving A.I.D. officials, project personnel, IARC officials and other donors in Washington, D.C., and overseas; (c) cabled responses from Missions and project implementors to inquiries made by the evaluators; and (d) site visits to selected African countries where SAARFA activities are important.

The evaluation will be conducted over a ten-week period (6-day work weeks) with an additional two weeks for the major drafter of the evaluation report to finalize the document. The team will have access to all relevant unclassified document.

A cable will be sent to participating Missions and REDSOs prior to the start of the evaluation requesting information relevant to the achievement of this evaluation's objectives. The cable will be drafted in consultation with the evaluators during a one or two-day planning meeting and the responses to this cable will be made available to the evaluation team. Additional information and answers to follow-on questions with the field will be made through cables, telephone calls and site visits.

6. Evaluation Team Composition:

The evaluation team will be composed of four outside consultants. They will be (a) an agricultural research planning specialist, (b) an agricultural research agronomist, (c) an agricultural research

research strategy; and (d) have knowledge of gender issues in agricultural research and education. Previous relevant development experience in Sub-Saharan Africa is required. No foreign language proficiency is necessary.

AFR/ARTS/FARA will provide a direct hire staff member to assist the SAARFA Evaluation Team with the logistics of the evaluation, in monitoring the progress of the evaluation, and in responding to issues raised by the team.

7. Reporting

A Workplan for carrying out this evaluation will be developed and submitted by the evaluation team for review and approval of A.I.D. during a two to three-day period one month prior to the evaluation. The Workplan will include a cabled Questionnaire for field Missions and project implementors to be sent to the field by A.I.D. Three copies of a Draft evaluation Report will be submitted to the SAARFA Project Manager eight weeks after the beginning of the evaluation. After receiving input from reviewers in A.I.D., the primary drafter of the Report will have an additional two weeks to submit to A.I.D. three copies of a Final Evaluation Report. The final report should be no more than 20 pages, single-spaced, not including the in-depth technical annexes of each expert. The primary drafter of the evaluation report will also submit a first draft of appropriate sections of an USAID Project Evaluation Summary (PES) document with the Final Evaluation Report.

The evaluation team will follow appropriate USAID evaluation reporting guidelines, consistent with the following documents.

- A.I.D. Evaluation Handbook, April 1987 (USAID Program Design and Evaluation Methodology Report No. 7, PN-AAL-D86); and,
- Guidelines for Data Collection, Monitoring, and Evaluation Plans for USAID Assisted Projects, April 1987 (A.I.D. Program Design and Evaluation Methodology Report No. 7 PN-AAL-086).

ANNEX B
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ANNEX C
PERSONS INTERVIEWED BY EVALUATION TEAM

USAID/WASHINGTON

BUREAU FOR AFRICA (AFR)

Jerome M. Wolgin
Director, Office of Analysis, Research and Technical Support
(AFR/ARTS)

Benjamin Stoner
Chief, Food, Agriculture and Resources Analysis Division
(AFR/ARTS/FARA)

Curt Reintsma
Deputy Chief, Food, Agriculture and Resources Analysis Division
(AFR/ARTS/FARA)

Michael Fuchs-Carsch
Technology Development and Transfer Unit Leader
Food, Agriculture and Resources Analysis Division (AFR/ARTS/FARA)

John Steele
Agricultural Economist
Food, Agriculture and Resources Analysis Division (AFR/ARTS/FARA)

Jeffery M. Hill
Agricultural Technology Development Advisor
Food, Agriculture and Resources Analysis Division (AFR/ARTS/FARA)

BUREAU FOR RESEARCH AND DEVELOPMENT (R&D)

Ralph W. Cummings, Jr.
Coordinator, International Agricultural Research Center Staff
(R&D/AGR/IARC)

**USAID REGIONAL ECONOMIC DEVELOPMENT SERVICES OFFICE/ EAST
AND SOUTHERN AFRICA (REDSO/ESA)**

Fred C. Fischer
Director

Bruce J. Odell
Deputy Director

Eric R. Loken
Deputy Chief, Agricultural and Natural Resources Division (ANR)

Hudson J. Masambu
Agricultural Development Officer

**USAID REGIONAL ECONOMIC DEVELOPMENT SERVICES OFFICE/ WEST
AND CENTRAL AFRICA (REDSO/WCA)**

Frederick E. Gilbert
Director

David A. Mutchler
Deputy Director

Kimberly A. Finan
Assistant Director, Office of Project Development and Engineering
(PDE)

Paul R. Crawford
Acting Assistant Director, Office of Productive Sector Development
(PSD)

Medjomo Coulibaly
Regional Education and Human Resources Advisor, Office of Health
and Human Resources (HHR)

USAID/KENYA

Thomas Hobgood
Chief, Office of Agriculture and Private Enterprise

Dennis McCarthy
Agricultural Development Officer

Maria Mullei
Agricultural Program Specialist

RETIRED USAID AGRICULTURAL DEVELOPMENT OFFICERS

Calvin Martin
Former Senior Agricultural Development Officer, REDSO/ESA, and
Assistant Director for Research, AFR/TR

Richard Edwards
Former Senior Agricultural Development Officer, REDSO/ESA

UNITED NATIONS DEVELOPMENT PROGRAMME

Nyle C. Brady
Senior International Development Consultant, and
Former Senior Assistant Administrator, USAID

US DEPARTMENT OF AGRICULTURE

Cheryl Christensen
International Programs Coordinator, Office of the Administrator,
Economic Research Service

THE WORLD BANK

Donald L. Plucknett
Senior Advisor, Consultative Group on International Agricultural
Research (CGIAR)

Moctar Toure
Executive Secretary
Special Program for African Agricultural Research (SPAAR)

INTERNATIONAL FERTILIZER DEVELOPMENT CENTER

Amitava H. Roy
President and Chief Executive Officer

Carlos A. Baanante
Director, Resource Management
Research and Development Division

Balu L. Bumb
Policy Economist
Resource Management Research and Development Division

UNIVERSITY OF FLORIDA

Michael J. Burridge
Professor
College of Veterinary Medicine

WARDA (BOUKE)

Eugene R. Terry
Director General (WARDA)

M. Sampong
Mangrove Swamp Rice Network Coordinator

Robert Guei
Breeder, Mangrove Swamp Research Network

Peter J. Matlon
Director of Research

K. Akuffo-Akoto
ADAF/Financial Controller

C. Grouto
Maintenance Engineer

A. Youdeowei
Director of Communication and Training

Akinwumi Adesina
Senior Economist

GHANA

Joseph Goodwin
Director, USAID/Ghana

Samuel Dapaah
Director, Policy Planning, Monitoring and Evaluation Department
Ministry of Agriculture

Professor Hazel
National Agricultural Research Council
within the Council for Scientific and
Industrial Research (CSIR)

Dr. Chandry
The World Bank (Accra)

INSTITUTE OF STATISTICAL, SOCIAL AND ECONOMIC RESEARCH (ISSER)

S.Y. Atsu
Senior Research Fellow

L.A. Atingdini
Senior Research Fellow

A.W. Seini
Senior Research Fellow

UNIVERSITY OF GHANA, LEGON

George T. Kwadzo
Member, Faculty of Agriculture

K. Yerfi Fosu
Member, Faculty of Agriculture

Owusu Bennoah
Member, Faculty of Agriculture

Ramatu Al-Hassan
Member, Faculty of Agriculture

MALI

Tadesse Kibreab
Mission Agricultural Program Officer

Catherine McIntyre
Mission Agriculture Development Officer

Thomas Melville
Pathologist and Sorghum Regional Research Coordinator
(ICRASAT)

M.S. Sompo-Ceesay
Director General, INSAH

INSTITUTE OF RURAL ECONOMY IER)

Oumar Niangado
Director General

Lassine Dembele
Deputy Director General

Bakary Coulibaly
Head, Department of Planning

Fusseyui Mariko
Director, SPARC Project

T. Schilling
Coordinator, SPARC Project

ISNAR

Cesar A. Falconi
Associate Officer

Barry Nestel
Program Director
Pablo B. Eyzaguirre
Research Officer

Matthew Dagg
Regional Coordinator (Anglophone Africa)

T. Ajibola Taylor
Program Director
Research Program Design and Management

Howard Elliott
Deputy Director General

CONSULTANT

Paul Hanegreefs
Program Director, Agricultural Adaptive Research Project
University of Rwanda

APPENDIX D

ANNEX D
SUB-PROJECT REVIEWS

This Annex contains the evaluation team's "examination of progress" of the following sub-projects, as called for in the scope of work (Annex A) for this evaluation:

1. Africa Bureau's buy-in to R&D Bureau's Food Security in Africa project being implemented by Michigan State University;
2. Africa Bureau's buy-in to R&D Bureau's Access to Land, Water, and Natural Resources (ACCESS) project being implemented by the University of Wisconsin;
3. Fertilizer Investment for Soil Fertility Restoration in W. Africa being implemented by the International Fertilizer Development Center (IFDC) and jointly funded with the World Bank;
4. Strengthening the Teaching and Adaptive Research Capability of the National University in Rwanda implemented by the University of Minnesota;
5. Fertilizer Policy Research for Tropical Africa being implemented jointly by IFDC and IFPRI;
6. Mangrove and Associated Swamp Rice Research being implemented by the West Africa Rice Development Association (WARDA);
7. Heartwater Research implemented by the University of Florida and focused in the SADCC region, especially Zimbabwe; and,
8. Experiment Station Operation Management implemented by the University of Arkansas in collaboration with ICRISAT and IITA.

Also, it provides a copy of the request for information from SAARFA contractors.

SAARFA SUB-PROJECT REVIEW: FOOD SECURITY IN AFRICA

Sub-project Title: Buy-in to R&D/EID Food Security in Africa (FSA) Project

Sub-project Number: 698-0435.08

Obligation Dates:	9/1/84	(56,000)
	9/1/84	(552,680)
	8/31/89	(600,000)
	7/17/91	(500,000)

Completion Date: 11/30/92

Total U.S. Funding:	SAARFA	\$1,708,680
	All Sources	\$12,506,162

Percent of Total Project Funding from SAARFA: 14%

Background and Recent Evaluation Findings

This sub-project is the AFR Bureau's contribution to core budget support of the S&T Bureau-led FSA project launched September 1, 1984, under a Cooperative Agreement between Michigan State University and USAID. Field mission buy-in's provided over half of the project's total funding. The FSA project was "officially" co-managed by the S&T/RD and AFR/TR, until its completion November 30, 1992. A new (FSA II) project was implemented in September 1992 to continue the FSA project activities with an AFR Bureau contribution of some \$700,000 from the PARTS project.

The FSA project's purpose was to develop operational approaches and analytical methodologies to help developing country governments achieve food security goals. The applied research supported under the project has focused on four substantive themes as they relate to food security: international trade; public and private sector roles; agricultural technology; and the linkages among food production, marketing, and consumption. The project had a strong operational and problem-solving orientation that placed heavy emphasis on capacity-building as well as on networking and dissemination.

MSU's "joint product/interim report" model, was used to implement the FSA project. The approach encourages integration of African policy-makers into the process of defining the research problems in order to "create a demand" for the research results; relies on systematic data collection and analysis to guide decision-making;

integrates African researchers into the entire research process; ensures the timely availability of research results by issuing interim reports and working papers before the final results are in; and disseminates these interim results via workshops and conferences held in Africa to help inform the policy debate.

The thorough Final Evaluation of the FSA project, completed in February 1991, was very favorable. It concluded that the project achieved significant accomplishments, and recommended a follow-on project to continue to address food security interests and allow limited technical assistance as well. Other recommendations included: continued focus on sub-Saharan Africa with selective expansion to other geographic regions; continued existing research focus with more explicit attention to the relationship between food security and certain other research themes; MSU implementation of the follow-on project (FSA II), but access of specific geographic and substantive expertise from other institutions; S&T management of the follow-on project; and authorization of the follow-on project for ten years.

During October 1992, the FSA project organized a conference at which researchers presented a number of recent studies, including those funded by the FSA project, on the returns to investment in technology development and dissemination. These studies confirm the high returns to investments in agricultural research and extension in sub-Saharan Africa, as earlier studies have for Asia and Latin America.

Sub-Project Outputs¹

1. Direct Outputs

Direct outputs in the form of working papers, reports, journal articles, thesis, conference reports, seminars and conferences held are listed on the FSA Fact Sheets.

2. Indirect Outputs

A generalized list of indirect outputs from FSA project activities follows:

1. Provided empirical evidence on the incidence of price policy on rural households based on whether they are net buyers or net sellers. Previously, most policy makers assumed that all farmers were net sellers.

¹The information in the following sections on outputs, reasons for success and impact was provided for the SAARFA final evaluation by the FSA staff at MSU.

2. Related to 1, provided evidence on the importance on the rural grain markets in assuring a back flow of grain to grain-deficit rural households. This was also a previously neglected part of food security.
3. In both Southern Africa and the Sahel, had a strong impact in shifting the debate from national food self-sufficiency to regional, national, and household food security. This shift was reflected in SADCC adopting food security rather than food self-sufficiency as an official goal, and in the participants at the CILSS/Club conference in Lomé (November 1989) agreeing that food security rather than food self-sufficiency is the appropriate policy goals.
4. Contributed to a more sophisticated discussion in policy circles of the impacts of investing in new policies, technologies, and institutions by providing evidence on the complementarity of such investments. This has moved the debate away from the "silver bullet" approach to development to a more sophisticated discussion of the sequencing of complementary investments.
5. Contributed to more sophisticated discussion in policy and research circles of the possible complementary (rather than the assumed competitive) role of food and export crops in improving farmer as well as national level food security.
6. Provided empirical evidence that African agricultural research has had significant and positive people-level impact, and that these impacts are large enough to justify the level of investment that led to the impacts.
7. Provided some example of the effective ways that social scientists can contribute to more informed policy on food security and create additional local support for the longer term institutionalization of such applied research and policy dialogue work.
8. Core food security staff at MSU and in field locations provide an international reference service - knowing a large number of host country and donor professionals and officials in Africa and in other parts of the world. Core food security staff members help keep a large informal network of people in touch with policy relevant reports and references, and with other researchers and officials by sending publications (MSU as well as those of other organizations) reprints, meeting notices, and personal correspondence.

9. Core staff of the project help identify people who would be successful as consultants in Africa, people who could benefit from attending policy related meetings, identify job openings in Africa and generally help professional agricultural economist with information about Africa, reviews and opportunities which helps get things down.

Three Most Important Reasons for Success of FSA to Contribute to Stated Purpose

1. AID/MSU-Quality People and Management Partnership -

Over the life of the FSA project, both AID/W and USAID participants, and MSU staff formed a meaningful partnership that focused on both substantive and administrative issues. The ability to come together to discuss and deliberate in an on-going manner about substantive and administrative issues greatly facilitated the design and implementation of project activities. Although there was considerable turn-over of AID staff involved in the FSA project over its life, there was a general agreement within AID/W to maintain the collaborative relationship established with MSU, and to maintain the major food security research themes already established.

On the MSU side, there was a relatively consistent critical mass of high quality senior and junior staff involved that provided needed African research experience, and continuity of focus on key research themes.

2. Joint Product Approach - New Knowledge and Capacity Building

In the design and early-on implementation of the project, it was mutually agreed by AID and MSU staff that it was especially important to focus project activities on creating new knowledge about real world conditions and problems facing selected African farmers, traders and consumers. This decision resulted from the diagnosis by project staff that much of the on-going policy debate about technology, policy and institutions was too often conducted at a theoretical and/or dogmatic level. Too little attention was being given finding out more about real world problems, opportunities and resources. So the project gave a priority to gaining new empirical insights about problems and opportunities on the ground.

It was also agreed that there was a need to go about collecting new knowledge in a way that truly helped African participants gain skills and experience to continue such empirical approaches to informing policy. This resulted in the project approach of designing applied research activities

in ways that attempted to maximize opportunities for African researchers to participate, and to learn new skills by gaining on-the-job experience of conducting applied research jointly with MSU senior and junior staff.

3. Focus on Informing Policy Issues

Another critical project feature was to organize and plan applied research outputs so as to contribute to a host-country environment of improved timely information for an on-going debate on key policy issues. This approach could be contrasted to one wherein researchers have the goal of producing reports that prescribe actions that policy makers should take, usually delivering them after considerable time and effort, regardless of local decision making needs. By using an interim report approach, results were made as timely as possible, thus providing on-going research insights to host country users and related donors.

This approach helped the project gain more meaningful involvement of African policy makers in both specifying the research questions and in debating possible conclusions from new empirical information collected.

Impact of Sub-Project or Activity on Beneficiaries in General

The ultimate impact of project outputs has been on both consumers and producers in various African countries. The social and economic conditions surrounding low income rural and urban consumers is much better understood as a result of project research, and this in turn has made it easier to understand how to target or promote policy, technology and institutional changes that improve the well being of these groups. The single fact that it has been shown that many farmers through out Africa are buyers, rather than simply sellers of food commodities, has greatly enhanced policy design and implementation.

As documented in the recent report on the impact of agricultural technology development and transfer in Sub-Saharan Africa, the project has helped to better understand the mix of needed changes in policy, technology and institutions required to assist farmers in expanding output, both for improved own-household welfare, and for purposes of contributing to national food supplies.

Perhaps most important over the longer-run, has been the project impact of increasing the capacity of African counterparts and related participants. They have gained new skills and applied research/policy dialogue experience that will be utilized long after the FSA project is completed.

How Sub-Project Contributed to SAARFA Project Purpose

This sub-project has made a major contribution to the SAARFA project purpose of "strengthening African agricultural research systems and programs." First, it has helped provide the empirical "rate of return" evidence needed to support sustained, and possibly increased, investments in agricultural research. It has undertaken studies of the performance of agricultural research programs in Africa that provide an empirical basis for understanding the factors that impede or facilitate agricultural research programs, and for developing methodologies to measure the economic costs and benefits of agricultural research. Second, it has demonstrated the benefits derived from research directed at policy and institutional problems related to commodity production research. Third, it has shown the importance of linkages between technology, institutions, and policies in food systems. Fourth, it has empirically unmasked incorrect "conventional wisdom" about food aid and self-sufficiency, intra-regional trade; privatization; rural households and markets; and the capability of farmers, traders, and government managers to respond to policy reform, institutional changes, and technological improvements.

SAARFA SUB-PROJECT REVIEW: ACCESS TO LAND, WATER AND NATURAL RESOURCES

Sub-Project Title: Buy-in to R&D Access to Land, Water and Natural Resources

Sub-Project Number: 698-0435.09

Date of Obligation: May 1987

Completion Date: July 1993

U.S. Funding: \$1,715,000

Percent of Total Project Funding from SAARFA: 15%

Background and Recent Findings

The ACCESS I and ACCESS II project purpose is to undertake applied research and problem solving with regard to the relationship between land and resource rights in the areas of natural resource management, agricultural production and land tenure.

The ACCESS II project focus is on three thematic areas: 1) land markets and transactions; 2) tenure issues in natural resource management; and 3) institutional and structural dimensions of tenure change. The impact of gender-related tenure arrangements and concern for tenure security have been cross-cutting themes. The research is undertaken in collaboration with host country research institutions and universities in order to enhance host country capacity.

Part of the ACCESS sub-project focused on tenure issues in Natural Resources Management. The other part was concerned with institutional and structural dimensions of tenure change. The project outputs and reported in that order.

1. Direct Outputs

From the mid-term evaluation of ACCESS II, carried out at the beginning of 1992 and based on material produced from work in 1989-91 under the SAARFA add-on, research under the later buy-in; work from late 1991 and 1992 was not yet written up: "Written output for this theme under ACCESS II consists of 35 pieces. Lawry's conceptual framework was written at the end of the ACCESS I grant. Just over half of these documents are working and final reports based on field research in Mali, Uganda and the West African Humid Zone (Cameroon, Nigeria and Togo). This set also includes French

translations for four English documents. Approximately one-third of the outputs are of a more academic nature. These published articles, research papers, workshop papers (including two French translations) include regional and topical overviews. Several of the latter category are quite close to state-of-the-art papers for particular topics within the sub-themes. The remainder of the outputs consist of reports on field-level impacts and lessons learned from short-term consultancies (both ACCESS and non-ACCESS funded assignments). It appears that there is at least one report available for all activities."

2. Indirect Outputs

- a. Establishment of LTC and AID as important forces in policy discussions of tenure issues in West Africa, especially in regards to tenure/forestry issues. LTC's earlier work had been largely in Southern and Eastern Africa.
- b. Increased integration of tenure reform targets into USAID country program objectives.
- c. Enhancement of awareness of tenure issues by other donors, and by PVOs and NGOs implementing USAID projects.
- d. Initiation or sustaining of important tenure reform initiatives in several countries, including the Senegal Forestry Code, the Niger Rural Code, and the Mali Forestry Code and Land Code.

SAARFA Sub-Project or Activity Outputs

1. Direct Outputs

The mid-term evaluation for the CA summarizes the products as of early 1992: "Over half of the written output (total nineteen) under ACCESS II consists of policy memos, reports and proposals to missions; the remainder include workshop reports, background papers, all of which are country specific; a bibliography, a concepts paper and a synthetic paper address broader issues."

Since that was written, six more country-specific reports have been completed. Subsequent outputs in this last year of the current CA will be synthesis pieces.

2. Indirect Outputs

- a. Emergence of AID as a leader in tenure policy dialogue in the Sahelian countries.

SAARFA SUB-PROJECT REVIEW: SOIL FERTILITY RESTORATION

Sub-Project Title: Fertilizer Investment for Soil Fertility Restoration

Sub-Project Number: 698-0435.12

Date of Obligation: 1/7/87

Completion Date: Continuing

U.S. Funding: \$3,721,000

Background and Recent Evaluation Findings

1. Soil Fertility Restoration Project*

This project assessed, under contrasting socioeconomic conditions in West Africa, the impacts of fertilizers and animal manures on 1) restoration and maintenance of soil fertility, 2) food and cash crop production, 3) evolution in land use and farming systems, 4) the socioeconomy of village communities, and 5) the implications for reversal of environmental degradation. The project was conducted in pilot areas in the humid zone of Ghana, savanna zone of Togo, and sahel zone of Niger. Each pilot area consisted of 4-5 villages within a radius of 40-50 km of large towns. Two of these villages were designated, respectively, experimental and control villages. A number of variables were studied and a summary of results is given below.

Sub-Project or Activity Outputs

1. Direct Outputs

A. Physical Relationships

An important component of this project was to 1) compare the agronomic and economic effectiveness of fertilizer types and 2) determine the socioeconomic effects of fertilizer use in the pilot areas.

Kumasi Pilot Area, Ghana. Average relative agronomic effectiveness in the pilot area of two types of Triple Super Phosphate (TSP) --

*This material draws heavily on Annual Report 1991, International Fertilizer Development Center, Circular IFDC-S-15, October 1992, p. 37-40.

partially acidulated 50 percent Togo phosphate rock (PAPR 50), and sulfur-fortified triple superphosphate (TSPS) -- was, respectively, 91, 93 and 98 on the basis of Single Superphosphate (SSP) = 100. This indicates that considerable savings in transport and storage costs could be realized by using high-analysis materials.

The evaluation of fertilizer option packages actually used provided the following information: highest maize yields of 3,700 kg/ha resulted from use of 80:40:40 kg/ha (N:P₂O₅:K₂O) applied as 15:15:15 compound fertilizer plus urea. However, there were no significant differences in grain yields of Dobidi maize variety from either of the following packages at 80:40:40 kg/ha: 1) 15:15:15 plus urea, 2) Togo PAPR-50 plus urea plus KCl, and 3) SSP plus urea. Average maize grain yields on the fertilized (package) and check plots in Kumasi were 3,400 and 1,800 kg/ha, respectively. In comparison, maize yields from a sample of farmers in the control village averaged 2,200 kg/ha.

Nutrient removal by maize from unfertilized plots over one growing season in this location was as follows: 26.2 kg N, 7.0 kg P₂O₅, 23.7 kg K₂O, 5.3 kg CaO, and 8.93 kg MgO/ha. This phenomenon, frequently referred to as "nutrient mining," is leading to soil degradation at an alarming rate. In sum, maize grain yield variability in the pilot area was associated mainly with changes in phosphorus rates, plant populations, and age of the bush fallow.

Dapaong Pilot Area, Togo. Average relative agronomic effectiveness of three types of fertilizer (TSP, TSPS, and PAPR 50) in the Dapaong pilot area was 78 percent, 96 percent, and 100 percent. The lower cost processing of indigenous phosphate rock from Togo into PAPR 50 was noted. Variations in the yields of millet and sorghum were associated with changes in plant population and fertilization.

Total grain yield of intercropped 3-month millet and 6-month millet ranged from 800 kg/ha on unfertilized plots in the experimental village and 2,200 kg/ha in the control village to 2,500 kg/ha on plots receiving 60:35:35 in the form of 15:15:15 plus urea.

Fertilization increased crop biomass both above and below ground level. At least 25 percent of the crop biomass was in the form of roots that both helped improve soil organic matter content and reduce erosion.

The following removals of soil nutrients per hectare were estimated from unfertilized plots of the millet/sorghum intercrop: nitrogen, from 6.4 to 12.4 kg; phosphorus, from 1.8 to 3.9 kg P₂O₅; potassium, 45 kg K₂O; calcium, 8.1 kg CaO; and magnesium, 3.8 kg MgO.

Naradi Pilot Area, Niger. This research suggests a role for high-analysis phosphate fertilizers in landlocked Niger. The effect of

phosphorus source was found to be independent of method of phosphate fertilizer application. Soil tests indicated that fertilization with SSP at 60 kg P₂O₅/ha raised phosphorus fertility levels on fertilized plots from 2.6 to 7.5 mg/kg soil.

For the millet/cowpea intercrop, the highest average millet grain and straw yields of 744 and 1,808 kg/ha, respectively, were obtained from 30:60:0 as SSP and urea. This compared with 251 kg/ha of millet grain and 808 kg/ha of straw obtained from the check plot.

Thus, for each zone studied, fertilizer boosted crop yields, had a demonstrable effect in the pilot villages, and ensured that fertilizer nutrients supplemented the native soil supply. At high rates of application, farmyard manures also raised crop yields. Fertilizer use did not result in an increase in nitrate levels of well water. Clearly, little or no use of fertilizers in all three pilot areas will lead to further degradation of the soil resource base.

B. Socio-economic Relationships

In addition to establishing crop response functions and other physical relationships, the project also investigated a number dealing with socio-economic variables. Under specific prices the highest average economic return was determined in one analysis. In another, several surveys were undertaken and demonstrated that almost all farmers used fertilizer when economic circumstances were good. Other surveys determined that farm characteristics could be used to estimate the demand for fertilizer. Central to the socio-economic studies was a longitudinal survey of a panel of 60 farmers for each of six research villages in the three pilot areas. These provided data to monitor and evaluate the qualitative and quantitative impacts of project activities on users and nonusers of fertilizers.

C. Role of Women

Survey data were also used to test several hypotheses about the roles of men and women in crop production in the pilot areas. No conclusive evidence was found that indicated that agricultural work was dominated by women. Rather there appears to be labor reciprocity between men and women with respect to farm work.

D. Training and Institution Building

At the end of 1991 the project had conducted 15 general and nine individualized training programs. They covered such topics as research and extension methods, survey techniques and data processing. These courses were attended by 135 national research

and extension collaborators who, in turn, trained approximately 800 farmers.

The most visible institution building involved the organization of three farmer associations and fertilizer revolving funds in the experimental villages. The objective of doing so was to create a dependable source of funds for fertilizer and soil amendment use on a sustainable basis.

2. Indirect Outputs

Sub-Project or Activity Purpose. To study the agronomic viability of using soil amendments and fertilizers as components of capital investment strategies which could be established by governments to restore the productivity of fertility-depleted land in different West African environments.

Success of Sub-Project or Activity in Contributing to State Purpose. The project has accomplished its stated purpose.

Three Most Important Reasons for Success or Failure to Contribute to Stated Purpose.

1. IFDC had the expertise to carry out the project.
2. The project was well designed.
3. Methodology known -- low risk activity.

Impact of Sub-Project or Activity on Beneficiaries. Basic crop response functions enable governments and the private sector to develop fertilizer promotion projects. Farmers have received information they needed.

Important Aspects of Sub-Project or Activity Not Mentioned Above. None.

How Sub-Project or Activity Contributed to SAARFA Project Purpose. This sub project has made a major contribution to the SAARFA project purpose of strengthening African agricultural research institutions and colleges of agriculture. The crop response functions determined are basic to almost any crop improvement program that might be mounted. Also, the socio-economic surveys detected key variables that help to explain fertilizer use. These are both economic and sociological. They are basic to designing a viable fertilizer extension program. In addition, the surveys provided insights into the role of women in production agriculture. Finally, more lasting consequences of the project were the training program and the establishment of the fertilizer revolving funds. Assuming that government policies are realistic, the project has provided the basis for one aspect of a program that could be mounted to transform traditional agriculture.

SAARFA SUB-PROJECT REVIEW:

**FACULTY OF AGRICULTURE OF THE NATIONAL UNIVERSITY OF RWANDA
(UNR)/UNIVERSITY OF MINNESOTA (UM)**

Sub-project Title: Strengthening the teaching and adaptive research capability of the National University of Rwanda

Sub-project Number: 698-0435.06

Obligation Dates: September 1987

Completion Date: September 1992

Total U.S. Funding: \$2,046,000

Background and Findings

This sub-project was supported by AFR/ANR under the Umbrella project, SAARFA. The purpose of it was to strengthen the Faculty of Agronomy by providing academic and field training in adaptive research philosophy, methodology and techniques so that it can teach and conduct adaptive research.

The project focus was on training for higher education and adaptive research by the faculty. At the beginning of the project there were 21 faculty members, of which 16 were Rwandan. Of these 5 had doctorates. Of the 11 potential candidates, the Canadian government awarded 7 students scholarships as well as support to send their families to Canada. Thus, USAID scholarships were not as attractive and the better candidates for Ph.D. programs went to Canada.

The exodus of these better faculty prompted the mid-term evaluation team to recommend that the sub-project focus on building capacity of the faculty. This could be done, they maintained, by training more potential faculty to expand the pool to handle the teaching responsibilities and to carry on adaptive research.

Research was undertaken in collaboration with host country research institutions and other universities in order to enhance host country capacity in this area.

The project had a coordinator, who interacted between USAID, UNR and UM. UM was responsible for providing short-term consultants and long term training.

During the implementation of the project the civil war erupted in the country causing the school to close.

SAARFA Sub-Project or Activity Outputs

1. Direct Outputs

A. Training:

Students were recruited from the university faculty. Academic training at the Ph.D. level was provided for three UNR faculty members in the United States. These were in the areas of agronomy, soil science, and animal science. In addition, 11 faculty were provided 45 hours of in-country training in a biometrics course. Also, one research technician was provided training to improve his skills in practical biometrics techniques.

Six faculty, two technicians and one student received 30 hours of SAS software instruction.

Five specialized courses conducted outside of Rwanda were attended by five different faculty members.

Ten faculty members attended seven international conferences.

Six faculty and eight staff members attended a series of English language courses conducted by USIS with the help of Peace Corps English language instructors.

Two technical training programs were sponsored for a plant pathology laboratory technician and another for a librarian.

Seven national seminars and workshops were attended by seven faculty. These provided opportunities for interaction with other colleagues as well as sharing problems and successes of common interest.

Two short courses were conducted for extension workers.

B. Research projects conducted

Six studies were completed and three departments have ongoing research programs in crop production, vegetable screening, and production of mushrooms as a result of the sub-project.

C. Employment and infrastructure

The government gave the university a 39 Ha (60 acre) experiment station for research by the Faculty of Agriculture. About 11 technicians are employed on the station. Approximately, 40 percent of the labor force are women.

There were no women faculty when the project started but now there are two women professors, both of whom are foreigners.

2. Indirect outputs

- A. A formal cooperative agreement was established between U of MN, UNR and IAV-Hassan II University in Morocco.
- B. A formal cooperative agreement was established with the Institut des Sciences Agronomiques du Rwanda (ISAR).
- C. An informal relationship for extension training was established with MINAGRI.
- D. The buildings and land area as indicated above devoted to faculty research were expanded.

Three Most Important Reasons for Success or Failure to Accomplishing the Stated Purpose

1. Positive Factors

The Dean and Vice Chancellor of UNR were open to questions and suggestions. There existed a great deal of transparency in project decision making. For example, criteria for selection of persons for training were made public.

An excellent relationship and understanding existed between the project staff and the UNR Faculty.

USAID provided considerable flexibility in the design of activities.

The project staff and faculty exhibited creativity.

2. Negative Factors

Devaluation of Rwandan currency made university operations costly.

Internal armed conflict interrupted university operations and made it impossible for students to do their research in Rwanda.

Insufficient numbers of qualified Rwandan scientists and staff were available to conduct adaptive research.

Impact of Sub-Project or Activity on Beneficiaries in General

Changed attitudes and the adoption of the work ethic among faculty in general about conducting research as well as teaching resulted from the sub-project. At first the primary focus was on teaching, but by the end of the sub-project faculty appreciated the value of

SAARFA SUB-PROJECT REVIEW: FERTILIZER POLICY RESEARCH

Sub-Project Title: Fertilizer Policy Research for Tropical Africa

Sub-Project Number: 698-0435.12

Obligation Date: 01/08/87

Completion Date: Continuing

U.S. Funding: \$2,700,000

Background and Findings

The first four years of the project, started in 1987, were devoted to fertilizer policy studies in a wide range of sub-Saharan Africa. However, in an effort to have a more visible impact, the number of study countries was narrowed to three. They were Ghana, Malawi and Mali. The foci were on selected fertilizer policy issues and capacity building. The latter is designed to result in a capability to undertake ongoing analysis of input policies. In addition, there is a policy advisory function performed for the benefit of government decision makers.

Fertilizer Policy Units have been initiated in Ghana and Mali. They provide counterparts to project personnel for the fertilizer policy studies. In Mali the unit is located in the Institut d'Economic Rurale in the Ministry of Agriculture, Livestock and the Environment. In Ghana it is in the Institute of Statistical, Social and Economic Research in the University of Ghana.

The policy issues addressed have been 1) Food, Security and Fertilizer Use, 2) Agronomic Potential of Fertilizer Use, 3) Agroeconomic Potential and Constraints on Fertilizer Use and Supply, 4) Policy Environment and Fertilizer Sector Development, and 5) Fertilizer Supply, Marketing and Distribution Strategy. These resulted from discussions of International Fertilizer Development Center (IFDC) personnel with host institutions and government agencies.

Analytical techniques and data management skills have been taught to counterpart personnel. Partly as a result, a number of reports have been published for the countries involved.

In addition to the central focus of the project, studies have been undertaken in the neighboring countries of Togo and Cameroon. In

conducting research. Many developed a new vision of what research can do for UNR.

Cooperation with ISAR and other international networks (CIAT, CIP, and CIMMYT) operating in Rwanda was established.

Eight hundred thirty farmers participated in activities at the Tonga research/demonstration farm and a number of them are adapting results of research, thereby contributing to increased income and improved family nutrition.

There is increased awareness about the need to strengthen research capacity. ISNAR completed a study and estimated that there is a need for 300 qualified scientists.

Important Aspects of Sub-Project not Mentioned Above

Many scientists and technical staff have made significant contributions to faculty development through visits to UNR supported by non-project funds.

Non-project funds were used to expand the library to many times its original size and content.

How Sub-Project Contributed to SAARFA Project Purpose

This was the only sub-project that focused solely on contributing to SAARFA project's stated purpose of strengthening faculties of agriculture.

Furthermore, it has met the SAARFA's intention of developing faculty with skills and commitment to conduct research. The Tonga station has become an active center of activity for faculty, researchers, extension workers and farmers.

Faculty have developed better educational materials, building on their experiences at the station and on their training in computer skills for research and training purposes.

It has helped the Faculty of Agriculture at the University of Rwanda (UNR) develop linkages with the Institute des Sciences Agronomiques du Rwanda (ISAR) and other appropriate Government of Rwanda (GOR) agencies, thereby making the Faculty a more viable institution for changing Rwandan agriculture.

The UNR/UM/SAARFA project in many respects has delivered more than was originally envisaged by SAARFA.

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the latter country the investigation concentrated on constraints to privatization of fertilizer imports and marketing.

Sub-Project Outputs

1. Direct Outputs

The following reports, resulting from the project, represent its most important direct outputs:

Badiane, Ousmane, et al. "Fertilizer Policy Research Program for Tropical Africa: Food Security, Comparative Advantages and Fertilizer Use in Ghana." Washington, D.C.: International Food Policy Research Institute, August 1992.

Badiane, Ousmane, et al. "Fertilizer Policy Research Program for Tropical Africa: Food Security, Comparative Advantages and Fertilizer Use in Mali." Washington, D.C.: International Food Policy Research Institute, August 1992.

Bumb, B.L., et al. "Fertilizer Policy Research Program for Tropical Africa: The Policy Environment and Fertilizer Sector Development in Ghana -- An Assessment." Muscle Shoals, Al.: International Fertilizer Development Center, December 1992."

Bumb, B.L., et al. "Fertilizer Policy Research Program for Tropical Africa: The Policy Environment and Fertilizer Sector Development in Mali -- An Assessment." Muscle Shoals, Al.: International Fertilizer Development Center, December 1992."

Henao, Julio, et al. "Fertilizer Policy Research Program for Tropical Africa: Agronomic Potential of Fertilizer Use in Ghana." Muscle Shoals, Al.: International Fertilizer Development Center, December 1992.

Henao, Julio, et al. "Fertilizer Policy Research Program for Tropical Africa: Agronomic Potential of Fertilizer Use in Mali." Muscle Shoals, Al.: International Fertilizer Development Center, December 1992.

Henao, Julio. "Fertilizer Policy Research Program for Tropical Africa: Management Information Systems Fertilizer Policy Support System for Ghana and Mali." Muscle Shoals, Al.: International Fertilizer Development Center, December 1992.

International Food Policy Research Institute. "Fertilizer Policy Research Program for Tropical Africa: Final Report." Washington, D.C.: International Food Policy Research Institute, December 1992.

International Food Policy Research Institute. "Fertilizer Policy Research Program for Tropical Africa: Service Provision and Its Impact on Agricultural and Rural Development in Zimbabwe - A Case Study of Gazaland District." Washington, D.C.: International Food Policy Research Institute, 1992.

Jha, Dayanatha, and Behjat Hojjati. "Fertilizer Use on Smallholder Farms in the Eastern Province, Zambia." Washington, D.C.: International Food Policy Research Institute, September 1991.

Rutungwa, Venant, and Tshikala B. Tshibaka. "Fertilizer Policy Research Program in Tropical Africa: Fertilite de Quelques Sols du Rwanda -- Gishamvu, Mugina, Kinyamakara, et Rwamiko." Washington, D.C.: International Food Policy Research Institute, July 1990.

Tshibaka, Tshikala B.. "IFDC/IFPRI Fertilizer Policy Project: Economic Policy Reforms and Fertilizer Use in Smallholder Agriculture in Malawi." Washington, D.C.: International Food Policy Research Institute, August 1992.

Tshibaka, Tshikala B., and Stephen Y. Atsu. "Fertilizer Policy in Tropical Africa: Fertilizer Use in Ghana -- A Study of Farm-Level Constraints." Washington, D.C.: International Food Policy Research Institute, June 1992."

Tshibaka, Tshikala B., and Carlos A. Baanante, eds.. "Fertilizer Policy in Tropical Africa: Workshop proceedings, Lome, Togo, April 1988." Muscle Shoals, Al.: International Fertilizer Development Center, July 1990.

von Braun, Joachim, et al. "Structural Adjustment, Agriculture, and Nutrition: Policy Options in the Gambia." In Working Papers on Commercialization of Agriculture and Nutrition, No. 4. International Food Policy Research Institute, April 1990.

2. Indirect Outputs

Policy advice has been given to government officials as a result of this sub-project. Especially during a period of structural reform is empirically based advice valuable.

Impact of Sub-Project or Activity on Beneficiaries in General

The sub-project has not been focused for a sufficiently long period of time for it to have had any substantial impact on beneficiaries. After it has become well established both producers and consumers should benefit. Efficient use of commercial fertilizer is one of the effective ways to keep pace with growing demand as well as contribute to the economic development of the agricultural sector.

Three Most Important Reasons for Success of FSA to contribute to Stated Purpose:

1. Limit of sub-project focus to those countries.
2. Experience of IFDC and IFPRI staff to undertake such studies.
3. Willingness of host institutions to participate in externally funded research projects.

How Sub-Project Contributed to SAARFA Project Purpose

This project has contributed to the SAARFA project purpose via the strengthening of institutional capacity to do fertilizer policy research in Ghana and Mali. Further, it provided valuable fertilizer policy insights in Ghana in association with structural adjustment in the economy.

SAARFA SUB-PROJECT REVIEW: WARDA MANGROVE RICE AND SWAMP NETWORK

Sub-project Title: Mangrove Rice and Swamp Network
Sub-project Number: 698-0435.08
Obligation Dates: December 1987
Completion Date: July 1993
Total U.S. Funding: \$2.5 million

BACKGROUND

Due to increases in population and urbanization, per capita rice consumption has increased drastically in the last decade. Regionally, demand is growing around 8.4 percent annually while yield has only increased by 0.3 percent over the last 10 years.

One third of the rice consumed in West Africa is imported, costing more than half a billion dollars a year of the limited foreign currency the countries can generate. Imported rice enters the region at subsidized prices against which farmers are unable to compete. At the farm level, locally grown rice is competitive with other staple foods, but it becomes less competitive in the major urban markets because of constraints such as poor transportation of both inputs and the product itself.

Mangrove swamps, a major rice ecosystem, are located on the tidal estuaries close to the ocean. Currently Guinea Bissau, Gambia, Guinea, Senegal, Sierra Leone, and Nigeria cultivate an estimated 214,000 hectares out of one millions hectares of mangrove swamps in West Africa. This comprises 7 percent of West Africa's total rice area but produces approximately 12 percent of its rice. The relative production is about 2 tons/ha under average conditions. Mangrove swamp rice areas are some of the most sustainable environments because of the sea tides which bring depositions of silt and other materials. Farmers have been cultivating rice in these areas for many years. However, high salinity and sulphate acidity characterize these soils.

USAID has been funding technology development and transfer within the mangrove swamp rice areas for about 15 years. The SAARFA sub-project, initiated in 1987, was developed to link the national programs and to facilitate the transfer of improved rice varieties and related technologies throughout the member countries. The project stimulated the development of a formalized network in 1991.

The network headquarters, operated by WARDA, is located at the National Research Station in Rokupry, Sierra Leone.

FINDINGS

Participating NARS are genuine partners in the network and are consulted on their needs and priorities. Research concentration is on soil and plant analysis, hybridization screening, acid sulphate, salinity, diseases, and pest control and varietal evaluation. Research responsibilities are allocated to national programs according to their strengths and weaknesses.

Composition of the Committee

The network is managed by two WARDA senior staff members and six junior scientists. The network has an elected steering committee comprised of scientists from member states. They annually review the network program progress and deal with network management issues such as the allocation of resources to national programs. The network coordinator carefully considers their decisions. A.I.D. and WARDA grants cover the costs of steering committee activities.

In order to avoid bias that would result from a committee comprised of only breeders, WARDA has added a social science dimension/component to its rice commodity research. A full time agricultural economist is working on identifying major socio-economic and policy constraints not only for this network but also for the other WARDA networks.

WARDA's Role in the Mangrove Network

WARDA's model of close collaboration with the NARS is recommended by many observers as a model for the other IARC's. Some NARS members indicated that WARDA is willing to work on wider problems in contrast to other IARCS which often concentrate only on germplasma production (varietal improvement).

Scientists at WARDA in Rokupry collaborate with The Southern Zone Water Management (SZWM) project in Casamance, Senegal which is funded by the USAID/Senegal. They have collaborated on varietal evaluation trials, training of technicians, and assessing production techniques in the valleys.

WARDA has collaborated with Overseas Development Natural Resources Institute (ODNRI) entomologists for 8 years. WARDA also collaborates with CORA, INGER, and IRRI through the dispatch of germplasm.

Priority Rice Growing Environments and WARDA Programs

WARDA's involvement with the Mangrove Swamp Rice Network has been through the coordination of several activities: research, technology transfer, training, documentation support, and identification of supplementary funding for NARS regional activities. The following provides a perspective concerning this ecosystem:

ENVIRONMENT/ PROGRAM	AREA (000ha)	PERCENT	PROGRAM LOCATION
Continuum:			
Upland/hydromorphic	1539	57	Bouke, IC.
Hydromorphic/Swamp	513	21	Suakoko, Lib.
Sahel (Irrigated)	135	6	Fanaye, Ndiaye Sen.
Mangrove	189	7	Rokupry, S.L.

Research: WARDA mangrove swamp scientists and national program researchers cooperate in exchanging and testing promising varieties. Since the Rokupry station started in 1930s, the major task has been to develop superior varieties of rice adapted to mangrove swamp conditions. In 1978 several high yielding, early maturing varieties such as ROK 5 were released. WARDA established a multidisciplinary program of working with NARSS on the development of technologies fit for mangrove swamp rice production, including technologies for intensifying and stabilizing production on areas already cleared.

Technology Transfer: Technologies are tested by WARDA scientists through on-farm trials in the six member countries. For example, in order to fit mangrove swamp conditions, WARDA/Rokupry scientists developed a nitrogen injector which has helped increase yields by 30 to 50 percent. Farmers are encouraged to participate in the technology development. Technology packages appropriate for the various mangrove swamp ecosystems were developed in the mid-80s, but due to poor linkages among national programs, not much progress occurred in the region until the creation of the network.

Training: Training is conducted in the form of workshops, monitoring tours and long term training programs.

In 1992 the network sponsored two training courses, both having to do with seeds. About 15 NARS participants from the region attended these courses. The network conducted a monitoring tour which enabled participants to assess current progress and constraints in research and production on mangrove rice. In addition, three research assistants received on-the job training. Finally, the

visiting scientist program attracted eight scientists who wanted to reinforce their skills.

Two research scholars were trained at the Ph.D level. One completed field studies in Guinea and Sierra Leone and wrote a dissertation entitled, "The Adoption of Improved Mangrove Swamp Rice in West Africa: A Case Study of Guinea and Sierra Leone". Among other things, his analysis shows that greater adoption of new varieties by mangrove swamp rice farmers depends on the ease of cooking, ease of threshing, tillering capacity and yield (Adesina and Zinnah, October 1992). This refutes the conventional belief that adoption depends on farm and farmer specific factors such as age of farmer, farm size, participation in on-farm mangrove trials, contact with extension agents and the years of experience since the farmer became the owner of mangrove rice farm.

Another researcher, still enrolled in a Ph.D degree program, is working on a study entitled "Characterization of the Mangrove Swamp Agroecology of West Africa". This study is very important for enabling the NARSS to target their varietal improvement according to their own agroecosystem.

The third researcher, a Post Doctoral Fellow, completed his studies and is now working on the evaluation of segregating populations to identify genetic materials tolerant to biotic and abiotic stresses.

Documentation Support: WARDA has been able to facilitate the communication between scientists in the region. This is done through the distribution of Current Contents and the timely response of requests for photocopies of articles. WARDA also conducts literature searches for NARS scientists. Finally, based on the profiles of network scientists, incoming literature is sorted and sent to the scientists who may not know that the publication exists.

Impact Assessment of Technology Transfer

The mangrove network has 500 rice lines. So far, three improved varieties of rice are now widely used by farmers. They include ROK 5, a short duration rice variety, ROK 10, and KUATIK KUNDUR. In 1990, a new variety, WAR 77-3-2-2, was introduced into the Gambia. Its yield exceeds those of ROK 5 by 40 percent.

A study was conducted in Sierra Leone and Guinea in locations where WARDA had adaptive on-farm trials. The survey showed that in Sierra Leone the number of farmers having adopted improved varieties increased from 5% in 1986 to 39% in 1989 and to 52% in 1990. In Guinea in 1989 only 1% of the farmers were using improved varieties but by 1990 17% of them had adopted the new mangrove rice varieties. It was estimated that the cumulative monetary benefits

in Sierre Leone is \$ 13.7 million and in Guinea \$.4 million. (Adesina and Zinnah, October 1992).

Three Most Important Reasons for Success to Accomplishing the Stated Purpose

WARDA has developed a system which focuses on coordinated subject matter research by NARSS and WARDA with the full participation from the very beginning of the planning process by both NARSS and WARDA scientists.

Membership on the Steering Committee has been expanded to include socio-economic analyses to complement varietal improvement as the approach to addressing production constraints.

WARDA has been able to facilitate the communication among scientists in the region. This is done through the distribution of Current Contents and the timely distribution of photocopies of articles. WARDA also conducts literature searches for NARS scientists.

CONCLUSION

The Mangrove Rice Network and WARDA play vital roles in the region. WARDA has undergone drastic reform over the past five years and has provided innovative leadership to the network. The network is comprised of competent, efficient scientists who are dedicated and motivated. The evaluation team was impressed by the coordination and collaboration witnessed. The participatory and collaborative model of WARDA is highly recommended for the other IARC's. Because WARDA is part of the region it serves, it has an advantage over other IARC's in terms of being attuned to specific problems in the region. This team's assessment is that the mangrove swamp rice portion of the WARDA program has made considerable progress and deserves continued donor support.

SAARFA SUB-PROJECT REVIEW: HEARTWATER RESEARCH

Sub-Project Title: Heartwater Research Programs
Sub-Project Number: 698-0435.14
Cooperative Agreement Number: AFR-0435-A-00-9084-00
Obligation Date: 01/08/89
Completion Date: Continuing
U.S. Funding: \$2,954,000

Background and Findings

The second evaluation, performed by a team of outstanding scientists, covered the accomplishments of this very technical project until August 1992. Highlights of their report are as follows:

The TAG was impressed with the accomplishments achieved by the investigators and the breadth of scientific findings. The TAG acknowledges the complexities and paucity of knowledge concerning heartwater that have served as significant barriers to unravelling the mysteries of this disease over the years. The heartwater project team represents an integrated, yet diverse group that is now recognized for its contributions to heartwater research.

The research and progress made....more than justifies the USAID support to date and warrants further support to ensure that new products are patented, licensed, and commercialized. Such tools can be the touchstone for the successful control of bont ticks and heartwater that have been so elusive in the past. With a new armamentarium of diagnostics, vaccines, and acaricides, significant parts of the African continent may be more productive for livestock.

....the spread of the tropical bont tick, Amblyomma variegatum, throughout the Caribbean and the knowledge that heartwater itself is also probably spreading with this vector is very disconcerting to the U.S. livestock industry and animal health officials. The potential for a disaster based on the expansion of the ticks and the

heartwater agent into the United States is very real. Thus, the development of the new tools by the heartwater research team has tremendous implications for supporting a tick eradication program in the Caribbean as well as for possibly combatting an incursion in the United States or South American continent.

The TAG was favorably impressed with the project's expertise, leadership, cooperation, and achievements. We unanimously agreed that overall the project was extremely valuable, useful, and that the commercialization possibilities are most exciting. The TAG further commends the project team for its scientific rigor and ability to mesh together a high-performance team.

Specific summary and recommendations included but were not limited to the following:

The major focus of the project should continue to be the generation of a recombinant subunit vaccine against the disease. The protective capacity of the recombinant 23kDA protein should be determined, and if protective it should be developed further as a potential vaccine, preferably in conjunction with a commercial partner. In the event that this antigen does not prove effective, antigen screening of the agent should be continued in the light of the results of ongoing immunological studies.

Finally the list of following publications attests to the productivity of the sub-project:

Andrew, H.R., and R.A.I. Norval. "The Carrier Status of Sheep, Cattle and African Buffalo Recovered from Heartwater." In Veterinary Parasitology, Vol. 34. Amsterdam: Elsevier Science Publishers B.V., 1989, pp. 261-266.

Andrew, Howard R. and R.A.I. Norval. "The Role of Males of the Bont Tick (*Amblyomma hebraeum*) in the Transmission of *Cowdria ruminantium* (Heartwater)." In Veterinary Parasitology, Vol. 34. Amsterdam: Elsevier Science Publishers B.V., 1989, pp. 15-23.

Burridge, Michael J.. "Caribbean diseases threaten Florida." In The Florida Cattleman, March 1986, pp. 40-41.

Byrom, B. and C.E. Yunker. "Improved culture conditions for *Cowdria ruminantium* (Rickettsiales), the agent of heartwater disease of domestic ruminants." In Cytotechnology, Vol. 4. Netherlands: Kluwer Academic Publishers 1990, pp.285-290.

- Byrom, B., et al. "In vitro isolation of *Cowdria ruminantium* from plasma of infected ruminants." In Veterinary Microbiology, Vol. 26. Amsterdam: Elsevier Science Publishers B.V., 1991, pp. 263-268.
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Sub-Project Outputs

1. Direct Outputs

Those direct outputs have resulted from the research on this blood parasite. They are 1) a diagnostic procedure, 2) a tailpatch for attracting bont ticks and 3) a recombinant sub-unit vaccine. Each deserves elaboration.

Prior to this research effort no diagnostic procedure was available for use on live ruminants. Only after the animal died of heartwater was it possible to diagnose the disease. For obvious reasons, the development of this diagnostic procedure for use on live animals was a significant accomplishment.

Since the bont tick is the vector by which the disease is spread, any new procedure for reducing its population would be valuable. Presently in Africa frequent dipping of animals at risk is the method of choice for reducing the tick population. This sub-project has developed a tailpatch designed to attract ticks so they will mate with others which will cause their offspring to be infertile. This output should be ready for commercialization soon.

The third output is a first generation vaccine. When perfected this will be the primary output of the research. The world-wide value of such a vaccine will be immense.

2. Indirect Outputs

Underlying the above mentioned visible outputs is a tremendous amount of new knowledge. The midterm evaluation estimated that more progress toward conquering the disease had been made by the sub-project in three years than all the progress made world-wide in the previous 30 years.

An indication of the impact of this indirect output is given in the number of publications in peer reviewed journals that resulted from this research.

This research demonstrates what science can do for agricultural development.

Three Most Important Reasons for Success of the Heartwater Sub-Project to Contribute to Stated Purpose.

1. Team of highly qualified scientists.
2. Support from many sources, especially from the host institution.
3. Multi-faceted approach to a very complex problem.

Impact of Sub-Project on Beneficiaries in General

This research effort will have world-wide impact. The disease is not only in Africa but also in other parts of the world, including on islands in the Caribbean Sea within a bird's flight of the U.S.. Just one bird could carry just one infected tick to the U.S. wild game population and much of the ruminant livestock population of the U.S. could be at risk. Prior to this research, little could have been done to control the damage to less than a disaster. As a consequence of this research, diagnosis is possible in live animals. Further, both the tailpatch and the vaccine are candidates for commercialization in the future. Clearly, the impact of this research could be one of the largest experienced in the post-World War II period for livestock.

How Sub-Project Contributed to SAARFA Project Purpose

The SAARFA project purpose focused on 1) technology development and transfer and 2) increasing institutional capacity. This sub-projects' accomplishments have been so great with regard to the former that little has been said concerning the latter. While technology development has been emphasized, investments have been made in enhancing institutional capacity also. This has primarily taken the form of training. Both long term graduate degree training and short term training have been undertaken. But perhaps the most important training has been the practice of "good science" that has resulted in such striking research results.

SAARFA SUB-PROJECT REVIEW: FOOD SECURITY IN AFRICA

Sub-project Title: Experiment Station Operations Management

Sub-project Number: 698-0435.15

Obligation Dates: 8-28-89
2-1-90

Completion Date: 10-29-92

Total U.S. Funding: SAARFA	\$282,000
All Sources	\$672,015

Percent of Total Project Funding from SAARFA: 42%

Background and Recent Evaluation Findings

Poor management and administration of agricultural research programs was identified as a serious constraint to the effectiveness of African Agricultural Research programs in the plan for supporting African Agricultural Research and Faculties of Agriculture. The plan called for upgrading the managerial capacity of selected individuals. A need was identified for instituting efficient management and administration of agricultural research farm operations. The basic need was to improve the capacity of researchers to achieve effective research results by relieving them of some of the troublesome management tasks of day-to-day farm operations.

As stated in the sub-project authorization, the goal of the sub-project was to increase the flow of technology from NARS to African farmers through achieving higher levels of production and efficiency on agricultural research farms. The sub-project involved a two and one-half year, three-cycle training program in Experiment Station Operations Management.

The sub-project design called for conducting four training programs and following-up with visits to the stations of participants in the courses. The follow-up visits were not possible in the case of the Frankafone course because of the limitation of funding.

Sub-project evaluation materials include comments of participants following completion of the courses. In general, they felt that the courses were highly useful and aided in improving their performance.

Sub-Project Outputs

1. Direct Outputs

Date of Training	Location of Training	Number of Trainees	Countries of Trainees
February 19 to March 9, 1990	IITA, Ibadan, Nigeria	17	The Gambia, Ghana(2), Liberia, Nigeria(13)
February 18 to March 8, 1991	IITA, Ibadan, Nigeria	18	Cameroon(2), Ghana(2), Nigeria(11), Sierra Leone(2), Uganda
February 9 to March 6, 1992	ICRISAT Sahelian Center, Niamey, Niger	28	Benin, Burkina Faso(6), Burundi, Cameroon(2), Guinea, Mali(2), Niger(6), Rwanda, Senegal(7), Chad
February 17 to March 6, 1992	IITA, Ibadan, Nigeria	18	The Gambia, Ghana(8), Nigeria(4), Seychelles, Swaziland, Tanzania, Uganda(2)

According to the contractor, the principle areas of course content emphasis were:

- a. **Concept and Role of Experiment Station Management:** Definition of objectives, types of stations, organizational structures; planning the operations, maintenance, and further development of Agricultural Experiment Stations; parameters for defining activities of stations, master plan methodology, strategic planning, resource base planning, planning for equipment, vehicles and instruments.

- b. Station Administration and Management: Organizational structure, time management, personnel management, financial management, purchasing and inventory control, communications.
- c. Micro-computer based management tools: Micro-computer based data management including spreadsheet, word processing statistical, and Geographic Information Systems programs.
- d. Resource Conservation, Development, and Improvement: Soil and water resource inventory, mapping, implementing resource conservation, surveying techniques, utilization of remote sensing imagery, land clearing and grading, surface-water resource development.
- e. Research Support Services: Analytical, computer and statistical services, meteorological stations, plot and field history records.
- f. Station Farm Operations: Crop production, land preparation, residue management, crop seeding and management, fertilizer management, water management, chemical techniques and equipment, integrated pest management.
- g. Post Harvest Handling and Storage: Seed and grain cleaning, drying and treatment; seed and grain storage; specialized storage.
- h. Equipment Operation and Maintenance: Procurement, workshop organization and management preventive maintenance, station vehicles and service, as well as animal traction farm equipment.

The training strategy was hands-on and practical. About 1/3 of the total instructional time was taken up with field and laboratory practical exercises.

In addition to the training program, per se, specific tailored training materials were developed. These were translated into French and are available in both languages.

2. Indirect Outputs

A generalized list of indirect outputs from the project includes:

- 1. Approximately six months after completion of each of the Anglofone courses, most of the trainees were visited by one or

more of the trainers. Changes were noted in the station's operations as a consequence of the courses.

Although funding did not permit follow-up visits from the Frankafone course, Mali, Rwanda, and Burundi have or are in the process of sending participants to the Master of Science program at the University of Arkansas in this subject matter area.

Three Most Important Reasons for Success of Training Program to Contribute to Stated Purpose

1. The cooperation between IITA, ICRISAT and faculty from the University of Arkansas was notable in making this training activity successful. As a result of their training and experience, they highly complemented one another in conducting courses that met the needs of the participants.
2. Both ICRISAT and IITA provided at the training sites a range of appropriate equipment and facilities essential to the training program. These ranged from hand tools to sophisticated, mechanized equipment. This enabled the courses to be balanced with regard to academic content and applied training in technical areas.
3. The combination of need for this training and genuine interest in it was important in explaining its success. The fact that the trainees came from 20 African countries indicates the breadth of interest in the course.

Impact of Sub-Project or Activity on Beneficiaries in General

1. Each participant obtained a set of focused, relevant, and, in large measure, unique materials as a consequence of the course. These were made available to them in their professional languages.
2. Each participant was required to develop an action plan for implementing some aspects of the course upon their return to their research farm. In the visits to the participants following the courses, there was an attempt made to measure these achievements. In most cases, the contractor reports that at least some of the materials from the course had been incorporated into the work performance of the participant, which resulted in improved station performance.
3. Initial explorations were launched to determine the feasibility of institutionalizing the course within indigenous institutions in the region.

4. The World Bank has solicited additional support from the Experiment Station Operations Management program at the University of Arkansas. Training activities are being planned for offerings in Mali and Uganda.

How Sub-Project Contributed to SAARFA Project Purpose

The effectiveness of many agricultural research programs is substantially impacted by the environment in which they operate. If there is a supportive environment such that research field operations can be undertaken on a timely basis with the scientist concentrating on the analytical portions of the research rather than the mechanical support needed to carry out the research, an effective program can result. On the contrary, if there are support problems, e.g., in terms of the Experiment Station lacking the ability to provide the necessary non-scientific aspects of the investigations, the result will be that the scientific contribution will be materially reduced. An effort to improve the management of these stations at the operational level has been the objective of this program. An effort that results in station managers being able to more effectively plan, implement and evaluate their support role, is of crucial importance. Although this is one of the sub-projects that does not directly result in increased production, it is of crucial importance in a balanced program designed to increase the flow of technology to farmers.

APPENDIX E

ANNEX E
NETWORKS IN AFRICAN AGRICULTURAL RESEARCH:
PAST EXPERIENCE AND FUTURE DIRECTIONS

1.0 Summary

Agricultural research networks are interconnected groups of agricultural researchers communicating and working together on common problems. The most common type of network supported by donors in Africa is the collaborative research network which involves joint inter-country (or inter-institute) planning and monitoring of research on problems of mutual concern within a region. Additional activities of these networks usually include general information exchange, technical collaboration and workshops or other training.

Networks are desirable because of benefits such as:

1. generates a fast, complete flow of information;
2. increase in research efficiency and less duplication;
3. researchers work on problems where most capable;
4. allows for a coordinated approach to problems;
5. assists researchers keeping current with information;
6. increases isolated scientists involvement;
7. strengthens governments commitment to research; and
8. assists industrialized countries with new knowledge.

Costs associated with a network must be more than covered in order to justify participation. Categories of costs include:

1. direct operating costs;
2. capital construction costs;
3. research foregone to do network activities;
4. excess international requests for particular scientists;
5. allowing donor money to alter NARS research priorities;
6. loss of competition as a motivating force; and
7. reluctance of donors to give support if they lose their identity with the project.

Recent reports of rates of return to agricultural research in Africa average between 40 and 50 percent and range between zero and 135 percent. The one known rate of return study of network activities is of the CIP led potato work in the Eastern Highlands; the estimated IRR for this work is 91 percent. While no evidence exists that networks will all receive such a high rate of return, organizing an activity with an anticipated high rate of return in a more efficient manner can be expected to be even more profitable.

Evaluations of network activities have identified a number of factors associated with successful networks. Most lists include the following:

1. effective coordinator;
2. internal planning and control by NARS representatives;
3. realistic agenda relating directly to the problem;
4. NARS researchers capable of scientific work;
5. effective communication with regular working sessions;
6. NARS resources committed to the work;
7. existence of basic research relevant to problem; and
8. external funds for coordinator and training at startup.

Two factors which may have negative impacts upon network activities are:

1. attempting to work on too complex of a problem; and
2. attempting to organize too large a number of countries.

A large number of the networks in Africa were started with IARC personnel as coordinators. Purposes of these efforts include moving IARC developed technology out of the station to the NARS, improving the research capability of the NARS scientists so they could make maximum benefit of the information from the IARCs, and helping groups of NARS organize so that information flows and research in the region were done more efficiently.

The organization of the networks tends to change as NARS scientists become more knowledgeable of the benefits of networking. The trend appears to be in the direction of increased member country control of the organization and direction of the research. This frees the IARC scientists from the organizational responsibilities and allows them to place greater effort on technical assistance.

The A.I.D. management of the funding of networks has changed from time to time more in reaction to internal situations than in attempts to further the development of the networks. It is recommended that USAID project oversight should be as close to the activity as is possible, that the managers should have both technical and managerial competence, and that the project should be sufficiently flexible to accommodate evolution of the networks as the NARS develop. It is further recommended that the funds and personnel be given to the REDSOs to undertake this work. If this alternative is not possible because of internal constraints on personnel, then a project should be developed to allow another U.S. Government Agency, such as USDA, to undertake the responsibility for the development of these regional organizations.

2.0 Rationale for Agricultural Research Networks

2.1 Definition

Networks are interconnected groups of people who are communicating and/or working together. International agricultural research networks are a specialized set of networks, the members of which are agricultural researchers working in a number of different countries. The formal networks have a stated focus which is to share information, technology, research methodology or the research effort in order to solve identified problems of a mutual concern. Throughout this paper, the term network will refer to international agricultural research networks.

2.2 Typology

Networks are designed to address specific problems and each is slightly different. For convenience, Cummings and Martin classified them into three types for the Special Program for African Agricultural Research (SPAAR). While others (Plucknett, et al.) have refined the classification, the SPAAR Model remains adequate for most usage. These types are:

A. Information Exchange Networks organize and facilitate exchange of ideas, methodologies, and results of research currently underway.

B. Scientific Consultation Networks involve country by country focus on common priority research conducted independently by participants who hold regular meetings and have other means to exchange information on research as in one above.

C. Collaborative Research Networks involve joint inter-country (inter-institute) planning and monitoring of research on problems of mutual concern within a region. These could include information exchange, technical collaboration, and sometimes training.

Because they saw the greatest advantage to be gained in Sub-Saharan Africa was from the collaborative networks, SPAAR strongly recommended that donor funds should be concentrated on this type. Unless otherwise noted, the remainder of this paper is devoted to collaborative networks.

2.3 Benefits

Networks, properly organized and utilized, can increase the efficiency with which some agricultural research is conducted. The benefits associated with collaborative networks are of the following types.

A. Networks enhance interactions between scientists, many of whom are in very isolated locations. The faster, more complete flow of information between researchers can mean that existing knowledge is put to better use and that fewer efforts are made to 're-invent the wheel'.

B. There can be expected to be an increase in research efficiency through the decrease in duplication of effort. The ideal situation would have a problem divided into several researchable components and these research projects allocated among the network members according to the skills and interests of the individuals. The results would then be shared to address the larger, common problem. This efficiency is particularly evident where agro-ecological zones cross national boundaries; the sharing of responsibilities avoids the involved countries duplicating the work of the others and saves on limited research resources. There are also numerous problems which transcend agro-ecological zones and where benefits are to be gained from a collaborative approach. Examples of the latter include some work in insect control, animal diseases, farm machinery, etc. The notable work by IITA on the biological control of cassava mealy bugs required detailed, applied tests in only a few countries before it could be transferred to wide areas of Africa is illustrative of this.

C. The small, African NARS have only a limited number of qualified researchers. The concept of a necessary, critical mass of research talent devoted to a problem area is valid and important. While there are examples of an isolated scientist making important observations or breakthroughs, the vast majority of new ideas occur in situations involving informed human interaction. In most small African countries there is often only a limited number of trained people for a given problem and, in many cases, there may well be insufficient resources to support more than one or two scientists working on a particular commodity or research problem. Regular communication with colleagues in neighboring countries can work to generate new ideas, identify errors of procedure, help validate concepts and the dozens of similar processes which result from human interaction on a given problem. Collaboration in the conduct of work will also benefit from the efficiencies of having researchers use their individual comparative advantage.

D. Networks have an advantage when problems are regional or international in scope. This is apparent with problems like the cassava mealy bug mentioned above. Multi-national, networking approaches are logical organizational arrangements for ecological and marketing problems as well.

Networks are appropriate when actions in one area produce an effect in a neighboring country. Many natural drainage areas transcend national boundaries and actions upstream have major effects downstream. Similarly, many lake areas are affected by the actions in a number of countries and realistic approaches to problem

solving require a coordinated approach. Many man made systems such as transportation routes also benefit from collaborative problem solving; the existence of several land-locked nations intensifies this desirability.

The existence of an excess productive capacity in one country may signal the desirability of network problem solving for a group of countries in the region. Often the establishment of the minimum capacity processing plant exceeds the available market. This is frequently observed with examples ranging from fertilizer factories to university departments for the training of specialized skills. The analysis (and coordination) of the use of such capacity or the trade of the output can be an effective multi-national activity.

E. With the explosion in knowledge which is occurring, continuing education beyond graduate training is an absolute necessity for all scientists. Workshops, seminars, and peer reviews organized by the network can assist in overcoming intellectual isolation.

F. Networks tend to make NARS scientists more active participants in the research process instead of passive recipients of information from IARCs. Generally, the more involved the researcher, the more likely that person is to contribute new ideas or provide valuable critique to on going work. Networks can assist with stopping the waste of human resources.

G. If a country makes an international commitment, then that government is more likely to keep the promise as compared with internal budgets. Budgets for agricultural research are under continuing pressure all over the world. This is particularly true in third-world countries with their very tight budgets and long history of having donors fund major portions of these costs. International commitments assist with the effort to keep an even flow of domestic funds for agricultural research.

H. The flow of knowledge, germ plasm, and other technological information is a two-way street. Industrialized countries receive information more quickly when scientists are involved as colleagues in the sharing of information. This aspect of networking becomes increasingly valuable as these countries cut domestic research budgets and as remedial measures are needed for emerging diseases and crop pests.

2.4 Costs

The realized benefits have a stream of costs associated with them which must be more than covered in order to justify organization and operation of a network. Clearly, it must be recognized that only a specialized sub-group of agricultural research activities will have benefit streams exceeding associated costs. Only an IARC or a relatively large nation will be able to afford and justify the expensive laboratories and time commitment to undertake biological

engineering. The majority of African nations will be concentrating, for the foreseeable future, on the application in their country of the more fundamental research being done on central stations, such as those of an IARC. It is in the realm of the conduct of the research which makes the transition from large, central experiment stations, to smaller, national stations, to farmer's fields that most African networks have been organized. While the concept of collaboration is intuitively attractive, there are associated costs which must be covered; categories of such costs are outlined below.

A. The direct operating costs of the network would include the cost of the coordinator's salary and office, travel and other costs associated with meetings, workshops and training, sub-project research costs for collaborative work, and costs for staff extended by the coordinating IARC.

B. Long-term capital investment costs to develop experiment stations, build laboratories, equip and maintain the laboratories, etc. Proposals often include the construction of new facilities. These costs must be considered regardless of the source of funding; it must be assumed that the funds have alternative use. While some investments have been justified in new networks, a general rule has been that the more a network relies upon existing facilities, the greater the success of the network.

C. A network runs the risk of overburdening a small NARS or making excessive requests of one or two stronger members in order to have more significant outputs. The value of the work foregone needs to be considered when assessing the value of a given network.

D. Related to 'B', there is often the complaint that there are too many meetings. In this case instead of a NARS being overburdened, a particular articulate or astute researcher (or director) is in demand by numerous networks. Enjoyment of the contacts with other researchers, the experiences of travel, and the per diem changes a once productive researcher into a marginally productive, but well known, world traveler.

E. There are the dangers and costs associated with the potential distortion of the research priorities of the NARS. There is the danger that a given IARC or donor may have goals totally outside the best interests of a NARS but be welcomed and have staff and resources allocated because they bring new monies, travel and training with association in the network. The SPAAR master plans may help control this, but it is doubtful.

F. A collaborative network substitutes cooperation for competition between researchers. Competition is a major motivating force. Unless other incentives and rewards are instituted to replace it, the loss of the idea of being the first to discover a particular finding, and possible recognition associated with that honor, the

drive to work may drop resulting in lower researcher productivity.

G. The majority of donors work on a bi-lateral basis and wish to have a relationship that can provide identification with successful output within that country. There is frequently a reluctance on the part of donors to support the in country work associated with a network. If this causes a decline in total donor support for that NARS, it could be considered a cost of the network.

2.5 Rates of Return to Research

Unfortunately, no rate of return studies are known in which attempts have been made to isolate the effect of a network. The rate of return studies reported in the 1992 Africa Bureau "Symposium on the Impact of Technology on Agricultural Transformation in Africa" were of a high rate of return over time to agricultural research. Internal rates of return averaged between 40 and 50 percent and ranged between 0 and 135 percent for the eleven studies reported. The only known rate of return study for an African networking effort (and not in the above eleven), is a 1992 CIP study for their Eastern African Highlands Potato Network in two small countries and one isolated region (Burundi, Rwanda, and Eastern Zaire). This study reported an IRR of 91 percent for the time period 1978-91. While no conclusions can be reached with a single study, most observers in East Africa would consider the reported results a reasonable estimate of the value of that Network. The ability of any one of the three countries in the CIP study to mount an effective research effort by themselves, on a root crop like potatoes, would be judged to be difficult. For the three to combine and produce such a positive result must be impressive. The argument in favor of networks that there are efficiencies to be gained through collaborative effort is creditable, particularly in the case of the relatively small African nations.

2.6 Factors with Positive Impact on Networks

There have been numerous attempts to list principles considered important for success of networks. Plucknett, Smith and Ozgediz (1990) list 24 principles that one or more of eight evaluators of networks consider important. Plucknett, et al., list 14 of the 24 as main principles. Regularly, workshops such as the IDRC "Eastern and Southern Africa Network Coordinators' Review" (1988) report and discuss factors important to network operation. All of the factors or principles are desirable attributes but it is difficult to identify the critical and necessary factors. One of the reasons is that the term success is not defined. The result is the informed judgment of students of the topic; a good and desirable output but not necessarily definitive.

I also have a personal list of factors I believe to be important to the operation of a network. I will present them as my personal

judgment of desirable factors but without any attempt to state that they are scientifically determined nor that they are necessary for a well operating network. I know differently. A factor that is on everyone's list, including mine, is an effective coordinator. Yet one of the best operating networks of which I am personally knowledgeable had a very weak coordinator for over two years. Other members of the governing committee made up for the coordinator's lack of skills by making sure his work was done. Under different circumstances, the network would have collapsed. While every design should be situational, it is my preference that special attention be given to the following list:

- A. Effective coordinator
- B. Internal planning and control by NARS representatives
- C. Realistic agenda relating directly to the problem
- D. NARS researchers capable of scientific work
- E. Effective communication with regular working sessions
- F. NARS resources committed to the work
- G. Existence of basic research results relevant to problem
- H. External funds for coordinator & training at the start

2.7 Factors with negative impact on networks

I have observed negative impacts which are difficult to overcome from trying to do too many things or trying to organize too many countries. Both of these factors are particularly relevant during the formative years. Working well with 4-6 countries is better than trying to juggle the work in 15-18 countries and ending up really only being effective in 2-3 of them. Of course once a network is operating and internally controlled, new members can often be added in a productive manner. The same is true of the numbers of crops or problems handled. One major problem area with 4-6 definitive sub-projects makes a task which can be managed and is likely to produce some meaningful output. Positive, meaningful results tend to bring about further support and researcher loyalty.

3.0 Agricultural Research Networks in Africa

Table 1 lists a number of the major agricultural research networks in Africa. All but two on this list would be classified as collaborative networks. There are, no doubt, more information exchange networks than this list indicates but the networks which receive attention and are readily recognized tend to be in the collaborative category. Quite possibly this is because their budgets are larger and thus the effort more noticeable. The networks on this list hold numerous workshops and seminars, publish newsletters or sponsor publications series, and foster scientific exchange in addition to any efforts to coordinate individual member's research.

Networks, as we are considering them, tended to have a beginning in the early to mid-1980s and to be associated with an IARC. This can

be partially explained by two factors. First, the IARCs markedly increased in number during the early 1970s and after an 8-10 year period of research needed an efficient way of extending their work to national programs. With the relative weakness of third-world NARS, organizing collaborative networks to strengthen NARS scientists and to disseminate the knowledge accumulated at the IARCs central station was a practical proposal. Secondly, the donor community still believed in the need for and benefits to be gained from agricultural research but was frustrated regarding the weak and apparently unproductive nature of African research on food crops and livestock production. Two approaches, agricultural research networks and farming systems research, received significant support during the early to mid-1980s. Thus, the IARCs proposed and the donors supported a number of agricultural research networks. Africa received a fair share of these efforts.

The networks generally started out as extensions of IARCs, or in the case of the CRSPs one or more US universities. In the majority of cases, the emphasis was on what was known at the lead institution and what 'adaptive research' was necessary for its adoption. As long as there were ample funds for training and travel of the member countries researchers, there was little thought given to how the network would have to change if it were to remain accepted and 'successful'. As the numbers of people trained increased and travel became more routine, the NARS leaders began looking at who was controlling the network and where the power was vested. As the structure of the network began being examined, so too were the goal and purpose of the organization opened up for scrutiny. The most apparent expression of this latter examination was the altering of monitoring activities. A typical change of monitoring criteria went from counting numbers of introduced varieties tested by NARS scientists and numbers of NARS scientists trained, to numbers of practices adopted by farmers and changes in the living conditions of farmers, and perhaps to discussions about changes in conditions of the country (i.e.: possibility of exports and foreign exchange earnings, nutritional status, etc.).

In answer to the query regarding how a successful network operates, one needs to consider a particular case situation. It is difficult to compare the methods and organizations desirable for a complete new line of research, such as agroforestry, with those appropriate to an established, reasonably well staffed line of work, such as maize in Southern Africa. Factors which are continually discussed include: 1) effective coordinators; 2) realistic agendas; 3) capable researchers; 4) resources committed to the work; 5) effective communication; and 6) existence of basic research relevant to the problem (see 2.6 for a slight expansion of the list). One will note that each of these factors has a qualifier which is, in turn, situational. An effective coordinator will need to work differently in the agroforestry example above than in the maize network. The six factors listed above are usually found in the African networks believed to be successful, given situational

definitions of the qualifiers.

One factor not frequently listed but inferred above is an understanding of the dynamics of change. The successful networks frequently have a leader or leaders who have a long term vision and who understand that the intermediate steps are often pragmatic adjustments to existing situations. They are also able to reassess changing situations and how they may change the planned growth path of the organization. They possess a working understanding that no unequivocally perfect organizational structure exists which can remain static. They also have the ability to analyze situations and devise solutions which optimize the use of resources on the track towards their vision. The CIP initiated PRAPACE network, described in the next section, has been strongly influenced by the CIP Regional Director who is an example of one with such skills. It is also possible for networks without a visionary to positively adjust and remain viable if the leaders are open to change and have the wisdom to select the more valuable ideas from the cornucopia of comments dumped upon them from consultants, donors, evaluators, etc. The opposite course, refusal to entertain change, will guarantee over time the failure of a network.

Table 1. African Agricultural Research Networks
(not a complete listing)

Network	Year	IARC	Nations (regions)
1. AFRENA-EA (Agroforestry Research Networks for Africa)	1986	ICRAF	Eastern Highlands
2. AFRENA-HULWA	1985	ICRAF	W Africa
3. AFRENA-SALWA	1985	ICRAF	Sahel
4. AFRENA-SA	1986	ICRAF	S Africa
5. Animal Traction Res. Net.	1988	ILCA	Africa
6. ARNAB (Afr. Res. Net. on Agricultural Byproducts)	1981	ILCA	Africa
7. CRSP Bean/Cowpea	1980	MSU	8 Afr.
8. CRSP Peanut	1982	U. Ga.	5 Afr.
9. CRSP Small Ruminant	1978	UC Davis	2 Afr.
10. CRSP Tropsoils	1981	NC State	4 Afr.
11. CRSP Sorghum/Millet	1979	U. Neb.	4 Afr.
12. EABRN (East African Bean Research Network)	1984	CIAT	5
13. EARSAM (East Afr. Regional Sorghum & Millet Network)	1982	ICRISAT	8
14. ESARRN (East & So. Africa Rootcrop Research Network)	1985	IITA	11
15. Great Lakes Reg. Bean Prog.	1983	CIAT	3
16. INIBAP (Int. Net. Improve Bananas & Plantain)	1985	IDRC & CIRAD	Africa
17. Int. Maize Improve Net.	1970	CIMMYT	Africa
18. Oilcrops Net. East Africa	1981	IDRC	3
19. PANESA (Pasture Net ESA)	1984	ILCA	19
20. PRAPACE (Potato & Sweet Potato Improve Program)	1982	CIP	6
21. RENACO (SAFGRAD Cowpea Net West & Central Africa)	1977	IITA	18
22. Trypanotolerant Livestock	1983	ILCA	10
23. WAFSRN (West Afr. Farming Systems Research Network)	1982	IITA	17
24. WECAMAN (SAFGRAD Maize Net)	1977	IITA	17
25. WECASORN (SAFGRAD Sorghum)	1984	ICRISAT	17

4.0 SAARFA Networks in East and Southern Africa

There were five SAARFA sub-projects supporting network type activities in East and Southern Africa and managed out of the REDSO/ESA/ANR office in Nairobi. The activities and organizational structure of these networks are summarized below along with comments which may be of a more general applicability.

4.1 PRAPACE

PRAPACE is an acronym of the French name for the Regional Potato and Sweet Potato Improvement Program for Central and Eastern Africa. This network was founded in 1982 to link the Irish potato research programs of Burundi, Rwanda, Uganda and Eastern Zaire with each other and with the International Potato Center (CIP). The original acronym of PRAPAC had an 'E' added in 1992 when the Eastern African countries of Kenya and Ethiopia were included and the network crop concerns expanded with the addition of sweet potatoes.

PRAPACE is a collaborative network with each member country NARS taking the lead for at least two research responsibilities. The selection of the areas of specialization are the result of negotiations in the Executive Committee which is composed of the National Directors of potato research and the coordinator of PRAPACE. The Network also conducts or facilitates courses, workshops, meetings, publications and peer reviews to foster the improvement of the NARS potato research and develop working linkages between scientists.

The network focus is to increase farmer productivity by making available, and by fostering the distribution of, disease resistant, high yielding potato varieties and improved cultural practices. The planned outputs of the network emphasize efficiency in the use of scientific personnel and other resources, the applied nature of the work, and the need to move findings out to farmers as quickly as is possible. The seven outputs of the current activities are listed.

1. Develop a functional, institutionally sustainable research network with demonstrable gains in efficiency, compared to what the programs could achieve working in isolation.
2. Improve capacity to evaluate and select improved genetic material, both on-station and in farmers fields, leading to the release of improved varieties as a regular output of the national research programs.
3. Increase the efficiency with which a range of production, pest management, and post-harvest technologies are introduced, tested, and transferred to farmers.
4. Develop improved systems for the production,

multiplication, and distribution of high-quality planting material.

5. Provide training to researchers and extensionists efficiently on a network basis.

6. Encourage on-farm research and improved linkages with extension and development institutions.

7. Improve the capacity for the monitoring and evaluation of research and transfer of technology to farmers.

The organizational structure of PRAPACE includes two formal committees, the office of coordinator and a commitment from CIP which involves an African regional office as well as resources from the central station in Lima, Peru. Reaching higher in the government structure of member countries than is the case with the average network, PRAPACE has organized a Directors Committee composed of the Directors of Research from each member country and the Director of CIP Region III. This Committee meets at least once, and sometimes twice, a year and is charged with the overall responsibility for the proper functioning of PRAPACE including priorities of research in the member countries, defining the working relationship between CIP and PRAPACE, approval of the plan of work and of the budget for potato research activities, recruitment of the network coordinator and establishing the governing policies of PRAPACE. The important factor with this committee is that they have sufficient knowledge and responsibility that their approval will be limited to feasible plans and they have the power to reasonably insure that plans they approve will be implemented. This committee was feasible because CIP considered the region of sufficient importance to establish a region and locate a Director in Nairobi. The existence of a senior CIP official in East Africa and his work at the highest level within the NARS is a major contributing factor to the success of PRAPACE.

The second major committee is the above mentioned Executive Committee composed of the national program leaders for potatoes, the leaders for sweet potatoes and the coordinator for PRAPACE. The members of this committee are the principal potato research scientists for their respective countries who, as a committee, establish the technical objectives and/or long term plans for the potato research work plan to be approved by the Committee of Directors. On the basis of these plans, they formulate annual work plans and budget requests, execute the work plans and prepare annual reports. The members of the committee, together with their colleagues and staffs at home, are the backbone of the research network. Further, it is the responsibility of these researchers to identify new problem areas which warrant being researched, propose them to the Directors Committee and prepare the formal project proposals if the concept receives approval.

The PRAPACE coordinator is the facilitator for the network and a most important link particularly in the formative years of the network. This person has had to provide leadership on a technical level, on an organizational level, and on the training level. In addition to being a negotiator, he must also be astute in group dynamics. The coordinator serves as a facilitator of the preparation and execution of the plans of work at the national as well as the regional level. He is responsible for the organization of the network sponsored training, workshops, seminars and research site visits. To the extent the network budget contains support for research, he must oversee the procurement of these supplies. To date the coordinator has been a CIP employee. This is a natural source for such talent in the formative years of the network. Although no time has been established for the transition, dialogue has started concerning the eventual recruitment of a coordinator from one of the member countries.

CIP, the IARC responsible for technical back stopping PRAPACE, played a critical role in the formation and early operation of the network. While it was clearly in their self-interest to see a strengthening of the NARS who would use and adopt the new technology developed by CIP, they have been following a program which strengthens both the research and the leadership capability of the member countries. CIP's apparent goal of having their role reduced to that of a scientific and technical resource with the local research and network leadership vested in the member countries seems to form a reasonable basis for believing PRAPACE has a chance to become sustainable.

The principal source of funding for PRAPACE since 1986 has been A.I.D. with annual expenditures averaging \$340,000 per year. The 1993 expenditures have been estimated at \$450,000. In addition, the USAID missions in Burundi, Rwanda, Uganda and Zaire (before the ending of assistance to Zaire) have given either dollar 'buy-ins' to the regional project or local currency grants for the operation of potato research/extension work in their respective countries. The initial monies for starting the network activities in 1982 were from CIP core funds. Each member country has a significant budget allocation for local salaries and experiment station resources. Donor funds are critical in the early stages and are believed to be essential for the operation of the network.

The monitoring and evaluation activities for PRAPACE were modest during the early years. However beginning in 1991, with AID encouragement, a significant CIP effort to track and measure impact was initiated under the guidance of the CIP regional social scientist located in Nairobi. The surveys in 1992 indicated strong farmer understanding of the value of improved varieties and cultural practices. While results varied between countries, a significant percentage of farmers were using new technology. For example, 93 percent of those sampled in Rwanda were using fungicide to control late blight and as many as 80 percent in Burundi were

using the introduced variety most resistant to late blight and tolerant to bacterial wilt. The 1992 study estimated the internal rate of return to all investments (CIP, NARS & donor) in potato research and extension in Burundi, Rwanda and Eastern Zaire since CIP began activity in 1978 through 1991 to be 91 percent. This is consistent with the more qualitative judgments that the work has been very successful and valuable to the region.

PRAPACE has had a number of factors in its favor. There were varieties and technologies available which, with modest adaptation, could solve existing wilt problems. There was a strong commitment from CIP to establish a viable network and introduce changes through strengthening the NARS. The start of the network was manageable with three countries and one crop. The activities were done in a cooperative manner which encouraged local planning decision making and increasingly greater management of the network. High level officials of the member countries regularly reviewed and approved the work plans and budgets ahead of time. Donor support for the regional activities was adequate but not excessive. There were important, additional donor monies to support NARS work; again available in a measured manner. The combination resulted in this network being judged by the 1992 evaluation team to be a good model for other efforts to study and copy. The Africa Bureau was sufficiently impressed with the PRAPACE progress that three years of additional funding has been found to continue the collaboration after the end of SAARFA (see 4.6).

4.2 EABRN

The East African Bean Research Network (EABRN) was initiated by CIAT in 1984 but implementation did not begin until mid-1986 for a number of administrative reasons. It initially included the countries of Ethiopia, Somalia, Sudan and Uganda. Kenya was intended to be included but agreement was not reached until 1990. At about this same time, two Indian Ocean island countries, Mauritius and Madagascar, requested to be added in order to receive the benefits of scientific interchange and improved germ plasm. These three are now active members. Internal problems have resulted in two countries becoming inactive. Current active member countries are Ethiopia, Kenya, Mauritius, Madagascar and Uganda.

EABRN is rapidly evolving into a collaborative network in keeping with the plans of CIAT when forming the organization. During the initial years, considerable interest was placed on training, scientific interchange, and adaptive research done cooperatively by CIAT and NARS scientists. Because of the need in the region for varieties resistant to insects and diseases not found in Latin America (source of most germ plasm), a major emphasis of the network was on bean breeding; this involved a heavy CIAT input. As the Network matures, more of this work is being done by local scientists and greater emphasis is being placed upon joint design of the research work.

The Network focus is two fold: a) to develop new bean production technology components for traditional and improved cropping systems; and b) to strengthen national research and technology delivery capacity in order to improve the nutritional and income status of farmers in the region. The four guides used to assess activities of the NARS are:

- 1) encouraging and approving projects focusing on common problems across the Network;
- 2) discouraging duplication of effort by researchers and/or scientists in different countries in the Network;
- 3) encouraging collaboration among researchers in different countries in the Network; and
- 4) encouraging timely reporting, publication, and presentation of results within and outside the Network.

The organizational structure of EABRN consists of a Network Steering Committee, the Network Coordinator, and a commitment from CIAT. The Network Steering Committee is composed of the National Bean Program Coordinators from each country in the Network and the Network Coordinator. The Steering Committee meets annually to formalize the Network work plans. A major factor of the work plan is the coordination of research work through the review and approval of sub-projects submitted by NARS bean researchers. These proposals represent the country priorities; about half involve bean breeding work to increase yields and disease or pest resistance and 40 percent are concerned with soil fertility/management problems. A portion of the budget of the sub-projects is provided from the EABRN budget as an incentive to conduct work not only important to the researcher and his country but also complementary to other work in the region. The Network Coordinator is a CIAT employee and occupies a very important spot in the organizational structure of this Network. Because of internal conflicts in some member countries (esp. Somalia, Sudan, Ethiopia, and to some extent Uganda) a strong coordinator was necessary to keep the work in focus. The individual who occupied the position in EABRN has been very good and deserves significant credit for the progress to date. The evolution of leadership from among the NARS members of the Steering Committee has been slower than planned but is now beginning to emerge.

The input from CIAT scientists has been very strong and in some regards may have over shadowed the progress made by NARSs scientists. CIAT initiated and coordinated three bean research networks: 1) EABRN; 2) the Great Lakes Network (Rwanda, Burundi & Zaire); and 3) the Southern Africa Network (SADCC countries). These three networks had a total of 14 staff doing bean research and coordinating networks. The output of their work has been significant and occurred far more rapidly than without their input.

These scientists were also responsible for important training activities in the region. The model used by CIAT for developing the networks attempts to simultaneously develop new technology and strengthen local institutions to take the innovations even further. Given their successes with new varieties being released and adopted, CIAT is changing emphasis in their leadership of the networks with relatively greater attention being given to the research effort done by NARSs scientists and the benefits to be derived from collaborative work. The interchanges among scientists are now including increased contacts among the three networks. There is also attention being given to the progress of bean research by the NARS directors as a group.

The financing of EABRN has been a joint effort of A.I.D. and CIDA with an average annual expenditure of \$800,000. The relatively high figure reflects the support for three full-time researchers in addition to the work and coordination of the Network. The co-funding with the Canadian government proved to be very beneficial as, at times, the work in three of the countries could not be funded by A.I.D. (Ethiopia, Somalia & Sudan). Some of the strongest member countries research was done in Ethiopia and being able to continue this work benefited other member countries as much as Ethiopia.

The monitoring and evaluation of the Network activities and research work has emphasized the achievement of outputs (i.e.: 22 bean varieties released, numbers of scientists trained, etc.). Farmer adoption studies are in the process of being done and should be available shortly. Case studies and qualitative observations of specific introductions, such as climbing beans and the use of green manures, indicates broad adoption by farmers. The acknowledgement that the monitoring and evaluation work should extend to farmer impact is expected to have a positive influence upon the way the researchers design their work.

The CIAT organization and their coordination of the bean networks have tried to combine both their own scientists conducting research and the strengthening of the ability of NARSs scientists to conduct the work. This approach has the danger of conflict. If the CIAT research is too strong, then the NARS scientists will not apply themselves and the sustainability of the Network will be jeopardized. Or, if the institutional building component is emphasized, then the desire for relatively rapid production of new technology will be scarified. Fortunately, good staff was used by CIAT and the coordinator of EABRN was skillful in balancing between these goals. The result appears to be the development of a network on schedule plus numerous new varieties. The external evaluations have generally been very positive and complimentary. Having the NARS directors take an interest in the progress and organization of EABRN is also taken as a positive sign. The Africa Bureau reacted to this positive movement with continued support for up to three years after the termination of

SAARFA.

4.3 ESARRN

ESARRN is the acronym for the East and Southern Africa Rootcrop Research Network. This Network was started by IITA in 1986 to link the cassava and sweet potato research in eight countries of the region and IITA into a working relationship. The concept was discussed two years earlier during a workshop in Uganda. This led to IDRC providing funding for an IITA coordinator who organized the eight countries and later added three more (Burundi, Ethiopia, Kenya, Malawi, Rwanda Tanzania, Uganda, and Zambia plus Angola, Madagascar and Mozambique). A.I.D. joined as a co-donor in 1987. A decision by CGIAR to give world wide responsibility for sweet potatoes to CIP (negating the Africa responsibility assumed by IITA) caused a period of uncertainty and turmoil in ESARRN which is still not fully resolved. The current working relationship has a CIP representative participating in the Steering Committee meetings to assist with sweet potato problems insofar as is possible. Increasingly, the Network is emphasizing cassava, the principal root crop of the region as a whole.

ESARRN is organized as a collaborative network. The heads of each country's root crops research program meet as a committee with the Coordinator to determine a plan of work which includes the emphasis of each country in the work. This planning is careful not to attempt tight specification of an individual member country's program as there is a value expressed for independence and freedom of individual researchers to develop and design their own activities. However through a negotiation process, collaboration is achieved which does make sure that the major problems are covered and that there is not excessive duplication of work. There has also been an extensive training activity conducted by the Network including numerous in country training workshops and support for graduate studies research.

The Network focus is primarily one of improving food security by increasing the production of staple root crops, particularly

cassava. The specific objectives guiding the work of the Network are to:

- 1) encourage rigorous collaborative planning and evaluation of root crops research in the region;
- 2) increase the genetic base of the principal root crops and enhance their use in regional improvement programs;
- 3) facilitate improvement of root crops based cropping systems through surveys and methodology development;
- 4) develop improved techniques for drying, processing and using cassava; and

- 5) foster the establishment of effective systems to exchange information and to deliver improved technology to farmers.

The organizational structure of ESARRN involves a Heads of Program Committee, a Steering Committee and a Network Coordinator. The Heads of Program Committee is composed of all eleven national chief researchers for root crops and the Network Coordinator. This is the organization which plans the research activities and which developed the collaborative framework under which the responsibilities are shared. Once the framework was developed, the Heads of Program Committee meetings were combined with technical workshops or symposia organized by IITA. The result is that the researchers, and frequently also their staffs, are able to spend significant amounts of time reviewing the previous years findings, working over reports of new technology and techniques from international centers, and revising their own national agendas in a collaborative fashion. The Steering Committee is composed of five of the members of the Head of Program Committee and meets twice a year to conduct the formal business of guiding the Network; this includes review and approval of annual work plans, budget review and approval, annual report review and approval, and review of the work of the Network Coordinator. The annual work plan and budget include some donor support for NARSS conducted sub-projects; the Committee can thus strongly influence the collaborative work of the NARSS.

The ESARRN Network Coordinator is an IITA employee and has had to assume a very active, important role in the operation, planning and operation of the Network. Although cassava is an important food crop in the region, little NARS attention had been given to research on the crop. Few researchers remained employed on the problems of this crop for many years; most moved on to work on other more 'glamorous' crops. The Coordinator had to try to reverse this lack of interest in the NARS, help organize the local research, organize and conduct training workshops and courses, and carry on his own program of research which was used as a model from which to teach. At the present time, more than half of the countries in the Network have a fairly strong national cassava research program and all of the countries have improved their support for root crops research since joining the Network.

There is co-financing of the Network activities with A.I.D. and IDRC averaging a total of approximately \$450,000 annually for the operation of the coordinator and his office, for training and workshop costs, and for some limited research activities. IITA also makes some core fund commitments to the operation of the Network by providing generous amounts of training and consultant time to work on special national problems. All of the input from CIP on special sweet potato problems is paid for from the CIP core funding.

The monitoring and evaluation activities have been limited to the

direct outputs of the Network and are just beginning to consider the farmer level impact. There have been significant amounts of on-farm research on the part of NARSs and most countries have numerous demonstration plots to show farmers the different new introductions, to provide for taste tests of these new varieties, and to distribute all of the available material as cuttings. The Network has records of the number of such trials and the quantities of cuttings distributed. They are just working on the estimates of whether farmers continue to grow the new varieties, what their yields might be, and whether these varieties are spreading to their neighbors. The qualitative observations are positive; more quantitative estimates are anticipated in another year's time.

ESARRN has been an ambitious undertaking. To build NARS root crops research programs from a base of little or nothing to something with an impact in eleven countries on a modest budget would be more than most coordinators would attempt. The progress has been positive and noteworthy. ESARRN clearly illustrates what a dedicated, energetic coordinator can accomplish. However, one can not help but wonder what the results would have been if a smaller, more homogenous set of countries had been chosen. The positive progress and food security importance of ESARRN collaboration resulted the Africa Bureau continuing support for the work for up to three years after SAARFA (see 4.6).

4.4 AFRENA-EA

AFRENA-EA is the Agroforestry Research Network for Eastern Africa and one of four African agroforestry networks coordinated by ICRAF. The Network was organized in 1986 and conducts work in the East African highlands of Burundi, Kenya, Rwanda and Uganda. Through this section the 'EA' will be implied but not written.

AFRENA is organized as a collaborative network for, what must be remembered, is a totally new line of research in the region. The agroforestry research work in the EA highlands is well organized taking into account altitude, rainfall, soil type, and land slope. Each country then assumes responsibility for a particular set of agro-ecological conditions. These results are shared between countries eliminating costly duplication of work. The Network also has active training and information dissemination activities.

The Network focus is difficult to articulate beyond conducting agroforestry research in the four member countries in a non-duplicative manner. Complete agreement has not been worked out between ICRAF and the two A.I.D. Bureaus (AFR & R&D) who fund AFRENA. The differences between the original ICRAF intention and the Africa Bureau desires regarding network operations are not great. However, the funds are channeled through an R&D project which has a research focus rather than a focus on the strengthening of NARSs and the delivery of technology to farmers. As a result,

the cooperative agreement which controls the funds to ICRAF stresses the conduct of research. One would hope that this will be clarified shortly.

The organizational structure of AFRENA starts with National Steering Committees who are expected to feed ideas into a Regional Steering Committee, and finally the AFRENA Coordinator who not only works at the regional level but also supervises the work of the four national research teams. The four National Steering Committees are chaired by the Directors of the principal agricultural or forestry research organizations of their respective countries. The members of the national committee are representatives of government agencies concerned with agriculture, forestry and research. The four national chairmen, the ICRAF Director of Research, the AFRENA Coordinator and the USAID/REDSO Natural Resource Advisor make up the Regional Steering Committee. The Regional Steering Committee approves annual work plans; the AFRENA Coordinator plays a major role in the design of these plans and then acts as the supervisor of the national research teams who implement them. A major point is that ICRAF assigns internationally recruited scientists to the national 'AFRENA' research sites and AFRENA provides funds for research activities, allowances for seconded national staff, logistic and administrative support, training, and an international scientist who coordinates the national research. The national team leaders in Burundi, Rwanda and Uganda are international scientists on the USAID project payrolls. Dutch, Swedish, Swiss, and Canadian monies support other researchers assigned to these and to the Kenyan locations. Kenya is the only country in the Network to have a country national as the research team leader. The research is so well supported and so collaborative as to almost have the appearance of one large ICRAF project instead of a regional network. In ICRAF's defense, their proposal called for "developing national capacity to put in place appropriate agroforestry technologies" while the R&D cooperative agreement changed this section to "select and genetically improve multipurpose tree and shrub species". One questions whether the USAID Africa Bureau will be willing to continue in the cooperative agreement, even though desirable technology is being developed, unless the emphasis is switched to strengthening the NARSSs.

The principal funding source for AFRENA has been the R&D Bureau forestry project with almost \$4 million of the over \$5 million the Network received between 1986 and 1992. The Africa Bureau contributed only \$300,000 in that period and other donors gave small amounts each. In 1992/93 R&D and the Africa Bureau each gave \$450,000 for a total of \$900,000 for the year.

The cooperative agreement between R&D and ICRAF is relatively general and contains no specific monitoring and evaluation requirements other than the periodic external evaluations. The AFRENA Coordinator has, however, been collecting a significant amount of data which will provide the background for an impact

assessment.

AFRENA has been working to establish a new area of research in the NARSS. In the best of circumstances, this is difficult on a bilateral basis. To work in four countries in a unified manner takes the skills of a juggler. The AFRENA Coordinator has done an excellent job with this task. There is now an accepted niche in all four NARSS for agroforestry research. Further, it has been efficiently organized to make the usable results for each country four times as large as would otherwise be the case. The next challenge will be to begin institutionalizing the work into a sustainable activity. In this regard, the Africa Bureau's approach has greater potential. It may well be the time to consider two separate project supports for AFRENA; the Africa Bureau could work on sustainability issues and the R&D Bureau continue to support the research effort. To allow time for these issues to be resolved, the Africa Bureau continued support for a year after SAARFA with the possibility of continued support should signs of network maturing be observed (see 4.6).

4.5 FSRP

The CIMMYT Eastern and Southern Africa Economics Program, alternatively called the Farming System Research Program (FSRP), operated as a training and information network from 1976 until 1992. The work was active in the eleven East and Southern African countries of Burundi, Ethiopia, Kenya, Malawi, Rwanda, Somalia, Tanzania, Uganda, Zambia, and Zimbabwe.

FSRP was an information network. Although there was no formal agreements between all countries, there was significant and regular participation in 'networkshops' by administrators and directors of NARS and agreements existed with a number of universities to institutionalize FSR training. Information exchange was accomplished with publications, workshops, conferences, scientific consultation, monitoring tours and numerous training 'networkshops'. The training manuals for all phases of farming systems research are a complete reference and training library by themselves.

The Network focus was to improve the applied research in the region by promoting, and building capacity in, systems-based on-farm research techniques among NARSS and teaching institutions in the region.

No formal organizational structure existed. The Network Coordinator was equally a project leader and an FSR trainer. The Coordinator was a CIMMYT employee and held the Coordinators position for a ten year period. Well known throughout the region, he was able to significantly influence the manner in which agricultural research design in all fields was constructed. The work, through his leadership, was particularly successful in

introducing and gaining acceptance for economic analysis along with agronomic research.

The sources of funding were A.I.D., CIDA, and CIMMYT. The Network averaged about \$600,000 per year for the last ten years of operation.

The monitoring and evaluation activities generally concentrated on participant evaluations of workshops and other internally generated instruments. In 1991, a tracer study of former trainees was undertaken to determine the extent of change in research design in the countries in the region. The conclusions were generally positive with regard to the influence on research methodology but no attempts have been made to extend the analysis to estimates of national or farm level impact.

This project is an excellent example of what a knowledgeable, energetic, personable leader can accomplish. In many network activities, the coordinator is the critical person who influences the degree of success of the network. This activity also illustrates that some networking comes to a successful conclusion and is appropriately allowed to terminate. That is not to say that there is no need in the region for a social science association or an economic information interchange network. There is but such a network would require a very different structure with support built on its own justification.

4.6 Post-SAARFA Funding

REDSO/ESA felt very strongly that four networks (PRAPACE, EABRN, ESARRN and AFRENA) were progressing in such a positive manner that A.I.D. funding should be found to continue their support after SAARFA. The alternative would have been such a cut back in activities that a self-sustaining organization could not be expected to be developed because the institutionalization process was only partially completed and no other donor funding had been identified. Further, REDSO's position was that these four networks had the potential for significant impact and that the U.S. Government would be well served to be associated with more than just the initiation of the activity. The result of several months of search and negotiating for funds resulted in a compromise agreement to continue the activities for up to three years under the PARTS project.

The arrangements made to fund the four ESA networks became somewhat complex. The PARTS project had the authorization to support activities such as regional networks but the management of the project was not designed to easily accommodate such an activity. The organization finally selected involved AFR/ARTS/FARA, R&D/AGR/IARC and REDSO/ESA/ANR. The role of each was broadly defined initially. AFR/ARTS had the money from the PARTS project which they transferred to R&D for contracting and management

purposes. However, because the Africa Bureau has such a strong interest in monitoring how the networks developed, a somewhat greater than normal interest and involvement in the grant approval and report process was maintained. R&D/AGR is the contracting and management unit because of their long-term association with and support of the IARCs. They have the mechanisms in place for good communication with the IARC headquarters. REDSO continued an involvement in field monitoring because of their proximity to the networks, their knowledge of the individuals and history of regional operation, and to help fulfill the need for more detailed responses for the Development Fund for Africa reports to Congress.

The PARTS project funding provided a total of \$2 million a year for up to three of operation. About \$200,000 was reserved for R&D and REDSO operations; the first year of funding for each of the four networks is \$450,000. The shift of some of the oversight expenses from A.I.D. operating budget to project funds began solving one of the previous problems with REDSO management of the networks.

The shift from SAARFA sub-projects to PARTS project funding forced the offices to have a detailed examination of operating procedures in January 1993. Representatives of each of the three offices together with the four network coordinators, the steering committees and the NARSS directors met in Nairobi to sort out the methods of operation. These deliberations are very well summarized in the paper "Proceedings of the "Agricultural Research Networking Workshop, 18 to 22 January 1993".

The change in funding has had many benefits in addition to the continuation of some good agricultural research. It has brought the NARs directors together to wrestle with the value of regional coordination. They fairly rapidly concluded that the four networks being discussed should not have equal budgets. While no decision was made at the workshop about relative sizes of budgets, their involvement and willingness to cooperatively work on policy directions is a positive step forward. The A.I.D. offices and the IARC representatives are also beginning to re-examine their roles and the evolution of the networks. It is becoming clearer that the establishment of a fixed structure will not hold over time. I believe it is also becoming clearer to the A.I.D. officers involved that the current PARTS funding has moved the funding management in the direction of excessive complexity and rigidity. While it can be tolerated in the short-term, the growth of the networks will benefit from simpler project administration designed to allow for evolving network structures.

5.0 Network Management

5.1 Network Evolution

One would expect the managerial organization of networks to change as they mature; the history of African networks over the past

fifteen years tends to verify this proposition. A typical sequence of change to date includes:

- A) The leadership, including research planning and field research leadership, undertaken by IARC employees;
- B) An adjustment is made with more NARS taking control of the research in their own country;
- C) The planning begins to shift as committees of NARS researchers begin to take charge of the planning function instead of reviewing and approving plans;
- D) Network committees begin to exercise more oversight on the coordinator's work plan, including number and type of workshops, etc.;
- E) A deputy coordinator is appointed from a member country and/or discussion begins about having the coordinator come from a member country.

We can be reasonably sure the process will continue. If support continues so that the networks do not terminate, then one conceivable scenario might have network development proceed along the following lines:

- F) The coordinator is a NARS scientist and the IARC representative becomes the IARC regional representative assisting with technical advice, coordinating training from the IARC, and assisting with the introduction of IARC developed technology;
- G) A committee of the NARS deputy directors assumes oversight of several related networks to make sure their budgets do not overlap;
- H) The networks are realigned to more nearly represent the majority of the NARS organizational patterns. Some networks are combined and some split into two parts. IARCs remain important resources and advisors; some networks have advisors from two IARCs;
- I) As donor funds completely stop, member countries must pay for continuation of the collaboration. Sufficient efficiencies are recognized that the countries continue and financially support one-half of the networks.

Obviously, not all networks will evolve in the same manner and there are dozens of paths that could be followed. While we can not, nor do not want to, control this path, it does seem appropriate to put forth some principles which should be observed.

A) Budgets should be allocated for research and administrative costs kept to a minimum. Current network budgets are excessive and justified only because international talent was required to start the coordination and significant training was judged desirable. Coordination can actually be done as a part time job of a network scientist. The biggest danger is the possibility of setting up an international office, United Nations style, and killing the network with excessively high overhead costs. This latter approach should be strongly resisted.

B) Network leadership should be dynamic and approach their tasks as researchers (problem solvers). For example, do not accept agendas arriving after meetings have been held with the coordinators excuse that the mails are slow. There are too many options to allow for that today. The committee needs to have the options explored and changes made.

C) Networks should not try to replace the work of the international centers. The IARCs have an important role in the generation and initial testing of new technology. This is the efficient route; networks should not try to replicate a center.

D) Organizations should not be kept beyond their period of usefulness. Networks should be allowed to die if the returns to their maintenance become small.

5.2 USAID Project Management

The SAARFA Project management of network sub-projects varied from management out of the Africa Bureau, to delegation of authority to REDSO/ESA, to buy-ins to R&D Bureau projects and now to a combined involvement of R&D, AFR, and REDSO. None of these managerial locations was ideal, but the use of REDSO/ESA came the closest to meeting the criteria of a desirable administrative and management location. My criteria include:

A) Administrative oversight should be as close to the activity as is possible. With a regional activity, oversight in the center of the region can provide rapid response to contractor (IARC) field inquires.

B) Technical expertise with which network officials can interact. The REDSO/ESA/ANR office had five professional agriculturalists (3-Ph.Ds) who worked part of their time on network problems and evaluations.

C) Close working relationship with contracting, financial, and legal offices for rapid administrative problem solving. These offices were all a part of REDSO/ESA.

D) Project design should be flexible enough to allow for and accommodate the growth of networks as organizations.

The difficulties with the REDSO location were not great but they were troublesome. They included:

A) The money was from a Bureau project and all major decisions, such as sub-project extensions, had to be run through Washington. Unlike the short turn around for decisions within REDSO, Washington office decisions could be measured by months of time. There was enough latitude delegated to REDSO that most of the time the delays could be worked around, but extensions of time and addition of funds were always difficult.

B) There was not sufficient direct hire REDSO/ESA/ANR staff to properly handle these sub-projects and the work USAID missions requested. Only one of the five officers was a direct hire. Even though there was one Kenyan and one-half of the time of a US contractor devoted to network problems, the time pressure on the direct hire employee did not allow him to be fully informed regarding the activities of the networks.

Regardless of the two problems experienced, REDSO was judged by the sub-project evaluations to be a good location for the USAID management and judged to be superior to the Washington location for the oversight.

5.3 Impact Assessments

Providing for proper impact assessments is no problem as long as USAID does not want to change the criteria of judgment in the middle of a contract with an IARC. Each of the IARCs was collecting the data requested in the contracts. With the Development Fund for Africa, a more detailed set of data, including impact at the farm level, was judged to be desirable. There were some periods of time required to re-negotiate the new, more expensive to obtain data, but once a new agreement was reached (esp. who would pay for it), there was no problem having it collected and analyzed. Note should be taken of the excellent CIP study and the progress CIAT, IITA and ICRAF are making in this regard. The IARCs have excellent scientific resources which can be brought to a problem once agreement is reached that this should be addressed.

5.4 Future

Networks have been shown to have a good rate of return and are providing an efficient method of organizing research in Africa where the countries are small. With agriculture such a major part of the African economies, development efforts on the continent need to improve the efficiency of this sector. Agricultural research

with network organizations is an appropriate mechanism which should be continued and expanded. Existing networks are not stabilized or institutionalized; continued USAID commitments to their further development are in order.

Networks are evolving organisms. As NARS scientists increase their skills and confidence levels, they can be expected to assume greater control over the activities. The IARCs are expected to play an important role, but increasingly, they will be addressing special, technical problems as advisors to networks and NARS. The IARC role as leader and coordinator of the networks can be expected to decline. It is quite possible that the near future may bring a reassessment of them as the appropriate channel for network operating funds. USAID management of network projects needs to be flexible and alert to the changing scope and needs of these activities. Two possible options are proposed for location of administrative management.

I. REDSO Projects

A budget line for regional agricultural activities would be given each REDSO. If the REDSO had network projects and if one direct hire employee was assigned to manage these projects, then the oversight of the activities would be close to the work, reactions to problems would be quick and the management of the project could be as flexible to changes in network needs as can be expected in USAID. The contractual arrangements would remain with the IARCs for the near term. Should the networks evolve into a more self-sufficient entity and different mechanisms be required, operating agreements would be entered into with the Ministry of Agriculture of the country with the network coordinator.

II. USDA PASA Management

A second option would be to have a Bureau project operated by USDA. The advantage with this arrangement would be USDA's experience with regional networks in the United States, with conduct of agricultural research, and with working cooperatively with IARCs, as well as having the ability to assign U.S. Government employees to manage the sub-projects of this activity. It would be expected that two or three African field offices would be established to administratively manage the ongoing and new network sub-projects. These offices would assume the responsibility for the impact analysis to allow for a continuous flow of information to USAID without encumbering the network with that responsibility. This option would continue the regional networks with minimum USAID management requirements. Having USDA offices in the region will facilitate project monitoring and oversight. USDA would be expected to assign senior staff with research experience who could advise on the institutionalization of the networks.

Given the expected tight direct hire personnel situation and the

problems anticipated by some with having the REDSOs directly engage in project management, it is recommended that the second option should be given serious consideration. It is envisioned that an umbrella type of project would be designed which would allow the support for regional networks under project specified guidelines. The project should include the mechanism of USAID mission buy-ins to allow individual missions the option of supporting in-country research related to a successful network without the burden of managing a relatively small activity. While initial coordination of individual networks would be through an IARC, the longer term goal would have the NARSS assume increasing responsibilities. This would require careful negotiations and is an additional reason for the involvement of senior officers.

ANNEX F
FIELD COMMENTS ON SAARFA PROJECT

The evaluation team asked Agricultural Development Officers in all USAID field missions in sub-Saharan Africa to provide input/feedback for this final SAARFA evaluation. Comments were requested with regard to "the effectiveness of SAARFA activities and sub-projects in reaching the SAARFA project purpose based on involvement with, or observation of, activities and sub-projects, and relevance of SAARFA activities and sub-projects to current mission strategy."

Responses were obtained from six missions. Those in countries where several SAARFA activities have taken place were all strongly positive. Two other missions were skeptical to negative. Examples of both types of responses are noteworthy.

The positive responses are illustrated with the following quotations: "extremely successful," "major contributions," "extremely cost-effective," "clearly there is (a need for agricultural research programs (like SAARFA)," "most important contribution in the past decade to improve regions....NARSS," "one of the lowest delivery costs of any project modality used in Africa," and "overwhelmingly positive."

The missions that had had little direct contact with SAARFA stated that they either had no position or preferred that the funds go directly to the IARCs and NARSSs.

Several suggestions for improvements and other advice were offered. Emphasizing that research to increase agricultural output was needed, one estimated that, "(Africa) will need to import 50 million tons (of food stuffs) by 2020 just to keep even." Another felt that a type of program like SAARFA could be improved by making the accounting procedures for bilateral buy-ins easier. Still others emphasized the need to provide for sustainability of agricultural research by or through IARCs. Finally, one urged caution in channeling assistance to or through SPAAR.

Finally, the outgoing cable is included in this Annex.

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AID/AFR/EA:PGUEDET {DRAFT}
AID/AFR/SWA:JGILMORE {DRAFT}

AID/AFR/CCWA:MGOLDEN {DRAFT}
AID/AFR/SA:KBROWN {DRAFT}

PRIORITY AIDAF

AIDAC TO USAID AND REDSO ADOS IN AFRICA

E.O. 12356: N/A

TAGS:

SUBJECT: STRENGTHENING AFRICAN AGRICULTURAL RESEARCH AND FACULTIES OF AGRICULTURE PROJECT (SAARFA: 698-0435) -- FIELD INPUT/FEEDBACK FOR FINAL EVALUATION

1. SUMMARY: SAARFA PROJECT FINAL EVALUATION TEAM (LED BY MELVIN BLASE, WITH GODBERTHA KINYONDO AND LANE HOLDCROFT) HAS COMMENCED WORK. THIS CABLE SUMMARIZES THE OBJECTIVES OF THE EVALUATION, AND REQUESTS INPUTS/FEEDBACK FROM MISSION AND REDSO OFFICES TO ENSURE THAT FINAL REPORT REFLECTS FIELD PERSPECTIVES WITH REGARD TO SUBJECT PROJECT.

2. BACKGROUND: THE STRENGTHENING AGRICULTURAL RESEARCH AND FACULTIES OF AGRICULTURE (SAARFA) PROJECT IS AN AFRICA BUREAU REGIONAL PROJECT AUTHORIZED AT DOLS 49 MILLION. THE PROJECT BEGAN IN AUGUST 1982 AND THE PROJECT ASSISTANCE COMPLETION DATE (PACD) IS JULY 31, 1993. THE PROJECT PURPOSE IS TO STRENGTHEN AFRICAN AGRICULTURAL RESEARCH SYSTEMS AND PROGRAMS TO ADDRESS RESEARCH PRIORITIES IDENTIFIED WITHIN THE VARIOUS AGRO-ECOLOGICAL ZONES OF AFRICA BY 1) IMPROVING DONOR COORDINATION AND 2) DEVELOPING NATIONAL AND REGIONAL AGRICULTURAL RESEARCH PROGRAMS AND IMPLEMENTING SUBPROJECTS THAT ADDRESS

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PRIORITY NEEDS OF THESE SYSTEMS AND PROGRAMS.

3. PURPOSE OF EVALUATION: THE SAARFA PROJECT HAS BEEN ONE OF THE MAJOR REGIONAL ACTIVITIES FUNDED BY THE AFRICA BUREAU TO STRENGTHEN AFRICAN NATIONAL AND REGIONAL RESEARCH AND TEACHING INSTITUTIONS. THE PURPOSE OF THE EVALUATION IS TO ASSIST IN DETERMINING HOW THE AFRICA BUREAU CAN IMPROVE ITS STRATEGY FOR PROMOTING AGRICULTURAL TECHNOLOGY DEVELOPMENT AND TRANSFER IN AFRICA. THE SPECIFIC OBJECTIVES OF THE EVALUATION ARE: A) TO REVIEW PROGRESS TOWARDS THE ACHIEVEMENT OF SAARFA'S PURPOSE BY THE DISCRETE SUBPROJECTS.

B) TO ASSESS SAARFA'S CONTRIBUTION AND EFFECTIVENESS IN ACHIEVING DONOR COORDINATION IN IDENTIFYING AND ADDRESSING THE RESEARCH PRIORITIES FOR DIFFERENT AGRO-ECOLOGICAL ZONES THROUGH THE INITIATIVE OF THE SPECIAL PROGRAM FOR AFRICAN AGRICULTURAL RESEARCH (SPAAR) TO REVITALIZE AGRICULTURAL RESEARCH IN AFRICA;

C) TO DEVELOP GUIDELINES AND RECOMMENDATIONS FOR U.S. ASSISTANCE REGARDING DONOR COORDINATION AND STRENGTHENING SELECTED NARS IN AGRO-ECOLOGICAL (ECO-REGIONAL) CONTEXTS THROUGH THE SPAAR INITIATIVE; AND

D) TO PROVIDE GUIDELINES IN SUPPORT OF THE SPAAR INITIATIVE AND THE AFRICA BUREAU'S STRATEGIC FRAMEWORK FOR TECHNOLOGY DEVELOPMENT AND TRANSFER IN SUB-SAHARAN AFRICA THROUGH SPECIFIC ANALYTICAL ACTIVITIES FOR POSSIBLE FUNDING UNDER THE POLICY, ANALYSIS, RESEARCH, AND TECHNICAL SUPPORT (PARTS) PROJECT.

4. SAARFA PROJECT ACTIVITIES AND SUBPROJECTS: SAARFA HAS TWO COMPONENTS: A) DIRECT PROJECT ACTIVITIES WHICH PROVIDE TECHNICAL ASSISTANCE FOR DESIGNING, MONITORING, EVALUATING AND COORDINATING PROJECT ACTIVITIES, PLUS SUPPORT FOR DONOR AND AFRICAN TECHNICAL PLANNING AND COORDINATION MEETINGS; AND B) DISCRETE SUB-PROJECTS WHICH ARE AUTHORIZED ON AN INDIVIDUAL BASIS TO SUPPORT PRIORITY AGRICULTURAL RESEARCH NEEDS ON A TRANSNATIONAL BASIS.

DIRECT PROJECT ACTIVITIES, MANAGED BY THE AFR/ARTS/FARA, INCLUDE:

A) FUNDS TO SUPPORT: MEETINGS AMONG DONORS, AFRICAN SCIENTISTS AND RESEARCH ADMINISTRATORS; SPECIAL STUDIES; AND, EVALUATIONS;

B) AN ASSESSMENT OF THE PRIORITY RESEARCH NEEDS BY AGRO-

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ECOLOGICAL ZONE IN SPECIFIC GEOGRAPHIC AREAS IN COORDINATION WITH AFRICAN SCIENTISTS AND OTHER DONORS;

C) TECHNICAL ASSISTANCE TO DESIGN, IMPLEMENT AND EVALUATE PRIORITY RESEARCH PROGRAMS - INCLUDING A PROJECT MANAGER IN REDSO/ESA TO MONITOR SAARFA SUBPROJECTS; AN AGRICULTURAL LIAISON OFFICER (ALO) BASED AT THE INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA); AND, SHORT-TERM CONSULTANT SERVICES FOR THE SPAAR SECRETARIAT FOR SPECIFIC ANALYTICAL TASKS AND THE DEVELOPMENT OF THE REMAINING FRAMEWORKS FOR ACTION;

D) A STUDY ON THE EFFECTS OF POLICIES ON FOOD CONSUMPTION PATTERNS IN AFRICA BEING IMPLEMENTED BY THE INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE (IFPRI); AND

E) A STUDY OF THE EFFECTS OF FARMER-BUILD DIKES FOR IMPROVING WATER INFILTRATION RATES, INCREASING SOIL FERTILITY AND REVERSING SOIL DEGRADATION IN THE SAHEL.

IN ADDITION TO THE DIRECT ACTIVITIES, THERE ARE FIFTEEN (15) AUTHORIZED AND DISCRETE SUBPROJECT ACTIVITIES:

A) EAST AFRICA BEAN RESEARCH NETWORK BEING IMPLEMENTED BY THE CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL (CIAT) AND JOINTLY FUNDED WITH THE CANADIAN INTERNATIONAL DEVELOPMENT AGENCY (CIDA);

B) BASES TO PLANT RESISTANCE TO INSECT ATTACK BEING IMPLEMENTED BY THE INTERNATIONAL CENTER FOR INSECT PHYSIOLOGY AND ECOLOGY (ICIPE) AND JOINTLY FUNDED WITH A NUMBER OF OTHER BI- AND MULTI-LATERAL DONORS;

C) FARMING SYSTEMS RESEARCH BEING IMPLEMENTED BY THE CENTRO INTERNACIONAL DE MEJORAMIENTO DE MAIZ Y TRIGO (CIMMYT) AND JOINTLY FUNDED BY CIDA;

D) POTATO IMPROVEMENT FOR CENTRAL AFRICA BEING IMPLEMENTED BY THE CENTRO INTERNACIONAL DE LA PAPA (CIP);

E) AFRICA BUREAU BUY-IN TO R&D'S FORESTRY/FUELWOOD RESEARCH AND DEVELOPMENT PROJECT BEING IMPLEMENTED BY THE INTERNATIONAL COUNCIL FOR RESEARCH IN AGROFORESTRY (ICRAF);

F) SOUTHERN AFRICA AGRICULTURAL RESEARCH MANAGEMENT TRAINING BEING IMPLEMENTED BY THE INTERNATIONAL SERVICE FOR NATIONAL AGRICULTURAL RESEARCH (ISNAR) AND JOINTLY FUNDED WITH CIDA AND ODA;

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- G) EAST AND SOUTHERN AFRICA ROOTCROPS RESEARCH NETWORK BEING IMPLEMENTED BY THE INTERNATIONAL INSTITUTE FOR TROPICAL AGRICULTURE (IITA) AND JOINTLY FUNDED WITH THE INTERNATIONAL DEVELOPMENT RESEARCH CENTER (IDRC) OF CANADA;
- H) AFRICA BUREAU'S BUY-IN TO R&D'S FOOD SECURITY IN AFRICA PROJECT BEING IMPLEMENTED BY MICHIGAN STATE UNIVERSITY;
- I) AFRICA BUREAU'S BUY-IN TO R&D'S ACCESS TO LAND, WATER, AND NATURAL RESOURCES (ACCESS) PROJECT BEING IMPLEMENTED BY THE UNIVERSITY OF WISCONSIN;
- J) FERTILIZER INVESTMENT FOR SOIL FERTILITY RESTORATION IN W. AFRICA BEING IMPLEMENTED BY THE INTERNATIONAL FERTILIZER DEVELOPMENT CENTER (IFDC) AND JOINTLY FUNDED WITH THE WORLD BANK;
- K) STRENGTHENING THE TEACHING AND ADAPTIVE RESEARCH CAPABILITY OF THE NATIONAL UNIVERSITY IN RWANDA BEING IMPLEMENTED BY THE UNIVERSITY OF MINNESOTA;
- L) FERTILIZER POLICY RESEARCH FOR TROPICAL AFRICA BEING IMPLEMENTED JOINTLY BY IFDC AND IFPRI;
- M) MANGROVE AND ASSOCIATED SWAMP RICE RESEARCH BEING IMPLEMENTED BY THE WEST AFRICA RICE DEVELOPMENT ASSOCIATION (WARDA);
- N) HEARTWATER RESEARCH IMPLEMENTED BY THE UNIVERSITY OF FLORIDA AND FOCUSED IN THE SADCC REGION, ESPECIALLY ZIMBABWE; AND,
- O) RINDERPEST VACCINE DEVELOPMENT IMPLEMENTED BY TUFTS UNIVERSITY WITH FIELD ACTIVITIES FOCUSED IN EASTERN AFRICA (USDA/PASA).
- 5) MISSION AND REDSO ACTION REQUESTED: AFR/ARTS/FARA WOULD APPRECIATE MISSION AND REDSO COMMENTS ON 1) EFFECTIVENESS OF SAARFA ACTIVITIES AND SUBPROJECTS IN REACHING SAARFA PROJECT PURPOSE BASED ON INVOLVEMENT WITH OR OBSERVATION OF ACTIVITIES AND SUBPROJECTS, AND RELEVANCE OF SAARFA ACTIVITIES AND SUBPROJECTS TO CURRENT MISSION STRATEGY. PLEASE RESPOND TO MICHAEL FUCHS-CARSCH BY MARCH 15 TO AFR/ARTS/FARA BY CABLE OR FAX (703-235-3805).

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FOR MICHAEL FUCHS-CARSON, AFR/ARTS/FARA

E.O. 12356: N/A
SUBJECT: STRENGTHENING AFRICAN AGRICULTURAL RESEARCH AND
FACILITIES OF AGRICULTURE PROJECT (SAARFA: 696-0435).
FIELD INPUT/FEEDBACK FOR FINAL EVALUATION

REF: STATE 040698

1. THE MISSION'S ASSESSMENT OF THE SAARFA ACTIVITY
"STRENGTHENING THE TEACHING AND ADAPTIVE RESEARCH
CAPABILITY OF THE NATIONAL UNIVERSITY IN RWANDA"
IMPLEMENTED BY THE UNIVERSITY OF MINNESOTA, IS THAT THE
PROGRAM HAS BEEN VERY SITE-SPECIFIC AND THEREFORE HAS
NOT CLEARLY RESPONDED TO THE ECO-REGIONAL AND
TRANSNATIONAL OBJECTIVES OF THE SAARFA PROGRAM. MISSION
PERCEIVES LITTLE DEVELOPMENT OF LINKAGES BETWEEN THE UMR
RESEARCH PROGRAM DEVELOPED UNDER SAARFA AND THE PROGRAMS

OF THE NATIONAL AGRICULTURAL RESEARCH ORGANIZATION, ISAR
(INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA). IT IS
TOO SOON TO ASSESS THE DIRECT IMPACT OF THE PROGRAM ON
THE CAPACITY OF THE UMR TO UNDERTAKE INDEPENDENT
AGRICULTURAL RESEARCH RELEVANT TO THE NEEDS OF THE
RWANDAN FARMER.

2. SAARFA ACTIVITIES IMPLEMENTED BY UNIVERSITY OF
MINNESOTA ENDED 9/30/92 ON TERMINATION OF THE UMIR
CONTRACT. NO EXTENSION OF THE CONTRACT WAS OFFERED
BECAUSE SAARFA ACTIVITIES WERE JUDGED BY THE MISSION TO
BE NO LONGER RELEVANT TO THE CURRENT USAID RWANDA
COUNTRY STRATEGY WHICH IS TO INCREASE COMMERCIAL OUTPUT
BY MEDIUM AND SMALLER SCALE ENTERPRISES. THE TARGET IS
TO EXPAND AG PROCESSING AND MARKETING OF MEDIUM AND
SMALLER SCALE ENTERPRISES.

3. AGRICULTURAL RESEARCH ACTIVITIES CONSISTENT WITH
SAARFA OBJECTIVES ARE BEING UNDERTAKEN IN RWANDA BY
CIMMYT, CIP, IITA AND CIAT BUT THESE ARE NOT SUPPORTED
UNDER THE SAARFA PROJECT. THESE ACTIVITIES INCLUDE:

A) FARMING SYSTEMS RESEARCH ON CEREAL CROPS SPECIALLY
MAIZE AND WHEAT, BEING IMPLEMENTED BY THE CENTRO
INTERNACIONAL DE MEJORAMIENTO DE MAIZ Y TRIGO (CIMMYT);

B) THE INTERNATIONAL INSTITUTE FOR TROPICAL AGRICULTURE
(IITA) WORKING ON VARIOUS KINDS OF TROPICAL CROPS
ESPECIALLY TUBERS (CASSAVA AND SWEET POTATOES); AND

C) POTATO CLEAN SEED IMPROVEMENT BEING DEVELOPED BY THE
CENTRO INTERNACIONAL DE LA PAPA (CIP).

3. ALL OF THE ABOVE RESEARCH CENTERS WORK IN
COLLABORATION WITH THE INSTITUT DES SCIENCES
AGRONOMIQUES DU RWANDA WHICH IS A GOR AGENCY.
THE EVALUATION TEAM SHOULD LOOK FOR POSSIBLE MECHANISMS
TO BE DEVELOPED WHICH CAN HELP RWANDA TO BE THE PRIME
EXPORTER OF POTATO SEEDS TO BURUNDI, ZAIRE, TANZANIA AND
KENYA. ANOTHER POSSIBLE TARGET OF OPPORTUNITY IS TO
INCREASE AND IMPROVE THE PRODUCTIVITY OF CASSAVA, SWEET
POTATOES WHICH ARE MAJOR SOURCES OF CALORIES AND STAPLE
FOODS FOR THE RURAL POPULATION. FLATEN

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FOR AFR/ARTS/FARA, MICHAEL FUCHS-CARSCH

E. O. 12356: N/A
SUBJECT: STRENGTHENING AFRICAN AGRICULTURAL RESEARCH
- AND FACULTIES OF AGRICULTURE PROJECT (SAARFA -
- 698-0435)

REF: STATE 040698

1. USAID/NIGER HAS NO DIRECT EXPERIENCE WITH SAARFA BUT HAS HAD INTERACTION WITH SEVERAL OF THE SUB-PROJECT ACTIVITIES THROUGH ITS CONTACTS WITH THE ICRISAT SAHELIAN CENTER IN NIGER. THESE INCLUDE IFDC AND ICRAF. USAID ALSO HAS SOME EXPERIENCE WITH TUFTS UNIVERSITY IN THE RINDERPEST VACCINE DEVELOPMENT. THIS EXPERIENCE HAS BEEN BENEFICIAL TO THE MISSION AND TO NIGER IN GENERAL, THOUGH IT MAY NOT BE DIRECTLY RELATED TO SAARFA PROVIDED FUNDING.

2. MISSION HAS DIRECT EXPERIENCE WITH THE LAND TENURE CENTER OF THE UNIVERSITY OF WISCONSIN THROUGH THE ACCESS PROJECT, WHICH HAS WORKED AT MISSION FOR SEVERAL YEARS. THEIR WORK HAS BEEN WELL RECEIVED, APPROPRIATE AND FIT WELL INTO THE MISSION STRATEGY.

3. CURRENT MISSION STRATEGY IN THE AGRICULTURE SECTOR IS BASED UPON NATURAL RESOURCE MANAGEMENT, AND THERE ARE SEVERAL SUB-PROJECTS WHICH MAY BE USEFUL TO THE MISSION, INCLUDING IFDC SOIL FERTILITY RESTORATION IN WEST AFRICA, FORESTRY/FUELWOOD RESEARCH AND DEVELOPMENT WITH ICRAF AND FARMER BUILT DIKES FOR INCREASING SOIL FERTILITY AND REVERSING SOIL DEGRADATION IN THE SAHEL. USAID WOULD APPRECIATE RECEIVING ANY PUBLICATIONS/INFORMATION ON THESE AREAS. WARD

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MISSION WILL PROVIDE SUPPORT FOR ACTIVITIES SIMILAR TO
SAARFA DIRECT PROJECT ACTIVITIES AS DESCRIBED IN PARA
4/A, B, E.

ACTION OFFICE AFAR-05
INFO AFSV-06 RDPO-01 BIFA-01 FAPR-02 POSP-01 POAR-02 POID-01
RDAI-01 FHAA-01 STAG-02 ENCY-02 SEOP-01 SERP-01 SECS-02
AMAD-01 FAGP-02 POCE-01 /033 AB 25/02372

4. WE HOPE THESE COMMENTS ARE USEFUL.
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AIDAC

FOR AFR/ARIS/FARA

E.O. 12356: N/A
SUBJECT: STRENGTHENING AFRICAN AGRICULTURAL RESEARCH AND
FACILITIES OF AGRICULTURE PROJECT (SAARFA: 696-0435).

REF: STATE 640698

1. PER REFTEL, PARA 5, PLEASE BE ADVISED THAT MISSION
HAS NEVER BEEN DIRECTLY INVOLVED IN SAARFA ACTIVITIES
LISTED IN PARA 4. HOWEVER, WE HAVE BEEN SUPPORTING
AGRICULTURAL RESEARCH WITH THE SENEGALESE AGRICULTURAL
RESEARCH INSTITUTE (ISRA) SINCE 1982. BASED ON OUR
EXPERIENCE, WE ARE NOT CONFIDENT THAT COLLABORATION WITH
A DISPERSED REGIONAL ACTIVITY LIKE THE SUBJECT PROJECT
WILL STRENGTHEN AFRICAN AGRICULTURE RESEARCH SYSTEMS OR
DEVELOP REGIONAL'S RESEARCH NETWORKING ANYMORE IN THE
FUTURE THAN IT HAS IN THE PAST. WE WOULD RATHER SEE

SUPPORT FOR THOSE EXISTING OR INSTITUTIONS AS IITA,
IAPRI, IFDC AND ICRISAT WHO SHOULD HAVE A NETWORKING
MANDATE. SOME OF THE ACTIVITIES AND SUBPROJECTS IN
WHICH WE WOULD LIKE TO SEE NETWORKS AND ARE DIRECTLY
RELEVANT TO OUR CURRENT AGRICULTURAL RESEARCH STRATEGY
ARE CROP PRODUCTIVITY IN ZONES OF RELIABLE RAINFALL,
VALUE OF TREE PRODUCTION AND LIBERALIZATION OF MARKETS.

2. MISSION HAS JUST STARTED A NEW NATURAL RESOURCES-
BASED AGRICULTURAL RESEARCH PROJECT (NRBAR) TO ADDRESS
OUR CPSP STRATEGIC OBJECTIVES. THIS NRBAR PROJECT WILL
FOCUS ON LOW-COST NATURAL RESOURCES MANAGEMENT
TECHNIQUES IMPROVING SOIL, WATER AND VEGETATIVE COVER
AND INTEGRATING LIVESTOCK, TREES AND CROPS INTO
PRODUCTION SYSTEMS TO INCREASE SOIL PRODUCTIVITY AND
BUILD BETTER SUSTAINABLE PRODUCTION SYSTEMS. NRBAR
PROJECT WILL STRENGTHEN ISRA BY IMPROVING ITS RESEARCH
AND FINANCIAL MANAGEMENT.

3. MISSION WOULD RATHER SEE AID SUPPORT FOR NETWORKING
AMONG THE NATIONAL AGRICULTURE RESEARCH SYSTEMS (NARS)
RATHER THAN ANOTHER REGIONAL ACTIVITY THAT WILL
ULTIMATELY HAVE LITTLE OR NO IMPACT ON COUNTRY PROGRAMS.
WE HAVE, FOR EXAMPLE, IN THE NRBAR PROJECT INCLUDED
ASSISTANCE FOR ISRA IN THE FOLLOWING AREAS: DEVELOPING
IMPROVED COORDINATION BETWEEN ISRA DEPARTMENTS AND
STRONGER LINKAGES WITH REGIONAL AND INTERNATIONAL
RESEARCH ORGANIZATIONS AND NETWORKS, AND PROMOTION OF
ON-FARM TRIALS. NRBAR WILL ALSO SUPPORT ANNUAL DONOR
COORDINATION MEETING. THESE MEETINGS WILL PROVIDE A
FORUM FOR INFORMATION EXCHANGE AND TO RESOLVE ANY

CONFLICTS AND DUPLICITY OF EFFORT RESULTING FROM DONOR
INTERVENTIONS AND INTERESTS UNDER NRBAR PROJECT. THE

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TO SECSTATE WASHDC 9472

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AIDAC

AID/W FOR AFR/ARTS/ FARA, M. FUCHS-CARSCH

E. O. 12356: N/A
SUBJECT: SAARFA PROJECT 698-0435 FINAL EVALUATION

REF: STATE 040698

1. MISSION KNOWLEDGE AND COMMENT ON SAARFA SUPPORTED ACTIVITIES IN MALAWI IS LIMITED TO SUBPROJECT ACTIVITY WITH WHICH WE HAVE HAD THE MOST CONTACT: THE EAST AND SOUTHERN AFRICA ROOT CROPS RESEARCH NETWORK (ESARRN).
2. ESARRN ACTIVITIES IN MALAWI HAVE EFFECTIVELY CONTRIBUTED TO LEGITIMIZING ROOT CROPS RESEARCH, AND ELEVATING IT TO THE NUMBER TWO AGRICULTURAL RESEARCH PRIORITY BEHIND MAIZE. NEW VARIETY DEVELOPMENT, COMBINED WITH THE FIELD TESTING OF IMPROVED VARIETIES OF CASSAVA AND SWEET POTATO, ESTABLISHED THE FOUNDATION FOR AN ONGOING FAMINE MITIGATION PROGRAM IN RESPONSE TO THE 1991-92 DROUGHT. THIS PROGRAM IS COOPERATING WITH NGOS AND OTHER DONOR FUNDED EFFORTS TO RAPIDLY MULTIPLY AND DISTRIBUTE IMPROVED CASSAVA AND SWEET POTATO PLANTING MATERIAL TO SMALLHOLDER FARMERS DURING THE 1992-93 CROPPING SEASON.
3. IN ADDITION, ROOT CROP RESEARCH ACTIVITIES SUPPORTED BY ESARRN ARE CLOSELY LINKED TO THE USAID/MALAWI STRATEGIC OBJECTIVE OF INCREASING AGRICULTURAL PRODUCTION AND PRODUCTIVITY, AND WITH THE AGRICULTURAL SECTOR ASSISTANCE PROGRAM EMPHASIS ON UTILIZING CROP DIVERSIFICATION TO IMPROVE THE WELL-BEING OF SMALLHOLDER FARMERS. PISTOR

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FOREFRONT OF TOPICS BEING DISCUSSED BY POLICY MAKERS IN MOZAMBIQUE. LTC'S ABILITY TO DO SO ARISES IN PART FROM THE MULTI-FORA DISSEMINATION OF LTC'S MOZAMBIQUE RESEARCH AND IN PART FROM BEING ABLE TO PRESENT THE EXPERIENCE IN LAND TENURE REFORMS OF OTHER AFRICAN COUNTRIES BASED ON FIELD RESEARCH.

ACTION OFFICE AFAR-05
INFO AFSA-03 AFDP-06 RDPO-01 BIFA-01 DL-01 FAPB-02 POSP-01
PDAR-02 PCID-01 GC-01 GCAF-02 GCCM-01 FVPP-01 RDA-01
OFDA-02 FHAA-01 POP-04 STRD-01 STAG-02 ADA-03 SEOP-01
SETH-01 FFP-09 SERP-01 SECS-02 AMAD-01 P001-01 FAPB-02
AFOM-06 POCE-01 GEO-01 /068 AB 02/1356Z

6. AN EXAMPLE OF THIS IS THEIR WORK HERE IN HIGHLIGHTING THE IMPORTANCE OF LOCAL AUTHORITIES IN RESOLVING LAND QUESTIONS WHICH IS OF CRITICAL IMPORTANCE BOTH TO REINTEGRATION OF DISPLACED POPULATIONS IN THE POST-WAR PERIOD, AND TO THE MISSION'S DEMOCRATIC INITIATIVES PROGRAM OVER THE LONGER TERM.

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7. MOZAMBIQUE IS EXPECTED TO HAVE ITS FIRST ELECTION IN ITS HISTORY WITHIN ABOUT ONE YEAR AND, AS THE MULTI-PARTY ELECTION PROCESS UNFOLDS, LAND POLICY IS EXPECTED TO BE A LEADING ITEM ON THE AGENDA OF MANY POLITICAL PARTIES. WHILE THE LTC WILL NOT BE DIRECTLY INVOLVED IN THE ELECTORAL PROCESS, IT CAN FILL A LEGITIMATE ROLE AS A SOURCE OF INFORMATION FOR ALL CONCERNED WITH THIS ISSUE.

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8. WE HAVE JUST RECEIVED A VISIT FROM JOHN BRUCE, LTC DIRECTOR, AND ARE IN THE PROCESS OF DISCUSSING THE POSSIBLE FUTURE ROLE OF THE LTC IN MOZAMBIQUE.

UNCLAS MAPUTO 01179

AIDAC FOR AFR/ARTS/FARA

E.O. 12356: N/A
SUBJECT: STRENGTHENING AFRICAN AGRICULTURAL RESEARCH AND FACILITIES OF AGRICULTURE PROJECT (SAARFA: 698-0435) -- FIELD INPUT/FEEDBACK FOR FINAL EVALUATION

REF: STATE 040698

9. IN SUMMARY, THE USAID/MOZAMBIQUE PROGRAM HAS BENEFITTED SIGNIFICANTLY FROM OUR ASSOCIATION WITH MSU AND THE LTC, AND THEIR REGIONALLY-SUPPORTED ACTIVITIES HAVE CONTRIBUTED TO THESE BENEFITS. FRIEDMAN

1. USAID/MOZAMBIQUE REPLY TO REQUEST FOR INFORMATION IS CONFINED TO PARAS 4. (b) AND 4. (l) OF REFTEL.

2. USAID INVOLVEMENT WITH FOOD SECURITY IN AFRICA PROJECT HAS BEEN PRIMARILY VIA A MISSION BUY-IN TO THE MICHIGAN STATE UNIVERSITY (MSU) COOPERATIVE AGREEMENT. IN SUMMARY, EXPERIENCE TO DATE HAS BEEN OVERWHELMINGLY POSITIVE DUE TO MSU ASSISTANCE WHICH HAS BEEN TIMELY AND EXTREMELY RELEVANT TO GOVERNMENT OF MOZAMBIQUE IGRD POLICY REFORMS IN THE PRICING OF AGRICULTURAL

COMMODITIES, A STRENGTHENED PRIVATE SECTOR AGRICULTURAL MARKETING SYSTEM, AND IMPROVED PROGRAMMING AND MANAGEMENT OF OUR PL 480 TITLE III COMMODITIES. THIS ASSISTANCE HAS BEEN PROVIDED BY THE IN-COUNTRY TEAM, PERIODIC VISITS BY MSU STAFF, AND THE RESEARCH CARRIED OUT IN MOZAMBIQUE BY GRADUATE STUDENTS.

3. HOWEVER, AND MORE DIRECTLY TIED TO SAARFA, USAID AND THE GRM HAVE ALSO BENEFITTED FROM MSU'S REGIONAL RESEARCH. THIS HAS BEEN BROUGHT TO BEAR IN POLICY DIALOGUE IN MOZAMBIQUE ON TOPICS SUCH AS DONOR COORDINATION OF FOOD AID PROGRAMMING TO SUPPORT DEVELOPING MARKETS, AND THE IMPORTANCE OF CASH CROPS, PARTICULARLY COTTON, TO IMPROVED SMALLHOLDER FOOD SECURITY. IN SUPP, MSU'S FOOD SECURITY IN AFRICA RESEARCH HAS BEEN BOTH RELEVANT TO THE MISSION'S STRATEGY (SEE PARAGRAPH 4) AND EFFECTIVE IN FURTHERING THAT STRATEGY.

4. OUR STRATEGY IN THE AGRICULTURAL SECTOR EMPHASIZES THE ROLE OF A FREE MARKET BOTH AS THE BEST INSTRUMENT TO PROVIDE CONSUMERS WITH ACCESS TO PRODUCTS AT AFFORDABLE PRICES, AND AS PROVIDING THE BEST APPROACH FOR PRODUCERS TO REALIZE AN ADEQUATE RETURN ON THEIR INVESTMENT. THEREFORE, WE ENVISION A CONTINUING RELATIONSHIP WITH MSU, EITHER WITHIN THE SCOPE OF THEIR COOPERATIVE AGREEMENT, OR ALTERNATIVELY, THROUGH A DIRECT CONTRACTUAL ARRANGEMENT.

5. OUR EXPERIENCE WITH THE UNIVERSITY OF WISCONSIN LAND TENURE CENTER (LTC) HAS BEEN LIKEWISE POSITIVE. THE LTC HAS BEEN INSTRUMENTAL IN BRINGING LAND ISSUES TO THE

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ANNEX G
LIST OF SAARFA PROJECT CORE ACTIVITIES

<u>ACTIVITIES</u>	<u>EXPENDITURE</u>	<u>TIME FRAME</u>
Tech Assistance	(\$000)	
Research Priorities, Zonal and Country Assessments/Devres Contract	3,481	9/82-10/85
Tech Support/USDA RSSA	1,600	8/83-7/93
RSSA Office Support/ 1515 Wilson Contract	29	7/91-6/92
Office Filing System/ Tasconsultation Assoc Contract	4	6/91-8/91
Tech Support/USDA PASA (Funded: IITA Ag Liaison Officer, Rinderpest Vaccine Sub- project, SPAAR Grant)	1,047	6/87-7/93
Tech Support/ Hudson Masambu PSC	243	9/86-9/92
AAAS Fellow	207	8/89-9/92
Evaluation-M/E System/ MSI Contract	160	12/89-5/90
Other Activities		
Effects of Selected Policies and Programs on Consumption and Child Survival in Africa Study/IFPRI Grant	270	7/87-6/88
Effects of Filtrating Dike Systems on Increasing Soil Fertility in the Sahel	20	9/88-9/99

Study/ J.Hooper PSC

Tissue Culture Seminars/Univ of Colorado Grant	3	1/89-6/89
Tuskegee-Sokoine Univ Collaboration Grant	6	6/87-9/87
Research Station Operations Mgt Training Manual/Univ of Ark- IITA-ICRISAT Grant	48	7/89-7/90
Ag Mkt Policy and Ag Bus Dev Study/AMIS Buy- in Contract	178	8/91-9/92
Financial Mkt for Ag Bus Dev Study/Ohio State Grant	120	8/91-9/92
Ag Bus and Public Sector in TDT Studies/Abt Assoc Contract	293	8/91-9/92

Total Expenditures to 12/31/92 7,709

Total Core Activity Expenditures (\$7.7 million) as Percentage of
Total Project Obligations (\$39.7 million) = 19.4 Percent

SOURCES: AID, Africa Bureau Regional Portfolio Review - SAARFA Project
Data, 3/15/92

AID, SAARFA Project Status Report - 1/1/90-12/31/90

AID, Office of Financial Management, SAARFA Project Status as of
12/31/92

AID-USDA RSSA and PASA documents - over life of project

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ANNEX I

RATE OF RETURN ANALYSES: A QUESTION OF APPROPRIATENESS

Caution must be used when evaluating projects like those in SAARFA with rate of return analyses for three reasons. First in many African countries thin national markets combined with inelastic demand curves for the commodities whose production is being increased can cause price depressing surpluses, if market development is not thoroughly integrated into a production-increase oriented project. Conceivably in such a case, the change in gross commodity income could be negative in spite of increased physical production. Second, several SAARFA sub-projects were designed to prevent reductions in production rather than increase it. Estimating the positive benefits of such activities creates difficulties. Finally, the output of several of the sub-projects was policy advise. What value should be placed on the ability created by those projects for AID Missions to become meaningful participants in the food security and tenure policy debates? In spite of these limitations, the returns on agricultural research investments in Africa were found by Oehmke and Crawford to be positive. Clearly, all things considered they are likely to underestimate the value of research outcomes for projects like these.