

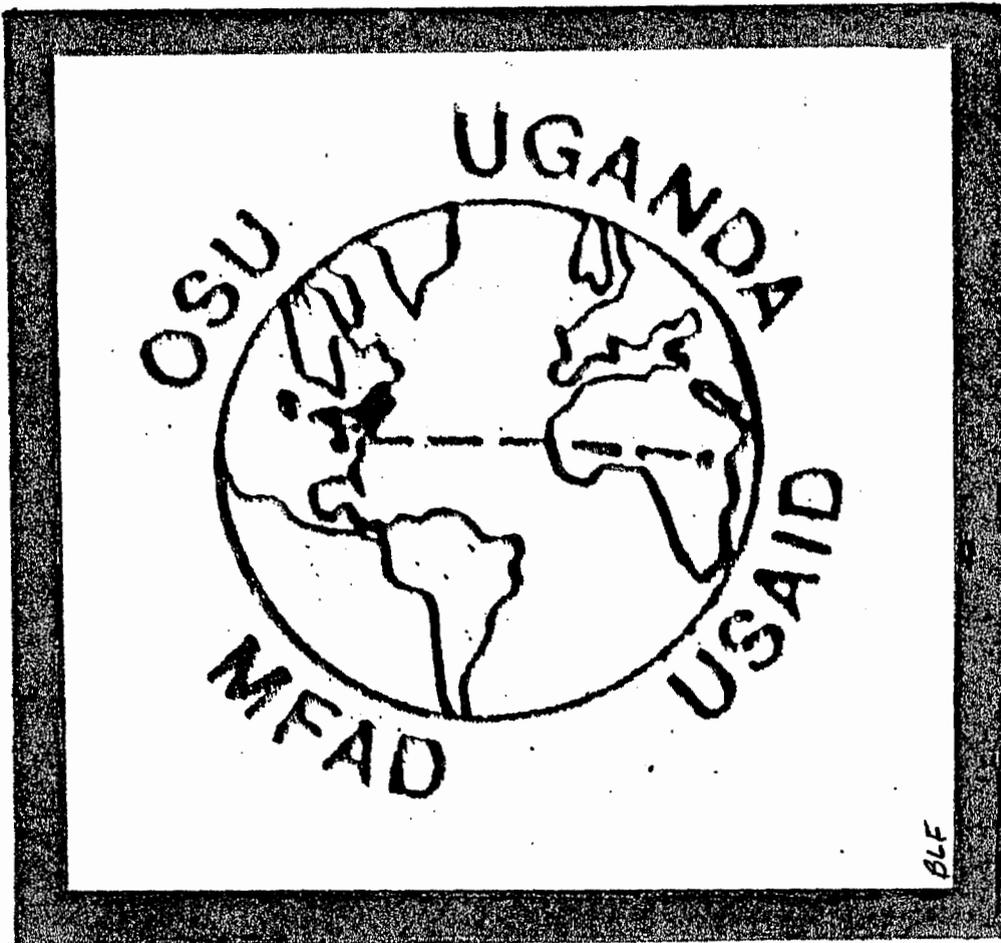
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PROJECT EVALUATION

[617-0103]



UGANDA MANPOWER FOR AGRICULTURAL DEVELOPMENT

NOVEMBER 14, 1987

PROJECT EVALUATION
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(617-0103)

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EXECUTIVE SUMMARY

USAID, Kampala - Project 617-0103

Since the project Grant Agreement was signed on August 26, 1983, USAID, Kampala has been implementing the five-year Manpower for Agricultural Development Project (MFAD) with Makerere University, Faculty of Agriculture & Forestry and the Ministry of Agriculture (formerly the Ministry of Agriculture and Forestry). The overall goal of the project is to assist the Government of Uganda in its recovery program to stimulate small farmer food crop production. In order to achieve this goal, the project's purpose has been to assist the Government of Uganda to rehabilitate, retrain and redirect its agricultural manpower and institutional capability in food crop research by primarily (a) providing assistance for retraining their agricultural research and teaching staff; (b) rehabilitating and re-equipping their agricultural research and teaching facilities; (c) supporting individual research proposals; and (d) supporting a program to introduce and test new plant material. The End of Project Status-EOPS is the restoration of food crop research capability in Uganda to such an extent that the country is poised to recommence major food crop research.

Outputs - Achievement of the EOPS predicated above depends upon attainment of a series of outputs as outlined below:

- a) retrained staff;
- b) rehabilitated and re-equipped research facilities;
- c) rehabilitated and re-equipped teaching and office facilities;
- d) development of a food crop research strategy and implementation plan; and
- e) a research system with established linkages to extension activities.

The above project goal, purpose and EOPS are from the original Project Paper (PP) dated April 1983 and the evaluation was to be based upon the Implementation Schedule given in PP Supplement No. 2 dated July 1986 as modified and agreed to by the Contractor (The Ohio State University Research Foundation) in Amendment No. 1 to Contract No. 1 AFR-0103-C-00-4047-00 dated 3/18/87.

The evaluation, at this time, is part of a two phase operation - evaluation and re-design. Many changes have occurred in Uganda since the project was designed in 1982 and implementation began in earnest during 1984. Also, it is apparent that the task of rehabilitation, retraining, and redirecting Uganda's manpower and institutional capabilities in food crop research is enormous and requires a long-term commitment. The Mission wishes to continue its commitment to revitalizing the food crop research, extension and teaching capacity in Uganda by extending the MFAD Project for five years to FY 93.

The methodology used was; extensive review of background documentation and reports; rapid rural appraisal type interviews carried out with a wide range of policymakers, scientists, administrators, trainee participants, technical assistance personnel and faculty members. The Evaluation Team Members also drew on their extensive collective experience with similar projects to determine performance in comparing expected outputs with actual achievements.

Major Findings

In reference to the projected outputs, significant progress is evident on the rehabilitation of research facilities at the Farm of the MU/FAF (Kabanyolo) and at the Kawanda Research Station of the MA. If rehabilitation continues as planned, both should be capable of a reasonable level of operation by the end of the present project in September, 1988. Also, at both locations, farm equipment is now arriving so operation of the farms should be possible by the end of the present phase of the project. The TA Project Staff have carried out their work very well. However, at both locations there are few if any local funds to support any significant research. Therefore, the actual implementation of research in the short run will be highly dependent upon project and other external funds to meet most of the recurrent expenditures. There have been long delays in procurement of laboratory equipment and supplies by the USAID selected Procurement Services Agency (PSA) and from all reports by project staff and staff of the implementing agencies the present PSA arrangement is unsatisfactory.

The rehabilitation of teaching facilities at MU/FAF has progressed very little during the life of the project. Rehabilitation plans have been drawn and a local contractor is to carry out the work rather than having it done under the supervision of the project personnel. This course of action was deemed necessary due to the large scale of the rehabilitation.

Rehabilitation, except at the MU/FAF, has progressed very well but there is still much that needs to be done that will not be covered under the present project. For example, there is no rehabilitation now scheduled for the Namulonge Research Station which is to be the main station for annual food crops. In the absence of a well defined plan for rehabilitation at Kawanda the Evaluation Team is not able to comment on the degree to which additional rehabilitation will be required beyond the present project. And, it appears that if security conditions improve and work can be reinstated at the Serere Research Station, there are no funds remaining in the project for its previously scheduled rehabilitation.

While the rehabilitation has, by and large, been carried out very well and with excellent supervision by the Management Assistants, there is little assurance, at least in the short run, that the implementing agencies will have either the trained manpower or the financial resources to maintain the facilities and equipment. Corrective measures must be taken in the design of the next phase of the project, as well as in negotiations between USAID and the GOU, to assure support for maintenance. This will need to include appropriate salaries to attract and hold the skilled technicians who are required for service and maintenance. Unless this assurance is given and the support actually provided, many of the inputs from the project will become another classic example of donor assisted projects rapidly deteriorating once donor assistance is terminated.

The retraining of staff has been carried out as planned and 32 staff persons from MU/FAF and 35 from the MA have received short-term training in the United States or at one of the IARCs. There has been little follow-up on the trainees since their return from training and the absence of any equipment or financial support for them on their return has negated any hope for early application of knowledge or new capability acquired as part of their training. It did provide significant numbers the opportunity for renewed contact with scientists in their field, which they had been denied for many years, and with updated scientific knowledge for which they are all very grateful.

The development of a food crop research strategy and implementation of a viable agricultural research program is still in a very preliminary stage. The Agricultural Research Advisor is working closely with the Chief Agricultural Research Officer, who was appointed in the MA as one of the project requirements, to bring about better planning, execution, monitoring and reporting of agricultural research. However, under the present MA organization for agricultural research, very little progress can be made. The Evaluation Team strongly supports an earlier Task Force Report which recommended the establishment of a semi-autonomous National Agricultural Research Organization which is in keeping with the experience of a number of Asian, African and Latin American

countries with successful agricultural research and development programs. In recent months the Contractor has arranged for some outstanding consultants to review and make recommendations on commodity programs and agricultural extension. Their reports are now under consideration and will be very helpful to the Redesign Team and to the GOU as plans are made to further improve the agricultural research and production system. Also, the Contractor and the implementing agencies have approved support for a number of individual research projects but these need to be viewed in an overall research context. The Evaluation Team has noted the high priority it believes should be given to the development of a national agricultural research plan which takes into account present and potential human, financial and physical resources and the priority problems in agriculture which can be addressed by research.

In regard to "assistance to the MU/FAF" there does not appear to have been any significant action by the Contractor in regard to curricula and staff development plans. Also, there was no action by the Contractor or the FAF on identification and training of "Extension Specialists" for the six departments of the FAF as had been agreed under the project. There is little evidence of any strengthening of linkages between research and extension or between the MA and the MU/FAF.

Interviews and observations carried out by the Evaluation Team indicate the project lacked effective leadership by the Prime Contractor in the field and from its headquarters. It is the conclusion of the Evaluation Team that these two factors have been a major reason for lack of unity or a "team" approach on the part of the TA personnel, which in turn affected project progress. Further, it is the conclusion of the Team that for lack of leadership and also insufficient action on the part of the implementing agencies, the project scope and content was never understood widely in the implementing agencies or in other key ministries of the GOU. Such understanding is essential to gain long-term support for the project.

To a certain degree, the progress on the project must be viewed in the context of the national situation in which it was operating. For almost the total period of the project there has been instability and security problems in the country. The TA Team and their families were evacuated and had to remain out of the country for about 10 months. The TA Team, their families and the staff of the implementing agencies must be given much credit for their willingness to carry on under these very difficult conditions.

Lessons Learned

The Evaluation Team believes there are a number of lessons learned which should be given consideration in the redesign of the project and probably have wider application.

Many of these lessons are not new and have been noted in many projects around the world. Among these are:

- a. A reaffirmation of the absolute requirement for excellent "team" leadership and for early corrective action if indicated;
- b. There is a need to make certain that information concerning the content and scope of the project is well known by all key individuals in the implementing agencies;
- c. In order to achieve (b) above, the Evaluation Team suggests that in addition to the TA Team Meetings which are usually held on a regular basis, there should be regular joint meetings attended by key individuals (decision makers not just counterparts) and the TA Team Members. These should be held at least quarterly.
- d. To assure mutual understanding of project progress, problems, corrective action needed, and of the project goals, there should be an annual joint review of the project by the TA Team, representatives from the implementing agencies, USAID and the Contractor (represented by its project coordinator from its headquarters);
- e. Arrangements (agreements) must be made before a project is implemented to assure maintenance of equipment and facilities by the implementing agency after the project is completed. Training for technical staff should be included in training programs.
- f. Project funds should not be used to establish a program that is obviously larger than what the host country can continue to support after the project is completed or to provide salary supplements to individuals which cannot be continued. Short-term gains of this nature usually cause serious long-term problems.
- g. Procurement is best handled by the Prime Contractor who has a direct interest in timely purchases and deliveries.

These are the lessons which the Team believes should apply equally to both the donor agency and the implementing agencies.

PROJECT IDENTIFICATION DATA SHEET

1. Country: Uganda
2. Project Title: Manpower for Agricultural Development
3. Project Number: 617-0103
4. Project Dates:
 - a) Project Agreement Signed with GOU: August 26, 1983
 - b) Final Obligation Date: September 30, 1988
5. Project Funding Obligated to Date:
 - a) Grant Agreement of August 26, 1983 = \$7,500,000.
 - b) Amendment No. 1 to Grant Agreement of February 28, 1984 = \$9,500,000.
 - c) Amendment No. 2 of July 15, 1985 = \$13,100,000.
 - d) Amendment No. 3 of July 28, 1986 = \$9,900,000.
 - e) Host Country Counterpart Funds:
 - 1st Agreement, 8-15-83 = \$3,009,000.
 - 2nd Agreement, 7-28-86 = \$4,709,000.

LIST OF ACRONYMS

AID	Agency for International Development
AO	Agricultural Officer
AAO	Assistant Agricultural Officer
BSc	Bachelor of Science
EI	Experience, Incorporated
FAF	Faculty of Agriculture and Forestry
FSR	Farming Systems Research
IADS	International Agricultural Development Service
IARC	International Agricultural Research Center
KRS	Kawanda Research Station
MA	Ministry of Agriculture
MAF	Ministry of Agriculture and Forestry
MSc	Master of Science
MU	Makerere University
NARO	National Agricultural Research Organization
NRS	Namulonge Research Station
OH	Ohio
OSU	The Ohio State University
PhD	Doctor of Philosophy
PRO	Principal Research Officer
PSA	Procurement Services Agent
RO	Research Officer
SO	Scientific Officer
SAO	Senior Agricultural Officer
SRO	Senior Research Officer
SRS	Serere Research Station
SSO	Soil Survey Officer
SSRO	Soil Survey Research Officer
TA	Technical Assistance
UM	University of Minnesota
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WI	Winrock International
VTC	Variety Testing Center

1. INTRODUCTION

The evaluation of the Uganda Manpower for Agricultural Development Project (617-0103) was carried out in October/November, 1987, by a team of consultants to USAID, Kampala. The Team was composed of two overseas consultants, Dr. William K. Gamble (Team Leader), Dr. J. Duain Moore and two Ugandan consultants, Professor John S. Mugerwa and Mr. P. M. Ofwono. Notes concerning the Team Members may be found in Appendix XIV of this report.

The evaluation was carried out in accordance with the Terms of Reference, which are reproduced in full in Appendix I, provided by the Agricultural Development Officer, USAID, Kampala.

The methodology used by the team was primarily that of Rapid Rural Appraisal but the methodology/review process is set forth in greater detail in Appendix II.

The evaluation of the project was a preliminary requirement for a redesign of the project which will be proposed to be initiated in September, 1988 at the termination of the present project.

2. THE PROJECT

2.1 Goal and Purpose

The overall goal of the project is to assist the Government of Uganda in its recovery program to stimulate small farmer food crop production. In order to achieve this goal, the project's purpose is to assist the GOU to rehabilitate, re-train and redirect its agricultural manpower and institutional capability to food crop research, teaching and production.

2.2 Major Project Components

The Prime Contractor which assumed responsibility for this project was The Ohio State University Research Foundation, Columbus, Ohio, USA. The Prime Contractor entered into sub-contracts for supply of some of the Technical Assistance Personnel. The sub-contractors are the University of Minnesota (UM), Experience, Incorporated (EI) and the International Agricultural Development Service (IADS) which later became Winrock International (WI). The Prime Contractors is responsible for all components of the project except procurement of equipment and supplies. The responsibility for procurement, to a limited extent was assumed by USAID, Kampala, but the main procurement responsibility was given by USAID to a Procurement Services Agency (PSA) in the United States. However the Prime Contractor is responsible for specification of equipment and supplies in accordance with the contract.

The Project has undergone two supplements and one amendment since its initiation but while the components or elements for which the Prime Contractor is responsible have been changed, the

changes are more in magnitude than in purpose. These components or elements, which are discussed in the body of this report, are as given in the final Amendment of March 3, 1987 and include:

- The retraining of agricultural research and teaching staff in the Ministry of Agriculture*(MA) and Makerere University Faculty of Agriculture and Forestry (MU/FAF).
- Assistance to the MA and MU/FAF in the development and implementation of research programs;
- The provision of Technical Assistance Personnel and assuring that they carry out their work in accordance with the Terms of Reference for each;
- Assistance to MU/FAF in the identification and training of "Extension Specialists";
- Assistance to MU/FAF in conducting a minimum of four conferences/seminars and workshops;
- Assistance to MU/FAF in developing medium- to long-term plans for upgrading the Faculty, in assessing the teaching and research program and in helping to develop plans for upgrading the Faculty teaching curriculum;
- Playing a key role in the rehabilitation of the Kabanyolo Farm, and the Kawanda and Serere Research Stations (the latter depending upon the security situation) and re-equipping of project sites;

*Prior to July, 1987 it was the Ministry of Agriculture and Forestry (MAF).

- Assistance to the MA to improve linkages between research and extension and to the MA and MU/FAF to improve research cooperation;
- To prepare and submit work plans and reports to USAID, Kampala, in a timely manner.

2.3 Time Frame for the Project

The Prime Contractor signed the Project Contract on October 22, 1984 with an effective date of September 1, 1984 and an expected completion date of September 30, 1988.

As noted above, the Project has had changes through two Supplements and one Amendment but the time frame has not been changed in spite of a major interruption due to civil war which caused evacuation of project personnel and cessation of project activities for about 10 months. Also, there was considerable destruction and looting during the war which increased the rehabilitation and equipment requirements under the project.

2.4 Institutions Involved in the Project

The Ugandan institutions involved in the project are the Ministry of Agriculture and Makerere University. In the former, the position most involved is the Commissioner for Agriculture with primary involvement of the research division and to a lesser extent the extension division. In the latter, the Faculty of Agric. and Forestry has direct involvement primarily through the Dean. The non-Ugandan institutions are USAID, the Prime Contractor and Sub-Contractors which have been noted above, and the Purchasing Services Agency.

3. THE SETTING

Uganda, as is well known, is highly dependent upon its agricultural sector which accounts for about 60% of the Gross Domestic Product (GDP). The majority, over 90%, of its population of approximately 14 million live in rural areas with most of the working age population directly engaged in agriculture. Uganda is a country of many small farms with the average farm family managing about 2.5 to 3.0 hectares. It is an equatorial country which contains a wide range of soils, rainfall patterns and altitudes which enable it to produce a diversity of crops and livestock. The high and medium potential farming areas have been identified in the Central, Southern and Western Regions and in the Busoga/Bukedi Districts of the Eastern Region. Also, the highly productive Lake Victoria Crescent is a major supplier of food for domestic consumption and agricultural exports. The major staple food crops are banana, sorghum, maize, finger millet, cassava, and sweet potato. Vegetable proteins are mainly provided by beans (Phaseolus), peas, groundnut, and sesame. Other crops of increasing importance, but still of minor importance in the diet, are rice, wheat, soybean and Irish potato. The major agricultural export crops are coffee, cotton, tobacco and tea.

Livestock production includes beef and dairy cattle, sheep and goats, pigs and poultry. Livestock products once formed a major source of income for the agricultural producers, especially in the pastoral communities and had an important place in the diet. However, livestock numbers decreased sharply from nearly 6 million head of cattle in 1974 to a present level of about 3.9 million head due to the ravages of disease, the breakdown of tick and tsetse control and civil disturbances. Due to the short supply of these products, their price has risen about the ability of a great share of the population to purchase

them on a regular basis.

Fisheries is a traditional and important income source of the rural population in the Lake Districts. In the areas near these lakes, fish is an important source of protein in the diet. Unlike a number of other products, the supply of fish has remained fairly stable. The main fish species are Nile Perch and Tilapia species.

Horticultural crops (fruits and vegetables) are important for internal consumption in Uganda and as a source of cash income for producers. The main commodities are amaranthus, capsicum cabbage, tomato, okra, onion, avocado, mango, passion fruit, melon, pineapple and papaya.

Uganda is socially complex with a number of distinct ethnic groups and languages spoken (over 40). English is the official language of the government and is the main common language throughout the country. The majority of the population live in the East, South & Southwest where rainfall and land potential fostered early and continued cash crop production.

During the colonial period (1902-1962) the colonial government had developed Uganda's agriculture toward cash export crops of coffee, cotton and tobacco and had developed two well endowed research facilities at Kawanda and Namulonge. The former for coffee and the latter for cotton. Both of these facilities were managed by British staff and the scientific staff were British. Prior to independence in 1962, Uganda was self-sufficient in basic foodstuffs and this self-reliance continued into the 1970's. The agricultural difficulties of the early 1980's stem from eight years of military misrule (1971-1979), one year of warfare with disrupted agricultural planting (1978-1979), a sustained drought that affected the

northern and eastern half of the country in 1979 and 1980, and lack of agricultural inputs. Recovery was foreseen in the early 1980's but this was cut short due to economic stagnation followed by civil war.

The number of trained and experienced scientists for research and teaching was inadequate at the time of independence. However, up to the mid-1970's good progress was made in manpower training and Uganda developed a reasonable number of well trained staff for agricultural research. Makerere University helped a great deal in this training and has continued to produce graduates every year, but due to the departure of many senior staff persons and lack of financial support it has had great difficulty in maintaining the standards of the early 70's. Starting in the mid-1970's as a result of misrule and other internal problems a number of well trained scientists began leaving the country. The breakup of the East Africa Community in 1977 further exacerbated the situation and seriously affected Uganda's ability to train high quality staff. Analysis of the present situation has revealed that lack of trained manpower has become a major constraint in planning, organization and execution of priority research programs.

The recent Task Force Report "Strengthening of Agricultural Research in Uganda", 31 March 1987, noted the steady decline in research since 1970. The Report noted that while the problems are great and will require a well planned effort, fully supported by donors and the GOU, it is essential to rebuild a strong national agricultural research system and program. This program must have clear priorities and be firmly directed to support increased and cost efficient production and supported by sound policy decisions, equitable pricing of inputs and outputs combined with appropriate processing and marketing systems. The Task Force Report gives the rationale and guidelines for the establishment of a National Agricultural Research Organization

and Board which is in keeping with the experience of productive research organizations in many other countries in Africa and Asia.

Another Task Force Study, "Manpower and Training for Agricultural Development", noted the need to make agricultural training more practical in nature and more attuned to the opportunities, problems and constraints of Ugandan agriculture. The study further noted the need for greater linkage between agricultural education on the one hand and research and extension on the other. The Task Force recommended a review of the present curricula to better fit it to the necessary upgrading of present research staff as well as better preparing new staff. Post-graduate training was noted as essential in a number of key disciplines. In-service training is essential for upgrading of the present research staff and rehabilitation of the MU/FAF is of high priority.

There is a lack of information about agricultural and livestock production and a national census is urgently needed. This is especially important in the face of a number of barter agreements which require payment in agricultural products, some of which are basic food commodities in the national diets.

Agriculture is the primary and almost exclusive source of increased revenue to rebuild Uganda's economy. It must have well qualified manpower, facilities and support to accomplish this task. At present, agricultural research is underfunded, understaffed with well qualified scientists and lacking in essential facilities and equipment. It also is lacking in adequate research program planning and in the setting of priorities.

4. EFFECTIVENESS OF THE PRIME CONTRACTOR & SUB-CONTRACTORS

4.1 In Administering the Training Program

A major activity of this project according to the project paper is to "retrain senior level professionals who will constitute a leadership group responsible for planning and implementing the agricultural research and development program. This leadership group will be composed of staff from MU/FAF and the MA. This project will provide refresher and retraining programs of approximately 3 to 4 months duration. Approximately 42 staff are scheduled for retraining from MU/FAF, 40 from the MA and 5 from the Ministry of Regional Cooperation." According to Supplement No. 2 of July 1986 the funds for training were reduced by one-half and the Amendment of March 1987 reduces the number of participants for training to 53 and the total months of training to 148.

The Ohio State University as the Prime Contractor was in charge of placing the trainees in appropriate institutions and was responsible for the overall administration of the retraining program in the USA, and in the International Agricultural Research Centers (IARCs). The list of participants as of 30 October 1987, is presented in the table in Appendix IV. A summary of the retraining is as follows:

Makerere University, Faculty of Agriculture and Forestry

<u>Department</u>	<u>Number</u>
Agricultural Economics	4
Agricultural Engineering	3
Animal Science	7
Crop Science	6
Forestry	5

<u>Department</u>	<u>Number</u>
Soil Science	6
Dean	1
	<hr/>
Sub-Total	32

<u>Ministry of Agriculture</u>	
<u>Research Stations or Headquarters</u>	<u>Number</u>
Headquarters - Entebbe	7
Kawanda	9
Serere	16
Namulonge	3
	<hr/>
Sub-Total	35
Grand Total	<hr/> 67

Based purely on the number trained it is fair to say that the program was carried out very well. Selection procedures were well established and followed by MA, MU/FAF and OSU. However, there do not appear to have been any members of the extension group among the participants. The majority of the participants, based upon sample discussions, benefited from the program and are grateful for the opportunity they had. This has been particularly important since the large majority of the participants had not had an opportunity for international contacts for many years and had even been cut off from major scientific publications.

Some of the participants have commented that the duration of the exposure, which ranged from three weeks to four months, was too short for a significant impact. Some noted that the inclusion of visits to some developing countries where agriculture is doing well would have been of considerable benefit. Also, while the international contact was always considered

excellent, whatever knowledge and experience gained from the training has had little immediate use, as meaningful application has been negated by lack of adequate and essential facilities at the home institutions of the returning scientists.

Concern was expressed by some about the OSU Office of International Programs seeming, at times, to have organizational difficulties at its headquarters in handling the number of trainees - which resulted in delays in participant arrangements.

It is the conclusion of the Evaluation Team that this part of the project was an essential ingredient at the time and was carried out with reasonable success. Given the large number of first degree holders in the research system the Evaluation Team recommends that future training, with the exception of technicians, be concentrated at the postgraduate level to address the staff needs of a well defined research program. Whenever possible the MSc degree should be taken at MU/FAF. The Evaluation Team recommends that in future training programs, laboratory and maintenance technicians be included.

4.2 In Assisting the Implementing Agents in the Development and Implementation of Research Programs

In accordance with the terms of the project, "the Contractor will assist the University and Ministry in developing annual agricultural research and training programs for the University Farm and the two Ministry stations - Kawanda and Serere. Additionally, the Technical Assistance (TA) team will: (a) guide the implementation of these annual agricultural research and training programs; (b) help the Ministry with the preparation of local currency research grants tied to activities at Kawanda, Serere and Kabanyolo; (d) help with the implementation of the Agricultural Research Grants Program funded by both dollars and local currency which was established to fund research proposals submitted by Ministry and University scientists for research considered important to agricultural production; and (e) ensure that previous (worthy) unanalyzed agricultural research data at the stations is properly analyzed and published and a system is developed to produce annual station reports in the future."

The Evaluation Team considers that the development and implementation of a national agricultural research plan in keeping with Uganda's present and potential financial, physical and staff resources, and its agricultural policy, is of highest priority. It is only within such a plan that there can be appropriate annual agricultural research and training programs and allocation of resources. Such a research plan must also take into account the previous research and production experience in the country and the applicable knowledge from external sources. Such a plan has not been prepared to date and to the Evaluation Team it appears there has been an ad hoc approach to research activities.

It is quite understandable that the formulation of a research

plan has been delayed due to the unstable conditions in the country during much of the life of the project and lack of any reliable data on agricultural and livestock production or research results for many years. Also, the gross inadequacy of research physical facilities, funds for research and a certain apathy of staff due to lack of support has not provided an environment in which planning is inviting. On the other hand, the Evaluation Team wishes to note that in time of crisis of funding and shortages of almost all requirements, planning and the establishment of well defined priorities is even more essential than in times of plenty.

Throughout most of the life of the project there has been great uncertainty about the possibility of working at the Serere Research Station and at present it is not accessible due to security conditions. Therefore, consideration is being given to the role the Namulonge Research Station can have in the project.

The Agricultural Research Advisor has been very active and successful in helping the Ministry and University in the preparation of local currency research grants and activities. These are presented in Appendix XIII. He and other members of the TA team have been successful in implementing the Individual Research Grants Program in the MA and MU/FAF. To date 24 such grants have been approved with 16 from MU/FAF and 8 from the MA. These grants are presented in Appendix VII and examples of grant requests are presented in Appendix VIII.

The Agricultural Research Advisor made a very significant contribution to the Task Force on Agricultural Research in February/March 1987. For some time he has been working to analyze the research data that appears to be useful but had not previously been analyzed. He is also working closely with

the Chief Agricultural Research Officer to produce an annual report for 1986 and to establish a process for timely reports in the future.

It is the conclusion of the Evaluation Team that the Contractor has performed very well on the items concerning agricultural research with the exception of the development of a national plan and the fitting of annual plans to such a plan. Also, the Evaluation Team questions the present and prospective role of the Variety Testing Centers (VTCs) and the District Farm Institutes (DFIs) in the research system. From the sample observed by the Evaluation Team they are poorly managed, will produce very little, if any, useful research information in this season. The research division has little control over these sites, they are costly to reach and it is highly questionable whether the MA will have the resources to operate these as research sites after the project is completed.

Some of the DFIs appear to be ideally located to be used as farms for seed production. The Team strongly recommends a consolidation of the research sites during the next and future seasons to those over which research will have control and which can assure some reasonable cost benefit ratio. It did not appear to the Team that the sub-stations of the main research stations are being used to the extent possible and perhaps they should be considered for greater use, in place of the VTCs.

The gross inadequacy of research facilities, now being corrected to a limited extent at Kawanda and Kabanyolo, still constitute a major mitigating factor against proper and full-fledged execution of a research program. However, as has been previously noted the Contractor and the implementing agencies should accord early attention to the development of a national plan

in keeping with resources and priorities to assure a productive research effort with attendant most efficient use of scarce resources. The Team believes such a plan and the execution of a cost effective and productive research program can best be carried out through a National Agricultural Research Organization (NARO) as was proposed in the Task Force Report on "Strengthening Agricultural Research in Uganda." The present structural and organizational arrangement for agricultural research is not conducive to a productive research and production system.

4.3 In Providing Appropriate Technical Assistance Personnel and Assuring That They Carry Out Their Terms of Reference

The Project included the provision that the Contractor provide TA personnel to assist the implementing agencies in the achievement of the project objectives. The Prime Contractor, if not able to supply all TA personnel could sub-contract for some of the TA but in all cases the appointment of TA personnel had to have the approval of the GOU implementing agencies and USAID, Kampala.

Originally the Contractor was to provide four "experts" to work with Ugandan counterparts at MU/FAF, Kabanyolo Farm and the MA at headquarters and the Kawanda and Serere Research Stations. There were also to be four PVO Volunteers to supervise and train Ugandans in the fields of mechanics, building repairs and construction at the Serere Station and Kabanyolo Farm. However, the recruitment of PVO Volunteers was dropped and approval was given for the recruitment of "Management Assistants" with more experience, practical knowledge, skills and ability.

The original staffing of TA personnel consisted of a Team Leader, an Agricultural Research Advisor/Entebbe, an Agricultural Advisor/

Serere, a Farm Management Specialist/Kabanyolo, an Administrative/Supply Management Officer/Kabanyolo, two Rehabilitation Management Assistants/Serere, & two Rehabilitation Management Assistants/Kabanyolo. The TA personnel and their period of service is presented in Appendix III. Due to the coup d'etat in July, 1985 and subsequent evacuation of TA personnel with uncertainty as to when the project might be resumed, it was decided to terminate the contracts of the Farm Management Specialist/Kabanyolo and one of the Rehabilitation Management Assistants/Serere and cancel the contract of one of the Rehabilitation Management Assistants/Serere who had not yet joined the project.

After the return to Uganda of the TA personnel in 1986, it was possible for the personnel assigned to Serere to be there for only a short period before security conditions forced them to abandon the site.

There followed a period of uncertainty as to whether the two persons would eventually be able to return to Serere, during which time it appears to the Evaluation Team that their services were not effectively utilized by the project. That situation seems to have been further exacerbated by personality differences between the Team Leader and the Agricultural Advisor/Serere and lack of flexible but decisive leadership on the part of the Team Leader.

A decision was reached, after some time of only partial use of his full capabilities, that the Rehabilitation Management Assistant would take up duties at Kawanda where he has been making good progress with the rehabilitation and demonstrating his ability. It is the observation of the Team that the Agricultural Advisor was assigned only minor responsibilities by the Team Leader which did not utilize the potential contribution he could have made to the project. It was only

in the last few months of his assignment that he appears to have been fully and productively utilized.

The Administrative/Supply Management Officer appeared to the Evaluation Team to be very effective in his position as is the Rehabilitation Management Assistant/Kabanyolo. The Rehabilitation Management Assistant now responsible for work at Kawanda, after some loss of time over the uncertainty of posting to Serere, appears to be very effective in managing the rehabilitation work at Kawanda.

It is the conclusion of the Evaluation Team that the OSU TA Personnel have never operated as a project "team". As noted in Chapter 2, the Contractor entered into agreements with three sub-contractors for the recruitment of TA Personnel. They have proceeded as individual units without the leadership and support that should have been given to assure that they are a cohesive unit. This is reflected, to a certain extent, in the view of the Evaluation Team, by the lack of knowledge and understanding of the project in the implementing agencies. However, a certain amount of responsibility for this lack of awareness must rest with the implementing agencies themselves.

It is the view of the Evaluation Team that the Prime Contractor should have been better informed on the difficulties being experienced by the Team Leader and should have taken action itself rather than having action taken by USAID, Kampala. The Team Leader was evidently a very nice person and well qualified in his professional field but did not prove to be the appropriate person for Team Leader in this particular situation.

4.4 In Assisting MU/FAF Identify "Extension Specialists"

The project provides to "retrain one Makerere Faculty staff member from each of the six departments; Agricultural Economics, Agricultural Engineering, Crop Science, Soil Science, Animal Science, and Forestry." The TA Team was to assist the MU/FAF identify personnel for this training. Following training the Contractor was to work with the scientists in preparing publications, conducting in-service training programs, imparting new knowledge to University personnel and students and in working with the MA with their in-service training programs.

The Evaluation Team could find no evidence that the Contractor had taken any action on this part of the project. During a meeting with the Heads of the Departments, a number of those present indicated to the Team that they were not aware of this part of the project. This lack of information to the Departments must be considered a joint failing on the part of the implementing agency and the Contractor.

The MU/FAF has under consideration the establishment of a Department of Agricultural Education and Extension. It is the consensus of the Heads of Department and the Dean that no action should be taken at this time to implement the original proposal to train one staff person from each department in extension. Rather, it is their view that funds allocated for this purpose should be utilized for postgraduate training for persons identified to become staff of the Department of Agricultural Education and Extension. The Evaluation Team believes this to be a sound proposal but does not have sufficient information on which to make a recommendation. It would rather raise the question with the Contractor as to why no action was taken on this part of the project to date.

4.5 In Organizing, Conducting and Reporting Conferences/Seminars and Workshops

The original contract had provision for a maximum of five

conferences, seminars or workshops to be organized by MU/FAF. The Amendment of March 1987 states that "the Contractor will assist the University in conducting a minimum of four conferences, seminars or workshops".

The Evaluation Team found that to date no conference, seminar or workshop has been conducted by the University under the project. One such event is scheduled by the University on the Uganda Pasture Network.

In December, 1986, the Soil Science Society of East Africa organized a conference in Kampala in which members of the MU/FAF and MA staff members participated. Two overseas participants, Drs. W. E. Larson and E. L. Schmidt were funded from the project to participate in this conference and to address the conference participants on "Soil Science and Erosion Control" and "Biological Nitrogen Fixation."

Some consultants to the project have had informal seminars and meeting with groups in their fields of specialization and these are noted in Appendix VI.

The leadership responsibility for coordination in organizing conferences at MU was part of the Terms of Reference of the Project Team Leader. While a part of the failure to organize these conferences, seminars and workshops must lie with the MU/FAF, a similar or greater part of the failure must lie with the Contractor. It is the view of the Evaluation Team that the Contractor should have seized the opportunity provided through funding, for these meetings to further one of its major responsibilities, namely, to facilitate linkages between the MU/FAF, MA and between research and extension. These activities could have been effectively organized to serve this purpose.

4.6 In Providing Additional Assistance to the University

The Contract Agreement states, "The Contractor will help Makerere University to: (a) develop medium- to long-term plans for upgrading the Faculty; (b) assess their teaching and research program; and (c) develop plans for and provide assistance in upgrading the Faculty teach curriculum".

Assistance on these items was assigned to the OSU Team Leader as a part of his Terms of Reference. There is no record in the reports or other documentation that this assistance was provided. There is reference in the USAID Field Project Officer's report of 3/31/87 that these items were planned in the "next 180 days". The next reference to this is in the Field Project Officer's report of June 30, 1987 that the Dean of the Faculty is to visit Ohio State University from 8 August to 28 August. From his program at OSU, it can be seen that he spent five to six days visiting and discussing curriculum and university administration in six departments and with the general administration at OSU.

Since his return from OSU, the Dean has established a Faculty Committee which is working on a review of its curriculum and staff development needs. There does not appear to be any OSU "assistance" involved at this stage of the project.

4.7 In Supporting the Rehabilitation and Acquiring Equipment in Accordance with the Contract

In regard to rehabilitation, the Amendment of March 3, 1987 states, "the Contractor will play a key role in the rehabilitation of Kabanyolo, Kawanda and Serere Research Stations (the latter depends upon the security situation). This will include (a) the identification and listing of commodities needed for

rehabilitation; (b) follow up on the procurement, delivery and receipt of these commodities; (c) establishment of an inventory and control system at all sites; and (d) supervision (as needed) and monitoring of progress at rehabilitation sites. The Contractor will not be responsible for the above commodity procurement although follow up on procurement to ensure timely delivery will be required. The Contractor will work with counterparts identified by MU and MA to: (a) identify vehicle, equipment and material needs that will be provided by the project; (b) prepare detailed lists of these needs and technical specifications; (c) draft procurement documents; (d) follow up on the procurement, delivery, and receipt of these commodities; and (e) ensure proper installation of all equipment and provide or secure the training necessary for operation of the equipment."

The Evaluation Team found that the rehabilitation work at Kabanyolo has proceeded on schedule according to the rehabilitation plan. In addition to the planned rehabilitation activities the Management Assistant has greatly assisted the Farm Manager at Kabanyolo in maintenance work on farm equipment. He has also given much personal attention to do what he can to repair or maintain items which may not have been in the plan but which are essential for the operation of the Kabanyolo Farm.

The Contractor has very satisfactorily carried out its responsibility in regard to the determination of material and equipment needs, the preparation of specifications, ensuring appropriate receipt of the commodities and the establishment of an inventory and control system at all sites.

The security situation at the Serere Station has not permitted rehabilitation work to be carried out so the Management Assistant previously assigned there is now fully engaged in rehabilitation

at Kawanda Station. There is no question that the Management Assistant is doing very good work in the rehabilitation there. However, the guidelines or plan for the scope of the work is not well documented. Hence, the Management Assistant has become involved in an almost limitless task of rehabilitation. The Evaluation Team strongly recommends that the scope of work be clearly defined and made known to the Director of the Station.

A major problem in the rehabilitation work has been and continues to be, labor. With GOU salaries which are very low and for which long delays in payment are almost the norm, the regular employees of the station are often absent from work or when present only remain a few hours. To try to carry out the rehabilitation within the time frame of the project, a system of incentive or supplemental pay has been initiated with the funds coming from local currency provided by USAID for the project. This has partially solved the problem but still has not completely assured work attendance and performance. It is also a practice that under present GOU regulations such pay will not be continued after the project is completed. Further, there seems to be no assurance of funding for maintenance of the buildings or equipment once the project is terminated.

The Evaluation Team will comment further on the purchase of equipment and scientific supplies under the Chapter dealing with the PSA. There have been long delays which have adversely affected project implementation. It is the view of the Team that procurement of all equipment, supplies and commodities should have been a responsibility of the Prime Contractor whose TA team would have been able to make direct follow up for timely procurement and delivery.

While there has been provision of some in-service training through Kabanyolo and Kawanda staff in the assembly and

testing of farm machinery and in building repair and maintenance, there has been no training for the operation of the scientific equipment. It does not appear that funds have been allocated for this type of training.

A final point on rehabilitation and re-equipping, it is the observation of the Evaluation Team that the Contractor has provided good service and met its commitment very well. However, the possibility of GOU funding for further rehabilitation or even maintenance of the presently rehabilitated buildings appears unlikely in the next few years. This issue must be addressed by GOU and USAID and some system of gradual increase of support for maintenance by GOU assured or the total project investment will be lost in a few years.

4.8 In Improving Linkages Between Research and Extension

In the Terms of Reference for Technical Assistance by the Contractor it is noted that "the TA Team will participate in activities which will help develop linkages between research and extension".

It is the view of the Evaluation Team that there has been very little activity specifically directed at improving these linkages. However, the recent consultancy on agricultural extension provided by the Contractor and work carried out by the consultant was a good step in this direction. The Team concludes that the prime responsibility for improvement of these linkages lies with the implementing agencies. Implementation by the GOU of the establishment of NARO and the creation of position of Research/Extension Liaison Officers at the research stations would go a long way to strengthen the desired linkages.

4.9 In Submitting the Required Reports and Work Plans in a Timely Manner

The Evaluation Team, in the sample of work plans and reports, found them to be adequate and apparently submitted in a timely manner. The Team has no additional comment on this item unless USAID, Kampala has some specific issue in regard to the reports which it wishes to bring to the attention of the Team.

5. ADEQUACY OF THE IMPLEMENTING AGENCIES
IN MEETING THEIR COMMITMENTS TO THE PROJECT

In accordance with the project contract the MA and MU/FAF were appointed as the implementing agencies. The implementing agencies were to fulfill certain conditions for proper and effective implementation of the project. These included the appointment of a Chief Agricultural Research Officer (CARO), provision of adequate and secure storage facilities for equipment financed by USAID, upgrading the educational status of the Farm Manager at Kabanyolo Farm, providing housing for the TA Team Members, transfer of the sorghum and millet research unit from the Ministry of Regional Cooperation to the MA, retention of funds accruing from sale of produce by kabanyolo Farm and the rehabilitation plan for the MU/FAF, Serere and Kabanyolo.

The implementing agencies have fulfilled the majority, if not all, of the requirements. Housing has been allocated for the use of the TA Team at the Kabanyolo Farm and in Entebbe and Kampala. The MA has appointed a CARO and a deputy was recently appointed as well. Both are stationed at Entebbe at MA Headquarters, but neither have regularly assigned office space.

Last year the Cabinet approved the transfer of the sorghum and millet research unit to the MA. However, a formal handing over has not been carried out. The rehabilitation plan for the MU/FAF has been completed as well as the plan for Kabanyolo. Storage space for equipment has been allocated which has been made secure through projects funds. It was reported to the Evaluation Team that a separate account for the Kabanyolo Farm has now been established which enables the MU/FAF to retain

funds from sales of produce from the farm for farm operation use.

The basic covenants appear to have been fulfilled by the GOU. The real question that remains is whether there will be sufficient support forthcoming from the GOU to maintain the equipment and facilities which have been provided under the project. Also, whether salary levels can be adjusted for all levels of staff which will permit them to devote full time to thier work rather than having to find additional outside work in order to live. These are issues which must be resolved between USAID and the GOU before an extension of the project is finalized.

6. ADEQUACY OF USAID SUPPORT TO PROJECT IMPLEMENTATION

It is the understanding of the Evaluation Team that the role of USAID in the project, once the agreement with the GOU has been completed and a Contract has been signed for the project to be carried out, is three-fold. That is, (a) to monitor the project to ensure that the project is implemented in accordance with the contract; (b) to maintain continuing contact with the Gou implementing agencies to ensure that there is compliance with commitments and to determine continuing or future aid support (in this context there should be close liaison with the Contractor and its Team Leader); and (c) to arrange for and participate in evaluations of the project and ensure appropriate reporting.

In addition to the above, it is understood that USAID, Kampala was to arrange for and provide adequate housing to be ready for occupancy for the TA Team occupancy on their arrival at post. The Evaluation Team understands that there was considerable delay in the housing arrangements and that considerable time was spent by the TA Team after arrival in organizing and securing their residences.

It appears to the Evaluation Team that USAID, Kampala has adequately carried out its required support to project implementation. However, from discussion held by the Evaluation Team there have been some communication problems with the project staff and the Contractor. It is reported that on occasion the USAID Field Project Officer and the ADO have indicated verbal authorization for certain project activities directly to project staff without going through the Team Leader who represents the Contractor. It is the view of the Evaluation Team that advice or instruction concerning project implementation should always be handled through the Contractor's representative who is the

designated TA Team Leader. Also, there are indications that the USAID office did not convey to the Contractor its dissatisfaction with the performance of the Team Leader at an early date to allow the Contractor to arrange for a timely transfer.

A final point on the subject of USAID - project relationship, the Evaluation Team has noted the recent transfer of \$154,000 from the project (from which line item is not clear to the Evaluation Team) for support of a new Field Project Officer who will have responsibility for USAID's monitoring of this project as well as other duties. The Evaluation Team did not find that this matter had been discussed with the Contractor or the implementing agencies. The Evaluation Team has no doubt but what USAID had authority to make this transfer but it appears to the Evaluation Team that this is another case where there could have been better communication as to the rationale for the transfer.

7. ADEQUACY OF THE PROCUREMENT PROCESS, THE U.S. PSA
IN PARTICULAR

The Evaluation Team received consistent and frequent reports from the TA Team and from authorities in the implementing agencies on the problems with purchasing with the PSA. Long delays are evident in purchasing and delivery of supplies and commodities. Many questions are reported to have been raised over specifications which appear to have been provided in accordance with normal catalog standards. These delays have resulted in a negative impact on the project implementation since chemicals and supplies urgently needed by the implementing agencies have still not arrived.

The Evaluation Team is not in a position to appraise the reasons for the delays in purchasing and delivery but it is the experience of the Team Members that whenever a Contractor has the capability to handle procurement, as in this project, it is most effective to give the responsibility to the Contractor.

It is the conclusion of the Evaluation Team that for whatever reasons, the present PSA arrangement is not working satisfactorily.

8. OVERALL APPRAISAL AND LESSONS LEARNED

8.1 Overall Appraisal

Given the unstable conditions which existed in Uganda during the life of the project, the interruption of the project for about 10 months due to civil war, the constant uncertainty as to whether work could be carried out at Serere and the state of the research and teaching facilities, the Evaluation Team concludes that it was impossible to achieve the level of accomplishment as expected at the beginning of the project. Even so, the Evaluation Team does not find the achievements to date to be up to what they believe possible or what should have been accomplished. While the TA Team and the implementing agencies be given great credit for their tenacity and optimism in meeting and dealing with many extremely difficult and unforeseen problems and conditions, both could have produced more. This is particularly true in the work at the Faculty of Agriculture and Forestry and in the development of agricultural research plans in the MA.

The Evaluation Team has attempted to address the question as to whether the Contractor carried out its responsibilities in a highly professional manner. Performance must be measured on at least two points. First, how well did the TA Team that the Contractor selected perform in the field. And second, how well was the project backstopped from its headquarters. On the first point, it appears that the TA Team Leader, though a highly competent individual in his professional field, was not an appropriate choice to represent the Contractor in the field and provide the leadership for the project. Still on the first point, the TA Team did not work as a "team". This had

its negative impact on the project by not presenting a team approach which would make the project more widely known inside and outside the implementing agencies with subsequent greater support. (Here, it must be noted that the implementing agencies did little to "spread the word" among their own staff about the scope and content of the project). Otherwise, given the conditions under which they worked and the recurring uncertainty of security, the TA Team has performed very well. There is no doubt, in the opinion of the Evaluation Team, that with better team leadership that all would have performed better. In regard to backstopping, this does not appear to be outstanding. The Contractor, in the view of the Evaluation Team must be faulted for not being better informed on the Team Leader's performance in the field and for not taking corrective action. Also, it does not appear that the Contractor kept itself advised as to whether all aspects of the project were being implemented or provided guidance to field staff on these matters.

The individual items for which the Prime Contractor had responsibility which reflect the overall appraisal have been discussed in Chapter 4. There it was noted that: (a) the training was carried out satisfactorily in accordance with the terms of reference; (b) considerable work was carried out in regard to the research program, data analysis, preparation of projects for local currency funding, arranging for appropriate consultancies for commodity research and extension planning and in organizing for an annual and subsequent reports, but the critical issue of the development of a national research plan has not yet been addressed nor does the "research" being carried out on the VTCs appear to be well monitored and conducted; (c) there has been no activity noted either by the Contractor or the implementing agency on the selection and training of "extension specialists" in the MU/FAF, (d) very little activity by the Contractor or the implementing agencies on conferences, seminars

and workshops; and (e) except for a visit to OSU by the Dean, there has been no "additional assistance" to the university on curricula or staff development plans; (f) there is little evidence of effective action by either the Contractor or the implementing agencies in strengthening linkages; and (g) the rehabilitation work is proceeding well in the face of serious labor problems due to lack of support by the implementing agencies for adequate salaries for the labor (and scientific) force to assure consistent work attendance and performance.

On balance, the Evaluation Team, while recognizing the many difficulties encountered in the project, unforeseen at the time of implementation, finds the overall performance of the project less than what might have been accomplished if it had strong leadership both in the field and from the Contractor.

8.2 Lessons Learned

A number of lessons should be learned from the project to date. Among these are;

- a. A reaffirmation of the absolute requirement for excellent "team" leadership and for early corrective action if indicated;
- b. There is a need to make certain that information concerning the content and scope of a project is well known by all key individuals in the implementing agencies;
- c. In order to achieve (b) above, the Evaluation Team suggests that in addition to the TA Team meetings which are usually held on a regular basis, there should

be regular joint meetings attended by key individuals (decision makers not just counterparts) and the TA Team Members. These should be held at least quarterly.

- d. To assure mutual understanding of project progress, problems, corrective action needed, and project goals, there should be annual joint reviews of the project by the TA Team, representatives from the implementing agencies, USAID and the Contractor (represented by its project coordinator from headquarters);
- e. Arrangements (agreements) must be made before a project is implemented to assure maintenance of equipment and facilities by the implementing agency after the project is completed. Training for technical staff should be included in training programs.
- f. Project funds should not be used to establish a program that is obviously larger than what the host country can continue to support after the project is completed or to provide salary supplements to individuals which cannot be continued. Short-term gains of this nature usually cause serious long-term problems.
- g. Procurement is best handled by the Prime Contractor who has a direct interest in timely purchases and delivery.

These are lessons which the Team believe should apply equally to the donor agency and the implementing agency.

APPENDIX I

TERMS OF REFERENCE FOR PROJECT EVALUATION
UGANDA MANPOWER FOR AGRICULTURAL DEVELOPMENT
(617-0103)

The Project

The overall goal of the project is to assist the Government of Uganda in its recovery program to stimulate small farmer food crop production. In order to achieve this goal the project's purpose is to assist the Government of Uganda to rehabilitate, retrain and redirect its agricultural manpower and institutional capability to food crop research, teaching and production.

Evaluation Components

1. Adequacy or effectiveness of the Prime Contract in:
 - (a) fulfilling the Terms of Reference as specified in Contract Amendment of 3/18/87 - Article 1, Section, C. 1 (see amendment for details);
 - (b) administering the training program (Article 1, Section C. 2);
 - (c) assisting the implementing agents in the development and implementation of programs for the MA research stations and Variety Testing Centers, Makerere's Kabanyolo University Farm as well as the MU/FAF. (Article 1, Section C. 1,3,4,5 and 8;
 - (d) in supporting the rehabilitation and equipping of the two MA research stations and Makerere's Kabanyolo Farm. (Article 1, Section F);
 - (e) in submitting required reports and work plans in a timely manner (Article 1, Section F);
2. Adequacy of USAID support to project implementation.

3. Adequacy of procurement process, the U.S. PSA in particular, in fulfilling procurements in a timely and satisfactory manner.
4. Statement of overall appraisal of project and level of achievements.

Outputs

- a. retrained staff;
- b. rehabilitated and re-equipped research facilities
- c. rehabilitated and re-equipped teaching and office facilities;
- d. development of food crop research strategy and implementation plan; and
- e. a research system with established linkages to extension activities.

APPENDIX II

METHODOLOGY

The Methodology used was: extensive review of background documentation and reports; rapid rural appraisal type interviews carried out with a wide range of policymakers, scientists, administrators, trainee participants, technical assistance personnel, and faculty members. The Evaluation Team Members also drew on their extensive collective knowledge of Uganda and their experience with similar projects in determining performance by comparison of expected outputs and actual achievements.

APPENDIX III

Table 1. Staff list.

<u>Name/Title</u>	<u>Arrival IN Uganda</u>	<u>Departed</u>	<u>ETD</u>
Dr. John L. Parsons Team Lead/Faculty Advisor/MU	Dec.5,'84	Jul.'87	
Dr. William E. Fenster Agric. Research Advisor/ Entebbe	Feb.23,'85		Sept.'88
Dr. John Trierweiler Agric. Advisor/Serere	May 8,'85	Oct.'87	
James Jacks Farm Management Specialist/Kabanyolo	May 14,'85	Aug.'85	
James G. Boyd Admin./Supply Management Officer/Kabanyolo	Sept.5,'84		April '88
Jeff Neilsen Rehab. Assistant/Serere	Nov.12,'84	Aug.'85	
Ted Lane Rehab. Management/Kawanda	Apr.27,'85		June '88
Lavern Raaum Rehab. Management/ Kabanyolo	June 15,'85		June '88
Dr. Trevor Arscott Team Leader/Faculty Advisor/MU	Sept.30,'87*		Sept. '88
Dr. Charles Simkins Agricultural Advisor	ETA Oct.'87		Sept.'88

*5 weeks

Table 2. FACULTY AND STAFF OF MAKERERE UNIVERSITY AND THE MINISTRY OF AGRICULTURE
WHO HAVE PARTICIPATED IN THE RETRAINING PROGRAM OF THE
MANPOWER FOR AGRICULTURAL DEVELOPMENT PROGRAM

Name	Home Institute and Title	Training Location	Training Emphasis	1984 Departure Date		Program Length (Wks)
				Uganda	USA	
Mwaule, Y.W.	Serere R.S. Director	USDA OSU/Wooster	Mgt. of Exp. Station Designing Field Experiments	July 84	Sept. 84	14
Ddungu, J.	MU/Professor	Monterrey, Calif.	Handling of Veg. Crops	July 84	Aug. 84	4
Okello, J.	SRS/SRO	OSU	Agronomy, Exp. Design	June 84	Aug. 84	12

Name	Home Institute and Title	Training Location	Training Emphasis	1985		Program Length (Wks)
				Departure Date Uganda	USA	
Nangoti, N.	Serere R.S. SO	OARDC, Wooster, OH OSU	Soil sampling and analy. and soil fertility	Apr.19	Aug. 26	18
Zake, J.	MU/Chr. Soil Science	IFDC OSU	Dev. of Indigenous Phosphate Deposits Lab and Lit. Review	May 15	Aug. 26	14
Mafulira, T.	Serere R.S. Biometrician	U. of Missouri U. of Minnesota	Ag. Research Methodology USDA TC 110-17 Intensive training in use of personal computer	May 26	Sept. 2	14
Nyakoojo, F.	MA, SAO Statistics	New Mexico State University Western Illinois University	Estab. data base and analytical systems for economic decision making Intensive training in use of personal computer	May 15	Aug. 17	17
Ruyooka, D.	MU/Chr. Forestry	U. of Arizona	Resource dev. of water- shed lands, Forestry in arid environments, Mycological methodology	Jun. 5	Nov. 4	22
Mwoga, V.	Serere R.S. SSO	Auburn University Western Illinois University	Soil testing & fertilizer management USDA TC 120-5 Keys to ag. dev. at the local level	Jun. 5	Sept. 2	13

Name	Home Institute and Title	Training Location	Training Emphasis	1985		Program Length (Wks)
				Departure Date Uganda	USA	
Magunda, M.	Namulonge R.S. SO/Agric. Res.	Colorado State University OSU	Irrigation problems and practice, USDA TC 120-1 Drainage problems	Jun. 9	Sept. 2	12
Owera, S.	MU/Lecturer, Crop Science	U. of Calif. (Riverside UC Davis)	Breeding disease resistance in edible beans	Jun. 16	Oct. 29	19
Fendru, I.	MU/Lecturer, Ag. Econ.	Mich. State University	Survey research, Pro- duction economics	Jun. 19	Oct. 14	17
Acidria, M.	Serere R.S. SO	Rutgers U. OSU	Vegetable crop prod. and mktg. Varietal testing USDA TC 130-11	Jun. 23	Sept. 16	12
Bareeba, F.	MU/Lecturer, Animal Science	Virginia Polytech	Re-use of protein from waste materials in animal rations	Jul. 3	Nov. 9	19
Wamajje, D.	Serere R.S. Food Tech.	OARDC, Wooster OH Perdue University	Bread baking technology	Jul. 7	Sept. 30	12
Ziwa, E.	MU/Lecturer, Ag. Econ.	OSU U. of Wisconsin	Cooperative Development	Jul. 20	Sept. 23	9
Kibalama	MU/Lecturer, Ag. Engineering	U. of Nebraska	Animal powered tillage	Jul. 20	Dec. 9	20
Kasisira, L.	MU/Lecturer, Ag. Engineering	U. of Nebraska	Tractor testing and equipment design	Jul. 20	Dec. 9	20

Name	Home Institute and Title	Training Location	Training Emphasis	1985		Program Length (Wks)
				Departure Date Uganda	USA	
Okurut-Akol, H.	Serere R.S. SO	Denver Wildlife Research Station	Bird pest control	Jul. 21	Oct. 28	14
		Sandusky Wildlife Research Station	Bird pest control			
Kiggundu, M.	Kawanda R.S. Director	George Mason U.	Management of Ag. Res. USDA TC 140-24	Jul. 24	Nov. 8	15
		U. of Minnesota	Soils analysis			
Dradu, E.	Namulonge R.S. Director	George Mason U.	Management of Ag. Res. USDA TC 140-24	Jul. 24	Oct. 21	13
		Texas A&M U.	Cotton production			

Name	Home Institute and Title	Training Location	Training Emphasis	1986 Departure Date		Program Length (Wks)
				Uganda	USA	
Msemakweli, L.	MU/Sr. Lecturer Ag. Econ.	Michigan State	Data collection, data management	Jun. 13	Aug. 30	11
Epila-Otara, J.	MU/Lecturer Forestry	OSU	Wildlife management and Ecology, feeding habits of sap sucking insects	Jul. 9	Sept. 11	11
Sakira, W.	Kawanda R.S. Acting Dir. of Res.	USDA U. of Minnesota OSU	Ag. Res. Stat. Mgmt. Weed research and spraying techniques	Jul. 23	Oct. 15	12
Kintukwonka, A.	Namulonge R.S. SSRO	USDA U. of Minnesota OSU	Mgmt. of Ag. Res. Soil testing Soil fertility res.	Jul. 23	Oct. 15	12
Bafokuzara, N.	Kawanda R.S. RO	USDA OSU	Plant quarantine Crop loss assess. Plant pest mgmt. tech.	Aug. 6	Oct. 15	10
Kibirige- Sebunya, I.	Kawanda R.S. and MU, Sr. Res. Scientist	Florida State Manhattan, KA	FSR techniques Multiple cropping techniques	Aug. 6	Oct. 15	10
Kakusya, G.	MU/Lecturer Animal Sci.	Texas A & M	Reproductive endocrinology in the goat	Aug. 20	Oct. 18	8
Ssendiwanyo, E.	Kawanda R.S. Soil Survey Officer/Pedologist	OSU	Pedology & soil survey	Sept. 3	Dec. 10	14

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Name	Home Institute and Title	Training Location	Training Emphasis	1986		Program Length (Wks)
				Departure Uganda	Date USA	
Akou, A.	Serere R.S. AO/Ox Cult. Div.	Agric. Tech. Inst. LSMOCO (Nev.)	Draft animal tech. Draft animal machine design	Sept. 10	Nov. 22	10
Odogola, W.	Serere R.S. Res./Ag. Eng.	Michigan State U. of Minnesota	Solar drying and harvesting tech.	Sept. 10	Dec. 3	12
Tumuhairwe, J.	MU/Lecturer Soil Science	OSU	Soil survey and class. Soil Mgmt. & Conserv.	Oct. 1	Dec. 10	10
Muduuli, D.	MU/Lecturer Soil Science	OSU	Food science/tech.	Oct. 1	Dec. 10	10
Sabiiti, E.	MU/Lecturer Crop Science & Pasture Agron.	OSU U. of Florida Tall Timbers Res.	Pasture legume Research and Dev.	Oct. 1	Dec. 10	10
Uma, I.	MU/Sr. Lecturer Soil Science	OSU	Soil and Water Conserv.	Aug. 8	Sept. 2	3½
Munyabuntu, C.	MU/Lecturer Animal Sci.	U. of Georgia	Mineral and vit. metabolism in ruminants	Oct. 8	Nov. 29	6

Name	Home Institute and Title	Training Location	Training Emphasis	1987		Program Length (Wks)
				Departure Uganda	Date USA	
Ekwamu, A.	MU/Lecturer Crop Science	OSU Texas A & M	Plant Pathology Cereal Pathology	Jan. 1	Mar. 20	12
Banana, A.	MU/Lecturer Forestry	OSU	Sawmilling Forest products	Jan. 14	Mar. 28	8
Adupa, R.	MU/Lecturer Crop Science	OSU U. of Wisconsin	Biometrics Computer use	Jan. 14	May 14	8
Ameny, M.	MU/Lecturer Soil Science	OSU U. of Minnesota CIAT	Biochemistry Cassava	Apr. 8	May 20	8
Byaruhanga, K.	MU/Sr. Lecturer Acting Head For.	OSU	Soil fertility, forestry, nursery mgt.	Apr. 8	May 22	6
Ochwoh, V.	MU/Lecturer, Res. Soil Science	OSU	Soil and water mgnt.	Apr. 8	Jul. 10	9
Rubaihayo, P.	MU/Lecturer, Res. Crop Science	OSU Illinois	Plant breeding	Apr. 15	Jul. 12	8
Olaboro, G.	MU/Lecturer Animal Sci.	OSU	Poultry management	Apr. 8	Jun. 15	8
Anyii, C.	Serere R.S. Agronomist	OSU CIAT	Pasture agronomy	Apr. 8	Aug. 5	12
Esele, J.	Serere R.S. Researcher	OSU U. of Minnesota	Plant Pathology	Apr. 8	Aug. 14	12
Nabasirye, M.	Kawanda R.S. SO	OSU USDA	Res. Methodology Biometrics	May 24	Aug. 14	12

Name	Home Institute and Title	Training Location	Training Emphasis	1987		Program Length (Wks)
				Departure Uganda	Date USA	
Isabirye- Balaba, M.	Masindi Seed Project	OSU USDA	Seed improvement	May 24	Aug.14	12
Iputo, G.	Serere R.S. SAAO	OSU USDA	Seed improvement	May 24	Aug.20	12
Namaganda, J.	Kawanda R.S. SO	OSU, USDA U. of Florida	Pest management	May 29	Aug.14	12
Wabire, L.	MU/Sr. Lecturer Ag. Econ.	OSU, USDA	Marketing	May 29	Aug.14	12
Koma-Alimu, F.	Serere R.S. RO	OSU, USDA Purdue University	Soil testing & fertilizer mgnt.	Jun. 5	Sept.16	12
Ojacor, F.	MA/Entebbe Dep.Comm.Ag.	OSU, USDA U. of Minnesota	Ag. Policy Extension Admin.	Jun. 5	Sept.10	12
Kavuma, J.	Kawanda R.S. SRO	OSU, USDA, IFDC	Soil testing & Fertilizer mgnt.	Jun. 5	Sept.15	14
Okello-Uma, I.	MU/Assoc. Prof. Animal Sci.	OSU USDA	Dairy Production Res. Admin.	Jun. 12	Sept. 4	8
Rubaihayo, E.	Kawanda R.S. Dir. KRS	OSU U. of Minnesota USDA	Maize breeding Res. Admin.	Jun. 21	Sept.11	12
Kiwuwa, G.	MU/Prof. Animal Sci.	OSU USDA	Dairy herd mgnt. Res. Admin.	Jun. 21	Aug. 19	12
Waibale, J.	MA/Entebbe	OSU, USDA U. of Minnesota	Res. Admin.	Jun. 21	Aug. 19	8

Name	Home Institute and Title	Training Location	Training Emphasis	1987		Program Length (Wks)
				Departure Uganda	Date USA	
Silver, M.	MU/Lecturer Soil Science	OSU	Soil microbiology Nitrogen Fixation	Jun. 21	Sept. 25	12
Ssali, C.	Namalere R.S. AO/Soil Surv.	OSU U. of Minnesota	Soil taxonomy Soil survey, land use	Jun. 28	Nov	12
Nyamwegyendaho, A.	MA/Entebbe Asst. Comm./Trng.	OSU U. of Minnesota	Training Ag. & rural Dev.	Aug. 1	Oct. 16	12
Bua, A.	Serere R.S. Oil Crop Agron.	U. of Minnesota	Oil seed crops	Jul. 17	Oct. 7	8
Emeetai-Areke, T.	Serere R.S.	ICRISAT	Breeding, pigeon pea, cowpea	Aug. 22	Went for MSc, England	1
Okuni, A.	Serere R.S. SO, Ox Cult.	OSU	Drafting and mechanics	Aug. 22	Nov.	8
Gombya- Sembajjwe, W.	MU/Lecturer Forestry	U. of Mass.	Forest econ. Forest resource dev.	Sept. 2	Dec.	12
Nanziri, S.	MA/Entebbe AAO	IITA	Maize Res. and Prod.	Oct. 9		12
Mugerwa, J.	MU/Dean of Ag.	OSU	Admin. Curr. and Faculty Development	Aug. 8	Aug. 29	3

APPENDIX V

EXAMPLES OF TRAINEES REPORTS

0231.15.164 Department of Soil Science 24 August 1987

The Vice-Chancellor,
Makerere University

Dear Professor Kirya,

REPORT ON OSU-USAID-UGANDA MFAD
SPECIAL TRAINING PROGRAM

I am pleased to report that I successfully participated in the above program from 8th April 1987 to 10th July 1987. The program provided me with a mixture of academic and practical experience, field observations and close association with scientists in my fields of interest.

During the first eight weeks I participated in Academic Courses (1) Advanced Soil Chemistry (Agron. 762), (2) Advanced Soil Biochemistry (Agron. 760). During this time I also had very useful discussions with (1) Prof. Arscott on tropical soils, soil acidity, liming and soil phosphorus availability, (2) Prof. Logan on soil fertility and soil phosphates, (3) Prof. Calhoun on soil phosphate fractionations and soil testing in relation to crop needs/yields, (4) Prof. Himen on teaching of soil science to undergraduate students.

After the Spring Quarter, I went on a two weeks tour of the southern states of Alabama and Georgia. While in Alabama my interests were mainly centered at (1) International Fertilizer Development Center (IFDC), and (2) Tennessee Valley Authority (TVA)- NFDC (National Fertilizer Development Center) both situated at Muscle Shoals. Here I met and had fruitful discussions with various scientists involved in the development of various fertilizer materials (i.e. urea, phosphates, and sulphur). Here, I also got several publications on the work they have done so far. I intend to make the lists available to members of the Soil Science Department so that we may all benefit from these publications.

While in Georgia, I visited (1) Fort Valley State College. Here I saw soil erosion control projects on small farms and Rural Integrated Development Projects. (2) Georgia Coastal Plain Experimental Station at Tifton, belonging to the University

of Georgia at Athens. Here I observed experiments on mainly tropical crops - groundnuts, tobacco, cotton, pearl millet, and some horticultural crops.

During the remaining weeks, I visited a) Watershed Management Experiments at Ooshoeton, Ohio, b) Ohio Agricultural Research and Development Center (OARDC) at Wooster and c) attended an American Society of Agronomy (ASA) North Central Branch meeting at Ames, Iowa.

I would like to register my sincere thanks to the OSU-USAID Team for the excellent arrangements they made for me while I was at Ohio State University. I am also grateful to you for having given me the permission to leave the University.

Yours sincerely,

Victor A. Ochwoh,
Senior Lecturer/Dept. of Soil Science
Makerere University, Kampala

Department of Agriculture
Namulonge Research Station
P.O. Box 7084
Kampala, Uganda

Ref:11/2(b)

21 November, 1986

Commissioner for Agriculture
P.O. Box 2,
Entebbe

REPORT ON TRAINING COURSE TC 140-24
MANAGEMENT OF AGRICULTURAL RESEARCH
July 28 - September 5, 1986

I had the honour to attend the above course held at George Mason University, Metro Campus, Arlington, Virginia near Washington D.C. This course was organized by the U.S. Dept. of Agriculture cooperating with USAID and other organizations. Fifteen participants from ten countries from Africa, the Middle East and Asia attended the course.

The main topics covered in the course included: the research environment, the role of agricultural research in the national society and economy, defining research needs and priorities, development of a comprehensive and integrated research plan, effective use of resources, management of scientific and research staff, and finally use of research results. In these topics five main objectives were covered:

1. To understand the unique context in which agricultural research management occurs.
2. Identify and prioritize research programmes and projects.
3. Maximize the effectiveness of existing personnel, funds, and facilities.
4. Identify opportunities and methods for intensifying and expanding research efforts and
5. Plan and implement more effective coordination with extension and farmers for setting research objectives and disseminating research results.

The above objectives were fully fulfilled in this course which was well organized and conducted. The course was organized

short introductions in lectures and the topics were fully discussed in small group discussions. There was a lot of interaction with groups and in my opinion was the best method of learning. The other methods of learning were by use of video tapes covered on certain topics and case studies. During the course we also had to list what our expectations about the course were and these happened not to differ much.

In the course we were introduced to ten responsibilities which any Research Director is involved in. These responsibilities are:

1. Determining research needs
2. Establishing priorities
3. Planning research programmes through time
4. Budgeting and financial management
5. Evaluating research programmes
6. Organising to carry out the programme
7. Providing leadership and motivation
8. Delegating components of the programme
9. Performance appraisals
10. Communicating research results

The ten responsibilities were each covered in detail and during our visits to universities and research stations we discussed fully how these responsibilities were being organized at the research stations. By discussions in groups which composed members from different countries these responsibilities were examined in detail how they are fulfilled. I briefly touch each responsibility in turn:

1. Determining Research Needs

Each institution has to identify researchable problems. The research programmes (projects) must then be designed to directly answer farmers problems. Industries (companies) should also be involved in determining research needs. The Extension Agents have to make contacts with farmers in order to identify researchable problems.

The researchers themselves have to visit farmers and identify the problems and the farmers themselves have to bring information to either researchers or extension agents. Researchable problems could be identified through Research-Extension Review Meetings and Research Station Open Days for farmers. This has not been possible in our case because of logistics i.e. lack of transport, facilities etc.

2. Establishing Priorities

There are a number of criteria used in establishing research priorities among which are: 1. demand from farmers, 2. demands from processors, 3. national demand e.g. food and fibre, 4. national crises, 5. market quality demands, 6. price factors, 7. foreign exchange requirements, 8. manpower resources of the

country etc.

3. Planning Research Programmes Through Time

Planning is part of management and by far this is the most important aspect of research management. In planning research programmes one ought to gain an understanding of the relationship between national agricultural policy and agricultural research. Many national policies of the various countries which participated in this course were examined and many of these policies included the following:

1. Self sufficiency in food
2. Increasing production of export oriented products
3. Emphasis on diversified agriculture
4. Use of improved technology for maximizing crop yields
5. Establishment of agro-based inputs
6. Improvement of agricultural marketing systems
7. Proper use of land e.g. soil and water conservation and land reclamation

All the research programmes should have a bearing on national agricultural policy of the country and the national development plan. Some of the constraints to agricultural production have also to be examined. Planning with network analysis was examined.

4. Budgeting and Financial Management

There are two ways of budgeting:

1. System of precedence - Line Item Budget
2. PPB system where all proposals have to be justified

5. Evaluating Research Programmes

Review of the research programmes every year is essential by peer review committee and by department heads at shorter intervals.

6. Organizing To Carry Out Programme

Programme leader has to organize to carry out the programme and individual scientists implement the programme (sub-programmes). Monthly meeting to review work programme is essential.

7. Providing Leadership and Motivation

Leadership is usually by consensus. Older staff usually difficult to manage, motivate and convince. Some benefits such as credit, monetary benefits are important in motivating staff. Promotion i.e. moving rapidly up the system is another way of reward of work and hence motivation. In this topic we covered things that really motivate (motivators). These give real satisfaction on the job such as if the job gives one the following:

achievement, responsibility, discretion and opportunity for learning and growth. The other things which motivate are grouped as maintainers. Maintainers usually stop dissatisfaction and are necessary but not sufficient to give stimulus to our employees the necessary motivation. Examples of maintainers are: benefits, working conditions, salary and job security.

These are some of the helpful techniques in motivating staff:

1. To take time talking to employees
2. To find ways to make their jobs more interesting
3. To offer more challenging and interesting assignments
4. To praise employees for work well done
5. To show interest in and respect for employees
6. To provide opportunities for teaching and personal growth
7. To explain the importance of each job
8. To encourage friendly group atmosphere
9. To develop clear and reasonable goals for employees etc.

8. Delegating Components of the Programme

Delegation is a very important aspect of management. Any manager cannot do everything for himself hence it is important to delegate some of the responsibilities to subordinates. Having delegated it is important to follow up and require accountability of what has been delegated. Whatever responsibility has been assigned to a subordinate it should be very clear what the job is and what result is expected.

9. Performance Appraisals

Performance appraisal should help an employee to know his/her strengths and weaknesses - hence where to improve. It can also help an employee to get a higher salary.

On the management side it helps the manager to know where a person would be most suited, 1) to plan training or retraining, 2) to assess total human resource potential of an organization, 3) to differentiate between best worker and average work. However some problems are envisaged in government system. These are:

1. It is difficult to rate an employee low.
2. It is difficult to measure research results because not all results are positive.
3. Sometimes ratings are changed at top management levels.

10. Communicating Research Results

It is useless to carry out any research if the results will not reach the client (farmer). The objective of agricultural research is to satisfy farmers needs hence there must be linkages between the farmer and the researcher. These linkages are very well known and these are the most important ways of communicating

research results to the farmers: 1) Through mass media (Radio and TV), 2) Research bulletins, technical and non-technical and 3) through field days at the research stations.

Apart from the ten management issues already discussed we were introduced to the International Research Network and each participant had to prepare and present projects for external funding.

Comments on the Overall Organization of the Course

On the whole the course was very well organized and training methods were novel and effective. There was a lot of interaction in small groups and we learnt quite a lot from each other. This method of learning is highly commended. The presentations and discussions by instructors were on the whole good. We also had a very good learning environment and the atmosphere was conducive to learning e.g. use of visual aids and case studies and simulation models.

We had opportunity to visit a number of research (experimental) stations and the field trips were practical - able to tie in with what we had learnt in the class. We also visited donor agencies and had to learn of what to do when one requires external funding. We were exposed to very many funding agencies which are willing to finance projects and programmes. Finally the sessions were open, relaxed and there was a lot of participation from the group.

However, I wish now to comment on some of the weaknesses of this training course - I felt like many participants that the course should be shortened to 5 weeks since all this material could be covered in that time. It is important to get prior information on participants in order to meet specific needs. There was little formal introduction to some topics before we broke into small groups and this made our discussions very difficult as we were not very well introduced to new topics. Some instructors assumed that the participants knew the topics when actually they didn't (e.g. management issues like motivation, delegation etc.).

The case studies included very little information outside of Latin America. Some of the case studies should have included examples of African and Asian studies since most of the participants were from these two continents. Also very little time was given in preparing research proposals and in studying topics such as budgeting and planning with networking. Finally additional topics could be included in the course such as creativity and idea generation, interpersonal behaviour, conflict resolution, self motivation, introduction to speed reading and time management.

What I Have Learnt During the Course

I have learnt very many ideas which I should apply to fit my own

situation. Some of these ideas are:

1. To change my working (management) style and use first opportunity to apply ideas.
2. Review and revise research priorities with part of staff and prepare short and long term plans.
3. Have to relate budget to projects and the goals have to be clearly stated.
4. Try to obtain funding for projects from different sources and follow up with agencies.
5. Will try to develop network plan for each project.
6. Exchange ideas with peers and have frequent communications.
7. Encourage officers to prepare research proposals in more detail and give major emphasis in their proposals and finally encourage information dissemination and highly commend commodity research on very important commodities just as what is being done in most countries. Of the ten countries that participated in this course only Uganda was carrying out research on disciplinary lines, all the others have moved to commodity research. The above can only be fulfilled with adequate funding and facilities.

In conclusion I wish to say that I benefited quite a lot from the course and it generated many ideas. I take this opportunity to thank USAID and for having sponsored me on this course.

A.F. Kintukwonka
Ag. Director,
Namulonge Research Station

The Commissioner for Agriculture
P.O. Box 2
Entebbe

The Chief Agricultural Research Officer
P.O. Box 2
Entebbe

The Director,
Kawanda

The Head of Soil Science,
Kawanda

A REPORT ON SPECIAL TRAINING IN SOIL SURVEY
AND LAND USE COURSES AT THE UNIVERSITY OF MINNESOTA AND
AT OHIO STATE UNIVERSITY, USA

(Eriabu V. Ssendiwayo - Scientific Officer/Pedology
Kawanda Research Station).

This training was sponsored by USAID/Uganda Manpower for Agricultural Development through Ohio State University.

I arrived at Ohio State University on September 4, 1986 and started my training programme immediately which was as follows:

1. 4 Sept.- General Orientation at OSU.
2. 8-26 Sept. - University of Minnesota
3. 26 Sept.-30 Nov. Pedology, Soil Survey Interpretation, Field Reviews and Land Use Course, Agro-Climatology Course and Tropical and Sub-Tropical Soils Course at OSU.
4. 30 Nov.-5 Dec. ASA Meetings, New Orleans.

At the University of Minnesota I was handed to Professor Dick Rust who is in charge of the Soil Survey Programmes. He worked out my training programme there. During the period of Sept. 9-18, I was stationed with one of their Field Survey Teams in Marshall County, Minnesota (City of Warren) where I was introduced to their field procedures. Much emphasis was given on the following:

1. The use and importance they attach to aerial photography.
2. The equipment they use.
3. The kinds of data they collect.
4. How they drive or establish a new soil concept (series).
5. The interpretations they develop.
6. How they deliver the information through District Conservation

Service Office, Extension etc.

7. Training of their Field Scientists.

I also took part in the Field Survey and Mapping.

For the period of September 19-26, I visited various laboratories and facilities in the Soil Science Department where Professor Rust explained and briefed me on the equipments and the procedures of using them, plus the methods they use for laboratory soil characterisation.

I also visited the cartographic facilities of their Cooperating Agency, and the USDA Soil Conservation Service. On Sept. 23, I accompanied Prof. Rust to Winona County, Minnesota to witness the occasion of the completion of the Soil Survey and to acquaint me with local agencies and individuals who use the information gathered in the course of the survey.

26 Sept. - 30 Nov. At Ohio State University.

During this period, I attended the following courses:

1. Use of soil information and maps as resource inventories (Instructor Dr. Gerald W. Olson).

This course covered Principles, Practices and Research techniques in interpreting soil information and maps for planning, developing, and using areas of land.

Methods of describing soil properties and using soil descriptions to help solve practical problems of land use and environmental improvement. Principles of soil classification for interpretations, capability, suitability, limitations, and potential groupings of soils.

Interdisciplinary comparisons and correlations of soil maps. Alternative uses of soils in the rural-suburban-urban transition areas. Procuring soil information and using it in development projects. work on actual soils consultant situations. Practice in assembling, presenting, and writing interpretive soils information, legislative use of soils.

2. Agroclimatology (Instructor Prof. Paul Henderlong).

This course covered a study of the radiation regime of the atmosphere in relation to the thermal and water regimes of soils and their inter-relationships in crop production.

3. Tropical and Sub-Tropical Soils. (Instructor Dr. Trevor Arscott).

This course covered a study of the physical, chemical, and biological properties and fertilization, physical and water management of tropical and sub-tropical soils; crop adaptation, plantation and subsistence farming.

While taking these courses I joined a team of Soil Scientists from OSU, Soil Conservation Service and District Soil and Water

Conservation to carry out Field Reviews for Ohio Soil Survey.

The field reviews are conducted in two parts:

- a) A review of the classification of soils, soils handbook, text manuscript, and other aspects of survey.
- b) A review of mapping, mapping techniques, understanding land forms and cartography.

I also joined them for technical visits, which are conducted as work sessions. Items covered included editing descriptions of series and map units, editing general soil map unit descriptions, completing SCS-S01-6 forms, soil classification - correlation, analysing laboratory data, and evaluating and making changes in computer generated soil interpretation tables.

30 Nov. - 5 Dec. - I attended the American Soil Science and Agronomy Meetings in New Orleans, La.

I completed successfully my training programme on 7 December 1986 as confirmed on the attached letter, and I am expecting to receive a certificate for this training from the University at any time.

Suggestions and Recommendations

During my training, I had a chance to meet some members of the Soil Conservation Service/Soil Survey Division in Ohio and Minnesota and we discussed about how we can use Soil Taxonomy Classification in Uganda without their assistance. They assured me that if we adopt the Soil Taxonomy Classification here in Uganda, they are ready to give us technical assistance such as a soil scientist to work with us.

It is good that three pedologists (Ugandans) have already acquired enough knowledge of using this classification, and more than 45 countries in Africa have already adopted it. Therefore I would recommend that we adopt it plus the FAO/UNESCO*.

A letter of notification if we adopt it and requests for technical assistance can be directed to:

Dr. Richard W. Arnold
Director, Soil Survey Division
Soil Conservation Service
P.O. Box 2890
Washington, D.C. 20013

I suggest that a National Soil Survey Team or Unit be formed so they can work out a National Soil Survey Programme. This team must comprise Pedologists from:

1. Research Division > Department of Agriculture
2. Farm Planning
3. Faculty of Agriculture - MU.

A comprehensive proposal will be written by the above parties.

(Signed) Eriabu V. Ssendiwayo

APPENDIX VI

Table 3. CONFERENCES/SEMINARS/WORKSHOPS

Makerere University/FAF and The Ministry of Agriculture

1. Soil Science Society of East Africa Conference (5 days).
Date: December, 1986
Audience: Soil Scientists from East Africa
Attendance: 160
Guest Speakers: W.E. Larson, Soil Mgt. and Erosion Control.
E.L. Schmidt, Biological Nitrogen Fixation.
2. Uganda Pasture Network Workshop (4 days).
Date: December, 1987
Audience: Pasture Agronomists and Animal Scientists
Est. Attendance: 100
Guest Speaker: P. Henderlong, Mgt. of Tropical Pastures.

Ministry of Agriculture

1. Maize Production Workshop (4 days).
Date: May 1987
Audience: Maize Scientists, Seed Production Agronomists,
Selected Extension Personnel.
Attendance: 40
Personnel Conducting Training: P. Anadajayasekeram:
Training Officer, CIMMYT; J.K. Ranson: Maize Agronomist,
CIMMYT.

2. Maize Research Workshop (2 days).

Date: August, 1987

Audience: Maize Researchers and Seed Production Personnel

Attendance: 20

Topic: Designing Maize Research Programs for Uganda.

Person Conducting Workshop: Ernest Sprague

3. Soybean Research Workshop (2 days).

Date: September, 1987

Audience: Soybean Research and Seed Production Personnel

Attendance: 25

Topics: Soybean Research Programs for Uganda.

Seed Multiplication.

Person Conducting Workshops: Carl N. Hittle

4. Extension-Research Linkage Workshop (2 days).

Date: September, 1987

Audience: Research Station Scientists and MA Extension
Administrators

Attendance: 35

Topics: Research-Extension Specialist Production Team
Concepts (REST).

How Extension Fits with the NARO Concept.

Person Conducting Workshops: Gene F. Pilgrim

APPENDIX VII

Table 5. INDIVIDUAL RESEARCH PROJECTS APPROVED

A. Makerere University, Faculty of Agriculture

Department	Researchers	Project Title	Level of Funding (US\$)
Ag. Econ.	I. Fendru, J. Tumuhairwe D. Katwire	A Survey of the Problems and Potential of Banana Production in Mbarara and Bushenyi Districts.	277,896
	E. Ziwa	The Management of Nakayaga Cooperative Society	55,603
	A. Semana J. Opio-Odongo L. Msemakweli	Evaluation of BSc (Agric.) Training Programmes and Employment Suitability	300,000
Ag. Eng.	E.W. Rugmayo E. Tibakuzira	Design and Development of Low-Cost Oil Expeller	44,476
Animal Science	J.S. Mugerwa F.B. Bareeba W.O. Odwongo	Feed Analysis and Formulation of Rations for Dairy Cattle	115,731
	M.W. Okot G.O. Olaboro J.S. Mugerwa	Indigenous Feedstuffs for	63,295
	I. Okello-Uma F. Tugume	Bovine Mastitis Research	93,883
Crop Science	P. Rubaihayo J.C. Ddungu C. Baliddawa	Makerere Grain Legume Germplasm	185,302
	S. Owera	Bean Common Mosaic Virus Serotypes	55,603
	P. Rubaihayo C. Baliddawa J.C. Ddungu M. Bafokuzara	Potato and Tomato Improv.	172,242

Department	Researchers	Project Title	Level of Funding
Crop Science Cont.	E.N. Sabiiti	Pasture Grass and Legume Germplasm	71,308
	F. Bareeba		
	J.K. Zake		
	J.S. Mugerwa		
	J.C. Ddungu	Passion Fruit Propagation	47,636
	C. Lwanga		
	W. Muwonge		
Forestry	J.S. Epila C.W. Baliddawa C. Lwanga	Susceptibilities of Varieties of S. Patoto to S.P. Weevils	109,869
Soil Science	J.K. Zake	Studies on Locally Available Rock Phosphate	109,869
	V. Ochwoh		
	J. Tumuhairwe		
	J.K. Zake	Rhizobial and Nitrogen Fertilizer Application	60,619
	M.C. Silver		
	C. Nkwine		
	J.C. Ddungu		
	D. Muduuli	Grain Storage Methods and the Development of Aflatoxins	300,000
	J.S. Mugerwa		
	E. Rugumayo		

B. The Ministry of Agriculture, Kawanda and Serere Research Stations

Researchers	Project Title	Level of Funding
E.B. Rubaihayo V. Okoth D. Kyetere	Breeding for Maize Streak Resistance	300,000
T. Sengooba A. Opio W. Tushemereirwe	Disease Levels in Beans in Association with Maize, S. Potato and Banana	300,000
G. Epieru	Integrated Pest Mgt. of Legumes	90,000
W. Odogola S. Oinya D. Wamajje B. Areke	Batch-Type Flat-Plate Solar Dryer	300,000
J. Ocen-Ayer J. Namaganda	Banana Weevil and Nematode Control	300,000
A. Okuni J. Eram J. Omuke	Acceptibility of the "Serere Crop Submarine" by Ugandan Farmers	300,000

GUIDELINES FOR RESEARCH PROPOSALS
MANPOWER FOR AGRICULTURAL DEVELOPMENT

The USAID/Uganda-MFAD Project has available funds for research grants to MU/FAF and the MA researchers. These grants will be awarded on a competitive basis and preliminary screening of research proposals will follow existing review and approval procedures in the MU/FAF and MA. Final awarding of the research grants will be done by an awards committee consisting of the: Dean-MU/FAF, Commissioner for Agriculture-MA, (or their designates), ADO-USAID, 2 Agricultural Advisors to MA-MFAD, Chm. (MU/FAF) Research Committee and CARO-MA.

Once a research grant has been awarded and approved by the National Research Council, an account will be set up to accommodate both the researcher and necessary monitoring and auditing procedures. All research accounts will be set up through and with the approval of the MFAD Team Leader and the USAID Director.

Amount of Awards:

- Individually sponsored study - not to exceed 5 million US\$
- Group sponsored study - not to exceed 10 million US\$

Due Dates:

All 1987 research proposals should be submitted no later than 15 May, 1987. Grants will be awarded by 15 June 1987.

Format:

- Descriptive Title
- Introductory Situation Statement (why is this study necessary)
- Objectives
- Plan of Work (how do you plan to accomplish objectives)
- Budget Statement (list all estimated expenses)

Guidelines:

- All research proposals should be directly or indirectly related to food crop production or processing
- Equipment purchases do not constitute a research proposal
- Budget items may include such things as in-country travel, chemicals, seed, labor, survey needs and miscellaneous items
- Research proposals should not exceed 3 pages in length

APPENDIX VIII

EXAMPLES OF INDIVIDUAL RESEARCH PROPOSALS APPROVED
UNDER MFAD PROJECT

Research Proposal - The USAID/Uganda MFAD Project

by

Experito Ziwa

Lecturer/Agricultural Finance Cooperatives and Credit

Title: THE MANAGEMENT OF NAKAYAGA COOPERATIVE SOCIETY -
MUKONO DISTRICT - UGANDA

Introduction:

Agriculture plays a big role in the economic development of Uganda. Over 80% of the population depend on farming for their livelihood and over 80% of Uganda Foreign Exchange earnings come from agriculture. The marketing of most of the major cash crops such as coffee and cotton is handled by cooperative societies and unions and there is now a drive to encourage primary societies to handle agricultural produce such as maize, beans, groundnuts etc.

Many cooperative societies are now engaged in the production of food crops such as bananas, maize, vegetables and they also carry out dairy farming, ranching and fruits. Farmers are encouraged to form cooperative societies in order to overcome marketing problems such as transport and storage facilities. Since 1961 when the cooperative act was enacted, many cooperative primary societies, and unions have been established. These societies are involved in various economic activities such as production, marketing, distribution of agricultural inputs, insurance, transport and banking.

Management is the art and science of planning, organizing, directing, coordinating and controlling the resources of an institution (manpower, capital and facilities) toward the achievement of its objectives. It is the guidance, leadership and control of group efforts to achieve common goals. It is also the act of combining ideas, processes, materials, facilities and people to effectively provide the services member-owners expect. Management is the decision making element of the cooperative. Its role entails formulating and executing policies, operating efficiently, providing good services and keeping the association financially sound to successfully meet its objectives.

Statement of the Problem

Management of the cooperative societies is supposed to be jointly carried out by the members, Board of Directors and the Manager. The members elect the Board of Directors and the Board of Directors hire a Manager. The Manager in turn hires other junior employees. It has been observed in some cooperative societies that there is mismanagement and the members do not get the expected services. Sometimes members sell their products and produce to societies but they are not paid cash. Sometimes it takes a very long time to get paid. The Managers and Directors usually take the societies as their personal businesses.

It has also been reported that Managers do embezzle cooperative finances and partonage refund is not paid to members in reasonable time. When agricultural inputs are brought to the societies, most of these inputs are not sold to members but are sold to outsiders at very high prices. Members get very little of the inputs. It happens that the members do not have full control over their societies and this results in the members being cheated. Loyalty of members to the society has also been reported to be low and as a result, members sell most of their products to outside private buyers who usually smuggle the products outside

Uganda.

Another important problem reported is the inefficiency of the society to order and distribute agricultural inputs in sufficient quantities and in time. There are insufficient quantities of hoes, insecticides, spray pumps, weed killers, seeds, ancaricides and fertilizers. Sometimes these important inputs arrive late when the rainy season has ended and therefore farmers did not have the use of them at the right time.

Cooperative education is also not well carried out and the members as well as the directors do not understand their responsibilities. Duties of the manager are also not well specified and usually there is a lot of interference by the directors in the day to day running of cooperative business.

It seems the situation in many cooperative societies is rather shaky especially as far as management is concerned. There is a gap among the members board of directors and the manager. There is lack of coordination among the three groups. This mismanagement can cause weaknesses in the production and marketing of agricultural products by the society. It can also lead to poor distrubution of agricultural inputs and in the end food production is reduced and food quantity lowered.

Since agricultural production and marketing are important and since cooperative societies play a key role in production, marketing of food and cash crops and distribution of agricultural inputs, then it is important that management is well carried out.

This study will examine the management of Nakayaga Cooperative Society in Mukono District and find out whether the members have full control of their business. Emphasis will also be put in the efficiency of the society to distribute agricultural inputs such as insecticides, ancaricides, hoes, seeds, weed killers, and

fertilizers in time.

Objectives of the Study

1. To find out the percentage of the coffee farmers who were fully paid for all their coffee sold to the society during 1985/86 coffee season.
2. To find out the quantities of hoes, banana weevil insecticides, (dieltrin dust), maize seeds, cranoxone round up and vitrogenous fertilizers and spray pumps received by the society during 1985/86 season.
3. To find out whether these quantities of agricultural inputs were enough for the farmers in the area covered by the society.
4. To find out whether these inputs were available to the farmers in time at the beginning of the rainy season.
5. To find out whether all the current Board of Directors were directly elected by the members.
6. To find out whether the Secretary Manager was directly hired by the Board of Directors.
7. To find out whether the Secretary Manager has full powers to hire his junior employees.
8. To find out how many educational programs for the members, the Board of Directors and the Manager have been carried out during the period 1980-85.
9. To find out whether the society holds an annual general meeting every year and if not how many times has the general meeting for the members been held since 1980.
10. To find out the type and number of committees which exist in the society.
11. To find out whether the cooperative objectives are clear, specific and written down.
12. To find out whether the society operates a revolving fund capital system and how often is patronage refund paid to members.

13. To find out whether the society has audited Balance Sheet and Statement of Operations for the years 1980/81, 1981/82, 1982/83, 1983/84, 1984/85.
14. To test the efficiency of the society by calculating the inventory turnover ratio.
15. Look at balance sheets for profit and loss.

Methodology

Location: The study will be carried out at Nakayaga Cooperative Society, Mukono District. The society is situated in three Gombololas, namely Nakisunga, Kisoga and Nkokonjeru. The Headquarters of the Society is about 40 km from Kampala towards Jinja. You take Jinja Road and you branch off at Mukono 14 miles away and you take Nkokonjeru Road. It is about 20 km from Mukono Town.

Sampling and Sample Size: A cooperative's member register will be used to select the farmers who will be interviewed. Farmers who grow coffee and bananas, and keep poultry and dairy cows will be interviewed.

A sample of 50 farmers will be interviewed.

Data Collection: Data will be collected from the sample of farmers selected. More data will be collected from the Board of Directors and the Manager as well as from Chief Accountant/Treasurer and from other junior employees. Interview schedules will be used and I will collect the data personally assisted by one or two assistants whom I will pay.

The farm supply shop at Kisoga will be visited and inventory of agricultural inputs taken. Sales of these inputs will also be examined and records observed. Methods of distribution of inputs, ordering them and stock control will also be examined.

Data Analysis: Analysis of the data will be done by using simply calculations. Percentages will be calculated. Tables and graphs will also be used when necessary. A calculator will be used in calculations.

Duration: The research will take about three months. Two months will be spent in the field collecting data and one month will be for data analysis and writing up the research project.

<u>Estimated Budget</u>	<u>Amount</u>
1. Transport for 60 days @ \$15.00	\$ 900.00
2. Hotel Accommodation for 30 days @ \$10.00	300.00
3. Breakfast for 30 days @ \$2.00	60.00
4. Lunch for 30 days @ \$2.00	60.00
5. Salary for one enumerator/assistant for 30 days @ \$2.00	60.00
6. Stationery, including typing and duplicating paper (5 reams), 5 ballpoint pens, 3 pencils, 2 rulers, files etc.	30.00
7. Typing, duplicating and binding	50.00
8. Miscellaneous	40.00
Total	<u>\$1,500.00</u>

A STUDY OF DISEASE LEVELS IN BEANS GROWN IN MONOCULTURE
AND IN ASSOCIATION WITH MAIZE, SWEET POTATOES AND BANANA*

by
T. Sengooba, BSc, MSc (Agric.)
A.F. Opio, BSc, MSc (Agric.)
W. Tushemereirwe, BSc
Plant Pathologists, Kawanda Research Station

Introduction

Beans (Phaseolus vulgaris L.) are an important food crop in Uganda and are the most widely cultivated grain legumes (Anon. 1920-1983). A conservative estimate would be that the production of about 200,000 tons annually is less than a third of the potential, the rest being forfeited due to biological and production problems. The challenge to researchers to increase the productivity of this crop is therefore obvious and enormous.

In Uganda the bulk of the beans are produced by small farmers who commonly practice intercropping. According to Osiru (1980) as much as 75-90% of beans in Uganda are grown in mixed crops. The census by the Department of Agriculture (Anon. 1966) indicated that the level of intercropping varied between districts ranging from 32-100% in Kigezi and Busoga Districts respectively.

The bean research in Uganda focuses on producing high yielding cultivars with resistance to the major diseases and with acceptable qualities to the farmers and consumers. The results of the past work, that is, selections, evaluations, pest control, fertilizer requirements, planting dates and plant populations were however, all based on bean trials grown in pure stands. It is a possibility that results obtained from pure stands may or may not be applicable to the small farmers' intercropping farm practice. It is therefore imperative for the bean researchers

*A Research Proposal submitted to USAID/Uganda MFAD Project for consideration for a Research Grant in 1986.

to widen their scope by exploring the farmers' cropping environment and taking it into account when producing cultivars to be grown by these farmers.

In the case of the bean diseases, which are a major production constraint, it is necessary to investigate their behavior in mixed versus pure stands. The results would enable the researchers to decide whether selection should, at least at a certain stage, be done under intercropping. From a pathologist point of view this study would be more rewarding if not only the bean diseases are assessed but also the diseases on the component crops.

The crops commonly grown with beans in Uganda include maize, sweet potatoes, cotton, cassava, sorghum, Irish potatoes, groundnuts, peas, etc. Beans are also common in young coffee plantations and under bananas. The combination of beans with maize, sweet potatoes and with bananas are chosen for this study on the basis of their importance in the country and the differences in the micro-environments these three crops offer to the bean plants.

Objectives

1. To establish the levels of the different major diseases of beans when the crop is grown in pure and mixed stands in the farmers' fields.
2. To establish the levels of the different diseases of beans when intercropped with maize and sweet potatoes under different spacial arrangements and plant populations.
3. To study disease expression on different cultivars of beans when grown in monoculture and in association with maize or sweet potatoes.
4. Establish the identity and level of the diseases that will develop on the component crops, that is maize, sweet potatoes,

and bananas.

Plan of Work

A. Survey

The study will be started off with a survey. The area of the survey will be Mpigi, Kabale and Fort Portal, Masindi (Kamwenge Area) Districts. The survey will concentrate on combinations of beans with maize, sweet potatoes and bananas. A questionnaire will be prepared to be used during the survey to compile information on cropping patterns, populations seasons and the disease levels.

Time - November 1986

B. Disease Levels In Beans Intercropped With Other Crops, On-Farm and On-Station Trials

About three farmers will be selected from each of the areas of the survey and trials will be set up on their farms. These trials will be repeated on the stations, if possible at both kawanda and Kachwekano. The variable in this trial will include cropping pattern (i.e. intercropping versus pure stands) and source of seed (i.e. farmers' versus Kawanda seed).

Time - 1st and 2nd Season, 1987

C. Disease Levels In Beans Intercropped With Maize and Sweet Potatoes Under Different Spacial Arrangements and Populations

On-station trials will be carried out. In the bean/maize intercrop the spacial arrangements and populations will be varied. The variables will include inter- and inter-row arrangements and the spacing of the two crops. In the case of the sweet potatoes, the hill and ridge patterns will be used for potatoes and the beans will be planted by broadcasting, in rows, on the hills or on the ridges. The final patterns to be used will be decided on after the survey.

Time - 1st and 3rd Season, 1987
and
1st Season, 1988

D. Disease Expressions On Different Cultivars Of Beans When Grown In Either Pure Or Mixed Stands

Field trials will be laid down at Kawanda and Kachwekano. The entries will include as many cultivars of beans as will be available and will include both the dwarf and the climbing types. A standar cropping pattern of one row bean, one row maize will be used. The sweet potato with beans trial will include only the dwarf type of beans.

Time - 1st and 2nd Season, 1987
and
1st Season, 1988

E. Diseases On Maize, Sweet Potatoes and Bananas

Through the survey (A) and all of the field trials the diseases will be assessed on the maize, sweet potatoes and the banana that will be growing in association with beans.

F. Second Season 1988, Write up And Submission Of Report.

<u>Estimated Budget</u>	<u>Cost in US\$</u>
1. Fuel (based on 4 trips to Kamwenge and Kachwekano and to the farmers in Mpigi per season plus the survey)	500
2. Survey (lasting 10 days, including 4 people paid @ \$20 per night (10x4x20)	800
3. Night allowance (1-3 people to visit 2 places, 3 times per season, each visit lasting 2-4 nights)	2,200
4. Stationery	200
5. Labour for on-farm and on-station work	500
6. Harvesting gunny and cloth bags	300
7. Seeds	150
8. Miscellenous expenses	350
	<u>\$5,000</u>

References

Anon. (1920-1983). Uganda Department of Agriculture, Annual Reports.

Anon. (1966). Report on Uganda Census of Agriculture (3). Ministry of Agriculture and Cooperatives, Entebbe, pp. 129-135.

Osiru, D.S.O. (1980). Genotype identification for intercropping system. In Intercropping: Proceedings of the Second Symposium on Intercropping in the Semi-Arid Areas, held at Morogoro, Tanzania, 1980. Ottawa, Ont., IDRC 1982 pp. 91-92.

Research Proposal For The Award of USAID Funds

Title: A SURVEY OF PROBLEMS AND POTENTIAL OF BANANA
PRODUCTION AND MARKETING IN MBARARA AND BUSHENYI
DISTRICTS

1. Statement of the Problem Situation

Banana production and marketing in Mbarara and Bushenyi Districts, as elsewhere in Uganda, is generally affected by such problems as scarcity and high cost of inputs including land; shortage of current inputs like fertilizers and agricultural chemicals; poor cultural and management practices; shortage of transport for extension workers, farm supplies and farm produce; lack of organized marketing; unattractive producer prices etc.

The banana is a leading staple foodstuff for many Ugandans. Bushenyi and Mbarara Districts are the main banana production zone in Western Uganda. Both Districts together constitute a major source of cooking and beer bananas for a number of urban markets including Kampala city and the towns of Mbarara, Bushenyi, Kasese and Kabale. This zone is also the major producer of dessert bananas for local consumption with great potential for export. The importance of this area as a major source of bananas is increasing with a growing demand due to the rising population of consumers both in urban areas and schools.

The proposed study is imperative because not much serious research has been done on the problems of banana production and marketing in Uganda let alone in the survey area. On the production side, important efforts have been made by K. Mukasa: Staple Food Crops in J.D. Jameson's Agriculture in Uganda, 1970 and M. Hall: Agricultural Development in the Coffee-Banana Zone of Uganda, PhD Thesis, Makerere University, 1971. While Mukasa describes

the general banana production practices, Hall carries out a rigorous economic analysis using sophisticated linear programming techniques. On the marketing side, even more general studies have been done. For example Shubert studied Food marketing in the Jinja Area under the Impact of Urbanization and Industrialization, RDR 53, 1967, Makerere University and J.J. Oloya and Poleman researched into The Food Supply of Greater Kampala, 1968, Makerere University.

The proposed study will go beyond this general approach and address some specific problems and prospects of banana production and marketing.

2. Objectives

The aim of the survey is to assess the agronomic and economic problems and prospects of banana production and marketing in Bushenyi and Mbarara Districts. The specific objectives are:

- a) To assess the cultural practices used by farmers such as planting methods; soil conservation; mulching; use of manure and fertilizer; and disease and pest control, especially banana weevils.
- b) To find out the types, varieties, yields and acreages of bananas grown.
- c) To determine the availability, amounts, and costs of production inputs e.g. planting materials, coffee husks, fertilizers and chemicals.
- d) To determine farm management practices used by farmers like keeping records and accounts.
- e) To establish the marketing channels or outlets for bananas in the survey area.
- f) To assess the effects of banana prices on farmers' production and marketing decisions.

- g) To ascertain transport and storage problems faced by farmers.
- h) To find out the main constraints on the work of agricultural staff in the survey area.
- i) To use the findings for making necessary recommendations for effecting desired improvements in production and marketing operations.

3. Survey Procedure

Introduction: The survey will involve interviews, field observations, and the use of questionnaires to collect the necessary data. Four counties will be chosen for this purpose - one in Mbarara and three in Bushenyi. A sample of 15 farmers will be randomly selected from each county for the survey. The survey is planned to take 18 months and will proceed through four stages: Preliminary planning, survey, pilot study and intensive field studies.

Phase I. Preliminary Planning - 1 month: This will take about one month during which the necessary ground and paper work will be done to get prepared for the field work.

Phase II. Exploratory Survey - 1 month: To carry out a general informal reconnaissance of the survey area to collect first hand information about farmers' circumstances and problems. A check list of information items will be used to conduct informal conversations with a cross-section of farmers, produce buyers, and agricultural workers. On-the-spot field observations will also be made. The information gathered will be used to formulate tentative hypotheses and plan the next stage.

Phase III. Pilot Study - 2 months: A random sample of 5 farmers each in Bushenyi and Mbarara Districts will be studied to verify and quantify the information obtained in the exploratory survey;

to verify the tentative hypotheses formulated during the exploratory stage; to refine and focus interview schedules and questionnaires for the next phase; to design and test the sampling scheme; and publicize the formal field work. A combination of interviews, questionnaires and field observations will be employed. Two field enumerators will be engaged for the pilot study. The results will help to perfect the interview schedules and questionnaires, and to ensure their completeness.

Phase IV. Intensive Field Studies - 14 months: More or less uniform sets of data will be collected from a relatively large number of respondents (60) throughout the survey area to verify and quantify data, and test hypotheses. These data will be collected with the aid of questionnaires based on the objectives stated about (a-h). The data to be collected will include for example:

- a) Finding out the type, amount, and prices of inputs and products.
- b) Measuring acreages of farm holdings to determine the area under bananas and other crops.
- c) Estimating production in terms of the number and weight of bunches on a monthly basis throughout the year.
- d) Estimating the proportion of produce consumed at home relative to what is sold on a regular basis.
- e) Soil surveying and sampling.
- f) Assessing farmers' cultural and management practices.
- g) Laboratory analysis of the soil samples.

Research Team: The research team will consist of:

- a) One Soil Scientist/Agronomist, J. Tumuhairwe
- b) One Agricultural Economist, I. Fendru
- c) One Soil Technologist, D. Katwire

The team will be assisted by one Technician, six Field Enumerators, and one Labourer. The Technician and Labourer will

work for about two months taking soil samples, while the Enumerators will be employed full time for 14 months.

BUDGET ESTIMATES

<u>Items</u>	<u>Cost (USh)</u>
<u>Phase I and II</u>	
Three Researchers (2 Round Trips)	
a) Travel to Area	300,000
b) Travel within Area	500,000
c) Allowances	432,000
<u>Phase III</u>	
1. Three Researchers (2 Round Trips)	
a) Travel to Area	300,000
b) Travel within Area	500,000
c) Allowances	432,000
2. Two Enumerators (Salaries, 2 Months)	160,000
<u>Phase IV</u>	
1. Three Researchers (5 Round Trips)	
a) Travel to Area	1,500,000
b) Travel within Area	5,000,000
c) Allowances	540,000
2. One Researcher (4 Supervisory Trips for Soil Sampling)	
a) Travel	400,000
b) Allowances	288,000
3. One Technician (2 Months-Soil Sampling)	
a) Travel	100,000
b) Allowances	450,000
4. One Labourer (2 Months - Soil Sampling)	40,000
5. Four Enumerators (Salaries - 14 Months)	2,240,000
<u>Materials</u>	
1. Five Bicycles @ 400,000	2,000,000

2.	Field Test Kit		1,500,000
3.	One Bale of Gunny Bags		400,000
4.	Two Polythene Rolls		400,000
5.	Chemicals		2,000,000
6.	Cost of Soil Analysis		2,000,000
7.	Spades and Hoes		100,000
8.	Stationery		1,000,000
9.	Secretarial Services		1,000,000
		Total	<u>23,582,000</u>
10.	Contingency (10%)		2,358,200
		Grand Total	<u>25,940,200</u>
	Equivalent in US Dollars	=	\$5,108.00

NB

We strongly suggest that a pool vehicle plus fuel be provided for Faculty Research work as an alternative to travel by public transport and special hire whose costs tend to fluctuate.

NAMULONGE RESEARCH STATION STAFF LIST AS OF 1 OCTOBER 1987

Job Title/Salary Scale/Name	Years of Service	Date of Present Appointment	Academic Qualifications/Remarks
<u>Director of Research (1)</u>			
Scale: U1			
Name: Vacant			
<u>Sr. Principal Research Officer (3)</u>			
Scale: U1			
Name: Vacant			
<u>Principal Research Officer (3)</u>			
Scale: U1			
Name: Odongo, J.C.W. 2 Vacancies	19	Dec. 28, 1983	BSc., M.Phil., PhD - Agronomist
<u>Sr. Research Officer (2)</u>			
Scale: U1			
Name: Kintukwonka, A.F. 1 Vacancy	19	Nov. 24, 1984	BSc., M. Agric.Sc. - Soil Chemist, Acting Director of Research
<u>Sr. Agricultural Officer (2)</u>			
Scale: U2			
Name: Ayedu, S.J.M. 1 Vacancy	20	1968	BSc., MSc., - Soil Chemist Agric. Officer/Administration
<u>Research Officer (4)</u>			
Scale: U2			
Name: 4 Vacancies			

<u>Job Title/Salary Scale/Name</u>	<u>Years of Service</u>	<u>Date of Present Appointment</u>	<u>Academic Qualifications/Remarks</u>
<u>Agricultural Officer</u>			
Scale: U5-3			
Name: Lusembo, P.	1	Feb. 18, 1987	BSc.,(Agric.) - Animal Husbandry
<u>Scientific Officer (5)</u>			
Scale: U3			
Name: 5 Vacancies			
<u>Scientific Officer (20)</u>			
Scale: U5-3			
Name: Ayiseni, D.	15	Apr. 25, 1973	BSc., MSc.(Agric.) - Plant Breeder
Maiteki, G	13	Apr. 1, 1975	BSc., PhD. - entomologist
Gumisiriza, G.	11	Apr. 1, 1977	BSc., MSc.(Agric.) -working on PhD.
Kabirizi, J.	13	Apr. 1, 1975	BSc. (Agric.) - Pasture Agronomist
Sserwadda, V.	11	Apr. 18, 1977	BSc. (Agric.) - working on MSc.
Ogwang, J.	9	Aug. 1, 1979	BSc., MSc., DIC, working on PhD.Entymol.
Imanywoha-Byabali, J.	5	Oct. 14, 1983	MSc., - Agronomist
Ziwa, R.	4	Nov. 8, 1984	MSc. -working on PhD., Agron./Weed
Kangire, A.	5	Oct. 24, 1983	BSc.,MSc. - Plant Pathologist
Ebiyau, J.	9	Aug. 7, 1979	BSc. - Plant Breeder
Waneloba, M.	2	Dec. 19, 1985	BSc. - Plant Pathologist
Bashasha, B.	2	Dec. 2, 1986	BSc., working on MSc. -Agronomist
Tukamuhabwa, P.	2	Mar. 4, 1986	BSc., working on MSc. -Plant Breeder
Obong, Y.	2	Jun. 24, 1986	BSc. - Agronomist/Weed
Ssemakula-Nankinga, G.	2	Feb. 10, 1986	BSc. - Plant Breeder
Mwanga	10	Apr. 1, 1978	BSc., MSc. - Plant Breeder
4 Vacancies			

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RESEARCH SCIENTISTS - KAWANDA RESEARCH STATION
OCTOBER, 1987

Name	Sect/Unit	1st Appt./Date	Pres. Appt./Date	Designation*	Qualification	Scale	Status	Remarks
Rubaihayo, E.	Botany	SO/6-8-68	PRO/28-12-83	Ag.Dir.	BSc,MSc	U1	Conf.	
Kirbirige-Sebunya, I.	Coffee	SO/1979	SRO/1984	Head/CRU	BSc,MSc,PhD	U1	"	
Kavuma, J.	Soil Sci.	AA/27-11-62	SRO/1984	Head/Chem.	BSc,DIP,Agric.	U1	"	
Sakira, W.	Agron.	AAO/1-1-67	SRO/1984	Head/Agron.	BSc, MSc	U1	"	
Bafokuzara, N.	Ent.	AAO/1-1-67	RO/1984	Head/Ent.- Nema.	BSc,MSc	U2	"	
Hakiza, J.	Hort.	SO/1971	RO/1984	Head/Hort.	BSc,MSc	U2	"	
Kabeere, F.	Seed Proj.	SO/1971	RO/1984		BSc,MSc	U2	"	Seed Proj.
Sengooba, T.	Path.	SO/1971	RO/1987	Coordinator Bean Pro. & Head/Path.	BSc,MSc	U2	"	
Hakiza, G.	Coffee	SO/1971	SO/1971	SO	BSc,MSc	U3	"	
Gamusi, P.	Coffee	AAO/1968	AO/1968	AO	MSc	U3	"	
Mangheni, W.	Botany	SO/1974	SO/1974	SO	BSc	U3	"	
Odoch, P.	Seed Proj.	SO/1979	SO/1979	SO	BSc,MSc	U4	"	Seed Proj.
Kayiwa, B.	Botany	SO	SO	SO	BSc,MSc	U4	"	
Karamura, D.	Botany	SO/1/12/77	SO/1977	SO	BSc,MSc	U5-3	"	Leave of Absence
Wagoire, W.	Botany	SO/1979	SO/1979	SO	BSc,DIP(Agric.)	U5-3	"	Buginyanya
Musaana, S.	Botany	SO/1979	SO/1979	Ag.Head/Bot.	BSc,MSc	U5-3	"	
Gibugonyi, G.	Botany	SO/17-5-78	SO/1978	SO	BSc	U5-3	"	Absconded
Bazirake, C.	Coffee	SO/1972	SO/1972	SO	BSc,MSc	U5-3	"	
Tumushabe, G.	Coffee	SO	SO	SO	BSc	U5-3	"	O/C Kituza & MSc study leave

1
8
1

Name	Sect/Unit	1st Appt./Date	Pres. Appt./Date	Designation	Qualification	Scale	Status	Remarks
Musukwe, T.	Agron.	SO/1977	SO/1977	SO	BSc,MSc	U5-3		
Laker, H.	Agron.	SO/1975	SO/1975	SO	BSc,MSc,PhD	U5-3	"	Absconded
Ayer, J.	Ent.	SO/1975	SO/1975	SO	BSc,MSc	U5-3	"	
Asea, P.	Soil Sci.	SO/1977	SO/1977	SO	BSc,MSc	U5-3	"	Study leave
Mukasa, J.	Hort.	SO/6-8-79	SO/1979	SO	BSc,MSc	U5-3	"	
Karamura, E.	Ent.	SO/1979	SO/1979	SO	BSc,MSc	U5-3	"	Study leave,PhD
Mugalu, J.	Ent.	SO/1979	SO/1979	SO	BSc	U5-3	"	Study leave,MSc
Turyamureeba, G.	Botany	SO/1979	SO/1979	SO	BSc	U5-3	"	Kalyengyere
Basirye, M.	Agron.	SO/1978	SO/1978	SO	BSc,MSc	U5-3	"	
Kyeterere, D.	Botany	SO/14-8-79	SO/1979	SO	BSc	U5-3	"	Study leave,MSc
Opio, A.	Path.	SO/5-5-80	SO/1980	SO	BSc,MSc	U5-3	"	
Okoth	Ent.	SO/1978	SO/1980	SO	BSc,MSc,PhD	U5-3	"	At ICIPE, leave of absence
Zziwa, M.	Botany	SO	SO	SO	BSc,MSc	U5-3	"	Study leave,PhD 1
Ongaya, M.	Botany	SO	SO	SO	BSc,MSc	U5-3	"	O/C Kalengyere 83
Mukulu, G.	Coffee	SO/1980	SO/1980	SO	BSc,MSc	U5-3	"	
Namaganda, M.	Ent.	SO/1980	SO/1980	SO	BSc	U5-3	"	Study leave,MSc 1
Ssendiwanryo,E.	Soil Sci.	SO/27/3/72	SO/1972	SO	MSc	U5-3	"	
Oree, A.	Ent.	SO/1-7-80	SO/1980	SO	BSc	U5-3	"	Study leave,MSc
Kisakye, J.	Agron.	SO/1983	SO/1983	SO	BSc	U5-3	"	Study leave,MSc
Ayo, C.	Hort.	SO/6-8-79	SO/1979	SO	MSc,PhD	U4-3	"	
Mugenyi, G.	Ent.	SO/18-10-83	SO/1983	SO	BSc,DIP(Agric)	U5-3	"	
Tushemereirwe	Botany	SO/18-10-83	SO/1983	SO	BSc	U5-3	Prob.	Study leave,MSc
Santos, E.	Coffee	SO/14-6-85	SO/1985	SO	MSc	U5-3	"	Absconded
Kashaija, I.	Ent.	SO/18-12-85	SO/1985	SO	BSc	U5-3	Prob.	
Birikunzira,J.	Coffee	SO	SO	SO	BSc,MSc	U5-3	"	O/C Buginyana
Mohammed, S.	Ent.	SO/18-12-85	SO/1985	SO	BSc,MSc	U5-3	Prob.	
Sekyewa, C.	Hort.	So/1-4-86	SO/1986	SO	BSc	U5-3	"	
Kato, G.	Hort.	SO/18-12-86	SO/1986	SO	BSc	U5-3	Prob.	Absconded
Bigirwa, G.	Botany	SO/12-12-86	SO/1986	SO	BSc	U5-3	Prob.	
Bakamwangiraki	Path.	SO/21-12-86	SO/1986	SO	BSc	U5-3	"	Kachwekano
Kabuye	Agron.	SO/18-12-85	SO/1985	SO	BSc	U5-3	"	

Name	Sect/Unit	1st Appt./Date	Pres. Appt./Date	Designation	Qualification	Scale	Status	Remarks
Musooli, P.	Coffee	SO/4-3-86	SO/1986	SO	BSc	U5-3	Prob.	
Arach, J.	Agron.	SO/1-6-75	SO/1975	SO	MSc, PhD	U5-3	Conf.	Study leave, MSc
Magunda	Soil Sci.	SO/1-11-74	SO/1974	SO	BSc, MSc	U5-3	"	
Opit, P.	Hort.	SO/1987	SO/1987	SO	BSc	U5-3	Prob.	
Wejuli, M.	Soil Sci.	SO/1986	SO/1986	SO	BSc	U5-3	Prob.	
Trubish, V.	Hort.	SO/23/3/87	SO/1987	SO	MSc	U5-3	Prob.	
Butegwa, C.	Soil Sci.	SO/1-7-77	SO/1987	SO	BSc, MSc	U5-3	Conf.	
Mujabi, N.	Admin.	SO/1-4-87	AO/1987	AO/Admin.	AO/Admin.	U5-3	Conf.	
Onzima, J.	Coffee	SO	SO	SO/Agron.	MSc, PhD	U5-3	Conf.	
Wetala, M.	Coffee	SO/1978	SO/1978	SO	BSc, MSc	U5-3	"	
Kalanzi	Botany	AO/1987	AO/1987	AO	BSc, DIP, Agric.	U5-3	Prob.	

*
PRO = Principal Research Officer
SRO = Senior Research Officer
RO = Research Officer
SO = Scientific Officer
AO = Agricultural Officer
AO/Admin. = agricultural Officer - Administration

SERERE RESEARCH STATION PRESENT STAFF LIST

Name	Discipline	1st Appointed	Present Rank	Highest Degree
Y. Mwaule	Hort.	1964	Pro/Dir.	MSc
T. Mafulira	Biometrics	1964	SRO	BSc
F. Koma-Alimu	Soil Sci.	1970	RO	MSc
V. Makumbi	Plant Breed.	1974	PRO	PhD
L. Serunjogi	Plant Breed.	1972	SO	MSc
C. Busolo-Bulafu*	Plant Breed.	1975	SO	MSc
N. Wanyera	Plant Breed.	1978	SO	MSc
G. Ochieng-Mbuye*	Agronomy	1975	SO	MSc
B. Odongo*	Ent.	1980	SO	MSc
T. Areke*	Plant Breed.	1975	SO	MSc
G. Otim-Nape*	Plant Path.	1976	SO	MSc
H. Akol	Ent.	1976	SO	MSc
C. Anyi	Agronomy	1983	SO	MSc
N. Nangoti	Soil Sci.	1974	SO	MSc
O. P'Obwoya	Agronomy	1982	SO	MSc
W. Odogola	Ag. Eng.	1984	SO	MSc
P. Esele	Plant Path.	1982	SRO	MSc
J. Oryokot	Agronomy	1985	RO	MSc
G. Epireu	Ent.	1983	SO	PhD
A. Bua	Agronomy	1983	SO	BSc
R. Molo	Ent.	1980	SO	BSc
P. Elobu	Agronomy	1985	SO	BSc
G. Oleju	Plant Breed.	1976	SO	BSc
W. Anyang	Plant Breed.	1985	SO	BSc
S. Ogwal	Soil Sci.	1986	SO	BSc
D. Wamajje	Food Tech.	1967	SAO	MSc
W. Khizzah	Plant Breed.	1972	SRO	MSc
J. Okello	Plant Breed.	1972	SRO	MSc
M. Acidria	Plant Breed.	1979	SO	BSc
E. Okello-Ekechu	Ent.	1979	SO	MSc
A. Onen-Anyoli	Plant Breed.	1972	SO	PhD
V. Mwoga	Soil Sci.	1964	RO	MSc

*Undergoing training for higher degree.

APPENDIX X

STAFF LIST FOR THE FACULTY OF AGRICULTURE
MAKERERE UNIVERSITY

Office of the Dean

J.S. Mugerwa	NDA (Glasgow), BSc, MSc (Rhode Island), PhD (OSU)
W.O. Odwongo	BSc (Agric.), MSc (Agric.), (MU), PhD (OSU), Undergrad. Tutor
C.W. Baliddawa	BSc (Agric.), MSc (MU), PhD (London) DIC, FRES, Assoc. Prof., Ent., Postgrad. Tutor
G. Kigonya (Miss)	BA (EA) Assistant Registrar
V. Kasenge	Dip. Agric. (EA), BSc (Calif.) MSc (Silsoe) Farm Manager
J.W. Nakedde	Dip. Agric. (Bukalasa), EADA Assist. Farm Manager, Crops
F. Tugume	BVM (MU), Assist. Farm Manager, Livestock

Department of Agricultural Economics

L. Msemakweli	BA (MU), MSc (Nairobi), Head Senior Lecturer, Econ. and Econometrics
J.M.A. Opio-Odongo	BSc (Agric.) (EA), MSc, PhD (Cornell), Assoc. Prof. Rural Soc.
A.R. Semana	BSc (Agric.) MSc, Lecturer (Exten.)
S. Ziwa	BSc (Agric.), MSc, PhD (Ag. Econ., Ife) Lecturer, Farm Mgt. Econ.
L. Wabwire	BSc (Agric.) (EA), MSc (Nairobi) Sr. Lecturer, Ag. Mktg.

E. Ziwa Dip. Agric. (Bukalasa) EADA
BSc (Agric.) (EA), MSc (MU),
Lecturer, Ag. Fin.

I Fendru MSc (Agric.) (Prague) MSc (Ag.
Econ.) MSc (Ag. Exten.) (Reading)
Lecturer

Department of Agricultural Engineering

E.W. Rugumayo BSc (Technion), MSc, PhD (Mich.
State), Head and Assoc. Prof.,
Food Eng.

I. O. Uma BSc (Ag. Eng.) (Silsoe), MSc,
PhD (Mich.), Sr. Lecturer,
Soil and Water Conserv.

Z.J. Olum BSc, MSc (W. Va.) (Farm Power) on
leave of absence

J. Sentongo-Kibalama BSc (Eng.) (MU), M. Eng. Sc.
(Melbourne), Lecturer, Farm Pwr.
Mach.

L. Kasisira MSc (Moscow), Lecturer, Farm
Mechanization

W.S. Kisalita BSc (Eng.) (MU), MSc (Brit. Col.),
Lecturer, on study leave

Department of Animal Science

I. Okello-Uma BSc (Windsor), Dip. Bact. (Toronto)
MSc (Saskat.) PhD (MU), Head
and Assoc. Prof., Dairy Mgt.
and Food Proc.

H.S.K. Nsubuga Dip., Vet. Sci. (EA) B. Vet. Med.
(London), MRCVS, MSc (EA), PhD
(MU), Prof. Animal Health and
Mgt.

J.S. Mugerwa NDA (Glasgow), BSc, MSc (Rhode
Island), PhD (OSU), Prof. Animal
Nutrition

G.H. Kiwuwa BSc (Agric.) (London), Msc (Ill.),
PhD (Cornell), Prof., Animal
Breeding and Genetics

M.W. Okot	Dip. Agric. (Bukalasa), EADA (EA), BSc (W. Va.), MSc, PhD (MU), Sr. Lecturer, Poultry Prod.
F.B. Bareeba	BSc (Agric.), MSc (MU), PhD (Manitoba), Sr. Lecturer, Animal Nutrition
G.R.E. Kausya	BSc (Agric.), MSc (MU), PhD (Manitoba), Lecturer, Animal Physiology
C.M. Munyabuntu	BSc (Agric.) (MU), M.Phil, PhD (Ife), Lecturer, Agric. Zoo. & Livestock Mgt.
Y. J. Ajeani	BSc (Agric.) (Khartoum), PhD (Okla. State U.), Lecturer, Ruminant/Nonruminant Nutrition On leave of absence
G. Olaboro	BSc (Agric.), MSc (MU), PhD (Manitoba), Lecturer, Poultry Science
W.O. Odwongo	BSc (Agric.), MSc (MU), PhD (OSU), Lecturer, Animal Nutrition
D. Mutettika	BSc (Agric.) (MU), MSc (Nairobi), Lecturer, Livestock Mgt.
<u>Department of Crop Science</u>	
J.C.M. Ddungu	Dip. Agric. (EA), MSc, PhD (New Hampshire), Head and Prof., Agronomy
J.K. Mukiibi	BSc (London), PhD (St. Andrews), Prof., Plant Path., on leave
C.W. Baliddawa	BSc (Agric.), MSc (MU), PhD (London), DIC, FRES, Assoc. Prof., Ag. Ent.
S.A.P. Owera	BSc (Agric.), Dip. Ed. (MU), PhD (Wales), Sr. Lecturer, Plant Path.
R.L. Adupa	BSc (Agric.), PhD (Wales), Lecturer, Biometrics
P. Rubaihayo	BSc (EA), MSc (MU), PhD, (Ill.) Associate Prof. - Plant Breeding

E. N. Sabiiti BSc (Agri.), MSc (Agric.) (MU),
PhD (UNB), Lecturer, Ecology
and Pasture Agron.

Adipala-Ekwamu BSc (Agric.), MSc (MU),
Lecturer, Plant Path.

I. Kibirige-Sebunya BSc (Agric.) (MU), MSc, PhD
(Saskat.) Part-time Lecturer,
Plant Breeding and Genetics

C. Sekabembe BSc (Agric.), MSc (Agric.),
Lecturer, Crop Agron.

Department of Forestry

D.B.A. Ruyooka BSc (Wales), PhD (Aust. Nat. U.),
Head and Assoc. Prof., Wood Ind.

J.R.W. Aluma BSc (For.), MSc (MU), DSc (Nor.)
Sr. Lecturer, Forest Eng.

J.S.O. Epila BSc (For.) (MU), PhD (Aust. Nat.
U.), Lecturer, Forestry Ent.

J.R.S. Kaboggoza BSc (For.) (MU), MSc, PhD
(Berkeley), Lecturer, Wood Tech.

A.Y. Banana BSc (For.) (MU), MSc (Berkeley),
PhD (aust. Nat. U.), Lecturer,
Wood Sci.

C.K.G. Muhirwe BSc (For.), MSc, Lecturer,
Forestry Mensuration

S. Gombya-Ssembajjwe BSc (For.) (MU), G.Dip., MSc
(Aust. Nat. U.), Lecturer, Forest
Econ.

T.K. Byaruhanga BSc, MSc (For.), Dip.Ed. (For.
Biol.)

S.R. Turyatunga BSc (For.) (MU), MSc, Ed., Part-
time Lecturer, Forestry Mgt.

Department of Soil Science

J.Y. Kitungulu-Zake BSc (Mich.), MSc, PhD (OSU),
Head and Prof., Soil Fertility/
Chem.

J.R.F. Aniku BSc (Alexandria), MSc (Ghent),
PhD (Davis) Sr. Lect., Ped./on leave

V.O.A. Ochwoh	BSc (Agric.), MSc (MU), Sr. Lecturer, Soil Fertility
D.S. Muduuli	BSc (Agric.), Dip. Ed. (MU), MSc, PhD (Manitoba) Sr. Lect.
M.A. Bekunda	BSc (Agric.) (MU), MSc (Wageningen), Lecturer, Soil Chem., on leave
J. Tumuhairwe	BSc (Agric.), MSc, Lecturer, Soil Chem.
M.K. Magunda (Part-time)	BSc (Agric.) (MU), MSc (Ghent), Part-time Lecturer, Soil Physics
M. Silver	BSc (Agric.), MSc (MU), Lecturer, Soil Micro.
M.A. Ameny	BSc (MU), MSc (Wales), Lecturer Biochem.
J.B. Byalebeka	BSc (Agric.), MSc, PhD (Nairobi), Lecturer, Soil Physics

APPENDIX XI

LIST OF INDIVIDUALS AND AGENCIES CONTACTED

(AM)

Kawanda Research Station

October 19, 1987

Mrs. Elizabeth Rubaihayo
W.A. Sakira

D.A.R. Ay
T.W. Lane
I. Kibirige
W. Maghein
C. Ayo
G. Bigirwa
J. Hakiza
J. Trierweiler
M. Higenyi
S. Thusaana

Acting Dir. of Res.
SRO, Head Agron. Sect.
Team Leader/Banana Res.
SO/Cotton Breeders, Soybean
Rehabilitation Supervisor
SRO/Head, Coffee Res. Unit
SO/Maize Breeding
SO/Agron., Hort.
SO/Maize Breeder
RO, Head, Hort. Res. Unit
MFAD, Agric. Advisor
Ag. Farm Manager
Head, Botany Sect. &
Coordinator VTC Prog.,
Ag. Coordinator, Nat'l.
Beans Program

(PM)

MFAD Project Team

(AM)
Kabanyolo Farm
October 20, 1987

J. Ddungu
D. Muduuli
F. Bareeba
I. Okello-Uma

E. Rugumayo

S. Owera
Rubaihayo
A. Semana
D. Akimanzi

L. Msemakweli

D. Ruyooka
E. Sabiiti
M. Oko
W. Odongo

Prof., Crop Science
Sr. Lecturer, Soil Sci.
Sr. Lecturer, Animal Sci.
Assoc. Prof., Head,
Animal Science
Assoc. Prof., Head,
Agric. Eng.
Sr. Lecturer, Crop Sci.
Assoc. Prof., Crop Sci.
Lecturer, Ag. Exten.
Coordinator Nat'l Potato
Res. and Dev., Entebbe
Sr. Lecturer, Head, Ag.
Econ.
Assoc. Prof., Head, For.
Lecturer, Crop Sci.
Sr. Lecturer, Anim. Sci.
Sr. Lecturer, Anim. Sci.

(PM)
Director, USAID Mission, Kampala

Deputy Director

ADO, PO

Namulonge
October 21, 1987

A. Ayiseni
A. Kintukwonka
S. Eyedu

SO/Cotton Breeder
Ag. Director
SRO

(AM)
Ministry of Agriculture - Entebbe
October 22, 1987

A. Osuban	Commissioner for Agric.
F. Ojacor	Dep. Comm.
J. Mubiru	Acting Dep. Comm.

(AM)
Permanent Secretary/ Ministry of Agriculture

(PM)
Dr. John Trierweiler/MFAD Team

(AM)
Kawanda Research Station
October 23, 1987

I. Kibirige-Sebunye	SRO/Head, Coffee, Cocoa and Oil Palm Res. Unit
E. Ssendiwanyo	SO/Pedology
M. Wejuli	SO/Soil Chemistry
S. Musaana	SO/Plant Breeding and Genetics, Head Botany and VTC Prog.
G. Mukulu	SO/Ent.
C. Ssekyewa	SO/Pathology
A. Opio	SO/Pathology
J. Hakiza	RO/Head, Hort. Res. Unit
B. Male-Kayiwa	SO/Plant Breeding
M. Nabasirye	SO/Biometrics
J. Onzima	SO/Agron., Coffee Res. Unit
Y. Mwaule	Dir. of Res./SRS
S. Kabuye	SO/Agronomist
V. Trubish	SO/Hort.
J. Mukasa-Luweeka	Ent./Hort. Res. Unit
C. Ayo	SO/Agron.
A. Hakiza	SO/Plant Path.

(AM)
Naumlonge Research Station

(PM)
Dr. William E. Fenster, Acting Team Leader
MFAD Team

Kamenyamigo VTC/DFI, Masaka
(Mr. Herbert Mbironton - Assist. Farm Manager)
October 26, 1987

(AM)
KACHWEKANO VTC/DFI, Kabale
(Mr. James Kasimbazi - Principal)
October 27, 1987

(PM)
Rubare VTC, Bushenyi
(Mr. Robert Rwabubale - Farm Manager)

Mubuku Irrigation Scheme VTC, Kasese
(Mr. Deo Munyazikwiye, Officer-in-Charge)
(Mrs. Rose Gahakawa - VTO)
October 28, 1987

(AM)
Mr. Mukasa-Kiggundu - CARO
October 29, 1987

(PM)
Mr. Gib Boyd, MFAD Team

(PM)
Mr. Ken Lyvers (ADO) and Dr. Fenton Sands (PO)
USAID Mission - Kampala

(PM)
Uganda Seeds Company, Study Team
Dr. Alex Grobman and Team

(AM)

Makerere University, Faculty of Agriculture and Forestry
October 30, 1987

J. Ddungu	Prof., Head, Crop Sci.
I. Okello-Uma	Assoc. Prof., Head, Anim. Sci.
J. Opio-Odongo	Assoc. Prof., Ag. Econ.
L. Msemakweli	Sr. Lect., Ag. Econ.
E. Rugumayo	Sr. Lect., Anim. Sci.
F. Bareeba	Sr. Lect., Anim. Sci.
G. Kiuwa	Prof., Anim. Sci.
J. Zake	Prof., Head, Soil Science
I. Fendru	Lecturer, Ag. Econ.
J. Aluma	Sr. Lect., Forestry Eng.

(PM)

Mr. Ted Lane and Mr. Lavern Raam, MFAD Team

APPENDIX XII

DOCUMENTS CONSULTED

- USAID Evaluation Handbook, April 1987.
Project Paper of August 15, 1983.
Contract (Project 617-0103) No. AFR-0103-C-00-4-47-00, October 22, 1984.
Project Supplement No. 1 of March 1985.
Project Supplement No. 2 of July 1986.
Contract Amendment of March 3, 1987.
Statement of Work - Evaluation/Re-Design of the Uganda Manpower for Agricultural Development Project - undated
Uganda Concepts Paper, Fy88-90, USAID/Kampala, March 1987.
Budget Speech of the Ugandan Minister of Finance, July 24, 1987.
Address to the Nation by His Excellency President Yoweri K. Museveni, at the Special Session of the National Resistance Council, May 15, 1987.
Uganda Agricultural Task Force Report - Strengthening Agricultural Research in Uganda, Revised Version, 31 March 1987.
Uganda Task Force Report on Organisation, Manpower and Training, March, 1987.
Agricultural Policy Committee, Uganda Agricultural Task Force Programme, Final Report Summary. April 15, 1987.
Research-Extension Specialist Team (REST) Concept Report. MFAD Project, Uganda, October 1987.
Soybean Development in Uganda, MFAD Project Report, October 1987.
A Plan for Maize Research and Seed Production in Uganda, MFAD Project Report, October 1987.
MFAD Rehabilitation Report - Present Status, Projections for LOP and Phase II, October 10, 1987.
Makerere University, Faculty of Agriculture and Forestry - Strengthening of Research, Graduate Training and Extension, Functions of the Faculty of Agriculture and Forestry, a Project Proposal, June 1987.
Semi-Annual Project Implementation Reports -
April 30, 1985.
April 6, 1986.
September 30, 1986.
December 31, 1986.
March 31, 1987.
June 30, 1987.
September 30, 1987.
First Annual Report. Contract AID/AFR0103 by Contractor for period September 1, 1984 - August 31, 1985.
Second Annual Report by Contractor for period January 1, 1986 - December 31, 1986.
MFAD Quarterly Report, July - September, 1987 by Acting Team Leader, 5 October 1987.

- MFAD Monthly Report, July and August, 1987 by Acting Team Leader.
- Plan of Work, USAID/MFAD Project, 1 April through 31 December, 1987 by Acting Team Leader.
- Report on the Visit Made to VTCs in Central and Western Uganda from 8-12 June, 1987 by Sophy Musana.
- Report to MFAD Research Grants Awards Committee, by Chairman Sub-Committee on Research Grants, 28 August 1987.
- The National Bean Research Programme Bean Breeding Annual Report for 1986 by Mrs. Sophy M.M. Musana.
- Letter and Telex Attachments dated September 30, 1987 from Ken Lyvers to the Commissioner for Agriculture and the Dean of the Faculty of Agriculture, Makerere University, concerning the visit and comments by Calvin Martin on the VTCs and SAARFA.
- Technology for Research Evaluation and Agricultural Development (TREAD), A Draft Project Proposal and Attachments, September 22, 1987.
- Memorandum dated January 13, 1987 from E.L. Schmidt to John Parsons on Recommendations Relating to Nitrogen Fixation in Uganda.
- Memorandum dated 27 September 1987 from Paul singleton to Bill Fenster on Legume Inoculation Sub-Project of TREAD.
- Agricultural Research and Faculties of Agriculture in Africa, undated document concerning support for Agricultural Research and Faculties of Agriculture in Africa.
- Strengthening African Agricultural Research and Faculties of Agriculture (SAARFA) (698-0435). Statement prepared for AID workshop, Nairobi, September 21-23, 1987.
- Strengths and Weaknesses of Title II Programs: Analysis of Mission Reports.
- Regional Collaborative Research Project on Common Bacterial Blight of Beans. Project Sponsored by USAID through CIAT by Sophy Mukwanah and Asinasi Fina Opio.

APPENDIX XIII

MFAD LOCAL CURRENCY PROJECTS

			(UShx000)
Title	Items Covered	Duration	Amount
MFAD Proj. Support	<ul style="list-style-type: none"> -Airfares for some participant trainees -Rehab. supplies and equipment -Shelf item procurement -MFAD residents maintenance -Office expenses -Vehicle maintenance -Incentive pay for rehab. workers at Kabanyolo Farm -Wages and finges for local hires on project -POL 	LOP	7,500
VTC Trial & Res. Grants	<ul style="list-style-type: none"> -Field equip. for VTCs -Research grants (MA staff)* -VTC inputs (fert., pesticides, etc.) -Incentive pay for field plot research workers at Kawanda -Incentive pay for rehab. workers -Per diems for researchers 	LOP	3,190
VTC Rehab. & Res. Grant Support Proj.	<ul style="list-style-type: none"> -Rehab. of some VTC facilities -Support for OFR -Per diems for researchers -Incentive pay for VTC plot workers -CIAT Bean Program logistical support -Payment for local consultants on MFAD Review and Redesign Team 	LOP	26,500
Reactivation of Res. and Teach. Pro- grams at Kabanyolo Farm	<ul style="list-style-type: none"> -Research grants (MU/FAF staff)* -Res. inputs, fert., pesticides, etc. -Teaching materials, supplies, and chemicals -Incentive pay for field plot workers -Per diems for researchers -Shelf item procurement -Misc. tools and supplies -POL 	Dec. 31, 1987**	2,180

*Research grants that were line-itemed in the original project paper are now covered with local currency. The local currency used is generated from PL 480 programs and other USAID activities that generate funds.

** An amendment is being prepared for about 4.5 million USH to carry through the LOP.

APPENDIX XIV

NOTES ON TEAM MEMBERS

William K. Gamble, from the United States, hold BSc and MSc degrees from Iowa State University and a PhD from Cornell University. Before his retirement in November 1985 he served as the found Director General of the International Service for International Agricultural Research (ISNAR), The Hague, The Netherlands, from 1980 to 1985 and as Director General of the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria, from 1975 to 1980. Prior to becoming Director General of IITA in 1975 he served for 20 years as a senior agriculturalist for the Ford Foundation in Burma, Mexico, Central America and the Caribbean, Colombia, Venezuela and West Africa. In West Africa he was responsible for the Ford Foundation's agricultural activities in 14 West and Central African countries. From 1966 to 1975 in addition to his responsibilities in agriculture he had overall management responsibility for the Ford Foundation's total program activities in Mexico, Central America and the Caribbean, Colombia, Venezuela and West Africa.

Since his retirement he has continued to be active in agricultural research and development with consulting assignments in Chile, Dominican Republic, Nigeria, Kenya, Ethiopia, Uganda and Indonesia. He also serves as a member of the Steering Committee of Michigan State University on its Kellogg International Fellowship Program in Food Systems.

Professor John S. Mugerwa, a Ugandan, born 1937, is Dean of the Faculty of Agriculture and Forestry of Makerere University, a position that requires him to provide leadership and direction in administration and academic matters. He hold a National Diploma in Agriculture from Glasgow, BSc (Agric.) and MSc (Animal Science) from the University of Rhode Island, Kingston and a PhD degree from Ohio State University, Columbus, Ohio. He joined Makerere University in 1969. He was Head of the Department of Animal Science between 1974 and 1982 and Dean from 1977 to 1982. Toward the end of 1986, he was returned to the Deanship. He is a member of several University Committees and Boards including the University Senate.

Professor Mugerwa's consulting experience includes FAO-East African Development Bank (EADB) sponsored Task Force on Agricultural Production Projects in Kenya and Tanzania in 1982, and several of Uganda's National Agricultural Development

Programmes. He is a member of the National Research Council, Agriculture and Animal Husbandry Committee, National Food and Nutrition Council, National Agriculture and Livestock Census Committee, Chairman of the National Steering Committee for Agro-Forestry Network for Africa (AFRENA). He is a member of the Government Education Policy Review Commission and has been requested to chair a Commission to investigate the Ranching Schemes in Uganda.

Polycarp Mark Ofwono, a Ugandan, born June 1932. Educated at Makerere University where he obtained a Diploma in Education in 1958. Later he went to the University of Colorado, Boulder, where he received an MA degree in History and Political Science, in 1962.

He taught at Teso College Aloet, 1958-59, was a lecturer at Nsamizi Training Centre, from March to June, 1962. He joined the Uganda Diplomatic Service in 1962 and served in various positions. He was appointed Ambassador to Egypt, 1969-71. He was Uganda's representative to ECOSOC from 1972-73. He was appointed Secretary to the Coffee Marketing Board and served from 1974 to 1977. He was the Permanent Secretary, Ministry of Foreign Affairs, from 1979-80, and Permanent Secretary, Ministry of Agriculture from 1986 to 1987. Recently retired from Government Service.

J. Duain Moore, Professor Emeritus, Department of Plant Pathology, College of Agriculture, University of Wisconsin, Madison. Holds BSc, MSc and PhD degrees. He has had a distinguished career in teaching and research at the University of Wisconsin and has held direct responsibility for research for some of its research stations.

He served on the UW Technical Assistance Team in the founding and early development of the University of Ife, Nigeria, where he served as Dean of the Faculty of Agriculture.