

INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA)

THE EAST AND SOUTHERN AFRICA
ROOT CROP RESEARCH NETWORK PROJECT

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East and Southern Africa Root Crops Research
Network (ESARRN), Interim Evaluation

GLOSSARY

AID	Agency for International Development
CIAT	Centro Internacional de Agricultura Tropical
CIBC	Center International for Biological Control
CGIAR	Consultative Group on Interantional Agricultural Research
CIP	Centro Internacional de la Papa
CMD	Cassava mosaic disease
CMV	Cassava mosaic virus
COSCA	Collaborative Study of Cassava in Afirca
GTZ	Federal Republic of Germany Development Assistance Agency
HCN	Hydrogen cyanide
IARC	International Agricultural Research Centers
ICP	International Cooperation Program - IITA
IDRC	International Development Research Center (Canada)
IITA	International Institute of Tropical Agriculture
NARS	National Agricultural Research Systems
ODA	Overseas Development Administration - British Government
PACD	Project Activity Completion Date
REDSO/ESA	Regional Economic Development Services Office for East and Southern Africa
SADCC	Southern Africa Development Coordination Conference
SPAAR	Special Program for African Agricultural Research
SOW	Scope of Work
TRIP	Tuber and Rootcrops Improvement Program - IITA
USAID	United States Agency for International Development

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REGIONAL ECONOMIC DEVELOPMENT SERVICES OFFICE
FOR EAST AND SOUTHERN AFRICA (REDSO/ESA)
AND THE INTERNATIONAL DEVELOPMENT RESEARCH CENTER (IDRC)

INTERIM EVALUATION OF THE
INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE'S (IITA)
EAST AND SOUTHERN AFRICA ROOT CROPS RESEARCH NETWORK (ESARRN)

DECEMBER 1988

EXECUTIVE SUMMARY

PURPOSE OF ACTIVITY

A collaborative Interim Evaluation of ESARRN, an unsolicited root crop research proposal, was successfully conducted by a five person team consisting of an IITA scientist, a REDSO project development officer, a REDSO agricultural officer, a IDRC program officer, and an external consultant/agriculturalist. ESARRN is a jointly funded three year \$1.5 million cassava and sweet potato research project which supports development of member country research programs in East and Southern Africa.

The goal of the project is to increase root crop production and productivity in East and Southern Africa. ESARRN, a network of 11 national root crop research programs receiving technical support from IITA, serves primarily as a training and technical assistance mechanism to support root crop development.

The project has five specific objectives:

- (1) Encourage rigorous collaborative planning and evaluation of root crop research in the region;
- (2) Increase the useful genetic base for principal root crops and enhance its utilization in the root and tuber improvement programs in the region;
- (3) Improve root crop based farming systems through surveys, design, and methodology development;
- (4) Develop improved techniques for drying, processing, and utilizing cassava in rural areas;
- (5) Foster the establishment of effective systems for delivery of improved technology to farmer through institutional and human resource development.

USAID is funding three principal components of the project:

- (1) Coordinator's Office - which include international and national staff, office expenses, travel, and communications.

(2) Networking Activities - mainly for training and workshops including M.Sc. level training.

(3) Regional Research Programs - equipment and operational costs.

The International Development Research Center (IDRC) is providing support for selected national research programs, training, equipment, and personnel. The grantee, IITA funds mainly consultants, training/workshops and regional research expenses.

At present ESARRN serves the following countries: Rwanda, Burundi, Uganda, Malawi, Kenya, Sudan, Tanzania, Zambia, Mozambique, Madagascar, and Ethiopia (IDRC funding).

PURPOSE OF THE EVALUATION

The project evaluation plan calls for a collaborative interim review of several priority areas to determine project progress in relationship to expected outputs of the grant agreement with IITA. The team reviewed project activities and outputs to determine if project objectives were being addressed. Lesson learned during initial implementation were identified and action recommendations made for remaining life of project.

The team visited four of the eleven ESARRN countries; Malawi, Rwanda, Uganda, and Kenya. In each country interviews were conducted with directors of national agricultural research systems (NARS), heads and researchers in root and tuber crop research programs, and USAID missions. The team also visited farm sites and research facilities in each country visited.

ESARRN has one full-time project coordinator (a plant breeder) stationed in Lilongwe, Malawi.

FINDINGS AND CONCLUSIONS

The interim evaluation of the IITA ESARRN project concluded that, notwithstanding the low level of funds utilization, the grant was being well implemented and that significant progress was being made with training, genetic material distribution, and strengthening of national programs.

The team made more than twenty recommendations. Major recommendations for four categories are enumerated as follows:

A. Project Management

(1) A second professional should be added to the project for remaining life of project.

(2) Terms of reference and operating guidelines need to be developed for the Steering Committee.

(3) Annual work plans and budgets need to be submitted and reviewed as scheduled.

(4) Consideration should be given to extending the project by up to nine months without additional funding.

B. Training

(1) Encourage B.Sc. degree training for diploma level root crop research workers.

(2) More training to national program staff in rapid multiplication and distribution techniques.

(3) Increased use of IITA staff for short term regional training and consulting activities.

C. Technology Development

(1) Greater efforts to develop and introduce improved genetic material into the region.

(2) Encourage publication of technical information on root crops for the region.

(3) Studies on the economic importance and sociological aspects of root crops should be undertaken. The use of universities in the region should be considered for this activity.

(4) Assist NARS to develop more efficient systems of technology transfer to farmers.

(5) More effort needs to be directed towards post harvest technology development.

(6) National programs should be encouraged to make greater use of the network in addressing issues and problems common to the region.

D. Program Development

(1) Active involvement of all root crop producing countries in the regions in the network should be encouraged.

(2) Following the transfer of responsibility for sweet potatoes to CIP, efforts should be undertaken to integrate CIP support into ESARRN.

(3) IITA should prepare a phase II ESARRN proposal including baseline data information..

(4) ESARRN should encourage the strengthening of national programs through increased allocation of national research resources and donor contributions for root crop research.

LESSONS LEARNED

A. Project Design Implications:

(1) The absence of detailed baseline information on root crops in the region made it difficult for the evaluation team to quantify benefits and achievements of the project. Baseline information should be included in any follow-on project activity.

(2) The project was generally well designed. The slower than anticipated start and low level of funds drawdown should not adversely affect the projects ability to achieve projected outputs if a no-cost extension is approved.

(3) Multi-donor funding can be effective and meet the objective of the donors if responsibilities and obligations are understood and agreed upon at the onset. Periodic joint review of activities facilitates coordination and supervision by donors.

(4) The collaborative networking approach was found to be cost effective and problems encountered in one country did not adversely affect overall project activity.

(5) REDSO/ESA is the appropriate AID agency for project management and technical supervision. Management by a bilateral mission would be disjointed and difficult because of the large number of countries involved. AID/W is too distant to respond to project needs in a timely manner.

(6) Regional networks are capable of cutting across national and linguistic borders and foster collaboration and cooperation among national research programs.

B. Broad Action Implications:

(1) One professional staff member is insufficient to meet the demands of national programs. A second professional should be added to ESARRN staff. Increased use should be made of IITA core staff as short-term consultants.

(2) Improvements need to be made in systems for technology transfer to farmers. Linkages between research and extension, and between the extension service and the farmer are generally weak for root crops. Increased impact on farmers will require improvement in the technology transfer system.

(3) Root and tuber crops are generally accorded low priority by national policy makers because of insufficient knowledge about the importance of root crops in the national economy. Economic and sociological analysis would help rectify this situation.

(4) Available improved genetic material is not being adequately tested and distributed in all member countries.

1. BACKGROUND TO PROJECT EVALUATION

1.1 Origin of East and Southern Africa Root Crops Research Network (ESARRN)

The International Institute of Tropical Agriculture (IITA) has actively encouraged the development of national root crop research programs in Africa. Root crops have long been recognized as a major food source in many countries and especially as a food security crop. Root crops are however often given a low priority by national research programs. Up until the 1980s there was a relatively small number of scientists in East and Southern Africa working on root crop research and interest in production was confined largely to the small farmers who produced root crops for direct consumption.

By 1985 heads of national root crop programs in East and Southern Africa reached a consensus that the interests of root crop development in the region could be better served through a regional network which would provide a base for regional collaboration in research and serve as a forum to promote root and tuber crops. IITA provided initial support to ESARRN by funding the coordinator's position. IITA also assisted ESARRN with the preparation of funding proposals, and approached both the International Development Research Centre (IDRC) and the United States Agency for International Development (USAID) with requests for network funding. IDRC approved a grant for \$379,000 in December, 1986. USAID's grant for \$943,000 followed in March, 1987. IITA committed from its own resources an additional \$237,000 bringing total project funding to \$1,559,000. The first phase of this project is for three years, ending March 11, 1990.

1.2 Project Objectives

The goal of the project is to increase root crop production and productivity in East and Southern Africa. The specific purpose of the project is to establish a root crop research network to foster cooperation and sharing of information and genetic materials among National Agricultural Research Systems (NARS) to support and train scientists in participating countries, and to strengthen national root crop programs. Specific project objectives include the following:

- a) encourage rigorous collaborative planning and evaluation of root crop research in the region;
- b) increase the useful genetic base for principal root crops and enhance its utilization in the root and tuber improvement programs in the region;
- c) improve root crop based farming systems through surveys, design, and methodology development;

- d) develop improved techniques for drying, processing, and utilization of cassava in rural areas;
- e) foster the establishment of effective systems for delivery of improved technology to farmers through institutional and human resource development.

1.3 Project Activities

The primary project activities consist of the following:

- a) establishment of a regional network for scientists working on root crops in east and southern Africa;
- b) short-, medium-, and long-term training;
- c) development of training materials;
- d) publication and dissemination of technical information;
- e) technical assistance for improved root crop research;
- f) exchange of improved genetic materials among national programs;
- g) provision of technical equipment and acquisition of research and office facilities.

1.4 Project Setting

Agriculture is the predominant sector in East and Southern Africa where the rural population often exceeds 80% of total population. In a large part of this region root crops play a major role as the basic provider of dietary calories and as a significant food security crop. While governments are duly concerned about food security and self-sufficiency, they often see root crops mainly as food security for drought situations. The importance of root crops for national food security varies considerably among the countries within the region, but most countries do have significant portions of their population that depend on root crops as their primary source of energy. In many countries cassava is considered a staple food of poorer people who practice low input agriculture in marginal low rainfall areas. The movement of more people into even more marginal agriculture areas has made cassava a popular crop among the rural people as well as in para-urban areas and it is estimated that cassava is produced on more than 2.6 million hectares in East and Southern Africa. Yields, however, tend to be in the low range (3 to 14 tonnes/hectare). Over 500,000 hectares of sweet potato are also grown, but production is mainly in East Africa.

ESARRN's role, as the primary training and networking mechanism in support of root crops development, continues to promote them as important food crop for national agricultural research programs. In terms of project activities, there have been some changes in levels of activity and locations from the original proposal, however, this is to be expected from a regional project that must respond to initiatives from national programs. Because of ESARRN's regional nature, political or security problems, although existing, have not been a constraint to total project outputs. ESARRN's bilingual staff have been able to work effectively in all ESARRN member countries. ESARRN member countries currently consist of Rwanda, Malawi, Uganda, Tanzania, Sudan, Kenya, Zambia, Burundi, Mozambique, Ethiopia, and Madagascar. Membership is open to other interested countries in the region.

The coordinator's office is located in Lilongwe, Malawi. The IITA headquarters in Ibadan, Nigeria, provides administrative and technical backstopping for the project. The primary donors, USAID and IDRC, monitor the project from their regional offices in Nairobi, Kenya.

1.5 Purpose of the Evaluation and Evaluation Methodology

The evaluation team was asked to assess the Project's implementation to date with a view to enhancing performance and potential impact. In particular, USAID is concerned with the low level of funds drawdown and if project objectives are being adequately addressed. This evaluation report presents findings, conclusions and recommendations which will assist USAID, IDRC, IITA and the Steering Committee to make decisions about the future of the project. The evaluation took place between November 27 and December 21, 1988.

The evaluation team consisted of representatives from USAID, IDRC, IITA, and an independent consultant who served as the teams technical leader. The Statement of Work (SOW) for the evaluation is attached as Annex 1. The team visited national programs in four countries (Malawi, Rwanda, Uganda, and Kenya). Field visits to on-station and on-farm research trials were made in each country visited. The team reviewed REDSO project files to familiarize themselves with the design and evolution of project activities. Documents reviewed include the IITA proposal, the grant agreement, periodic reports, internal files in ESARRN coordinator's office, and relevant documents from national root crop programs.

The team held interviews with IITA headquarters staff, leaders of national root crop programs, host government representatives, and USAID mission personnel in countries visited to obtain their views on project performance and suggestions for future project activities. A list of persons interviewed is attached as Annex 3.

At the completion of field visits, discussions were also held with members of the ESARRN Steering Committee concerning project implementation issues and the evaluation recommendations. Financial records and reports in the coordinator's office and REDSO were also reviewed.

The Evaluation Team was composed of Dr. Theodore Ferguson (independent consultant and technical team leader), Mr. Gregg Wiitala, (USAID/REDSO/ESA), Mr. Andrew Ker, (IDRC/Nairobi), Dr. Andrew Uriyo, (IITA, Ibadan), Dr. K.B. Paul, (USAID/REDSO/ESA), Dr. Marikis Alvarez, (ESARRN coordinator), Dr. Sang Ki Hahn, (IITA TRIP Director), Mr. Robert McColough (USAID/REDSO/ESA) and Mr. Hudson Masumbu, (USAID/REDSO/ESA) participated in the evaluation as resource persons. Their assistance has enabled the team to carry out its work efficiently and within the time allotted for the evaluation.

The draft evaluation report was completed and presented to USAID and IDRC on December 21, 1988, prior to the teams departure from Nairobi.

1.6 Conditions Precedent

The ESARRN grant agreement project specified one condition precedent for first disbursement which required evidence that the Government of Malawi had agreed to locate the ESARRN coordinator's office in Lilongwe. This condition precedent was satisfied in June 1987.

2. REVIEW OF PROJECT ACTIVITIES

Comparison and Assessment of Project Activities with ESARRN Project Proposals

Project activities are grouped for the purpose of this evaluation.

2.1 OBJECTIVE 1 - To encourage rigorous collaborative planning and evaluation of root crop research in the region

2.1.1 Activities

Project activities included, Steering Committee meetings, Heads of Root Crop Programs meetings, Training, Exchange Visits, Workshops and Collaborative Research Projects.

Steering Committee Meetings

The Steering Committee was constituted at the 1985 workshop held in Malawi from which four members were selected from the then three strong national root crops improvement programs of Uganda, Tanzania and Rwanda and from the host

country Malawi. The Steering Committee has worked closely with the ESARRN's coordinator to establish a fully operational network. The Steering Committee has been functioning for three years.

The First meeting of ESARRN Steering Committee was convened at IITA in April 1987. At this meeting, the Steering Committee approved the annual work plans of the participating national programs. It also approved that initial disbursement for the first year should be up to 75% of the annual budget with subsequent installments to be made after submission of financial statements and progress reports.

The Second meeting of the Steering Committee was convened and hosted by the Institut des Sciences Agronomiques du Rwanda (ISAR) at Gisenyi in August 1987. At the meeting a supplemental funding proposal for national research activities was prepared and submitted to SPAAR by IITA on behalf of the Steering Committee.

The Third Steering Committee meeting was held in Dar es Salaam, Tanzania, March 14 - 18, 1988. This meeting was a follow-up on the Third East and Southern Africa Root Crops Workshop held at Mzuzu, Malawi, in December 1987. The Steering Committee reviewed the position of the network, approved work plans and also reviewed the proposed IITA/CIAT Collaborative Study of Cassava in Africa (COSCA).

The Fourth Steering Committee meeting was held in Mwanza, Tanzania, on August 24, 1988 and it reviewed progress made in implementing ESARRN's collaborative projects and approved seed money for Madagascar and the Center International for Biological Control (CIBC) proposed linkage with ESARRN.

The Review Team Recommends that the Steering Committee formalize its existence by adopting terms of reference and operational procedures. In this exercise there should be a close examination of the role of the meetings of heads of national root crop improvement programs and the desirability or otherwise of involving the national directors of agricultural research at some stage in the decision making process of the network.

Heads of Root Crops Research Programs Meeting

An ESARRN Heads of Programs meeting was held in Mzuzu, Malawi during the meeting of the Third East and Southern Africa Root Crops Workshop in December 1987. At this meeting, objectives of ESARRN were reviewed and workplans developed.

A subsequent ESARRN Heads of Root Crops Research Program meeting was held at Mwanza, Tanzania from August 22 - 26, 1988. The meeting discussed the progress of the network's activities, identified new regional root crops research priorities and discussed funding and other collaborative activities.

Training

One of the major objective of the network is to develop manpower resources to provide continuity and improved management of research projects in the various root crop programs at the national level. The training activities which were supported by the project included:

Non-degree in-service training

The Review Team noted that a limited number of root crops research and extension workers from East and Southern Africa attended the 10 week root and tuber crops training courses conducted at IITA each year. Since the inception of ESARRN, in-service training courses have been held in Zambia, Burundi and Rwanda where 19, 17 and 40 participants respectively were trained.

The Review Team noted with concern the lack of back up support from IITA training department for in-service training given in the region since the inception of ESARRN's network activities. It is RECOMMENDED that for the remaining life of the project, IITA should provide backstopping support to in-country training activities according to the provisions of the grant agreement. This support should include technical assistance for training, logistic support and training materials. Such support will reduce the coordinator's management workload for training courses so that he can put more effort into other scientific network activities. The Review Team noted that CIP in keeping with the CGIAR action plan signed with IITA for sweet potato activities should now also be involved in backstopping activities specific to sweet potato.

The Review Team noted that resource persons within participating national programs have been used for in-country training in other countries and RECOMMENDS that the practice should be encouraged as it builds confidence among national scientists and it is cost effective as well.

Masters level degree training

The project has funded three masters level degree training in areas consistent with the needs of the national programs and the region as shown in Table 1. In addition IITA has supported the team of two students from Tanzania for Ph.D. degrees at the University of Ibadan and one student from Zambia for the M.Phil. degree at the University of West Indies.

Table 1: List of postgraduate fellowships funded by ESARRN.

Country	Discipline	Crop	University
Burundi	Breeding	Sweet Potato	University of Nairobi
Malawi	Integrated Pest Management	Cassava	University of Ibadan
Kenya	Agronomy	Cassava	University of Ibadan

Exchange Visits

Exchange visits were also a feature of ESARRN's network activities. Such visits enabled the participating national scientists to obtain an overall view of the different programs and encouraged free flow of information among the researchers. The exchange visits that were accomplished since the inception of ESARRN are shown in Table 2.

Table 2 - Exchange Visits

Country	Number of Scientists	Program Visited	Activities Accomplished
Rwanda Root Crops Team	2	Kenya Root Crops Program Madagascar FOFIPA FIFAMANDR	Cassava & Sweet potato germplasm evaluation, represent ESARRN in root crops discussion
Kenya sweet potato breeder	1	Rwanda Root Crops Program	Orientation and germplasm exchange
Ethiopia Root Crops Technician	1	Rwanda Root Crops Program	Orientation and germplasm exchange
Zanzibar Root Crops Coordinator	1	Kenya Root Crops Program Zambia Root Crops Program	Cassava germplasm evaluation
Mozambique INIA Director University staff	3	Rwanda Root Crops Program and IITA	Orientation to program structure and multiplication scheme
SADCC/PFIAU Post-harvest Section	1	IITA	Orientation to development in post-harvest activities
Mozambique	1	Malawi Root Crops Program	To observe rapid multiplication techniques
Kenya Root Crops Coordinator an Technical Officer	2	IITA	Orientation to rapid Multiplication Techniques
Uganda Sweet Potato Breeder	1	Rwandan Root Crops Program	Orientation to in-country training

Workshops

As part of ESARRN efforts to promote regional linkages, the coordinator participated in the following workshops: CIBC/IITA Regional Biocontrol workshop held in Malawi in October 1987; the Root and Tuber Crops Germplasm Exchange Workshop with special reference to sweet potato and organized by CIP in Nairobi and the USAID African Bureau of Agriculture, Natural Resources and Rural Development Workshop also in Nairobi.

The Third Eastern and Southern Africa Regional Root Crops Workshop was organized by ESARRN and held at Mzuzu, Malawi from December 7 through 11, 1987. The workshop was attended by over 70 root crops researchers from 12 countries in Eastern and Southern Africa. The four-day workshop was preceded by a one-day field tour into the root crops growing areas of Malawi.

A cassava post-harvest workshop was organized by SADCC in collaboration with ESARRN and hosted by the Malawi Government in Mzuzu, Malawi from November 28 to December 2, 1988. The Review Team observed the opening sessions where over 25 regional and international scientists were present.

Research Projects

The Evaluation Team visited field research projects in Malawi, Rwanda, Uganda and Kenya. The team noted that root crops were important in the food security of each country visited, but saw little evidence that national research programs were allocating national resources for root crops improvement at levels commensurate to their actual importance. Rwanda is the only exception to this statement.

Pests and diseases are the most serious constraint to increased root crops production in East and Southern Africa at present.

However part of the problem in addressing the issues of pests and diseases is the current state of root crop research in the region. It could be characterized as having a lack of adequate and experienced research staff capable of conceiving a researchable agenda that will address both immediate and long-term constraints that root crops farmers are facing in the region. ESARRN's Steering Committee noted this shortcoming at its last meeting in which it was unanimously agreed that in the future there would be need for each project to be reviewed by members of the Steering Committee or by consultants specialized in the area concerned so as to ensure that the methodologies are achievable and are consistent with the project's objectives. Collaborative research projects supported by the network are shown in Annex 8.

Relevance of the Collaborative Research Projects to National Programs

The Review Team is of the opinion that the collaborative research projects were very relevant to national programs and that the objectives set were relevant and to large extent they were attainable.

It is Recommended that IITA, ESARRN, and the national programs screen all advanced/breeding material for HCN content, and increase their efforts to identify mosaic-resistant cassava varieties which are low in HCN content for further testing and distribution. Where material with high HNC content has to be distributed, high priority should be given to research and extension on improved processing methods which reduce the HCN content to acceptable levels.

2.1.2 Achievements

The Review Team interviewed national research leaders and all acknowledged that root crops were important in their national economies. ESARRN's major achievement is that it has sensitized national research leaders on the importance of root crops research.

ESARRN has also succeeded in motivating national research programs to start national root crops improvement programs with short-term and long-term objectives. These national root crops improvements programs are at different stages of evolution and have benefited significantly from network support .

The Review Team found some evidence of ESARRN being able to influence additional resource allocation to root crops research by national programs. The increase in bilateral support for root crops research in Uganda, Rwanda, Malawi and Mozambique was in some measure directly influenced by the activities of the network.

ESARRN's network activities provide appropriate support to national root crops improvement programs. However, there was little evidence of collaboration in root crops research and training between national root crops improvement programs and faculties of agriculture at the universities. The Evaluation Team feels that ESARRN can play a major role in stimulating collaboration between national root crops improvement programs and faculties of agriculture in root crops research and training.

ESARRN has made considerable progress in institutional and manpower development. Shortage of qualified personnel has made it impossible for ESARRN to utilize all the available training slots. The evaluation team RECOMMENDS that ESARRN should discuss this matter with USAID (IDRC's policy is to support graduate level training) and work out a plan whereby existing national root crops research workers with diplomas

could be supported for degree training at either Bunda College (Malawi), Sokoine University of Agriculture (Tanzania) or other regional institutions where such facilities for upgrading diploma holders exist.

Technology transfer, developed by research on root crops, to extension workers needs to be strengthened. Similarly, technology transfer to farmers was somewhat lacking. The Rwanda program was well ahead of the other programs visited. Some of the on-farm research trials visited in Uganda were short of the Review Team's expectations. In Kenya the Review Team was informed that there is a good market for planting materials of sweet potato and cassava. It is RECOMMENDED that the national coordinator of the Kenya Root Crops Improvement program prepare a request to ESARRN for a training program on rapid multiplication of root crops.

2.2 OBJECTIVE II To increase the useful genetic base for the principal root crops, and to enhance its utilization in improved programs in the region.

Specifically, the project aims to:

- (a) Collect, introduce and maintain cassava, sweet potato, yams and cocoyam genetic materials.
- (b) Evaluate the genetic material for yield, pest, diseases and wide adaptability.
- (c) Generate and improve populations with desirable agronomic characteristics and make them available to ESARRN members.

2.2.1 Activities

In general, there has been significant activities in most participating countries towards meeting this objective. The presence of many potentially devastating pests and diseases in the region emphasize the need for the development and introduction to the farming community varieties resistant to the more important of these pest and diseases.

The cassava mealybug is one of the major pests affecting cassava production in Zambia, Malawi, Tanzania, Burundi, Rwanda and Mozambique. There is a strong likelihood that this pest will spread to Uganda and Kenya in the very near future. The Review Team had the opportunity to visit the lake shore area in Malawi which is currently experiencing a devastating attack from the cassava mealybug. Cassava is the major food crop grown in the area and the present outbreak greatly reduces the productivity of the crop. Many farmers have experienced almost total crop loss. Zambia and Burundi have also suffered greatly from the presence of this pest. Successful parasites releases have been made by the Africa-wide Biological Control Program of IITA in an effort to control the mealybug (see ABCP evaluation

reports). Highly resistant cassava varieties have not yet been identified by IITA and some national programs are currently working on the development of varieties that are tolerant to mealybug at low population levels.

Another major pest of cassava is the cassava green mite which is currently present throughout the ESARRN region. Most of the locally grown varieties are susceptible and yield losses of up to 30 per cent occur in some areas. Current attempts at biological control have not yet given effective results. The introduction and development of resistant germplasm is an effective approach in controlling this pest.

The African Cassava Mosaic Virus (CMV) is present in all network countries. The review team visited an area badly affected by this disease in Central Uganda (The Luwero Triangle). Yields were greatly affected and the more recently planted fields show poor growth and may produce little or no yield. The use of resistant varieties and clean planting material are the most effective methods of controlling this disease. Unfortunately no sweet cassava varieties resistant to CMV have undergone on-farming multi-locational trials and therefore not available for distribution.

In addition, cassava in the region is also attacked by cassava bacterial blight, cassava anthracnose disease and cassava scale insects.

There are two major problems for sweet potato in the region. The sweet potato virus complex and sweet potato weevil. Again, there is a need to identify, develop and distribute resistant germplasm in the region.

The East and Southern Africa region is characterized by sharp differences in ecology between countries ranging from very arid to humid tropical and cool upland conditions. There is a need to select varieties for these varied conditions. Furthermore, there are distinct taste preferences with regards to the quality (bitterness, starch content, etc.) of tubers as they fit into current consumption patterns.

Clearly the development or introduction of improved germplasm is a very important objective. Such improved germplasm can have immediate impact on increasing or maintaining yields and in widening the genetic base for greater crop sustainability thus ensuring better food security for the future.

The networking country programs have all undertaken some activities on improving their useful genetic base. These national activities are highlighted in Appendix 5.

2.2.2 Achievements

The achievements to date as measured by the impact of variety releases on the farming community is limited, however, given the short time that ESARRN has been in operation the achievements are commendable.

The variety releases in Rwanda are getting through to the farming community because of the excellent system of rapid multiplication and distribution of planting material put in place by the national program. Rwanda could serve as a model for replication in other countries.

In most other countries variety releases have been made but the lack of efficient system for making clean planting material available to farmers greatly limits the rate of adoption of the new varieties. The Review Team notes, however, the positive developments in Malawi, Zambia, Burundi and Zanzibar in improving existing systems of multiplication and distribution of planting material.

The project had some success in broadening the genetic base for cassava and sweet potato in practically all participating countries. Genetic material from tissue culture or seed sources were supplied by IITA to interested countries. In some countries IITA accessions have already been released to farmers. IITA sweet potato varieties have been released in Malawi, Rwanda, Kenya, Burundi, Tanzania and IITA cassava varieties released in Tanzania and Rwanda.

The hybridization work in Rwanda has produced improved populations of cassava and sweet potato which will enhance the possibility of producing cassava and sweet potato varieties better suited to the region. It is significant that over 60,000 seeds from this hybridization effort has been distributed to Kenya, Ethiopia, Malawi, Tanzania, Uganda and Mozambique. Hybridization is also about to commence in Malawi for both cassava and sweet potato thus further widening the genetic base in the region.

The arrangement for the development of a regional quarantine facility in Kenya will greatly facilitate the movement of selected outstanding varieties among the countries of the network.

It is Recommended that ESARRN continue to encourage national programs to develop improved varieties and increase the genetic base. Increased emphasis on improving systems for farm distribution are also required.

2.3 OBJECTIVE III To Facilitate Improvement of Root Crop based Cropping Systems through surveys, design and methodology development

2.3.1 Activities

Only a few countries seem to have undertaken activities towards achieving this objective. In many countries the over-riding issue of rapidly spreading pest and diseases forced a change of objectives toward finding solutions to minimize the effects of these pests and diseases particularly the mealy bug.

A comprehensive survey was conducted in three districts in the Luapula Province in Zambia to measure the impact and the attitude of farmers to the cassava mealybug. The results showed that cassava was extremely important as a food crop in the diets of the farmers and that the mealybug was a major threat to the regions food supply. In areas where cassava production had fallen farmers were only able to have one meal per day. Improved planting material was identified by the farmers as their major need.

Malawi is planning to undertake a farm level survey of the major cassava growing areas in order to gather information on the contribution of cassava to the diet and to identify constraints in processing methods and storage systems. This survey will be undertaken in collaboration with Bunda College of Agriculture of the University of Malawi and UNICEF.

There were no studies carried out on the design and development of methodology for undertaking farming systems research.

The national program of Tanzania was given network responsibility for development of cassava-based intercropping systems which are economically advantageous to the region. Studies are in progress to determine the biological and economic benefits of intercropping with various combinations of cassava, cowpea, maize, sorghum and sweet potato as compared to pure stand cassava.

2.3.2 Achievements

Achievements to date are limited to the survey in Zambia which provided valuable data on the adverse impact of the cassava mealybug on livelihood of the people in the affected areas. It highlighted the economic importance of root crops in the country and has helped the national program in setting priorities for its research and development activities.

There is a need for similar and perhaps more detailed studies to be undertaken in other participating countries in order to bring to the attention of policy makers an accurate

picture of the status of root crops in the individual economies. Further, such surveys will be of tremendous benefit in helping researchers to identify and prioritize constraints affecting root and tuber crops in their countries.

The farming systems methodology is of a somewhat long-term nature and requires much technical and financial resources in order to do the multi-seasonal and multi-locational testing that is required before moving to the stage of large scale on-farm trials. It is RECOMMENDED that the approach should be modified towards working on only one or perhaps two components of widely established systems rather than attempting to change too many variables at the same time. For example studies may be restricted to influencing an existing system by introducing a variety that is better adapted to intercropping as determined by yield of the introduced crop and/or the yield of the other intercrops. The area of farming systems research needs further discussion between IITA and the Steering Committee on the development of methodologies which can lead to quantifiable benefits.

2.4 OBJECTIVE IV To develop improved technologies for drying, processing and utilizing cassava in rural areas

2.4.1 Activities

A survey was conducted in Uganda to identify the traditional methods of processing and utilizing cassava. It was found that this varies with varieties and local customs. The traditional methods included eating cassava raw or after roasting, boiling, or steaming and as a flour after drying and grinding.

In Malawi a study is in progress to determine post-harvest constraints at the farm level.

In Rwanda there is an active program for the development of traditional and non-traditional foods and dishes from cassava. The Review Team had the opportunity to see and sample many of these promising processed food products during their visit. Attempts are being made to further develop and popularize these products.

2.4.2 Achievements

The program in Uganda has stopped short of evaluating the drying technologies developed on-farm. It is RECOMMENDED that researchers be encouraged to work in closer collaboration with farmers in order to ensure rapid adoption of any improvements. Studies should be conducted on the development of improved technologies for the chipping of cassava. Chippers developed in other countries should be introduced and evaluated.

The work on the development of processed cassava based foods in Rwanda offer some exciting prospects for improving the utilization of cassava in both rural and urban areas. Other national programs can benefit from the Rwandan efforts.

2.5 OBJECTIVE V - To Foster the Establishment of Effective Systems for Delivery of Improved Inputs and Technologies to Farmers

2.5.1 Activities

Activities aimed at accomplishing the above objective include the development of close linkages between researchers and extension agencies and the various development projects involved in working with root crop farmers. The effectiveness of the transfer of improved technologies is dependent on the degree of collaboration between these groups in the conduct of on-farm trials, the evaluation of recommended technologies, the multiplication and distribution of planting material for new improved varieties, the holding of field days and demonstrations and in the preparation of farmer training materials.

The Review Team visited on-farm trials in Rwanda and Uganda. In Rwanda researchers collaborate with the extension service by holding field days for farmers. Also in Rwanda researchers have established an impressive system for the rapid propagation and distribution of improved planting material varieties. Malawi is currently developing a similar system.

In Rwanda, the root crops program has established a sound intra-country network system involving research stations, extension agents, development projects and farmers. This linkage has played a vital role in bridging the gap between research stations and farmers.

This system starts with annual 2 weeks in-country training courses for extension workers from the ministry, technicians from development projects and teachers from schools. These training courses also serves as a forum for farmer field days. The course participants constitute a national cadre for the dissemination of root crops technology to the farmer.

2.5.2 Achievements

In general, the Review Team found that there is much room for improving and making more efficient systems for transferring improved technologies to farmers. There is need for more on-farm trials and researchers should make a greater effort to work in closer collaboration with the extension services and to involve them more in the review process. On farm trials should be targeted to expose farmers to specific technologies which may have potential for early impact.

In some countries field level extension workers have participated in in-country root crop training courses. If properly organized these courses can be a very effective way to expose extension workers to improved methodologies. It is RECOMMENDED that ESARRN should continue to encourage member countries to organize in-country training courses for extension officers and farmers where possible.

2.6 PROJECT INPUTS

2.6.1 USAID

A.I.D. financing for project inputs are mainly for support of the coordinators office, networking activities, IITA overhead costs, and for regional collaborative research and training. Recently A.I.D approved a request from IITA to finance the long-term lease of offices and research facilities for the project in Malawi. A.I.D. input for the project is mainly that of providing grant funds to IITA. With the exception of direct support to national research programs, which is funded solely by IDRC, A.I.D. supports all remaining categories. A.I.D. contribution for LOP is \$942,900.

2.6.2 IDRC INPUTS

IDRC provides U.S.\$ 379,000 in grant funds primarily for national research program, training/workshops, equipment and personnel. Backstopping is also provided by Nairobi based program officers.

2.6.3 IITA INPUTS

IITA is providing U.S.\$237,000 to the project. Half of this amount will be for training and workshops with the balance for consultancies and regional research expenses. The Evaluation Team was not able to verify the amount expended by IITA as pertinent. Financial records were not available in the project office. IITA will be providing this information during first quarter 1989.

2.6.4 National Program Inputs

The inputs from national programs are not easily quantified from discussions held with the coordinator and heads of national programs. It would appear that root crops are generally a low priority in most countries with the exception of Rwanda and Uganda. Member countries are supporting project activities by paying the salaries of staff working in national programs, providing facilities and meeting various operational and logistical costs.

In general the projects inputs provided by participating donors and institutions are in keeping with the grant agreement and greatly facilitated the project meeting its objectives to

date. The late start of the project undoubtedly limited the ability of the network to utilize more funds. In particular, the lack of proper office facilities for the coordinator and the delayed appointment of senior administrative staff limited the number of activities the coordinator could effectively pursue.

2.7 Network Linkages with IITA, IARCs and Other Institutions

ESARRN project is involved in other complementary activities in the region. These include, among other, such institutions as CIP, CIAT, CIBC and SADCC.

2.7.1 IITA Biological Control Program (BCP)

This program is involved in developing and implementing biological control methods for the cassava mealybug and the cassava green mite both of which are serious pests in the region. This program has a close working relationship with ESARRN. BCP has trained staff of national root crop programs in the biology and control of the two pests. The coordinator of ESARRN is kept informed of BCP activities in the region to mutually facilitate the work of the two programs.

2.7.2 IITA/CIAT Collaborative Study on Cassava in Africa

This study aims to provide basic information on cassava in Africa for research planning by IITA, CIAT and by various national agricultural research systems and for policy planning by various national ministries of agriculture and economic planning. The specific objectives are to:

- (a) Describe the structure of cassava based cropping systems in principal producing areas;
- (b) Define the technical and economic parameters for cassava processing techniques;
- (c) Describe the marketing system for cassava and its implications for income;
- (d) Understand present and future problems of demand for cassava in rural and urban areas for direct food consumption and other uses;
- (e) Provide general information on occurrence of nutrition effects of cassava consumption;
- (f) Evaluate the impact of price and import policy on the production and consumption of cassava.

This study will be carried out in selected countries throughout Africa. ESARRN will work closely with this study which is expected to commence during 1989 and will be completed in 1992.

2.7.3 CIBC Root Crop Pest Management Project for East Africa

This project was only recently approved for funding by IDRC and will assist national programs in Eastern and Southern Africa to develop effective research programs on integrated pest management for root crops. This project will work in collaboration with ESARRN and with IITA's BCP. The specific objectives in collaboration with ESARRN are:

- (a) To participate fully in the formulation and implementation of collaborative research directed towards the ecologically sound management of root crop pests;
- (b) To assist plant breeders in national programs to develop improved, scientifically based techniques of screening for pest resistance;
- (c) To provide appropriate information and specialized materials relevant to pest control in national programs; and,
- (d) To organize regional workshops for exchange of research results on root crop pest control and in-country and other appropriate training in plant protection techniques for technical staff and extension workers.

The specific objectives in collaboration with IITAs BCP are:

- (a) To ensure timely supply of biological control agents of cassava mealybug and cassava green mite to countries throughout the region; and,
- (b) To work closely with the staff of National Biological Control Programs in the region to implement biological control of cassava mealybug and cassava green mite, including, where appropriate, the establishment of local rearing facilities for bio-control agents.

This project is expected to strengthen the activities of ESARRN by the provision of expertise in plant protection which would compliment existing capability in the fields of agronomy and plant breeding. Activities in this project will be organized within the framework of ESARRN.

2.7.4 CIP Sweet Potato Project

The International Potato Center (CIP) recently assumed global responsibility within CGIAR for sweet potato improvement. The operational mandate for sweet potato has been transferred from IITA to CIP. These two international institutions signed, in June 1988, an Action Plan for the smooth transfer of responsibilities and to avoid confusion among National Agricultural Research Systems (NARS) and donors concerning the roles of CIP and IITA.

The Action Plan makes specific reference to interaction with NARS and networks as follows:

- (a) For existing IITA special projects (e.g. ESARRN)
 - (i) CIP will backstop sweet potato components of IITA Root and Tuber Projects with materials, consultants and training as mutually agreed upon with IITA and subject to budgetary limitations;
 - (ii) A letter will be sent to NARS and donors explaining the implications of the transfer of sweet potato improvement research to CIP.
- (b) For new initiatives by either CIP or IITA in support of root and tuber projects with NARS involving sweet potatoes.
 - (i) Both centers are to inform one another of new proposals involving support for root and tuber research which contain a sweet potato component in Africa. There is acknowledgement of a need for further discussions in the planning and monitoring of such proposals.
 - (ii) Recognizing the importance of training in roots and tuber programs the two centers will make special effort to collaborate in this area.

As per agreement, CIP now has the institutional responsibility to backstop the sweet potato component of ESARRN. There is need however, for ESARRN, IITA and CIP to discuss and to formally agree on the extent of backstopping that CIP can provide to the current project.

It was further understood (although no project document was available for review) that CIP with GTZ funding has commenced on a significant sweet potato research project in some East and Southern African countries. The coordinator for this new initiative is based in Nairobi, Kenya. This initiative will greatly enhance the research activities on sweet potato in the region, but it was not clear to the Review Team that these activities will necessarily take place within the framework of regional cooperation for root crop research as developed by ESARRN. It is RECOMMENDED that ESARRN and IITA invite CIP to discuss the integration of CIP's activities into the network.

2.7.5 GTZ Project Activities

GTZ is currently involved in assisting the Government of Malawi in research on the identification, breeding and release of parasites and predators for the control of the cassava mealybug. A GTZ team is based in Malawi and works in close

association with the national root crops program. There are promising results from this project that could produce benefits for all cassava producing countries in the region. ESARRN has good working relationship with the GTZ project.

2.8 Assessment of the impact of project activities on national research policies

The project has been in operation for only 18 months. It has undertaken some activities which will eventually have an impact on national research policies, but it is too early to assess at this time.

2.9 Present level of Resource Allocation

Cereals, legumes and selected cash crops for export have traditionally received most of the resources allocated for research in member countries of ESARRN. However, with the growing awareness of the importance of root crops in the food supply system and the importance in ensuring food security in the region, countries have within the last five years committed more resources to root crop research. Most programs now have at least two scientist with a number of supporting technicians. In Uganda where root crops are particularly important eleven scientists and 24 technicians are working in the root crop program.

There is however much room for improvement in upgrading the professional skills of existing scientist and in increasing the number of trained scientists and technicians in most countries.

ESARRN has had some impact in sensitizing policy makers on the importance of root crops in the region and the need to have a cadre of trained personnel to undertake the necessary research and development activities.

The existence of mealybug, the cassava green spider mite and cassava mosaic virus has created national emergencies resulting in an increased allocation of professional and financial resources for root crops research. While ESARRN cannot claim to have influenced the allocation of those resources, it had helped member countries in the efficient application of the resources.

2.10 Improvement in the Management and Organization of National Programs

ESARRN has helped various country programs to prioritize their national research objectives. It has also helped to train several researchers and technicians from national programs in various aspects of root crops production. The researchers from collaborating national programs have been able to visit other national programs, and in the process have

gained new ideas. All these activities have helped the various national programs to gain credibility, to better organize and manage their respective programs.

2.11 Transfer of Technologies to Extension Workers

Both ESARRN and the national programs have initiated steps to develop and/or improve the existing systems to effectively transfer successful technologies developed on station to the farmers. Three systems are currently being tried: (1) through on-farm trials, the researchers are bringing in the farm level extension workers and the farmers together to test a new technology. If the farmers like it, they readily adopt the technology. Through them and the extension workers, the technology is slowly diffused to other farmers; (2) the on-station researchers work closely with various agricultural development projects, and these projects take the lead to disseminate new technologies to extension workers and farmers; and, (3) through in-country training sessions for the extension workers and field days for the farmers, the researchers highlight a technology ready for diffusion.

It should be emphasized, however, that more concerted efforts on the part of the national programs are needed to successfully deliver the technologies to the farmers.

2.12 Role and Accomplishments of IITA

IITA's contribution to the network and to the national programs has been primarily in the area of training and the provision of improved germplasm. Trained manpower is the first step in building strong national programs.

IITA, through ESARRN, has conducted several in-country training courses, has organized exchange-visits by researchers between different national programs, and has helped in the exchange of selected germplasm between the member countries.

IITA has also provided its improved germplasm to the national programs within ESARRN's network for testing and evaluation.

These linkages, already established, will be further reinforced during the coming months. These bonds could be expected to persist beyond the life of the project.

2.13 Review of ESARRN and National Programs Policies on Root Crops and Consistency with A.I.D.'s African Research Initiative

ESARRN supports international agricultural research and outreach activities in partnership with National Agricultural Research Systems (NARS) in order to contribute to sustainable

and increasing food production in the humid and subhumid tropics and thereby to improve the well-being of low-income people.

ESARRN has a mandate for cassava and sweet potato improvement in east and southern Africa. Given the achievements of IITA's previous work to breed cassava resistant to bacterial blight and mosaic virus diseases, and the development of methods to multiply improved planting material, the major current needs are to diversify cassava genotypes to meet the needs of diverse environments, farming systems, and farmer and consumer requirements. In particular, there will be greater emphasis on cassava for the farming systems of the humid forest zone, a new initiative to breed cassava for Eastern and Southern Africa (especially the mid-altitudes), and the extension of cassava breeding to cover the dry savannas of Africa. The IITA Medium Term Plan for cassava improvement are given in Annex 6.

Current research involves collection of local germplasm, evaluation of local and foreign germplasm for yield, disease and pest resistance, rapid multiplication of improved germplasm; introduction of resistance to pests and disease to local germplasm, control of pests of cassava, post harvest technology including processing and utilization and training at all levels.

A.I.D.'s African research initiative for agriculture as outlined by the African Bureau invites a two-prong approach of (1) strengthening agricultural research capabilities, and (2) strengthening faculties of agriculture. A.I.D. is committed to helping to build strong applied research capabilities through the funding of research networks which link national agricultural research systems with international agricultural research centers such as IITA. The major focus of A.I.D. support is targeted to food crops.

The policies on root crops of national programs of ESARRN countries and that of IITA appear to be highly consistent with A.I.D.'s African research initiative.

Training is also an important activity at ESARRN for strengthening national research capabilities.

ESARRN currently assess a wide variety of in-country group training course. ESARRN will, during the Medium Plan Term, begin training trainers and thereby moving to decentralize training to the country level. This will permit an increase in the number trained per country, reduce costs and enhance the relevance for training for national problems.

In addition, ESARRN will develop criteria to guide the selection of countries for incountry training and reallocate staff time from activities in Nigeria in order to enhance human

resource development in extension, technical support and production techniques in NARS. IITA will encourage in-country courses by providing training outlines and materials, by inviting national trainers to participate in courses, and by providing IITA scientists and trainers as resource persons. The goal is to strengthen the national organizations' capacity to satisfy their own requirements.

3. PROJECT MANAGEMENT

3.1 Project Staffing and Implementation Responsibilities

IITA as the grantee is responsible for project implementation. Delays in obtaining Government of Malawi approval for location of the ESARRN office in Lilongwe has resulted in a slower project start than was originally anticipated. The project occupied temporary office facilities in the Chitedze Research Station pending completion of new office and research facilities that form part of the ICRISAT regional complex at Chitedze. These facilities will be ready for occupancy in January, 1989.

The project coordinator is an IITA root crop scientist. From the onset of the project, the coordinator has been directly responsible for project management and field administration in addition to providing technical support to national programs and conducting training activities. Expanding project activities makes it increasingly more difficult for the coordinator to perform routine administrative duties in addition to his primary responsibilities of network coordination and technical assistance to national programs. Provision for an administrative assistant is included in the project. Recruitment to fill this position is underway and it is anticipated that this position will be filled by January, 1989. The administrative assistant will receive initial training at IITA headquarters and further training from IITA internal audit staff in Lilongwe.

Requests from national programs for assistance from ESARRN have increased during the past year. It is unlikely that the coordinator alone will be able to respond to all requests for assistance from national programs. Some of this demand could be met through increased use of short-term technical assistance and training from IITA. To date the project has only used a limited amount of short-term IITA assistance, however the project should increase its draw on these IITA resources. IITA short term technical assistance alone will not be adequate. Budget permitting, the project should consider adding a second professional to the coordinators office. Given the coordinators background in plant breeding, a second professional should have skills and experience that would complement those of the coordinator. An agronomist with an interest in training and extension together with previous African experience would be an appropriate choice.

3.2 Coordination of Project Activities

The project coordinator reports to the IITA's Directors of Tuber and Root Improvement Program (TRIP) and International Cooperation Program (ICP) who has project oversight responsibility for the grantee. A project Steering Committee of four persons representing the ESARRN members serves as networks direct liaison to the project. Membership on the Steering Committee has come largely from root crop researchers who were active in forming ESARRN. Future efforts of the Steering Committee would be enhanced by formalizing the committee's terms of reference and operating procedures.

The ESARRN project coordinator has been responsible for coordination of all project activities including training outside the region. Project activities have expanded steadily over the past year and further expansion is anticipated for the remaining life of the project. A second professional in the project would increase the project's ability to respond to national programs. This person should work out of the Lilongwe office so as not to significantly increase administrative overheads. Any additional professional staff assigned to the project should report to the project coordinator.

3.3 Project Planning

The project's purpose is to strengthen the root crop research network of national programs in the region. Working with 11 national programs requires advanced systematic planning of activities in order to provide timely input of project resources. Early identification and prioritization of network member's specific requirements is essential for preparation of annual workplans. These individual program requests are discussed and prioritized from the network's prospective during the regional heads of programs meeting. Ideally, this activity should be completed during the first half of the year to enable IITA to meet a 4th quarter deadline for annual workplan submission to AID. Growth of network activities is increasing the amount of the coordinator's time that must be spent on evaluating national program requirements and reviewing requests for assistance with the Steering Committee. The first annual workplan was prepared on time for submission to AID, but the second workplan is now over due.

IITA in consultation with the Steering Committee should review the current status of the project and the recommendations of this mid-term evaluation with a view to revising the remaining life of project strategy and activities.

It is RECOMMENDED that a revised strategy and activities plan for the remaining LOP be prepared. The project is overfunded at this time relative to the remaining time to PACD. This needs to be addressed in the revised plan. The preparation of detailed annual workplans should continue.

3.4 IITA Project Management

IITA as the grantee has full responsibility for implementing the project. To facilitate implementation, USAID agreed that the established implementing and operating procedures being used by IITA would also be used to implement major portions of this project. The IITA TRIP Director has made periodic visits to the region to review project activities and consult with the project coordinator. Evaluation team discussions with the Director indicate that he is well versed with project activities and is providing adequate supervision of project activities. There are some issues relative to financial management that will be discussed in Section 4.6.

The evaluation makes the following RECOMMENDATIONS with respect to IITA project management.

1. Comprehensive annual workplans with budgets should be prepared in accordance with the grant agreement. Effort should be made to quantify outputs for the workplan so that progress toward achieving objectives can be measured and verified.

2. IITA should expand the terms of reference for the planned February 1989 internal audit to include design and installation of improved financial control and reporting systems. Follow-up training should be provided to administrative staff maintaining the system and to the coordinator for analyzing monthly accounts.

3.4 REDSO/ESA Management

Responsibility for AID management of the IITA/ESARRN project resides with REDSO/ESA and RFMC, both located in Nairobi. The Agricultural/Natural Resources Division of REDSO/ESA is charged with monitoring responsibilities. These include reviewing project activities and ensuring that the grantee complies with provision of the grant agreement. This has been accomplished through review of project activity and financial reports and periodic visits to national programs for observation of project sponsored activities in the field.

This project is regional in focus and operation and therefore, suitable as a regional managed A.I.D. project. While USAID bilateral missions expressed interest in considering possible financial support to the project, none were interested in becoming significantly involved in implementation activities as the amount of project activity on an individual country basis was considered to be relatively small.

USAID missions felt the current arrangements of REDSO management to be most suitable.

The evaluation team makes the following RECOMMENDATIONS with respect to AID management.

1. The AID project manager should ensure that annual workplans and budgets are received and reviewed as provided in the grant agreement.

2. AID management responsibilities should continue to reside with REDSO/ESA. Direct management by AID/Washington or a bilateral mission is not recommended as most of the assistance required is at the regional level.

3. AID should explore ways by which bilateral AID missions can "buy-in" to the project to support national root crop programs. Project management would still reside with REDSO/ESA in order to avoid project fragmentation and increased supervision costs.

4. The REDSO/ESA grant officer should prepare a handbook that provides information to project field staff on matters related to project implementation and standard regulations covering use of project funds.

4. Financial Support and Financial Management

4.1 AID, IDRC and IITA Funding

The project receives funding from three sources, USAID (\$943,000), IDRC (\$379,000), and IITA (\$237,000) for a total of \$1,559,000.

A summary financial plan is attached as Annex 4. The evaluation team has reviewed expenditure reports for the AID and IDRC portion, but were unable to confirm the level of IITA contribution. Delays encountered in starting project activities have resulted in a significantly lower level of expenditure than originally planned. Of the AID portion, 62% of the funds remain with only 15 months to completion date (PACD). The IDRC funding has a completion date of November 30, 1988, however this will likely be extended for another year. Approximately 66% of IDRC funds have been disbursed. It is unlikely that available funding from all sources will be utilized without both a significant increase in project activity and extension of the PACD.

4.2 Project Activity Support from Other Sources

Although it is difficult to measure empirically the level of commitment by member countries to ESARRN activities, discussion with heads of the national programs during the evaluation did indicate that member countries are supporting project activities by paying the salaries of staff working in national root crop programs and other logistical costs, and

providing facilities. Traditionally root crops have been accorded very low priority in the allocation of host country resources for research and extension activities. The project is helping to sensitize national policy makers to the importance of root crops to national food security.

The Special Program for African Agricultural Research (SPAAR) has recognized that inadequate funding by national governments for agricultural research is the most serious factor inhibiting full participation of national programs in regional networking activities. SPAAR requested IITA, in consultation with the ESARRN Steering Committee, to prepare a supplemental funding proposal (\$1.3 million) covering a three year period. The proposal has been submitted to the SPAAR donor group and is currently under review.

IDRC is also funding bilateral programs for root crop research in Rwanda (Can\$ 245,000), Uganda (Can\$ 330,000), Malawi (Can\$ 223,000) and Zanzibar (Can\$ 175,000). Rwanda is a two year project, the other are for three years. The German technical assistance organization GTZ is also planning to provide bilateral assistance for development of root crops in the region. It would be advantageous for the network and serve to promote better donor coordination if ESARRN were to be consulted when national programs develop bilateral projects in support of root and tuber crops research.

4.3 Accounting and Financial Records

IITA/Ibadan receives periodic advances from USAID and provides centralized accounting and financial reporting for the project. This arrangement is suitable given the size of the project, however IITA have experienced difficulty in submitting financial reports on time to AID. The current quarter is the first time that IITA has been able to submit a request for funds advance prior to the completion of the period for which the funds were requested. The evaluation team was not able to review IITA/Ibadan accounting documents other than financial reports sent to RFMC and those in the coordinator's office.

The coordinator records financial transactions in the Lilongwe office and forwards this information monthly to IITA/Ibadan. This may have been adequate for the project during the initial year when facilities were temporary and activity limited. However, the projected level of increased activity will require improvements in field office accounting. IITA plans to conduct an internal audit of the Lilongwe office in February, 1989, with a view to improving the field accounting. Furthermore, the recently recruited administrative officer will undergo training in IITA/Ibadan in January, 1989, in IITA procedures which will enable him to perform most routine accounting tasks previously done by the coordinator.

IITA/Ibadan prepares a monthly financial report for the project. The September-1988 report was reviewed in the Lilongwe office. These reports provide comparative expenditure information relative to the annual budget, expenditure for previous month and cumulative expenditure. This system needs to be reviewed by IITA accounting staff to ensure that allocation of expenditures are being made to the correct categories. As it appears now, the project is overspending in two categories and is considerably underspending in most of the remaining categories. For example, the IITA financial reports to AID indicate that 80% of funds allocated for travel and transportation and 64% training/workshop funds have been spent whereas only 16% of personnel costs and 19% of total project costs have been expended. This report is adequate in terms of accounting for expenditures, but is of limited use for planning as significant variances from line items in the annual budget exist.

The evaluation team was unable to verify from records available the level of contribution by IITA to the project. IITA should prepare documentation that quantifies the value of the IITA contribution. The grant agreement budget specifies that IITA will support consultancies, regional research expenses, and training/workshop activities.

4.4 Budgets

Project budgets, both annual and LOP, are inadequate for project management and financial planning. The variances in budget projections and actual expenditures are significant. For example the expenditure for vehicle maintenance in September 1988 (\$9,123) is nearly twice the annual budget allocation whereas staff costs appear to be grossly under reported (\$118 for the month).

The percentage of funding remaining from AID sources as of September 31, 1988 are as follows:

<u>Item</u>	<u>% Remaining</u>	<u>Balance Available</u>
Personnel	84%	\$ 273,701
Consultancies	81%	\$ 19,354
Office Rent	72%	\$ 25,836
Travel/Trans	21%	\$ 12,038
Regional Research	100%	\$ 156,000
Training/Workshops	36%	\$ 22,622
Publications	88%	\$ 26,251
Equipment	96%	\$ 22,070
Audit/Evaluation	100%	\$ 40,000
Overhead	79%	\$ 101,499
Contingency/Inflation	<u>100%</u>	<u>\$ 60,900</u>
Total	81%	\$ 760,271

Although records are not available to verify the exact amount of IITA contribution to the project, discussions with IITA officials and the project coordinator have led the evaluation team to conclude that IITA, like AID and IDRC, have experienced a lower than planned drawdown of funds due in part to slow project startup. Therefore the following actions relative to project and financial planning are RECOMMENDED:

1. That IITA/Ibadan prepare a financial statement indicating project expenditure funding from IITA resources.
2. Prepare a revised financial plan from the 1989 through to the projected PACD based on the current balances from all funding sources.
3. Request a no-cost extension of the PACD .
4. Review the current financial status of the project and propose amending the project agreement to accommodate a revised budget.
5. Revise budget and accounting procedures so that financial reports more clearly reflect expenditure patterns.

4.5 Audits

An internal audit is scheduled for February 1989 and this audit should take place as planned. It is RECOMMENDED that the terms of reference for the audit be expanded to include assessment of the accounting and reporting procedures and training be provided to administrative staff to implement the recommended changes in the accounting systems. Provision have been made in the grant agreement for an external audit. It is RECOMMENDED that an external audit be scheduled during the first half of 1990. Consideration should be given to using IITA existing external auditors who have offices in both Lagos and Lilongwe. Staff of the auditor's Lilongwe office could carry out required review of the coordinator's office with the Lagos office being responsible for auditing IITA headquarters.

4.6 Financial Management Issues

The project has not been able to maintain basic checks and balances for initiating and approving payments in the Lilongwe office because only one officer is stationed in that office. When the administrative assistant starts in January, a system of having the administrative assistant record invoices, prepare vouchers and cheques should be instituted. The coordinator would be responsible for reviewing the vouchers and authorizing payment.

As ESARRN has been a relatively small project in IITA's overall portfolio, IITA has been able to support cash flow requirements from internal resources. The intention of AID to institute reimbursements on a monthly basis will have a significant impact on IITA's ability to generate adequate cash flow if expenditure reports are not processed promptly. For this reason the evaluation team RECOMMENDS that the financial management and administrative procedures employed by the project should be reviewed relative to IITA's ability to submit monthly returns and USAID's time requirements for processing reimbursements. An initial quarterly advance should be given to the ESARRN and project expenditures reimbursed on a monthly basis.

4.7 Project Funding for Remaining LOP

With current balances of funding available from AID, IDRC, and IITA, the project is able to expand both technical personnel (both long- and short-term technical assistance) as well as extend the completion date.

The project could continue with the present levels of expenditures on the major categories of training, networking, and technical assistance to national programs and still add one additional professional staff member for an 18 month assignment. The fully burdened cost according to IITA is \$100,000 per annum. If recruitment commenced soon, a visiting scientist could be available to the program by mid 1989. If project completion was extended to December 30, 1990, this would provide for 18 months of additional full-time technical assistance. No additional project vehicles or capital costs would be required other than household furnishings.

5. FUTURE ACTIVITIES

5.1 Follow-on Project

The project had a slow start because of a number of constraints and it is unlikely that all the funds obligated by both USAID and IDRC will be expended by 31st March 1990. In order for the project objectives to be achieved, it is RECOMMENDED that the project completion date be extended up to a maximum of 31st December 1990 and that the contractor shall submit for approval to both USAID and IDRC a revised budget that will take into account the extended project completion date.

Interviews with national research leaders revealed the need for additional scientific support to the coordinator and as such it is RECOMMENDED that a visiting scientist specialized in agronomy and experienced in training should be added to the coordinator's office as soon as he or she can be recruited by the contractor and the revised budget should make budgetary

provision for such a scientist for the remaining life of the project. Such a scientist shall be part and parcel of the scientific staff for a Phase II proposal.

Given the current momentum of research activities in national programs and the long-term nature of research on root crops a follow on phase (Phase II) is proposed.

It is RECOMMENDED that the contractor should initiate dialogue with USAID, IDRC, and the NARS as soon as it is practicable and draft a phase II project proposal document which should take into account the achievements made in Phase I and the need to consolidate those gains and spread them across the network members.

The Phase II proposal should have baseline data that can be used in future reviews to measure progress made in achieving network objectives. In this regard, consideration should be given to undertaking analysis related to baseline data during the remaining LOP. This data would thus be available for use in a Phase II follow-on project proposal.

Pests and diseases are the major constraints to root crops production in Eastern and Southern Africa and a Phase II proposal should make provision for a pathologist/tissue culture specialist who can handle the production and introduction of improved planting material. Phase II proposal should cover a period of five years after the completion date of the present phase.

5.2 ESARRN as a REDSO/ESA Priority regional program

A.I.D.'s African Bureau has as its major thrust for improving agricultural progress in Africa the support of agricultural research and Faculties of Agriculture in Africa. A.I.D. is further focussing its agricultural research efforts on food crops through a number of research networks. It is believed that research networks will serve as a means of both accelerating research pay off as well as strengthening national systems. International Research Centers are key supporting organizations in this strategy to develop and fund research networks.

ESSARN is a priority program for REDSO/ESA and it fits well within the overall strategy of A.I.D.'s plan for supporting agricultural research. It involves an important group of food crops, the root crops, and links IITA with national agricultural research systems in East and Southern Africa.

5.3 Additional Resources Required for ESARRN and National Programs

No additional funds are required from A.I.D. for the completion of the project to the revised PACD. National programs should however, be encouraged to strengthen their programs through the allocation of more local resources and assistance from other donors.

5.4 Member Countries Interest and Commitment to Continued Project Activity

There is strong interest by member countries in the continuation and strengthening of ESARRN. In the countries visited discussions were held with senior officials who all recognized the important contribution ESARRN is making to the development of root and tuber crops in their individual countries. Countries generally requested further strengthening of the network. There is a high level of commitment to continued project activity in most countries.

5.5 A.I.D Mission Interest - Regional and Bilateral

Discussions were held with AID's regional office in Nairobi and with country mission in Malawi, Uganda and Kenya. The regional office (REDSO/ESA) is strongly committed to supporting the current project and future ESARRN project activities as they may arise.

The A.I.D. Mission in Malawi is involved in funding a bilateral project on an improving manpower within the Ministry of Agriculture in collaboration with world Bank and ODA. The Mission will give favorable consideration to supporting bilateral activities for root crops provided that the proposal also receives Malawi government support.

The Rwanda AID mission expressed interest in possible future bilateral support for rootcrop activity in Rwanda. However, the mission was concerned that such support should not significantly increase mission management responsibilities. The A.I.D. Mission in Uganda expressed a strong commitment to providing local currency support for research and development activities on root crops. The Mission is now considering a 5 year food crops plan for Uganda in which there are many research proposals on root crops. Further, the A.I.D. Mission indicated that they will give favorable consideration to providing local currency support for a program of multiplication and distribution of clean cassava planting material in the districts which are currently badly affected by the African cassava mosaic virus. IDRC has expressed an interest in collaborating with the provision of the necessary foreign exchange inputs.

The A.I.D Mission in Kenya is not involved in providing any direct support for root crops in Kenya.

5.6 IDRC Interest

IDRC is committed to funding activities on root and tuber crops research in East and Southern Africa and would be willing to consider supporting another phase of the project. Further the IDRC has recently agreed to fund in CIBC project on the control of cassava mealybug a cassava green mite in the region in collaboration with ESARRN and IITA ADOP. IDRC is also supporting a number of bilateral root crops projects in Uganda, Rwanda and Zanzibar and has under consideration bilateral projects for Malawi and Mozambique.

6. LESSONS LEARNED

Some of the more important lessons learned from the review are:

1. The project was well designed and thus greatly facilitated the relatively smooth implementation of the grant to date. The experiences can be used in the development or operation of other networks.

2. The lack of detailed baseline information on the status of root crops production and research in the individual countries made it difficult for the Review Team to fully quantify the benefits and achievements of the project. The project should initiate activities to gather such data which will benefit not only future evaluation but can help to demonstrate the importance of root crops and influence policy.

3. The Review Team found that the collaborative networking approach followed by the project to be extremely cost effective. With a single scientist as coordinator, ESARRN was able to stimulate significant research activities in most of the 11 member countries. It is to be noted that difficulties or delays in any one country had little impact on the overall progress of the network.

4. The network cuts across national and linguistic borders and creates a better understanding among researchers and policy makers of the problems affecting root crop production in the region as a whole. Many of the problems are regional in scope and can best be solved through a cost effective regional approach.

5. The network has facilitated the rapid exchange of germplasm among participating countries and with sources outside the region. Similarly it has helped in information exchange among participating countries thus minimising the conduct of unnecessary research.

6. The network makes it possible for countries in the region to be more aware of impending disasters (e.g. mealybug), to learn from affected countries and to make contingency plans as necessary.

7. The network has greatly facilitated the more efficient use of the limited professional manpower available in the region as resource personnel in training courses and as consultants to countries other than in which they reside.

8. A major benefit of the network is that it has had a legitimizing effect for research workers and their national programs within countries. Policy makers now give greater recognition to root crop research and the researchers are more confident about their work. In many countries policy makers are rapidly becoming more aware of the importance of root crop research and its implication towards national food security.

9. The growing intensity of research activity in ESARRN countries as well as discussions on the rapidly spreading pests have made national programs more aware of the weak and limited genetic base of sweet potato and cassava in the region. There is need to develop national contingency plans to broaden the genetic base as quickly as possible.

10. The availability of improved germplasm of cassava and sweet potato in tissue culture from IITA has not been adequately exploited by networking countries. It was particularly disturbing that many countries after receiving material failed to conduct the minimum evaluation necessary.

12. IITA germplasm, although having certain advantages, have shown major limitations as far as the specific needs of region are concerned. The network provides an opportunity to give rapid feedback to IITA to help focus and improve their plant breeding program.

13. IITA training activities have had a major impact on root crop research in the region. Most of the current personnel working on root crops are ex-IITA trainees. The network has helped to consolidate the work of these trainees.

14. One of the significant contribution of the network is that it has assisted in formal training of staff for higher degrees, production training courses at IITA, and in-service training courses given in the region.

15. Despite the comments in 13 and 14 above, there is still a tremendous shortage of trained root crop researchers in the region. There is need to increase the number of professionally trained people and for the continuation of in-service training to existing workers. The network should also facilitate the training of diploma holders to the B.Sc. degree level.

16. Universities in the region have had minimal involvement in current research and training activities on root crops. They represent a significant pool of trained manpower and their greater involvement in the network should be facilitated.

17. The existing systems for transfer of technology to farmers is generally weak. A notable exception is Rwanda. Greater emphasis should be given to the development of appropriate systems.

18. There is a paucity of research and development activities in the area of post harvest technology. Training of personnel may be a pre-requisite before a significant increase in activities in this area can be expected.

19. Short consultancy visits by IITA staff can be highly beneficial to national programs. IITA should provide greater assistance in this area.

20. The coordinator is doing a good job. There was general satisfaction with his performance at national levels. National programs express a desire to have more of his professional time but this is not possible given the number of countries to be covered. There is clearly a need to increase professional staff in the project.

21. Management and supervision of the project from AID regional offices is appropriate in situations where the project is also in the same region. Host governments are more receptive to having regional project activity managed by an AID regional office rather than by a bilateral mission from another country.

7. RECOMMENDATIONS

The following are the major recommendations of the Review Team:

1. Consideration should be given to extending the project by up to nine months. The contractor should submit a revised budget to IDRC and USAID.

2. A second professional should be engaged as a visiting scientist (extension agronomist).

3. The network should develop terms of reference and operating guidelines for the Steering Committee.

4. The network and IARCs should make greater efforts to develop and introduce improved genetic material into the region.

5. National programs should be encouraged to make greater use of existing opportunities provided by the network.

6. Greater emphasis should be given to training staff of national programs in rapid multiplication and distribution of clean planting material.

7. The training component of the project should be widened to encourage holders of diplomas to continue in African universities for B.Sc. degrees.

8. IITA should increase its technical assistance to the project through more consultancy visits by their staff and greater involvement in training activities.

9. CIP should be requested to comply with the June 15, 1988 Action Plan made with IITA to provide back up support to ESARRN for sweet potato research and training.

10. ESARRN should encourage the strengthening of national programs through a greater allocation of resources from both national and donor sources.

12. ESARRN should make a special effort to more fully integrate the Universities of the region in research and training on root crops. Development of baseline data for the network would be an appropriate area for university participation.

13. ESARRN should take steps to encourage the publication of more technical information on root crops for East and Southern Africa.

14. The network should encourage studies to be undertaken on economic and sociological aspects of root crop production in the region. The universities should be encouraged to undertake such studies.

15. Greater effort should be given to stimulating more post harvest studies on root crops.

16. ESARRN should encourage the development of a more efficient systems for the speedy transfer of improved technologies to farmers.

17. Annual work plans and budgets should be submitted and reviewed as scheduled.

18. USAID should continue with the initial quarterly advance to IITA which would then be reimbursed on a monthly basis following submission of expense vouchers by IITA.

19. The grant should continue to be managed by REDSO/ESA as this has proven to be cost effective and administratively efficient when compared to either bilateral mission or AID/W.

20. The network should make efforts to involve all root crop producing countries in East and Southern Africa in its activities.

21. The contractor for the project should initiate the preparation of a proposal for a second phase of 5 years for consideration by donors.

ANNEX I - ITINERARY FOR EVALUATION TEAM

Saturday, November 26, 1988

Arrival of Review Team into Lilongwe

Sunday, November 27, 1988

08:00 - 19:00

Lilongwe - Malawi
Tour of cassava producing areas in Malawi. Travel along the Northern Lake shore area to view cassava production and problems

Monday, November 28, 1988

08:30 - 12:00

Participate in opening ceremony of Cassava Post-Harvest Workshop
Discussion with Malawi's Director of Research

12:00 - 13:00

Visit to designated main Root Crops Station in Malawi (Mkondezi) and GTZ Biological Control Laboratory

13:00 - 18:00

Tuesday, November 29, 1988

08:00 - 13:00

Mzuzu - Lilongwe
Introduction to ESARRN

14:30 - 18:00

- * Background
- * Objectives
- * Organization

Thursday, December 1, 1988

08:00 - 11:00

Discussion of program activities

- * Burundi
 - * Ethiopia
 - * Kenya
 - * Malawi
 - * Rwanda
 - * Tanzania
 - * Uganda
 - * Zambia
 - * Madagascar
 - * Mozambique
 - * Sudan
- Critical Review of ESARRN
- * Project Activities
 - * Training
 - * Cooperation with NARS
- Cocktail (Lilongwe Hotel)

18:30 - 19:30

Wednesday, November 30, 1988

09:00 - 13:00

Visit to Chitedze Research Station, office base for ESARRN
Discussion of training and other aspects of collaborators development

14:00 - 15:00

15:00 - 17:00	Discussion of collaboration with USAID
14:40	Depart Lilongwe
<u>Friday, December 2, 1988</u>	
08:00 - 12:00	Discussion among team members
15:00 - 16:00	Visit IDRC in Nairobi
<u>Sunday, December 4, 1988</u>	
12:30	Nairobi - Kigali
<u>Monday, December 5, 1988</u>	
09:00 - 11:00	Kigali - Rubona*
11:12:00	Visit ISAR Station at Rubona and witness in-country training session
14:00 - 17:00	Introduction to the Rwanda Root Crops Program.
17:00 - 19:00	Meeting with ISAR Director
<u>Tuesday, December 6, 1988</u>	
08:00 - 13:00	Visit of Root Crops trials and ISAR Station
13:00 - 15:00	Demonstration and tasting of cassava based food products
16:00	Rubona - Kigali
<u>Wednesday, December 7, 1988</u>	
08:00 - 12:00	Field visit to Karama Station - cassava multiplication - cassava trial plots - cassava crossing blocks
12:00 - 14:00	Lunch
14:00 - 16:00	Faming systems trials
16:00 - 18:00	Returning to Kigali
<u>Thursday, December 8, 1988</u>	
08:00 - 12:00	Discussions among team members
15:00 - 16:00	REDSO/ESA staff visit USAID
17:00 - 18:00	IDRC and IITA members meet with Director of ISAR
<u>Friday, December 9, 1988</u>	
08:00 - 10:00	Discussions among team members
10:00	Kigali - Entebbe
17:00 - 18:00	Preliminary discussion with Uganda Root Crops team

* The Root Crops in-country training in Rwanda was in session at ISAR during the time of our visit.

Saturday, December 10, 1988

08:00

14:00

15:00

Leave Kampala for Tororo
Visit cassava trials at Tororo VTC
(Var-Trial Center)
Visit on-farm trials Kisolo, Tororo,
and Jinja.

Sunday, December 11, 1988

10:00

Leave Jinja for Kampala

Monday, December 12, 1988

08:30

10:00

11:00

14:00

15:00

16:00 - 17:00

17:00

Meet USAID Officials in Kampala
Leave Kampala for Entebbe
Meet CARO/CA/rs and Hon. Minister of
Agriculture
Leave Entebbe for Kampala
Visit composite flour mill
Visit markets around Kampala: Kalerwe
Visit Makerere University

Tuesday, December 13, 1988

08:00

09:15

09:30

14:30

16:30

Two teams were formed (I & II)
Team I for Namulonge Research Station
Meet Director and Root Crops
Scientists
Visit field trials
Leave for Kawanda Research Stations
Meet Station Director and observe
demonstration of sun drying of cassava

Team II - Travel to the Luwero
Triangle to observe cassava mosaic
disease devastation.

Wednesday, December 14, 1988

08:30

10:00

Meet CARO/CA/PS at Entebbe
Depart for Nairobi

Thursday, December 15, 1988

08:00 - 09:30

09:30 - 14:00

Visit with Mr. W. Wapakala - KARI
Visit to Machakos Research Station

Friday, December 16, 1988

09:00 - 11:00

14:00 - 16:00

Saturday, December 17, 1988

09:00 - 12:00

Group discussions - Evaluation team
Writing of reports

Wrap up session with ESARRN Steering
Committee present

December 17 - 19, 1988

Write-up

Monday, December 19, 1988

08:30 - 09:30

Meeting with USAID/Kenya Mission

Tuesday, December 20, 1988

First draft complete, and agreed upon
by the evaluation team

ANNEX II - IITA/ESARRN INTERIM EVALUATION

SCOPE OF WORK

SECTION ONE: Activity to be Evaluated.

The East and Southern Africa Root Crops Research Network (ESARRN) is a multi-donor supported project funded by grants from A.I.D., IDRC and the International Institute for Tropical Agriculture (IITA). The grants support the Root Crops Improvement program of IITA in the establishment of a research network in this region. The project's base is in Malawi where the IITA Regional Network Coordinator is located.

Authorization No. 698-0435-07

Title: IITA/ESARRN Root Crops Research Network
in East and South Africa

Cost: USAID/REDSO/ESA: U.S. \$942,900

IDRC: U.S. \$379,000

IITA-Contributions worth U.S. \$237,000

Life of Project Dates: 03/11/1987 - 03/10/1990

PACD: March 11, 1990

SECTION TWO: Purpose of the Evaluation

This interim evaluation provides a timely opportunity to review IITA's multi-country networking concept and its present validity as a research coordination unit. The review should produce a consensus opinion between the Evaluation Team and key project collaborators on the IITA's tuber and root crops improvement program's immediate operational needs and future programming requirements. In addition, the review will afford REDSO/ESA an opportunity to assess the adequacy of grant management arrangements. Evaluation recommendations will serve to guide project management in its planning for the remaining LOP, a Phase II continuation and hopefully lead to greater project sustainability and eventual growth of the ESARRN network and its collaborating national programs.

The purpose of this first collaborative interim evaluation is to provide project management with recommendations and strategies in the following key areas: (1) Is the project producing expected and needed outputs in: (a) a regional collaborative forum and coordinated research network; (b) institutional and manpower development of national programs; and, (c) improved genetic materials that are accessible to local farmers? (2) Should a Phase II project be considered, and if so, at what funding levels and from what sources? (3) Should ESARRN remain a priority regional program for REDSO/ESA? and, (4) Is the project adequately monitored by donors and by IITA's home and field offices?

SECTION THREE: Background

(a) Introduction:

In response to an unsolicited proposal presented to A.I.D. and IDRC by IITA, grants were made by both donors to the IITA's tuber and root crops development program. The grants support this program's efforts in the establishment of a root crops research network in the east and southern Africa region. At present, the following national programs are participating: Burundi, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Sudan, Uganda, Tanzania, Somalia and Zambia.

(b) Project Goal and Objectives:

The project goal is increased root crop production and productivity throughout east and southern Africa. The purpose of this project is to establish a root crop research network to foster cooperation and sharing of information and genetic materials among national research systems. To support and train local scientists and technicians and to strengthen national programs. Specific project objectives include the following: (1) encourage rigorous collaborative planning and evaluation of root crop research in the region; (2) increase useful genetic base for principal root crops and enhance its utilization in the tuber improvement programs in the region; (3) improve root crop farming systems through survey design and methodology development; (4) develop improved techniques for drying, processing and utilizing cassava in rural areas; and, (5) foster the establishment of effective systems for delivery of improved technology to farmers through institutional and human resource development.

SECTION FOUR: Statement of Work

The evaluation team is asked to review several priority areas to determine project progress in relationship to expected outputs of the IITA unsolicited proposal, the Donors' Grant agreements and the collaborating national research agencies' agenda, workplans and priorities. The analysis of team's findings and conclusions may lead to specific recommendations to improve ESARRN and national programs operationally and assist ESARRN management in developing a long term strategy.

(a) Study Areas:

(1) Determine the present status of the root crops research network in the region, identify its staffing configuration, establish what are its management and working relationships and delineate its principle activities and accomplishments.

(2) Determine whether direct and in-kind project inputs are being made as needed and establish whether these inputs, as well as the level of performance of all participating institutions, are consistent with the original project agreement. To what degree have these inputs contributed towards achievement of the stated project objectives of regional research collaboration, farmer access to improved genetic planting materials, host country manpower training and institutional development?

(3) Assess the impact of project activities on National Research policies, resource allocations for root crops and tuber research and the improvement in management or organization of participating country programs. What has been the role and accomplishments of IITA relative to the institutional development of a regional network and its eventual sustainability?

(4) Assess the effectiveness of IITA's technology information system and the extent to which it is being utilized to disseminate relevant project outputs to the interested parties and targeted groups in the region.

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

(6) Estimate the nature and extent of any further involvement of member countries, IDRC, USAID (REDSO/ESA or Bilateral Missions) or other donors in follow-on project activities after the completion of the current three years regional A.I.D. Grant to IITA. The team should also propose a strategy and organizational structure that will enhance prospects of project sustainability.

(b) Additional Project Activities to be Analyzed:

(1) Assess the quantity as well as the quality of collaborative research sub-projects and regional research activities that are being conducted by NARS. Determine whether research objectives are consistent with those of the donors, and IITA as stated in the Grant Agreements and other official project documents. Establish whether these sub-projects are perceived by National Programs to be relevant to their priority needs or only those of ESARRN.

(2) Evaluate the training being offered through the project.

(3) Assess (from the beginning of the project) the direct input of IITA professionals and consultants and establish whether it is consistent with the grant agreement and the stated needs of the member countries.

(4) Determine whether any new root crop varieties have been developed as well as the number of cropping practices that have been validated as ready for transfer.

(5) Identify additional areas of support or resources needed by the National Programs that may have resulted directly or indirectly from project activities.

(6) Review project budget and cumulative levels of expenditure by line item, recommend revisions if warranted. Review internal and external IITA systems for financial audits.

(7) Review IITA's policies and those of national programs concerning future root crop and tuber research work in the region and establish whether they are consistent with A.I.D.'s African Research Initiatives.

(8) Assess IITA's role in cassava related projects, funded by other donors, operating in the region that have indicated their interest in membership or participation in ESARRN activities. Projects under this category include the CIAT/IITA economics study of cassava in Africa and the CIBC Biological control of crop pests project in east Africa, the SADCC/IITA mealybug control project.

(9) Should the next phase of donor support be designed so that bilateral missions could buy-in to the program. Is there interest?

(c) Management Consideration:

(1) Do present donor arrangements for grant management provide for sufficient project monitoring?

(2) Determine whether the existing institutional arrangement between IITA and the National Agricultural Research Systems (NARS) have facilitated effective project coordination and contributed to efficient project implementation. Has the presence of the Network promoted and supported collaborative root crops research nationally and within the region?

(3) Review the effectiveness of donor and IITA Project management arrangements and financial controls and recommend improvements where appropriate.

(4) Review IITA/ESARRN annual workplans and operational budgets and assess the effectiveness of these as management tools for project implementation (also assess compliance with grant agreement covenants).

SECTION FIVE: Methods and Procedures

The Evaluation will take place from November 28 through December 16, 1988 in Kenya, Malawi, Rwanda and Uganda. The evaluation will be done in accordance with the provisions of the

grant agreement which calls for a mid-term evaluation during this period. The review will assist with regular project monitoring and oversight requirements.

The IITA/ESARRN project office in Lilongwe, Malawi in consultation with REDSO/ESA and IDRC will prepare a travel and study program for the evaluation team to follow as well as providing working space, accommodation and logistical support to the evaluation team.

The team will follow the format and guidelines established by USAID in the supplement to chapter 12, A.I.D. Handbook 3, project assistance entitled "A.I.D. program design and evaluation methodology report No.7". The team will use the following data collection and interview methods:

(1) Review, since the beginning of the project, all donor project documentation, the records of the ESARRN Committee's deliberations, the coordinator's formal presentations and the consultants reports.

(2) Interviews and discussions with appropriate scientists involved in the project and an examination of their activity records, data and conclusions. Interview trainees that have participated in formal and informal training activities.

(3) If necessary, to gather further data, visits to field research sites, training facilities and farms in the selected participating countries.

(4) Visits to collaborating institutions and agencies for discussions with National Research Directors, Donor Representative and Directors, Program Leaders and Project Managers.

SECTION SIX: Evaluation Team Composition

A five person Evaluation Team will be composed of representatives from the (1) REDSO/ESA (agronomist and project development officer), (2) IITA Headquarters, and, (4) IDRC resource personnel for the evaluation team will be available from REDSO, IITA/ESARRN and NARS participating national programs and personnel in each country. A REDSO/ESA PDO will have overall responsibility for preparing the required A.I.D. documentation (e.g. PES face sheet); while the independent consultant will be the team's technical leader.

SECTION SEVEN: Reporting Requirements

The format of the evaluation report will follow A.I.D. guidelines established in "The supplement of Chapter 12 of A.I.D. Handbook 3" and will include an executive summary, a table of contents, the body of the report not to exceed 30 pages single spaced and appropriate appendices (e.g. executive summary, evaluation scope of work, contact list and bibliography).

The evaluation team will specify conclusions based upon the findings of the study and prepare a set of recommendations for improving future project implementation processes. The report will be written jointly by the evaluation team under the coordination of the team leader, who will be responsible for submission of the document to the relevant institutions and in leading the debriefing sessions with donor missions, national ESARRN leaders, IITA and REDSO/ESA. The team leader, in consultation with other team members, will assign to individuals responsibility for drafting sections of the evaluation report.

SECTION EIGHT: Funding

Estimated cost of the evaluation is U.S. \$23,290

Cost of the evaluation is estimated at U.S.\$ covering the following items:

US Dollars	REDSO	IITA	ESARRN	CONSULTANT Approx.\$2,000	IDRC
International travel	-	-	-	Approx.2,000	-
Regional travel	(800x2)=\$1,600	\$ 800	\$ 800	800	800
Per diem	(2x1080)=2,376	1,410	1,740	1,740	1,080
Secretarial se. ces and miscellaneous loss	100	100	500	-	1,000
Consultants fees	-	-	-	5,250	-
Sub Totals	\$ 3,956	\$2,028	\$4,356	\$9,160	\$1,980

ANNEX III - Persons and Institutions Interviewed

	Names	Position/Address
MALAWI		
1.	Bock, K.	ICRISAT Project Team Leader Chitedze Research Station
2.	Chibambo, Mary	Root Crops Res. Officer Chitedze Research Station
3.	Chomba, Steven	Assistant ADO; USAID
4.	Day, Richard	Program Officer, USAID
5.	Hammons, H.	Entomologist, GTZ Biological Control Program
6.	Mkumbira, J.	Research Officer Mkondezi Research Station
7.	Nyirenda, S.	Research Officer Mkondezi Research Station
8.	Nyirenda, Dr.	Chief Entomologist
9.	Sauti, R. F.	Head, Root Crop Res. Program
10.	Sibalo, P. K.	Director Chitedze Research Station
11.	Manda, W.	Chief Agricultural Research Officer
RWANDA		
1.	Crawford, Paul	ADO, USAID
2.	Gahanamyi, Leopold	Director, ISAR
3.	Gasana, Theogene	
4.	Ndamage, George	Head, Root Crop Program
5.	Ntawuruhango, Pheneas	Researcher, Root Crops Karama Research Station
6.	Mulindagabo, Joseph	Researcher, Root Crops Rubona Research Station
7.	Rubyogo, Jean Claude	
UGANDA		
1.	Kintukwonka, A.	Director Namulonge Res. Station
2.	Mofulira, T.	Research Officer & Biometrician Namulonge Res. Station
3.	Mubiru, J. B.	Dy. Commissioner for Agri.
4.	Mwaule, Y. W.	Chief Agril. Res. Officer
5.	Naluhuba, W.	D.A.O., Tororo
6.	Ojacor, F. A.	Commissioner for Agri.
7.	Otim-Nape, M.	Head, Root Crop Program
8.	P'Obwoya, O.	Researcher, Root Crop Prog.
9.	Rubahayo, E.	Director Namulonge Research Station
10.	Ssekitoleko, V. Hon.	Minister of Agriculture

KENYA

- | | |
|--------------------|---------------------------|
| 1. Abubaker, A. S. | Coast Agric. Res. Stn. |
| 2. Omari, F. F. | N.D.F.R.C. - Katumani |
| 3. M'Ragwa, R. | Researcher, N.D.F.R.C. |
| | Katumani Res. Station |
| 4. Kiarie, A. W. | Root Crop Researcher |
| | Katumani Res. Station |
| 5. Shakoor, A. | FAO Plant Breeder |
| | Katumani Res. Station |
| 6. Wapakala, W. W. | Chief Agric. Res. Officer |

OTHERS:

- | | |
|----------------------|-------------------------------|
| 1. Gingerich, James | Head, Agri. Division |
| | USAID, Kenya |
| 2. McColaugh, Robert | Head, Agric. & NR Div. |
| | REDSO/ESA, |
| 3. Msabaha, M. | TARO, Tanzania |
| | ESARK; Steering Com. Member |
| 4. Carli Carlo | Researcher, Seed Potato Prog. |

ANNEX IV
SUMMARY FINANCIAL PLAN
(US \$000)

INPUT	AID	IDRC	IITA	TOTAL
Personnal	326	88		414
Consultancies	24	12	60	96
Office Rent	6			6
Travel/Transportation	56	14		70
Regional Research	156	14	66	236
National Research		94		94
Training/Workshops	62	86	111	259
Publications/Communi.	30			30
Equipment	23	33		56
Audit/Evaluations	40	4		44
Overhead	129	12		141
Contingency/Inflation	91	22		113
	—	—	—	—
TOTAL	943	379	2371	1,559

ANNEX V - Review of National Activities on increasing genetic
base for root crops

Rwanda

Thousands of controlled crosses have been made resulting in the production of over 100,000 hybrid seeds of cassava and sweet potato. Populations produced are being screened for resistance to important pests and diseases, adaptability to high altitude and for high yield. The program has also distributed over 60,000 seeds, representing 75 families, to national programs in Kenya, Ethiopia, Malawi, Tanzania, Uganda and Mozambique.

Local selections of cassava, sweet potato and yams are also being evaluated. The sweet potato variety, Mugande, which is drought tolerant, virus resistant, high yielding and early bulking has been released recently. Three varieties of yams have also been released.

In addition, the Rwanda national program has evaluated tissue cultured material of outstanding varieties of root crops received from IITA. The IITA variety TIS 2534 has been released as Gunda 2.

The program is actively involved in the rapid multiplication of recommended varieties and is making large quantities of planting material available to farmers.

The review team was highly impressed with the systematic and objective approach being followed by researchers in this program. The decision of ESARRN to use the Rwanda program as a model for less developed national programs seems justified.

Malawi

Crossing blocks for cassava and sweet potato were recently established. These are expected to generate improved populations for the selection of sweet potato and cassava varieties adapted to local conditions. It is planned to distribute seeds to other national programs when these become available.

Fourteen sweet potato and 28 cassava varieties received in tissue culture from IITA are being evaluated along with local selections. One of IITA's varieties TIS 3017 along with three local sweet potato varieties were recently released by the national program. Rapid propagation nurseries have been established in order to expedite the distribution of planting material of improved selection to local farmers.

Uganda

The national program in Uganda is involved in the evaluation of over 450 local accession of sweet potato and 350 local accessions of cassava. These are being evaluated for yield and resistance to the major pests and diseases. Open pollinated seeds

(31,000) of sweet potato have been collected for evaluation. Fifteen varieties of sweet potato and 24 varieties of cassava were received in tissue culture from IITA and are also being evaluated. The cassava varieties Ebwenatekara and TMS 30572 are being multiplied for distribution to farmers.

In general, the Review Team felt that this project lacked coordination in planning and conduct of activities with the result that effort may be wasted in unnecessary duplication of effort. There is also a need to re-examine and define the objectives and methodology utilized. Training in research methodology is essential if rapid progress is to be made. It is recommended that IITA should provide greater technical assistance to this program which the Review Team noted has 11 scientists and a fair level of financing.

Kenya

Activities in Kenya involves the evaluation of local and introduced sweet potato and cassava lines. Seeds of sweet potato from IITA and the national program in Rwanda are being evaluated along with locally collected open pollinated seeds. Seeds of cassava families received from IITA are in an advanced stage of evaluation.

A number of IITA cassava and sweet potato lines received as tissue culture from IITA sweet potato lines TIS 2534 have been released as KSP 20 and TIS 2498 AS KSP 17. Two local cassava varieties with broad adaptability are now being multiplied for distribution to farmers.

This program is suffering from limited personnel and trained expertise. The Review Team noted that the resource allocation is not commensurate with the importance accorded to root crops in the country.

Other Countries

Burundi has selected four sweet potato varieties (3 local and one IITA) and three cassava varieties for multiplication and distribution to farmers. The cassava germplasm of 150 accessions is now being screened for resistance to mealybug.

Ethiopia is interested in selecting sweet potato varieties that are early, high yielding and resistant to drought. Promising lines from local collections and from IITA are now in advanced yield trials. Similarly, cassava from local collections and introduced material are being evaluated. Improved populations have also been introduced from Rwanda for local evaluation.

In Zambia selections from sweet potato seed populations obtained from IITA have been made and are now in advanced yield trials. Similarly, cassava seed populations obtained from IITA have been evaluated, particularly for resistance to mealybug. Some promising cassava lines are being multiplied for distribution to farmers.

ANNEX VI Objectives of IITA Medium Term Plan for
Cassava Improvement

(a) The selection of plant types with a range of plant architectures and maturities to fit diverse cropping systems and the varying requirements of farmers in all African environments where the crop is grown. An especially important requirement is the farmers' need to retain the flexibility of labor use which is provided by the range of maturities and harvest dates in their traditional cassava varieties.

To extend IITA's capability to breed cassava for the humid forest, a cassava breeding substation will be established in that zone in 1989. Later, in 1992 and subject to discussions with SACCAR, two scientists will be placed in Eastern or Southern Africa to breed cassava with emphasis on the mid-altitudes, and to work in association with the East and Southern African Root Crops Research Network. The focus of cassava improvement will also be extended to include the semi-arid zones where the crop is important though grown on a relatively small area.

(b) Resistance to mosaic virus, bacterial blight, and anthracnose is routinely incorporated into all IITA's improved cassava clones. With improved access to the Latin American germplasm, greater resources will be applied to the search for host-plant resistances to mealy bugs (Phenacoccus manihoti), green spider mites (Mononychellus spp.), and grasshoppers (Zonocerus spp.).

(c) The selection and enhancement of tuber qualities suitable for the major types of utilization. Tuber quality is assessed in terms of starch quality for incorporation in bread flours, cyanide content, consumer preferences, and skin color. White skinned tubers will be preferred if they can be processed without peeling.

Special attention will be given to international testing, including the transfer of elite, virus-free clones in vitro. In addition, the use of recurrent selection methods for cassava improvement will be emphasized. Populations grown from true seed will be screened and recurrently selected in a range of well-defined ecosystems.

A number of more specialized areas of basic research that will be conducted by IITA's cell and tissue scientist and cytogeneticist, or which are appropriate for collaboration with advanced institutes will also be an important component of the essential program. Major topics of interest include studies of the induction of flowering; somatic embryogenesis; production of haploid embryos; screening methodologies to assess tuber quality; the cytogenetics of related wild species, the biology of cassava symbiotic organisms and cassava starch quality in relation to weaning diets for infants.

IITA is also increasing research on post-harvest technology and utilization of cassava, both for sweet and bitter varieties.

In cooperation with CIAT and the ICIPE, IITA has a project for the control of insect pests of cassava, which were accidentally introduced into Africa from Latin America.

Another component of collaboration between IITA and CIAT is an agro-economic study of cassava in Africa. The study will provide comprehensive information which will be invaluable in the continuous refinement and review of the objectives of cassava improvement by IITA and CIAT.

ANNEX VII - IITA Technical Assistance and Support to ESARRN

Technical Information Systems IITA publishes research briefs, annual reports, research highlights, technical bulletins, monographs and an annotated bibliography on root crops which are all available to research and extension workers working on root crops in East and Southern Africa.

Consultants IITA has provided financial support for various scientists to visit East and Southern Africa to provide backup support to ESARRN's activities. This included financial support for Dr. J. A. Otoo's visit to Tanzania to attend the Fourth ESARRN's Steering Committee meeting, Dr. M. Akoroda's visit to Zanzibar; visits of biocontrol scientists to Burundi, Zambia, Tanzania, Malawi and Mozambique; and Mr. E. A. Degamu's visit to Malawi to advise ESARRN on various IITA administrative procedures.

Workshops and Meetings IITA provided financial support for Drs. S. K. Hahn, F. Caveness, A. Almazan, A. P. Uriyo and Mrs. Ng to attend the third East and Southern African Root Crops Workshop held at Mzuzu, Malawi, in December 1987. IITA also covered the entire cost for two interpreters who provided simultaneous interpretation of the proceedings.

IITA financed the participation of Dr. A. Almazan at the cassava post-harvest workshop recently held in Mzuzu, Malawi from November 28 to December 1988.

IITA supported the attendance of five scientists from East and Southern Africa at the Genetic Resources of Cassava workshop held at IITA in October 1988.

Financial support was also provided by IITA to enable Dr. Alvarez to attend the in-house review meeting of the Root and Tuber Improvement program at IITA and also the workshop on the Economics of Cassava in Africa also held at IITA in September 1988.

IITA also arranged the visit to the Rwanda Root Crops Improvement program and to IITA of two scientists from Mozambique and one scientist from the SADCC Food Security Unit in Harare.

Training IITA continued to finance short-term training at IITA for a period of 10 weeks to selected technicians working within ESARRN's network. IITA also provided backup to in-country training activities in Tanzania, Zanzibar, Rwanda and Zambia.

For degree related training, IITA financed the M. Phil. studies of Mr. Moses Simwambana at the University of West Indies and at IITA. Financial support was also provided by IITA to Mr. H. Makame to support his Ph.D. degree he is working on part time basis for the University of Ibadan. Miss. Regina Ndibaza of TARO Ukiriguru, Tanzania also received financial support from IITA for her M.Sc. studies at the

University of Ibadan. She is registering for Ph.D. studies with the University of Ibadan on part time basis and IITA will provide financial support for her registration and field research in Tanzania. IITA also provided training manuals for some of the in-country courses conducted in the region.

Provision of germplasm IITA has provided germplasm in tissue culture and in seed form to national programs working within ESARRN's network.

Release of parasites Beneficial parasites for biocontrol of cassava pests have been provided to Rwanda, Tanzania, Uganda, Zambia, Malawi and Mozambique.

Other in-kind inputs IITA has provided inputs to national programs in East and Southern Africa that will support research on root crops. Such inputs included pollination bags, light meters, weighing scales, etc.

Direct Inputs IITA has provided seed money for research activities in Uganda, Kenya, Ethiopia and Mozambique. The costs involved with Dr. S. K. Hahn and A. P. Uriyo's participation in the mid-term review of ESARRN project will be from IITA's core program.

ANNEX VIII - Collaborative Research Projects

National programs were assigned specific research projects that they had to carry out and the results would be shared by all member countries participating in the ESARRN's research network. The following are the collaborative research activities undertaken by each member of the network.

Rwanda

Within the framework of the network, Rwanda is addressing the following objective:

To generate improved populations of both sweet potatoes and cassava from recombination of selected clones with specific desired characteristics, such as adaptation to high altitude drought resistance, virus and altanaria resistance.

Thousands of controlled crosses have resulted in more than 100,000 hybrid seeds. Improved seed population of both cassava and sweet potato totalling more than 50,000 seeds representing more than 75 families have been distributed to other collaborators as shown in Table 1.

These populations have high frequency genes for the following characteristics:

Sweet potatoes: Earliness, high yield, adaptability to medium and high altitude 1400-2300 MASI and resistance to altanaria

Cassava: Resistance to cassava mosaic virus, CGM, high yielding and adaptability to medium altitude.

Table 1 - Distribution of seeds produced in Rwanda

Recipient Country	<u>Number of Families received*</u>	
	cassava	sweet potatoes
Kenya	15	20
Ethiopia	10	15
Malawi	-	20
Tanzania	12	8
Uganda	5	10
Mozambique	10	-

*These families represent more than 60,000 seeds from both crops.

Some of the recipient national programs have already started selections from these populations. Prior to this, most national programs with interest in germplasm relied solely on International Agricultural Research Centers (IARCs) for improved populations.

Burundi

For the benefit of both the national root improvement program and the network, Burundi is addressing the following objective:

To establish a multiplication system and management techniques needed for the maintenance of vigour, health and rapid regrowth of multiplication plots.

Initial base material of three hectares each for sweet potato and cassava was established for this system. The varieties are shown in Table 2. The demand for planting materials increased tremendously after the training course and since then thousands of cuttings have been distributed. The increase in need for planting material was further enhanced by the arrival of the cassava mealybug in the area from Nynza-lac region to the southern boarder of Burundi. The graveness and urgency of this problem has forced a change in priorities. For this reason, the program was forced to move its cassava germplasm of one hundred and fifty accessions to the mealybug area for screening against this pest prior to further multiplication.

Table 2: Root crops varieties multiplied and distributed to farmers and projects in Burundi.

Sweet potato	Cassava
Rusenya	Mpamba
Nsasagatebo	Zaymete
MOHC 2022	Creolinhe
TIS 2498	

Ethiopia

The main thrust of the Ethiopian program is towards the selection of early bulking, drought resistant sweet potato varieties.

The objective of the Ethiopian study was to carry out a systematic evaluation of sweet potato lines for earliness and resistance to drought and adapted to the major drought prone production areas.

The first stage of the screenings were conducted at Awasa and Areka. The best four varieties yielded higher than the local checks. From this preliminary evaluation, it seems that the potential for earliness could be realized under these conditions in Ethiopia. The selected materials will be tested in the next

To establish a system for root crops technology dissemination to farmers.

In addressing this objective, the program has established and revitalized seven other national centres on Zanzibar to facilitate the dissemination of improved lines to farmers. The stations revitalized for cleaning and production of healthy planting materials are: Kizimbani, Mahonda, Kama, Mbuzini, Bambi, Bungi, Fumba and Makunduchi.

season. Improved populations of both sweet potato and cassava originating from Rwanda have been introduced to Ethiopia to broaden the gene pool for evaluation and selection.

Zambia

The Zambian Root and Tuber Improvement Program has evaluated more than 100 lines of sweet potato selected from an IITA source population in a preliminary yield trial. Cassava seed population were also evaluated for resistance to the cassava mealybug.

In compliance with the network objective, Zambia is screening cassava varieties for mealybug resistance and at the same time monitor its rate of spread in the country and its influence on the farming system in the affected areas.

Because of lack of a cassava plant breeder, the screening part of the work has just started.

The cassava mealybug was first observed in Zambia in Mansa District in 1981. From this district the pest spread rapidly to other provinces, and by 1987, nearly all cassava growing areas in Zambia had been infested by this pest. The Government of Zambia in collaboration with the IITA Africa-wide Biocontrol Program initiated work in Zambia in 1984, which has resulted in the establishment of the mealybug parasite Epidinocarsis lopezi over large areas in Zambia.

To assess the impact and attitude of farmers about the cassava mealybug, a survey was carried out in three districts in Luapula Province. This survey assessed the attitude of farmers to cassava during a crisis situation and all responded that cassava is an important food source and must continue to grow it.

Uganda

Cassava processing is lengthy and labor intensive. Because of the perishable nature of the crop, quantitative and qualitative losses take place within 24-72 hours after harvest. In dealing with this constraint the Uganda National Root Crops Improvement Program, in collaboration with ESARRN, has shared the following objective with Malawi.

To identify efficient cassava processing methods and to design and construct efficient drying systems that could be readily manufactured and to determine important characteristics in cassava flour that influence quality and acceptability when used as composite with sorghum, millet or maize.

The Uganda National Root Crops Improvement Program scientists' constructed open-sun drying trays of two designs using timber and coffee-wire mesh as bottom for one system and the other consisted of half-split 0.5" poles nailed as a mesh and reed-mats nailed onto the bottom.

The drying trays were mounted off-ground on common wooden frame structure with a tilt angle of 19.5° for maximum harnessing of solar radiation.

The reed-mesh tray was easiest and cheapest to construct. Its performance over the wire-mesh tray increased with sunny weather. During inclement weather conditions, the performance of the reed-mesh tray was lower compared to that of the wire-mesh. The quality of the crop dried on trays was superior to that dried on the ground, being clean and free from mould.

Malawi

In Malawi, cassava is an important staple food crop and is second only to maize. Malawi Government policy has encouraged the use of cassava as a food security crop and therefore the Malawi Root Crops Program is considering ways of increasing the acceptability and usage by addressing the problem of post-harvest technology at the farm level as well as packaging of composite flours for urban consumers.

The objective which the Malawi Program addressed in collaboration with the network is:

To identify efficient methods of processing cassava and to improve on its utilization by developing suitable composite flours (cassava/maize) with acceptable quality and packaging.

Malawi will initially look at the post-harvest constraints at the farm level. To this end, a survey has been planned for one of the major cassava growing areas. This survey will gather information on processing methods and constraints, storage systems and its extent of contribution to the daily diet. This survey will be done in collaboration with Bunda College of Agriculture and UNICEF.

Tanzania

Cassava and sweet potatoes are important root crops in both the Tanzania mainland and Zanzibar.

In an effort to elucidate the cassava based farming systems in the area, the Tanzania/Zanzibar Root Crops Programs addressed the following objective:

To identify cassava-based intercropping systems which are economical in the region.

In addition to conducting intercropping trials with cassava, sweet potato, upland rice and coconuts. The Zanzibar principal also addressed the issue of technology transfer on behalf of the network. The objective is:

A.I.D. EVALUATION SUMMARY - PART I

1. BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS.
2. USE LETTER QUALITY TYPE, NOT "DOT MATRIX" TYPE

IDENTIFICATION DATA

A. Reporting A.I.D. Unit: Mission or AID/W Office <u>REDSO/ESA</u> (ES# _____)		B. Was Evaluation Scheduled in Current FY Annual Evaluation Plan? Yes ☒ Skipped ☐ Ad Hoc ☐ Evaluation Plan Submission Date: FY ____ Q ____		C. Evaluation Timing Interim ☒ Final ☐ Ex Post ☐ Other ☐	
D. Activity or Activities Evaluated (List the following information for project(s) or program(s) evaluated; if not applicable, list title and date of the evaluation report.)					
Project No.	Project /Program Title	First PROAG or Equivalent (FY)	Most Recent PACD (Mo/Yr)	Planned LOP Cost (000)	Amount Obligated to Date (000)
698-0435.07	East and Southern Africa Root Crops Research Network (ESARRN)	1987	3/90	\$943	\$943

ACTIONS

E. Action Decisions Approved By Mission or AID/W Office Director		Name of Officer Responsible for Action	Date Action to be Completed
Action(s) Required			
<u>RECOMMENDATIONS</u> -There are 20 specific recommendations of which major ones are enumerated here: - IITA should prepare a revised annual workplan/budget and remaining LOP strategy and budget to determine funding requirements for on-going activities and availability of funding for expanded activity. - Funds permitting, IITA should consider hiring an additional scientist with a background in extension and agronomy to join the coordinator's office. - With the recent transfer of the mandate for sweet potato research to CIP, efforts should commence to integrate CIP support for sweet potato research into ESARRN. - The coordinator should work with the ESARRN Steering Committee to develop comprehensive Terms of Reference and Operational Guidelines for Steering Committee operations.		IITA IITA IITA and CIP ESARRN Coord. and Str. Commit.	4/89 9/89 6/89 9/89
(Attach extra sheet if necessary)			

APPROVALS

F. Date Of Mission Or AID/W Office Review Of Evaluation:		(Month)	(Day)	(Year)
G. Approvals of Evaluation Summary And Action Decisions:				
	Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer	Mission or AID/W Office Director
Name (Typed)	R.E. MCCOLAUGH	M.N. ALVAREZ	MONICA K. SINDING	SATISH P. SHAH
Signature	DRAFT	DRAFT	<i>Monica K. Sinding</i>	<i>Satish P. Shah</i>
Date				

ABSTRACT

H. Evaluation Abstract (Do not exceed the space provided)

The goal of the project is to increase root crop production and productivity in East and Southern Africa. ESARRN, a network of 11 national root crop research programs receiving technical support from IITA, serves primarily as a training and technical assistance mechanism to support root crop development. This project is being implemented by the International Institute of Tropical Agriculture (IITA) and receives funding from IITA, AID, and the International Development Research Center (IDRC). The evaluation was conducted jointly by a team from IITA, USAID/REDSO/ESA, and IDRC. The purpose of this evaluation was to assess the current status of the project relative to stated project activity in the grant agreement and to make recommendations relative to changes in project focus, management practices, and implementation procedures. The project has five specific objectives:

- o Encourage rigorous collaborative planning and evaluation of root crop research.
- o Increase the useful genetic base for principal root crops and enhance its utilization in the root and tuber improvement programs in the region;
- o Improve root crop based farming systems through surveys, design, and methodology development;
- o Improved techniques for drying, processing, and utilizing cassava in rural areas;
- o Foster the establishment of effective systems for delivery of improved technology to farmers through institutional and human resource development.

ESARRN has initiated activities in seven areas which contribute to the goal, purpose and outputs of the project. These are (1) collaborative planning and evaluation of root crop research; (2) in-service and formal training; (3) development of training materials; (4) publication and dissemination of technical information; (5) technical assistance for improved root crop research; (6) exchange of improved genetic materials among national programs; and (7) provision of technical equipment and acquisition of network research and office facilities.

The project was slower than anticipated in starting due to protracted negotiations required to secure approval for ESARRN to locate in Lilongwe, but significant progress has been made in all project sub-activity. Increasing small-holder agricultural production is supportive of AID's agricultural strategy for East and Southern Africa and other USAID commodity research efforts in the region. The co-funded collaborative network approach was seen to be a cost effective means of in-service training and fostering cross border cooperation between national research programs. Some activity levels have changed from the original proposal, however, this was to be expected since a regional network must be able to respond to different initiatives and resource levels of its collaborators.

Major recommendations were: (1) development of a network baseline and benchmark data series to assist with evaluation of the present project and for guidance in design of follow-on activity; (2) conditional upon funding being available a second scientist should be added to the core ESARRN staff; and, (3) IITA invest more time of their headquarter's scientists and in the development of educational materials.

C O S T S

1. Evaluation Costs

1. Evaluation Team		Contract Number OR	Contract Cost OR	Source of Funds
Name	Affiliation	TDY Person Days	TDY Cost (U.S. \$)	
Dr. Theodore Ferguson	Consultant	25	\$9,410	ESARRN
Mr. Andrew Ker	IDRC	20	n.a.	IDRC
Dr. Andrew Uriyo	IITA	25	n.a.	IITA
Mr. Gregg Wiitala	REDSO/ESA	25	n.a.	AID
Dr. K.B. Paul	REDSO/ESA	25	n.a.	AID

2. Mission/Office Professional Staff

Person-Days (Estimate) 50

3. Borrower/Grantee Professional

Staff Person-Days (Estimate) 25

A.I.D. EVALUATION SUMMARY - PART II

SUMMARY

J. Summary of Evaluation Findings, Conclusions and Recommendations (Try not to exceed the three (3) pages provided)

Address the following items:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Purpose of evaluation and methodology used • Purpose of activity(ies) evaluated • Findings and conclusions (relate to questions) | <ul style="list-style-type: none"> • Principal recommendations • Lessons learned |
|--|--|

Mission or Office:

REDSO/ESA

Date This Summary Prepared:

February 28, 1989

Title And Date Of Full Evaluation Report:

East and Southern Africa Root Crops Research
Network Project Interim Evaluation-Dec.1988

PURPOSE OF ACTIVITY - IITA has actively encouraged the development of national root crops research programs in Africa recognizing that root crops are a major food crop in many countries. However root crops were generally accorded low priority and a relatively small number of scientist work in this field. Interest in production was largely confined to small farmers who produced for direct consumption. By 1985 the heads of root crop research programs in the region reached the consensus that their interests would be better served through regional collaboration. IITA provided initial support and approached AID and IDRC for funding to support a regional root crops research network. IDRC approved a grant of \$379,000, AID provided \$943,000, and IITA contributed an additional \$237,000 bring total project funding to \$1,559,000 for a three year project ending March, 1990. The goal of the project is to increase root crop production and productivity in East and Southern Africa. The specific purpose of the project is to establish a root crop research network to foster cooperation and sharing of information and genetic materials among national agricultural research systems to support and train scientist in participating countries, and to strengthen national root crop programs. The specific objectives of the project include the following: (1) encourage rigorous collaborative planning and evaluation of root crop research in the region; (2) increase the useful genetic base for principal root crops and enhance its utilization in the root and tuber improvement programs in the region; (3) improve root crop based farming systems through surveys, design, and methodology development; (4) develop improved techniques for drying, processing, and utilizing cassava in rural areas; and (5) foster the establishment of effective systems for delivery of improved technology to farmers through institutional and human resource development.

Primary project activities consist of the following: (1) establishment of a regional network for scientists working on root crops in East and Southern Africa; (2) short-, medium-, and long-term training; (3) development of training materials; (4) publication and dissemination of technical information; (5) technical assistance for improved root crop research; (6) exchange of improved genetic materials among national programs; and (7) provision of technical equipment and acquisition of research and office facilities. ESARRN, with its focus on collaborative research and training in support of improved root crop productivity for small holder agricultural production, is supportive of AID's agricultural strategy for East and Southern Africa and other USAID commodity research efforts in the region. Bilateral USAID missions have expressed support for the regional collaborative approach of ESARRN which would be difficult to accomplish on a bilateral basis. ESARRN's role, as the primary training and networking mechanism in support of root crops development, continues to promote root crops as important food crops for national agricultural research programs.

In terms of project activities, there have been some changes in levels of activity from the original proposal, however, this was expected from a regional project that must respond to initiatives from national programs. ESARRN's bilingual staff have been able to work effectively in all ESARRN member countries. ESARRN member countries currently consist of Rwanda, Malawi, Uganda, Tanzania, Sudan, Kenya, Zambia, Mozambique, Burundi, Ethiopia, and Madagascar. Membership is open to other interested countries in the region.

The coordinator's office is located in Lilongwe, Malawi and IITA headquarters in Ibadan, Nigeria, provides administrative and technical backstopping for the project.

PURPOSE OF THE EVALUATION - The project evaluation plan called for a mid-term evaluation to assess the progress of the Project in achieving project objectives. The evaluation team was asked to assess project implementation to date with a view to enhancing performance and potential impact. In particular, USAID is concerned with the low level of funds drawdown and if project objectives are being adequately addressed. The evaluation report presents findings, conclusions and recommendations which will assist USAID, IDRC, IITA and the Steering Committee to make decisions about the future of the project. The evaluation took place between November 27 and December 21, 1988. The evaluation team consisted of representatives from USAID, IDRC, IITA, and an independent consultant who served as the teams technical leader. The Statement of Work (SOW) for the evaluation is attached as an annex. The team visited national programs in four countries (Malawi, Rwanda, Uganda, and Kenya). Field visits to on-station and on-farm research trials were made in each country visited. Project files in REDSO/ESA and ESARRN coordinator's office were reviewed. The team held interviews with IITA headquarter staff, leaders of national root crop programs, host government representatives, and USAID mission personnel in countries visited. A meeting was also held with the Steering Committee concerning project implementation issues and the evaluation recommendations. Financial records and reports in the coordinator's office and REDSO/ESA were also reviewed.

FINDINGS AND CONCLUSIONS - The interim evaluation of the IITA ESARRN project concluded that, notwithstanding the slow start-up, the grant was being well implemented and that significant progress was being made with training, genetic material distribution, and strengthening of national programs. Major Findings and Conclusions are as follows:

1. There is inadequate baseline data on root crops to make a quantitative assessment of project accomplishments.
2. Although the project started more slowly than anticipated, the desired outputs of this first project can still be achieved by PAOD.
3. The periodic joint review by donors has helped clarify responsibilities and improved coordination.
4. The collaborative networking approach was found to be cost effective and implementation problems encountered in one country did not adversely affect overall operation of the network relative to project activities in other countries.
5. REDSO/ESA is the appropriate AID office for project management and technical supervision. Management by a bilateral mission would be disjointed and difficult because of the large number of countries involved. AID/W is too distant to respond to project needs in a timely manner.
6. The professional staff of ESARRN needs to be expanded to cope with demand for services from national programs.
7. The final evaluation of research is farmer adoption. At present, technology transfer and extension services need to be strengthened as linkages between research/extension/farmers are generally weak.
8. Inadequate funding for the expansion and improvement of root crop research programs at the national level is a major constraint to achieving ESARRN's objectives of (1) technical training in root crops research; (2) networking; and, (3) establishing sustainable national root crops research programs.
9. Available improved genetic material is not being adequately tested and distributed in all member countries.

Lessons Learned

Although the project is not completed and we anticipate the need for a follow-on grant to achieve all long-term objectives, some important design and implementation lessons can be drawn from the evaluation findings.

SUMMARY (Continued)

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|--|-----------------|-------|
| 5. IITA should initiate the collection of baseline data on root crop production in the region. | IITA | 12/89 |
| 6. Economic and sociological studies should be included as part of the research effort on root crops production. | IITA | 3/90 |
| 7. B.Sc. degree training for diploma level root crop researchers should be supported by the project in addition to M.Sc. level training. | IITA | 3/90 |
| 8. Increase the training opportunities for national program staff in rapid multiplication techniques. | IITA | 3/90 |
| 9. Increase the use of IITA staff for short-term training, educational materials development and consulting. | IITA | 3/90 |
| 10. Increase the flow of new genetic material into the region for both cassava and sweet potato. | IITA/CIP | 3/90 |
| 11. IITA should assist NARS to develop improved extension and technology transfer systems at the national level that would contribute to increased farmer adoption of improved techniques. | IITA and NARS | 3/90 |
| 12. Project activity in support of post-harvest technology development should be expanded. Increased emphasis should be directed toward rural processing and storage of rootcrops. | IITA | 3/90 |
| 13. National governments should be encouraged to increase allocation of national resources for root crops research. | ESARRN and NARS | 3/90 |

Project Design Implications

1. It is imperative that adequate, reliable baseline data be collected prior to embarking on a major research effort. The absence of this data inhibits meaningful evaluation efforts and impairs the ability of donors, host countries and IARCs to make informed judgements during project implementation.
2. Regional networks which can cut across nationalistic and linguistic barriers are an effective means to foster collaboration and cooperation among national programs. Network support of African scientists through workshops, publications, travel, mid-career and in-service training to maintain performance, competence and morale through regional programs is both operationally efficient and cost effective.

Broad Action Implications

A regional approach to support research efforts can only be effective if there is commitment at the NARs level to fully participate in the network. Furthermore, national governments must demonstrate their commitment by allocating sufficient resources to develop and maintain national research programs. Any follow-on project activity will require careful analysis of government capability and interest in sustaining network supported activities following project completion.

ATTACHMENTS

K. Attachments (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier; attach studies, surveys, etc., from "on-going" evaluation, if relevant to the evaluation report.)

ESARRN Interim Evaluation Report

COMMENTS

L. Comments By Mission, AID/W Office and Borrower/Grantee On Full Report

REDSO/ESA finds the evaluation addressed the issues as presented in the SOW and is complete. AID agrees with the full set of recommendations and actions indicated, except in the case of a no additional cost PACD extension. We are uncertain at this time if an additional person can be added to the ESARRN staff and still have a sufficient budget residuals for an extension past the present PACD.

REDSO is concerned about NARs funding mechanisms, donor sources, and additional local resource allocations required during the remaining LOP, issues which must be treated by all parties as high priority.

The evaluation team is to be congratulated and the grantee commended for a successful initiation of this regional project.

IITA Remarks:

Robert McColaugh/J. P. Ekebil/IITA, Ibadan Telex dated March 21, 1989

Quote IITA fully agrees with all the recommendations except that we feel that the resources available are inadequate to carry out a baseline survey for root crops in the region. Preliminary analysis shows that the resources available are inadequate to employ a second scientist at no additional cost PACD extension. IITA is grateful to USAID and IDRC for financing the regional root crops network.

Please accept this telex as a signature for block G. End Quote.

Interim Evaluation of the East and Southern Africa Root Crops Research Network

A collaborative interim evaluation of ESARRN was successfully conducted by a five person team consisting of an IITA scientist, a REDSO project development officer, an IDRC Program Officer and an external consultant.

The team visited four of the eleven ESARRN Countries; Malawi, Rwanda, Uganda and Kenya. In each country interviews were conducted with directors of national agricultural research systems, heads and researchers in root and tuber crop research program, USAID Mission and with IDRC regional office in Nairobi.

The interim evaluation of the IITA/ESARRN project concluded that notwithstanding the low level of funds utilization, the grant was being well implemented and that significant progress was being made with training, genetic material distribution, and strengthening of national programs. The following were lessons learned and recommendations made by the evaluation team.

Lessons Learned

Some of the more important lessons learned from the review are:

1. The project was well designed and thus greatly facilitated the relatively smooth implementation of the grant to date. The experiences can be used in the development or operation of other networks.
2. The lack of detailed baseline information on the status of root crops production and research in the individual countries made it difficult for the Review Team to fully quantify the benefits and achievements of the project. The project should initiate activities to gather such data which will benefit not only future evaluation but can help to demonstrate the importance of root crops and influence policy.

3. The Review Team found that the collaborative networking approach followed by the project to be extremely cost effective. With a single scientist as coordinator, ESARRN was able to stimulate significant research activities in most of the eleven member countries. It is to be noted that difficulties or delays in any one country has little impact on the overall progress of the network.
4. The network cuts across national and linguistic borders and creates a better understanding among researchers and policy makers of the problems affecting root crop production in the region as a whole. Many of the problems are regional in scope and can best be solved through a cost effective regional approach.
5. The network has facilitated the rapid exchange of germplasm among participating countries and with sources outside the region. Similarly it has helped in information exchange among participating countries thus minimising the conduct of unnecessary research.
6. The network makes it possible for countries in the region to be more aware of impending disasters (e.g. mealybug), to learn from affected countries and to make contingency plans as necessary.
7. The network has greatly facilitated the more efficient use of the limited professional manpower available in the region as resource personnel in training courses and as consultants to countries other than in which they reside.

8. A major benefit of the network is that it has had a legitimizing effect for research workers and their national programs within countries. Policy makers now give greater recognition to root crop research and the researchers are more confident about their work. In many countries policy makers are rapidly becoming more aware of the importance of root crop research and its implication towards national food security.
9. The growing intensity of research activity in ESARRN countries as well as discussions on the rapidly spreading pests have made national programs more aware of the weak and limited genetic base of sweet potato and cassava in the region. There is need to develop national contingency plans to broaden the genetic base as quickly as possible.
10. The availability of improved germplasm of cassava and sweet potato in tissue culture from IITA has not been adequately exploited by networking countries. It was particularly disturbing that many countries after receiving material failed to conduct the minimum evaluation necessary.
11. IITA germplasm, although having certain advantages, have shown major limitations as far as the specific needs of the region are concerned. The network provides an opportunity to give rapid feedback to IITA to help focus and improve their plant breeding program.
12. IITA training activities have had a major impact on root crops research in the region. Most of the current personnel working on root crops are ex-IITA trainees. The network has helped to consolidate the work of these trainees.

13. One of the significant contribution of the network is that it has assisted in formal training of staff for higher degrees, production training courses at IITA, and in-service training courses given in the region.
14. Despite the comments in 12 and 13 above, there is still a tremendous shortage of trained root crop researchers in the region. There is need to increase the number of professionally trained people and for the continuation of in-service training to existing workers. The network should also facilitate the training of diploma holders to the B.Sc. degree level.
15. Universities in the region have had minimal involvement in current research and training activities on root crops. They represent a significant pool of trained manpower and their greater involvement in the network should be facilitated.
16. The existing systems for transfer of technology to farmers is generally weak. A notable exception is Rwanda. Greater emphasis should be given to the development of appropriate systems.
17. There is a paucity of research and development activities in the area of post harvest technology. Training of personnel may be a pre-requisite before a significant increase in activities in this area can be expected.
18. Short-term consultancy visits by IITA staff can be highly beneficial to national program. IITA should provide greater assistance in this area.
19. The coordinator is doing a good job. There was general satisfaction with his performance at national levels. National programs express a desire to have more of his professional time but this is not possible given the number of countries to be covered. There is clearly a need to increase professional staff in the project

20. Management and supervision of the project from AID regional offices is appropriate in situations where the project is also in the same region. Host governments are more receptive to having regional project activity managed by as AID regional office rather than by a bilateral mission from another country.

Recommendations

The following are the major recommendations of the Review Team:

1. Consideration should be given to extending the project by up to nine months. The contractor should submit a revised budget to IDRC and USAID.
2. A second professional should be engaged as a visiting scientist (extension agronomist)..
3. The network should develop terms of reference and operating guidelines for the Steering Committee.
4. The network and IARCs should make greater efforts to develop and introduce improved genetic material into the region.
5. National programs should be encouraged to make greater use of existing opportunities provided by the network.
6. Greater emphasis should be given to training staff of national programs in rapid multiplication and distribution of clean planting material.
7. The training component of the project should be widened to encourage holders of diplomas to continue in African Universities for B.Sc. degrees.
8. IITA should increase its technical assistance to the project through more consultancy visits by their staff and greater involvement in training activities.

9. CIP should be requested to comply with the June 15, 1988 Action Plan made with IITA to provide back up support to ESARRN for sweet potato in research and training.
10. ESARRN should encourage the strengthening of national programs through a greater allocation of resources from both national and donor sources.
11. ESARRN should make a special effort to more fully integrate the Universities of the region in research and training on root crops. Development of baseline data for the network would be an appropriate area for university participation.
12. ESARRN should take steps to encourage publication of more technical information on root crops for East and Southern Africa.
13. The network should encourage studies to be undertaken on economic and sociological aspects for root crop production in the region. The universities should be encouraged to undertake such studies.
14. Greater effort should be given to stimulating more post harvest studies on root crops.
15. ESARRN should encourage development of a more efficient system for the speedy transfer of improved technologies to farmers.
16. Annual work plans and budgets should be submitted and reviewed as scheduled.
17. USAID should continue with the initial quarterly advance to IITA which would then be reimbursed on a monthly basis following submission of expense vouchers by IITA.

18. The grant should continue to be managed by REDSO/ESA as this has proven to be cost effective and administratively efficient when compared to either bilateral mission or AID/W.
19. The network should make efforts to involve all root crop producing countries in East and Southern Africa in its activities.
20. The contractor for the project should initiate the preparation of a proposal for a second phase of 5 years for consideration donors.