REPORT Of THE EVALUATION

OF THE

STRENGTHENING AFRICAN AGRICULTURAL RESEARCH

AND FACULTIES OF AGRICULTURE PROJECT (SAARFA)

August, 1989

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PREFACE

The Strengthening African Agricultural Research and Faculties of Agriculture (SAARFA) project is funded by AID's Africa Bureau at $41 million over a ten-year period, 1982-1992. Having passed its mid-point, this evaluation is in keeping with AID requirements.

AID selected four persons to evaluate the project, all of whom have had extensive experience with agricultural research. Three of the team members have lived in Africa for extended periods and all four have worked in Africa. Their academic training and experience encompass both natural and social rural sciences and they are familiar with AID's programming and management procedures.

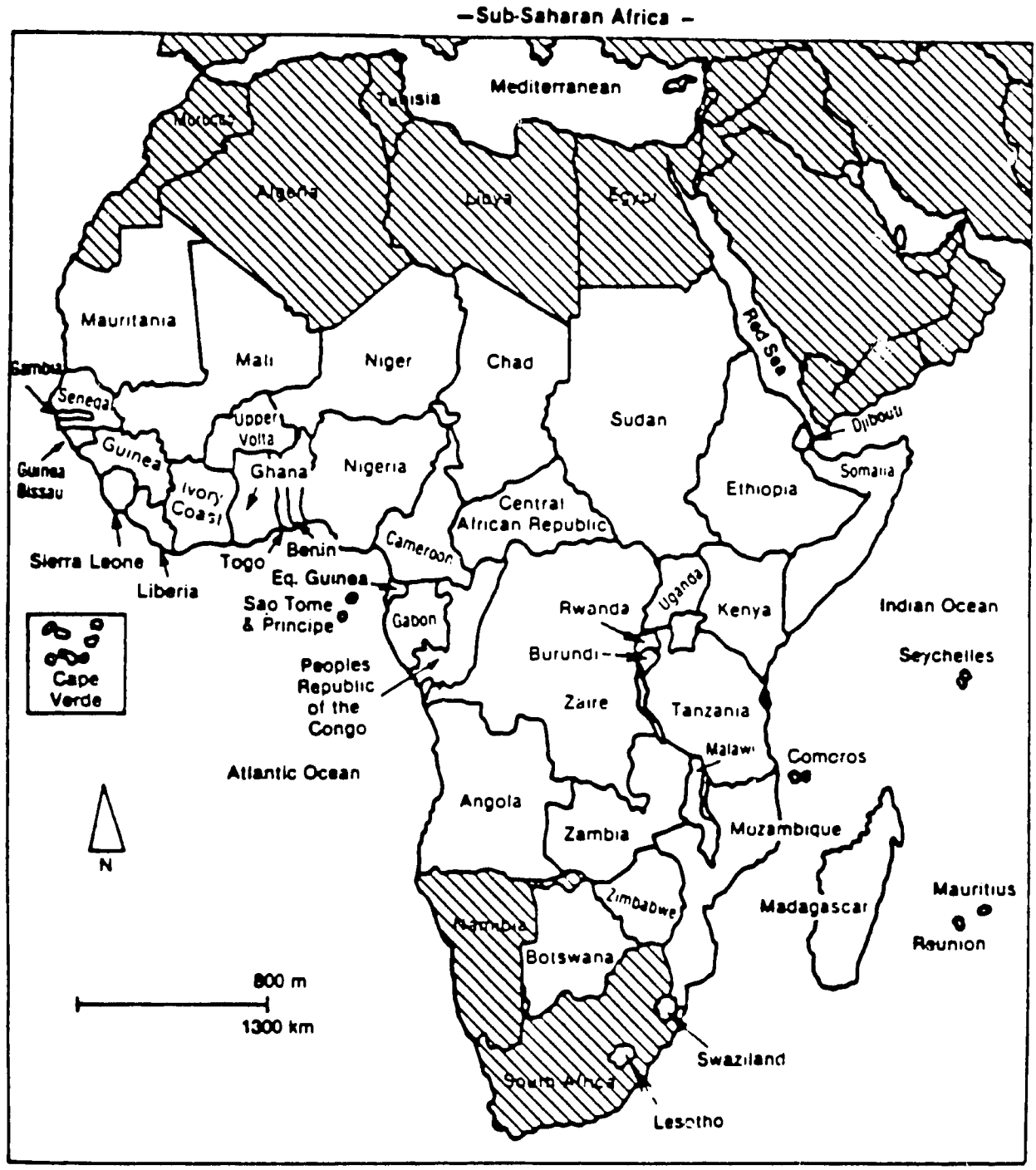
As would be expected, the team used different methods between Washington and the field. In Washington, the need was to become familiar with broad agricultural policies, review documentary and analytical research materials, and understand administrative management of the project. To do so, the team arranged interviews and participated in a series of briefings.

In the field portion of the evaluation, team members visited countries in East and Southern Africa, where most of the SAARFA sub-projects are based, and made a brief visit to West Africa. Through individual interviews, group meetings, on-site visits, and rapid field appraisals, the team was able to evaluate the several networks that form the field portion of the project and look critically at general research issues.

The evaluation was arranged through OICD/USDA and guided by a general scope of work with individual assignments for members of the team prepared by the AID SAARFA Project manager, who accompanied the team on their visit to East and Southern Africa, and who provided general support throughout the evaluation period.

The evaluation was carried out intermittently during the period January to June 1989. The field visits to Africa were made in January and February.

This report is for the most part an integrated summary of information in Attachments A through G and Appendix E prepared by individual members of the evaluation team. For detailed discussions of particular topics, the reader is referred to the Attachments and Appendix E.



SOURCE: General Accounting Office, "Africa's Agricultural Policies: A More Concerted Effort Will Be Needed If Reform Is Expected," GAO/NSIAD-83-36, Sept. 8, 1983. (Adapted from map by Martin Greenwald Associates, Inc.)

ACRONYMS USED

AFR/TR/ANR	Africa Bureau /Technical Resources/Agriculture and Natural Resources (AID)
AID	Agency for International Development
AID/S&T	Agency for International Development/Science and Technology Bureau
ARRA's	Agricultural Research Resources Assessments
CDA	Cooperative Development for Africa
CIAT	International Center for Tropical Agriculture
CIMMYT	International Center for Wheat and Maize Improvement
CIP	Center for International Potato Research
CRSP	Collaborative Research Support Program
IARC's	International Agricultural Research Centers
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFPRI	International Food Policy Research Institute
IITA	International Institute for Tropical Agriculture
ILCA	International Livestock Center for Tropical Agriculture
ISNAR	International Center for National Agricultural Research
MOA	Ministry of Agriculture
MSU	Michigan State University
NARS	National Agricultural Research Systems
OAU	Organization for Africa Unity
PACD	Project Assistance Completion Date
PASA	Participating Agency Service Agreement
REDSO/ESA	Regional Economic Development Service Organization for East and Southern Africa (AID)
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
SPAAR	Special Programs for African Agricultural Research
TAC's	Technology-Adapting Countries
TPC's	Technology-Producing Countries
WARDA	West African Rice Development Association

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EXECUTIVE SUMMARY

PURPOSE

Strengthening African Agricultural Research and Faculties of Agriculture (SAARFA) is a project that embodies a modified approach to agricultural research. Its prime objectives are to help improve national agricultural research systems in each of five ecological zones of Sub-Saharan Africa and to encourage donor coordination. SAARFA planners realized that a flexible approach was needed to meet the project's objectives.

This evaluation is in accordance with A.I.D.'s procedures. Its purpose is to determine whether the project's objectives are being met and whether each element of the project is achieving the progress that is expected at this point. The evaluation also is to offer recommendations and mid-course corrections as may be appropriate.

METHODS

In Washington, briefings, review of documents, analytical studies and interviews provided background materials for the evaluation. Similar methods were used in the field but in addition the team made on-site visits to research locations and used their own past field experience to determine the state of research.

FINDINGS

The evaluation team found that SAARFA is fulfilling its purpose in accordance with the Africa Bureau's Research Plan. Thirteen sub-projects are operational, research networks have been established, socio-economic research is complementing technical research, and a donor group under World Bank leadership is cooperating enthusiastically.

The umbrella features of the SAARFA project are definitely appropriate, because of Africa's huge size, diverse ecology and critical need for improved technology.

Continuing improvement in management of SAARFA's direct or core activities will be needed. Existing problems are mainly administrative details having to do with cooperative agreements (buy-ins). The delegation of the management functions to the field has gone smoothly. Slow vouchering and reporting, when they occur, are due more to external conditions that are beyond control than to lax internal project management.

Networking was found to be working effectively and is a definite advancement in facilitating research; notwithstanding, interactions between bilateral programs and the networks and between socio-economic "buy-in" research and IARC commodity research should be strengthened.

Labels such as "technology producing countries," technology

Countries visited ?

adapting countries" and "university centers of excellence" lack appreciation on the part of many Africans. National interests override regional interests, and each African country wants its own university before conceding to a "center of excellence." This pattern of thought also explains why U.S. missions' "buy-ins" can not substitute for REDSO management.

SPAAR is rated highly among donor members, but African research directors in Kenya and in other countries visited by the team had only a hazy idea of SPAAR and its activities.

Cultivation is being pushed more and more on to marginal and sub-marginal lands; thus, production and consumption patterns are changing. Easier to produce "poor man's crops" -- roots, tubers, and legumes -- seem slowly to replacing foodgrains. More off-farm employment is being sought. These and other changes detected by SAARFA research have important policy implications.

Finally, SAARFA's most complicated problems in the future will be integrating the many facets of the project, maintaining management efficiency, maintaining control over sub-project grants and welding this umbrella project into a package that is sustainable.

RECOMMENDATIONS

A. SAARFA and Donor Coordination

Some meeting a first step - Is this type info worthwhile

1. The U.S. should continue to encourage and help support cooperation among and between donors in providing support to NARS through the SAARFA project. More effort should be made to explain SPAAR's purpose and benefit to African officials.

2. At all levels of donor interaction on agricultural research, the U.S. should fully assert its interests, comparative strengths and capacities for leadership .

3. At SPAAR and similar donor meetings, U.S. delegates should be authorized to represent the U.S. on technical and budgetary matters with the full support of the Agency.

B. SAARFA Management

1. A logical framework matrix should be prepared for SAARFA and all future sub-projects should have logical frameworks which mirrow SAARFA's purposes and procedures. This will provide a better basis for monitoring and evaluating this umbrella project and it sub-projects.

2 Maintain current decentralized arrangements for providing administrative management support to sub-projects in Africa For SAARFA II, officials should determine the feasibility and desirability of making arrangements in West and Sahelian Africa which parallel currently highly satisfactory arrangements in East and Southern Africa.

3. SAARFA AID/W officials should review and ensure that accounting procedures used for cooperative project arrangements (buy-ins) are in accordance with recommendations of the AID Controller.

4. Mechanisms for AID Mission buy-ins to SAARFA sub-projects should be considered as means to encourage and facilitate greater mutual program support and interaction between SAARFA sub-projects and Mission bilateral projects.

5. Program considerations should determine the size of SAARFA with respect to the number of sub-projects.

C. SAARFA Sub-Projects

1. The SAARFA sub-project portfolio should continue to have a balanced mix of natural/agricultural and social science projects.

2. There should be increased support for research on evaluating and supporting key choices in agricultural policy. Because of the potentially large impact policy decisions have for agricultural productivity, as well as for incomes and well-being of farmers, it is recommended that SAARFA enlarge this portion of its social science research.

3. SAARFA's research projects on technical problems, institutional reform and economic indicators provide substantive regional support to NARS and in the process provide excellent technical and policy-relevant insights for planning and project adjustments. Notwithstanding the current satisfactory circumstance, adjustments and additions should be considered with respect to the commodity research networks. Specifically, SAARFA's commodity research networks should concentrate on basics of crop, soil and water use along with improvement of specific crops. There should be a definite shift of emphasis toward sustainable cropping practices and low-cost inputs especially suited to small farms. In this regard, the team suggests consideration of i) an expanded research network directed towards natural resource use/conservation and crop production (i.e., soil management, water use and sustainable cropping systems for humid and semi-arid areas), ii) a research network involving small ruminants, crops/forages and agroforestry for high-rainfall, tropical areas, iii) additional commodity research networks to include bananas/plantains and sweet potatoes and iv) continued support for mangrove rice as a part of the upland rice continuum.

4. The process of sub-project selection from unsolicited proposals has advantages and disadvantages. The procedure should continue but be followed with caution to ensure that the project mix is acceptable with regard to objectives, management requirements, progress potential and expected benefits.

5. With regard to support for faculties of agriculture in African universities, consideration should be given to providing support through Africa-wide and/or regional organizations that carryout programs which address needs and interests of agricultural faculties

in ways similar to the networks conducted by the IARC's in support of NARS. Such programs would link agricultural faculties with special regard to agricultural research and training, conduct programs of mutual interest and benefit, and complement and supplement bilateral and multilateral assistance.

LESSONS LEARNED

1. Donor Coordination

The SAAR and SAARFA experiences with CDA and SPAAR indicate that, while there are occasional shortfalls in performance by individual donors, substantial benefits accrue to donors and NARS through donor coordination. The successes of SAARFA's commodity research networks can be attributed to a considerable degree to multilateral collaboration and coordination through CDA and SPAAR.

2. Value of Networks

a. Commodity research networks are cost effective investments that leverage resources of donors and participating IARC's and NARS.

b. Research networks provide beneficial services in a participatory manner valued highly by NARS, but, perhaps most of all, such networks do things which need to be done which individual nations can not do for themselves or which individual donors can not do.

3. Socio-Economic Research

Micro and macro socio-economic research investigations are necessary to help understand the economic development impact and consequences of agricultural research and to help provide national policy guidance for agricultural research and related activities.

4. Management

A large, umbrella project with diverse purposes and activities, such as SAARFA, can be administered and managed effectively and efficiently. Decentralized management of field activities with clearly defined and delineated responsibilities, procedures, and accounting at the regional level appears to be the key to successful management of such a project.

II. PROJECT DATA

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: July 1, 1992
   c. Most Recent Project Assistance Completion Date: September 29, 1992

5. Project Funding (Amounts obligated to date):

a.	Core Activities:	$ 5,246,000
b.	Sub-Projects:	22,837,500
c.	Total:	$28,083,500

6. Mode of Implementation:

a.	AID Direct Contracts:	2 activities -	$ 3,556,000
b.	RSSA (USDA):	1 activity -	1,000,000
c.	PASA (USDA):	1 activity -	400,000
d.	Grant Instruments:	12 activities -	21,727,500
e.	Buy-ins S&T projects:	3 activities -	1,400,000

7. Project Designers: AID in collaboration with other donors

8. Responsible AID Officials:

   a. AID/Washington: Director, AFR/TR
   b. Project Officers:

      Agriculture and Natural Resources
      Division Chief, AFR/TR
      Research Advisor, AFR/TR/ANR/FS

9. Previous Evaluation(s): N/A

III. THE SAARFA PROJECT

A. Background

At a meeting in Washington, D.C. in November, 1980 arranged by the CDA (Cooperative Development for Africa), the members -- Belgium, Canada, Federal Republic of Germany, France, Italy, United Kingdom and United States -- designated the U.S. to develop an approach for strengthening agricultural research in Africa, including guidelines for program implementation which CDA members could support. Recommendations were made that 1) research on food production should be intensified to compensate for past neglect, 2) emphasis should be on upgrading and re-orienting complete national research systems, 3) research should be managed on the basis of agroclimatic zones, and 4) agricultural research programs in Africa should include a focus on on-farm investigations in order to address effectively the problems of small scale systems common to Africa.

Subsequent CDA discussions led to agreement to divide Sub-Saharan Africa into five major agroclimatic zones and for a CDA donor to take the lead for agricultural research in an agroclimatic zone. The U.S. agreed to take the lead in Southern Africa and share the lead with France in the Sahel (AID, July, 1982).

To secure up-to-date information on which to base research programs, it was decided that research inventory/assessments should be undertaken for each agroclimatic zone. These studies were called Agricultural Research Resources Assessments (ARRA's).

The U.S. assumed responsibility for ARRAS's for the Sahel and Southern Africa, and, in 1982, the Strengthening African Agricultural Research (SAAR) project was designated and authorized to finance the U.S. commitment to the CDA. A good deal of cooperative effort was put forth, but by the end of 1985 it was apparent that the CDA lacked continuing support. When CDA activity ended in 1986, the U.S. joined the newly created Special Programs for African Agricultural Research (SPAAR) led by the World Bank.

B. Project Description

1. Concept and design

In 1982, the U.S. needed a funding mechanism to further its interests in securing greater and more effective donor collaboration and coordination in programs to help strengthen NARS of nations in Sub-Saharan Africa. In particular, it needed a means to participate in and promote the efforts of the CDA consortium. Participation in CDA required funds to support a variety of tasks, such as, acquiring information, holding planning meetings with donors and African nations, arranging donor leadership for the several regions of Sub-Saharan Africa, developing and supporting specific projects for support of NARS, and establishing an administrative management system to accomplish the tasks involved. Project authorization, July 21, 1982 (AID, July, 1982), describes and authorizes The

Strengthening African Agricultural Research (SAAR) as a "... multi-donor, Africa-wide project ..." In 1987, support for Faculties of Agriculture was added, the name was changed to **Strengthening African Agricultural Research and Faculties of Agriculture (SAARFA)**, and authorized funding was increased from $19.5 million to $41 million. At the same time, it was stated that "the SAARFA project will henceforth be used to support some of the priority activities developed under the Africa Bureau Plan, the CDA initiative and SPAAR." (AID, June, 1987) Thus, the original project has evolved by design into a substantial, regional, "umbrella" project to promote and achieve U.S. interests as they relate to African agricultural research.

2. Project Objectives

a. Improve donor coordination in planning and implementing agricultural research activities.

b. Develop regional agricultural research programs and implement specific regional and national sub-projects that address priority needs with these programs.

3. Project Inputs

Two components of SAARFA -- direct project activities and sub-projects -- provide a wide variety and range of inputs.

Inputs provided through direct project activities (or "core" activities) are those needed to a) support donor and African technical planning and coordination meetings, including agricultural research conferences and network workshops, and b) contracts and/or USDA PASA's for technical assistance and services. A major direct project input has been through a contract with Devres, Inc. which developed ARRA's to help the U.S., other CDA members and concerned nations develop plans and programs for the Sahel and Southern Africa.

Inputs provided through the sub-projects are the usual kinds of inputs associated with technical assistance projects. Twelve of the 13 SAARFA sub-projects are classified as technical assistance, network projects. Through these networks, SAARFA inputs include the following:

- o Collaborative Research
- o Germplasm Exchange
- o Workshops and Meetings
- o Non-formal Training
- o Information Exchange
- o Expatriate Specialists
- o Circuit Riders
- o Monitoring Tours
- o Degree Training
- o Financial Support

Chart 1 provides and overview summary of the inputs by 12 of the 13 SAARFA sub-projects. Presentations of the full range of direct

inputs are provided in Attachments A, B, C, and D.

4. Project Outputs

a. Direct project activities

In summary, these outputs have been:

1) Coordinated donor arrangements and activities.

2) Information and data for development and guidance of the SAARFA project.

3) Policy and technical information and guidance for donors and nations.

4) Meetings, conferences and workshops for donors and nations.

b. Sub-Project activities

Specific outputs of SAARFA sub-projects are presented in considerable detail in Attachments A, B, C, and D. The collective outputs of the SAARFA sub-projects have been quite substantial. From evaluation reports and the review team's observations and discussions in the field with project and host country personnel, there is evidence of increasing:

- o availability and use of improved agricultural production materials, technologies and methodologies;
- o international cooperation between and among nations;
- o knowledge and understanding;
- o capacities and capabilities;
- o research-based plans and policies.

C. Basis and Objectives of the Evaluation

The Scope of Work given Appendix A provides the basis for this evaluation of the SAARFA project.

Objectives of the evaluation are to:

a) review progress towards achievement of the project's purpose, especially as it relates to strengthening NARS and programs;

b) assess the appropriateness of the project's umbrella-type structure and implementation mechanisms in achieving the project objectives and suggest ways to improve its effectiveness;

c) assess SAARFA's contribution and effectiveness in achieving

donor coordination in identifying and addressing the research priorities for different agroecological zones identified by the CDA initiative; develop guidelines and recommendations for U.S. assistance regarding donor coordination, through the SAARFA project, to the SPAAR initiative led by the World Bank; and

d) provide the direction needed to strengthen SAARFA's contribution toward achieving the objectives of the Africa Bureau's Plan for Supporting Agricultural Research and Faculties of Agriculture in Africa (he "Plan"), the objectives of the Development Fund for Africa and those of the Plan for Supporting Natural Resources Management in Sub-Saharan Africa.

CHART 1

SAARFA PROJECT INPUTS/RESOURCES PROVIDED TO AFRICAN NATIONAL AGRICULTURAL RESEARCH SYSTEMS

SAARFA PROJECTS	RESOURCES PROVIDED/NETWORK INPUTS									
	CR*	EPS	GE	IE	MT	CR	WM	DT	NT	FS
BEANS CIAT	X	5	X	X	X	X	X	X	X	X
FORESTRY ICRAF	X	2	X	X	-	X	X	O	X	X
POTATOES CIP	X	4	X	X	-	X	X	O	X	X
RICE WARDA	X	2	X	X	-	-	X	X	X	X
ROOTS/T IITA	X	1	X	X	O	X	X	X	X	X
RES MGMT ISNAR	-	O	-	-	-	-	X	-	X	X
FSR CIMMYT	X	4	-	X	O	O	X	O	X	X
INSECT RES ICIPE	X	4	X	X	-	-	X	O	X	X
FERT RESTO IFDC	X	3	-	X	-	-	X	O	X	X
FOOD SEC MSU	X	6	-	X	-	-	X	O	X	X
FERT POL IPPRI/IFDC	X	2	-	X	X	X	X	O	X	X
ACCESS U WISC	X	2	-	-	-	-	X	-	X	X

* CR - Collaborative Research; EPS - Number of Expatriate Scientists; GE - Germplasm Exchange; IE - Info Exchange; MT - Monitoring Tours; CR - Circuit Riders; WM - Workshops and Meetings; DT - Degree Training; NT - Nonformal Training; FS - Financial Support
Not Applicable; O - none

IV. SAARFA EVALUATION

A. SAARFA Plans and Strategy

Plans and strategy to help strengthen NARS in Africa by focusing and concentrating on a limited number of commodities and on a few promising, designated, technology-producing countries (TPC's) in major ecological zones of Africa are sound. The strategy as it relates to commodities is supported firmly by development experience, as well as, by scholars especially knowledgeable of Africa (Eicher, 1988 and Oram, 1988). Such a program strategy should be followed and modified from time to time as conditions warrant. The evaluation team notes that there are SAARFA sub-project activities in 31 countries of Africa. This is at first glance hardly "concentration and focus," but SAARFA helps to connect TAC's with TPC's.

Further, the program strategy to help strengthen NARS through research networks coordinated mainly by IARC's is also sound and based on development experience. Such a strategy builds on the strengths and comparative advantages of the international research centers: access to world collections of crop germplasm, reliable technologies, training for development, and research support services designed especially to meet the needs of developing countries. Important features of such networks are their leveraging and synergizing effects on the resources of participants. With respect to programming regional support to NARS, networks are clearly the best available means, perhaps, the only effective means. The strategy exploits the things that networks do exceedingly well, but it also recognizes that networks have limitations (IDRC, 1988). In particular, they can not substitute for direct technical assistance where such assistance is needed, as may be the case with many nations in Africa In this regard, networks tend to complement and enhance the effectiveness of bilateral assistance.

The matter of external support for agricultural research in countries that have been designated as "technology-adapting" countries (TAC's) is a matter of some concern. In recalling lessons from development experience, Ruttan reports, "those countries that have attempted to rely primarily on borrowed technology have rarely developed the capacity to adapt and manage borrowed technology in a manner capable of sustaining agricultural development." (Ruttan, 1988 p 13) While individual donors are free to set their development assistance priorities with regard to countries, multilateral assistance agencies, including the IARC's, do not have to make such choices. Thus, the SAARFA strategy to support IARC-coordinated, research networks has special merit as a means to join TPC's and TAC's and leverage other agricultural resources.

In summary, the evaluation team believes the Bureau's strategy to support agricultural research through the SAARFA project is sound and should be continued for several reasons. First, investments in agricultural research have consistently achieved rates of return that are among the highest available for national governments and

development assistance agencies (Ruttan, p 13), although the Team recognizes that there are special conditions in Africa which are likely to delay such returns. Second, recent investments in agricultural research in Africa have played a role in preventing an even more significant deterioration in agricultural production in parts of Africa (e.g., research-developed strains of cassava resistant to the devastating cassava mosiac virus). Third, improved agricultural productivity (based on adoption of superior technology) is critical to the success of policy reforms designed to stimulate growth. In agrarian nations, agricultural productivity is essential to helping to break the cycle of poverty and begin the process of capital formation. Fourth, there are usually lengthy periods required for developing/adapting and adopting productivity-increasing technologies. The environments -- bio-physical/socio-economic -- in sub-Saharan Africa are such that time-consuming, location-specific research is predictable; thus, prudence dictates early rather deferred investments in agricultural research (See Appendix E for a discussion of the case for agricultural research in sub-Saharan Africa).

B. SAARFA Direct Project Activities and Sub-Projects

SAARFA inputs and outputs have been summarized in Section IIIand are presented in detail in Attachments A, B, C and D. At mid-point in its currently planned operational life, there is no question as to the productivity of SAARFA. Its inputs and outputs to date are extensive and substantial and likely will have pervasive, enduring beneficial impacts on building capacity in African NARS and on their participation in international affairs. Concurrently, there have been significant improvements in donor cooperation/collaboration. These achievements, of considerable benefit to recipient nations and to the U.S. and other donors, have been made possible through adequate funding and through the program flexibility and agility characteristics of SAARFA's direct project activities and sub-projects.

The impacts of SAARFA sub-projects, which represent the principal use of SAARFA funds ($22,877,500 out of $28,089,500 to date), are summarized in succeeding paragraphs.

1. Agronomic and Related Networks

These networks (See Attachment A or B for detailed descriptions) represent the current principal focus of the SAARFA project: they represent nine of thirteen sub-projects and 72.1% ($17.6 million) of funding for sub-projects.

Three of these networks are relatively new -- underway for two and one-half years or less -- with negligible impacts so far, but six have been underway for some time and are beginning to show tangible results in certain areas and certain commodities (See Attachment A for specific achievements by each sub-project). Also, there are noticeable changes in attitudes and approaches to research and technology generation. The CIMMYT II OFR/FSR network, for example,

has already had a major impact on changing operational strategies among administrators and researchers.

Widespread adoption of new agronomic research findings under SAARFA has currently occurred only in cassava. Inadequate basic data on this crop (including accurate measures of area planted, yields and prices) make quantitative evaluation of its economic impact difficult to achieve. It is clear, however, that in stemming the devastation of an important subsistence crop, it stabilized food security in several regions where production would otherwise have deteriorated sharply. Promising field trials are underway in several other sub-projects whose economic impacts should be carefully evaluated as they move to widespread dissemination. Over time, these sub-projects could be among the most profitable investments in Sub-Saharan Africa. Some authorities recommend redoubling of efforts to increase agricultural productivity (Mellor, 1988 p 4).

Notwithstanding SAARFA's current highly satisfactory status, the evaluation team believes that modifications and additions to the commodity networks should be made to accomodate needed shifts in emphases and attention to other important commodities and circumstances. Specifically the team sees the need for all commodity networks to devote more attention to the basics of crop, soil, water management and more reliance on low-cost inputs and practices along with emphasis on their specific commodities. In short, all commodity networks should have an orientation towards sustainable cropping for small farms and small farmers (See Attachments A and F for further discussion of this position). Further, new sub-projects should include those that are perceived to be important by small farmers (e.g., bananas, sweet potatoes, small ruminants, maize, mangrove rice and forage crops) and those that are critical to protection and sustained use of natural resources (e.g., soil and water conservation and use). See Attachments A and D for discussion and rationale for these suggested additions.

2. Socio-Economic Research

The socio-economic research activities under SAARFA were, in general, begun relatively recently. All were initiated in 1987, and hence, do not have a "long track" record under SAARFA. In most instances, however, the research harks back to a longer tradition of work under earlier activities, and this general "baseline" can be used to a certain extent in interpreting the patterns found to date.

The socio-economic activities differ in the degree to which they fit the original SAARFA objectives. For more detailed assessment, see project specific summaries in Attachment B.

The newer sub-projects contribute to an important objective not covered under the original SAARFA mandate. They emphasize research capability of evaluating and supporting key choices in agricultural policy. In light of the increased commitment to policy reform, and the potentially large impact decisions about agricultural policy have for agricultural productivity, as well as, the income and

general well-being of farmers, this emphasis seems appropriate and should be more explicitly recognized in future SAARFA projects.

The newer socio-economic research activities also hold the potential for enhancing the utility and perceived relevance of more commodity-based agricultural research. The importance of socio-economic factors in determining the applicability of technical research results, and the need to build a knowledge of such factors into both the research and extension process was recognized in the original SAARFA mandate. The evaluation team finds, in fact, that SAARFA has been a useful vehicle for incorporating this awareness into national and international research institutions. Several of the new socio-economic activities extend this lesson from the micro-level to more macro considerations, examining the extent to which policies are an integral part of the environment in which agricultural research and innovation occur, and providing a channel for evaluating empirically the probable impact of alternative policy decisions on farmers.

3. Faculties of Agriculture

The Africa Bureau is supporting a number of agricultural education and training projects in nations of sub-Saharan Africa as a part of the Bureau's "Plan." However, under SAARFA there is only one such project: Strengthening of Teaching and Adaptive Research Capability of the University of Rwanda. Begun in late 1987, this sub-project is being conducted by the University of Minnesota and is in the early stages of getting established; thus, its impact to date has been quite limited.

The goals of this project are laudable and the project is an element of the Bureau's strategy to help selected, national faculties of agriculture produce well-trained research scientists. For the University of Rwanda, this is hope and promise which, over time, may become reality. Eventually, it can be expected that the University of Rwanda will make contributions to the nation's agricultural research requirements. In this regard, bilateral support for strengthening the University Rwanda in agricultural research may be more appropriate than through SAARFA. Since most African countries, including Rwanda, fall into the Plan's "research adapting country" category, the University of Rwanda could become a test case for universities at similar stages of development (See attachment C for a discussion of faculties of agriculture).

SAARFA officials may wish to consider support for kinds of regional activities in higher agricultural education for which there is need and which fit squarely into SAARFA's regional mandate. Regional associations could provide fora and activities to address needs and interests of national faculties of agriculture in ways much similar to IARC-coordinated, commodity research networks. Such activities would complement and supplement bilateral and multilateral assistance to faculties of agriculture in African universities.

4. Donor Coordination in Support for NARS through SAARFA Direct Project Activities and Sub-Projects

Coordination of bilateral and multilateral assistance to developing nations has ebbed and flowed with the times and circumstances. This has certainly been true with respect to aid to nations in Africa. Currently, coordination of support to African NARS is on the up-beat.

The U.S. SAAR and SAARFA projects, as well as the World Bank's SPAAR, evolved from the CDA. Under CDA agreements, donor nations were assigned the tasks of preparing agricultural research resource assessments (ARRA's) for the regions (agro climatic zones) for which they had responsibility. The U.S. and Canada completed their ARRA's, and, in this respect, performed better than the European members of CDA. As support for CDA waned, it was succeeded by SPAAR.

From the experience with CDA and current operations under SPAAR, several things seem clear. First if donor coordination is to be meaningful, technical committees as existed in CDA and now in SPAAR must be supported effectively by leaders of their agencies and ministries. Second discussions and recommendations made in donor groups should be in alignment with budget realities. This was lacking on the part of CDA members. Third a donor grouping even when voluntary must identify a leader. In the absence a leader, mutual interest will prove be insufficient in holding the group together. The World Bank serves this purpose with the SPAAR.

The nature of donor cooperation under CDA also suggests a lesson for U.S. participation in SPAAR. At international meetings, other donors expect the U.S. to take leadership positions. U.S. delegates to SPAAR meetings should therefore be authorized to speak with a degree of confidence on research policy and budgets, as well as on technical matters. Strong U.S. support for SPAAR will encourage support from other donors. The U.S. delegates should be strong advocates for the Africa Bureau's "Plan," and should promote donor co-financing to the fullest degree.

While recognizing that the primary function of SPAAR is to mobilize donor resources, a softspot is its lack of recognition among African officials. Some scientists, even at the level of research director, have only a faint knowledge about SPAAR.

The U.S. has been associated with donor coordination for Africa throughout the 1980's. This is recognition that the sheer scale and complexity of the continent's development problems tend to overwhelm the efforts of single donors. Some kind of cooperative effort is likely to continue and should be encouraged. In this regard and with respect to NARS, the SAARFA project is quite effective.

C. SAARFA Administrative Management

SAARFA is by far AID's largest agricultural research project in Africa. By design it has evolved into a substantial, regional, "umbella" project composed of diverse activities in size, nature, and mode of implementation and administrative management.

1. Organization and staffing

Differences in objectives/purposes and mode of implementation between core activities and sub-projects impose different administrative management requirements. Administrative tasks, program responsibilities and financial accountabilities are quite different for grants and contracts. Core activities are generally funded through contracts, PASA's and RSSA's with AID retaining major management responsibilities; whereas, sub-projects are usually funded and executed through grants with minimal AID involvementin direct project implementation.

Project management functions are handled, for the most part, through core activities that support the field programs (activities of sub-projects being conducted by grantees) by monitoring, reporting, coordinating, supporting field operations, and conducting studies on important issues. A most important managerial function is the review and approval of all proposed core activities and sub-projects.

Broad oversight of management is provided by an officer in the Africa Bureau's Division of Agricultural and Natural Resources (ANR), who works closely with the agricultural staff in the Technical Resources (TR) office. He is also the key person on all committees having to do with project matters. When needed, contracts, PASA's and RSSA's are used to procure additional services.

To provide management support for field activities arrangements have been made through appropriate offices and institutions in Africa. In East and Southern Africa, a local hire field manager has been employed under a personal services contract (PSC) and assigned to staff of AID's Regional Economic Development Service Office for East and Southern Africa (REDSO/ESA) in Nairobi. Support activities in West Africa and the Sahel are handled by an Agricultural Liaison Officer (ALO) posted at IITA in Ibadan, Nigeria.

2. Administrative Operations

The review team had adequate opportunity to observe, discuss and assess SAARFA administrative operations with AID direct hire and contract personnel, grantees/project personnel and cooperating host country scientists and administrators in East and Southern Africa but less so in West Africa. Discussions and observations also took place in AID/W during the course of the review. A detailed account of administrative operations is given in Attachment E. The team's overall assessment is that current administrative management of the SAARFA project is highly satisfactory. Several items of special interest and concern came to the attention of the team during the course of the review. Comments on these are summarized in succeeding paragraphs.

a. Unsolicited Proposals

Sub-projects, which comprise the largest portion of SAARFA's operations and which represent the project's main

programmatic thrusts, have been selected largely from unsolicited proposals from the outside. As a management procedure, how does the use of unsolicited proposals compare with the use of standard (handbook) design procedures? Are sub-projects well-chosen; do they support the Bureau's "Plan"?

Unsolicited proposals have distinct advantages and disadvantages. As for advantages, they save time, are less expensive, and are likely to be programmatically tight and comprehensive, can be flexible and well-suited to research networking, and, of great importance, they can leverage an array of additional human, natural and financial resources in support of specific development opportunities. SAARFA does not have a logical framework matrix for guiding the selection of proposed sub-projects. The "Plan" which serves as a guide should be reviewed from time to time to ensure that it is closely related with on-going development problems and issues. Otherwise, unsolicited proposals can result in outdated sub-projects and to "scattering" of narrowly-focused, uncoordinated activities.

In spite of the recognized disadvantages of unsolicited proposals, the review team concluded that on balance they serve the needs of SAARFA better than would standard design procedures and should be continued. To help guide project selection, AID officials should prepare a logical framework matrix for the SAARFA project as a common anchoring point for all direct activities and sub-projects. Each sub-project should have a log-frame to guide monitoring and evaluation.

b. Field Management and Implementation

Strengths and weaknesses of field management were considered during the team's visits to Africa. Most observations were in East and Southern Africa where a number of sub-project networks are operational and require various types of logistical and administrative support. AID/W has delegated such management functions to field offices. REDSO/ESA has the responsibility for SAARFA sub-projects within countries in East and Southern Africa. AID management support in West and Sahelian Africa differs in that most support for SAARFA is through an Agricultural Liaison Officer (ALO) posted at IITA, who provides an extension function between IARC's, USAID's and African NARS. Monitoring most commodity networks in West Africa is handled by SAFGRAD with guidance and financial oversight mainly from IITA.

The review team's assessment is that the management support system in place for East and Southern Africa is functioning satisfactorily and should be continued. The circumstances in West and Sahelian Africa are not as clear and easy to sort through. The team did not visit extensively in West Africa and the Sahel; thus, the team is less sanguine regarding field management and implementation of SAARFA activities in these regions.

There are several options available for providing management support for SAARFA activities in West and Sahelian Africa:

1) shift major management responsibilities for SAARFA to REDSO/WCA, use a PSC employee as project manager and follow the same structure and practices as are being used in REDSO/ESA, 2) retain the present management structure which relies on SAFGRAD and IITA, and 3) broaden and deepen the ALO's mandate/role and, if necessary, post him at REDSO/WCA rather than at IITA. If only AID's administrative management considerations were involved, options 1 and 3 would seem to be logical choices in that order; however, SAFGRAD, an organ of OAU's Science and Technology and Research Commission, is involved and has an assigned coordinating role for commodity research networks in the region. Further it can provide political, economic and technical inputs. Currently, these considerations appear to outweigh possible gains in administrative management efficiency through options 1 and 3; thus, it is the view of the team that for the present option 2, the present management arrangement, should be continued. For greater discussion of field management, see Attachment E.

c. Reporting and Accountability

The principal types of sub-projects under SAARFA are 1) commodity or related biological research and 2) socio-economic policy related research. The former for the most part are field-based in Africa, while the base of socio-economic research activities varies between Africa and the U.S. Reporting and financial accountability varies between the two types of projects.

Because of the limited time in Africa, the evaluation team could only scan the large volume of the reports, but they appeared to provide updated accounts of the technical and administrative state of sub-projects.

Financial transactions and reporting in the field are controlled by organizations entrusted with management oversight. In East Africa, account records are maintained in REDSO/ESA after necessary correspondence with implementors, such as IARC's. These accounts are subject to frequent audit. The team discerned no major problem with accounts and concluded that REDSO can physically track funds that have been sub-obligated to the purposes intended. Where there is a slack in the system, it is due mainly to delays that can be corrected. The team concluded that field reporting and financial records are being handled competently.

On the other hand, it does not appear that cooperative agreements (i.e., buy-ins) have the same reporting systems as field-based sub-projects. Two sub-projects (IFDC and IFRI) are managed by AFR/TR/ANR and on these no reporting or accountability problems were noted. The Wisconsin ACCESS sub-project managed by AID/S&T has issued several implementation reports, but they have not been subject to critical review. On the positive side of the ACCESS sub-project, funds have been carried as a line item and are being segregated and can be tracked. Reporting for the WARDA sub-project lags and lacks cohesion. The remaining two buy-ins, ICRAF and MSU Food Security, are both managed by AID/S&T. They provide timely and well-prepared implementation reports, but no financial reports on ICRAF were located

in AFR/TR/ANR. And it seems clear that AFR/TR/ANR funds for the Food Security sub-project are co-mingled in a way that made tracking of particular funds impossible.

Thus, whereas, field-based sub-projects show few reporting and accountability problems, more problems are found in the "buy-in" part of the SAARFA project. Perhaps, the AID Controller should advise on the accountability procedures that would be most suitable for cooperative agreements.

The evaluation team concludes that for field-based sub-projects reporting and accounting procedures should be closely monitored, not replaced, because both functions appear to be handled well. For management of direct activities (core) and cooperative agreements (buy-ins), one or two persons with controller skills should review present arrangements with the AID Controller to insure that fully reliable, acceptable procedures are in use.

3. Future Directions

a. Management Structure

As previously stated, the team is less than fully confident and optimistic about current management support arrangements for SAARFA's sub-project activities in West Africa and the Sahel, particularly with regard to monitoring, reporting and financial accounting. At some point, preferably during the planning period for the project follow-on to SAARFA (SAARFA II?), AID officials should make an in-depth, thorough review to determine the most appropriate arrangement for West Africa and the Sahel.

b. SAARFA Direction

The team has fully endorsed SAARFA's mix of sub-projects for good, valid reasons; however, prevailing farm and farming conditions in most of Africa are such as to give cause to consider possible shifts/adjustments in emphasis and direction of the commodity research portion of SAARFA's portfolio of sub-projects. As pointed out in detail in Attachment G, there is a need to adjust perceptions and programs to reality -- small, impecunious farmers not in a position to risk the costs of new technologies involving expensive inputs often associated with IARC-sponsored crop improvement programs.

Where they are not doing so, SAARFA commodity networks should emphasize the basics of crop, soil and water use along with their specific commodities. The task of these networks and their NARS collaborators should be to combine their "improved, drought-tolerant, disease and insect resistant, high quality crop varieties" with locally-available, low cost, yield-increasing inputs with a minimum blend of inputs from the outside. Where practical and possible, emphasis should shift to greater use of such inputs/practices as green manures, crop rotations and intercropping with legumes, recycling village wastes, optimum plant spacing, weed control, soil and water

conservation practices, and improved hand tools/implements and animal power/traction for better seedbed preparation, crop tillage/culture and increased labor productivity. In essence this means a shift back to crop production basics to provide the foundation for effective use of modern technologies and sustainable increases in production. It also means that where they have not done so, the IARC's would have to adjust their research and outreach programs/networks to farm conditions and related circumstances in Africa. The ICRISAT-sponsored OPSCAR program (Operational Scale Research) in the Sahel may be a model in this regard. The view of the team is that if commodity networks under SAARFA are renewed they should incorporate such approaches in the new sub-projects.

Also with respect to direction, consideration should be given to determining the feasibility and likely consequences of linking selected SAARFA sub-projects (commodity and social science) in various ways and degrees to exploit inherent complementarities and provide more comprehensive research approaches to productive, sustainable agriculture.

Crop production is directly dependent on moisture availability and the productive capacity of the soil. Little can be done about inadequate moisture (since irrigation is limited), but something can be done about stemming the loss of soil productivity which has been accelerating and has reached disaster proportions in some areas, particularly in Africa's more fragile ecologies. For this reason and because conventional methods/approaches tend to be fragmented, diffused and frequently ineffective, a comprehensive approach to rational soil fertility/productivity restoration with broad applicability to tropical Africa and herein referred to as "sustainable cropping" is proposed as a high priority, future initiative to be included in SAARFA II (See Attachment A for discussion of this concept -- the "basics plus" and its special suitability in Africa). Several of the IARC's (IITA, ILCA, ICRAF, CIAT and ICRISAT) have capabilities and interests in sustainable cropping technologies and could make significant contributions to expanded research and networking on sustainable cropping for Africa. One possibility would be to establish consortia of IARC's and regional institutions led, for example, by IITA in West/Central Africa, ICRISAT in the Sahel, SACCAR in Southern Africa and CIAT or ILCA in East Africa.

Improvements in livestock production and tropical pastures are essential to uplifting small farmer living standards. Moreover, tropical pasture improvement is integral to farmings systems and is relevant to sustainable farming systems. In the future, SAARFA through NARS should give special attention to exploiting the symbiotic niches that small ruminants have on small farms in Africa. FAO reports (FAO, 1986) that in "Developing Africa" there were 133,565,000 sheep and 136,504,000 goats. Clearly, the impressive numbers of small ruminants indicate there is vast potential for greatly increased contributions to diets and incomes. Further, there are exciting opportunities for hair sheep in the high rainfall, tropical areas that are worthy of serious investigation. In Kenya,

CRSP research on dual purpose goats for milk and meat and family consumption and sale has moved the Kenya Government and the USAID Mission to consider a bilateral program. In Tanzania officials are moving to emulate the Kenya dual purpose goat program. In perspective, small ruminants have the capacity to convert plant materials (cellulose) that may not otherwise be used into a variety of useful products. In doing so, they contribute to balanced, productive use of resources available to small farmers. Despite the unimpressive history of livestock projects in Africa, the establishment of ILCA and the advances made by AID's Small Ruminant CRSP in Africa (Morocco and Kenya) and elsewhere (Peru, Brazil and Indonesia) may have shifted the odds in favor of success with small ruminants. SAARFA officials are urged to investigate the feasibility and prospects for small ruminant networks in the several ecological zones of Africa. The activities sponsored by such networks may be ways in which NARS can increase participation in national improvement programs. In 1986, FAO reported that sheep and goat inports for all of Africa were valued ar $1.80 billion and exports at $1.79 billion. The economic implications of small ruminant improvement in small ruminant-producing nations are clear.

c. General Structural and Procedural Concerns

Commodity networks may easily become too large -- five to six countries may be optimum in terms of ensuring full participation by all members, better service to individual countries, more efficient management, an more homogeneity of agroecological and socio-political conditions. A good example is CIAT's East and Southern Africa Bean Network with three separate, but strongly linked networks in East Africa, Great Lakes region, and the SADCC countries.

The IARC's should attempt to delineate regional research from networking activities, though linking them closely. This will reduce some of the misunderstandings with both NARS and donors, and contribute to increased efficiency of operations. It would also allow better access to genetic and other materials needed for regional distribution.

There appears to be too little concern by the research establishment, both the IARC's and the NARS, for assessing the impact of the technology developed. This is attributed to the existing unreliable data base, to lack of procedural methodologies for evaluating and quantifying impact, and to the fact that such information is seldom included or stressed adequately among the expected outputs of funding grants. The IARC's and their network coordinators should be put on notice to begin, if they have not already done so, documenting the impact of their respective technologies. Similarly, NARS applying for commodity research support should assume this responsibility for their countries. Of course, collecting the necessary data will usually require additional support and expertise. Of particular interest in this regard is the information obtained by SESU/MSU from farm-level surveys in Rwanda.

d. USAID/Mission Buy-ins

Collaborative research between IARC's and NARS should be integrated with bilateral Mission projects, where possible, with management support vis-a-vis REDSO's or other SAARFA field offices clearly delineated and agreed. Mission agricultural research projects and IARC-managed commodity research networks are generally complementary and supplementary with synergistic effects. The SAARFA projects would benefit from Mission involvement through additional resources that would be available. A Mission "buy-in" mechanism to the SAARFA project would give greater flexibility and support to sub-project activities.

e. Size of SAARFA

The evaluation team feels that 13-15 sub-projects is probably an appropriate number of sub-projects in relation to the various considerations, i e., funding, management, needs/opportunities, ability of NARS to participate, etc. Notwithstanding, the team recognizes there can be differences in management support requirements for sub-projects, differences in participation demands imposed on participating host countries by sub-projects, and other size differences in projects; thus, numbers of projects may not be an appropriate means to determine SAARFA's size. Therefore, it may be best not to set a number or a range, but to let program considerations and judgement at given points in time control SAARFA's size.

V. FINDINGS AND CONCLUSIONS

A. SAARFA and Strengthening African Agricultural Research Systems

1. The SAARFA project has funded a number of diverse activities, including crop research and research methods conducted by the IARC's, 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. Though its 13 sub-projects are generally at beginning and mid-stages of development, the SAARFA project portfolio is beginning to have noticeable impacts on NARS. SAARFA's diversified activities have promoted multi- and inter-disciplinary approaches to agricultural research. Its socio-economic research has been a means to help NARS evaluate and understand the probable consequences and impacts of production technologies and agricultural policies. In this regard SAARFA has helped to enhance the utility and perceived relevance of commodity-based research. The farming systems and on-farm research activities of the commodity research networks are accelerating the introduction and adoption of productivity-increasing materials and practices. Perhaps best of all, these SAARFA-supported research networks and related activities, are creating new awareness and attitudes regarding agricultural research -- its role, development and use.

2. Commodity networks supported by the SAARFA project have followed and are consistent with the networks identified for support under the "Plan," the exception being the mangrove/swamp rice sub-project. On the other hand, the current set of commodity networks under SAARFA (and SAFGRAD) falls considerably short of addressing the research needs identified by the ARRA's for the SAHEL and Southern Africa.

SAARFA officials should review the SAARFA's sub-projects with regard to adequate coverage of the Bureau's several plans, networks identified as being needed by the ARRA's prepared for the Sahel and Southern Africa, and the suggestions/recommendations in this report. An over-arching concern is how can SAARFA assist NARS with the widespread problem soil fertility/productivity.

A major concern of SAARFA officials should be to mobilize resources in support of African NARS. In this regard, several AID-supported CRSP's have special features and capacities of great relevance to strengthening African NARS. In particular, the Soil Management CRSP, through its participating institutions -- Cornell, N.C. State, Texas A&M, and Hawaii -- is one of the world's leading organizations conducting global research on tropical soil management. Similarly, the Small Ruminant CRSP may be world's only research organization involved in small ruminant research on a global scale across tropical ecological-zones. The team strongly recommends that SAARFA consider including these two CRSP's in future sub-projects that may involve tropical soils and small ruminants. INTSORMIL and the Bean/Cowpea CRSP are currently associated with their counterpart

IARC's, CIAT, IITA and ICRISAT and arrangements to support NARS with their commodities are in place.

B. SAARFA and Donor Cooperation with Special Regard to CDA and SPAAR

1. Through SAARFA and its predecessor project, SAAR, the U.S. satisfactorily fulfilled its commitments under the CDA initiative. ARRA's for the Sahel and Southern Africa were completed through SAAR/SAARFA funding. The ARRA's have served to help guide the U.S. and others in identifying priority research needs in these zones. Subsequent IARC-coordinated commodity research networks, designed to serve NARS on a regional basis, have provided highly acceptable, useful activities for donor cooperation and collaboration.

2. With the demise of CDA, the U.S. is continuing to support donor cooperation through the SPAAR program led by the World Bank. This is a highly regarded, greatly-needed initiative and one through which the U.S. should fully assert it interests and leadership at all levels. Currently, the U.S. is well represented in the SPAAR Working Group on Networking. Based on the CDA and SPAAR experience, U.S. representatives to SPAAR meetings should be authorized to represent the U.S. on research policy, budgets and technical matters and have full support of the Agency.

3. SAARFA direct project activities (core activities) should be continued to promote and carryout greater and more effective donor cooperation and collaboration in strengthening NARS in African nations, as well as, provide needed administrative management and technical support for SAARFA's sub-projects.

C. SAARFA and the Africa Bureau's Plans

Through the SAARFA project, the Africa Bureau has a funding means to help carryout its Plan for Supporting Agricultural Research and Faculties of Agriculture and its Plan for Supporting Natural Resources Management in Sub-Saharan Africa.

The record at this mid-point evaluation, is that SAARFA is fulfilling its purposes with regard to donor cooperation and to the Bureau's plans. The purposes of the plans are mutually supportive and do not require separation or separate projects for their achievement. Specific U.S. interests which have evolved since SAARFA was authorized, such as those related to the SPAAR or other consortia, can be easily, effectively accommodated within SAARFA.

As a funding mechanism, SAARFA is fully adjustable to and compatible with the Bureau's several plans and special interests regarding natural resources and agricultural research now and in the future, as may be modified by peer review. Programwise, SAARFA should remain flexible and agile, so as to ensure timely, rapid responses to change/unforeseen circumstances. This not to propose a license to scatter resources and lose direction, but a suggestion to remain relevant and responsive.

D. SAARFA Management

Administrative management of SAARFA is judged by the team to be highly satisfactory overall; however, the diverse, diffused nature and substantial size of direct (core) and sub-project activities require constant vigilance -- monitoring and supervision -- in AID/W and in Africa. The team found reporting and financial accounting satisfactory, with possible exception of procedures being followed for direct project buy-ins to AID/S&T projects For this reason, SAARFA officials should take action to ensure that procedures and practices for cooperative agreements (buy-ins) approved by the AID Controller are being followed. Satisfactory procedures appear to be in place for reporting and accounting of sub-projects which follow clearly established "grant" procedures. Similarly, direct activity contracts, PASA's and RSSA's follow defined, established procedures.

In AID/W, overall management of SAARFA is fully satisfactory through effective organization and established procedures. The system in place is working well; hence, no changes are suggested by the team.

In East and Southern Africa, administrative management of SAARFA activities is functioning smoothly and effectively. Largely because the evaluation team did not travel extensively in West and Sahelian Africa and observe operations as it did in East and Southern Africa, the team is less certain about administrative management arrangements in the West and in the Sahel. Nevertheless, the team believes that for the present current arrangements should continue, with the caveat that before SAARFA II officials should examine the feasibility and desirability of making arrangements similar to those in East and Southern Africa.

VI. RECOMMENDATIONS

A. SAARFA and Donor Cooperation

1. The U.S. should continue to encourage and help support cooperation among and between donors in providing support to NARS through the SAARFA project. More effort should be made to explain SPAAR's purpose and benefit to African officials.

2. At all levels of donor interaction on agricultural research, the U.S. should fully assert its interests, comparative strengths and capacities for leadership.

3. At SPAAR and similar donor meetings, U.S. delegates should be authorized to represent the U.S. on technical and budgetary matters with the full support of the Agency.

B. SAARFA Management

1. A logical framework matrix should be prepared for SAARFA and all future sub-projects should have logical frameworks which mirrow SAARFA's purposes and procedures. This will provide a better basis for monitoring and evaluating this umbrella project and its sub-projects.

2. Maintain current decentralized arrangements for providing administrative management support to sub-projects in Africa. For SAARFA II, officials should determine the feasibility and desirability of making arrangements in West and Sahelian Africa which parallel currently highly satisfactory arrangements in East and Southern Africa.

3. SAARFA AID/W officials should review and ensure that accounting procedures used for cooperative project arrangements (buy-ins) are in accordance with recommendations of the AID Controller.

4. Mechanisms for AID Mission buy-ins to SAARFA sub-projects should be considered as means to encourage and facilitate greater mutual program support and interaction between SAARFA sub-projects and Mission bilateral projects.

5. Program considerations should determine the size of SAARFA with respect to the number of sub-projects.

C. SAARFA Sub-Projects

1. The SAARFA sub-project portfolio should continue to have a balanced mix of natural and social science projects.

2. There should be increased support for research on evaluating and supporting key choices in agricultural policy. Because of the potentially large impact policy decisions have for agricultural productivity, as well as for incomes and well-being of farmers, it is

recommended that SAARFA enlarge this portion of its social science research.

3. SAARFA's sub-projects on research on technical problems, institutional reform and economic indicators provide substantive regional support to NARS and in the process have provided excellent technical and policy relevant insights for planning and project adjustments. Notwithstanding the current satisfactory circumstance, adjustments and additions should be considered with respect to the commodity research networks. Specifically, SAARFA's commodity networks should concentrate on the basics of crop, soil and water use along with improvement of specific crops. There should be a definite shift of emphasis to include sustainable cropping practices and low-cost inputs especially suited to small farms. In this regard, the team suggests consideration of i) an expanded research network directed towards natural resource use/conservation and crop production (i.e., soil management, water use and sustainable cropping systems for humid and semi-arid areas), ii) a research network involving small ruminants, crops/forages and agroforestry for the high rainfall, tropical areas, iii) additional commodity research networks to include bananas/plantains and sweet potatoes and iv) continued support for mangrove rice as a part of the upland rice continuum.

4. The process of sub-project selection from unsolicited proposals has advantages and disadvantages. The procedure should continue but be followed with caution to ensure that the project mix is acceptable with regard to objectives, management requirements, progress potential and expected benefits.

5. With regard to support for faculties of agriculture in African universities, consideration should be given to providing support through Africa-wide and/or regional organizations for programs which address needs and interests of agricultural faculties in ways similar to the networks conducted by the IARC's in support of NARS. Such programs would link agricultural faculties with special regard to agricultural research and training, conduct programs of mutual interest and benefit, and complement and supplement bilateral and multilateral assistance.

VII. LESSONS LEARNED

A. Donor Coordination

The SAAR and SAARFA experiences with CDA and SPAAR indicate that, while there are occasional shortfalls in performance by individual donors, substantial benefits accrue to donors and NARS alike through donor coordination. The successes of SAARFA's commodity research networks can be attributed to a considerable degree to multilateral collaboration and coordination through CDA and SPAAR.

B. Value of Networks

1. Commodity research networks are cost effective investments that leverage resources of donors and participating IARC's and NARS.

2. Research networks provide beneficial services in a participatory manner valued highly by NARS, but, perhaps most of all, such networks do things which need to be done which individual nations can not do for themselves or which individual donors can not do.

C. Socio-Economic Research

Micro and macro socio-economic research investigations are necessary to help understand the economic development impacts and consequences of agricultural research and to help provide national policy guidance for agricultural research and related activities.

D. Management

A large, umbrella project with diverse purposes and activities, such as SAARFA, can be administered and managed effectively and efficiently. Decentralized management of field activities with clearly defined and delineated responsibilities, procedures, and accounting at the regional level appears to be the key to successful management of such a project.

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APPENDIXES

EVALUATION SCOPE OF WORK

STRENGTHENING AGRICULTURAL RESEARCH AND FACULTIES OF AGRICULTURE

1. Activity to be Evaluated:

The Strengthening Agricultural Research and Faculties of Agriculture (SAARFA) project (698-0435) is an Africa Bureau Regional Project authorized at $41 million for a ten-year period. The Project Assistance Completion Date (PACD) is September 29, 1992. 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 within these programs.

2. Purpose of the Evaluation:

The Africa Bureau has planned a series of evaluation activities in FY-1988/89 to assist in determining how the Bureau can improve its strategy for promoting agricultural technology development and diffusion in Africa. One of these activities is a mid-course evaluation of the SAARFA project, the major regional activity funded by the Bureau to strengthen African national and regional research and teaching institutions. The mid-course evaluation team will review documents available in the U.S., information generated by cables and telephone calls to the REDSOs and implementing agencies, and conduct field visits to verify that information.

The objectives of the overall evaluation are:

a) to review progress towards the achievement of the project purpose, especially as it relates to strengthening National Agricultural Research Systems (NARS) and programs;

b) to assess the appropriateness of the project's umbrella-type structure and implementation mechanisms in achieving the project objectives and suggest ways to improve it's effectiveness;

c) to assess SAARFA's contribution and effectiveness in achieving donor coordination in identifying and addressing the research priorities for different agro-ecological zones identified by the Cooperation for Development in Africa (CDA) initiative;

d) to develop guidelines and recommendations for U.S. assistance regarding donor coordination, through the SAARFA project, to the Special Programs to Support African Agricultural Research (SPAAR) initiative led by the World Bank; and

e) to provide the direction needed to strengthen SAARFA's contribution toward achieving the objectives of the Africa Bureau's Plan for Supporting Agricultural Research and Faculties of Agriculture in Africa ("Plan").

3. Background:

The SAARFA project began in 1982 as SAAR (Strengthening African Agricultural Research), and was designated as the primary regional vehicle through which the U.S. would respond and fulfill its responsibilities to the CDA research initiative. Several activities for implementing a long-term plan in agricultural research were initiated under SAAR in 1982 and 1983 before an "umbrella" type project was formally initiated in 1984. The project is composed of two components: a) direct project activities which provide technical assistance for designing, monitoring, evaluating and coordinating SAARFA 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.

In April 1987, an amendment to the project increased the LOP funding from $19.5 to $41 million, and changed the name of the project to add support to "Faculties of Agriculture". It was also decided that the SAARFA project would henceforth be used as the primary regional project for supporting: a) the priority activities of the Africa Bureau's "Plan" to strengthen agricultural research and faculties; and b) A.I.D.'s participation in the World Bank-led Special Programs for African Agricultural Research (SPAAR).

Direct project activities are managed by the Africa Bureau, AFR/TR/ANR, in AID/Washington. They have included or presently include:

a) funds to support donor and African meetings, and special studies and evaluations;

b) an assessment of the priority research needs by agro-ecological zone in specific geographic areas in coordination with other donors;

c) technical assistance to design, implement and evaluate priority research programs - presently include a Project Manager in REDSO/ESA to monitor SAARFA subprojects and an Agricultural Liaison Officer (ALO) based at the International Institute of Tropical Agriculture (IITA);

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-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 13 authorized sub-project activities. The two IFDC activities and three buy-in's to S&T projects are managed in AID/W, while the rest are managed in the field at either REDSO/WCA or REDSO/ESA. Seven of these were authorized in FY 1987 and are therefore in the very early stages of implementation. The 13 are:

a) East Africa Bean Research 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 with CIDA;

d) Potato Improvement for Central Africa Being implemented by the Centro Internacional de la Papa (CIP);

e) Africa Bureau buy-in to S&T'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 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&T's 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 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;

h) Fertilizer Policy Research for Tropical Africa being implemented jointly by IFCD and IFPRI; and

i) Mangrove and Associated Swamp Rice Research being implemented by the West Africa Rice Development Association (WARDA).

4. Statement of Work:

In order to achieve the objectives of this mid-course evaluation, the following questions will be addressed by the evaluation team. They are organized into four categories; technical, programmatic, implementation, and management.

a. Technical:

The donors participating in the CDA initiative were to have identified the research priorities within the different agro-ecological zones of Africa. The U.S. through the SAARFA project, was responsible for Coastal West, Central and East Africa. How well did the U.S. do in executing our responsibilities compared to other donors? What lessons about donor coordination can be learned from this? Was the level of detail in those assessment in terms of identifying constraints and action programs sufficient for planning purposes? What have these studies contributed to donor coordination, research collaboration and strengthened National Agricultural Research Systems (NARS)?

The CDA Initiative has evolved somewhat into the World Bank-led SPAAR effort to achieve donor coordination for priority research programs. How can the U.S., through the SAARFA project, assist this effort to achieve better donor coordination and support for agricultural research? How should our role in SPAAR be defined within the SAARFA project and within the context of the "Plan"? What further steps could or need to be taken to assess research priorities (e.g., ISNAR has produced a number of country research profiles), at what level of detail, and what benefits might be expected?

One recommendation of the assessments was the development of regional commodity research Networks. Has the SAARFA project been effective in developing and strengthening country to country and IARC to NARS Networking? What is the nature of the contributions to NARS, i.e., germplasm transfer, exchange of methodologies and training? What Networking activities have been the most successful? In quantifiable terms, what progress in agricultural research, e.g., improved crop varieties and/or research methodologies, has been developed and transferred to NARS with SAARFA support? What were the impacts of those contributions both in terms of improved NARS programs and the spread of improved technologies? What improvements in

Networking do you recommend in terms of commodities, other types of Networks, or regional emphases?

The "Plan" has targeted Agency support to NARS based on the capacity of a country to produce or to adapt new technologies. How have SAARFA Networking activities supported the bilateral research efforts of USAIDs 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 the "Plan" and 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? Do SAARFA activities address the priority research needs as defined by our assessments? Do the sub-projects meet the additional criteria as they are spelled out in project authorization documents? Is the project purpose relevant to the current and coming generation of SAARFA activities? What changes would you suggest? How might SAARFA activities better reflect any changes in the objectives of the "Plan" suggested by the Peer Review?

Networking is viewed as an important role of the IARCs and a necessity in disseminating improved technologies to NARS, who often lack the capacity to conduct basic research. Are networks a cost-effective method for supporting technology development and dissemination? Have they also been cost-effective in terms of providing services required in USAID-funded projects in the regions where they operate? In a larger sense, what is the future of these networks? Are there possibilities of them finding alternative sources of funding in the future, or be self-financing? Do they provide an essential service? For what kind of activities are they generally successful or unsuccessful, permanent or temporary? Will the role of the IARCs be more or less permanent, or should they be programmed to cede their role in time as NARS become better developed? If support to networks should continue, what kind of a timeframe are we talking about? What alternatives to networking exist, and are they preferable?

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 theses 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 into SAARFA activities? In light of the new DFA legislation, should the project have a narrow or a broad focus? What should that focus be? What funding criteria would you suggest for future activities?

In a time of shrinking resources the Agency recognizes that our investments must be prioritized. How do the investments we have made in the SAARFA project compare with other investments we have made in credit, marketing, extension, agricultural education, policy reform, etc., in terms of cost benefit analysis? How have they complemented these other investments? Are there examples where SAARFA activities have had multiplier or downstream effects in other bilateral projects or country programs? How have SAARFA activities contributed to achieving the Agency's overall goals for economic growth? In the future what role should SAARFA activities play in the Africa Bureau strategy for achieving agricultural development? How should they relate to the Bureau's Plan for Supporting Natural Resources Management for Sub-Saharan Africa?

To date the project has only one sub-project in the very early stages of implementation which is designed to strengthen a faculty of agriculture. What can be done in the SAARFA project 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?

Have SAARFA activities been designed to ensure that relevant issues affecting woman farmers are investigated? Are the sub-projects designed to facilitate the involvement of woman as project participants and beneficiaries? Are they in accord with the Africa Bureau WID Action Plan? What oversights in design and/or implementation, if any, exist and how can these be addressed?

c. Implementation:

The SAARFA project has no firmly established set of inputs and outputs, but instead relies on the submission of unsolicited proposals for the development of sub-projects. Has the flexible "umbrella" structure of the project facilitated or constrained the achievement of SAARFA's objectives, as well as those outlined in the "Plan"? Have

the core activities been effectively designed and used to support and complement sub-project activities? How effective has the project been in finding proposals for funding that at the same time contribute to achieving the project purpose, address priority research areas, and support the "Plan"? Is this mechanism appropriate? What are the advantages and disadvantages? What other mechanisms can be suggested?

The Bureau has adopted a policy of transferring the implementation of sub-projects to the field while retaining the management of core activities in AID/W. Have these arrangements been effective in achieving management efficiencies while at the same time accomplishing programmatic objectives? Are there systems in place for the adequate monitoring of project progress at the input, output and purpose levels? Have AID/W and field reviews served to effectively track both core and sub-project implementation? Do SAARFA's sub-projects and other activities include technical benchmarks (output-level indicators) for monitoring progress toward the achievement of the overall project purpose? What additional or more appropriate benchmarks are recommended to ensure that SAARFA's overall objectives are appropriately tracked? Do all activities have accountability built into the reporting systems? What could be done to improve reporting and AID's tracking of those activities?

d. Management:

REDSO's are principally regional servicing rather than project management' offices. What problems have arisen in requesting them to manage regional SAARFA sub-projects? Has the placement of a PSC Project Manager in REDSO/ESA eased the management load? Will this be required for REDSO/WCA? What other solutions to problems can you suggest? Do REDSO ADOs perceive SAARFA activities as an add burden or as one of the tools they possess to address regional research problems? Are sub-projects in fact a useful tool for this purpose? How could they be better integrated into the services provided by REDSOs, if this is desirable?

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-in's" 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 mid-course 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 inquires made by the evaluators; and (d) site visits to selected African countries where SAARFA activities are important.

The evaluation will be conducted over a four-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 in December 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 programming specialist, and (d) an agricultural research economist. They should have the following qualification.

Research Planner:

This individual should be (a) a senior agriculturalist with extensive experience in agricultural research planning, from the perspective of international, regional and national programs; with (b) knowledge of issues pertaining to higher agricultural education, especially as these related to linkage with agricultural research; and have the (c) ability to assess the effectiveness and "fit" in an overall strategy of research efforts of a diverse and multidisciplinary nature. Previous relevant development experience in Sub-Saharan Africa is required. No foreign language proficiency is necessary

Research Agronomist:

This individual should be (a) an agricultural research technical specialist with extensive experience in the implementation of agricultural research in Sub-Saharan Africa; and have the (b) technical knowledge of the major constraints to agricultural production problems in Sub-Saharan Africa; and the (c) ability to assess the merits of agricultural research efforts from a technical and methodological point of view. Previous relevant development experience in Sub-Saharan Africa is required. No foreign language proficiency is necessary.

Research Programmer:

This individual should be (a) a senior agriculturalist with extensive experience in overseeing and implementing AID-funded agricultural research programs, regionally and bilaterally; with (b) experience in overseeing and implementing AID-funded programs in higher agricultural education, especially those which support agricultural research; and (c) have the ability to assess the effectiveness of alternative AID project organizational and management structures. Previous relevant development experience in Sub-Saharan Africa is required. No foreign language proficiency is necessary.

Research Economist:

This individual should be (a) a senior agricultural economist with experience in the evaluation of a wide variety of agricultural research projects; and have the (b) ability and breadth of experience to compare investments in agricultural research with those in other agricultural subsectors; as well as the (c) ability to evaluate the fertilizer policy reform, land tenure, food security, and nutritional research efforts within the context of an agricultural research strategy; and (d) 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/TR 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 requirements:

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 four 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 AID Project Evaluation Summary (PES) document with the Final Evaluation Report.

The evaluation team will follow appropriate A.I.D. evaluation reporting guidelines, consistent with the following documents.

- A.I.D. Evaluation Handbook, April 1987 (A.I.D. Program Design and Evaluation Methodology Report No. 7, PN-AAL-D86), and

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

APPENDIX B

PERSONS CONTACTED

IN KENYA

USAID/REDSO/ESA

Arao, L.A.	Development Officer
Edwards, Robert	Development Officer
Gibson,David	Forestry Advisor
Masambu, Hudson	Project Manager/SAARFA
McColaugh, Robert	Chief Agr Division
Sentz, J.C.	Agr Liaison Officer, IITA/USDA
Shah, Satish	Acting Director
Sinding, Monica	Evaluation Officer

KENYA NATIONAL PROGRAMS

Okioga, D.	Dir, Plant Quarantine Station/KARI
Karanja, G. M.	Agronomist, Reg. Research Ctr/Kigoni
Maobe, S. N.	Agronomist, Reg. Research Ctr/Embu
Matata, J. B.	Assistant Director/KARI
Milikau, R.	Biometrician/KARI
Njoroge, Isaiah	Dir., Potato Res Ctr/Kigoni
Wapakala, W. W.	Director Research/KARI

IARC NETWORKS

Anandajayasekaram, P.	Regional Economist/CIMMYT II
Palmer, F.	Maize Agronomist/CYMMYT
Kirkly, R.A.	Bean Coordinator, CIAT
Nganga, S.	Regional Potato Coordinator/CIAT
Kidanemariam, H. M.	Regional Potato Breeder/CIP
Alvarez, M. N.	Regional Root Crops Coordinator/IITA
Arrumm, P. M.	Protocol Officer/ICIPE-N
Murita, Mama	Farmer, Oyugis ICIPE Project
Ngode, L.	Extension Leader ICIPE Oyugis
Odino, M. O.	Biological Control/ICIPE-MP
Rapemo, Mathayo	Farmer, Oyugis ICIPE Project
Seshu Reddy, K.V.	Applied Ecology/ICIPE-MP
Saxena, K. N.	Leader, Plant Res/Insects/ICIPE-MP
Kurira, Peter	Farm Mgr/ICRAF/Machakos
Rao, M. R.	Researcher/ICRAF/Machakos

IN RWANDA

USAID

Crawford, P. R.	ADO
Graham, J. A.	Director
Hanegreef, Paul	Univ Minn/Univ Rwanda/Bukure
Ndoreyho, Valens	Agr Project Officer

RUHENGIRI POTATO CENTER

Kloos, Jerden	Coordinator, PRAPAC/CIP
Pierre, Regera	Director/PNAP/ISAR

RWERERE AGROFORESTRY

Burleigh, James R.	Ldr/Plant Pathologist/Univ Arkansas
Eylands, Val	Agronomist/Univ Arkansas
N'diaye, Serigne	Rural Sociologist/Univ Arkansas
Yamock, Charles F.	Soil Scientist/ Univ Arkansas

RUBONO/BUKARE

Bwiliza, Runyinya B.	Dean, FA National University of Rwanda
Gahamanyi, Leopold	Director/ISAR

SESA/MSU/KIGALE

Loueridge,	Food Security Project/Mich State Univ

IN UGANDA

USAID

Aberg, Al	Agriculture
Lucas, Ernesto	Agriculture
Lyvers, Ken	ADO
Podol, Richard	Director

KAWANDA RESEARCH STATION - BEANS

Grisley, William	Regional Bean Economist/CIAT
Wortman, Charles S.	Bean Agronomist/CIAT

KABANYOLO FARM (MAKERERE UNIV)

Kasenge, Valentine	Farm Manager
Simmons, C.	Manpower for Agr Dev/USAID

NAMULONGE RESEARCH STATION - ROOT CROPS/MAIZE PROGRAM

Gumiseriza, Gadi	Grain Legume program/NARO
Hakiza, J. J.	Leader, Maize program/NARO
Kabanyoro, Ruth	Maize Agronomist/NARO
Mwanga, Robert	Plant Breeder/Root Crops/NARO

MAKERERE UNIVERSITY

Arscott. Trevor	Chief of Party/MFAD/USAID
Mudola, Don M.	Professor Political Science/MISRA
Mugerwa, John	Dean, Faculty of Agriculture
Mugerwa, Kisamba K.	Senior Research Fellow/MISRA
Zaki, Julius	Professor/Head Soil Science

APPENDIX B

IN SENEGAL

USAID

Egan, William	IWME/USAID
Ellis, Jane	Agr Dev Office
Haycock, Gil	IWME/USAID
Kita, Moribadjan	Agr Dev Office
Nilsestuen, Wayne	Agr Dev Officer
Terry, Eugene	Dir Gen/WARDA, Cote D'Ivoire
Schillhorn, Dr.	Ldr, Mich State Univ Research Project
Sidibe, Anne Williams	Michigan State Research Project
Watts, Doral	Agr Dev Office

IN WASHINGTON, D. C.

USAID/W

Brady, Nyle	AA/S&T
Cummings, Ralph	S&T/A
Jepson, Lance	AFR/TR/ANR
Martin, Calvin	AFR/TR
Newberg, Richard	AFR/TR/ANR/FS
O'Brien, Patricia	AFR/TR/ANR/NR
Shelton, Norman	AFR/TR/ANR/FS

IFPRI

Oram, Peter	Research Fellow Emeritus

ITINERARY - TRAVEL IN AFRICA

Date/1989	Travel or Place	Persons
1/11	Travel fr Wash., D.C. to Kenya	Rachie, Christensen, Johnson and Newberg
1/12-17	Nairobi, Kenya	" "
1/18-20	Nairobi, Kenya	Christensen and Johnson
1/17	Travel Nairobi to Kigale, Rwanda	Rachie and Newberg
1/17-20	Kigale, Rwanda	Rachie and Newberg
1/20	Travel fr Nairobi to Egypt & USA	Christensen
1/20	Travel fr Nairobi to Zimbabwe	Johnson
1/20	Travel fr Kigale to Uganda	Rachie and Newberg
1/20-24	Kampala, Uganda	Rachie and Newberg
1/20-24	Harare, Zimbabwe	Johnson
1/24	Travel fr Harare to USA	Johnson
1/24	Travel fr Kampala to Nairobi	Rachie and Newberg
1/24-27	Nairobi, Kenya	Rachie
1/24-28	Nairobi, Kenya	Newberg
1/27-28	Travel fr Nairobi to USA	Rachie
1/28-29	Travel fr Nairobi to USA	Newberg
2/15-16	Travel fr USA to Senegal *	Gray
2/16-24	Dakar, Senegal	Gray
2/18-19	Travel fr USA to Senegal *	Rachie
2/19-24	Dakar, Senegal	Rachie
2/24-25	Travel fr Dakar to USA	Gray and Rachie

* Gray and Rachie in Dakar, Senegal for USAID-sponsored Bean/Cowpea Collaborative Research Support Program (CRSP), but during period met with SAARFA participants and USAID officials.

Country/Commodity Matrix for Networks Supported by A.I.D. Regional Projects

RESEARCH AND FACULTIES PLAN COUNTRY PRIORITIES	RESEARCH AND FACULTIES PLAN COMMODITIES/SUBJECT MATTER PRIORITIES														
	Maize IITA	Sorghum ICRISAT	Millet ICRISAT	Upland Rice	Cassava IITA	Potatoes CIP	Sw. Potatoes IITA	Beans CIAT	Cowpeas IITA	FSR CIMMYT	Res. Mgmt. ISNAR	Agroforestry ICRAF	Soils	IPM	Forages
Technology Producing - 1st Priority															
Cameroon	SAFGRAD	SAFGRAD							SAFGRAD						
Kenya		SAFGRAD	SAFGRAD		SAARFA		SAARFA			SAARFA		SAARFA			
Malawi		SACCAR	SACCAR		SAARFA		SAARFA			SAARFA	SAARFA				
Senegal	SAFGRAD	SAFGRAD							SAFGRAD						
Sudan		SAFGRAD	SAFGRAD		SAARFA		SAARFA			SAARFA					
Zaire						SAARFA			SAFGRAD						
Zambia		SACCAR	SACCAR		SAARFA		SAARFA			SAARFA	SAARFA				
Zimbabwe		SACCAR	SACCAR							SAARFA	SAARFA				
Technology Producing - 2nd Priority															
Ghana	SAFGRAD	SAFGRAD							SAFGRAD				SAARFA		
Ivory Coast	SAFGRAD	SAFGRAD							SAFGRAD						
Nigeria	SAFGRAD	SAFGRAD							SAFGRAD						
Tanzania		SAF/SAC	SAF/SAC		SAARFA		SAARFA			SAARFA	SAARFA				
Uganda		SAFGRAD	SAFGRAD		SAARFA	SAARFA	SAARFA	SAARFA		SAARFA		SAARFA			
Technology Adapting - 1st Priority															
Botswana		SACCAR	SACCAR							SAARFA	SAARFA				
Burkina Faso	SAFGRAD	SAFGRAD							SAFGRAD						
Burundi		SAFGRAD	SAFGRAD		SAARFA	SAARFA	SAARFA			SAARFA		SAARFA			
Gambia	SAFGRAD	SAFGRAD							SAFGRAD						
Lesotho		SACCAR	SACCAR							SAARFA	SAARFA				
Liberia				IRRI	SAARFA		SAARFA								
Madagascar									SAFGRAD						
Mali	SAFGRAD	SAFGRAD							SAFGRAD				SAARFA		
Niger	SAFGRAD	SAFGRAD													
Rwanda		SAFGRAD	SAFGRAD		SAARFA	SAARFA	SAARFA	SAARFA		SAARFA		SAARFA			
Sierra Leone		SAFGRAD							SAFGRAD						
Swaziland		SACCAR	SACCAR							SAARFA	SAARFA		SAARFA		
Togo	SAFGRAD	SAFGRAD							SAFGRAD						
Technology Adapting - 2nd Priority															
Benin	SAFGRAD	SAFGRAD							SAFGRAD						
Cape Verde	SAFGRAD	SAFGRAD							SAFGRAD						
CAR	SAFGRAD	SAFGRAD							SAFGRAD						
Chad	SAFGRAD	SAFGRAD							SAFGRAD						
Djibouti															
Guinea	SAFGRAD	SAFGRAD							SAFGRAD						
Guinea Bissau	SAFGRAD	SAFGRAD							SAFGRAD						
Mauritania		SAFGRAD							SAFGRAD						
Somalia		SAFGRAD	SAFGRAD					SAARFA		SAARFA					

SAFGRAD - Semi-Arid Food Grains Research and Development
SACCAR - Southern African Committee for the Coordination of Agricultural Research
SAARFA - Strengthening African Agricultural Research and Faculties of Agriculture
IRRI - International Rice Research Institute

APPENDIX D
SAARFA

The Case for Investing in African Agricultural Research

In a time of shrinking resources, the Agency recognizes that investments must be prioritized. It is therefore prudent of examine the case for or against continued investment in agricultural research in Africa, as well as examining the consistency of those investments with others being made by AID.

The evaluation team strongly supports continued investment in agricultural research for several reasons. First, investments made in agricultural research (eg. cassava, beans) played a role in limiting the decline in agricultural production. Second, improved agricultural productivity (based on the adoption of improved agricultural technology) is critical to the medium to long term success of policy reforms designed to stimulate growth. Third, agricultural research investments have in general yielded good returns, although there are special conditions in Africa which are likely to delay those returns. Fourth, better linkages between socio-economic and physical science research can strengthen the link between agricultural research and increased productivity. Fifth, given the harsh economic conditions prevailing in Africa, donor investments in research will be required to sustain it.

Agricultural Research and Growth in Africa

The conjunction of a general worsening of agricultural conditions and increased investment in agriculture and agricultural research has led to questions about the utility of further investment in agricultural research in sub-Saharan Africa. The gains associated with agricultural research in Asia during the development of the Green Revolution have proved elusive in sub-Saharan Africa. Yet, this should not come as a sunrise to those familiar with the African setting. A decade ago, there was broadly-based increased in productivity, the "models" for technological change developed in the United States and Asia could not be effectively transferred to most of sub-Saharan Africa. New research, responsive to the BOTH the physical variety and complexity of sub-Saharan Africa's "microclimates" and the economic environment in which production occurred would be needed to support more intensive, higher productivity production. It was also clear that pursuing these objectives had a 20-25- year time frame.

During the 1980's many of the dismal forecasts for sub-Saharan Africa's agricultural performance were confirmed. So was the assessment that research offered little which could be pulled off the shelf for a short-term "quick fix". The crises created, however, did catalyze a willingness to address some of the deep seated policy constraints to agricultural production, and the importance of the performance of the agricultural sector to overall economic growth.

As countries undertook policy reforms, both local governments and international donors gained greater experience with the constraints and lags involved in implementing policy reform. Recent World Bank

reviews of the experience with policy adjustment lending concluded that in sub-Saharan Africa, the lags experienced the agricultural sector's response to policy changes were a major factor in the region's lack of economic growth. The lags were often attributable to non-price factors, such as weak infrastructure and a lack of the productivity-increasing technologies needed to support an aggregate price response.

This experience, and earlier analysis, suggests a strong need to maintain (and even expand) investment in agricultural research. Without improved productivity, sustainable increases in economic growth will not be achieved. It also suggests the critical role the donor support for research will play. Economic pressures force an attention to immediate needs--at the expense of investments which will support growth. This, of course, is not unique to sub-Saharan Africa. However, given the low level of productivity and the dramatic declines in per capita income, the impact of eroding the basis for growth will be severe, and will relatively rapidly undermine the positive movement toward policy reform.

Within this relatively dismal environment, the SAARFA team found some evidence that research investments are beginning to show positive results, although not on the scale which characterized research in Asia. First, as discussed in the review of the networks, research results have in some cases played a rather direct role in preventing an even more significant deterioration in agricultural production. The most dramatic example is the development of cassava strains resistent to cassava mosaic virus, and the relatively rapid diffusion of those varieties. Second, research efforts appear to be producing a body of both physical and socio-economic information which is both contributing to an unlearning of erroneous "conventional wisdom" and contributing knowledge of the broader physical and socio-economic environment which is critical to relevant research. Third, investments in training researchers has now begun to produce a larger cadre a qualified researchers. Many of these researcher work under harsh and unpromising conditions. However, network activities and research support help stimulate commitments to higher quality professional work.

These positive observations, of course, should not be taken as signs that research is about to produce a Green Revolution in sub-Saharan Africa, or the researchers with inadequate equipment and support will by the sheer force of motivation produce breakthroughs. They do indicate, however, that in many instances we seem to be on the right track, and that we and African countries have much to loose if we do not "stay the course".

The discussion which follows attempts to put the SAARFA evaluation team's observations in a broader context, to emphasize the potential significance of our observations, and the complementarily between the SAARFA activities and other investments in agricultural marketing and policy reform.

Technological progress, reflected in increased productivity, is a critical component of the ability of the agricultural sector to contribute to economic growth. The classic paradigm is that significant increases in productivity associated with agricultural technology or innovation create an expanded food supply, which in turn will lower per unit food costs. Lower prices stimulate demand, making it possible for farm income to rise by selling a greater quantity of food at a lower unit cost of production and a lower unit price. Income growth over time stimulates demand for a wider range of agricultural products, including animal protein, higher valued vegetables and fruits, and more processed foods (Engles Law).

The type of innovation which will produce these productivity gains depends on BOTH the physical environment and the socio-economic environment. The physical environment in much of sub-Saharan Africa creates production constraints which are quite different from those prevailing in Western countries or Asia. This complicates the "transfer" of agricultural technologies from other regions, and requires a heavier investment in site-specific research. Networks capable of producing and exchanging such information have a high utility under these conditions.

The economic environment in Africa is also considerably different from that which prevailed in other countries which experienced significant agricultural revolutions. The same was true of the Asian economic environment vis a vis the Western countries, like the United States, which were the source of the initial agricultural "revolutions". Hence, the Green Revolution technologies had different features--as the literature demonstrates. Economists have found that relative price relationships (as summaries of demand relationships and factor endowments) have a major impact on the development and spread of technological innovation (induced innovation).

In order for "induced innovation" to occur, relative price relationships must somehow be linked to the process of research and technology development. How strong these links are depends on the nature of the economic environment itself (eg. how market oriented it is) and the ties between markets and research establishments. Links are strongest in a "commercial" environment (but at the cost of a shorter perspective, lack of attention to public goods, etc). Links are intermediate in public research settings where there is still a significant amount of significant and accurate information on economic realities.

For a combination of institutional, policy and historical reasons, economic "realities" (as experienced by the majority of farmers) have not been accurately fed into the post-independence research apparatus of the NARS. In the colonial period, with a heavier emphases on cash crop production for the world market, relevant economic information was more accessible because colonial administrations and institutions focused heavily on profitability and tightly controlled local "cash crop" economic environments in ways oriented toward the world market.

As a result of a variety of changing factors in the last decade, we are beginning to see changes which could make induced innovation more relevant to sub-Saharan Africa, and hence, make technological change more relevant to economic growth. Farming systems research (FSR) and associated "social science" perspectives with a more "empirical" approach to African farmers (such as on-farm research (OFR)) are generating (albeit imperfectly) more accurate information on economic (as well as socio-cultural) realities. This information has often been unavailable from more "traditional" sources, such as macroeconomic data, official price series) for a variety of reasons, including:

- prevalence of significant divergence between "official" and "unofficial" markets (and less accurate knowledge of the latter);
- ignorance of economic (and other) realities of production on units which do not benefit significantly from subsistence (eg credit, inputs) and/or producing commodities not controlled by the government (subsistence food crops, "minor" crops);
- policy changes, which we expect will increase as policy dialogue increases.

This is not a argument for the theoretical/research value of farming systems research, but an attempt to clarify its functional role in the innovation process, from an economist's viewpoint. One of the reasons why the "simple" results of on farm research seem "just common sense" to some scientists from the U.S. tradition are the numerous ways in which economic information enters the researcher's consciousness in a more open, integrated economic system like that in the U.S.

The confluence of these changes, coupled with several new features of the African environment, hold real potential for significant change in both research generation and adoption, and the links to economic growth.

- "Micro" approaches (like FSR, OFR) provide better information on economic realities to researchers. This may be a temporary phase.
- The development of significantly improved capabilities for accessing and moving germplasm (as reflected in the IARCs and distributed through the "networks")means that researchers can make more rapid and effective use of this information than national systems operating under their constraints (eg. breeding from available stock, length of time to search for traits, etc).
- better distribution of results through networking activities, a partial but incomplete compensation for infrastructure weaknesses--another example of a "micro" approach to what may eventually be handled at the "macro" level (better communication infrastructure).

These hypotheses are consistent with results being seen in SAARFA. If The hypotheses were correct, the SAARFA features would be early indication of shifts in research and productivity relationships. The hypotheses also help explain some of the otherwise pulling features of the project (eg. why the "minor" or "poor man's" crops are doing so well).

To elaborate:

1. Crops covered (roots and tubers, beans) have been important in the informal economy. One can pick up and convey accurate signals with even relatively "superficial" surveys, and these relationships have been built in by farmers (increasingly seen as "rational") to existing production practices, and integrated with resource and factor constraints.
2. Economic mismanagement and food crises (including drought) combined with environmental deterioration, has increased the importance of these crops significantly over the past decade (as reflected in the micro data), eg. significant shifts in/growth of cassava acreage in response to:

   a) economic factors (eg. low cotton prices in Tanzania and Uganda, somewhat in Rwanda); general biases against export crops
   b) drought
   c) income declines (Engle's law in reverse)
   d) environmental degradation (eg. decreased soil fertility)
   e) opportunities for farm/consumer level adjustment due to lack of policy interference (some evidence in Rwanda study that farmers selling this way make more than cash crop exporters at the small end)

   Not all countries are equally affected. Kenya with better policies supporting agricultural exports and a relatively better overall economic position has less significant trend in this direction than many other countries in the region--although even here shift in consumption toward potatoes which produce higher number of calories per hectare (IFFPRI).
3. The significance of these crops to the broad base of farmers ("small farmers") makes the spread of significant innovation possible (though not easy) even with all the constraints of local "extension systems" IF that technology can be generated and diffused through vehicles with links to (and some capacity to work with) national systems (eg. cassava mosaic virus).
4. Confluence of technical capacity and the information which we hypothesized earlier exists and is beginning to be tapped via networks (eg. beans, cassava) makes

it more likely than it was a decade ago that research results can be effectively linked to agricultural productivity.

In short, for reasons which probably didn't "drive" the design or implementation of the research projects, we seem to be on track. Experience and vaguely felt "demands" for linking micro information and more macro concerns (eg. policy) as evidenced in some of the new projects could play a similar role. This also explains idiosyncratic role of Rwanda as a "success" story in the region.

Implications:

1. Don't spoil it.
2. Pay more attention to results. Identify and document as well findings and initially promising results to help "make sense" of micro data in a macro context

   -cannot really do this by improving whole statistical systems in time (although note rice synergism in Rwanda)
   -need different reporting in projects
   -need better information links between natural an social sciences
3. SAARFA is relevant to and important for economic growth supporting policy change.
4. Anticipate and explore the implication of demand linkages flowing from Engle's Law (eg. what happens if incomes rise again--potential for surpluses; how to capturing the benefits if this occurs by finding new uses for commodities like cassava for livestock fees; processing and value added.)

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Attachment A

AGRONOMIC RESEARCH NETWORKS

BY

K. O. RACHIE

CONTENTS

EVALUATION REPORT ON SEVEN SAARFA
COMMODITY NETWORKS AND OTHER ACTIVITIES

(K. O. Rachie)

Attachment A

EVALUATION REPORT ON SEVEN SAARFA COMMODITY NETWORKS AND OTHER ACTIVITIES

I. BACKGROUND:

This midterm management review of the USAID-sponsored SAARFA project began on December 13-16, 1988 with a briefing and organizational meeting at he U.S. State Department offices in Washington, D.C. At that time field travel assignments were made for January 1989. A pre-departure meeting was held in Washington, D.C. on January 10-11, and four members of the Evaluation Team departed for East Africa on the evening of January 11th (see Annex "A"). Following some initial meetings in Nairobi, the team split up with Johnson and Christiansen traveling to Harare, and Rachie and Newberg (AFR/TR-Washington) proceeding on to Rwanda, Uganda and Kenya before returning to the States on January 26th 1989. A third team meeting was held in Washington on February 9-10, 1989 and a final meeting may be necessary prior to completing the report in March or early April.

The purpose of this evaluation is to review progress towards the achievement of the project purpose relative to strengthening national agricultural research systems and selected faculties of agriculture at national universities; and to suggest ways to improve the SAARFA structure, encourage donor coordination (re: SPAAR) and provide direction toward achieving the objectives of the USAID Africa Bureau's plan for the project..

This report is focused primarily on the seven commodity networks shown as items 1-7 in Text Table 1. Direct contact was made with each of the six coordinators (items 1-6) and their colleagues in East Africa (both IARC staff and NARS collaborators) in Nairobi and some of the NARS collaborating centers (see Annex B). The group of coordinators without exception proved to be high caliber professionals, enthusiastic, highly dedicated and very hard working. Similarly, their associates and collaborator were also capable and imbued with the aims and objectives of networking. This excellent group of competent professionals bodes well for the future of the project.

It was not possible to visit the mangrove swamp rice project located at Rokupr, Sierra Leone. However, a fortuitous meeting was held with the WARDA Director General, Dr. E. R. Terry, on February 22 in Dakar, Senegal while this reviewer was on another assignment in West Africa.

Regional management of SAARFA in East Africa is vested in USAID/REDSO/ESA (Nairobi) and led by Mr. Robert McColaugh and his associates: 6 Americans and 3 Africans. The project officer specifically assigned to monitor the sub-projects is Mr. Hudson Masamba, a Kenyan. This appears to be an excellent arrangement since the responsibility for the project rests with persons highly knowledgeable about the region and its problems. Moreover, Mr. McColaugh is both deeply interested and enthused by the potential for SAARFA.

II. THE COMMODITY NETWORKS:

The six commodity networks operating in east and southern Africa include CIMMYT, CIP, ICRAF and ICIP headquartered in Nairobi, CIAT in Ethiopia (Debre Zeit) and IITA in Malawi. Two of the networks (Based of Plant Resistance to Insect) and AFRENA (agroforestry) are sited at their institutional main centers also located in Nairobi: the CIMMYT OFR/FSR project does both in-country and regional training (latter Harare, Zimbabwe). CIAT has staff members stationed in both Ethiopia and Uganda; and they are linked with two related CIAT bean networks supported by other donors in the Great Lakes Region (Rwanda) and in Southern Africa (SADCC Countries). IITA has only one staff member for east and southern Africa stationed at Lilongwe, Malawi. ICIPE conducts most of its activities at their major field station, Mbita Point, located on the west shore of Lake Victoria. ICRAF is moving into research (originally conceived as a training, advisory and diagnostic service) centered at Machakos about 1-1/2 hours by road east of Nairobi.

In general terms all six network sub-projects have been successful in the following aspects and activities:

(1) Developing and strengthening linkages between IARC's and NARS (highly successful) and NARS to NARS (successful).

(2) The networks have been particularly successful at exchanging germplasm, sharing knowledge of methodologies, and in training.

(3) Direct contributions to national agriculture is not yet measurable as the time period is too short. Nevertheless, improved bean, potato, cassava, and sweet potato cultivars are moving into advanced testing and farmer's field trials. Similarly, improvements in cultural practices and pest control are in widespread evaluation. Hundreds of NARS staff members have been trained and provided with information, consultation services, genetic stocks and material support.

It must be recognized that agricultural research and networking are activities with long lead times (10 to 20 years), but extraordinary multiplicative potential. The SAARFA project is less than five years in operation with some sub-projects becoming established as late as 1986-1987. Moreover, two IARC's (ICRAF and ICIPE) have only recently become involved in the kind of applied research appropriate to networking. However, both centers appear to be making a good start - especially ICIPE which is investigating plant resistance to stemborers of maize and sorghum.

Each of the seven commodity networks will be discussed briefly in the sections to follow:

A. CIAT - Bean Research in East Africa:

Coordination is headquartered in Ethiopia (supported by CIDA), but SAARFA supports two researchers in Uganda. Other elements of the African bean network are located in Rwanda, Tanzania and SADDC countries supported by other donors. The East Africa network covers Ethiopia, Uganda, Somalia, and (unofficially) Kenya. The present grant terminates on July 27, 1991.

The project supports bean research oriented around varietal improvement (disease and pest resistance/high yields), training - both short and long term, and other networking activities. Special attention is given to the on-farm testing in both research and training. For small farmers in the highlands CIAT is also working on climbing beans; and for the low, hot climate of Somalia, cowpeas are advocated in collaboration with IITA.

About three training courses are held each year with an interdisciplinary workshop held every two years, and a technical workshop about every nine months.

Among the significant developments on bean improvement are: excellent resistance to Callosobruchis in storage, new releases are imminent in Uganda and Ethiopia (2 Carioca cvs., NPV-from Zambia, and Ex-Rico from Colombia). Other developments and findings include: (i) increasing consumption of beans in the region due to high cost of meat and other protein sources, (ii) increasing preference for climbing beans in Kigezi and highlands of Rwanda, (iii) rhizobia inoculum not useful, except perhaps in Madagascar, (iv) many promising intercropping schemes such as beans with bananas (being studied in Uganda), and (v) generally rising interest in beans and bean improvement among the countries and NARS in E & S Africa.

The CIAT bean program in Africa is organized into three separate networks which are coordinated from Ethiopia (Kirkby). However, each network can call on special expertise from a sister network as needed. Some CIAT staff, like bean economist (Grisley) stationed at Kawanda in Uganda, have regional responsibilities. An earlier problem occurred with Kenya when that country refused to host the bean coordination office, and Kenya did not join the network. However, this relationship is gradually warming, and CIAT does import bean germplasm through the Kenyan PQS at Muguga. Nevertheless, Kenyan participation in other aspects of networking remains minimal.

Outlook: The CIAT bean network has made good progress with earlier efforts beginning to payoff in advancing technology some cultivars are nearing official release, and in training a collaborating group of professionals in the region. However, CIAT differs from some of the other networks in that it does not delineate clearly between "regional core research activities" and networking that implies more localized (national) research, training, and interchange activities. Other IARC;s, like ICRISAT, CIP, IITA and CIMMYT have favored core out posted sub-centers with long term, ongoing programs in regions where they have major responsibilities. The advantages of this arrangement are more rapid progress in technology generation, lower probability of creating misunderstandings with both NARS and donors, and a long term commitment to the region. The separation of CIAT's bean outreach activities in Africa into three regional networks

appears to have several advantages: (i) provides better definition of the agro-ecology and research strategies; (ii) economy of scale - some activities like economic studies and regional training can be shared by all three networks; (iii) general preference by NARS participants for smaller networks; and (iv) the smaller, regionally-defined networking packages may be more attractive to donors.

The internal management review carried out in April 1988 has given CIAT good marks for progress made by the East African Bean Research Network. This was found to be a well managed scientific effort collaborating in the development and testing of new varieties and bean production technologies resulting in a strong regional network being led by an active regional steering committee, although initial implementation was delayed by two years to August 1986. The project has also made good progress on training: 7 researchers are currently studying, or in the pipeline for higher degrees, 7 scientists have been the CIAT for short courses, and 154 researchers have attended in-country or regional short courses. The bean network has also established strong linkages with other institutions operating in the region, including CIMMYT, World Bank, ILCA, IITA, and other CIAT networks in the region. However, drawdown on grant funds has been slower than expected owing to the delay in project implementation.

It is concluded that CIAT has established a successfully functioning network in East Africa despite the early implementation delay. Therefore, this sub-project should be extended until the end of SAARFA Phase I, or at least one more year.

B. ICIPE - Bases of Plant Resistance to Insects:

Support for this project began in 1984 and terminates September 1, 1991. This project is mainly oriented around research on maize and sorghum resistance to stemborers, primarily Chilo partellus: (i) evaluation of germplasm for resistance, (ii) determine and characterize the mechanism of resistance, and (iii) study the genetics of resistance. The work is carried out mainly at the Mbita Point field station in western Kenya. Field evaluations were also conducted at Kenyan research stations at Machakos, Embu, Mtwapa, and Busia (Lambrue) and at ICIPE Field Site in Ungoye. Specific studies include: evaluating germplasm, mass insect rearing, alleviating agronomic practices (eg. intercropping, time of planting and insect trapping).

Resistant/tolerant lines of sorghum identified include: Serena (moderate), IS1044 (excellent) and IS12308 (poor plant type). It was also discovered that early infestation of susceptible sorghums (eg. 10DAE) results in heaviest damage - up to 90 or 95 percent; whereas later infestation results in reduced damage to the crop. Sorghum intercropped with cowpeas or beans is less affected than when sole-cropped. The Biocontrol Section has also studied four potential insect parasites of stemborers including species of Pedobus, Dentichasmias, Apanteles, and Trichogramma (egg parasite); and some insect pathogens (Nosema spp and nematodes).

The project has trained two post doctoral fellows, three research associates (short term), and three technicians (short term); and a workshop on methodology was organized for Kenyan research. Networking has developed and been extended to other countries with

participation in experiments in Zambia and Mozambique. The project is also in touch with ICRISAT in India and Zimbabwe; and with CIMMYT. ICIPE has initiated on-farm trials using state-of-the-art stemborer controls including resistant varieties and generally improved practices. This is an amazing turn of events for an avowedly basic and esoteric institution!

Outlook: The major concern of the review team during the mid-term evaluation in May 1987 was whether the information obtained and sources of resistance identified would be effectively used by IARC's and NARS to develop resistant varieties. This concern was subsequently addressed by ICIPE through collaboration with Kenyan and other plant breeders.

In general, good progress is being made toward realization of the projects objectives. Therefore, funding should be continued for one more year to the end of SAARFA-I.

C. CIMMYT-II - OFR/FSR Training:

A CIMMYT FSR project has operated in east/southern Africa, and headquartered in Nairobi since 1976. The current project with a five man team, and funding of $5 million was approved by AID on May 20, 1985 and will terminate in May 1990.

This is not a research network per se, but rather a training activity, which by all counts has been highly successful and has trained more than 100 national professionals at international and regional workshops on OFR/FSR, and 500 national research staff at in-country training courses. The regional coverage includes 13 countries from Sudan and Djibouti to Zambia and Zimbabwe. Network staff have also provided consultation on OFR/FSR and are promulgating improved research methodologies through exchange and interaction of 20 quarterly newsletters and workshop findings in 17 countries. The project has also achieved the institutionalization of OFR/FSR in at least six countries in the region.

There is no doubt about the impact of the project on current philosophies and strategies of the technology process at the national level as evidenced from discussions with researchers and their administrators in East Africa; and by the trend to institutionalize OFR/FSR. In terms of institutional development, the best progress has been made in Malawi, Zambia, Zimbabwe, Tanzania, Uganda, Ethiopia, and Swaziland.

Outlook: The OFR/FSR project will have completed its major objectives by May 1990 when it terminates, but a "smoother phase-our" would require at least another 12 months. CIMMYT will continue some training in OFR in E/S Africa (probably at Edgerton University and in Harare), but it will be tied to crop management research (CMR), mainly focused on maize. An extension to the end of SAARFA LOP is recommended. This would allow the OFR/FSR project to work intensively in one or two countries to show some tangible results of these methodologies; and to work more closely with selected university faculties of agriculture to help institutionalize OFR/FSR.

The interim Evaluation of the OFR/FSR project carried out on May 10, 1988 made 30 recommendations, the major ones concerning the

following topics: (i) submission of a 1988 work plan and budget, and a remaining LOP strategy statement and budge; (ii) appointment of a field project coordinator/administrator; (iii) correcting management deficiencies and reconciliation of expenditures (as actually incurred) and capital purchased; (iv) agreement between CIMMYT and CIDA for agronomic support to CIMMYT-II (by CIDA - funded agronomist); (v) develop the means to document and measure farmer adoption of technology resulting from OFR/FSR; (vi) Title XII support to OFR/FSR should be based on the need to strengthen NARS and extension rather than general service to the projects: and (vii) project TA should focus on the whole farming system calling on other IARC's when their expertise is required (eg. livestock - ILCA and ILRAD). These recommendations have been noted by CIMMYT and appropriate responses are being made.

D. CIP - Potato Improvement/PRAPAC:

The CIP network on potatoes supported by SAARFA includes Kenya, Uganda, Rwanda and Burundi. Ethiopia is also included with support from CIDA. The network is headquartered at Nairobi (adjacent to ILRAD at Muguga). CIP has had several years of experience in the region dating back to 1974 and can be considered a more mature program. Current support under SAARFA runs to February 13, 1991.

The primary research focus of the potato program is breeding for resistance to late blight, and other diseases together with adaptation and yield; secondly, post-harvest handling/storage is increasingly important; and improving cultural practices. Training, communications, supply of germplasm are also given high priority in this program. The best network development and functioning has occurred in Rwanda under PRAPAC., this collaborative relationship includes Rwanda, Burundi, Eastern Zaire, and Uganda (recently). The PRAPAC collaboration assigns primary responsibility for breeding for resistance to late blight resistance, seed multiplication and post-harvest studies to Rwanda; breeding for bacterial wilt and other attributes to Burundi; and agronomy, processing and adaptation breeding to Zaire.

An excellent potato training facility has recently been constructed at Ruhengiri in northern Rwanda where the national potato research center (PNAP) is also headquartered. This facility is self-contained to house and feed up to 22 trainees and has additional classroom space. Two staff houses were also constructed.

The major problem of potatoes, as elsewhere in the world, is late blight. The most common control measure is spraying with fungicides up to twice weekly during active growth. Good resistance can be bred for, but the fungus organism comprises several races each of which can build up rapidly when specific resistant genes are incorporated into a released strain. The rate at which this occurs (within 2-3 years) does not allow time for multiplying sufficient seed of new vertical-resistant strains. The alternate strategy is to develop horizontal resistance by incorporating large number of minor genes - a very difficult and time consuming process. This objective being carried out elsewhere will require another 5 years, after which other desiradata must be incorporated into the new strains.

Despite the intractable disease problem (including LB, BW, several viruses, golden nematode and others), the CIP staff (Kloos) believes commercial potato yields have increased by 30 percent in east and central Africa through the application of improved technology; and that use of fungicides, where feasible, increases yields by 3 to 4 times. Rwanda has developed 3 new strains being tested in advanced trials. The project has also developed in vitro culture of meristem tissue as a means of rapid multiplication of clean seed; and has studied possibilities for using true seeds.

The CIP training program collaborates directly with the national potato program and with the FSRP. They send trainees to CIP (Peru), Holland and Tunisia in addition to conducting regional national training courses (2 courses in 3 years).

Outlook: The CIP potato project has made good progress and new technology has reached advanced testing prior to recommending/release. However, the need continues for the foreseeable future and support should be continued for the LOP of SAARFA. There remain major problems like introducing new germplasm for breeding purposes which is mainly done through the Kenya PSQ station at Muguga (Kidanemariam/Okioga). This facility processes only about 100 clones/9 months.

Another concern is the perception that "the Irish potato is a rich man's food" which is partially borne out by SESA/MSU studies in Rwanda. This data shows that potatoes contribute only 3 percent of the total caloric intake in Rwanda compared with 26 percent for sweet potatoes, 29 percent from beans and 19 percent from bananas. Even sorghum, maize and cassava contributed more calories than the Irish potato. Similar potato consumption figures may be typical of the region: Burundi grows 20-30,000 ha, Zaire: 40,000 ha, and Uganda about 90,000 ha compared with Rwanda's 40,000 ha.

The third issue relevant to CIP's African programs is the recent assumption of global responsibility for sweet potatoes (formerly with IITA). The sweet potato is far more important on the continent and most of the technology and leadership for improvement have been provided by IITA. This transfer of mandate appears to be going smoothly, but there will be a hiatus while CIP Brings the SP program up to speed and establishes international linkages. It is not yet clear when CIP will be ready to initiate a full-fledged sweet potato network in Africa, but this should receive highest priority in the future.

E. ICRAF - Agroforestry and AFRENA:

This project began only recently (8-31-86) and will terminate on August 31, 1991. The objectives of the project are to establish a collaborative, inter-country agroforestry research network in Kenya, Uganda, Burundi and Rwanda. Headquarters are in Nairobi and trials are carried out at Machakos. The focus is on woody species improvement trials within the network leading to genetically superior multipurpose trees and shrubs for identified agroforestry technologies. Training of agroforestry researchers in member countries will also be carried out.^R

Outlook: The ICRAF has only very latterly and reluctantly decided to become involved in research. The field work at Machakos is interesting, but not exciting. However, some species like Sesbania, sesbaw, Cassia siamea, Leucaena leucocephala K-8, and others have been identified as promising for intercropping with annuals as fence rows or farm woodlots. However, ICRAF needs to borrow staff expertise or train one of their own at IITA on hedgerow intercropping. Another serious shortcoming is that ICRAF has no ready means of increasing and supplying its own seeds/planting materials or germplasm. Moreover, field studies and trials appeared to be conducted very deliberately and laboriously with a minimum of supervision. It might be questioned whether training should be carried out under such circumstances. Recommendation: wait and see whether ICRAF develops research and networking capability.

F. IITA - East and South Africa Root Crops Network:

This project (ESARRN) has recently come under SAARFA on March 31, 1987 and is scheduled to terminate on April 1, 1990. The primary focus is on cassava now that CIP has taker over sweet potato; but some limited effort is also placed on other R&T crops like yams and cocoyams where applicable. The project currently serves east and southern Africa with only one staff member (Alverez, the coordinator) headquartered at Chitedze Experiment Station at Lilongwe in Malawi. Formerly it was situated in Rwanda.

The project has achieved considerable progress in supplying and exchanging germplasm pools between and among IITA and NARS in the form of true seeds of both cassava and sweet potatoes, and in utilizing both IITA and local germplasm in intercrossing schemes (mainly in Rwanda). In addition, much technology on production systems, rapid propagation and post-harvest handling has been transferred to participants. Training conducted both in the region and at IITA has achieved short and medium term training of 180 technicians, and long term training of 6 MSc. candidates.

A recent spectacular development in cassava improvement is the successful intervention in spread of the disastrous mealy bug through introducing an effective insect parasite (E. lopezi) from Latin America. This technology emerged from research done by the Biocontrol Unit at IITA. Although at least two predators appear promising for controlling the greenspider mite (GSM), good host plant resistance is also available. Therefore, and effective breeding program could make rapid progress on this problem, especially in East Africa where the pest is more widely spread.

Outlook: Cassava production has increased dramatically in East and Southern Africa in recent years now estimated at 2.6 million ha. According to professional opinion this has occurred on account of the burgeoning population growth which has brought more marginal lands under cultivation and intensified cropping on more fertile lands, thereby depleting their fertility. Cassava performs better on poor soils and during droughty periods than most other crops, and does not necessarily require storage (harvest as needed). Unfortunately, national programs have not yet recognized the emerging importance of cassava, nor have they assigned and trained professional staff to

carry out research and development on this crop. Therefore, additional support for research, development and capacitating human resources is a high priority. Moreover, the IITA network should have at least one more professional to assist Alvarez with ESSARN in some 13 member states.

Other problems as observed by the ESARRN interim Evaluation of December 1988 include the need to strengthen training, increase expert consultation and trouble-shooting (from headquarters at IITA), assign greater emphasis to post-harvest handling, and improve management. As of September 31, 1988 - or midway through the grant period, only 19 percent of available SAARFA funds had been expended.

F. WARDA - Mangrove and Associated Swamp Rice Research:

Support for this subproject began on 9-28-87 and will terminate on September 28, 1989. The primary work is carried out at Rokupr, Sierra Leone and allows WARDA to continue to research, technology transfer and training program in 1988 and 1989. The funding is intended to support the station between the end of the WARDA II project on 12-31-86 and the anticipated onset of USAID core support to WARDA in 1989. The project is aimed at rice production in the coastal problem areas of Sierra Leone, the Gambia, Guinea Bissau and Nigeria; and it focuses primarily on varietal improvement and control of pests endemic to these problem soils areas.

Very fortuitously Dr. Eugene R Terry, Director General of WARDA, was in Senegal during the annual B/C CRSP meetings of the External Evaluation Panel, Board of Directors and Institutional Representatives in Dakar, Senegal on the 21-25th of February 1989. Therefore, a dinner meeting on the evening of the 23rd February 1989, was arranged with Dr. Terry to discuss the SAARFA bridging grant for Mangrove and Related Swamp Rice Improvement at Rokupr, Sierra Leone.

Background on WARDA:

The fate at Warda for about the first eighteen years of its existence was precarious at best. Current wisdom during those early years was that it would eventually fold up and disappear. However, the CGIAR finally stepped in and agreed to bring the institute under its aegis and support pending several urgently needed changes and improvements, beginning in 1987. The first and major change was the appointment of Dr. Terry (formerly Director of International programs at IITA). Dr. Terry then arranged for the move of WARDA headquarters from Monrovia, Liberia to Bouake, Cote'd Ivoire. It also necessitated wholesale changes in staffing - both at the support and scientific levels. Other major changes have occurred in terms of focus, strategies and modus operandi.

The WARDA has now organized its programs around distinct rice farming ecosystems in West Africa. The principal technical factors that determine such ecosystems are surface hydrology and soils. Rice ecosystems are further categorized by biological stress and human factors which characterize distinct farming systems. The three major rice ecosystems in the region are:

	AREA (000 ha)	PERCENT*	PROGRAM LOCATION
1. Continuum:			
-Upland/hydromorphic	1539	57	Bouake. CI
-Hydromorphic/Swamp	513	21	Suakoko, Lib.
2. Sahel (irrigated)	135	6	Fanaye, Ndiaye Sen.
3. Mangrove	189	7	Rokupr, S.L.

* Not included is low potential deep water rice

Of these classifications greatest potential is for the continuum group, especially for the hydromorphic/swamp category.

WARDA now includes in its operational reperatoire the commissioning of special studies in important problem areas at selected centers of excellence in the region, or wherever outstanding expertise exists, if such a program (or scientist) has a comparative advantage over WARDA (ala CIP).

SAARFA support to WARDA

The SAARFA grant for $1.4M was intended to provide support to WARDA to allow continuing the Mangrove Swamp Rice Research Project until institutional reorganization was completed in 1989. However, the project was approved late and support was not activated until the end of 1987. Therefore, WARDA has requested an extension of time until 12-21-90 to complete the transfer of budget allocation. However, this does not imply and increase in the original grant. The project carries 1 senior staff member (Sampong) plus 6 junior scientists, operation of equipment/vehicles, supplies, and other recurring expenses. It is, moreover, "the only research project of consequence in all Sierra Leone".

Outlook: This reviewer, by virtue of long acquaintance with the DG of WARDA, the extensive organizational and structural changes occurring to that center, and the potential for impacting on development in Sierra Leone and four other countries in West Africa, strongly supports this sub-project. Moreover, no less authority on rice improvement, Dr. Ronnie Coffman at Cornell, has stated that WARDA's mangrove swamp rice breeding program has made more progress than any other research activity at that center. Therefore, SAARFA support be continued until the end of 1990. This extension will not require additional funding beyond the original grant of $1.4 million. A request for extension has already gone forward from SAARFA to AFT/TR.

III. FACULTIES OF AGRICULTURE AND OTHER SAARFA ACTIVITIES:

Contact was made with three faculties of agriculture - one each in Kenya, Rwanda and Uganda. In addition visits were made to some non-networking SAARFA projects and peripheral activities. These are briefly discussed below:

A. East African Faculties of Agriculture:

1. Edgerton University - Kenya

This semi-private institution has advanced steadily from its early 1970's status as a teacher's training college and mainly with USAID assistance. It is now filling an important gap as a dynamic and an effective training - cum-applied research institution. CIMMyT has proposed that Edgerton become involved in some of the long term training activities normally carried out in Mexico.

This proposal has considerable merit - particularly for wheat and maize crops and theoretical studies on these and other crops. However, the elevation at Edgerton exceeds 7000 ft. making it unsuitable for most tropical lowland crop species.

2. University of Rwanda at Burkare/UM

The faculty of Agriculture - UR is located in southern Rwanda. It received a grant of $2,046 million on 9-30-87 which will terminate in September 1992 (LOP of SAARFA). The University of Minnesota is the principal partner institution assisting UR. Major activities include both training/teaching and research. The UR has the national mandate for rice improvement (24,000 ha), but other crop research may be added later. On the animal side, UR plans to focus on small ruminants and their nutrition - mainly on improving forages. Soil science, FSR and rural sociology will be included both as research disciplines and for training.

The UR plans a new 5 year program to replace the present 6 year course (first 2 years require common training while the last 3 years are for specialization).

At present the UR/FA has only 100 students and will graduate 21 ingenieurs per year. The major problem is lack of trained manpower. There are only 21 professorial staff members, but six members are studying abroad at present. Of the remaining 15 staff, 8 have Master's level training and 7 are Ph.D's - but of the latter 6 are expatriates. Eight additional staff members have been requested, but GOR has approved only four new positions. The present four departments (Agronomy, Animal Production, Engineering and Economics) will eventually increase and UR expects to double the student enrollment to 200.

The development of such an institution is important to the nation's future, but it is necessarily long term. There is no reason to assume that less than two decades will be required to reach institutional maturity (as in the case of Hassar-II University in Morocco).

3. Makerere University - Faculty of Agriculture

The faculty of Agriculture - MU was the premier institution of its kind in the late 1960's. At its zenith it attracted leading academicians from around the world and was training at the BSc, MSc and PH.D levels. Since the early

1970's, however, the university went through a very difficult period for about 15 years, although the number of B.Sc students continued to increase from a student body of around 200 to about 400 at present (3 year course).

As a consequence of the "the war" and economic hardship (continuing devaluation) the faculty lost two-thirds of its' teaching staff - from 60 down to 20. The teaching/research farm of 500 acres at Kabanyolo was all but abandoned. At the height of economic distress and even continuing up to the present, staff salaries remained at former shilling levels, but their value in terms of purchasing power declined to the point that even senior academicians received the equivalent of only a few dollars a month. This meant that all who stayed on had to moonlight (eg. cultivate their own shambas) to survive.

Fortunately, USAID began a Makerere rescue operation in the early to mid-1980's (on hold from 1981-1985) and the faculty building on campus is being completely renovated, Kabanyolo Farm is 70-80% rehabilitated and new staff have been recruited. At present there are 54 senior staff, 38 of whom have Ph.D's - the rest have Master's degree; and 14 new posts were recently created to and will bring the total teaching/research staff up to 75 (20 vacancies at present). There are now seven full fledged departments: Animal Science, Soils Science, Forestry, Crop Science, Agriculture Engineering, Agriculture Economics, and Extension. In 1989/90 a new department - Food Science will be started. Moreover, 15 graduate students will be registered in 1989.

Problems remain, like continuing political instability and the economic distortions, but if these are overcome, and the institutional support base can be broadened by increasing the number of external donors to pre-war levels, the FA could become the institution of choice for graduate training on the continent (or even outside Africa).

B. Other Non-Networking Subprojects Visited:

1. UA/FSR project at Rwerere, Rwanda:

The University of Arkansas Farming Systems Project located in an isolated, highlands area (2200m) of northern Rwanda has an expatriate staff complement of five scientists, including a plant pathologist/administrator, agronomist, soils scientist, socio-economist, and extension specialist. The project began in 1985 and terminates in 1990. The primary focus of the project is farming systems research emphasizing soil and water conservation, plant nutrient (fertility) problems, and plant disease/pest control. They are most enthused about alley cropping (IITA), but have reservations about ICRAF networking activities.

A major problem of the UA/FSR project is isolation from the Rwandan mainstream, nor have they been assigned national counterparts after nearly four years. There appears to be difficulties with the project relationships with ISAR.

Moreover, the number of networks and FSR activities in Rwanda may exceed both the availability of trained NARS scientists and resources. There are also three other FSR projects in the country with diverse goals and methodologies.

2. SESA-MOA/MSU - Kigale, Rwanda:

This food security project with Michigan State University participation has made several interesting findings through a number of farm level surveys. For example, about half of the commodities being marketed came through the country's leaky borders. They also discovered that sweet potatoes make up nearly a third of the food energy sources available to the poorest half of the population and 26 percent overall. Overall kilocalories production of other food commodities is as follows:

beans = 20%	bananas = 19%
maize = 10%	sorghum = 12%
cassava= 9%	Irish potatoes = 3%

Pole beans were found more important on smaller farms where cultivation is much more labor intensive. The SESA/MSU project also discovered a very wide (unacceptable) divergence between actual on-farm sampling and official (FAO?) statistics.

This is an interesting project, that could be profitably carried out elsewhere. The patterns of production - consumption are likely to be similar for adjoining highland areas, especially Burundi, eastern Zaire and southwestern Uganda.

3. Makerere Institute of Social Research:

The MISR located on Makerere Hill, Kampalo is linked to the University of Wisconsin on a project to study land tenure in Uganda. The project focuses on the nature of land tenure like the breakdown of "milo-tenure" (large tracts of land originally awarded to tribal chiefs) and enforcement of the freehold land tenure law in 1975. They are also monitoring the population expansion around the national (game) parks and encroachment onto public lands.

The impact of land tenure on resource base conservation, long term investment in agriculture, and the national agricultural economy have become evident from these studies. It is interesting that there is an active, private land market in Uganda at present, although it often remains a sensitive issue both at the local and national levels.

IV. DISCUSSION AND RECOMMENDATIONS

This section includes discussion and recommendations on assessment of research priority needs by agro-ecological zone, SAARFA structural and procedural matters, and a summary of specific recommendations for Phases I and II.

A. Assessment of Research Priority Needs

Six agro-geographic zones have been identified in tropical (sub-Saharan) Africa for donor-supported collaborative development by the CDA. These include: the West African Coast Sahel, the Sudanian Region, West Africa Coastal Region, Zairean Basin, East Africa, and Southern Africa. Within each of these zones a wide range of ecological climates occur depending on several factors especially elevation, rainfall, latitude, soils/topography and pests. The resulting "sub-zones" range from humid rain forest to semi-arid/desert and alpine ecologies with highly diverse plant growth potential. Superimposed on these regions are a host of socio-economic factors and widely variable infrastructural/industrial development. The total sub-Saharan region is huge, mainly undeveloped, and comparatively underpopulated. Overall, the region is highly complex, fraught with political, economic, infrastructural, and environmental problems. Agricultural research achievements have frequently been inadequate and/or spotty. Clearly, much more needs to be done and particularly as area of site-specific activities.

The CDA-defined agro-geographical zones are not very appropriate as a basis for organizing and developing agriculture research, although some zones like the Zairean Basin, WA Coastal Region, the Sudanian and the Sahel are somewhat more homogenous than East and Southern Africa.

Overall per capita agriculture production is very low throughout Tropical Africa. Exacerbating this problem is the chronic deterioration of productive capacity of the land, resulting from reduction of the fallow period, lack of plant nutrient replacement, inappropriate cropping practices, and build up of pests and diseases. Reversing the trend of declining productivity through conventional approaches like application of purchased inputs (fertilizers, pesticides), long term rotations (fallow), and water management (leveling, terracing) has not proved practical for food crop production in Africa, except to a very limited extent or in special circumstances.

The problem of identifying gaps in research and improvement (including networking) of food crops in Africa should begin with an inventory of currently important commodities in the different agro-ecologies and a broad subjective assessment of improvement activities underway. The attached inventory (Table 2) is limited to those commodities contributing major sources of energy and proteins to human diet. This inventory omits reference to important cash/export crops like palm and coconut oils, natural rubber, cola nuts, cacao, coffee and tea. An exception is the peanut which is both exported and used for subsistence.

Table 2. AN INVENTORY OF PRIMARY FOOD CROPS BY AGRO-ECOLOGICAL ZONE IN AFRICA AND A BROAD ASSESSMENT OF THE ADEQUACY OF IMPROVEMENT UNDERWAY

CDA REGION AGRO-ECOLOGY	PRIMARY FOOD CROP	ADEQUACY OF IMPROVEMENT[1]
1. Zairean Basin:		
- Low/humid	Cassava	***
	Sweet Potato	***
	Other roots	*
	Banana	ND
	Maize	**
	Rice	**
-Mid-elevation	Cassava	***
	Sweet potato	***
	Maize	***
	Beans	**
2. West African Coastal:		
-Guinean Zone: (low/humid)	Cassava	***
	Sweet Potato	***
	Other roots	**
	Banana	ND
	Maize	***
	Rice	***
	Cowpeas	***
-Low subhumid	Cassava	***
	Maize	**
	Sorghum	**
	Cowpeas	***
3. Sahel:		
-Low/semi-arid	Pearl Miller	*
	Sorghum	*
	Cassava	**
	Cowpeas	**
	Peanuts	***

[1] Improvement adequacy: ND=not determined (or non-existent); * = minimal (or beginning); ** = established; *** = established/making impact

CDA REGION AGRO-ECOLOGY	PRIMARY FOOD CROP	ADEQUACY OF IMPROVEMENT
4. Sudanian Zone:		
-Mid-elevation/ subhumid	Sorghum	**
	Pearl millet	*
	Maize	*
	Cowpeas	ND
5. East Africa:		
-Low Elevation/dry	Cassava	*
	Sorghum	*
	Pearl millet	*
	Cowpeas	ND
-Mid-elevation	Cassava	*
	Sorghum	**
	Pearl millet	*
	Cowpeas	*
	Pigeon peas	*
-Great Lakes: mid-elevation/subhumid	Banana	ND
	Maize	**
	Sorghum	**
	Finger millet	ND
	Cassava	*
	Sweet potato	*
	White potato	***
	Beans	***
-High elevations	Wheat/triticale	***
	Barley	**
	Maize	***
	Teff	*
	White potato	***
	Inset	ND
	Beans	**
6. Southern Africa:		
-Low elevation/dry	Maize	**
	Sorghum	**
	Pearl millet	*
	Cassava	*
	Cowpeas	*
Mid-elevations	Maize	***
	Sorghum	**
	Cassava	*
	Sweet potato	*
	Beans	***

1. Primary Food Crops

This broad evaluation of the adequacy of improvement activities on primary food crops in 12 ecologies of the six CDA agro-geographical zones includes about 18 commodities representing some 20 genera important in human diet in tropical Africa. Broad groupings of these crops are (1) roots, tubers and bananas, (2) warm weather cereals, (3) cool weather/highland cereals, and (4) pulses.

Roots, tubers and bananas. These crops, especially cassava and sweet potato--are emerging as tropical Africa's most important source of direct human nutrition. The reasons for the rapid increase in cultivation of these crops is complex, but relate primarily to their hardiness under stress and in marginal areas, ability to produce in fertility-depleted soils, reduced storage requirements, and relative freedom from pests.

The IITA has had a major impact on cassava and sweet potato improvement in parts of West Coastal Africa and the Zairean Basin; but less progress has been made in East and Southern Africa, where rapid increases in the importance of root crops was not foreseen twenty years ago. Moreover, the NARS have not been very interested in roots and tuber improvement (except perhaps the white potato). It is therefore essential for research/networking on both cassava and sweet potato be strengthened--particularly in East and Southern Africa.

The CIAT has assembled and maintains the world collection of Cassava, and could make important contributions to the further improvement of this crop, particularly in finding solutions to several diseases and pests (some of which may have spread from the New World).

Sweet potato improvement is in grave danger of being neglected for an undetermined period as CIP assumes international responsibility for this commodity. Nevertheless, IITA has in place an outreach activity which has already succeeded in carrying out several networking objectives, especially in the areas of germplasm transfer, national breeding activities, training and communications. Although these efforts were generally secondary to those on cassava, there have been some notable developments that need continuing support until they can be folded into newly established CIP program for this crop. To ensure the minimum loss of existing momentum, a separate network for sweet potatoes coordinated and managed by CIP should be established as soon as possible.

A very important but largely unrecognized and neglected primary dietary staple throughout the subhumid and humid tropics is the banana--both the sweet or dessert and cooking types. This species embodies most of the attributes desired for small-holder, manual production systems: (i) high yielding, (ii) nutritious energy source, (iii) year around fruit bearing, (iv) multipurpose uses, (v) conserves the resource base, and (vi) does not require onerous and debilitating primary tillage each season. Unfortunately, the

improvement of the banana has been largely neglected on account its "genetic intractability". Moreover, some serious diseases and pest like Black Sigatoka Disease now threaten this important and ubiquitous crop. However, breeding techniques based on "conventional" principles have now been worked out by FHIA - Honduras and several major advances are in the offing. Further developments may also be forthcoming through biotechnology research over the next five years. IITA has the international mandate for bananas in Africa.

The pending danger to bananas coupled with break-throughs in its genetic improvement strongly mitigate in favor of supporting IITA in developing a continent wide improvement network.

The Cereals. Among these crops, the cool weather crops (wheat, triticale and barley), maize and rice have generally enjoyed high priority status by NARS, and long term support by CIMMYT and WARDA/IRRI in Africa. On the other hand, sorghum and the millets (pearl/bulrush and finger millet) may not have received the attention deserved relative to their current importance and potential. Fortunately, ICRISAT has over the past decade or so launched major projects on sorghum and pearl millet in Africa. Of the two, pearl millet is reckoned to be furthest behind and deserves special attention in the future. However, it may be premature to make any specific recommendation at this time. Finger millet, although greatly neglected, appears to persist in subhumid to humid mid-elevations of East and Southern Africa. It's virtues include "rusticity" or ability to perform better than maize under irregular rainfall and fertility-depleted soils, dual purpose--both as a cereal and for malting, and ease of long term storage. Although, no specific recommendation for SAARFA support is indicated, ICRISAT should be encouraged to monitor this crop, collect and evaluate the germplasm, and assume responsibility for more active improvement in the future if warranted. Finger millet or ragi is also important in southern India and the Himalayan region. The IDRC has supported some preliminary studies on finger millet.

Teff (a cereal lovegrass) and inset (Musa inset-starch is extracted from fleshy leaf petioles) are important, but exclusive to the Ethiopian highlands. Unless these two crops find wider interest and potential, no further recommendations are made at this time.

The pulses. Among this group, Phaseolus beans and groundnuts (peanuts) are adequately catered for by NARS, IARC's (CIAT and ICRISAT) and other institutions. Likewise cowpeas have been improved for the Guinean zone of West Africa (IITA), and these efforts are now being extended to the Sahel, East and Southern Africa. Pigeon peas are grown throughout the African tropics, but larger scale plantings are made in certain areas like the West Nile district of Uganda and the semi-dry, mid-elevations of central Kenya. This excellent pulse/vegetable could find wider use potential in Africa and ICRISAT should be encouraged to explore this possibility. Several other pulses (eg. mung bean, lima bean, yam bean, banbara groundnut, chick

pea, faba bean, and tepary bean) are sometimes grown in more or less limited areas, but their potential is not yet determined.

The constraints. There are numerous problem areas specific to each commodity. For example, some crops and particularly those indigenous to Africa, may have virtually dozens of insect pests and plant diseases, not to mention weeds, birds, rodents, storage problems, moisture stress and depleted soil fertility. For the most part, the complex of constraints varies from location to location and often requires site-specific research relative to each commodity. Therefore, a multidisciplinary approach to crop improvement is imperative.

2. Land Management and Sustainable Cropping.

Crop production is directly dependent on moisture availability and the productive capacity of the soil. Little can be done about inadequate moisture, (since irrigation is limited), but loss of soil productivity has been accelerating and has already reached disaster proportions in some areas, particularly in Africa's more fragile ecologies. For this reason and because conventional methods are not feasible, a comprehensive approach to rational soil fertility restoration with broad applicability throughout tropical Africa and herein referred to as "sustainable-cropping" is proposed as a high priority initiative for inclusion in SAARFA's Phase II.

The term "sustainable cropping" is used to cover a range of restorative cropping practices like green manuring, residue mulching, live mulching, cut and carry mulching, perennial hedge row (alley) cropping, and azolla/rice production. It may be combined with various conservation measures like contouring, terracing, tied (basin) ridging and strip cropping. However, the primary objectives are to recycle plant nutrients from the air and deeper layers of the soil, improve soil tilth, increase water infiltration, and minimize wind and water erosion. While some of these practices have been used sporadically in fragile ecologies throughout history, the more recent concepts of alley/hedgerow cropping and live mulching have been developed and studied at IITA. Subsequently, ILCA and ICRAF have become involved in alley and hedgerow cropping.

Fundamental to sustainable cropping is the strategic deployment of species in various rotations, sequences, relays, and mixtures both spatially and temporally. These may feature an infinite range of combinations and management practices designed to optimize the outturn of useful product with minimal investment of time and inputs while conserving soil and water and improving the productive capacity of the land. While appropriate combinations of annuals can contribute to these objectives, the more interesting configurations are alley cropping schemes comprised of annuals and perennials and particularly where the perennial has a useful product, is a deep-rooted nitrogen-fixer (legume) and provides some year-around ground cover.

Some useful alley crop combinations have been identified at various African sites based on leguminous shrub/trees, especially species of Leucaena, Sesbania, Glyrcidia, Flamingia, Cassia, Acacia, Prosopis and others. However, studies of these species, their many variants, and a host of even more promising species based on a global survey has only begun. Herein lies the research challenge for the future--to identify new more useful species of both woody and succulent plants suitable for both an understory ground cover and in various intercropping configurations. Moreover, useful applications of sustainable cropping are urgently needed for marginal ecologies like the Sahel/Saharan fringes, and for depleted/eroded soils. Among the best sources of companion restorative species for sustainable cropping is CIAT in Colombia where several thousands of tropical pasture legumes and grasses are maintained and studied. These include both annuals and perennials in the form of trees/shrubs, bushes and succulents, many of which are adapted to difficult soil conditions.

The universal need for sustainable cropping technology is particularly urgently in the more fragile ecologies. It is a field in which several IARC's have a vested interest or could make significant contributions, especially IITA, ILCA, ICRAF and CIAT. Other possible interested parties are ICRISAT, CIMMYT and CIP. The critical issue is to find the means for greatly expanding research and networking of sustainable cropping in Africa. One possibility would be to establish a consortium of IARC's and other interested institutions coordinated by IITA and/or ILCA (in east Africa). SAARFA is in an excellent position to instigate and support such a development in Phase II.

3. Tropical Pastures

The improvement of animal nutrition is essential to uplifting small farmer living standards. Moreover, tropical pasture improvement is integral to the overall farming system and is particularly relevant to sustainable cropping. Primary responsibility for animal nutrition and tropical pastures in Africa on the international level is assigned to ILCA in Ethiopia. Both IITA and ICRISAT share an indirect involvement in tropical pastures through their farming systems activities in the humid and semi-arid ecologies, respectively. An African forage research and development network has been established by ILCA in cooperation with NARS and other IARC's (eg. IITA and ICRISAT), but some aspects may need expanding and extending, particularly those overlapping crop management. It is suggested that CIAT, with vast reserves of tropical pasture germplasm including a broad sampling of South American legumes, is particularly well equipped to participate in developing new technology for both tropical pastures and sustainable cropping.

B. General Structural and Procedural Concerns

The SAARFA project as presently constituted is diffuse and includes several regional commodity networks, support to faculties of agriculture (only one), baseline studies, a variety of training

activities, and other activities--some of which would be better suited to bilateral support. Although, each of these projects do contribute to the overall objectives of SAARFA, it would be easier to manage and evaluate a more homogeneous group of activities. It is further suggested that AID establish a better defined and more rigorous procedure for selecting and prioritizing subprojects qualifying for support under SAARFA rubric.

Commodity networks may easily become too large--5 to 6 countries may be optimum in terms of ensuring full participation by all members, better service to the individual countries, more efficient management, and more homogeneity of agro-ecological and political conditions. A good example of such networking is CIAT's E&S Africa Bean Network with three separate, but strongly linked networks in East Africa, Great Lakes region, and the SADCC countries.

The IARC's should attempt to delineate regional research from networking activities--though closely linking them. This will help reduce some of the misunderstandings with both NARS and donors, and contribute to increased efficiency of operations. It would also allow better access to genetic and other materials needed for regional distribution.

There appears to be little concern by the research establishment--both IARC's and NARS--for assessing the impact of the technology developed. This is attributed to the existing unreliable data base, lack of procedural methodologies for evaluating and quantifying such impact, and because this information is seldom included or stressed adequately among the outputs of funding grants. It is therefore proposed that IARC's including their network coordinators be put on notice to begin (if not already done so) documenting the impact of their respective technologies. Similarly, NARS applying for commodity research support should assume this responsibility for their countries. Of course, collecting the necessary information will usually require additional support and expertise. Of particular interest in this regard is the information obtained by SESU/MSU from farm-level surveys in Rwanda.

The CIMMYT "Farming Systems Research" network features training not research, and focuses on "on-farm research" not classical FSR. Nevertheless, this project is having a major impact on the attitudes and strategies of agricultural technology generation in the region it serves (ESA). This highly desirable development should now be extended to other regions, especially to West and Central Africa. However, excellent this net-work and its declaration of commodity neutrality, it nevertheless is perceived to be biased in favor of CIMMYT's mandated crops (wheat and maize). Other IARC's would incur a similar problem. Therefore, this project might be better managed by an appropriate non-IARC contractor if transferred to another region.

Regional commodity networks are certainly the most effective means for validating and transferring technology to national research and production systems. While the present group of networks should be

nurtured and continued for the foreseeable future, there are other opportunities and urgent needs if funds are available and/or included in Phase II of SAARFA.

An interesting question may be raised on the optional model for networking as the six IARC's have developed their outreach activities somewhat differently despite the similarity of objections. However, it may be premature to select a prototype network as a model for the future, although CIAT's bean network is attractive. The East Africa bean network comprises only four countries and is closely linked to the other two bean networks in central (Great Lakes) and southern (SADCC countries) Africa. The three sub-networks are linked by an institutional coordinator and share expertise. This allows a broader range of disciplines in residence on the continent and less reliance on expertise from the home institution in Colombia, S. A.

Finally, it would be interesting to determine how the six networks compare relative to each other. Although the evaluation was much too limited and superficial, the preliminary ratings on regional effectiveness are as follows:

EFFECTIVENESS RATING *

ASPECT	CIAT BEANS	ICIPE INSECTS	CIMMYT OFR/FSR	CIP POTATO	ICRAF FORESTRY	IITA ROOTS
1. Research	5	4	N/A	3	1	3
2. Training	4	3	5	4	1	3
3. Communications	4	2	4	4	2	3
4. Institutional-ization	4	3	4	5	2	3
5. Impact on Policy	3	2	5	3	2	2

* 5 = highest rating; 1 = poorest

Two additional concerns with broad relevance to the SAARFA project, but which do not fall under purview of this evaluation are briefly discussed in outline form as "Extraneous Notes" on Technology Transfer (Annex "C") and impact of Technology on African Agriculture (Annex "D").

C. Summary of Recommendations

Proposed improvements and recommendations of the SAARFA commodity subprojects are briefly summarized in three categories: (1) Subproject continuation in Phase I; (2) Ongoing and new iniatives in Phase II; (3) Policy and structural adjustments.

1. Subproject continuation in Phase I.

CIAT-Beans. This highly successful subproject should be supported throughout Phase I (to August 1991); and continued in Phase II. However, CIAT might find it advantageous to delineate regional research activities from networking per se.

ICIPE - Bases to Plant Resistance to Insects. This subproject has made satisfactory progress towards its objectives and should be supported fully throughout Phase I (September 1991). Any new initiative in Phase II should be considered favorably, (if reasonably budgeted), but linked to ICRISAT's programs both in Africa and India.

CIMMYT-II Farming Systems Research. This has been a highly productive training activity which will largely complete it's goals by the present terminating date (June 1990). If possible, this subproject should now focus on West and Central Africa--from 1990 and into Phase II.

CIP-Potato Improvement. Continue support until February 1991 with encouragement for a new initiative in Phase II. Considering the minor importance of white potato in Africa, any significant expansion of current activities would not be justified.

ICRAF-Forestry/Fuelwood. Current activities and policies are not satisfactory to justify continuation of SAARFA support. Any consideration of continuing the subproject beyond it's present LOP (September 1991) should be contingent on ICRAF's change of policies and management and the immediate establishment of a vigorous, productive research program.

IITA-E&S Africa Root Crops. Continue support for the subproject LOP (April 1990); and, if possible, on a strengthened basis, (adding a second scientist). Encourage extension for one year to (April 1991), and submission of a new initiative in Phase II.

CIP - Sweet potato Network. Provide additional support for CIP to launch a new program on sweet potato whenever that Center is ready; and continue in Phase II.

WARDA-Mangrove Rice. Continue the bridging grant until the end of 1990. No new initiatives are foreseen for Phase II.

2. Ongoing and New Initiatives in Phase II.

Ongoing subprojects. It is anticipated that at least five ongoing programs will be continued in Phase II: (i) CIAT-Beans; (ii) ICIPE-Bases to Plant Resistance to Insects; (iii) CIP - Potato Improvement; (iv) CIP - Sweet Potato Improvement; and (v) IITA - E&S Africa Root Crops Improvement. In addition, CIMMYT may develop a new OFR training project for West and Central Africa; and ICRAF might possibly make the changes necessary to qualify for continued support. (Note: for this purpose the CIP-Sweet Potato Network is assumed to have become established by the end of Phase II.

New Initiatives in Phase II. Highest priority is recommended for establishing a new and comprehensive program on "sustainable cropping" for all tropical ecologies in Africa. This subproject might assume the form of a consortium of IARC's and other interested institutions. Led by IITA, other partners might include ILCA, CIAT, ICRAF (if qualified) ICRISAT, and interested U.S. universities.

Among new commodity subprojects highest priority is given to banana/plantains managed by IITA. This network will need working centers and testing sites in West, Central and East Africa--perhaps in Uganda, Rwanda Cameroon, Zaire, Nigeria and Ivory Coast.

The third new and widely applicable initiative would be tropical pastures coordinated by ILCA. At present there is no assessment of the adequacy of the research and networking in this area. However, there is an urgent need to increase animal production through improved tropical pastures and to link-up this research with whole farm enterprise, especially with sustainable cropping.

Policy and Structural Adjustments. The concept and operational strategy of SAARFA is brilliant. Although it is a new program, relatively few deficiencies and misdirections were noted by this reviewer. These have been noted in prior sections and will be only briefly mentioned below:

(i) Policy on support to agricultural universities is not clear. It would appear more appropriate at this juncture to support more 'mature' institutions ready and prepared to assume a specialized training or research activity on a regional/international basis. Other worthy institutions (eg. University of Rwanda) should receive bilateral aid.

(ii) Commodity networks can easily become too large. A maximum of 5 or 6 countries in a more homogeneous area would be ideal (a la CIAT).

(iii) Blurring the distinction between integral activities and special projects can result in confusion and misunderstanding by NARS and donors alike. Therefore networking coordinators (IARC's) should make long-term commitments (eg. core research projects) to Africa as a pre-requisite to special project support from SAARFA.

(iv) Network contractors and their NARS collaborators must be held accountable for assessing the impact of their technology/training activities (see Annex D).

(v) The present arrangement for central management of SAARFA being assigned to USAID/REDSO in East Africa is excellent and could not be improved upon.

V. CONCLUSIONS:

The SAARFA project may have the greatest potential of all conceivable activities for effecting desirable change and progress in its target region and countries. Nevertheless, this is a long term activity which may not produce significant economic gains for at least ten years. On the other hand there are beginning to be some tangible results in different areas and commodities; and the beginning of change in attitude and approach to the technology process. The CIMMYT-II OFR/FSR training network has already had a major impact on changing strategies among administrators, researchers, and technicians.

Although measurable economic gains accruing directly from SAARFA networking are still in the future, this project will be perceived as the most profitable investment in Africa by the turn of the century. It must, however, be sustained by external support for the foreseeable future--or at least for another 20 years. This will ensure that the excellent cadre of scientists and net-workers--both at the IARC and national levels--will continue their current activities with enthusiasm and vigor.

TEXT TABLE 1- LIST OF SAARFA COMMODITY NETWORKS EVALUATED

TITLE	*IMPLEMENTING AGENCY	PROJECT FY83-88/9	PERCENT OF TOTAL FY83-89	PERIOD FUNDED START	FINISH	REGION & COUNTRIES
1. East Africa Bean Research 698-0435.01	CIAT (also CIDA)	2.500	8.9	8-84	8-91	Primarily Kenya, Uganda,
2. Bases To Plant Resistance To Insect Attack 698-0435.02	ICIPE (others)	2500	8.9	9-84	9-91	Carried out mainly in Kenya
3. Farming Systems Research 698-0435.03	CIMMyT (CIDA)	5000	17.8	6-85	6-90	East and South Africa (13 countries)
4. Potato Improvement For Central Africa 698-0435.04	CIP	1557	5.5	2-86	2-91	Encompasses Zaire, Rwanda & Burundi (orig.) to be expanded
5. Forestry/Fuelwood Research and Development 698-0435.05	ICRAF (AID/AFR-B)	300	1.1	9-86	9-91	Headquarted in Nairobi; target areas incl. 4 zones: lowland humid tropics-the Sakel;subhumid unimodal highlands of S.A.-sub-humid bimodal highlands of E.Afric
6. East & Southern Africa Rootcrops Research Network 698-0435,07	IITA (IDRC)	943	3.4	4-87	4-90	Trip enter in Malawi; incl. Sudan,Ethiopia,Kenya,Uganda, Rwanda,Burundi,Tanzania, Malzam,Mazambigui,Madagascar
7. Mangrove & Associated Swamp rice	WARDA	1400	5.0	10-87	10-89	Sited at Rokupr, S.L. (80%) others:Gambia,Guinea-Bissau and Nigeria
Other Sub-Projects (6)	*Incl.other Donors	10267	36.6			
Direct Activities	DEVRES, USDA PRSA, IPRI PEDSO/ESA	5226				
Items 1 - 7		14200				
Overall (Incl. New Sub-Projects)		18064				
GRAND TOTAL: 1983 - 92		42003.5				

* Malawi

Attachment A
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Annex "A"

TRAVEL/DAILY ACTIVITIES REPORT
SAARFA EVALUATION: 1988-89

K. O. Rachie - Agronomist

DATE	TIME	ACTIVITY
12-13-88	Dep. 7:30 hrs Arr. 13:00 hrs	Travel from Hot Springs to Little Rock (AR) and Washington, D.C. for briefing on SAARFA evaluation
12-14-88	All Day	Planning/organizational meeting on SAARFA project evaluation
12-15-88	All Day	Planning meeting on SAARFA evaluation
12-16-88	Dep. 7:30 hrs Arr. 17:30 hrs	Travel from Washington, D.C. to Hot Springs Village, AR
1-6/7-89	All Day (2)	Preparation for travel to Africa; perusual of documents/reports
1-10-89	Dep. 12:05 hrs Arr. 16:00 hrs	Travel from Clermont, Fla. to Orlando and Washington, D.C. for pre-departure meeting on SAARFA evaluation.
1-11-89	All Day Dep. 20:00 hrs	Attend meeting on SAARFA evaluation; depart from Dulles AP for Nairobi
1-12-89	All Day Arr. 24:00	Travel to Nairobi
1-13-89	All Day	Nairobi USAID-REDSO (McColough); Met with Director of the Kenya Agriculture Research Institute or KARI (Wapakala/Matata)
1-14-89	All Day	Nairobi: discussions with REDSO/ESA (McColaugh/Masamba)

1-15-89	All Day (Sunday)	Nairobi: Met with Network Coordinators at McColaugh's home: IITA (Alvarez), CIP (Nganga), CIAT (Kirkby); also IPRAF and ICIPE
1-16-89	All Day	Nairobi: Meeting with CIMMYT (Ananda) KARI (Matata), Edgerton University officials and REDSO
1-17-89	Dep. 10:30 hrs Arr. 12:30 hrs	Traveled from Nairobi to Kigale, Rwanda; briefing by USAID (Crawford and Graham)
1-18-89	All Day (Rawanda)	Traveled to Ruhengiri (North) and met with PRAPAC/CIP project (Kloos and Pierre); proceeded to ISAR-Rwerere to visit University of Arkansas Farming Systems Project (Yamoch and Colleagues) Returned to Kigale
1-19-89	All Day (Rawanda)	Traveled to ISAR headquarters at Rubono to meet with the Director (Gahamanyi); and to the University of Rawanda at Bukare to meet with the Dean, Faculty of Agriculture (Bara Bwiliza) and University of Minnesota (Hanagreef).
1-20-89	Morning Dep. 12:30 hrs Arr. 14.45 hrs	Met with SESU/MSU project in Kigale (Loveridge); traveled from Kigale to Kampala; briefing by USAID (Agard/Iyvers); and met with CIAT bean researchers (Wortmann/Grisley)
1-21-89	All Day (Uganda)	Visited Kawanda research station with Wortmann to see CIAT bean network program and research facilities; traveled to Makerere University Farm at Kabanyolo to observe the rehabilitation of that facility (Kasenge/Simmons)
1-22-89	Sunday (Uganda)	Holiday - Studied reports

1-23-89	All Day	Meeting with USAID (Iyvers/Agard/Lucas); visited Namulonge Research Station to meet with national root crops program (Mwanga) participating with the IITA Root crops Network. Afternoon meetings were held at Makerere University with the Makerere Institute of Social Research (Mudola); and with the Dean of Faculty of Agriculture (Mugerwa) and his heads of departments.
1-24-89	Morning	Kampala: briefing with the USAID Director (Podol); meeting with the National Potato Research and Development Program affiliated with CIP (Akimanzi) and the AFRENA (agroforestry) representative located at Kabale and affiliated with ICRAF; and had a luncheon meeting with MOA officials in Entebbe (Mukiibi/Mugerwa/Fenster). Departed Entebbe for Nairobi at 3:30p.m.
1-25-89	All Day	Visited the plant Quarantine Station at Muguga (Okioga) partially supported by CIP. Met with the National Potato Research Center and CIP Potato Breeder (Njoroge/Kidanemariam) and with CIMMyT-II On-Farm Training Network Coordinator (Anandajaya Sekaram) in the evening.

1-26-89	All Day (Kenya)	Traveled to Mbita Point, the ICIPE Field Station on Lake Victoria (Saxena) and the on-farm development at Oyugis with ICIPE researchers, including meetings with three small farmers collaborating with ICIPE in practicing recommended (low purchased inputs) maize/beans agronomy. Returned to Nairobi by air in the evening
1-27-89	All Day (Kenya) Dep. 23.25 hrs	Visited the ICRAF Field Station at Machakos (Rao/Kurira) to observe agroforestry plots. Held meeting with REDSO for debriefing with the Director (Shah/McColaugh) in the afternoon. Departed Nairobi for the U.S. at midnight.
1-28-89	Arr. 21:30 hrs	Travel to US via Amsterdam, London, Orlando
2-6/10-89	All Day (5)	Florida: Study documents and preparation of report
2-9-89	Dep. 6:30 Arr. 10:00	Travel· Clermont, Fla. to Washington to attend a review and planning meeting on SAARFA evaluation
2-10-89	All Day	Washington, D.C. attending a review and planning meeting on SAARFA evaluation
2-11-89	Dep. 7:40 Arr. 11:00	Travel: Washington, D.C. to Florida
2-13/14-89	All Day (2)	Florida: Preparation of report
2-22-89	Two Hours	Dakar, Senegal: Discussions on Mangrove swamps rice with Dr. E. R. Terry _ DG of WARDA

Est		
3/21-23/89	All Day (3)	Florida and/or Washington - reviewing reports and wrap-up meeting.

Estimated days worked: 32-35

PRINCIPAL CONTACTS INTERVIEWED DURING SAARFA EVALUATION TRAVELS IN AFRICA

(K. O. Rachie and R. Newberg)

USAID

Monica Sinding	-	Evaluation Officer	- REDSO/ESA
Satish Shah	-	Acting Director	- REDSO/ESA
Robert McColaugh	-	Chief, Agricultural Div.	- REDSO/ESA
David Gibson	-	Reg. Forestry Advisor	- REDSO/ESA
Robert Edwards	-	Development Officer	- REDSO/ESA
L. A. Arao	-	Development Officer	- REDSO/ESA
Hudson Masambu	-	Project Manager	- SAARFA/REDSO/ESA
J. C. Sentz	-	Agriculture Liaison Officer	- IITA/USDA/USAID

KENYA NATIONAL PROGRAMS

W. W. Wapakala	-	Director of Research - KARI
J. B. Matata	-	Asst. Director - KARI
R. Milikau	-	Biometrician - KARI
D. Okioga	-	Director, Plant Quar. Sta. - KARI
Isaiah Njoroge	-	Director, Potato Res. Ctr., Kigoni
G. M. Karanja	-	Agronomist, Reg. Res. Ctr., Kisii
S. N. Maobe	-	Agronomist, Reg. Res. Ctr., Embu

IARC NETWORKS

P. Anandajayasekaram	-	Regional Economist	- CIMMyT-II
F. Palmer	-	Maize Agronomist	- CIMMyT
R. A. Kirkly	-	Bean Regional Coordinator	- CIAT
S. Nganga	-	Potato Regional Coordinator	- CIP
H. M. Kidanemariam	-	Regional Potato Breeder	- CIP
M. N. Alvarez	-	Root Crops Regional Coord.	- IITA
K. N. Saxena	-	Leader, Plant Res/Insects	- ICIPE-MP
K. V. Seshu Reddy	-	Applied Ecology	- ICIPE-MP
M. O. Odindo	-	Biological Control	- ICIPE-MP
P. M. Arrumm	-	Protocol Officer	- ICIPE-N
L. Ngode	-	Ext. Proj. Leader	- ICIPE-Oyvgis
Mama Murita	-	Farmer, Oyugis	- ICIPE, proj.
Mathayo Rapemo	-	Farmer, Oyugis	- ICIPE, proj.
M. R. Rao	-	Researcher	- ICIPE, proj.
Peter Kurira	-	Farm Manager	- ICRAF Station at Machakos

RAWANDA

USAID

J. A. Graham	-	Director	- USAID (Kigale)
P. R. Crawford	-	ADO/USAID	- (Kigale)
Valens Ndoreyho	-	Agriculture Project Officer	- USAID
Paul Hanagreef	-	U of Minnesota/U of Rwanda	- (Bukare)

RUHENGERI (Potato Center)

Jeroen P. Kloos	-	Coordinator	- PRAPAC/CIP
Tegera Pierre	-	Director of PNAP/ISAR	

RWERERE (Agroforestry)

James R. Burleigh	-	Leader/Plant Pathologist,	U of Arkansas
Val Eylands	-	Agronomist	U of Arkansas
Charles F. Yamoch	-	Soils Scientist	U of Arkansas
Serigne N'diaye	-	Rural Sociologist	U of Arkansas

RUBONO/BUKARE

Leopold Gahamanyi	-	Director of ISAR
Runyinya Bara Bwiliza	-	Dean, FA Natl. Univ. Rwanda

SESA/MSU - Kigale

Scott Loueridge	-	Food Security Project, Mich. St. Univ.

UGANDA

USAID

Richard Podol	-	Director, USAID Mission
Ken Lyvers	-	ADO/USAID, Kampala
Al Aberg	-	Agriculture/USAID
Ernesto Lucas	-	Agriculture/USAID

KAWANDA RESEARCH STATION - BEANS

Charles S. Wortmann	-	Bean Agronomist, CIAT
William Grisley	-	Bean Regional Economist, CIAT

KABANYOLO FARM (MAKERERE UNIVERSITY)

Valentine Kasenge	- Farm Manager, Kabanyolo
Ch. Simmons	- Manpower for Ag. Dev. (MFAD), USAID

NAMULONGE RESEARCH STATION (ROOT CROPS/MAIZE PROGRAM)

Robert Mwanga	- Plant Breeder-Root Crops, NARO
Ruth Kabanyoro	- Maize Agronomist, NARO
J. J. Hakiza	- Leader, Maize Program, NARO
Gadi Gumiseriza	- Grain Legume Program, NARO

MAKERERE UNIVERSITY

Don M. Mudola	- Prof. of Political Science, MISR
W. Kisamba - Mugerwa	- Sr. Research Fellow, MISR
John Mugerwa	- Dean, Faculty of Agriculture
Julius Zaki	- Prof. and Head, Soil Science
Trevor Arscott	- Chief of Party, MFAD/USAID

NATIONAL AGRICULTURE RESEARCH ORGANIZATION

John Mukiibi	- Secretary for Agriculture, NARO (Entebbe)
John Okorio	- Research Officer, AFRENA/ICRAF
Deo R. Akimanzi	- Potato Research/Development, NARO (Entebbe)
William Fenster	- Research Advisor, MFAD/USAID

SOME EXTRANEOUS NOTES ON SAARFA EVALUATION:
A Primary Constraint To The Technology Process - The National Agriculture Extension Services

Translating research advances into on-farm improvements is difficult at best given the prevailing compartmentalization of key element of the technology process especially research and extension. Extension services in many LDC's seldom function effectively in technology diffusion nor are they adequately equipped to do so. Moreover, the NAES often act as a buffer between researchers and the farmer - a situation many scientists all too readily accept. Therefore, it is surprising when technology is designed specifically for farmer use and actually diffuses through the barrier. Further aspects of this problems are discussed below.

A. The problem With NAES:

1. Buffer researcher contact with farmers
2. Almost universally ineffective in disseminating technology in LDC's
   a. Lack of good technology to extend.
   b. Lack of budget and facilities (esp. transport)
   c. Burdened with other duties

B. Possible Solutions:

1. Reorganize part of NAES along commodity lines
2. Vertically integrate research/validation/diffusion (re. commercial seed companies)
3. Provide farmer-to-farmer incentives to multiply transfer of technology components
4. Eschew the cavalier attitude toward farmers by research/extension/political establishment (eg. farmer determines which technology components he wants)
5. Strengthen the seed industry and input distribution networks
6. Ensure final testing of technology components over entire growing region (perhaps 10 to 100 x at present)

C. Intranational Network Model - A Discussion:

The ultimate model of effective networking would be to utilize these principles at the national level - that is in close concert with its' ultimate client, the farmer. Until there is complete integration of the three major phases of development (technology, generation, validation, and diffusion) and researchers come into intimate contact with farmers and their problems, progress will be unnecessarily slow. Recognizing this persisting impediment several interesting new models are being explored,

such as: (i) the ICIPE on farm validation project at Oyugis, Kenya; (ii) minikit trials of cowpea varieties and practices in Senegal (bean/cowpea CRSP/USAID/UCR), and (iii) commercial seed industry in the Western Hemisphere, Europe and Asia. It is suggested that a successful, intranational, vertically integrated commodity network have the following attitudes and functional characteristics:

(1) Assume that individual farmers are both rational and motivated by a complexity of factors. In any event, they have full autonomy to accept or reject technology, and sometimes for undetermined reasons. It further assumes that farmers do not have to be convinced to accept good, useful technology, but will subscribe eagerly once they see its benefits.

(2) Agriculture technology is more likely to be evolutionary than revolutionary - especially on rainfed areas and in stressful situations. That is, progress occurs in incremental steps and more deliberately over time. Nevertheless, breakthroughs are possible especially when unusual events occur (such as drought, change in economic conditions, presence of devastating diseases or pests), if the research "lucks out".

(3) Technology generation is directly focused on real farm problems, and is carried out in close concert with farmers/clients. This approach necessitates much more on-farm testing than at present to better represent the agro-ecological conditions being served, and a broader range of farmer's conditions and requirements. These tests need not be complex, but can be as simple as plus and minus effects. It is further suggested that simple validation trials can, if widely replicated, even replace demonstrations. This will also raise the "plane of expectations and participation" to the more interesting and dynamic level of experimentation and innovation rather than the routine with demonstration which everyone is familiar.

(4) Vertical integration of the technology process including all aspects of generation, validation and diffusion in such a way as to ensure relevance of the research and continual feedback from growers needed to fine tune the design. In this way the ultimate client (the farmer) can participate in all phases of the process including on farm testing. It is further suggested that farmers can participate directly in carrying out simple trials on other farms, if properly trained and given incentive. Moreover, they will also find it profitable to distribute improved seeds, planting stocks and animal breeds, especially if networks of commercial input suppliers have not yet become established.

(5) There are at least two models for final validation trials and diffusion of technology:

(i) Nucleus estate or "mother farm" which is strategically located and willing to serve a number of nearby smaller farms. Perhaps it already services other inputs and purchases produce from its neighbors. On-farm trials can be conducted, seeds increased and distributed from this "mother farm".

(ii) Farmer-to-farmer networks or "pyramids" in which farmers are trained and provided incentives to carry out simple trials on their neighbors fields. This scheme will accomplish the distribution of improved genetic materials, but usually not other inputs (equipment, tools, fertilizers, pesticides).

It can be concluded that the technology process from generation to diffusion is highly inefficient as currently practiced. However, weakness in the system are recognized and new models are beginning to emerge. These may be improved further if suitable opportunities arise in countries or "regions ready for change". Ultimately, such new models could benefit most from emulating the best features of commercial seed companies in developed countries. What is needed is the courage to change and support for experimenting with these models in small holder production systems.

SOME EXTRANEOUS NOTES ON SAARFA EVALUATION: Proposed Study on "The Impact of Technology on Agriculture in Africa"

A continuing concern of administrators is ensuring long-term support for the technology process in Africa as a consequence of the prevailing notion that technology has had little or no impact on agriculture in the continent, and particularly on the improvement of food crops, and production by small farmers. This misconception is exacerbated by the lack of reliable production statistics and/or continuing documentation of the impact of technology in different regions, areas and systems. One possible approach to this problem is outlined below.

A. Justification:

1. Justify resources expended/committed.
2. Focus public concerns and interest in African problems.
3. Help coordinate donor support.
4. Establish a baseline for future study and evaluation.
5. Change/modify attitudes and thinking of administrators, researchers and developers (eg. need to begin immediately in assessing impact of technology).

B. Some Proposals on an Impact Study:

1. Organize a World Conference for about 10 to 14 days, not less than 2 years nor more than 5 years from initial planning date (eg. 1992-95).
2. Seek participation by all national governments (tropical Africa) and donors of record in the collection of information and costs.
3. Designate an independent organization (contractor) to do detailed planning, organizing, assembling information, carrying out the logistics, and publishing.
4. Provide support to improve the data base (official production statistics) through verification techniques like:
   a. Independent experiences and judgement of knowledgeable persons:
      - Government officials
      - NARS researchers
      - Marketing groups
      - International networking coordinators
      - Statistics departments
   b. Independent production/yield sampling (eg. MSU/SESU project).
   c. Food consumption sampling.
   d. Landstat mapping data.

e. Combinations of the above.

C. Commission Topical Papers for Advance Preparation: *

1. Two parts:
   a. Part I: pre-independence with focus on cash/export crops to the early 1960's (broad summary)
   b. Part II: early 1960's up to the present with primary focus on food crop research
2. Structure conference in three sections:
   a. Section A: papers on specific commodities and problem areas
      - Food grains: maize, sorghum/millet rice
      - Root crops: potatoes, cassava, sweet potatoes, yams, bananas
      - Grain legumes: cowpeas, beans pigeon peas, others
      - Horticulture and other crops
      - Animal science: large ruminants, small ruminants, poultry, swine, other
      - Fisheries and aquaculture
      - Animal health
   b. Section B: consolidation/over view papers: *
      - Synthesis of materials presented in Section "A" and broad conclusions:
        + cash/export commodities
        + food grains/root crops
        + legumes/horticultural crops
        + animal production/health
        + fisheries/aquaculture
      - Neglected crops and future needs
      - Demographic trends
      - Priority areas and prospects for the future
      - Investments needed to make the required changes
3. The Product:
   a. Proceedings to be published in two volumes.
   b. Newsletter on the progress of technology (2-4 x per year)
   c. VCR tapes on problem areas and technology breakthroughs.
   d. Other communications.
4. Plan a second international conference after 10 years.

* NOTE: It is widely acknowledged that productivity levels have declined over much of tropical Africa as a consequence of degradation of the resource base: eg. increased pressure on the land, increasing cultivation of marginal lands, shortening the fallow period, rapid rise in cost, unavailability of inputs and rapid build up of pests and diseases in more intensively cropped areas. Therefore, due attention must be give not only

to measurable improvement in yield levels; but also to those technologies responsible for slowing the production decline, to developments contributing to the efficiency of production-especially when manual or animal draft cultivation methods are used, and especially when technology breakthroughs allow intervention of catastrophes. Examples of the latter include: (i) discovery and rapid (air) dispersion of the parasite controlling the disastrous cassava mealy bug; (ii) streak-resistant maize varieties and (iii) multiple disease/pest resistances of rice, wheat, cowpea and other crops.

ATTACHMENT B

Socioeconomic Research Under SAARFA

The socio-economic research activities under SAARFA were, in general, begun relatively recently. All were initiated in 1987, and hence, do not have a long a "track record" under SAARFA. In most instances, however, the research harks back to a longer tradition of work under earlier activities, and this general "baseline" can be used to a certain extent in interpreting the patterns found to date.

The general objectives of the SAARFA project were to strengthen regional and national agricultural research systems and programs to improve:

a) their technical and managerial capacity
b) their relevance to client farmers' priorities, economic and social problems
c) linkages among African research centers and the international research centers, and
d) functional linkages with and support of national agricultural extension systems.

The socio-economic activities differ in the degree to which they fit the original SAARFA objective. For a more detailed assessment, see project specific summaries.

The newer subprojects contribute to an important objective not covered under the original SAARFA mandate. They emphasize research capable of evaluating and supporting key choices in agricultural policy. In light of the increased commitment to policy reform, and the potentially large impact decisions about agricultural policy have for agricultural productivity, as well as the income and general well being of farmers, this emphasis seems appropriate, and should be more explicitly recognized in future SAARFA projects.

The newer socio-economic research activities also hold the potential for enhancing the utility and perceived relevance of more commodity-base agricultural research. The importance of socio-economic factors in determining the applicability of technical research results, and the need to build a knowledge of such factors into both the research and extension process, was recognized in the original SAARFA mandate. The evaluation team finds, in fact, that SAARFA has been a useful vehicle for incorporating this awareness into national and international research institutions. Several of the new socio-economic activities extend this lesson from the micro-level to more macro considerations, examining the extent to which polices are an integral part of the environment in which agricultural research and innovation occur, and providing a channel for evaluating empirically the probable impact of alternative policy decisions on farmers.

Direct Project Activities

Direct Activity Title: Effects of Selected Policies and Programs on Consumption Patterns and Child Survival in Africa

Project Number: 698-0435

Date of Obligation: 01-07-87

Completion Date: 30-06-88

U.S. Funding $270,000

This direct project activity is being implemented through the International Food Policy Research Institute.

Its purpose is to provide concrete information on the role of domestically produced and imported foodgrains in the diet, the effects of agricultural sector policies on food consumption and nutritional status, and the income and nutritional effects of macro-structural adjustments on the poor.

There has been no evaluation of this activity.

The subproject did not emphasize the importance of strengthening local institutions, and in this respect, differs from the emphasis of many other SAARFA activities. Its primary focus was to conduct research which would provide guidance to the Africa Bureau on three major policy issues: consumption substitution between domestically produced and imported food grains; possible effects of production shifts from food grains to cash crops, and the commercialization of agriculture; and the implications of the changes in the nature/type of development assistance to Africa. These objectives seem legitimate, and play an important role in assuring consistency between overall research "Plan" objectives, and the objectives and priorities reflected in AID's commitment to policy dialogue and program assistance to support policy reform.

IFPRI publications on dietary composition and commercialization impacts are well done, salient, and appear to have been useful to both AID and a larger audience. Initial work on the nutritional impacts of adjustment was important. Greater attention to this important issues is now characterizes both World Bank studies of adjustment lending and AID's project portfolio, especially its recently funded Project on the Nutritional Impact of Structural Adjustment Lending in Africa (Per Pinstrup-Anderson, Cornell University).

Based on the discussions of the evaluation team in the field, more attention in future work of this type should be paid to non-cereal crops, which appear to play an important role in the consumption shifts occurring in response to both environmental and economic conditions. These commodities include rootcrops (eg. cassava, sweet potatoes) and legumes (eg. beans). More accurate information on consumption shifts could lbs tied directly to the work of networks in East and Southern Africa.

The issue of the impact of commercialization of agriculture is important, but should probably not be limited to a discussion of cash crops. Again, field discussions and the preliminary results of other research (eg. Michigan State Food Security team in Rwanda) suggest that food crop sales are a significant source of income for farmers. These transactions are often difficult to evaluate, either because they occur outside central, "controlled" markets or because they occur as "informal" trade across national borders. Better understanding of these patterns, particularly in the light of economic and policy adjustments, would again strengthen both commodity network and support more effective policy change.

Sub-Project Activities

Sub-Project Title: Food Security in Africa

Sub-Project Number: 698-0435.08

Date of Obligation: 11-05-87

Completion Date: 11-03-90

U.S. Funding: $600,000

This subproject is being implemented by Michigan State University.

The purpose of the subproject is to assist African countries in formulating alternative institutions and management processes to deal with critical short and medium term food security problems in ways that are consistent with longer-term strategies for achieving more reliable, productive and dynamic food systems.

The subproject was evaluated in March, 1988.

The SAARFA evaluation generally concurs with the favorable evaluation of this project, evaluated as a free-standing activity.

The subproject has had a significant output, both in terms of written material and seminars/briefings. It has been particularly adept at formulating working papers, which have been circulated locally while analysis was still preliminary as a mechanism for stimulating policy dialogue and incorporating results into policymaking process.

The subproject has been the most adept of those reviewed in identifying substantive findings and reporting them, both in the field and through briefing materials and participation in professional meetings (eg. AAEA).

However, when evaluated as part of the overall SAARFA activity, the team sees several areas in which improved integration would enhance both the performance of the subproject itself, and the overall functioning of the SAARFA.

1) Coordination with technical projects
An important thrust of the subproject has been its focus on the interaction of technical change, institutional reforms and macro-level policy in overcoming food production and marketing constraints. This focus appears to have produced policy relevant insights, particularly

with respect to proposed bean pricing changes in Rwanda, and the effects of proposed marketing reforms in Mali.

Based on discussions in the field, the evaluation team concluded the commodity networks, and the REDSO/ESA officials responsible for managing and coordinating the network subprojects, had virtually no knowledge of the Michigan State activity, its findings, or their potential relevance to ongoing technical work. The team concludes that more effective integration of the work under this subproject and that of the commodity networks would be both possible and desirable. Formal transmittal of analysis to commodity network coordinators could usefully complement socio-economic activities ongoing in the networks themselves. Feedback on technologies being developed/evaluated (eg. bean varieties) would, in turn, provide this subproject with more up to date information on potential technological change.

SAARFA evaluation team interviews in Southern Africa found informal contacts existed between MSU activities and the CIMMYT farming systems research activities. These included joint attendance at workshops and exchange of papers. Budgetary constraints were cited as a limitation to expanding such interactions.

Particularly in Eastern and Southern Africa, where networks are well developed, every effort should be made to create linkages. This does not necessarily preclude a "policy analysis" network, although the latter may be more difficult to establish, and have less clear elements of exchange (eg. the equivalent of germ plasm) than other networks.

2) Integration with other socio-economic projects

Some of the themes explored in the Michigan State project are also treated, at a more macro level, in the IFRI work (eg. the net production or consumption status of farm households, food/cash crop "tradeoffs"). The SAARFA team understands that researchers in both the IFPRI and Michigan State subprojects are aware of each other's work. However, would recommend that a formal effort be made to distribute analytic results both centrally and in the field. Given the alternative commodity coverage (eg. Michigan State does have some additional information on non-cereal commodities), greater integration could both conceptually and programmatically strengthen output.

3) More attention to national institutional strengthening

In addition, while the project has clearly been successful in creating policy-relevant materials, and obtaining the participation of policy makers in its seminars, its progress in strengthening national policy analysis capability in less clear cut.

The SAARFA evaluation team interviews in Southern Africa explored the relationship between MSU activities and the SADDAC/SACCAR activities. There was contact, especially involving joint participation in conference, on panels and transmittal of papers to the SADACC Council of Ministers. This was characterized as a "slow process", however.

Training activities, while increasing the human capital available for national policy analysis activities, does not automatically translate into sustainable increases in the ability of local units to undertake relevant policy analysis and translate it into meaningful policy changes. The evaluation teams recommends that the SAARFA project consider additional funding to permit an assessment of the factors which affect the demand for policy analysis within key host country organizations, and develop explicit strategies for creating/servicing that demand within the framework of the socio-economic projects.

Sub-Project Activities

Sub-Project Title: Fertilizer Policy Research for Tropical Africa

Sub-Project Number: 698-0435.12

Date of Obligation: 01-08-87

Completion Date: 30-07-92

U.S. Funding: $2,091,000

This subproject is being implemented by the International Food Policy Research Institute (IFPRI).

The purpose of the project is to collect and analyze primary and secondary data on fertilizer use as a basis for recommending fertilizer use policies and training fertilizer policy analysts in selected African countries.

There has been no evaluation of the sub-project. One is scheduled for July, 1990.

Project implementation appears to be behind the original schedule, primarily because of difficulty and delay in hiring research fellow to be posted in Togo. While this has now been accomplished, it is 10 months behind the initial schedule.

Data collection activities, the holding of policy workshops, and initiation of detailed country reviews have proceeded essentially on schedule.

The research topic identified is an important one, both because government policies have historically affected agricultural inputs such as fertilizer, and because a wide range of economic adjustments can directly or indirectly impact fertilizer policy, as well as fertilizer supply and distribution.

Output to date has been limited. A review of the research strategy, and the proceedings of the conference, suggest a number of issues which should be addressed in the context of the wider SAARFA activity.

- The research strategy has been organized around agroecological zones, in part because of the need to tie analytic results to physical response data. This strategy depends very heavily on the

quality of the available physical response data. Several members of the evaluation team have questioned the adequacy of such data, and hence, the ability to make scientifically well grounded analysis of policy

Sub-Project Activities

Sub-Project Title: Access to Land, Water and Natural Resources

Sub-Project Number: 698-0435.09

Date of Obligation: 31-05-87

Completion Date: 31-05-90

U.S. Funding: $500,000

This subproject is being implemented through the Land Tenure Center, University of Wisconsin. It is a Africa Bureau contribution in support of the worldwide project on Access to Land, Water and Natural Resources (936-5301).

Its purpose is to undertake research into the relationship between land and resource rights and sustainable agricultural production and natural resource management, and devising land tenure arrangements and sustainable agriculture. The research is intended to enhance the capacity of African research institutions and universities to conduct applied research and problem solving in the areas of natural resource management, agricultural production and land tenure.

The ACCESS project was evaluated in December, 1986. The evaluation was in general favorable. It recommended increased attention to land tenure aspects of natural resource management, greater long-term research commitment and more collaboration with host country research institutions. The SAARFA subproject was initiated in part as a mechanism for responding to these recommendations.

The action memo indicated that the subproject would also assist in implementing the Africa Bureau's Plan for Natural Resources Management, as well as the Plan for strengthening Agricultural Research and Faculties of Agriculture. Both of these plans are broadly consistent with work undertaken under the subproject, although several areas for potential divergence should be noted. These include:

The action memo provided a general specification of inputs (through a line item budget) and categories of outputs. However, quantitative indicators of input an output were not specified. Neither were there indicators linking these output categories with the broader SAARFA objectives.

Output expected under the SAARFA subproject includes:

- a "state of the art" paper on land tenure and natural resource issues (due in April, 1989)

- case studies of land and resource tenure in natural resource management (with likely emphasis on the Sahel and the strong role of the state in resource management)
- applied research reports serving as input to missions where land tenure is an issue

Work underway in Uganda, Somalia and Lesotho has in each case made some direct input to mission/government policy of resource management.

Given the much larger ACCESS project, and previous Africa Bureau support for it, is difficult to explicitly isolate contributions under the SAARFA subproject. Detailed funding acknowledgement were not explicitly provided in the recent papers reviewed by the team. Output reviewed indicates that the general themes identified as priorities under the SAARFA subproject are being addressed, and that some of the work either has been (Uganda) or will be (Somalia) related directly to increasing the capacity of local analytic units. However, much of the work appears to have the character of relatively short-term analysis, rather than a more focused and sustained commitment to enhancing local capacity (eg. though networks or sustained presence).

The research topic is clearly one of great importance for Africa, and additional work in this area is required. However, more direct links should be made between the process of completing studies, and the more general SAARFA objectives of strengthening national research/policy making capacity. Without greater emphasis on these themes, such work might be more appropriately continued through other project vehicles (eg. NARMs).

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of the evaluation team have questioned the adequacy of such data, and hence, the ability to make scientifically well grounded analyses of policy alternatives.

- It remains as yet unclear how the project will forge the institutional links which will strengthen local analytic capabilities. In this respect, it mirrors similar concerns about several other socio-economic projects in the SAARFA project.

- While the initial proceedings demonstrated a wide range of involvement, and some of the topics to be addressed, the papers appear uneven, and do not cumulatively appear to push either methodological or empirical frontiers very far.

- Discussions in general do not seem as response as one might expect to natural resource considerations.

Programmatic Issues

The SAARFA project has funded a number of significant, diverse activities, including crop research and research methodology development conducted by the 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.

The advantages of diversifying SAARFA's research activities are two-fold. First, diversification provides a better understanding of the macro and micro environment in which agricultural research will be adopted (or not adopted), and in which government support for research will be determined. This is particularly important now, as economic crisis and adaptation to changed economic conditions are affecting both consumption and production patterns, and the nature of government intervention in the agricultural sector. Second, diversification offers the opportunity to forge more direct links between commodity-based agricultural research the emphasis on policy reform (eg. the Development Fund for Africa). More should be done in this area, particularly because the viability of many policy reforms depends heavily on technological change in agriculture. (See the discussion of the role of agricultural research in Africa).

The major disadvantage of diversification is that it can lead to a scattered approach which fails to achieve critical mass in any of its activities. Effective management is needed to avoid this outcome.

SAARFA's diversification has contributed to strengthening a multi-disciplinary approach to research in some of the NARS--particularly at the level of stimulating the inclusion of social scientists (such as agricultural economists) in research programmes. This appears to be occurring mainly at a junior staff level, and with an even impact on the overall operation of national research.

In light of the new Development Fund for Africa (DFA) legislation, SAARFA should maintain a broad focus, however tempting it might appear to concentrate resources more narrowly on physical science research in a few commodities. The focus should include:

- maintaining and consolidating SAARFA's commitment to commodity research networks;
- maintaining and expanding research on the actual economic conditions in which production and consumption decisions are made, including:

improved understanding of the economic constraints faced by small and larger scale producers; the nature of local and/or unofficial markets and the prices facing both producers and consumers in them; the consumption and production changes being made in response to changing economic conditions; and the associated changes in production practices (eg. use of purchased inputs, labor);

- reinforcing and expanding research on the policy environment, and the link between policy choices and the capacity for technological change.

Funding criteria should be developed which will help transmit the SAARFA focus more effectively to institutions submitting unsolicited proposals. An annually updated action plan (as suggested in the discussion of project implementation) should be supplemented by a commonly accepted collection of funding criteria. These criteria could include:

- the substantive merits of the research and the professional capability of the researcher/institution proposing the research (which appears to be a strong implicit funding criterion now);
- well developed plans for linking research directly to other activities under SAARFA--with special emphasis on linkages across the physical and social sciences;
- well developed indicators/reporting systems for substantive research progress.

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FACULTIES OF AGRICULTURE

BY

V. C. JOHNSON

FACULTIES OF AGRICULTURE

The Africa Bureau's Plan for Supporting Agricultural Research and faculties of Agriculture provided a strategy for assisting faculties of agriculture under SAARFA. The primary purpose of such assistance was to produce and sustain a critical mass of well trained agricultural research scientists and enable universities to actively engage in research as a complement to the national and regional agricultural efforts.

Until now only the faculty of agriculture at the National University of Rwanda (UNR) has been programmed under SAARFA. In addition to evaluating the UNR sub-project, the SAARFA evaluation team was asked to comment on the contribution that Africa's universities can make, not only to training for research, but also to the production, adaption, and dissemination of agricultural technology to the overall goal of agricultural growth and development. Are universities likely to become fully accepted as research institutions in their respectively countries? Are they likely to have influence on policy decisions? Should SAARFA discard or revise its strategy of support for faculties of agriculture?

BACKGROUND

The role that universities have undertaken and their contribution relate to arrangements from the past. At the point of independence only a few full-fledged universities had been established in Africa - mainly in ex-British colonies such as Nigeria, Sierra Leone, Ghana and Uganda. Such universities were elitist with strong links and tutelange ties to english universities (Ijere, M.O., 1980). Philosophically these new universities were detached from aspects everyday life and the place of agriculture in their curricula was limited and in some cases nonexistent. Moreover, the indicators are strong that except for law and medicine, Africans themselves regarded study of the classics the hallmark of good university training.

The approach of the French was somewhat different. Prior to World War II there was essentially no investment in higher education in francophone Africa. When rethinking the situation after the war, higher education for Africans focused on french culture and assimilation.

In both British and French cases, the primary duty of a university was to teach with only limited interest in research and even less in community service (extension). Thus faculties of agriculture (then and now) were placed under Ministries of Education rather than Ministries of Agriculture. Both the French and British provided some non-degree training in agriculture to produce low level skilled personnel for public service.

This training was conducted at certificate and diploma granting agricultural training schools.

At the point of independence, therefore, the colonial legacy not only resulted in an acute shortage of trained African agriculturists, but also an institutional structure that placed a distinct limit on university participation in research and one that also created negative attitudes toward agriculture. These characteristics carried over into the era of independence.

UNIVERSITIES IN POST-INDEPENDENCE AFRICA

In post-independence Africa the pace for establishing national universities varied, but with a faster tempo in ex-British colonies. In any event, it become fashionable as a fulfillment of independence to have a university. The shortage in trained manpower made training and institution building top priorities in development programs. In U.S. assistance to faculties of agriculture emphasis was on the Land Grant tri-functions of research, teaching and community service(extension). Harking back to its own experience of high returns to investment in human resource development, justification for such U.S. support was prima facie. No further justification was required. Large U.S. university contracts were supported in countries such as Ethiopia, The East African Community of Uganda Kenya and Tanzania, Sierra Leone, and Nigeria. Foreign training and training in Africa were accelerated significantly.

It was assumed that outputs from such investments (i.e. trained manpower and increased technology) would contribute to domestic economic growth, would ease balance of payments problems, and thus would ensure project sustainability. The SAARFA project presumably had similar objectives in its support for agricultural faculties.

OUTCOMES

After more than 25 years of support to Africa's universities what has been achieved? When considered as a group, African universities have made significant progress since independence. The numbers of universities and the size and layout of campuses have grown enormously. The number of students enrolled far surpasses anything that might have been expected, and literally hundreds of Africans through university contracts have received higher degrees abroad, many at U.S. land grant universities. Most of them profess a strong interest to be involved in research.

Perhaps these indicators are all that should have been expected. In any case, only one or two universities have advanced very far beyond teaching. To the extent that U.S. support (including SAARFA's) was to transplant a

land grant model the attempt until now has failed. Only a limited number of Africa's universities have even attempted to mount creditably research programs let alone agricultural extension. One may ask what went wrong with the idea?

A central problem evident to the evaluation team is lack of host government support particularly by those key officials who are responsible for host-country budgeting such as the Ministers of Finance. Despite personal preferences of agricultural faculty members to engage in research, university budgets are among the first to experience budget cuts while items such as research may even be eliminated. Until now the key decision-makers in host governments seem no more convinced than their colonial predecessors that universities should compete with government ministries as providers of agricultural research and extension. Even in "technology generating countries", such as Kenya, the opinion expressed by government officials during the team's visit was that Egerton, the national agricultural university, already has its hands full in meeting the challenge of newly conferred university status and therefore should leave the primary responsibility for research to the Kenyan Institute for Agricultural Research (KARI) where historically it always has been. In Zimbabwe, officials in the Ministry of Agriculture (MOA) remarked that whereas some basic research might be undertaken at the university, applied research should be planned and executed where agricultural policy is made, i.e. by the MOA.

Most knowledgeable analysts (Wilcock and McDowell 1986 Eicher 1988) agree with the directions that were outlined in the Africa Bureau's Plan (May 1985) for Research and Faculties of Agriculture. The indicators are straight-forward: 1) more involvement by faculties of agriculture in research, 2) concentration of AID support on 4 to 6 centers of prospective university excellence and share the output with technology adapting countries, and 3) operate within a long-term time frame of 20-25 years. There seems little to be contested in these directions.

On the other hand, the evaluation team senses that some miscalculations and problems do exist, not in concept but in application. In the past, cooperation among universities in Eastern and Southern Africa broke down because of inter-country politics that emerged soon after independence. More recently, it was found that the "centers of excellence" concept conflicts with Africans' push for equity, even at the price of efficiency. In 1982 when a CDA team inquired about this issue in Southern Africa, it was clear that each country wanted to improve its own university before conceding any deference to centers of excellence. Currently, the agricultural education proposal from Southern Africa makes clear that SACCAR's desire is to assist all SADCC countries to improve agricultural training at the undergrad level, and to share training responsibility in

the region rather than to contemplate centers of excellence. In East Africa neither Egerton, Sokoine, nor Makerere universities (Kenya, Tanzania, and Uganda respectively) would be happy with one of them being accorded special status.

A second problem that seems to be recognized only dimly is the training of research scientists. Here large numbers have been trained yet output has lagged. The problem is double edged. On the whole research scientists in Africa, by any comparison, are still in short supply. Meanwhile the greatest concentrations of research competence are found at Africa's universities where as indicated little research is being undertaken. Low productivity and underemployment among the educated seem to be common. Obviously lack of host country support for university research, low salaries, negative attitudes, and low support budgets has led to distortions in the market for research talent. How many more research scientists should be trained before those already with graduate degrees are able to raise their productivity?

POSSIBILITIES FOR GREATER UNIVERSITY INVOLVEMENT

It is obvious that if faculties of agriculture are to be assisted, there must be a project by which development activities can be planned, organized and funded. U.S. universities have much to offer and indeed still are seriously engaged in development projects (Table 1). Their participation in development should be encouraged. On the other hand, the SAARFA evaluation team sees no advantage in funding an activity under SAARFA which customarily has been funded bilaterally through USAID Missions and university contracts. On the contrary, the advantage for strengthening national universities would appear to lie with AID Missions in that closer oversight can be maintained and dialogue can be brought to bear more readily. SAARFA management is not structured for dialogue of this kind.

If as suggested, the routine strengthening of agriculture faculties is to be left to AID missions, and if, as discussed above, agro-climate zones do not offer realistic basis for creating university "centers of excellence" as proposed in the Africa Bureau's Plan, then what actions, if any, would be appropriate to expand the role of Africa's universities? As indicated, research talent is there to be tapped?

The SAARFA evaluation team sees three approaches for university support. Two approaches would require revision in the Bureau's plan for university strengthening and the third would require intensification of SAARFA's on-going activities. They are: 1) reduce the number and alter the criteria for selecting universities; 2) use African organizations with a regional focus to meet common needs of universities, and 3) intensity interaction between universities and SAARFA supported networks.

1. SELECTION OF UNIVERSITIES: From the viewpoint of U.S. assistance, it is evident that development budgets are becoming more limited and priorities are being carefully reviewed. Heretofore the primary aim of assistance to universities was institution building with a strong bias toward training to replace donor staff and to produce research and extension personnel mainly for the public service. But, as indicated, unemployment among the "educated" is a growing. Strategies with regard to universities undoubtediy will be further reexamined. What can we say about the "centers of excellence" concept considering AID's prime focus on environmental protection and economic growth?

Admadu Bello university in Nigeria offers one example of what is possible in university strengthening. When last visited (1986) that university was offering agricultural degrees through the Ph.D. All research over the ten States of northern Nigeria was planned and managed from the university campus, and whereas the states continued to employ extension personnel, an agricultural extension liaison office functioned on campus. The agricultural complex consisted of the faculties of agriculture and veterinary medicine, the institute of Agricultural Research, The Division of Agricultural Colleges (composed of 2-year and 3-year certificate and diploma-level schools), The Agricultural Extension and Research Liaison Service, and the National Animal Product Research Institute (See: AID Project Impact Evaluation Report No. 66, CDIE).

The student body at the university had reached 21,000 (including branches) and a considerable number of foreign students were being drawn to the university. Overall, it would appear that such a university would meet SAARFA standards and more.

What was different about this university? First, support provided by Kansas State University (under AID contract) in the early years was highly significant as was co-funding from the British, Dutch and Ford Foundation. The essential factors, however, were the favorable attitude and voluntary support granted from the beginning by Government. Political risks were taken to strengthen the university at the expense of long standing government bureaucracies. Even during subsequent budget crunches (when universities usually suffer disproportionly), a structure such as that at Admadu Bello helped to cushion negative effects.

In spite of the difficulty of assisting universities on the basis of agro-ecological zones, and of coping with tight AID budgets, the evaluation team strongly supports the strengthening universities as recommended under SAARFA. The economic case for doing so is that idle capacity at universities carries high fixed costs not to mention the high price of degrading research in economic environments where technology is so urgently

needed. This is not to imply, however, that SAARFA staff should accept proposals to provide direct support to universities. Our preference is to reduce the number of universities to be assisted from 4-6 (Per Research Plan) to two. Potential for generating technology (per SAARFA guidelines) should remain an important criterion for selection, but the essential condition should be an assurance from host governments that they are willing to provide sustained support to the university at the expense of inefficient Ministry bureaus.

The two most likely candidates for this kind of support are the Cameroon Dschange University complex where AID already is heavily engaged nationally, and Makerere University in East Africa (politics willing) where the attitudes are in the right direction. Progress currently being made in research, opportunities open to foreign students potential spillover to surrounding countries, and progressive faculty members give these universities an edge. U.S. support to them should increase but at the same time should be contingent on regional as well as national service. The Africa Bureau should also revise its strategy from direct assistance SAARFA to indirect assistance as discussed below.

2. SUPPORT THROUGH AFRICAN ORGANIZATIONS: We are left with the questions of whether and how national universities in general can be strengthened by Africa-wide programs like SAARFA? Is SAARFA-type assistance applicable? What kinds of indirect assistance would be rewarding? Although each national university has its own environment - history, culture, levels of support, curricula, growth rate, potential etc., there are common needs that could be addressed from a regional approach.

Rather than direct funding for university contracts, or attempting to make choices among universities on a zonal basis, SAARFA could channel support through African organizations that support agricultural faculties. One such Africa wide organization is the Association of Faculties of Agriculture in Africa (AFAA), formed in 1973 and headquartered in Rabat, Morocco. That organization holds meetings and conferences, undertakes studies, exchanges information, provides guidance and promotes the causes of its members. It is a viable professional organization which takes an active role in furthering the development of higher agricultural education in Africa (BIFAD, Occasional Paper No. 11, February, 1987). SAARFA and AFAA representatives could discuss needs/issues that are widely common in Africa and design ways to address them.

Problems of outmoded curricula, depleted libraries, depleted budgets, the brain drain of African scientists, distortions in the market for research talent in Africa, mobilizing more political support for university based research, devising technical training techniques for farmers with

limited formal education, support for continuing education programs that offer farmer training, and other problems could be addressed through an African organization such as AFAA. These and others have commonalities that cross national and regional boundaries. SAARFA support for such African organizations may well yield higher returns than offering a neighbor's "center of excellence" to small countries who are striving for their own universities.

Another example of an organization that warrants this kind of support is SACCAR in Southern Africa. Since, SACCAR is in touch with all agricultural research in the nine SADCC countries and works closely with Deans of agricultural colleges, problems and issues that are common to the region could be addressed through SACCAR.

Undoubtedly SAARFA representatives could search for and help to create other organizations and through them develop problem oriented networks that are regional in character.

3. STRENGTHENING TIES BETWEEN SAARFA NETWORKS AND UNIVERSITIES: We have mentioned above that European influences carried over into independence. The primary function of Universities was to teach with only limited attention to subjects such as agriculture. In the U.S., on the other hand, land grant universities had loomed so large in agricultural development that project design took the form of rigid institutional transplants. The result has been disappointing. Many factors account for the limited progress that has been made, but a primary government support - a lingering doubt from the colonial era remains and resistance from old-line government bureaucracies was felt. In essence it has been a classical catch-22 condition where to be accepted in research universities must prove their worth, but in order to prove their worth the universities require full government acceptance and support which, until now, has been luke warm at best.

The new, and one of the most important services that SAARFA offers is a means by which International Agricultural Research Centers (IARCs) can link with Nars, and spread their expertise through commodity and socio-economic research is expanding at universities but not as expected. First, the SAARFA networks de-isolate African countries and their NARS, and they provide incentives to African scientists. Second, unlike host governments the IARCs are beginning to establish closer linkages with local universities and utilize university scientists. Michigan State's food security sub-project operates from the university of Zimbabwe. CIMMYT likewise makes use of university resources in several East and Southern Africa countries, and CIAT and CIP have established linkages with Makerere University. The nearby University of Ibadan handles some of the coursework for persons seeking post graduate training at IITA and the university, in

turn, is including more IITA research results in their agricultural curricula.

These and other examples suggest that given interest and funds significant resources at universities can be tapped and cooperation between IARCs and universities can be strengthened. Moreover, the examples also tend to counter the conventional idea that Africa's research problems are so complex that a build-up of multi-disciplinary research skills are required before progress can be made. In moving beyond traditional agricultural practices, many of the research projects can be kept simple approximating those carried out in the U.S. during the early part of this century. Team members know of situations in West Africa where an energetic professor with funds of about $100,000 was able to procure transport and employ a support staff to mount and guide important research on yams, an important food and market crop. The team noted also that even those governments that are slow to promote research at universities are nonetheless turning to them for "special" services such as in Kenya where, with strong support from MOA, Egerton University is gearing for training that theretofore was only available at CIMMYT headquarters in Mexico. Also in Kenya donors have contracted with the university to maintain data banks that are relevant to the donor's and government's agricultural programs. In African countries research opportunities are opening for sub-contracting with faculties and faculty members. These beginnings may well develop to the point where institutional form at universities can take shape.

Undoubtedly Africa's universities are attempting to adapt to conditions and influences that one presently finds in Africa. The austere economic climate makes this difficult. Differences in capability between universities will continue to exist. By and large, the strengthening of national universities would remain the in the hands of bilateral missions and universities contracts but these efforts can be complemented by African organizations (with donor assistance) and opportunities provided by cooperation between universities and SAARFA networks. These latter relationships should become more formal through sub-contracts between IARCs and faculty of agriculture.

TABLE 1. SUMMARY OF ACTIVE TITLE XII PROJECTS BY REGION, FY 1988

	BUREAU			
ITEM	AFRICA	ANE	LAC	TOTAL
Number of Countries	23	13	11	57
Number of Title XII Proj.	42	34	21	97
Universities holding contracts or sub-contracts	45	28	25	62*
Average contracts or sub-contracts per univ.	1.8	1.6	1.6	2.8
Average years of contracts	5.8	5.8	4.0	5.6
Total dollar value of contracts (millions)	$300.3	225 1	$56.3	$581.7
Average dollar value per contract (million)	$ 7.1	$ 6.6	$ 2.7	$ 5.9

SAARFA RESEARCH PLANNING/STRATEGY TECHNICAL ANALYSIS

by

CLARENCE C. GRAY III

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This report draws heavily on conversations with and reports by other members of the Evaluation Team -- Dr. Cheryl Christensen, Dr. Vernon C. Johnson and Dr. Kenneth O. Rachie -- who reviewed and evaluated the SAARFA project. Their keen observations and insights as to the status and impact of various SAARFA direct activities and SAARFA sub-projects are the bases of the analyses and conclusions of this report. I am indebted to the members of the Team and members of the USDA/OICD and USAID staffs for their assistance and support with the evaluation and preparation of the report.

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July, 1989

SAARFA RESEARCH PLANNING/STRATEGY TECHNICAL ANALYSIS

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SAARFA RESEARCH PLANNING/STRATEGY TECHNICAL ANALYSIS

I. Background

The Strengthening African Agricultural Research and Faculties of Agriculture project (SAARFA) is a major element of the Africa Bureau's effort to help build capable African national and regional agricultural research systems. It is designed to complement and supplement USAID bi-lateral and global programs, as well as national efforts and programs of other donors.

Originally set up for the purpose of helping to carryout the United States' responsibilities under the Cooperation for Development Africa (CDA) initiative in agricultural research, the SAARFA project has undergone a number of modifications since it was authorized in 1982. While its purpose remains that of strengthening national and regional agricultural research systems, it now serves several interests which derive from: (a) the Bureau's "Plan" (AID 1985), (b) the Development Fund for Africa, (c) CDA and SPAAR (Special Program for Africa Agricultural Research) initiatives and (d) the recent plan for supporting natural resources management (AID 1987).

Under the Bureau's "Plan," eight countries -- Cameroon, Kenya, Malawi, Senegal, Sudan, Zaire, Zambia, and Zimbabwe -- have been designated as technology producing countries (TPC's) and because of their status and potential they are considered priority candidates for receiving USAID agricultural development assistance.

Based on their obvious general need for donor assistance to strengthen their capacities to import technologies and adapt them to their local environments, the Bureau's Plan has designated many of the nations in Africa as technology adapting countries (TAC's). See Appendix B for the countries in this category which suggests a lower priority and kinds and levels of assistance tailored to their special needs.

Through CDA agreement, Africa has been divided into six ecological zones for the purpose designing and prioritizing programs and for assigning and facilitating donor coordination. The match of CDA zones and TPC's is as follows: Sahel - Senegal; Coastal Africa - Cameroon; Sudan - Sudan; East Africa - Kenya and Malawi; Zaire Basin - Zaire; and Southern Africa - Zambia and Zimbabwe. Under the CDA initiative, the US was given donor coordination responsibility for the Sahel and Southern Africa and for coordination of agricultural research in all of the regions.

With regard to commodity priorities, the Bureau's Plan gives its highest support priority to maize, sorghum, millet, upland rice, roots and tubers (cassava and potatoes), and edible legumes (beans and cowpeas). In certain situations and ecological zones, forages and tree crops are also given high priority support.

The US Development Fund for Africa (DFA), authorized by Congress, is administered by the Africa Bureau. DFA considerations are major factors in providing U.S. assistance to countries in Africa. The DFA has established three priority categories of countries, i.e., Category 1, Category 2 and Category 3 with Category 1 as the highest priority. DFA Category 1 includes ten countries six of which are TPC's under the Plan, but Category 1 also includes Madagascar and Mali which are TAC's under the Plan. Zimbabwe, a TPC, is in Category 3 with the lowest DFA priority; thus, there are substantial differences in country priorities between the Plan and the DFA.

The priorities under the Plan, that is, the judged agricultural research and development status and potentials of national systems -- TPC's or TAC's -- and the judged importance of commodities, provide a measure of program guidance and rationale for selecting and funding SAARFA sub-projects.

To date, funding of activities under the SAARFA project has totaled $34.647 million. Activities funded fall into two categories: 1) direct project activities, which generally are either contracts for special services required to conduct the SAARFA project, activities related to donor coordination or activities of special interest; and 2) sub-projects, which are discrete, regional activities designed to directly strengthen national agricultural research systems (NARS).

II. THE NATURE, ROLE AND IMPACT OF SAARFA SUB-PROJECTS

Just a bit beyond mid-point in its operational life of ten years, the SAARFA project now has 13 sub-projects designed to provide a range and variety of inputs and outputs to strengthen national and regional agricultural research systems. Their value individually and collectively is measured by their contributions toward 1) achievement of the SAARFA project's purpose and 2) advancement of the SAARFA project's interests.

A. Classification of SAARFA Sub-Projects

The 13 sub-projects can be classified as follows:

Commodity Research Network Projects

Beans	- CIAT Bean Research in East Africa (7/1986)
Forestry	- ICRAF Forestry/Fuelwood Research and Development (8/1986)
Potatoes	- CIP Regional Potato Improvement Program in Central Africa (2/1986)
Rice	- WARDA Mangrove and Associate Swamp Rice Research (9/1987)
Root Crops	- IITA East and Southern Africa Rootcrops Research Network (1/1987)

Research Management Networks

General	- ISNAR II Southern African Agricultural Research Management (8/1986)
Farming Systems	- CIMMYT Farming Systems (5/1985)

Disciplinary Research Networks

Entomology	- ICIPE Bases of Plant Resistance to Insect Attack (8/1984)
Soil Fertility	- IFDC Fertilizer Investment for Soil Fertility Restoration in West Africa (7/87)

Agricultural Policy Research Networks

Food Security	- MSU Food Security in Africa (12/1987)
Fertilizer	- IFDC/IfPRI Fertilizer Policy for Tropical Africa (7/1987)
Land Tenure	- Univ Wisc Access to Land, Water and Natural Resources (7/1987)

Education and Training Projects

University
Development- Univ Minn Strengthening the Teaching and Adaptive Research Capability of the National University of Rwanda (9/1987)

Five of the 13 sub-projects are commodity research projects. Four of the five support Bureau-designated priority commodities. The fifth, Mangrove (or swamp) rice is not a priority commodity. There are two research management network projects, two disciplinary network projects, three agricultural policy research network projects and one agricultural education and training project. In terms of their nature and orientation, all of the sub-projects are directly relevant to and supportive of the SAARFA project's purpose and interests.

The 13 SAARFA sub-projects are quite dissimilar in background and status. Some are new projects with no history and are in the process of being established and becoming operational. Others are extensions and/or conversions of existing IARC activities and interests in Africa. And several are continuations of USAID funded programs. A review indicates that:

Five sub-projects appear to be new:

Agro-forestry (ICRAF)
Research Management (ISNAR)
Fertility Restoration (IFDC)
Fertilizer Policy (IFPRI)
Agricultural Education (U MINN)

Four sub-projects are new as projects but in reality are conversions and/or extensions of existing IARC activities and interests in Africa:

Beans (CIAT)
Potatoes (CIP)
Rice (WARDA)
Roots and Tubers (IITA)

The remaining four sub-projects are continuations of on-going projects funded through SAARFA and/or other USAID authorizations and/or other donors:

Farming Systems Research (CIMMYT)
Insects/Bases of Host Plant Resistance (ICIPE)
Food Security (Mich State UNIV)
Tenure/ACCESS (U Wisc)

Most of the sub-projects, eight out of thirteen, had a headstart and have been able to build on longstanding

CHART 1

SAARFA PROJECTS AND TECHNOLOGY-PRODUCING COUNTRIES

SAARFA PROJECTS	* CAM	KEN	MAL	SEN	SUD	ZAI	ZAM	ZIM
BEANS CIAT								
FORESTRY ICRAF		X						
POTATOES CIP						X		
RICE WARDA				X				
ROOTS/T IITA		X	X				X	
RES MGMT ISNAR			X				X	X
FSR CIMMYT		X	X		X		X	X
INSECT RE ICIPE		X					X	X
SOIL FER IFDC								
FOOD SEC MSU				X				X
FERT POL IFPRI/IFD	X		X	X			X	X
TENURE U WISC				X				
FOOD CON IPRI		X			X			
AGR ED U MINN								

* CAM - Cameroon; KEN - Kenya; MAL - Malawi; SEN -Senegal; SUD - Sudan; ZAI - Zaire; ZAM - Zambia; ZIM - Zimbabwe.
X - Indicates project activity.

CHART 2

SAARFA PROJECTS, PRIORITY COMMODITIES, REGIONS AND TECHNOLOGY PRODUCING COUNTRIES

REGIONS * TPC'S	PRIORITY COMMODITIES					
	MAIZE	S&M +	R&T +	LEG +	RICE +	F&F +
SAHEL SENEGAL						
COASTAL W AFR CAMEROON						
E AFRI KENYA MALAWI			IITA # IITA	CIAT #		ICRAF #
ZAIRE BASIN ZAIRE			CIP #			
SOUTH AFR ZAMBIA ZIMBABWE			IITA #			
SUDANIAN SUDAN						

* Technology Producing Countries

\+ S&M - Sorghum & Millet; R&T - Roots & Tubers; LEG - Legumes; Rice - Upland Rice; F&F - Forages & Forestry.

\# SAARFA Commodity network project conducted by an IARC

Chart 3

SAARFA AND SAFGRAD PROJECTS, PRIORITY COMMODITIES, REGIONS AND TECHNOLOGY PRODUCING COUNTRIES

REGIONS & TPC'S ★	PRIORITY COMMODITIES					
	MAIZE	S&M +	R&T +	LEG +	RICE +	F&F +
SAHEL SENEGAL	SAFGRAD			SAFGRAD		
COASTAL W AFRICA CAMEROON	SAFGRAD			SAFGRAD		
E AFRICA KENYA MALAWI	SAFGRAD	SAFGRAD	IITA IITA	SAFGRAD		ICRAF
ZAIRE BASIN ZAIRE			CIP			
SOUTH AFR ZAMBIA ZIMBABWE	SAFGRAD SAFGRAD	SAFGRAD SAFGRAD	IITA	SAFGRAD SAFGRAD		
SUDAN SUDAN		SAFGRAD				

★ Technology Producing Countries

\+ S&M - Sorghum and Millet; R&T - Roots & Tubers; LEG - Legumes; Rice - Upland Rice; F&F - Forages & Forestry

CHART

SAARFA PROJECT INPUTS INTO
AFRICAN NATIONAL AGRICULTURAL RESEARCH SYSTEMS

SAARFA PROJECTS	NETWORK INPUTS *									
	CR	EPS	GE	IE	MT	CR	WM	DT	NT	FS
BEANS CIAT	X	5	X	X	X	X	X	X	X	X
FORESTRY ICRAF	X	2	X	X	-	X	X	O	X	X
POTATOES CIP	X	4	X	X	-	X	X	O	X	X
RICE WARDA	X	2	X	X	-	-	X	X	X	X
ROOTS/T IITA	X	1	X	X	O	X	X	X	X	X
RES MGMT ISNAR	-	O	-	-	-	-	X	-	X	X
FSR CIMMYT	X	4	-	X	O	O	X	O	X	X
INSECT RES ICIPE	X	4	X	X	-	-	X	O	X	X
FERT RESTO IFDC	X	3	-	X	-	-	X	O	X	X
FOOD SEC MSU	X	6	-	X	-	-	X	O	X	X
FERT POL IPPRI/IFDC	X	2	-	X	X	X	X	O	X	X
ACCESS U WISC	X	2	-	-	-	-	X	-	X	X

* CR - Collaborative Research; EPS - Number of Expatriate Scientists; GE - Germplasm Exchange; IE - Info Exchange; MT - Monitoring Tours; CR - Circuit Riders; WM - Workshops and Meetings; DT - Degree Training; NT - Nonformal Training; FS - Financial Support
- Not Applicable; O - none

relationships and experience. On the other hand, the new projects have had to find their way and establish relationships, arrangements and credibility. All of the new projects have been operating for less than two years.

B. Location of Activities of SAARFA Sub-Projects

Chart 1 shows the location of SAARFA sub-project activities in the TPC's. The distribution of SAARFA sub-projects in TAC's is given in Appendix 2. Clearly, there are more SAARFA activities in the TAC's than in the TPC's.

With respect to ecological regions of Sub-Sahara Africa, there is a concentration of SAARFA sub-project activities in East and Southern Africa.

C. SAARFA Sub-Projects, Priority Commodities and Technology Producing Countries

Chart 2 presents SAARFA sub-projects in the CDA-designated regions and in the TPC's in relation to priority commodities. The chart shows that the SAARFA IITA Roots and Tuber sub-project is active in three CDA regions and four TPC's. The CIP Potato sub-project is in Zaire and the ICRAF agro-forestry activity is Kenya. There are no SAARFA commodity sub-projects in the Sahel and Sudan regions and there are no SAARFA sub-projects concerned with production and improvement of maize, sorghum and upland rice. When SAFGRAD (Semi-Arid Food Grains Research and Development) projects are added to SAARFA projects, the coverage of priority crops and TPC's is impressive.

D. SAARFA Inputs/Sub-Projects

With the exception of the Agricultural Education (U Minn) project, all SAARFA sub-projects are collaborative research networks or are being operated as such. As can be arranged, important inputs and services being provided through the sub-projects to help initiate and establish the networks. The SAARFA sub-projects provide a variety and range of inputs and services as may be required. Such inputs and services include:

- o collaborative Research
- o Expatriate Scientists
- o Monitoring Tours
- o Circuit Riders
- o Workshops and meetings
- o Degree Training
- o Non-Formal Training
- o Financial Support

As Chart 4 shows, all of the sub-projects provide financial support toward the operating costs of the networks and in most instances provide funds for nations to

participate in the networks. Such costs may include those for conducting collaborative research, such as, equipment, supplies, travel and salaries, and other costs associated with participation in a network. Non-formal training, e.g., on-the-job training and specially organized courses in participating countries or at the headquarters of the network sponsor, is an integral element and input of all the networks. Similarly, workshops and meetings and information exchange are major inputs by all the networks. A special feature of the SAARFA research networks is the arrangement for collaborative research activities in member nations with participation of expatriate scientists and specialists in the research and in the day-to-day operation of the networks.

CIAT's operation of the Bean Network involving Uganda, Ethiopia and Somalia is an example of the effective use of a full range of inputs for the successful operation of a commodity research. As shown in Chart 4, CIAT provides those critical inputs generally accepted as ones needed to help make a commodity network successful. It should be noted that to help insure timely delivery and desired use of inputs, CIAT has arranged to locate five expatriate scientists in two of participating countries. The Bean Steering Committee (or Network Council composed of country representatives and the Network Coordinator provided by CIAT), is responsible for developing and guiding the execution of network plans and programs. The Council plays an important role in determining the nature, magnitude, and suitability of network inputs and their timely use.

SAARFA OUTPUTS

With regard to the outputs of the 13 SAARFA sub-projects, five are relatively new with few outputs of consequence to assess at this time. The remaining sub-projects have been in operation long enough to produce or begin to produce expected outputs. On the basis of several formal evaluations, annual progress reports, observations in selected countries by the Review Team and discussions with A.I.D. officials, major observed or reported SAARFA outputs are summarized in succeeding paragraphs.

CIAT Bean Research Project. This project had an internal review in (CIAT 1988). The review team found "... a well-managed scientific effort collaborating in the development and testing of varieties and bean production technologies in East Africa ... positive results are being obtained by national bean programs through collaboration with CIAT."

Though somewhat behind schedule, the outputs are as predicted in the proposal. They include:

- Introduction of improved bean germplasm. Nine

superior lines have been identified and are expected to released soon

- o Two monitoring tours
- o Seven regional workshops
- o Seven training courses on bean research topics
- o Collaborative research approved by the Steering Committee is underway in network countries
- o Cadre of bean researchers are in place in network countries
- o Improved research facilities
- o Regional Bean Improvement network in place and operating

CIMMYT II Farming Systems Research Project. This project involves 16 countries in East Africa: Kenya, Mozambique, Djibouti, Zimbabwe, Zambia, Malawi, Swaziland, Lesotho, Uganda, Rwanda, Burundi, Somalia, Sudan, Botswana, Tanzania and Ethiopia (CIDA funding). The project had a mid-term evaluation in 1988. (CIMMYT 1988) The evaluation was favorable. It found the grant to be "... well implemented and its assistance is contributing to strengthening the Farming Systems (FSR) methodology at the regional and national levels within research, extension and university systems."

The outputs of this project are primarily of two types: networking and training. With respect to networking a Farming Systems Research network has been established and is functioning. Seven FSR workshops have been held and a Farming Systems Newsletter is being published and circulated on a regular basis. With regard to training, the network has provided a variety of short courses and training workshops for national extension:

- o 8 Regional Technical Workshops
- o 9 Regional Training courses
- o 2 Regional workshops for administrators

MSU Food Security Project. Operated by Michigan State University, this sub-project is a buy-in to an on-going centrally-funded S&T project; thus, there is now a steady stream of outputs. A mid-term evaluation conducted in 1988 reported "...the project is successfully addressing its objectives in an efficient and cost effective manner. Progress to date has been substantial." (Food Security 1988)

The evaluators visited several of the countries where project activities are underway. Their report listed the following outputs:

- Innovative research methodologies
- 52 Working papers
- 39 Conference papers
- 37 M.S. and Ph.D. students
- 36 Host Country counterparts received on-the-job training

Not quantifiable but of special consequence has been the impact of project-generated results on the attitudes, perceptions and decisions of policy makers. In Rwanda, the Review Team found that research by the Food Security project alerted policy makers that plans for setting a high floor price for rice to increase incomes of small farmers would have an overall adverse impact on the majority of the rural population -- the reverse of intentions. In Somalia, the Team found a somewhat similar situation. The Government of Senegal's plans to stimulate rice production through increasing rice prices were aborted when the Food Security project's research showed that technical factors were the major constraints to increasing rice production.

The project's outputs have been on the demand and supply sides of issues and in this regard its outputs have been highly relevant to issues and have helped to fill existing voids in data needed for policy making. Thus, outputs of the project are credited with helping to change attitudes with regard to the policy relevance and value of field level data.

ICIPE Basis of Plant Resistance to Insect Attack. This project is basically an institutional research project with some training and limited networking activities. ICIPE is an established, well-regarded institution. The research being funded under the SAARFA is largely on-going research; therefore; it is not surprising that the project's outputs have been substantial during the short life of the project. An evaluation was conducted in 1987. (ICIPE 1987 The principal research outputs -- knowledge, methodologies and breeding materials -- are those produced by research designed to achieve greater and more effective sorghum and maize

resistance (host resistance) to the stem borer, Chilo partellus. While in Kenya, the Review Team visited ICIPE's headquarters and field research sites and found that ICIPE is making good progress in its research program. The Review Team's findings corroborate those of the 1987 evaluation, which were high on the research outputs of the project, but less impressed with the network activities and direct support to NARS. In fact, weak linkages to national programs, other than with Kenya, is a major shortcoming of the project and reduces its effectiveness as a regional project. Notwithstanding, its outputs can be expected to flow indirectly into NARS through ICIPE's linkages with CIMMYT, ICRISAT, and other IARC's. Also, through its resident research scholar program for national scientists, its outputs may flow into NARS on an informal, irregular basis.

CIP Regional Potato Program in Central Africa. This project is a commodity research network built on prior activities of CIP in the region. Nations participating in the networks are Kenya, Ethiopia, Uganda, Burundi, Rwanda and Zaire. The Review Team observed operations of this project network in Kenya, Uganda and Rwanda. The Team's assessment is that the project's outputs have been substantial:

- Establishment of a mature operating network under the guidance of a Steering Committee made up of representatives of network nations. The network provides for a division of leadership responsibilities for specific lines of research, e.g., Rwanda has leadership for late blight disease control; Burundi has post-harvest technology.

- Introduction and dissemination/exchange of germplasm

- Highly-rated non-formal training

- Strengthening of regional quarantine facilities in Kenya

- Upgrading/improvement of national research and regional training facilities

While the Review Team was impressed with progress of the potato research network, it found that in several countries sweet potatoes are more important in the diets of most of the people than are potatoes and are not being afforded research attention commensurate with their importance. CIP, which has recently taken over CGIAR global responsibility for research on sweet potatoes, has posted a scientist at IITA to promote greater attention to the crop. It is expected that CIP will use the already established IITA network.

ICRAF Forestry and Fuelwood Research and Development. This is one of the newer SAARFA sub-projects. Members of the Review Team visited ICRAF's headquarter while in Kenya. The general impression of the Team is that efforts to date may be "more form than substance." Specifically, there does not appear to be much depth in ICRAF's assessments of the agro-forestry regimes upon which the program will be based, and the sort of interventions being planned are quite general and lacking the detail usually associated with successful programs. With limited research underway, programs conducted may lack appropriate technical foundation.

Thus far, outputs have been quite limited, mainly because of the short period of operation. A number of nurseries have been established in participating countries. The Review Team was not overly impressed with the demonstration nurseries at ICRAF's headquarters. For example, in at least one instance, trees were not planted on the contour as would be expected on sloping terrain. The Team observed other glaring instances of poor management which did not reflect to the credit of those in charge of the project.

The Team's assessment is that ICRAF has considerable promise, but a number of things need attention: better definition of ICRAF's role and stronger policy guidance by its Board of Trustees; greater backup-research for outreach programs; adequate facilities for seed and plant multiplication; and more effective supervision of field studies and trials.

U WISC ACCESS. The Review Team had several separate sessions with representatives of the University of Wisconsin to discuss this land tenure project which is a 1985 buy-in of an on-going AID/S&T-supported program. The major project output has been knowledge, i.e., detailed facts and information about specific situations, which has provided informed bases for land tenure-land use policies by several governments.

In Uganda, for example, pressure on the land in certain areas resulted in people moving into and illegally settling in forest preserves. The illegal holdings grew into stable communities. The project's research findings eventually helped lead to a policy of separating the land which had developed into permanent settlements from the forest preserves. This permitted settlers and their communities to retain their holdings, settled a potentially serious problem and maintained adequate forest preserves.

In Somalia, ACCESS has been involved in an irrigation rehabilitation project. Pre-project investigations led to land registration as a condition for settlement in the irrigation command area. This government regulation has provided tenure protection to people on the land, as well as

a means for controlling distribution of land in the project area.

In Mali, the project has been concerned with natural resource management, forest codes, and tenure regimes. Through its research, ACCESS has helped the Government of Mali sort through and better understand conservation and use implications of state-controlled ownership and use of trees.

In Senegal, the Review Team found that the University of Wisconsin has been involved in several activities with counterparts in the Government of Senegal: a study of the impact of tenure arrangements on investment and capital formation in an irrigation command area in the Senegal River Basin and a study to help clarify the impact of land tenure on natural resource management/conservation, with special regard to government forest codes. The results of the latter study have been very helpful to the GOS and USAID in developing plans for reforestation in Senegal. The final report on the capital formation study had not been received.

In all of the countries in which ACCESS operates it has worked with and through local institutions and authorities; thus, there is a built-in training output, as well as assured delivery of research results to government planners and policy makers.

ISNAR Southern African Research Management. While in the southern Africa region, the Review Team attempted to assess the outputs and impact of this project. The project operates out of the ISNAR headquarters in the Hague. Its principal output is training of personnel of NARS. To arrange and conduct the training sessions, a representative from ISNAR visits the region three or four times a year. The training can be described as high level and directed largely to center managers. Appraisals of the training sessions are described as "sterile" and "adequate." A major criticism is that there is no follow-through on largely classroom-type instruction.

The outputs and impact of this project are rated by the Review Team as unimpressive and, perhaps, not adequately addressing basic requirements for helping to build capacity and capability in NARS. More attention should be devoted to activities which help the nations of Africa to produce unbiased, reliable research results; i.e., help build basic capacity from the bottom up. Present activities seem to assume that such capacity exists. This is probably not the case in many of the nations in Africa.

IITA East and Southern Africa Rootcrops Research Network. The review Team's assessment regarding outputs of this project is that there is now an operating network for the improvement of root and tuber crops in East and Southern

Africa under the general coordination of IITA. Overall, the network operates satisfactorily under the guidance of a Steering Committee. Notable outputs of the project have been:

- Introduction and exchange of cassava germplasm
- Progress in control of cassava insects and diseases
- Training of national personnel in network countries

The Review Team noted the impressive increase in production of cassava in East Africa and its rise as a basic food commodity. The general feeling of the Review Team is that while the outputs of the project must be judged as satisfactory, the project inputs fall far short of the inputs required to accelerate improvement of this major food commodity.

U Minn Strengthening the Teaching and Adaptive Research Capability of the National University of Rwanda. This is a new SAARFA project with no previous history and with little to report in the way of progress toward achievement of objectives. The proposed U Minn leader of the project, a Belgian national, is yet to be confirmed; thus, the project has been slow in getting underway. The Review Team visited the University of Rwanda and has serious concerns about the prospects of this project contributing importantly to strengthening NARS in this or the next several decades. The Team found that there is little justification at this time for funding the development of the University of Rwanda as a regional activity. For some years to come, this is clearly a national development project for consideration of support under U.S. bilateral assistance.

With regard to SAARFA and the strengthening of national faculties of agriculture, there is a question as to what kinds of assistance are appropriate for a regional project. There are certain things common to most, if not all, universities in Africa that need attention and which can be approached, in part, on a regional basis. Things that are made to order for SAARFA's regional activities: appropriate curricula for nation-building, roles of agricultural research and agricultural extension in colleges and universities, library development and an information-sharing and other topics of mutual need and interest. Opportunities to arrange such regional activities through existing African education organizations and associations merit consideration and exploration.

IFDC Fertility Restoration. The Review Team was unable to visit this project's village research sites in Togo, Ghana and Niger, nor visit the project's headquarters in Lome, Togo. Therefore, assessments have been made on the basis of reviews of project documents and discussions with AID/W personnel.

Badly needed and long overdue, this West Africa/regional project is designed to "... examine the difference that the availability on a timely basis and use of fertilizers could make at the village level in different countries and assess the impact on (1) sustained crop production, (2) restoration and sustainability of soil fertility, (3) evolution of farming systems, and (4) socioeconomy of selected communities." (IFDC 1989)

The project has been slow in getting started, probably because arrangements with countries for research sites had to be made after funding had been obtained from USAID, the World Bank, Rockefeller Foundation and France (IRAT/CIRAD). Rainfed research sites have been secured near villages in representative humid, savanna and Sahel zones: Kamasi, Ghana; Dapaon, Togo; and Maridi, Niger. Thus, the research is well-positioned to work with soils and major crops (maize, cassava, sorghum and millet) across several agroecological zones. Plans are being made to arrange for similar research at irrigated sites in Togo, Ghana and Benin. Baseline surveys have been made and well-designed research is underway in accordance with a five-year, time-phased course of action.

The conceptual model which has been prepared by IFDC for the Soil Fertility Restoration Project (SFRP) is impressive and if events are such that it can be followed, it should guide the project to successful achievement of its objectives. It should be noted that the project's time frame may be overly optimistic and additional time may be required beyond the five-year period.

Notwithstanding the slow start and a likely unrealistic time frame, the prospects for important results from this project are promising, given thorough planning and the presence of close backup support by IFDC-Africa in Lome. An important project feature is the projected use of indigenous fertilizers materials (phosphate rock) from Niger and Togo.

This SAARFA sub-project is an example of effective donor coordination and collaboration for research on a major, widespread agricultural production constraint in West Africa. In addition to involving a consortium of donors and three participating nations, IFDC has solicited and secured participation of several influential, private fertilizer promotional organizations -- the World Phosphate Institute and the American Phosphate Institute.

If there is a shortcoming with regard to this sub-project, it may be its size in relationship to the magnitude of the problem. Low soil fertility and low soil productivity are major production constraints in West Africa. Many authorities believe that a substantial soil management research effort in West Africa is needed to provide knowledge and management procedures needed to help achieve and sustain higher levels of agricultural production. If this view is correct, consideration should be given to expanding the SFRP or arranging for similar, complementary projects in the region.

IFPRI & IFDC Fertilizer Policy. This project is being conducted by IFPRI, the International Food Policy Research Institute. An important element of the project is about 10 months behind schedule, because of difficulty and delay in hiring a research fellow for assignment to Togo. That has been accomplished. Other activities, such as, data collection, holding policy workshops and initiation of detailed country reviews are in process and close to schedule. Initiated in August, 1987, there has not been an evaluation. One is scheduled for July 1990.

The research topic is timely and important, because of the impact of fertilizers on production (where other factors are not limiting) and the influence of fertilizer policy on fertilizer supply, distribution and use.

The project has been underway for about two years and output has been limited and, while in the satisfactory range, has been unimpressive with respect to quantity and substance.

It may be that this study will be compromised to a considerable degree by factors beyond control of the project, i.e., availability and quality of yield response data to fertilizers. Further, it remains to be seen how this project will develop the means to strengthen local analytical capabilities.

The outlook for this sub-project is conjectural, at best.

WARDA Mangrove and Associated Swamp Rice Research. This sub-project is directed towards improvement of rice production in the coastal areas of Sierra Leone, the Gambia, Guinea Bissou and Nigeria. As a percentage of the area of rice grown in West Africa, Mangrove/swamp rice is probably in the range of 7-10%. Nevertheless, it is significant and has favorable prospects for contributing to increasing the supply of rice, a highly-prized food.

Members of the Team met with the new WARDA Director General, Dr. Eugene Terry, while in Senegal. Dr. Terry, an experienced agricultural scientist-administrator, has been

active in bringing desired changes to WARDA. Recently, WARDA moved its headquarters to Bouke, Cote'd Ivoire and in the process it has undergone significant organizational and staff changes. The Team's assessment is that the mangrove/swamp rice portion of WARDA's program has made considerable progress and rates continued donor support.

The Team concludes that the structural changes which have taken place and the progress that is being made in the research program bode well for the future and raise the prospects for increased swamp rice production in West Africa. AID officials should consider swamp rice a major commodity in areas of West Africa.

III. NATURE, ROLE AND IMPACT OF SAARFA DIRECT ACTIVITIES

SAARFA direct project activities can be referred to as "core" activities for they fall into a class of activities which generally can not be done or done well through highly-targeted, technical and/or disciplinary research projects. SAARFA direct project activities have included contracts and/or PASA's for securing technical assistance for designing, planning, monitoring, evaluating and coordinating/managing SAARFA activities. An occasional grant has been made to secure research information. Direct activities also include support to facilitate and improve donor coordination, regional conferences, and networking workshops. Direct project activities are administered and supervised by the Africa Bureau/AID/W.

The latest SAARFA Project Paper Supplement (March 1987) placed a limitation of $500,000 on each direct project activity, $1,000,000 total per year, and $2,000,000 limitation for direct project activities over the life of the project. Such limitations appear to have worked well and facilitated the work of the project.

The Review Team assessed the status and impact of categories of and/or individual direct project activities listed in succeeding paragraphs.

A. Funds to support donor and African meetings, and special studies and evaluations.

SAARFA activities to promote and improve external assistance to strengthen African national agricultural research systems (NARS) through greater and more effective donor coordination have been exceptionally effective and beneficial to all concerned. In particular, through SAARFA and other USAID efforts, the U.S. has had a leadership role in conceptualizing and providing operational criteria for more than a dozen, donor-supported agricultural research networks operating in Africa under World Bank's SPAAR program (Special Program for African Agricultural Research).

With regard to the impact of SAARFA on U.S. obligations under the former CDA consortium and now under SPAAR, the Review Team's assessment is that SAARFA direct project activities have provided valuable means through which the U.S. has had considerable influence and leadership in planning and executing both multilateral and bilateral assistance to NARS -- increasingly other donors are following U.S. leadership in arranging and conducting agricultural research networks in Africa.

Similarly, SAARFA funding has enabled the U.S. to play a key role in helping to arrange meetings and conferences of

representatives of NARS to promote regional cooperation and mutually beneficial activities to strengthen NARS and improve the efficiency and effectiveness of donor assistance.

In instances where special studies and evaluations have been needed to clarify situations and provide bases for policies and action, SAARFA direct project funding has provided the flexible, readily available means to do so. For example, through contract funding through Devres, Inc., the Africa Bureau/AID was able to secure critically needed factual, current, detailed, reliable data and recommendations on which to base plans and programs for the Sahel and East and Southern Africa regions. Under the CDA arrangements the U.S. had agreed to take the CDA leadership role in agriculture in those regions. In securing and distributing the Devres reports, the U.S. helped to fulfill its CDA planning obligations to other donors.

The Review Team finds that SAARFA direct project activities have provided valuable, enabling means to achieve the project's purposes.

B. A study on the effects of farmer-built dikes for improving water infiltration rates, increasing soil fertility and reversing soil degradation in the Sahel.

In many parts of the world there are ancient man-made terraces across slopes designed to slow the downward movement and acceleration of water, minimize soil erosion, channel and/or impound water, and provide physical structures/bases for permanently productive agriculture. Such structures stand as monuments to initiatives of local people. In other parts of the world, denuded land surfaces are mute testimony to the lack of such initiatives.

Through SAARFA direct funding, a small amount of money -- $20,000 -- has been provided to support a North Carolina State University graduate student (TropSoils M.S. degree candidate) conduct a study of the impact of stone hedges built on the contours of slopes by local farmers. The work is being carried out in Burkino-Faso and is a small, perhaps serendipitous, activity. However, if the study shows that clear potential benefits can accrue from such initiatives, low-cost, simple means may be available for land reclamation as a first step leading to sustained, productive crop and/or animal husbandry.

It should be pointed out that small investigations such as this farmer-built dike activity can produce unexpected, surprising results. For instance in Niger, "trash mulching" of stems and leaves researched by an observant Texas A & M TropSoils CRSP scientist has become an important part of the national reforestation -- firewood development program. (TropSoils, 1988 page 17). It was found that branches of

trees and shrubs, left behind by woodcutters, when spread on the soil surface are covered by blowing sands and frequently produce new stands of trees and shrubs. The regenerated vegetation reduces wind erosion and produces a soil base for production of more wood. This is an important finding because it may help to halt the seemingly inexorable process of deforestation and desertification. It may be that farmer-built dikes may have similar implications for national, natural resource management programs.

C. A study of the effects of policies on food consumption in Africa.

The primary purpose of this study was to provide guidance to the Africa Bureau on three important policy issues: consumption substitution between domestically produced and imported food grains; possible shifts of production from food grains to cash crops, and the commercialization of agriculture; and the implications of the changes to the nature/type of development assistance to Africa. The study was conducted by IFPRI during the ten-month period between July 1, 1987 and May 30, 1988. There has not been an evaluation of the study.

Outputs as measured by recent IFRI publications on dietary composition and commercialization impacts appear to have been useful to AID and a larger audience. The work has been well done, but with regard to scope, it has fallen somewhat short in its coverage of issues identified. This can be attributed to an unreasonable time frame and unrealistic expectations from such a limited study. Nevertheless, the study underscored the importance of nutritional aspects of adjustments and has influenced greater attention to this issue, as exemplified by shifts in AID funding and the World Bank's studies of adjustment lending. In this respect and with regard to helping to assure consistency between overall research "Plan" objectives and those related to AID's commitments to policy dialogue and policy reform, this SAARFA-supported study has been valuable.

D. Summary assessment of the value and impact of SAARFA direct project activities.

Direct project activities or "core" activities are essential for planning, facilitating, administering and evaluating a large, multi-purpose, multi-faceted project, such as, the SAARFA project. Also, direct activities provide a capability to explore issues/problems and/or acquire information not readily available or in a form needed.

The Review Team's summary evaluation is that SAARFA direct project activities are fully justified and they have been judiciously chosen and responsibly managed.

IV. SAARFA PROJECT MANAGEMENT

The SAARFA project is made up of two distinct types of activities -- direct project activities and sub-projects -- requiring different management. Direct project activities are managed by the Africa Bureau's AID/W staff and sub-projects are managed in the field by personnel stationed at IITA for activities in West Africa and by personnel at the REDSO in Nairobi for activities in East and Southern Africa. Direct projects are usually conducted through contracts or a USDA PASA. The contractor and USDA execute direct activities in accordance with contract or PASA provisions. On the other hand, sub-projects are grant programs with execution by the grantee, but with certain grant management requirements by USAID which it can accomplish directly through its own personnel or indirectly through a contractor. In the case of SAARFA sub-projects, a Regional Development Support Office for East and Southern Africa (REDSO) and a contract office at IITA carryout USAID's grant management functions in East/Southern Africa and in West Africa, respectively.

Insofar as could be determined, the Review Teams' assessment is that present structures and procedures for planning, administering, monitoring/supervising, evaluating and managing SAARFA activities and U.S. funds are fully satisfactory and should be continued. This is not to state there are not occasional problems with delays in voucher payments, reporting requirements, burgeoning travel budgets, supplies and lagging host country support. Such problems are inherent in foreign assistance and require monitoring and correction, but they are not sufficient to require overhaul of the system.

Present management of the SAARFA project is fully adequate to facilitate achievement of SAARFA purposes.

V. DISCUSSION AND ANALYSIS

A. Introduction

The previous sections of this report have been devoted primarily to description and review of the nature, organization, inputs and outputs of direct project and sub-project activities, including their management. This section will devoted to summary discussions of the SAARFA project, with special regard to the questions posed in the Scope of Work for the evaluation. In this connection the SAARFA project does not have a logical framework to guide its implementation and its evaluation.

B. Program Plan and Strategy

The plan and strategy to help strengthen NARS in Africa by focusing and concentrating on a limited number of commodities and a few promising technology-producing Countries (TPC's) in major ecological regions is sound and firmly supported by development experience, as well as by scholars especially knowledgeable of Africa (Eicher, 1988 and Oram, 1988). Such a program plan and strategy should be maintained and followed and modified as circumstances indicate. It is conjectural whether the Africa Bureau/USAID can maintain and implement such a program strategy over time. As pointed out in Section II of this report, there are currently more SAARFA sub-project activities in technology-adapting Countries (TAC's) than in TPC's and there are SAARFA activities in 31 countries in West, East and Southern Africa. This is hardly "focus and concentration." However, this situation has probably resulted from funding sub-projects which were largely unsolicited proposals not especially tailored to implement the Bureau's plans/strategy. Then there are DFA interests which appear paramount and which afford special, priority attention to several TAC's over several TPC's. So it remains to be seen whether the Africa Bureau will hold to or modify its "Plan."

Support for agricultural research in countries designated as TAC's is a matter of some concern. In recalling some lessons from development experience, Ruttan reports, "those countries that have attempted to rely primarily on borrowed technology have rarely developed the capacity to adapt and manage the borrowed technology in a manner capable of sustaining agricultural development." (Ruttan, 1988 page 13) While individual donors, such as, the U.S., are free to set their development assistance priorities with regard to countries, multilateral assistance donors, including the IARC's, do not have to make such choices.

Further, the program strategy to help strengthen NARS through networks coordinated largely by IARC's is also sound

and based on development experience. Such a strategy builds on the strengths and comparative advantages of the international centers: access to world collections of crop germplasm, reliable technologies, training for development, and research support services tailored to needs of developing countries. Important features of such networks are their leveraging and synergistic effects on the resources of their participants. With respect to programming regional support to NARS, networks clearly are the best available means, perhaps the only effective means. Such a strategy recognizes that there are certain things networks can do exceedingly well, but it also recognizes that networks have limitations. (IDRC, 1988) In particular, they can not substitute for direct technical assistance where such support is needed, as may be the case with many nations in Africa. Also, certain nations are reluctant to or refuse to participate in networks; however, this tendency seems to be abating, as nations perceive that they are being left behind. Networks tend to complement and enhance the effectiveness of bilateral assistance to NARS.

C. SAARFA, CDA, SPAAR, DFA and the "PLAN"

SAARFA and other programs of USAID have played important complementary, supplementary roles in CDA initiatives. In recent years, consortia for support to agricultural research in Africa have shifted from CDA to the World Bank-led SPAAR program.

The U.S. has had to have an available, flexible funding means of sufficient magnitude to further its interests in socioeconomic development in Africa. The Development Fund for Africa (DFA) has helped to provide this means. At the agricultural sector level, the Africa Bureau required means to fulfill U.S. interests and commitments to donor collaboration in Africa, as well as the means to respond to the Bureau's "Plan." The SAARFA project was designed specifically to meet these Bureau requirements. Recently, the Bureau developed and approved a plan for supporting management of natural resources (AID, 1987). Thus, another purpose was given to SAARFA.

The record at this mid-point evaluation is that SAARFA has fulfilled its intended purposes with regard to the CDA, SPAAR, the DFA, and the several Bureau plans. These several purposes are mutually supportive and do not require separation or special projects for their achievement. Specific U.S. interests which have evolved since SAARFA was authorized, such as those under the SPAAR or other consortia, should and can be easily, effectively accommodated within SAARFA.

As a means to an end, i.e., a funding mechanism, SAARFA is fully adjustable to and compatible with the Bureau's

several plans regarding managing natural resources and supporting agricultural research, now and in the future, as they may be modified by peer review. Programwise, SAARFA should remain flexible and agile, so as to ensure timely, rapid responses to changing, unforeseen needs and circumstances. This is not to propose a license to scatter resources and lose direction, but a suggestion to stay relevant and responsive.

D. Research Priorities and Changes

At regular intervals, perhaps no greater than biannually, unless some unusual opportunity or event dramatically changes prospects, Bureau officials should continue to use its regularly scheduled meetings of AID/W and Africa USAID mission personnel as fora to review/update regional research priorities and special interests to be carried out through the SAARFA project. In AID/W, the SAARFA Project Steering Committee and the Project Working Group, have been and will continue to be operational means to recommend and support changes in research priorities.

The SAARFA research portfolio of 13 sub-projects should be reviewed with respect to balance and effective coverage of research needs/priorities in regions of Africa of special interest and concern to the U.S.

The recent addition of economic sub-projects is recognition of the diverse nature and requirements for development (Lewis, p 164). Complementary social science research is essential to help understand the impact and consequences of production technologies, guide the allocation and use of resources and identify appropriate policy and other adjustments needed to encourage and facilitate widespread adoption of productivity-increasing technologies. SAARFA support for agricultural policy research should be continued and consideration should be given to adding social science components to on-going commodity research networks. SAARFA offers an excellent opportunity at the regional level for comparative research to identify development paradigms. In this regard, the MSU Food Security and Wisconsin ACCESS projects have added a needed dimension to the SAARFA project.

To a degree, the selection of sub-projects becomes an issue of timing and balance. In the case natural science research, which is absolutely essential for increasing productivity and breaking the cycle of poverty on the both the demand and supply sides (Nurkse, p 4-5), there may be considerable time required for nations to develop and/or adapt and adopt productivity-increasing technologies. Thus, in many nations of Africa, it may be prudent to get appropriate natural/agricultural science research and related social science research underway as soon as possible. In instances where productivity-increasing

technologies are available and production is stagnant, social science policy research probably should be given priority.

With regard to the matter of the time required to develop sustainable, productivity-increasing, agricultural technologies for the tropics, the experience of A.I.D. and its predecessor agencies is helpful. The Agency has spent at least two decades, perhaps longer, on research to understand the nature, properties and management of tropical soils in South America through a series of bilateral and regional programs. The current TropSoils CRSP is the latest in a sequence of long-term, USAID-supported research. As a consequence of the Agency's will and capacity " to stay the course," it appears that soil management practices are now available for replacing undesirable slash and burn practices in the Amazon Basin with sedentary, sustainable agriculture. Similarly, it has taken decades to develop suitable soil management practices for the acid savanna regions of South America. Both technologies are transferable to and needed in Africa, but, predictably, it will be a decade or longer for adaptation to African ecosystems/zones, human, economic and political circumstances.

The diversification of the SAARFA project portfolio should prove to be an advantage and opportunity to NARS to arrange multi- and inter-disciplinary approaches to the solution of problems.

Concerning the matter of possible changes or additions to the current group of SAARFA sub-projects, several adjustments may be in order. One has to do with inclusion of animal research to balance and complement present sub-projects with the objective of developing suitable, integrated crop-livestock systems. Another has to do with possible expansion of the soil fertility restoration project and/or establishment of a West Africa Soil Management Research Network. And, a third, is the question of what to do about the support to faculties of agriculture component of SAARFA. A fourth is the matter of agricultural research and sustainability.

Officials should look for attractive opportunities for research and development of crop-livestock systems for small farmers, with special attention to sustainable systems and more effective use of available resources. The Small Ruminant CRSP has identified several possible opportunities. One involves dual purpose goats for semi-arid/sub-humid regions of East Africa, such as in Kenya. The other involves the use of hair sheep in the humid regions of West Africa, such as in the Cameroon. Of the two, the most attractive from a development standpoint may be hair sheep, because of their potential for creating a productive, symbiotic niche within the farming systems of small farmers in the high-rainfall, tropical areas of West Africa. Economic and social

feasibility are required; technical feasibility is promising and seems be assured from the results of current investigations. The potentials are exciting. SAARFA officials are encouraged to explore what may be a promising opportunity with potentially significant socioeconomic implications. For example, SAARFA could help join ILCA, the Small Ruminant CRSP and several nations and arrange a regional project for development, introduction, and integration of hair sheep into small-scale farming systems i the humid tropics.

A "green revolution" is unlikely in West Africa because of the existence of large areas of problem soils which exten from the humid regions through the savannas to the Sahel. Such soils can greatly constrain crop and forage production. While crop cultivars adapted to specific, adverse soil conditions can be developed and provide temporary solutions, such cultivars may exacerbate and eventually worsen conditions when not managed properly; thus, resource conservation and sustainability become issues.

Given the nature and extensiveness of soil constraints t agricultural production and the urgent need to conserve irreplaceable resources in West Africa, there is a strong case for greater and more extensive soil management research in the region. It may be strategically important to help strengthen NARS in this particular regard through SAARFA. Consideration should be given to arranging a SAARFA sub-project which would enable IARC's operating in the regio (IITA, ICRISAT, IFDC, and perhaps IBSRAM) and interested nations form a West Africa Soil Management Research Network. Such a research network might complement/supplement the ICRISAT-sponsored OPSCAR project (Operational Scale Research). With current institutional capabilities of the IARC's in soil science as they are, consideration should be given to including the TropSoils CRSP in such a network. The CRSP would provide access to the extensive, proven, tropical soils experience and expertise of Cornell, N.C. State, Hawaii and Texas A & M universities. TropSoils is planning a MOU with the Cameroon which will permit the four universities to participate in research in the humid, savanna and semi-arid regions of that country.

E. T. York points out that agricultural production systems are "... inherently neither sustainable or unsustainable. They respond to changes that either enhance or endanger sustainability depending on the nature of the change ... If an agricultural system fails to respond to change, however, it is unlikely to be sustainable." York concludes that " All agricultural research should be planned and conducted with a sustainability perceptive." (York, 1988, pages 20 and 29.)

E. SAARFA Focus

In agrarian nations, such as those in Africa south of the Sahara, promoting increases in productivity of agricultural enterprises is clearly the means to help start and/or accelerate the process of capital formation and sustained economic growth and development. This is the current focus of the SAARFA sub-projects and should be continued. Some authorities recommend redoubling of efforts to increase agricultural productivity. (Mellor, 1988 page 4)

F. SAARFA Performance

SAARFA inputs and outputs have been presented in considerable detail in Section II. There is no question as to the productivity of SAARFA. The results at mid-point are impressive. Its substantial inputs and outputs have had and will continue to have pervasive and likely long-lasting, beneficial impacts on building capacity and capability in NARS. Concurrently, there has been clearly significant improvements in donor cooperation and collaboration, as evidenced in the success of networks, due in part through SAARFA activities.

The project has progressed as planned with only a few shortcomings. Management has been highly satisfactory. Except as noted, all elements have performed well.

As would be expected, human and institutional limitations of donors and participating nations and forces over which there are few or no controls, such as civil strife, wars and natural calamities, have been and will continue to be the major sources of constraints to SAARFA progress. Enduring, unfavorable weather in East and Southern Africa has been a major constraint during the period of SAARFA's existence. On the other hand, human and institutional performances of participants in SAARFA direct projects and sub-projects have been and will continue to be major sources of success and progress toward achievement of goals and objectives.

G. SAARFA and Networking

The principal thrust of the SAARFA project is support for organization and/or operation of networks to help achieve the project's goals and objectives. At mid-point, SAARFA is supporting five commodity networks, two research management networks, two disciplinary networks and three agricultural policy research networks; thus, 12 of the 13 SAARFA sub-projects are networks designed to strengthen NARS.

A special feature of these SAARFA-sponsored networks is that they leverage resources of other donors and participating IARC's and NARS. As a result they are cost effective investments for supporting technology development

and dissemination. According to Ruttan, "Agricultural research has consistently achieved rates of return that are among the highest available to either national governments or development assistance agencies." (Ruttan, 1988 page 13) Further, in those instances where the networks complement and supplement USAID or other donor projects, additional benefits accrue.

The number of agricultural networks in Africa has grown rapidly in the past decade. At present, there are 14 networks supported and promoted under the SPAAR initiative and there is a total 40 or more networks of various kinds in Africa. The reason for their growth is that they provide beneficial services in a participatory manner valued highly by nations. As long as nations perceive that they benefit, networks will continue to exist. For the foreseeable future, external assistance will be required to support agricultural networks in Africa. Prospects for alternatives to USAID funding are not favorable at this time.

H. WID Considerations

Gender concerns are pervasive throughout SAARFA direct and sub-project activities. The consequences and differential impact of technologies on family members are common threads that run through all of the network projects. For example, the farming systems network and the on-farm research elements/tests of the agronomic networks systematically involve and/or consider all members of families as integral elements of the their research. Further, because women students, technicians, and scientists are well-represented in SAARFA sub-project training programs, over time, women will be greater participants in conducting and managing agricultural research programs in African NARS.

I. A Logical Framework for SAARFA

As previously noted the SAARFA project is operating without a logical framework. Apparently, one was not prepared when SAARFA was developed. As a result, this evaluation has been conducted solely on the basis a recently prepared Scope of Work. This is somewhat analogous to "making up the rules while the game is underway."

The Team recommends that a logical framework be prepared for the SAARFA project and that all future direct and sub-projects have logical frameworks which mirror that of SAARFA. Proposed indicators for SAARFA have been drafted by the SAARFA Project Manager and his colleagues. To these can be added the "Checklist Suggestions for Evaluation of SAARFA Projects" prepared for this review (See Appendix D).

VI. CONCLUSIONS

Review and analysis of the SAARFA project at mid-point in its planned operational life lead to several conclusions:

1. The SAARFA project has been highly effective, fully satisfactory means to help advance U.S. interests and commitments with regard to:

a. Supporting and facilitating donor collaboration and cooperation in providing external assistance to strengthen agricultural research systems in nations of Africa.

b. Organizing and/or supporting agricultural commodity research, research management and policy networks to strengthen agricultural research systems in nations of Africa.

c. Promoting and helping to achieve U.S. interests, with special regard to the DFA and the Africa Bureau's several plans for providing development assistance to nations in Africa.

2. SAARFA commodity research networks and social science projects are providing useful technical and policy information for NARS. With the exception of the ISNAR II - Southern Africa Agricultural Research Management Training project and the ICRAF - Forestry/Fuelwood Research and Development project, performances of sub-projects to date have been highly satisfactory. Notwithstanding this favorable circumstance, adjustments and additions to the portfolio should be considered. Specifically, SAARFA officials are urged to consider adjustments and/or additional sub-projects to provide:

a. Social science components to commodity research networks to help ensure desired design, implementation, likely impact and adjustment features are included in all such networks.

b. Greater attention and emphasis to cropping practices and resource management, with special regard to soils and water, which promote and provide for permanently-productive agricultural/farming systems (i.e., sustainable enterprises and combinations of enterprises). Through SAARFA, the Africa Bureau and USAID Missions could provide leadership for establishing an urgently needed West Africa Soil Management Research network involving NARS, IARC's and the AID-sponsored TropSoils Collaborative Research Support Program (CRSP).

c. Support for research and development to more effectively integrate livestock into small scale farming systems with the objective of improving nutrition and incomes of farm families and achieving greater utilization and productivity of available resources. In this regard, SAARFA officials are encouraged to explore and exploit opportunities to introduce, adapt/develop, and integrate hair sheep into small farmer production systems in the humid tropics and dual-purpose goats in the sub-humid and semi-arid tropics through networks involving NARS, ILCA, and the AID-sponsored Small Ruminant CRSP.

3. The SAARFA project and all of its direct projects and sub-projects should have logical frameworks to guide their implementation and evaluation.

4. The SAARFA project has funded a number of diverse activities under its direct projects and sub-projects: five commodity research networks, two research management networks, two disciplinary science research networks, three agricultural policy research projects and one university development (agricultural research) project. Though most of the projects/activities supported are generally at the beginning or mid-stages of development, the SAARFA project portfolio is beginning to have noticeable impacts on NARS. SAARFA's diversified activities have promoted multi-and inter-disciplinary approaches to agricultural research. Its socio-economic research has been a means to help NARS evaluate and understand the probable consequences and impacts of production technologies and agricultural policies. The farming systems and on-farm research activities of the commodity research networks are accelerating the introduction and testing of productivity-increasing materials and practices by NARS. Perhaps most of all, the SAARFA-supported networks are creating new awareness and attitudes regarding agricultural research -- its role, development and use in national development.

5. Commodity networks supported by the SAARFA project have followed and are consistent with crops/networks identified for support under the "Plan;" the exception is the mangrove/swamp rice sub-project, which is not a priority crop. On the other hand, the current set of commodity networks under SAARFA (and SAFGRAD) falls considerably short of addressing the research needs identified by the ARRA's for the Sahel and Southern Africa.

6. With the demise of CDA, the U.S. is continuing to support donor cooperation through the World Bank-led SPAAR program. SPAAR is a highly regarded, greatly-needed initiative and one through which the U.S. should fully assert its interests and leadership at all levels. Currently, the U.S. is well-represented in the SPAAR Working Group on Networking.

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APPENDIXES

For Appendix A to Attachment D, Scope of Work, see Appendix A to SAARFA Report.

For Appendix B to Attachment D, SAARFA Country Matrixes, see Appendix D to SAARFA Report.

For Appendix C to Attachment D, Persons Contacted, see Appendix B to SAARFA Report.

CHECKLIST SUGGESTIONS FOR SAARFA PROJECTS
(Draft 01/10/89)

I. STATUS

A. Current project activities and their relevance

1. On schedule?

2. Changes?

B. Progress to towards achievement of objectives

1. Contribution toward strengthening the national research system.

   a. Research results: technologies/methodologies disseminated and in use, i.e., what has been the impact of the project? Evidences of changes in productivity of commodities and resources.

   b. Training results, i.e., has training personnel made a difference? Retention of trainees? WID training?

   c. Institutional results: changes re personnel (esp. WID), facilities and budgets, with special regard to the adequacy and condition of research facilities. Evidences of effective use of personnel, funds and facilities and evidence of institutional capability to conduct unbiased, reliable agricultural research.

2. Contribution toward improving donor coordination, with special regard to CDA and SPAAR activities.

   a. Joint planning and funding

   b. Collaborative execution of activities

   c. Other results

3. Contribution toward developing, operating and/or participating in IARC and country-country research networks.

4. Contribution to the Bureau's Plan?

5. Contribution to the Bureau's priority DFA interests?

6. Contribution to general WID activities/programs.

7. Contribution to the Plan for Supporting National Resource Management for Sub-Saharan Africa?

C. Funding/Fiscal management

1. Adequacy of funding? Single or multi-donor?

2. National and donor contributions (amount and %) to recurring and non-recurring project budgets.

3. Adequacy of salaries and allowances for project personnel?

D. Evaluations and reviews, including audits

E. Factors or conditions facilitating and/or impeding progress/impact/sustainability

1. USAID Mission

2. Bilateral aid (CDA) and Multilateral aid support or non-support.

3. IARC's, including IARC-sponsored networks.

4. Inputs of other donors: magnitude and impact? Complementary, supplementary, overwhelming, over-committing?

5. National ability to absorb and effectively use various forms of external assistance.

6. Human and natural resources

E. Evaluations and reviews, including audits

F. Project management

1. Managed by AID/W, Country USAID mission, REDSO/ESA, REDSO/WCA or a "buy-in."

2. How do project personnel monitor project performance and progress?

3. Evidence or estimate of the quality of output, i.e., are project recommendations, technologies and methodologies reliable?

4. Evidence or estimate of the project output relative to input, i.e., is the project productive? Efficient?

G. Summary of project status

1. Overall estimate of current status -- pluses and/or minuses, strengths/weaknesses.

2. Any surprises? Positive or negative?

3. What has been the contribution of this SAARFA project toward strengthening the national agricultural research system? To donor coordination?

II. NEEDS AND PLANS

A. Re donor coordination

B. Re improving project or network operations

C. Other

III. PROSPECTS

A. Trends

B. Outlook

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PROJECT MANAGEMENT

BY

V. C. JOHNSON

PROJECT MANAGEMENT

BACKGROUND

SAARFA's two components have been referred to throughout this evaluation. The first component is a set of core (direct) activities initiated and managed directly by AID/Washington. The second component consists of 13 discrete sub-projects that are implemented by specialized research organizations. Proportionately the size of the core budget is only a fraction of the total.

Operation: Project management functions (distinct from technical functions) are handled, for the most part, as core activities that support the field program by monitoring, reporting, coordinating, supporting meetings and workshops, and by conducting studies on important research issues. A most important management function is the review and approval of all unsolicited proposals that are submitted to SAARFA for support.

Staffing: Broad oversight of management activities is provided by an officer in the Africa Bureau's Division of Agriculture and Natural Resources (ANR), who works closely with agricultural staff in the Bureau's Technical Resources (TR) office. He is also a key person on all committees having to do with project matters. When needed contracts and pasas are used to procure additional services.

To cover project management assignments in East and Southern Africa, a local hire field project manager has been employed under a personal service contract (PSC) and assigned to the staff of AID's Regional Economic Development Service Office for East and Southern Africa (REDSO/ESA), in Nairobi. Washington also has posted an Agricultural Liaison Officer (ALO) at IITA in Ibadan, Nigeria.

ADVANTAGES AND DISADVANTAGES

How well is the project managed? To pursue this question several key management functions are selected for discussion.

1. Unsolicited Proposals: Functions such as, studies evaluations, and workshops are built into project. They can therefore be initiated by Washington staff simply and quickly. Speed, of course is a distinct advantage considering AID's drawn out design process. Sub-projects, on the other hand, are treated differently. They are based on unsolicited proposals from outside. As a management tool how do unsolicited proposals

rate in comparison with standard (handbook) design procedures? Are the sub-projects well chosen, do they support the Bureau's research "Plan"?

Unsolicited proposals have several advantages over handbook design procedures. First, remembering that SAARFA is an umbrella project, unsolicited proposals cover "separate" sub-projects (and implementors) all aimed at a common objective. They save time and are far less costly than the standard designed projects consisting of feasibility studies, PIDs, project papers etc. Second, because the implementing agent has a research specialty, the unsolicited proposal is likely to be tighter and more comprehensive than if prepared by several independent design-team members. Thirdly, an unsolicited proposal is more likely to accommodate networking which because of its regional character, requires a higher degree of flexibility than would be found in one standard design document.

With regard to selecting the "right" sub-projects, most research todate is on the priority commodities that are listed in the Bureau's Plan and others cover useful socioeconomic topics. The team suggests, however, that the number of sub-projects be held within the known range of available financial and management resources.

There are of course some disadvantages in the use of unsolicited proposals. First, each proposal focuses only on a small part of the project. Size of the larger project could get lost in the process. Similarly, since sub-projects are submitted by different contractor conceptual "scattering" could become a problem. Second, because SAARFA has no logical framework itself, its main points of reference are the Africa Bureau's Research Plan dating back to 1985 and CDA guidelines which are older. Unsolicited proposals may therefore be outdated and may promote a commodity (from the Plan) whose demand has decreased or it may follow assumptions expressed in the Plan which have become invalid for any number of reasons. Finally, without a logical framework for the parent project (SAARFA) no common base exists for relative measures of success during interim sub-project evaluations.

Given the flexible nature of SAARFA the evaluation team, in summary, is of the belief that unsolicited proposals have a definite advantage over standard design procedures. It is equally clear, however, that the Africa Bureau's Plan for Research and Faculties of Agriculture should be re-examined at 2-3 year intervals and should be updated by addendum in light of new realities. This need is overdue. Secondly, a logical framework should be prepared for SAARFA as a common anchoring point for all sub-projects. The team makes clear, however, that in view of budget and management constraints, the aims should not be to broaden the scope of the project, but rather to alter emphases and adjust directions where needed.

2. Field Management and Implementation: We now come to issues of day-to-day management in the field. Under SAARFA, as noted, AID/W has delegated these activities.

Strengths and weaknesses of field management were considered during team visits to Africa. In Nairobi, research networks are being managed by REDSO/ESA and were being handled effectively. A Kenyan officer under PSC has direct responsibility for project management. He is assisted by REDSO's economist and is directed by REDSO's ADO. If necessary he can also obtain legal, engineering or programming advice from REDSO personnel. Although the management of SAARFA goes beyond REDSO's earlier mandate of providing special service to A.I.D. missions, it does not appear to be an additional burden. Rather it broadens REDSO's service scope and its easy access is judged as a definite strength by all network coordinators.

The evaluation team noted Specific advantages by having REDSO mange network activities. First, Nairobi is central to network activities and the project manager appears to be an excellent selection for the position. In order to stay abreast of project affairs, he attends steering committee meetings (as an observer) and he travels to national agricultural research stations to check progress. A data bank of all research network activities in East and Southern Africa is maintained in the manager's office, and he routinely receives and forwards sub-project implementation reports to A.I.D./W. Updated financial accounts also are maintained and are subjected to frequent review by AID auditors who occupy the same building. No major problems were reported in this regard. Second, because of its long tenure as a regional organization, the REDSO is knowledgeable about research problems in surrounding NARS and in USAID missions, and can use such knowledge to advantage in network management. Finally, good management in this cause is low cost. REDSO facilities and staff represent fixed assets. The only additional cost is for the one PSC local hire employee Who all team members agree is an excellent choice.

In reverse manner, the evaluation team is of the opinion that whereas mission "buy-ins" have been discussed as a substitute for REDSO management, this would fail. It would mean first that the essential regional character of the project would be lost. On this point, it must be remembered that economic growth and development are national in character. Research is the responsibility of NARS. The NARS can, and should, receive advice from networks on national research programs, they should obtain information and research materials, they may seek help in the economic use of these resources, but they should not expect that networks will substitute for them. In similar manner, a mission cannot substitute for REDSO's regional reach. Other countries in the region would not accept it.

To the extent that disadvantages in REDSO's management occur, they are limited and frequently external to REDSO. Among them, The turn-around time between REDSO/ESR and IARC headquarters (eg. Mexico) is slow with some indication that IARCs should tighten oversight of their networks coordinators and familiarize themselves more thoroughly with A.I.D. procedures. Slow handling of vouchers, the absence of banks in outlying areas and limited transport everywhere retard network activities. Network coordinators complain of A.I.D.'s extremely heavy reporting requirements which detract from technical work and slows the reporting process between network coordinators and REDSO and consequently between REDSO and A.I.D. The need here is to tighten procedures and remove lags rather than a change of method.

Delegation of management activities in West and Sahelian Africa differs from that in East and Southern Africa. REDSO/WCA in Abidjan manages only one sub-project, i.e. WARDA. Monitoring of most commodity networks has been handled by SAFGRAD with guidance and financial oversight mainly from IITA. To roundout the administering of SAARFA activities, an Agricultural Liaison Officer (ALO) is posted at IITA and provides an extension function between IARCs, USAID missions and African NARS.

Only two team members were able to make a brief visit to West Africa. For this reason, views on management are structured mainly from his report and from Washington interviews and reviews of documents. From these, several management options are advanced. One option would be to shift major management responsibilities of SAARFA to REDSO/WCA using a PSC employee as project manager and using management practices similar to those used in East Africa. A second option is to retain the present management structure. This would require continuing reliance on SAFGRAD (an organ of OAU's Science Technology and Research Commission), and on IITA. With headquarters in Ouagadougou, BirKina Faso SAFGRAD coordinates commodity networks between African countries and IARCs (particularly IITA). This arrangement is sometimes criticized as being two-layered with, it is said, only limited SAFGRAD efficiency. Others contend, perhaps more strongly, that SAFGRAD has a definite coordinating role and can provide both political as well as an economic/technical input. A final option maybe to broaden and deepen the ALO's mandate and if necessary post him at REDSO/WCA rather than IITA.

The 1982 trip report to Nigeria that covered the establishing of the ALO post at IITA said in part: "a considerable amount of agricultural research information generated at IITA never finds it way into NARS... The U.S. Scientist would be expected to have full knowledge of agricultural research at IITA; have insight into the problems and working of NARS, then provide an extension function between IITA and national research stations". A

change in job description would be required if a broader management role is to be considered.

The evaluation team is of the view that the present management approach (second option) in West Africa should be continued. It should be reviewed and if necessary revised before thought is given to replacing it. AID has had a long association with SAFGRAD, a relationship that should not be discarded without careful consideration.

A purpose of SAARFA, with the help of donor coordination under SPAAR, is to spread improved agricultural technology over an enormous land mass but in a way that recognizes physical, technical and human diversity. As noted the absence of a logical framework for SAARFA weakens the ability to tract returns to research inputs and makes management more difficult. In spite of the difficulties, management does not appear to be a major constraint.

Finally, management innovations are being put to use. The evaluation team is informed that IITA and the university of Arkansas are cooperating to establish a Research/Farm Management Course; that a nuts and bolts type "how-to" research training manual highlighting successes (eg. in research trials) is being prepared, and that basic ordering agreements (a sort of generalized mission buy-in of services) are either underway or contemplated. The evaluation team agrees with innovative actions such as these.

3. Reporting and Accountability: The principal types of sub-projects under SAARFA are: 1) commodity or service related research and 2) socioeconomic policy related research. The former sub-projects, for the most part, are field based while the socioeconomic research teams alternate between the U.S. and Africa. Reporting and accountability varies between the two types of project implementors.

Reporting and accountability of field-based sub-projects have, with other elements of management, been delegated to REDSOs and IARCs which, in turn, require reports from network coordinators. In East Africa for example, implementation reports are sent semi-annually to the ADO at REDSO/ESA. They include a brief summary of sub-project activities. More specifically, the purpose and outputs are usually restated followed by progress from the point of obligation through progress over the most recent six months. The report also may indicate problems that were solved (and not solved) and major actions planned for the coming six months.

Because of limited time in Africa the evaluation team could only scan the large volume of these reports, but they appear to provide a clearly updated account of the technical state of sub-projects.

As indicated above, financial transactions and reporting in the field are controlled by organizations that are entrusted with management oversight. In East Africa, account records are maintained in REDSO after necessary correspondence with implementors such as IARCs. These accounts are subject to frequent audit. The team discerned no major problem with accounts and therefore concluded that REDSOs can physically track funds that have been sub-obligated to the purposes intended. Where there is slack in the system it is due mainly to delays that can be corrected. The team concluded that field reporting is being handled competently.

It does not appear, on the other hand, that cooperative agreements (i.e. buy-ins) have the same reporting system as field-based sub-projects. Two to these latter sub-projects (IFDC and IFPRI) are managed by TR/ANR and on these on reporting or accountability problems were noted. The Access sub-project (University of Wisconsin) managed by S&T, has issued several implementation reports but they have not been subject to critical review. On the positive side of the access sub-project funds are carried as line item and thus being segregated can be tracked. Reporting for the WARDA sub-project lags and lacks cohesion. The remaining two buy-ins, ICRAF and MSU Food Security are both managed by S&T. They provide timely and well prepared implementation reports but no financial reports on ICRAF were located in TR/ANR and it seems clear that TR/ANR funds for the Food Security sub-project are co-mingled in a way making the tracking of particular funds impossible.

Thus, whereas field-based sub-projects show few reporting and accountability problems, more are found in the "buy-in" part of the project. Perhaps the AID Controller should advise on the kind of accountability procedure that could be most suitable for cooperative agreements.

4. Donor Coordination: Just as the technical (research) element of CDA was assumed by SAARFA, the donor coordination function of CDA was undertaken by SPAAR. The continuing felt need for group action indicates the high priority that the donor community attributes to agricultural research. The relative poverty of Africa, the complexity of its agricultural problems, the high costs of development, and the duplication of effort and wastes that occur when donors act in isolation all suggest a need for donor cooperation and coordination.

Although SPAAR has not gone far beyond the organizing stage, some potential strengths can be identified. First, as mentioned elsewhere in this report the IBRD has assumed a position of leadership. The executive secretary of SPAAR is a position funded by the Bank. This is fortunate in that one of the persistent problems under CDA was the absence of leadership

in an environment where all CDA members were posing as equals. When lags and problems arose within the donor group no corrective pressure could be applied. Secondly, SPAAR recently held its 8th meeting, thus the apparent determination to remain in tact is itself positive proof of Progress. Thirdly, prior agreement among donors on constraints to research, exchanges of information and research materials, mutual priority of strengthening NARS, and the spreading of administrative costs and functions among the donor group are clearly steps forward.

Potential weaknesses in SPAAR also are present: First, as an "outside" donor group it is suspect in the eyes of aid missions and by African officials. Except in Southern Africa where persons representing SPAAR were helping with a feasibility study on regional training (SARP), African officials were hazy on SPAAR's purpose. The tolerance of U.S. missions also is short for ideas generated outside their host country. A second potential weakness would be failing support (or even mild) support by high level donor policy makers. If SPAAR decisions cannot be implemented (eg. because funds are lacking) confidence in it will surely erode.

The evaluation team concludes that for field-based sub-projects reporting and accountability should be tightened, not replaced. For the most part both functions are handled well. For management of direct activities and cooperative agreements (buy-ins) one or two persons with controller skills should review present arrangements and standardize workable procedures.

But even where reporting is satisfactory, one may ask, of course, how do SAARFA managers account for the more than $30 million that has been obligated so far? This question is both easy and difficult. It is easy in about $25 million has gone into its 13 sub-projects a figure which does not include principal expenses for the core activities under the project. Therefore we know where funds are going. The difficulty lies in trying to measure benefits from research in substantive terms instead of numbers of workshops etc. It is known, without systematic quantification, that research has had positive results in particular locations involving such crops as maize, beans, root control of certain insects (eg. mealy bug). Spreading benefits of research anywhere is slow and cumbersome. In Africa lack of markets to spread research benefits and other handicaps, make it all the more frustrating. Only a plea for patience can be offered at this time.

August 14, 1989

Memorandum

To: See Distribution

Thru: AFR/TR/ANR, Lance H. Jepson

From: AFR/TR/ANR, Richard Newberg

Subject: Review of SAARFA Evaluation

Attached for your review is the Strengthening African Agricultural Research and Faculties of Agriculture (SAARFA) Project Evaluation. A review meeting will be held on Tuesday August 22, 1989 from 1:00 - 3:00 in Room 5951 NS. In addition to the Project Committee, in attendance will be several members of the SAARFA Evaluation Team, representatives from both REDSOs, members from our field Agricultural Development Offices and other interested parties.

Please plan to attend.

Distribution:

AFR/TR:Richard Cobb
AFR/TR:Brian Kline
AFR/TR:Cal Martin
AFR/TR/ANR:Lance Jepson
AFR/TR/ANR:Norm Sheldon
AFR/TR/ANR:Tom Hobgood
AFR/TR/ANR:Abdul Wahab
AFR/TR/ANR:Russ Backus
AFR/TR/ANR:Paul Animosa
AFR/TR/PRO:Donald Mackenzie
AFR/TR/EHR:Gene Peuse
AFR/EA:David Lundberg
AFR/SA:Fred Fischer
AFR/CCWA:Bonnie Pounds
AFR/SWA:Phyllis Dichter
AFR/PD/SWAP:Barry Burnett
AFR/PD/SAP:Cynthia Rozelle
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BIFAD:Lynn Pesson

REDSO/WCA:S.K. Reddy
REDSO/ESA:Richard Edwards
REDSO/ESA:Robert McColaugh
USAID/Kampala:KSherper
USAID/Lagos:James Sentz
USAID/Ouaga:Dennis McCarthy
USAID/Yaounde:John Balis

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ATTACHMENT F

SOME LONG-TERM CONSIDERATIONS FOR AGRICULTURE RESEARCH IN AFRICA

BY

V. C. JOHNSON

ATTACHMENT F

SOME LONG-TERM CONSIDERATIONS FOR AGRICULTURAL RESEARCH IN AFRICA

BACKGROUND

Agricultural development in advanced countries has been accompanied by, and in fact resulted from, progress in technology which in turn is the product of research. Knowing this agricultural research is given high priority in U.S. aid programs. This is especially true in Africa where agricultural productivity not only is lower than elsewhere, but on the whole is still declining.

One of the questions that should be emphasized is why hasn't research contributed more to development? Many answers undoubtedly would be forthcoming - insufficient numbers of trained African scientists, poor organization and management of research, need for general policy reform, weak institutional support, drought conditions and others, African countries have engaged in agricultural research through the colonial ear and a few notable advances were achieved (Eicher, 1988). On the whole however, results were disappointed.

During the first 20 years after independence (1960-1980), bilateral donors financed a number of agricultural research projects. Meanwhile, other donors established International Agricultural Research Centers. These latter institutions, it was thought, would be able to introduce a mode of research in Africa similar to that which had fostered the "green revolution" in Asia. A rair assessment of both ventures is that whereas the buildup of effort was noteworthy, the effects on agricultural production have been negligible.

SAAFTA MODIFICATIONS

The SAARFA project represents a different approach to agricultural research in Africa. Through it and the SPAAR, coordinated donor impact is being brought to bear on selected crops that are important to the food and export chains of the continent. Research is managed better by focusing on agro-climatic zones and national agricultural research systems within zones, rather than attempting to focus on the continent as a whole. Moreover, under SAARFA, Africa's universities have been given a place of importance for research training and in research itself, and more research is being undertaken on relevant agricultural policy issues, consumption, and in general on the demand side of the equation. All of these efforts are important and should continue.

PERSISTING PROBLEM

The most persistent and frustrating problem with agricultural research todate and indeed with every element of agricultural development is the failure to reach small farmers effectively. Since the vast majority of Africa's farmers are in this category, it underlines the point that unless we can solve the problem of small farmers' participation, we are not likely to increase Africa's agricultural production and income. The remainder of this paper discusses future research needs within the context of small farmers' concerns.

OBSERVATIONS AND FUTURE NEEDS

1. Need For A Changed Image: The first observation is conceptual - a need to view small farmers from a different perspective. Currently we treat them analytically as part of an indistinguishable mass when they should be treated as resource using farm managers and their farms should be treated as small business enterprises. From this baseline questions would be whether agricultural research as seen by small farmers is cost effective and whether the risks are reasonable? Since most research todate features purchased (and undoubtedly imported) inputs, risks during the early years of adoption could simply be too high to be assumed by small impecunious farmers.

If this perception is reasonable, a job for agricultural researchers would be to combine accessible low-cost, yield-increasing local inputs with a minimum blend of inputs from outside. An essential such as commercial fertilizer is an example. In this regard use of green manuring, rotations of legumeous crops, recycling village wastes, recommended plant spacings, clean weeding, effective intercropping, more drought tolerant crops, better (and better care of) hand tools and animal traction to enhance labor productivity, and better water management would all be practices with low money costs, and they approximate simplified farm management research that was common in the U.S. during the early part of this century. Moreover, yields would be increased moderately while farmers are gradually testing more expensive inputs.

2. A Need to reexamine typical production units: If today one returned to an African village after, say, a 20 years absence, rather than increasing yields and self-reliant farmers he would more likely find stagnant or decreasing yields and growing dependency. Traditional farming in Africa has become institutionalized in a way that fragments land and fixes farm size at poverty levels while creating a treadmill effect for farmers. Even if additional land is available, a combination of family labor and capital in the form of hand tools becomes the limiting factor to

higher productivity. This problem is especially acute at times of peak labor need such as weeding.

Traditional farming in Africa presents a puzzle because private enterprises are too few to service them and small farms (and farmers) are spread too widely to be serviced adequately by weak governments, donor assistance notwithstanding. Meanwhile, the farmers' resources are too limited for effective self-help. What we have is a sort of equilibrium at a low level of production. Until there is a basic structural change in traditional farming, this long standing condition will persist.

In the future agricultural research in Africa therefore should shift more toward land and farm management problems - land capability, land use, land tenure, soil conservation, and particularly how to increase the productive capacity of farms. Farmers with incentive for change need to know how they can move their farms from the present 2 acres under cultivation to 5 acres, on to 10 acres and eventually to 50 acres or more. At present neither the available technology nor the institutional/legal structures for acquiring and holding land give encouragement to this prospect. In fact, small garden-type farms are treated analytically as given. If one were to ask questions and propose long-term structural change the responses most likely would be 1) that small farms do well in Asia, why not Africa? or, 2) that acre for acre small farms yield higher than large farms, and 3) that no alternative employment opportunities exist for present farm labor, thus, the only realistic option is to raise productivity and income on present farms.

Our comments to such responses are provided in reverse order. First, migration from farms already is an on-going and accelerating occurrence and is common to agricultural development in general. Why must Africa be different? Also, wage employment on private commercial farms in Africa already is considerable in a few countries (Zimbabwe, Kenya, Ivory Coast) and could more generally become an alternative source of income. Moreover, most of Africa's arable land at any given point in time is in bush fallow. If research could replace long fallow periods with repetitive cropping, new cultivated areas would open up and active farms could become much larger. Second, whereas higher yield per acre on small farms does supply in many countries, it does not, as general rule, apply in Sub-Saharan Africa. Privately operated medium to larger commercial farms consistently perform better than small traditional farms or large parastatal farms. This is true whether under European, Asian or African management, or whether in the Kenya highlands, Zimbabwe, Zambia or Ivory Coast. The most successful farmers in Africa are those with private commercial holdings and who are best able to help themselves. Finally, to compare small farms in Africa with small Asian farms is unrealistic. For the latter the soil is more fertile, cropping is a different mix and far more intensive, irrigation

water is available over wide areas, and private and government support is stronger. If research can lead to more productive farms in Africa, the commodities to be produced and research priorities for the future would be determined in large part by market price.

3. Need for Research on Processing, Food Technology and Marketing: Two final areas of future agricultural research should be mentioned. The first is research into the processing of agricultural products and food technology. Maize (corn), for example, is produced widely over Africa, but it usually undergoes only one process-grinding or pounding - before being consumed directly as human food. Thus little employment (or income) is generated. In the U.S., on the other hand, corn is processed into numerous commodities (cereals, fuel, starch, animal feeds, syrup etc.) and each derived product stretches demand and generates additional employment and income. As for food technology, few agricultural commodities in Africa are adequately protected from insects or rodents, nor are they preserved or refrigerated for grain, to say nothing of perishable crops, were carefully valued in money terms. Undoubtedly the sum would be enormous. Finally, research on market expansion and research on marketing efficiency are growing needs. It is observed that most African countries in a region tend to produce similar crops, a practice which reduces the economic basis for trade. More research to sharpen comparative advantage, specialization and to accelerate trade between and among African countries would be a move in the right direction.

SUMMARY

Before the 1980s research assistance, by and large, was by way of resource transfers from colonial powers and later from donors to Africa. Small Farmers benefitted only marginally. SAARFA is a major new and useful approach designed to stimulate production of small-scale traditional farming.

The thrust of this short conceptual paper, however, is to suggest that an over-arching agricultural research problem for the future lies in the rigidity of traditional farming itself-institutionally, legally, and technical. Traditional farmers find themselves on an economic treadmill. They are unable to accumulate their own growth capital and are too numerous and too widespread to be assisted effectively by weak African governments. Donors have equal difficulty. However, analyses into economies of scale as they apply to Africa are rarely suggested and if one questions the economy of small farms he is charged with promoting "large-scale mechanized farms". The need, to repeat, is neither garden size farms nor large parastatal farms but rather rational commercial farms, open access to land, modernized tenure practices, and accelerated research on farm management designed for family operations. Unless African governments make real

structural changes, a foci of policy especially with regard to scale of operations, the growth objective will continue to be elusive.

ATTACHMENT G

PROJECT REVIEWS

"Southern Africa Agricultural Research Management"

"Strengthening the Teaching and Adaptive Research Capability of the National University of Rwanda"

BY

V. C. JOHNSON

Project Title: SOUTHERN AFRICA AGRICULTURAL RESEARCH MANAGEMENT TRAINING

Project Number: 698-0435.06

Date of Obligation: August 29, 1986

Completion Date: August 28, 1990

U.S. Funding: $700,000

This sub-project is being funded jointly by the U.S., Canada, and the United Kingdom. It is implemented by the International Service for National Agricultural Research (ISNAR), an IARC headquartered in The Netherlands. The training covers the nine countries of Southern Africa that comprise the Southern African Development Coordinating Conference (SADCC) and is designed to prepare middle and high level persons to be effective managers of agricultural research. The activity functions through the research arm of SADCC viz. The Southern African Center for Cooperation in Agricultural Research (SACCAR). To implement the sub-project ISNAR has assigned a full-time coordinator/trainor, who with the help of other training specialists as required, travels at prescribed times between The Netherlands and Southern Africa.

The first full evaluation of the sub-project is to be conducted in 1989.

The evaluation team took note of appropriateness of the sub-project, the level of effort being put forth by ISNAR, and the follow-on support that trainees receive on the job after the training course is completed.

As for appropriateness it is evident that management is a major weakness in the strengthening of NARS in Africa. With very limited (and frequently without) management training research directors with meager budgets are attempting to cope with difficult research problems. The unsolicited proposal leading to this activity was developed jointly by SACCAR and ISNAR and it received favorable comment from the AID review committee. The course content is derived from prior field studies that ISNAR had pretested. The SAARFA evaluation team agrees that training in research management is indeed appropriate.

While in Southern Africa evaluation team members looked into training operations under the sub-project. The course is structured through workshops and seminars principally in Botswana where SACCAR is headquartered, however, a training unit may be offered in one of the other

SADCC countries. Teaching methods are in the form of lectures, case studies, graphic presentations, and sometimes via. field trips. In interviews, however, the local assessment of the training received mixed comments ranging from "Sterile" to "satisfactory". Most of the training is conducted outside the day-to-day work environments of the trainees and whereas limited post-training feedback is requested no convincing measure of course benefit was found. Neither, does it appear that extremely weak national research budgets are given weight in the course content. Nor, does it appear that the training coordinator is in close contact with other SAARFA financed sub-projects in the region.

A general comment heard in the region was that short intermittent training trips between Europe and Southern Africa does not provide the level of effort that is required, nor is it clear when or how the research management training is to be institutionalized in the region.

Finally it is the team's belief that every effort should be made to obtain more host government support for agricultural research. The unsolicited proposal for this sub-project listed such an appeal to governments as an important task for ISNAR. Although no actual host country budgets were examined, there is little on the surface to indicate that research is receiving higher priority by local governments based on ISNAR effort.

The evaluation team recommends that AID should give careful attention to the anticipated sub-project evaluation with the stipulation that any consideration for extending this training will depend on a higher level of effort reflected in the training coordinator being posted in Southern Africa for the remaining LOP and that he will be expected to lay the base for institutionalizing management training in the region after sub-project phaseout.

Project Title: Strengthening the Teaching and Adaptive Research Capability of the National University of Rwanda

Project Number: 698-0435.11

Date of Obligation: September, 1987

PACD: September, 1992

Managed by: USAID Kigali

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

The Africa Bureau's research plan stipulated that in 4 to 6 of the "technology generating countries" support also would be given to faculties of agriculture to produce a critical mass of well trained agricultural research scientists and to have universities contribute to the pool of national and regional agricultural research. Until now the faculty of agriculture at the National University of Rwanda (UNR) is the only one being assisted under SAARFA.

Assistance is being provided by the University of Minnesota (UM). The purpose of the sub-project is to improve teaching and to enhance the ability of Rwanda to adapt research technologies from outside with the aim of increasing national productivity and income.

The development of agricultural faculties in Francophone Africa has lagged behind english speaking areas. However, the University of Minnesota has been uniquely successful over the past two decades in assisting Hassan II University in Morocco, and has presented a comprehensive unsolicited proposal under which Hassan II will join UM in assisting UNR. While mentioning weakness to be overcome, the proposal implied that UNR will indeed be able to train research staff and in time will be able to contribute to Rwanda's research requirements. Staff from the University of Minnesota indicated further that problems similar to those currently at UNR were found at Hassan II University twenty years ago. With this reference, the proposal makes a case for long term support.

AID of course will have to decide the whether and how of long-term financing. It is the evaluating team's understanding that the UNR sub-project was supported with the hope of having it become a model for French speaking countries of Sub-Saharan Africa. This on the face of it is a worthy objective.

Findings: The proposal for this sub-project denotes that even if successful UNR will require many years to become effective as a national

institution. Moreover, Rwanda is not a "research generating country". It is therefore unclear why this was the first agricultural faculty to be funded under SAARFA when the Plan is to concentration faculties in technology generating countries?

Beyond this, however, based on a visit to the campus at Butare it is difficult to envisage when and how UNR will be able to fulfill the outputs listed in the unsolicited proposal. Of 21 agricultural faculty members (Rwanda and foreign) six were away in training at the time of the team's visit. Faculty improvement and buildup are just beginning problems. The last graduating class consisted of only 21 students, and of a total of about 100 students enrolled in agriculture only two are foreign. Laboratory equipment and supplies are inadequate for university training. Thus, the faculty, student body, and equipment will have to show significant improvement if the teaching objective is to be met.

The evaluation team also made inquiries about UNR's plans for research, and about the university's relation with the government's research institute. The unsolicited proposal emphasizes the need for research and actions to slow and finally reverse the loss of natural resources especially top soil and forests. The research agenda at UNR however offers no research program in soils and only a plan for forestry. Its priority is on rice, nutrition for small ruminants, and later to rural economy and forestry. The sub-project proposal emphasizes linkages with existing networks, however, by examining the networks that are functional in East Africa (root crops, beans etc.) only UNR's research in forestry will be able to link directly with an IARCs (i.e. ICRAF). In other words, the present choice of research priorities will increase the difficulty to make progress under SAARFA guidelines. In similar fashion neither does UNR's research appear to be coordinated closely with that of the government's National Agricultural Research Institute (ISAR).

In summary, the unsolicited proposal for Building Capacity of Rwanda's Research System to Conduct, Disseminate and Teach Adaptive Research in Agriculture is well written and comprehensive, and its projected output in terms of improved faculty training in research is needed. On the other hand, much doubt remains about achieving these objectives. Its goal of contributing to improving income for farmers and its purpose of adapting new technologies for production and environmental protection are even more remote. The evaluation team senses that most of SAARFA's objectives (centers of excellence, graduate training, technology producing, network linkage etc.) are beyond the reach of UNR within any reasonable LOP. It probably would be more realistic for such activities in research adapting countries, if funded at all, to be supported by the respective U.S. mission over a period of 15-20 years.

Department of State

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AIDAC

FOR RICHARD NEWBERG, AFR/TR/ANR

E.O. 12356: N/A
SUBJECT: REDSO/ESA - REACTIONS TO DRAFT SAARFA EVALUATION

REF: NAIROBI 10988

1. AS A GENERAL STATEMENT, REDSO/ESA IS PLEASED AND IN AGREEMENT WITH THE MAJORITY OF THE FINDINGS AND RECOMMENDATIONS OF THE JULY 1989 DRAFT OF THE SUBJECT EVALUATION. WE ARE PARTICULARLY GRATIFIED TO READ THE EVALUATION COMMENTS WITH REGARD TO THE MANAGEMENT OF SAARFA SUB-PROJECTS IN THE EASTERN AND SOUTHERN AFRICA REGION. WE UNDERSTAND THE ADMINISTRATIVE CONSTRAINTS WHICH HAVE LEAD TO THE MANAGEMENT CHANGES AS OUTLINED IN REFTEL. WE STILL BELIEVE THAT ACTIVE OVERSIGHT IN REASONABLE PROXIMITY TO THE WORK LEADS TO MORE EFFICIENT USE OF AGENCY RESOURCES. WE WILL DO AS MUCH AS IS POSSIBLE IN OUR MODIFIED, TECHNICAL ROLE TO FOSTER EFFICIENT USE OF PUBLIC MONIES.

2. THERE IS A STRONG FEELING BY THE REDSO ANR DIVISION THAT ATTACHMENT E SHOULD BE BROUGHT FORWARD, PERHAPS AS A BACKGROUND FOR THE BODY OF THE EVALUATION (PAGES 1 - 25). THIS CLEARLY LAYS OUT THE ROLE OF RESEARCH AS A BUREAU ACTIVITY. ADDITIONALLY, WE WOULD SUGGEST THAT THE AUTHOR PRESENT THIS AS A KEY NOTE TOPIC AT THE ADO CONFERENCE.

3. THE EVALUATION TEAM HAS EMPHASIZED THE IMPORTANCE OF GENERATING LOW-INPUT, SUSTAINABLE AGRICULTURAL PRODUCTION TECHNOLOGIES THROUGH RESEARCH, AND THEIR ADOPTION, BUT HAS NOT STRESSED RESEARCH-EXTENSION LINKAGES, AND THE PROCESSES OF TECHNOLOGY DIFFUSION. REDSO CONSIDERS THESE AS VERY IMPORTANT ACTIVITIES AS THESE ARE PREREQUISITES TO TECHNOLOGY ADOPTION. WE FIND THAT IARCS ARE GENERALLY RELUCTANT TO GO BEYOND THE ON-FARM RESEARCH STAGE. THEY SHOULD AT LEAST HELP THE NARS TO DEVELOP EFFECTIVE MECHANISMS OF TECHNOLOGY TRANSFER TO THE FARMERS. FUTURE SUB-PROJECT PROPOSALS SHOULD PRESENT STRATEGIES AS TO HOW THE QUESTION OF TECHNOLOGY TRANSFER WILL BE ADDRESSED.

4. ALTHOUGH WE BELIEVE IN THE VALUE AND USEFULNESS OF NETWORKS, ANY FURTHER INCREASE IN NUMBERS OF NETWORKS SHOULD BE DONE ONLY AFTER CAREFUL THOUGHT. NATIONAL PROGRAMS IN THIS REGION

GENERALLY HAVE LIMITED NUMBERS OF QUALIFIED STAFF AND LIMITED RESOURCES FOR THE SUPPORT OF WORK AND TRAVEL. SOME COUNTRIES END UP SENDING THE DIRECTOR OF RESEARCH TO REPRESENT THEM AT MANY OF THE NETWORK MEETINGS. WE SUPPORT THE CONCEPT OF SMALL ANIMAL AND SOILS NETWORKS BUT BELIEVE THE NUMBER OF COUNTRIES CAPABLE OF PARTICIPATING IS LIMITED.

5. REDSO SUPPORTS THE CONCLUSIONS OF APPENDIX B SOCIO ECONOMIC RESEARCH UNDER SAARFA PARTICULARLY REGARDING THE THREE ITEMS OF DESIRED FOCUS FOR A FOLLOW-ON PROJECT AND THE NEED TO ISSUE CRITERIA OF SUB-PROJECT SELECTION AS A GUIDE TO ASSIST ORGANIZATIONS WHO WISH TO SUBMIT UNSOLICITED PROPOSALS. OUR THINKING WITH RESPECT TO THE LINKAGES BETWEEN THE PHYSICAL AND SOCIAL SCIENCES MAINLY EMPHASIZES THE INTEGRATION OF AGRICULTURE ECONOMICS AS AN AID IN THE ALLOCATION OF RESEARCH RESOURCES, AS WELL AS THE WORK OF OTHER SOCIAL SCIENTISTS IN THE PROCESS OF TECHNOLOGY DEVELOPMENT TO UNDERSTAND THE FACTORS WHICH MAY LIMIT NEW TECHNOLOGY ADOPTION. THE APPENDIX B FOCUS ON THE QUOTE ECONOMIC CONDITIONS IN WHICH PRODUCTION AND CONSUMPTION DECISIONS ARE MADE UNQUOTE AND THE QUOTE LINKAGES BETWEEN POLICY CHANGES AND CAPACITY FOR TECHNOLOGICAL CHANGE UNQUOTE IS APPROPRIATE. WE DO NOTE, HOWEVER, THAT POLITICAL, SOCIAL, AND ECONOMIC CONSIDERATIONS ARE EQUALLY IMPORTANT IN POLICY ANALYSIS.

6. REDSO/ESA SUGGESTS SECTION B, PAGE 19-20, NEEDS A MUCH MORE REALISTIC FOCUS, OVERSTATES IARC HIGH INPUTS IN THIS REGION AND NEGLECTS THE USE OF ORGANIZATIONS SUCH AS SACCAR AS A CONSORTIA FOCAL POINT. FURTHER, ILCA WOULD NOT BE A SELECTION WE WOULD MAKE FOR EAST AFRICA COORDINATION, IGADD MIGHT HOWEVER PLAY SUCH A ROLE IN THE FUTURE.

7. WE CONCUR WITH THE STATEMENTS THAT DONOR COORDINATION IS AN IMPORTANT AREA AND SHOULD BE EMPHASIZED MORE. THE TEAM'S RECOMMENDATION TO INCREASE THE AMOUNT OF EMPHASIS IS APPRECIATED.

8. WE CONCUR WITH THE STATEMENTS ON PAGE 13 EMPHASIZING THAT COMMODITY RESEARCH SHOULD INCLUDE ITEMS PERCEIVED AS IMPORTANT BY SMALL FARMERS (RE: ROOT CROPS, BANANAS, ETC.).

9. WE LOOK FORWARD TO THE RECEIPT OF THE FINAL REPORT. GRIFFIN