

PDBBA380

AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT DATA SHEET</b>		1. TRANSACTION CODE <input checked="" type="checkbox"/> A = Add C = Change D = Delete	Amendment Number	DOCUMENT CODE 3
2. COUNTRY/ENTITY UGANDA		3. PROJECT NUMBER 617-0103		
4. BUREAU/OFFICE AFR		5. PROJECT TITLE (maximum 40 characters) MANPOWER FOR AGRICULTURAL DEVELOPMENT		

6. PROJECT ASSISTANCE COMPLETION DATE (PACD) MM DD YY 09 30 88	7. ESTIMATED DATE OF OBLIGATION (Under "B:" below, enter 1, 2, 3, or 4) A. Initial FY 83 B. Quarter 4 C. Final FY 84
----------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------

8. COSTS (\$000 OR EQUIVALENT \$1 = )

A. FUNDING SOURCE	FIRST FY 83			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	( 7,021 )	( 479 )	( 7,500 )	( 8,521 )	( 479 )	( 9,000 )
(Loan)	( 7,021 )	( 479 )	( 7,500 )	( 8,521 )	( 479 )	( 9,000 )
Other U.S.						
1.						
2.						
Host Country		747	747		3,009	3,009
Other Donor(s)						
<b>TOTALS</b>	<b>7,021</b>	<b>1,226</b>	<b>8,247</b>	<b>8,521</b>	<b>488</b>	<b>12,009</b>

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) EN	188	080		-		7,500		9,000	
(2)									
(3)									
(4)									
<b>TOTALS</b>								<b>9,000</b>	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each) 600 963	11. SECONDARY PURPOSE CODE 121
12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each) A. Code R/AG XII PVOU B. Amount	

13. PROJECT PURPOSE (maximum 480 characters)

To assist the Government of Uganda to rehabilitate, retrain and redirect its agricultural manpower and institutional capability in food crops production.

14. SCHEDULED EVALUATIONS Interim MM YY 12 85 Final MM YY 09 88	15. SOURCE ORIGIN OF GOODS AND SERVICES <input checked="" type="checkbox"/> 000 <input checked="" type="checkbox"/> 941 <input checked="" type="checkbox"/> Local <input type="checkbox"/> Other (Specify)
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16. AMENDMENT'S/NATURE OF CHANGE PROPOSED (This is page 1 of \_\_\_\_\_ page PP Amendment)

17. APPROVED BY	Signature <i>John A. Cole</i>	18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION MM DD YY
	Title <i>Mission Director</i>	

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## List of Acronyms

ADO	-	Agriculture Development Officer
AID/W	-	AID/Washington
BIFAD	-	Board of International Food and Agriculture Development
CARO	-	Chief Agricultural Research Officer
CIAT	-	International Center for Tropical Agriculture
CIF	-	Cost Insurance and Freight
CIP	-	International Potato Center
CIMMYT	-	International Maize and Wheat Improvement Center
EOPS	-	End of Project Status
FAA	-	Foreign Assistance Act
FAF	-	Faculty of Agriculture and Forestry (Makerere)
FAO	-	Food and Agriculture Organization
FSR	-	Farming Systems Research
FVA	-	Bureau for Food for Peace and Voluntary Assistance
FX	-	Foreign Exchange
FY	-	Fiscal Year
GOU	-	Government of Uganda
IARC	-	International Agricultural Research Center
ICRISAT-	-	International Crops for Research Institute for the Semi-arid Tropics
IEE	-	Initial Environmental Examination
IITA	-	International Institute of Tropical Agriculture
ILCA	-	International Livestock Center for Africa
LC	-	Local Currency
MAF	-	Ministry of Agriculture and Forestry
MU/FAF	-	Makerere University, Faculty of Agriculture and Forestry
PACD	-	Project Activity Completion Date
PID	-	Preliminary Identification Document
PIO/T, C, P,	-	Project Implementation Order/Technician/Commodity Participant
PO	-	Purchase Order
POL	-	Petroleum, Oil, Lubricants
PP	-	Project Paper
PSA	-	Procurement Services Agency
PVO	-	Private Voluntary Organization
PY	-	Project Year
REDSO/ESA	-	Regional Economic Development Services Office/East and Southern Africa
RFMC	-	Regional Financial Management Center
RFP	-	Request for Proposal
SRS	-	Serere Research Station
TA	-	Technical Assistance
USG	-	United States Government

SECTION 2

DRAFT PROJECT AUTHORIZATION

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Manpower for Agricultural Development Project (617-0103) grant funds over a two year period from date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project. The planned life of the Project is five years from the date of initial obligation.

2. The Project will assist the Government of Uganda to rehabilitate agricultural institutions in research, teaching and extension in Uganda through the retraining of agricultural research and teaching staff, rehabilitation and re-equipping of agricultural research, teaching and office facilities, support for individual agricultural research proposals, retraining of extension staff, and the development of linkages between agricultural research and extension activities. It is planned that the A.I.D. grant will provide financing for retraining, technical assistance, facilities rehabilitation, a small grant research program, and commodities and equipment.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and other major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a. Source and Origin of Commodities, Nationality of Services

Commodities financed by A.I.D. under the Project shall have their source and origin in the Cooperating Country or in countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing. The suppliers of commodities or services (including ocean shipping) shall have the Cooperating Country or countries included in A.I.D. Geographic Code 941 as their place of nationality, except as A.I.D. may otherwise agree in writing.

b. Conditions Precedent

Prior to the disbursement of funds for rehabilitation of housing for AID-financed technical assistance advisors and to disbursement of funds for the services of such advisors, or to

the issuance of any commitment documents with respect thereto, the Cooperating Country will provide, in form and substance satisfactory to A.I.D.:

1) Evidence that specific houses acceptable to A.I.D. have been identified and assigned for each advisor and assurances that such housing will remain committed for Project use for the entire life of the Project; and

2) A rehabilitation plan for the house or houses for which disbursement is sought which includes a list of repairs to be made, the materials required for such repairs, the planned arrangements for receipt and safekeeping of repair materials, a repair schedule, an identification of the persons who will be responsible for making the repairs, and how and by whom the repairs will be supervised.

3) Prior to the disbursement of funds for rehabilitation or re-equipping of agricultural research, teaching, and office facilities, or to the issuance of any commitment documents with respect thereto, the Grantee will provide, in form and substance satisfactory to A.I.D. a rehabilitation plan for such facilities which includes a list of repairs to be made and new equipment or repair parts required; materials required for such repairs; planned arrangements for receipt and safekeeping of repair materials, new equipment, and repair parts; a schedule for repair and re-equipping; an identification of the persons who will be responsible for making repairs or installing equipment; and how and by whom repairs and equipment installation will be supervised.

c. Covenants

1. The Cooperating Country agrees to fill the position of Chief Agricultural Research Officer (CARO) in the Ministry of Agriculture within nine (9) months of the date of the signature of this Agreement, unless A.I.D. agrees to a later date in writing.

2. The Cooperating Country covenants and agrees to take the necessary measures to insure that adequate secure storage space is made available at the Serere Research Station and the Kabanyole Farm to insure that equipment financed by A.I.D. under the Project is protected from theft, unauthorized use, or damage from the elements.

3. The Cooperating Country agrees that the educational status of farm managers at the Kabanyolo Farm should be upgraded, the Farm Manager position to M.Sc. and the two Assistant Farm Managers to B.Sc. Within the first year of the Project, the Cooperating Country will submit to A.I.D. a definitive plan for upgrading these positions.

4. The Cooperating Country agrees that the housing made available by it for the technical assistance advisors financed by A.I.D. under the Project will be made available for as long as such housing is required for the Project and that no agency of the Government of the Cooperating Country shall in any way interfere with or hinder the occupancy and use of the housing units by the technicians to whom they are assigned.

5. The Cooperating Country agrees that responsibility for the sorghum and millet research activities at Serere Research Station will be transferred from the Ministry of Regional Cooperation to the Ministry of Agriculture within six (6) months of the date of signature of this Agreement, or by such later date as A.I.D. may agree to in writing.

6. The Cooperating Country agrees that it is desirable to ensure that the Kabanyolo Farm has an assured source of funds to meet essential farm operating costs and, in this regard, agrees that steps will be taken to permit the farm to have first claim on revenue generated from the sale of produce therefrom, such funds to be reserved to meet the necessary operating expenses of the farm, including the capitalization of a fund for periodic repair, maintenance and replacement of farm equipment. The Cooperating Country will provide a written report to A.I.D. on the steps which have been taken in this regard no later than six (6) months from the date of signature of this Agreement.

### SECTION 3

#### PROJECT RATIONALE AND DESCRIPTION

##### A. Relationship of the Project to the Sector Goals

Uganda is overwhelmingly an agricultural country, with 93 percent of the population of 13 million living in the rural area, and even a higher percentage relying on the agricultural sector for a living. The population growth rate of three percent a year will lead to a doubling of the population from 13 to 26 million in the next 23 years, and a further doubling to over 50 million by 2040. The country is

fortunate at present in having sufficient fertile land for the food needs of the growing population as well as having the opportunity and the market to export food crops to neighboring food deficit countries. However, further increases in agricultural production will have to come from increased productivity, more intensive use of the existing land base and from a movement into more marginally productive areas. Thus population growth and export potential call for a substantial expansion of food and fiber production for domestic use and a major diversification and growth of production for export.

Uganda was self-sufficient in basic foodstuffs throughout the period of the British Protectorate (1902-1962) and this self-reliance continued after independence in 1962. At a time when many developing countries are described as countries of chronic food deficits, Uganda is not yet among them. The causes of agricultural difficulties in the early 1980s can be regarded as temporary, resulting from eight years of military misrule (1971-79), one year of warfare with disrupted agricultural planting in 1978-79, drought, which has affected the northern and eastern half of the country during 1979-80, and lack of agricultural inputs. Until recently Uganda's diet has been reasonably adequate and diversified (FAO calculates the average food consumption at 2050-2100 calories per day, including 56 grams of protein), but past circumstances do not assure an adequate food supply for the future. Only a successful agricultural improvement program can enable the country to maintain food self-sufficiency and food exports to neighboring countries as its population climbs toward 24 million in 2000.

Eight food crops provide 96 percent of the calories in the Ugandan national diet. Included are three cereals - finger millet, maize and sorghum; three starchy or high carbohydrates foods - plantain, cassava and sweet potatoes; one legume, phaseolus beans, and one oilseed, groundnuts. All eight crops have been studied by the research service with recommended varieties and agronomic practices tested and released by the Government.

Despite this attention, the research service has relatively little influence upon farmers, chiefly for two reasons. First, much research was not aimed at reducing the farmers' constraints to increased agricultural production of food crops, and second, because of the turmoil during the past decade, there has been practically no opportunity to carry out badly needed research. The research staffs have been limited because of equipment and supply shortages, lack of supporting budgets for salaries for both professional, technical and labor

staffs, and the opportunity to keep up to date on agricultural research carried out in institutions outside of the country. In order to make applied research effective, Uganda will need to re-equip its research stations and re-train its research staffs. In addition, the research capability must begin to be more closely linked with extension. The training in extension discussed in 3.C. below will lay a foundation for the research/extension linkage within the education system of the country.

The Recovery Program 1982-84, Republic of Uganda, April, 1982 addresses the policies for the agricultural sector by stating:

"The objectives for the 1982-84 recovery period are to restore agricultural productivity and to encourage structural adjustments in the sector that reflect Uganda's comparative advantage. This will be achieved through a combination of policies and public sector investment measures that provides farmers with the incentive and means to increase production. Priority will be given to measures that have an immediate effect or which are essential to the long-term development of the sector." The Recovery Program has most recently (June 1983) increased emphasis on agricultural research as it is one component which has received no donor interest to date.

In its CDSS the USAID strategy is to provide incremental financial resources to the available human and natural resources which will yield steady, long term growth. The Ugandan farmers are relatively sophisticated, produce a variety of crops and livestock, and are quite responsive to technological developments that will enable them to increase productivity. At present they do not produce at capacity, in part because of the inefficiency of the education, extension and research institutions that should either directly or indirectly serve their needs. This project should begin to restore the capacity of a number of Uganda agricultural institutions to develop and improve agricultural skills and methodology.

#### B. Project Objectives

1. Goal - The overall goal of the project is to assist the Government of Uganda in its recovery program to stimulate small farmer food crop production.

2. Purpose - In order to achieve the above-stated goal, one of the elements which must be accomplished is revitalized agricultural institutional manpower. Thus, the purpose of the project is to assist the Government of Uganda to rehabilitate, retrain and redirect its agricultural manpower and institutional capabilities in food crops production.
3. End of Project Status (EOPS) - At the end of this five year project one should be able to state that the agricultural research capability of Uganda for food crops (and to an extent export crops) has been improved through retraining, re-equipment and rehabilitation and is poised to recommence major agricultural research in food crops. To the extent that this EOPS is approached prior to the terminal date of the project, it will accelerate the initiation of new food crop research for the benefit of small farmers.
4. Outputs - The EOPS predicated above depends on the achievement of the series of outputs listed below
  - a) retrained staff;
  - b) rehabilitated and re-equipped research facilities;
  - c) rehabilitated and re-equipped teaching and office facilities; and
  - d) a joint research coordination system which establishes research priorities and is linked to extension.

These outputs will evolve from the effective implementation of project activities which coordinate the flow of project inputs.

### C. Project Elements

#### 1. Inputs and actions

##### (i) Technical Assistance

The technical assistance provided by this project will consist of four (4) professionals,

(a) the Team Leader, located at Makerere University, Faculty of Agriculture and Forestry (MU/FAF), with the responsibility for preparing documentation and follow-up actions for participant training before departure and after returning in conjunction with a developed training plan (see Scope of work Annex E-3), and collaborating in the development of the teaching and research rehabilitation program at the Faculty.

(b) A professional farm manager, located at the University Teaching and Research Farm (Kabanyolo), who will provide farm management leadership and assist in the rehabilitation of the Farm. Teaching components are necessary at the Farm to provide practical student training and in-service training for research and extension workers.

(c) An agricultural advisor, located at Serere Research Station (SRS) in Northern Uganda, who will provide assistance in the management of the station during the rehabilitation period, and will aid the Station Director and staff in the designing and implementation of in-service training sessions for the research staff.

(d) An agricultural research advisor located at the Ministry of Agriculture and Forestry (MAF) headquarters to assist and advise the Chief Agricultural Research Officer (CARO) in planning, coordinating and implementing the national research effort for the MAF.

The technical assistance professionals will be required as follows:

Team Leader	4 years
Agriculture Research Advisor	3 years
Farm Management Specialist	3 years
Agricultural Advisor	3 years

In support of the professionals assigned to Kabanyolo and Serere, the project proposes to locate four PVO volunteers (Peace Corps type individuals who receive a nominal

remuneration for services provided) who will assist in the enormous task of rehabilitation of facilities and equipment as well as in installing and maintaining new equipment.

### In-Service Training

A major activity of this project is to re-train 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 MAF. Staff from the MAF have been selected from the ministry headquarters, the agriculture colleges, Serere Research Station and Kawanda and Namulonge Research Centers. Staff from MU/FAF and the Farm Managers constitute those candidates for re-training at the university level. The network approach undertaken by MU/FAF and the MAF in cooperation with the International Agricultural Research Centers (IARCs) and U.S. agricultural institutions will provide a sound basis for the Government to accelerate the agricultural rehabilitation program. This project will provide refresher and retraining programs for approximately 3 to 4 months duration. Staff currently holding Ph D, MSc and BSc Degrees will receive the short term training with only a limited number at the BSc level. Careful selection of the staff will be required to ensure continuity of the ongoing programs in teaching, research and extension.

Given the mix of re-training presented above, this project should lay the foundation for farming systems research activity that fits well into the Agriculture Research/Extension network being established in East and Southern Africa.

Approximately 42 staff are scheduled for retraining from the MU/FAF, 40 from the MAF and 5 from the Ministry of Regional Cooperation. An average of sixteen professors, scientist educators and extension workers per year will participate in the retraining program. (See Annex E-4)

### MU/FAF "Extension Specialist"

Research, teaching and extension should be perceived as a single technology system with feedback linkages for implementation of programs for increased food production. This has been a problem for Uganda in past years and several reports recognize this situation and have recommended that various methods be used to provide linkages between MU/FAF research, national research centers, Kawanda, Namulonge and Serere, and the MAF extension service.

The Faculty administration will identify personnel who will act as "extension specialists" for the Faculty. Their major responsibility will be work with MU/FAF scientists in preparing publications, conduct in-service training programs and work directly with MU/FAF and the MAF extension services in providing new knowledge for the farm population.

The project provides for the retraining in the U.S. of one MU/FAF staff member from each of the six departments in the Faculty - Agriculture Economics, Agricultural Engineering, Crop Science, Soil Science, Animal Science and Forestry.

### Seminars

The project will provide for a maximum of five (5) conference/seminars hosted by MU/FAF. Short term educators and scientists from International Agricultural Research Centers and U.S. universities will be funded from the project for the purpose of presenting papers or leading discussions in conferences/seminars on topics of immediate importance to agricultural development. Administrative, extension and research staff and other persons in agricultural development in Uganda will participate in these conferences/seminars.

### Research Proposals

This project provides funding for a limited number of research proposals, providing the opportunity for university scientists and MAF to undertake research into problems of immediate concern and importance to agricultural food production in Uganda.

The granting of funds to scientists will be approved through MAF, the Makerere research committee and the National Research Council.

### Rehabilitation

Funds are made available for several rehabilitation activities. As most housing is dilapidated or has been looted, it will be necessary to renovate all quarters to be occupied by expatriate technical assistance and PVO Volunteers. Rehabilitation will also be necessary on selected buildings at MU/FAF (primarily glass replacement, paint, plumbing, some wiring and fixtures) and at Serere (glass replacement, paint, some roof and ceiling work, laboratory table tops and sinks and a fumehood room). In addition, specific rehabilitation actions

are envisioned for selected farm facilities, such as the greenhouse, piggery, dairy facilities and the greenhouse, cattle dip tanks etc., at Serere. A detailed presentation of the rehabilitation requirements is presented in Annex E-2.

### Re-Equipment

An overwhelming need of all facilities is for renovation of existing equipment, whenever possible, or the provision of new equipment. All existing equipment showed the effects of ten years of extremely limited maintenance with totally inadequate spare parts supplies. Visual inspection by the PP team led to the discovery of a surprising amount of usable or, nearly usable, equipment which could be put back in shape with a nominal quantity of spare parts. The equipment included in this project is considered to be only that equipment which is essential to permit the various facilities to commence operation. All items have to be scrutinized to ensure that new items are procured only if it is evident that rehabilitation through spare parts would exceed the cost of new procurement. The objective in all equipment procurement is to prepare the facilities to resume their roles in agricultural training and research without necessarily duplicating the status of those facilities in the late 1960s.

## 2. Project Sites

### (a) Makerere University - Faculty of Agriculture and Forestry (MU/FAF)

Makerere University is composed of 10 Faculties and 5 Institutes with approximately 325 staff and 4500 students. In the 1960s Makerere was widely recognized as one of the leading universities of Africa. The University is located in Kampala, the capital of Uganda with a population of 450,000.

Agricultural instruction began at Makerere University as early as 1922 with a three - year diploma course taught largely by the officers of the Ministry of Agriculture. It became a Faculty of Agriculture and Forestry in 1961 and awarded the London BSc in Agriculture. The FAF presently has 37 staff in agricultural economics, agricultural engineering, crop science, soil science, animal science and forestry. Both the MSc and BSc programs are currently offered at the FAF with nine students enrolled in the MSc program and 297 in the BSc program. The BSc is a three year program with 235 students in agriculture and 62 in forestry.

(b) The University Farm (500 acres), located at Kabanyolo approximately twelve miles northeast of Kampala on the Gayaza road, is used for teaching and research by the FAF staff. There are apartments for about 20 graduate students and dormitories for 80 undergraduates who spend their second year at the Farm engaged in practical training. Approximately 15 senior staff houses are located at the Farm and are occupied by staff from the FAF. Research emphasis in the past has been on the major food crops, particularly maize, grain legumes, pastures, dairy, poultry and rural economy.

(c) MAF Headquarters - Entebbe

The Ministry of Agriculture is located at Entebbe, approximately 22 miles south of Kampala. Entebbe has a population of 21,000 and is the former capital of Uganda. Most ministries, however, have moved to Kampala, although of the MAF has not. The Veterinary Training Institute and the Forestry Department are also located here.

(d) Serere Research Station -

Serere Research Station is located in Northern Uganda, 18 miles south of Soroti on 1800 acres, of which 200 are for cropping and 60-70 for experimental use. The station is located in the ecological zone known as the short grass area, with long rains from March to July and short rains September to October. The station is at an elevation of 1300 metres, has 1000 mm annual rainfall, and serves the Eastern and Northern Uganda areas. 30 sub-stations are in this area, of which 20 are operational and 10 are presently being used by Serere Station.

3. Project participants and responsibilities

Project implementation on the part of the GOU will be carried out by the MAF and MU/FAF. The MAF will be responsible for activities at Entebbe, within the Agricultural Research Division of the headquarters, and at the Serere Research Station. MU/FAF will be responsible for on-campus activities at the Faculty and for both training and research activities at the Kabanyolo Farm. Primary responsibilities of the GOU entities is to assure that the GOU funding is provided on a timely basis to pay staff, provide for agreed upon operating expenses and make any necessary local arrangements to accomplish project objectives (see Implementation Plan - Section 5 for details).

USAID/Uganda is also a participant with the specific responsibilities usual in project implementation such as contracting, procurement, training placement, monitoring and evaluating. These responsibilities are discussed in greater detail in Sections 5 & 6 below.

#### 4. Project beneficiaries

There are five types of project beneficiaries in this project (one institutional and four individual) which derive differing levels of benefit from the project. Perhaps the most obvious beneficiaries are the 87 senior professional staff who will receive 3-4 months of re-training each. They will benefit from the opportunity of being brought up-to-date in their field and can thus provide an indirect benefit to one of the next levels of beneficiaries. Another set of direct beneficiaries (as well as indirect from the professional staff) are the students of the Faculty of Agriculture (approximately 450 over the life-of-project) who will be able to use up-dated equipment, supplies, and books, as well as learn practical agricultural techniques on the operational Kabanyolo Farm. A third type of beneficiary are the workers on the research station and the farm who will be able to effectively contribute to research activities taking place at these locations because they will have functioning equipment with which to work. The last set of individual beneficiaries is well removed from any direct benefit from this project. Nevertheless, the small farm food crops producing family (of which there may be 2 million in Uganda) will certainly derive downstream benefits from rejuvenated agricultural research activities. Such downstream benefits may take years to arrive and will certainly require other inputs to be fully achieved, but ultimate increases in food production attributable to agricultural research are indisputable. Finally, the institutional beneficiary is the GOU, to the extent that the MAF and MU/FAF are institutionally strengthened to perform their assigned tasks (for a further discussion of beneficiaries see the Social Soundness analysis - Section 7-D).

#### Section 4: Cost estimates and financial plan

The project calls for grant funding from AID in the amount of \$9,000,000 with local currency support from the Government of Uganda in the amount of \$3,008,940 over the life of the project. Table I shows the breakdown of the AID contribution into technical assistance (\$2,417,000), training (\$1,058,000), commodities (\$2,720,000), other costs (\$765,000), and contingency and inflation (\$1,830,000). Of the total

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grant, \$8,521,000 (95%) will be expended as foreign exchange while \$479,000 (5%) will be expended in local currency (mostly for POL, local training, and research proposal support.). Considerable back-up data for Table I is to be found in Annex E.

The Government of Uganda supporting budget is shown in Table II and totals \$3,008,940 over the life of the project. This contribution constitutes 25.1 percent of the project, thus complying with the requirements of Section 110-a of the FAA.

The costing of inputs related to outputs is shown in Table III. The four outputs receive the following percentages of the AID provided funds:

(A) Ministry of Agriculture (HQ)	13.9%
(B) Makerere/Faculty of Agriculture	27.1%
(C) Kabanyolo Farm	26.4%
(D) Serere Research Station	32.6%

The final Table presents the anticipated expenditures of AID funds by Fiscal Year for the life of the project.

TABLE I

	PY I		PY II		PY III		PY IV		PY V		TOTAL	
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC
<b>I. Technical assistance</b>												
A) Team leader- Makerere	150		150		150		150		-		600	
B) Farm Manager- Kabanyolo	145		145		145		-		-		435	
C) Farm Manager- Serere	145		145		145		-		-		435	
D) CARO Advisor- Entebbe	150		150		150		-		-		450	
E) PVO Volunteer	150		150		-		-		-		300	
F) Short term TA	35		35		35		35		35		175	
G) Evaluation			11		-		-		11		22	
	<u>775</u>		<u>786</u>		<u>625</u>		<u>185</u>		<u>46</u>		<u>2417</u>	
<b>II. Training</b>												
A) U.S.	(14)227		(5)83		(7)116		(3)116		(3)47		(36)589	
B) IARCs	(11)99		(13)117		(13)117		(9)81		(5)45		(51)459	
C) Local		$\frac{2}{2}$		$\frac{2}{2}$		$\frac{2}{2}$		$\frac{2}{2}$		$\frac{2}{2}$		$\frac{10}{10}$
	<u>326</u>		<u>200</u>		<u>233</u>		<u>197</u>		<u>92</u>		<u>1048</u>	
<b>III. Commodities</b>												
A) Farm Machinery	600										600	
B) Generator pumps	160										160	
C) Office equipment	85										85	

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	PY I		PY II		PY III		PY IV		PY V		TOTAL	
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC
D) Lab equipment	600										600	
E) Farm Supplies	56		28		28		28				140	
F) Furniture	220										220	
G) POL		42		42		42		42		42		210
H) Books & Journals	55		12		11		11		11		100	
I) Transport	410	-			195						605	
	<u>2186</u>	<u>42</u>	<u>40</u>	<u>42</u>	<u>234</u>	<u>42</u>	<u>39</u>	<u>42</u>	<u>11</u>	<u>42</u>	<u>2510</u>	<u>210</u>
IV. Other												
A) Rehabilitation												
(1) Farms	425										425	
(2) Houses	330										330	
(3) Security	20										20	
B) Research grants	20	20	20	20	20	20	20	20	20	20	100	100
	<u>795</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>875</u>	<u>100</u>
Subtotal	4082	64	1046	64	1112	64	441	64	169	64	6850	320
Contingency 10%	408	6	105	6	111	6	44	6	17	6	685	30
Subtotal	4490	70	1151	70	1223	70	485	70	186	70	7535	350
Inflation 10% FX (8%)	367		115		257		161		86		986	
15% LC 10%)		7		11		23		36		52		129
TOTAL	4857	77	1266	81	1480	93	646	106	272	122	8521	479
	<u>4934</u>		<u>1347</u>		<u>1573</u>		<u>752</u>		<u>394</u>		<u>9000</u>	

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TABLE II GOU BUDGET  
(in U.S.\$\*)

	PY I	PY II	PY III	PYIV	PY V	TOTAL
<b>I. Ministry of Agriculture</b>						
(A) Headquarter						
Salaries	4565	2408	2408	2408	2408	14
B) Serere						
Salaries	66582	35108	35108	35108	35108	207014
Operation Support	347578	183268	183268	183268	183268	1080650
	<u>418725</u>	<u>220784</u>	<u>220784</u>	<u>220784</u>	<u>220784</u>	<u>1301861</u>
<b>II. Makerere/FAF</b>						
Salaries	145203	76562	76562	76562	76562	451451
Office expenses	12172	6418	6418	6418	6418	37844
Stores	51379	27091	27091	27091	27091	159743
Travel	40681	21450	21450	21450	21450	126481
Special Expenses	10966	5782	5782	5782	5782	34094
	<u>260401</u>	<u>137303</u>	<u>137303</u>	<u>137303</u>	<u>137303</u>	<u>809613</u>
Contingency 10%	67913	35809	35809	35809	35809	211149
Inflation 15%	-	59084	127031	205171	295031	686281
Total	747039	452980	520927	599067	688927	3008940

\*Based on GOU fiscal year 1983 budget at exchange rate of U/Sh. 116/- for PY I  
220/ for remainder

TABLE III

Input/Output (site)	MAF HQ	MU/FAF	Kabanyolo Farm	Serere Station	Total
I. Technical Assistance					
LT	450	600	435	435	1920
ST	40	135			175
PVO Volunteer Evaluation	6	6	100	50	300
	<u>496</u>	<u>741</u>	<u>590</u>	<u>590</u>	<u>2417</u>
II. Training					
U.S.	(11) 180	(24) 392		(1) 17	589
IARC		(15) 135	(2) 18	(34) 306	459
Local	3	3	2	2	10
	<u>183</u>	<u>530</u>	<u>20</u>	<u>325</u>	<u>1058</u>
III. Commodities	215	495	905	1105	2720
IV. Other					
Rehabilitation	60	60	380	275	775
Research grants	40	120		40	200
	<u>100</u>	<u>180</u>	<u>380</u>	<u>315</u>	<u>975</u>
Subtotal	994	1946	1895	2335	7170
% Contingency	99	195	188	233	715
% Inflation	155	302	295	363	1115
Total	<u>1248</u>	<u>2443</u>	<u>2378</u>	<u>2931</u>	<u>9000</u>

TABLE IV  
\$'000

FY 83	
FY 84	
FY 85	1,590
FY 86	3,600
FY 87	1,600
FY 88	1,330
	880
Total	<u>\$9,000</u>

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5. Implementation Plan

This section will present the strategy of how the project will procure the various inputs required for project activities, how it will provide training and obtain contracts, and on what time basis these actions will take place.

A. Contracting for Technical Assistance -

1. Expert Technicians. A PIO/T will be drafted using the scopes of work attached in Annex E-1 which will seek to obtain a contract for services with a university or consortium of universities as was proposed in the PID-like document approved by AID/W. USAID/Uganda, assisted by REDSO/ESA, will use the service of BIFAD/AID/W to shortlist eligible Title XII institutions which will be requested to submit proposals. REDSO/ESA will contract with the selected institution following normal AID direct contracting procedures.
2. PVO Volunteers - USAID/U will work with FVA/AID/W to ascertain the possibilities of obtaining PVO interest in supplying the 4 volunteers (scopes of work in Annex E-3) needed in this project. It may be that the selected PVO will act as a sub-contractor to the selected Title XII university. In any case the project will support the costs of placing the volunteers in the field.

B. Training - Prior to the arrival of the prime contractor in Uganda, USAID/Uganda will use standard AID PIO/P procedures to send selected trainees for training in the U.S. and at the IARCs. Airfare, normally required of the host government, will be paid by USAID upon approval of a waiver by the USAID Director. Justification for this waiver is the dearth of foreign exchange available to the GOU which would rapidly become a constraint on effective implementation of training activities.

C. Rehabilitation Contracts -

1) Makerere - The FAF will use its special expenditure category in its budget to pay for labor for rehabilitation activities at the Farm and at the Faculty building. Makerere's Estates Department will provide all

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supervision necessary for rehabilitation. AID will be responsible for providing supplies/equipment for rehabilitation, which will arrive in tranches and will be stored and used under supervision of the Department and MU/FAF. All supplies will be procured after the implementation and supervision plan has been provided and agreed to by AID.

2) MAF - Labor for rehabilitation will be provided by the MAF and supervision will be arranged by them from the Ministry of Housing, which supervises this level of GOU force account activity. As above, AID will be responsible for providing supplies/equipment for rehabilitation, which will arrive in tranches and be stored by the MAF. All supplies will be procured after the implementation and supervision plan has been provided and agreed to by AID.

3) Housing - USAID/Uganda has an existing procedure for restoring damaged and looted houses for its own personnel. This procedure will be expanded in terms of needed personnel for supervision, etc., and utilized for all units at Kampala, Entebbe and Kabanyolo. The housing at Serere will be undertaken by the MAF as part of 2 above.

#### D. Research Proposals

The existing procedures for review and approval of research proposals for the MAF and MU/FAF will be utilized. As to funding, each entity will establish a special account from which to draw necessary funds as each research proposal is approved. It will be necessary to provide each special account with an initial advance which can be replenished on a 60 to 90 day basis as expenditures are justified. The Project Paper preparation team envisions that the research proposals to be funded under the project will be in food and non-traditional export crops in the following discipline areas: (a) soil management and plant nutrition; (b) plant breeding; (c) economics of new agricultural technology; (d) agricultural policy analysis; (e) marketing systems analysis; (f) cereal and legume research on less favorable environments; (g) farming systems research analysis; (h) farm level postharvest grain losses; (i) nitrogen fixation on legume crops; (j) mixed crop and livestock systems; (k) plant diseases and insect control; and (l) cultural practices on oilseed crops.

1) MU/FAF - The existing review and approval procedure is that an individual researcher develops a research proposal for submission to the Faculty Research Committee. The

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Faculty recommends the research proposal to the National Research Council (which includes representation of both the MAF and MU/FAF) for approval. Once approved, the applicant can obtain funding from the special account under the supervision and accounting of Makerere's Grants Section.

2) MAF - The current procedure is for an individual researcher to develop a proposal for review by the head of his section at a research station. Each research station has an Experiments Committee chaired by the Director of the Station. If endorsed by the Experiments Committee, the proposal is forwarded to the National Agricultural Research Advisory Committee chaired by the Commissioner of Agriculture with representation of the Dean of MU/FAF. Upon approval by this Committee, the proposal is funded from a special account established by the MAF and a research supervisor is assigned to monitor the applicant's research activities.

#### E. Procurement

Given that a substantial portion of this project is equipment procurement, the procurement plan is more extensive than otherwise might be expected. All comments on procurement of equipment are keyed to the table on page. Equipment under categories A (Farm Machinery), B (Generators), C (Pumps), E (Office Equipment and Supplies), G (Lab Equipment), and J (Appliances for Housing), will be purchased in the United States by a procurement service agent (PSA). The general specifications for the equipment are contained in the PP as Annex E. No waivers are anticipated at this time.

The PSA will be chosen in accordance with the procedures set forth in draft Chapter 4 of Handbook 15. The estimated fee to the PSA will be less than \$100,000. The PSA will procure the items on a CIF basis in accordance with the regulations contained in Chapter 3 of Handbook 11. The PSA will ensure that commodities are delivered to the correct project sites; Makerere University, Serere, or Entebbe respectively. All these commodities are required in country as soon as possible, and a specific delivery schedule will be included in PSA's contract.

Commodities in lists D, (materials for repair/renovation of milk parlor, piggery, etc), I (materials to rehabilitate housing), J (furniture for housing), and N (materials to renovate buildings and farms), will be procured in Nairobi by a local procurement service agent.

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Specific lists of commodities which will be required, plus a delivery schedule AND will be forwarded to AID by the host country with the exception of the furniture requirements (list J) which will be furnished by USAID/Kampala. All items will be of local manufacture or will be procured under the extended shelf item rule. No waivers will be required. General specifications for the items are contained in Annex E-5. The local PSA will be chosen in accordance with procedures contained in draft Chapter 4 of Handbook 15, and will conduct purchases on a CIF basis, in accordance with Handbook 11, Chapter 3. The fee for the PSA will be under \$100,000. Commodities shall be delivered to the specified project sites in country in accordance with delivery schedules specified in the contract.

Item F (Vehicles) and H (Agricultural Chemicals) will be purchased in Nairobi by REDSO/ESA. Because the estimated value of the vehicles will require waivers which exceed the REDSO Director's authority, source/origin waivers for the vehicles have been requested from AID/W. USAID/Kampala will prepare 2 PIO/Cs (one for Vehicles, the other for Agricultural Chemicals). naming

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Procurement Plan  
Abbreviated Commodity List

CIF Prices in U.S. Dollars

	Makerere University	Serere Research Station	MAF Headquarters Entebbe	Total
A. Farm Machinery	300,000	300,000	-	600,000
B. Standby Generators	50,000	50,000	-	100,000
C. Pumps and Spares	25,000	35,000	-	60,000
D. Renovation/repairs for milking parlor, piggery e.t.c.	25,000	100,000	-	125,000
E. Office equipment and Supplies including A.V. equipment	35,000	15,000	35,000	85,000
F. Vehicles	300,000	200,000	105,000	605,000
G. Lab equipment	300,000	200,000	-	500,000
H. Ag. Chemicals - Ferti- lizer, Pesticides, Herbicides	70,000	70,000	-	140,000
I. Rehabilitate Housing	100,000	80,000	40,000	220,000
J. Furniture & Appliances for Housing	100,000	80,000	40,000	220,000
K. POL	100,000	75,000	35,000	210,000
L. Security Improvements, lights, locks, e.t.c.	100,000	10,000	-	110,000
M. Books and Periodicals	50,000	25,000	-	75,000
N. Bldg. and Farm Renovations	200,000	-	-	200,000
<b>TOTAL</b>	<b>1,755,000</b>	<b>1,240,000</b>	<b>255,000</b>	<b>3,250,000</b>

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REDSO/ESA as the authorized agent. General specifications for Agricultural Chemicals are contained in Annex E. Agricultural Chemicals will be procured in 3 tranches to coincide with the local planting season. REDSO/ESA will request authorization from the Director of SER/COM to purchase non U.S. fertilizer based on a finding of significant price differentials.

Item K (POL), will be procured locally by USAID/Kampala.

Item M (Books), shall be purchased by the American Overseas Book Company under Contract No. OTR-0000-I-2107-00. USAID/Uganda shall issue a purchase order, Standard Form 147 in original and three copies directly to American Overseas Book Co. Inc., 53 Orchard Street, Ridgefield Park, New Jersey, 07660. The P.O. should include title, author, quantity, publisher, list price (if known), date delivery required, shipping instructions, and instructions for submitting invoice.

Procurement Schedule

- |           |    |                                                                                                                                                                                                        |
|-----------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| July      | 83 | - Project Authorized, vehicle source/origin waiver requested from AID/W                                                                                                                                |
| August    |    | - Grant Agreement signed                                                                                                                                                                               |
| September |    | - RFP's prepared and sent to PSAs in U.S. and Nairobi                                                                                                                                                  |
| October   |    | - PIO/C issued to REDSO for vehicles and 1st tranche of agricultural chemicals                                                                                                                         |
| November  |    | - Proposals received from PSA's and contracts signed with U.S. PSA for items in lists A, B, C, E, G, and J (furniture only) and with Nairobi based PSA for items in lists D, I, J (appliances), and N. |
| December  |    | - P.O. issued to American Overseas Books                                                                                                                                                               |
| January   | 84 | - Vehicles (except 4WD wagons) and agricultural chemicals arrive in Uganda                                                                                                                             |
| March     |    | - Commodities procured by Nairobi PSA arrive in Uganda                                                                                                                                                 |
| June      |    | - 4WD wagons arrive in Uganda                                                                                                                                                                          |
| July      |    | - Books, periodicals from U.S. arrive                                                                                                                                                                  |
| October   |    | - PIO/C issued to REDSO for second tranche of agricultural chemicals                                                                                                                                   |
| November  |    | - Commodities from U.S. received                                                                                                                                                                       |
| January   | 85 | - Second tranche of agricultural chemicals arrives in Uganda                                                                                                                                           |
| October   |    | - PIO/C issued to REDSO for 3rd tranche of agricultural chemicals                                                                                                                                      |
| January   | 86 | - Agricultural chemicals arrive in Uganda                                                                                                                                                              |
| March     |    | - PIO/C issued to REDSO/ESA for replacement vehicles                                                                                                                                                   |
| June      |    | - Replacement vehicles arrive in Uganda                                                                                                                                                                |

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**F. Disbursing Procedures**

1) Foreign currency - All foreign exchange will be disbursed in accordance with AID disbursing procedures and tied to various PIO/Ts, PIO/Ps, and PIO/Cs. A small amount of foreign exchange (\$20,000 p.a.) is programmed to be available to fund possible foreign exchange costs of research proposals.

2) Local currency - The only local currency to be disbursed will be through the special accounts for research (Para. D above). An additional small amount (\$2,000) will be provided on an advance basis to the Makerere Grants Section each year to defray costs of local seminars. Justificatory documentation will be required.

G. The following implementation schedule is presented as the best present estimate of what actions will take place, at what time, and which agent for action is primarily responsible. Month zero is predicted to be August 1983 when the Grant Agreement is to be signed.

**IMPLEMENTATION SCHEDULE**

<u>Event</u>	<u>Timing</u> <u>(Project Month)</u>	<u>Agent</u>	
Project authorized	(July 1983)	0	USAID/REDSO
Grant Agreement signed		1	USAID/GOU
Issuance of PIO/Ts (TA-Title XII) (PVO)		1	USAID/REDSO
Satisfaction of Conditions Precedent		2	GOU/USAID
RFPs for PSAs in US and Kenya (PIO/C) for REDSO (1st Order)		3	USAID/REDSO /(PSA)
PIO/Ps (15 participants)		4	REDSO
PSAs contracts signed		3	USAID
Departure of 1st 15 participants		4	USAID
Rehabilitation of Houses		5	USAID
	(1984)		
Return of 1st 15 participants (February)		7	USAID
Arrival of 1st Rehabilitation Commodities		8	USAID/ GOU (PSA)

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1st Seminar	8	GOU
Technical Assistance Contract Signed	9	AID/W
Training Departure 2 participants	9	USAID
Completion of House Rehabilitation	10	USAID
Training Departure 1 participant	10	USAI
Training Departure 4 participants	11	USAID
Arrival Team Leader	11	Contractor
Arrival 3 Technical Assistance advisors	12	Contractor
Training Departure 1 participant	13	USAID Contractor /USAID/(PSA)
Arrival (4 PVO volunteers)	14	USAID
Research Funding	14	GOU/USAID
Training (18 participants) (PIO/Ps)	14	USAID or Contractor
Commodities arrives from US	16	PSA
Seminar (Short term consultants)	17	GOU
Short term Consultants	varies	Contractor
(1985)		
Seminar (Short Term Consultants)	21	GOU
PIO/Ps (20 participants Training)	23	USAID or Contractor
Evaluation	29	USAID/REDSO
(1986)		
Replacement Vehicles (PIO/Cs) (March)	32	USAID/GOU (PSA)
Seminar (Short Term Consultants)		GOU
PIO/Ps (16 participant) Training	35	USAID/ Contractor
Arrival Replacement Vehicles	36	USAID/GOU (PSA)
Departure 4 PVO volunteers	38	PVO
(1987)		

Seminar (Short Term  
Consultants (March)  
Training (8 participants)

44  
46

GOU  
USAID or  
Contractor

Departure 3 Technical  
Assistance Staff

47

Contractor

(1988)

Seminar (Short Term  
Consultants) (March)  
Evaluation  
Departure Team Leader  
PACD

56  
59  
59  
62

GOU  
USAID/REDSO  
Contractor  
USAID

## 6. Monitoring Plan

Project monitoring will depend on the timely availability of information from a variety of sources. The AID Project Manager (ADO/USAID/Uganda) is expected to ensure that these items of information are obtained by him/her on a timely basis, reviewed, and necessary actions taken or recommendations for actions submitted to the Mission Director. The Project Manager is expected to work very closely with the Mission Project Officer in monitoring project activities.

The Project Manager's initial responsibility will be to monitor the GOU's satisfaction of all conditions precedent to disbursement and indicate to the Mission Director and RFMC (as well as the GOU) when disbursements can be effected. Once disbursements commence the Project Manager is expected to review periodically project disbursement records available from RFMC. Subsequent to the arrival of the contract team, the Project Manager will be able to utilize the contractor's quarterly progress reports to monitor most project implementation activity. Likewise, the PSA will issue periodic procurement status reports to permit the Project Manager to remain up-to-date on procurement actions. Nevertheless, the Project Manager will develop his/her own sources of information regarding project implementation by periodically visiting the project sites to visually review progress. Scheduled meetings with GOU personnel involved with project implementation will also be arranged on a regular basis. Finally, the Project Manager will be responsible for distilling all available information relating to project implementation into the required quarterly status reports for review by mission management and AID/W.

## 7. Project Analyses

The following section presents the various analyses required in the project paper. In several cases the whole analysis is included because the analysis is brief. Elsewhere a summary is presented with the complete analysis placed in Annex E.

### 7A. Technical Analysis Summary:

This summary will review the technical aspects of this project from the perspectives of agricultural education, research and extension, as well as the interrelationships between them.

In education, MU/FAF has a long history of outstanding contributions to agricultural education and research in East Africa. The Faculty has had the capability to supervise and grant postgraduate degrees in agricultural fields. Regretfully, during the 1970s, this educational facility entered a period a severe neglect and consequent decline. Nevertheless, the present situation finds the Faculty with 75% of its positions filled by fully qualified staff, despite a nearly total dearth of modern facilities for education or research. The recommendations for education are as follows:

(a) Since, during the past ten years, the staff has suffered from almost total isolation from the world scientific community, funds should be made available for short term, specialized refresher training at IARCs and U.S. agricultural universities.

(b) It is necessary to restore the excellent field labs, crop and animal research equipment to the state of excellence achieved by 1972 this can be accomplished by providing spare parts, laboratory and farm equipment, field plot equipment, refrigeration for germ plasm storage and some expendable supplies and rehabilitation supplies.

(c) Provision of a senior, experienced educator to provide new ideas and leadership in new directions who will assist the staff in curriculum changes, and, where necessary, staff retraining programs.

(d) To achieve better coordination and cooperation between the MAF and MU/FAF, workshops and seminars should be held at Makerere on a semiannual or annual basis on appropriate agricultural subjects such as extension and commodity oriented research.

In research, the MAF has long supervised a substantial effort in export crop research, with relatively little attention paid to food production. One reason was that the country as a whole was never deficient in food. There was, therefore, little incentive to devote much research effort to food crops as large increases in production often proved very difficult to market. Nevertheless, although the main research emphasis was placed on the export crops such as cotton, coffee and tea, there was a significant program of crop diversification, especially towards food crops which had some export potential. Some food crop research was carried on at Serere (sorghum, finger millet and cassava) while at Kabanyolo considerable attention was given to grain legumes, including

cowpeas, soybeans, phaseolus beans, and pigeon peas. Some selections were carried out with maize and sorghum. Intercropping studies were conducted with some of the cereal and legumes.

Since the mid-1970s the organization of research within the MAF has moved away from the grouping of research workers by discipline towards the organization of research by commodity or crop type. It was considered that this would provide a more effective joint effort towards improved crop production. In order to strengthen the position of the Research Division within the Ministry, the post of Chief Agricultural Research Officer (CARO), who will report directly to the Commissioner for Agriculture Development, Production and Administration, has been approved.

The following recommendations are made regarding agricultural research:

(a) Provision of the services of a research advisor for three years to assist in the setting up of this office and to provide on-the-job training and guidance to the CARO.

(b) The drastic deterioration of agricultural research facilities over the past decade has had a very adverse effect on the caliber of the research work conducted. The major constraints involve a lack of equipment, machinery and vehicles, together with appropriate maintenance and repair facilities and a scarcity of basic inputs for field and laboratory experiments. Library services and materials are totally inadequate. There is a serious concern over the lack of a constant water and power supply. This project should provide funds to purchase the essential commodities to reduce these constraints.

(c) The research staff at Serere Research Station has not kept up to date on research techniques and methodologies. A comprehensive retraining program is essential to the success of future programs. Upon return from refresher training programs, the research staff will direct its attention towards, and take advantage of links, between the Uganda research community, many international agricultural research centers whose work is very relevant to Uganda's needs and possible sister universities in the U. S. These IARCs include ICRISAT, IITA, ILCA, CIAT and CIMMYT, CIP. Close and continuing links with the appropriate centers will enable Uganda to make use of their germ plasm, technical expertise, research information and training facilities.

(d) Provision of an agricultural advisor who will work closely with the Station Director to assist in coordinating the research activities of the Serere Research Station. During the period of rehabilitation of the research station he will assist in the operation, maintenance and repair of the new and existing equipment and facilities.

Regarding extension prior to independence the extension service performed two main functions of (1) enforcing the laws relating to extension and (2) teaching farmers to adopt new methods of agricultural production. After independence, in 1962, extension workers stopped functioning as law enforcement officers and were encouraged to work directly with farmers and develop local leaders among farmers. The Extension Service reached its peak of field activity during 1971-72, but gradually deteriorated until the liberation war, at which time the service became almost non-operational. In any case, much of the agricultural research carried on was not particularly aimed at the problems of small farmers. In addition, the constraints on agricultural research have had profound implications for Uganda's extension programs as they have not been able to respond to the needs of the farmers because there are no new technical packages to give the farmer. Assistance to Uganda must, therefore, be oriented toward reestablishing the research and education institutions to provide technology well adapted to the various crops and site specific environments.

The following recommendations are made for extension;

(a) The project will re-initiate the research programs which will become the basis for an FSR system. The scientists at Makerere University and Serere Research Station should form the initial FSR group and would serve as a training model for further groups to be developed.

(b) The project will initiate the retraining of the extension staff by giving five of the senior staff from headquarters refresher training under this project. Upon their return to Uganda they will begin to hold in-service training for the more senior officers of the extension service throughout the country.

#### Alternative Strategies

1. One alternative initially considered by the design team was whether refresher training should be provided to all the research workers attached to the three research stations of the MAF. Two of these, Kawanda and Namulonge, are located very near to, and in the same ecological zone as Kabanyolo.

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Furthermore, these two Ministry stations primarily conduct research on the export crops such as cotton, coffee, tobacco, tea and sugar cane. The Government realizes that there has been little emphasis given to the major food crops and that there is a need to strengthen research on these crops. The Kabanyolo Farm will continue to work on the pulses, maize and livestock. The Serere Research Station will perform research on sorghum, millet, peanuts, oil seed crops and animal traction. Therefore, the PP design team has recommended that the refresher training be offered to those scientists working on the major food crops.

2. The design team also considered the alternative of providing long term academic training leading to Ph.D. degrees. This was rejected since the staffs at MU/FAF, the Serere Research Station and the MAF Headquarters have the basic training required for their respective positions, but, during the past decade, have been unable to keep informed of present day research technology and techniques. The opportunity to become familiar with recent research findings has been practically void. Acquisition of new germ plasm for crop improvement, agricultural inputs and basic laboratory supplies and equipment have been practically unavailable. This project will provide the refresher training and commodities to greatly expand and enhance the educational system and research work.

3. The technical package being recommended to the farmers through the agricultural extension service is based upon research findings which have not been updated for at least the past decade. Furthermore, essentially the same technical package is being recommended for application in all ecological areas, although it is widely recognized that there are at least 11 agro-climatic zones in the country. There have been many years spent in crop improvement of the major food crops, yet there are few varieties recommended for cultivation by the farmers which are yielding more than those commonly grown. Among other questions concerning appropriate research is the question of the contribution being made by the row spacing guidelines and weeding practices recommended by the extension service to the farmers. Thus, dependable supportative research is required for increased agricultural production and a project based upon this purpose should be implemented.

4. Consideration was also given by the design team as to which crop should receive initial attention should be given. It is clear that at the present time qualified and experienced staff are only available for a limited number of the food crops. The research program must place attention on the most

economically and nutritionally important food crops. Research will be conducted towards results which are directly applicable to farmers' conditions. Activities will include the collection, evaluation and multiplication of the best available varieties, improvement of agronomic practices and pest and disease control using integrated pest management. Therefore, it is considered, that for the immediate future, emphasis should be placed on the crops well known to the farmers and not upon the introduction of new or exotic ones.

7. B. Financial Analysis

This project does not fit nicely into the recommended models for financial analysis. Three-fourths of the activities are non-revenue producing, while only the remaining fourth (Kabanyolo Farm) is expected to be given the task of partial financial self-sufficiency to cover its operating expenses. This section will therefore treat the overall project as non-revenue producing, considering the GOU budget and recurrent costs, the financial competence of the GOU entities involved and verifying that a "least cost" option has been selected.

A. GOU Budget and Recurrent Costs. The 1982/83 budget for the MAF is (converted at the exchange rate likely to prevail over most of the life of the project)<sup>1</sup> \$12,554,532 while the budget for the Research Division is \$893,395. Of the latter, \$206,673 is devoted to Serere Research Station for salaries and operating costs. Makerere's overall budget, calculated on the same basis, is \$1,261,764, with the FAF receiving \$111,782 for salaries and operating costs. If some annual increase is allowed to account for inflation, the Ministry and the University should have ample resources to make their required contribution, as no real increase in expenditures, beyond what are currently being made, is anticipated over the life of the project. Once the project is completed, however, the Ministry and the University will have to assume certain annual costs which will be borne by USAID during project implementation. These costs are as follows, denominated in \$U.S.:

Farm Supplies	\$ 28,000
POL	42,000
Book and Journals	11,000
Research Grants	40,000
Depreciation - Equipment @ 12% p.a.	260,000
Depreciation of Rehabilitated Structures @ 7%	40,000
Total	<u>\$421,000</u>

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The amounts to be absorbed by the MAF and MU/FAF are estimated to be \$230,000 and \$218,000, respectively. Also, it should be noted that it will be possible for the GOU entities to keep operating on as little as \$121,000 for current expenditures, letting slide the \$300,000 which should be reserved for replacement and repairs of equipment and structures. The post-project annual funding requirement for the MAF constitutes 23% of the 1982/83 budget for the Research Division and 1.6 percent of the overall Ministry's budget. In the case of Makerere, the post-project annual funding requirement constitutes 17.3% of the overall university budget, but 195% of the budget of the FAF. GOU efforts to contain non-essential expenditures and to develop new and better revenue sources, coupled with the "fiscal dividends" associated with growth and recovery should, by the end of the project, ensure that sufficient resources are available to the Ministry and the University to technically meet these requirements needs, provided steps are taken to ensure that these needs are incorporated in the budgetary process. The University, however, given competing demands for resources, may well not be able to effect a three-fold increase in the budget of the FAF. Accordingly, efforts should be made to make the Farm viable in terms of its ability to cover its operating costs and, to the extent possible, a portion of its capital costs, as is proposed in the project and in the covenant in Section 8 below.

B. Financial competence. In the Administrative Analysis (Section 7.E) it is affirmed that the administrative capabilities of the two GOU entities are satisfactory to undertake project implementation responsibilities required of the GOU. These capabilities include financial competence. The only possible point of concern would be financial competence at the Kabanyolo Farm. Given the thorough review that proposal is receiving at all levels in the administration of Makerere University, it appears that financial competence in farm management will be assured and will be carefully scrutinized by University financial authorities.

C. "Least cost" option. This project proposal reinforces the position presented in the Technical Analysis (Section 7.A) that any activity other than retraining, re-equipping and rehabilitation makes no technical sense. In terms of cost, provision of long term training rather than retraining would be a factor of at least 7:1, and recreating research stations rather than re-equipping and rehabilitating existing ones would probably exceed \$50 million, thus being a factor of more than 16:1 over the present proposal. Given the dimensions of these admittedly crude calculations, it is,

nevertheless, clear that the proposed project represents a "least cost" alternative to improve the agricultural research, education and extension capability of Uganda.

### 7.C Economic Analysis

The purpose of the project is to assist the GOU in creating a revitalized agricultural institutional structure in the Ministry of Agriculture and Makerere University for research and extension, a necessary but not sufficient condition for expanded food production by small farmers which will be, in turn, a key factor in the country's future growth and development. Uganda cannot feed its growing population without significant improvements in the yields obtained from land which is devoted to food production. To feed its population by removing land from the production of export crops (including exports of basic foodstuffs to neighboring countries) or by increasingly devoting the returns from such crops to the importation of foodstuffs would clearly be counter-productive, as it would consume external resources required to support and sustain long term growth and development. Beyond the direct benefits to staff and students, the project will, thus, benefit small farmers as producers and as the major population group of an economy that is increasingly capable of mobilizing resources to support development.

Although the project is highly important, its benefits cannot be presently quantified such as to permit a cost/benefit analysis of the traditional type. This is because the project will produce its benefits through the intermediate actions of individuals and institutions which will benefit directly from the project, and because it depends upon other necessary conditions such as extension, credit and agricultural inputs for its long term success. At the same time, however, ex-post evaluations around the world have revealed exceptionally high internal rates of return (ranging from 25 percent in Japan to 93 percent in Mexico) for agricultural research which is undertaken as a part of an overall process of agricultural development. As such, there is little reason to doubt that the potential benefits of the project are well in excess of its costs.

Has the project been designed in such a way as to ensure that these potential benefits are attained at the least cost to the U.S. and the Government of Uganda? This would appear to be the case for several reasons. First, the project focuses on rehabilitating and re-equipping existing research and teaching facilities to the extent and degree made necessary by Ugandan

agriculture in the 1980s, clearly recognizing that simply restoring them to their "pre-Amin" status may be inappropriate. Secondly, it emphasizes updating the skills and knowledge of already trained (and in-place) researchers and teachers who have fallen behind professionally during the Amin period. Third and lastly, it also emphasizes the institutionalization of a strong link between research - extension - small farmers such that research results can quickly be translated into increased output.

Given the long time frame over which the projects benefits will be produced, two further issues need to be reviewed; the question of recurrent costs and the question of the Government of Uganda's commitment to a small farmer-market oriented food production strategy.

The recurrent cost issue has already been discussed in the section on financial analysis. Basically, this should not be a problem given the GOU's efforts to rationalize its budgetary process and the economic growth which should flow from the rehabilitation process. It is important, however, that the University Farm be made as financially self sufficient as possible, and that the annual resources which will be required by the University and the MAF be included in the planning and budgetary process.

It should be noted, that it may be some time, given the financial restrictions under which it is operating, before the Government can pay all ministry and university personnel salaries that are truly adequate for their needs. Accordingly, the research grants to be provided under the project constitute an important incentive to Ugandan agricultural researchers that may well require donor support beyond the life of the project.

The Government of Uganda seems, at the present time, to be committed to a small farmer-market oriented development strategy. It has removed administrative price controls on a variety of items including food crops. It has taken steps to reduce and rationalize the operations of the parastatals and announced substantial increases in the prices paid for export crops.<sup>1/</sup> Most importantly, it has established a two-tier exchange rate system and begun to rationalize the allocation of foreign exchange in line with the needs of the economy. These developments should ensure a greater availability of inputs and

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<sup>1/</sup>In May, 1983 prices for cocoa, tea, coffee, tobacco and cotton were raised by 15 to 50 percent. In June, certain producer prices were again raised by 50 percent.

incentives to small farmers and also serve to establish a framework in which the initial benefits of a small farmer oriented strategy can be quickly realized.

#### 7. D. Social Analysis

As a institutional development effort, this project will help create the conditions whereby opportunities for significant expansion of food crop production can reach the rural population. The majority of Uganda's export crops, as well as its food crops, are produced as part of family agricultural enterprises. An estimated 90 percent of the economically active population derive their livelihood from agriculture. The majority of these are smallholders. In order to analyze the channels whereby benefits will eventually flow to the rural population. It is useful to review the situation and constraints facing farming individuals and households, and to discuss project activities in terms of their long term impact upon these groups.

#### Context

Uganda is socially complex, due to the number of distinct ethnic groups and languages spoken (over 40), geographical variations in resource potential, and the play of historical events. However, certain generalizations apply to agricultural production. A basic distinction is often made between north and south, using a line which can be drawn roughly from Tororo in the east to Pakwach in the the west. About 75 percent of the population lives in the south and southwest, where rainfall and land potential fostered early and continued involvement in cash crop production and industrial development (although a significant minority of livestock herders are located in Ankole). The remaining 25 percent of the population -- Nilotic, Nilo-Hamitic, and Sudanic groups -- are settled less densely on somewhat drier savannah lands to the north and east. The Bantu speaking peoples in the south and southwest, especially the Buganda, inhabit the most fertile and well-watered parts of the country, with over 80 inches of rainfall and a year-round growing season. Dominant crops in the south are the perennials, coffee and plantain, along with maize, beans and cassava, and oilseeds which are grown for cash and food. In the north, mixed farming is prevalent, farms are somewhat larger, and fields need longer fallow periods. Annual cereal crops (finger millet, sorghum) are supplemented by sweet potatoes, cassava and legumes, and cotton and tobacco are major cash crops.

In colonial times the spread of cash crop production was centered on Buganda and on the Eastern Province. The Buganda, in particular, were favored by British colonials and employed by them as agents of the colonial administration. The northeastern and northwestern parts of the country, relatively neglected through World War II, tended to serve as labor reserves for farm and other unskilled jobs in the south. These disparities were somewhat modified after independence and into the 1970's, as government programs were directed toward the diversification of production and promotion of cash crops (tobacco, sesame and groundnuts) in the north.

Much of the country's economic growth up to 1971 was based on expansion of agriculture, especially the export of coffee, sugar and tobacco. Agriculture produce provided over 80 percent of Uganda's export trade in the 1960's and early 1970's. In the 1970's, a reliance on agriculture in rural areas enabled many families to endure the period of economic decline. Most farmers turned to production for domestic consumption -- using lower levels of technology and inputs -- and were able to subsist despite malfunctioning agricultural institutions, insufficient producer prices, and unsatisfactory marketing channels. Between 1974 and 1979, export production dropped dramatically. Coffee became the sole significant export crop -- providing 95 percent of foreign exchange -- but its export volume steadily decreased. Food crop yield per acreage declined for most crops.

Uganda's farmers have proven themselves resilient and able to produce under difficult conditions, willing to innovate with new crops, and attuned to agriculture as both a source of subsistence and of income. They must at present rely on agricultural institutions and on an economy still struggling to return to normal. However, even with improved access to inputs, better marketing channels and more appropriate price structure, there are clear limits to expansion in the sector, because of the lack of new technologies to improve Uganda's farming systems.

In planning for Uganda's agricultural needs, it is necessary to examine the likely effect of population growth. With a 3 percent growth rate, the population will double in 26 years, or grow to an estimated 18 million by 1990 and 25 million by 2000. In the period 1971 to 1980, there was about a 30 percent growth in population, and during that period both total agricultural yield and per capita food production declined. Although the current low yields are expected to improve as delivery systems begin to return to a normal (e.g. 1970) situation, there will be less and less agricultural land per

capita, and dramatic improvements in productivity will be necessary to sustain economic growth.

As has been discussed elsewhere in the project paper, farmers cannot turn to extension institutions to provide relevant and useful technologies, because extension workers have little that is new or useful to offer to the average farmer. Recent conversations with farmers suggest that they feel that extension staff know little more than they do about production constraints, and tend to recommend technologies which are uneconomic in terms of cash or labor inputs, or appropriate for only a small group of so-called progressive farmers.

Due to the recent hiatus in agricultural research, improved technologies are not available which have been developed through joint farmer-researcher extension worker collaboration and which address the varied needs of farmers throughout Uganda's agroecological zones. Although supervised test plots show yields much higher than those normally attained by farmers, these yields do not represent testing under farmer circumstances.

This project deliberately builds upon Uganda's strong tradition in agricultural research. Although, early in the century, agricultural research in Uganda was devoted almost exclusively to export crops, especially cotton, over time this emphasis has broadened to include a wide range of food crops with and without export potential, including beans, groundnuts, maize, and cassava. And, although food and non-food export crops have been given priority in the past, research continues to be oriented toward problems of small farm enterprises. Over the years some studies have been conducted of small farm production and farm management. Despite these achievements, the research services remain, to a significant extent, isolated from farmer's problems and from essential linkages with farmers and extension workers.

There is a need for research on Uganda's farming systems and on ways in which new technologies can be integrated into those systems. The profitability of new technologies should be tested under real, situation and area-specific conditions. Data are needed on the economics of farm production, processing and marketing; the production responses of individuals, families and enterprises, especially to price factors; and, tradeoffs in land and labor between different crops. It will be important, as well, to have a better understanding of men's and women's inputs and roles in the phases of agricultural production and marketing -- by crop, by region and by social group. In order to improve upon current extension approaches

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(which, for example, train women in household management more than in production), it will be important to know much more about income and expenditures of different household members and their roles in decisions about investment or innovation in new farming practices.

#### Beneficiaries and Impact

As indicated above, there are several categories of direct and indirect beneficiaries from the proposed project. Benefitting directly will be:

- senior professional staff (87) of the MAF and MU/FAF, who will benefit from retraining;
- students at Makerere (450 over the life of the project), who will have increased access to improved educational facilities in Kampala and at the University Farm;
- workers and staff of research stations and the farm who will have improved research equipment.

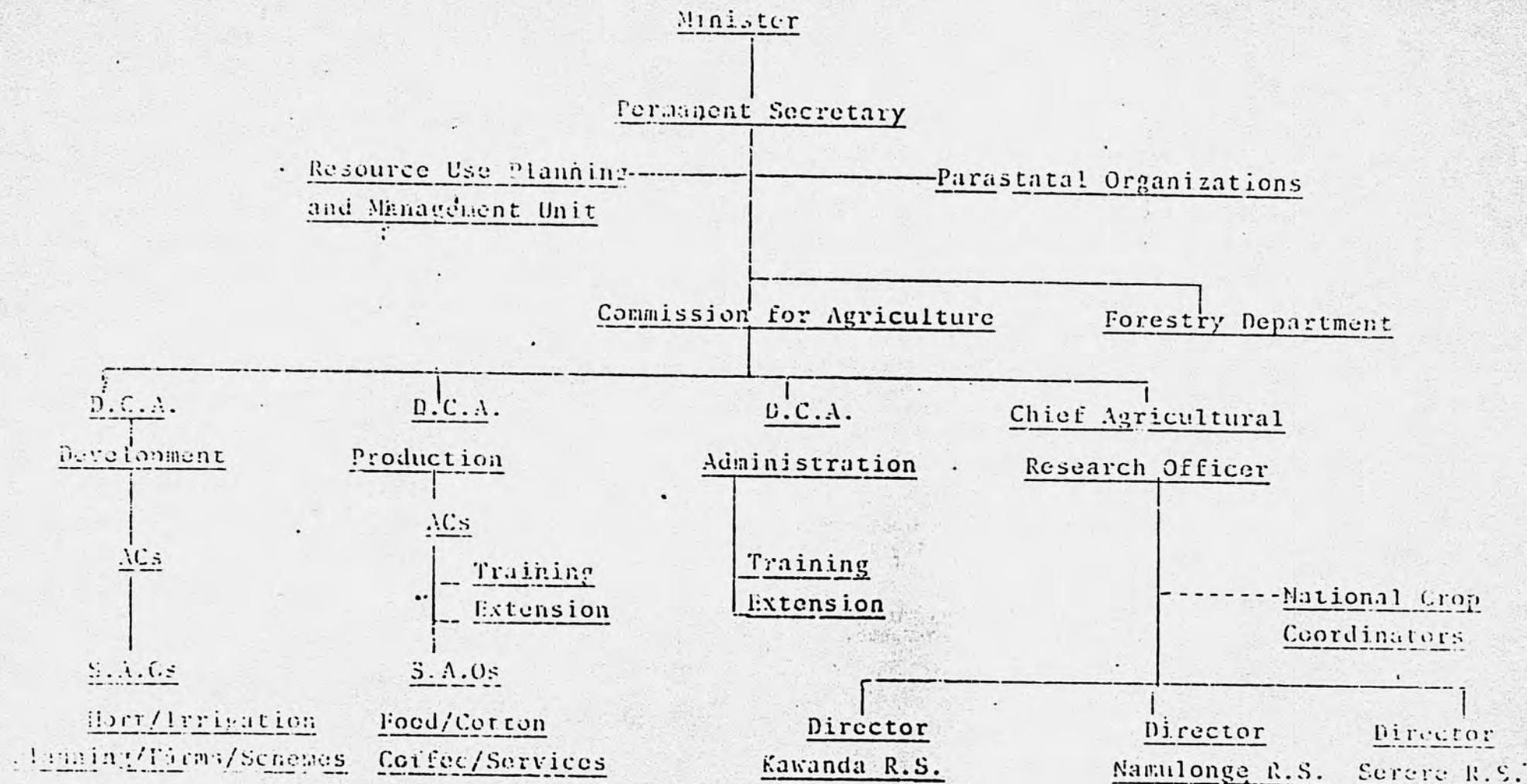
In addition, several institutions within the GOU will benefit: the Ministry of Agriculture, at Serere Research Station and at headquarters, and the University Faculty of Agriculture facilities. Both the University and the Ministry will have the capacity, once again, to be leaders in agricultural research. More broadly, the training provided as part of the project will to re-equip a senior management cadre to be able to plan and set priorities for research, extension and planning in the agricultural sector.

It is through direct impact over the long term that a much larger number of people will be affected by the changes proposed in the project. Indirect beneficiaries are all Ugandan producers who eventually benefit from improved technologies developed as a result of a strengthened research capacity. The two research facilities selected for rehabilitation, Serere research facility and the Kabanyolo Farm, will be equipped to focus on all major annual and perennial food crops and the diverse farming systems and agroecological zones throughout the country.

Even given the potential for these research institutions to function to capacity by the end of the project, impacts from renewed research will not be felt for some time. The project will begin a process whereby a sound research orientation can lead to research results. This impact will be enhanced as:

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Structure of Ministry of Agriculture and Forestry



D.C.A: Deputy Commissioner for Agriculture

R.S: Research Station

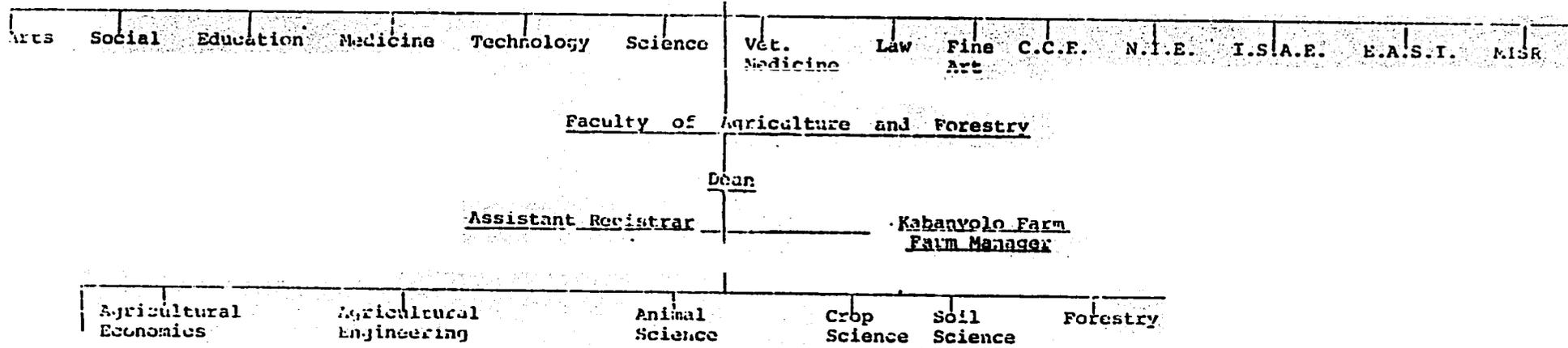
AC: Assistant Commissioner

S.A.Os: Senior Agricultural Officer

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MAKERRERE UNIVERSITY  
FACULTY OF AGRICULTURE AND FORESTRY  
ORGANIZATION CHART

Chancellor  
Vice Chancellor



Abbreviations: C.C.E : Centre for Continuing Education  
 N.I.E.: National Institute of Education  
 I.S.A.E.: Institute of Statistics and Applied Economics  
 E.A.S.L.: East African School of Librarianship  
 M.I.S.R.: Makerere Institute of Social Research

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- (1) retraining includes appropriate methodologies to ensure that priority is given to research which involves close farmer-researcher collaboration in the study of production systems and testing of innovations;
- (2) retraining assists agricultural policy and planning administrative staff to establish better linkages between research institutions and the extension program;
- (3) retraining assists Ugandan leaders to design agricultural policy and strategy which assures that research is tailored to domestic needs and the international market situation.

The individuals selected to benefit from proposed training activities are all highly qualified agricultural scientists or administrators with the ability to make maximum use of training opportunities. It is worth noting that retraining will also strengthen Ugandan capacity in the fields of development economics, rural sociology and agricultural economics.

Through the research capacities which are built and the downstream linkages established between research and extension, the project has potential for significant spread effects and impact beyond project life.

E. Administrative Analysis:

a) Government of Uganda entities

Although the formal grant agreement will be signed with the Ministry of Finance, all implementation will take place under MU/FAF and the MAF. A third entity, the Ministry of Regional Cooperation, is peripherally involved at the Serere Research Station.

Makerere University, an autonomous unit under the Ministry of Education, is a long established institution with substantial experience in utilizing donor funding over the past twenty years, including several USAID grants during the 1960s. The FAF (see organization chart) operates the Kabanyolo Farm as a teaching site and a research station. In terms of administration and accounting capability, the University and the FAF are fully qualified in terms of training and experience for undertaking their responsibilities in the project. Technical assistance provided the Faculty serves more as a

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coordinator of the expatriate TA team, monitor for AID assistance and technical advisor to the Faculty than as a direct support in project implementation.

Makerere University also operates the Kabanyolo Farm as an entity within the FAF. As noted above, the Farm serves a teaching site and research site, but is also viewed as a mechanism to earn money from produce marketed. Up to now, funds from produce marketed have reverted to the overall University account, while all funds required for Farm operation must be allotted by the University in competition with other Faculties. The FAF has proposed to the University that the Farm be placed on a financially self-sufficient basis and retain income from produce sold while being responsible for all farm operating expenses. This proposed self-sufficiency is being reviewed by the University authorities and is likely to be granted. USAID views such a move as having positive effects on the efficient functioning of the Farm and has included a covenant to encourage this proposal. Nevertheless, the self-sufficiency status of the Farm is not a sine qua non for AID assistance to the Farm.

Technical assistance to Kabanyolo Farm is incorporated in the project because the long-time (25 years) Farm Manager has just retired and has been replaced by a younger man with less experience. During the Farm Manager Advisor's presence at the Farm it is anticipated that the Farm Manager will be appreciably helped in handling farm management problems and will gain necessary experience to run the Farm.

In the MAF this project substantially affects only one unit - that of Agricultural Research (see organization chart). As with Makerere, the MAF has had extensive relationships with donor agencies and USAID over the past twenty years and is qualified in terms of training and experience to undertake its responsibilities in project implementation. The Agricultural Research Section, headed by the Chief Agricultural Research Officer (CARO), is responsible for the research stations at Kawanda, Namulonge and Serere. Technical assistance is being provided to the CARO on an advisory basis, because the position is presently vacant and responsibilities are being shared by the research station directors and the Commissioner's Office. Recruitment for a qualified CARO is underway and it is anticipated that the post will be occupied by the time the CARO Advisor arrives.

Serere Research Station is an operating entity within the Agricultural Research Unit and has been operating for many years. Nevertheless, the rehabilitation process faced by the

station is such that it was deemed essential that technical expertise be provided to accomplish the bulk of rehabilitation on an expeditious basis. Once the facilities are back in working order, administration of the research station will easily be managed by the existing experienced staff.

Physically located at Serere is a small unit of the Ministry of Regional Cooperation which has been involved as a sorghum and millet research entity. This facility was started as a part of the East African Community and, subsequent to its dissolution, became the responsibility of the Ministry of Regional Cooperation. Although the long-term objectives of the sorghum and millet facility are not fully determined (it may be absorbed by the MAF or it may become a regional center under the Ministry of Regional Corporation for research in composite flour from sorghum and millet), the basic rehabilitation, re-equipment and re-training offered by this project will serve as basic restoration for whichever role is ultimately selected. Current working relationships between the two entities at Serere are cordial and informal cooperation toward scientific objectives is good. No difficulties are expected from either Ministry and both have endorsed the AID proposal to assist the Station as a whole. No funding would be channeled through the Ministry of Regional Cooperation as it would only be the recipient of training, limited equipment and modest rehabilitation.

In summary the GOU entities involved in the administration of this project are considered to have adequate experience both in routine operation and in dealing with AID on previous projects. No major difficulties of an administrative nature are foreseen.

#### B. AID

USAID/Uganda will be the principal implementing agent on behalf of the USG. Daily implementation will be the responsibility of the selected contractor under the supervision of the Project Manager, the Agricultural Development Officer at USAID. Although this individual is presently managing a substantial project portfolio, it is expected that, with the addition of a Project Officer to the USAID staff, the latter will be able to assist the ADO in project management. USAID/Uganda will be contracting out the rehabilitation activities and will call upon the special services of REDSO/ESA to assist in implementation. It is believed that USAID/Uganda, with its full complement of staff, as assisted by REDSO/ESA and RFMC, has the administrative capability to manage this project.

F. Environmental Considerations

An Initial Environmental Examination (IEE) was submitted with the PID for this project. Although the PID was approved, the IEE was not formally approved. Due to modifications made in the project subsequent to the PID approval (See Annex A), it was considered necessary to submit a modified IEE for AID/W approval. Annex E-6 includes both the field cable (Kampala 1505) setting forth the IEE and recommending a Categorical Exclusion (CE) and the AID/W response (State 171908) approving the field recommendation. During the preparation of the Project Paper, the Regional Pesticide Advisor provided guidance in the management of pesticides for agricultural research (see Annex E-6). No other environmental review or analysis is required for authorization of this project.

8. Conditions, Covenants and Negotiating Status

A. Conditions:

The conditions precedent to disbursement in this project are detailed in the draft project authorization (Section 2 above). The justification for including such conditions precedent are discussed in this section.

1. The Ministry of Finance must designate the MAF and Makerere University as agents of the GOU for implementation. It will be necessary to obtain a letter from each of these entities designating the officer(s) who will be responsible for implementation.

2. Given the difficulties of obtaining appropriate housing, it will be necessary for the GOU to designate, in writing, housing to be made available for expatriate occupation which is acceptable to USAID, prior to the disbursement of any funding for rehabilitation activities or for technical services.

3) Prior to the disbursement of funds for rehabilitation or re-equipping of agricultural research, teaching, and office facilities, or to the issuance of any commitment documents with respect thereto, the Grantee will provide, in form and substance satisfactory to A.I.D. a rehabilitation plan for such facilities which includes a list of repairs to be made and new equipment or repair parts required; materials required for such repairs; planned arrangements for receipt and safekeeping of repair materials, new equipment, and repair parts; a schedule for repair and re-equipping; an identification of the persons who will be responsible for making repairs or installing equipment; and how and by whom repairs and equipment installation will be supervised.

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No other conditions precedent to disbursement are considered necessary for effective implementation.

B. Covenants:

The following covenants will also be detailed in the draft project authorization (section 2 above) and are discussed in this section.

1. Filling the position of Chief Agriculture Research Officer (CARO) in the MAF is essential for positive leadership of the Ministry in agricultural research. The Ministry is presently recruiting for a qualified candidate and expects to fill the position. This covenant is included to indicate AID concern that the position is indeed filled.
2. The Cooperating Country covenants and agrees to take the necessary measures to insure that adequate secure storage space is made available at the Serere Research Station and the Kabanyolo Farm to insure that equipment financed by A.I.D. under the Project is protected from theft, unauthorized use, or damage from the elements.
3. The management of the Kabanyolo Farm needs to be upgraded during the life of the project. The Farm Manager position should be upgraded in an MSC program and the two Assistant Farm Managers should be upgraded in B.Sc. programs. The principal reason for urging the up-gradng of the educational status of Farm Management is to permit these individuals to more effectively support the research and training activities taking place at Kabanyolo.
4. The sorghum and millet research activities at Serere now under the Ministry of Regional Cooperation should be absorbed into the MAF. Whether this will mean a change in some of the objectives of that unit is not of great significance. It simply is not consistent with good use of resources for sorghum/millet research to take place under a separate Ministry.
5. The Kabanyolo Farm experiences chronic difficulties in getting funds for operating expenses. At the same time it is presently obliged to turn over all funds earned from farm produce to Makerere. A proposal has been made to grant the Farm financial self-sufficiency in-so-far as using revenue generated to cover operating expenses. USAID believes this proposal should be approved and includes it as a covenant in the Grant Agreement.

6. In addition to the condition precedent housing (See A-2 above) the GOU should covenant to refrain from interfering in designated housing during the period of its assignment to the project technicians.

C. Negotiating Status:

This project has been developed with the full collaboration of the MAF and Makerere University. Appropriate meetings have also been held with the Ministry of Finance, the Ministry of Planning and the Ministry of Regional Cooperation. It is believed that no significant issues will arise in the negotiation of the grant agreement, and that once the agreement is signed, the implementation of project activities can commence expeditiously.

9. Evaluation Arrangements:

As this project is primarily designed to rehabilitate a previously existing agricultural institutional capability for training, research, and extension, it is not essential to develop an elaborate baseline from which to measure progress. These capabilities existed in 1970 and, given the inputs proposed in this project, should be improved by the end of the project. There are, however, two evaluations proposed in the project aimed at two different objectives. The first evaluation in project month 29 will determine the extent to which physical rehabilitation proposed in this project has been accomplished. This evaluation can be performed by a team including an agricultural research administrator, an agricultural economist or educator to review appropriateness of training, an engineer and either the regional environmental officer or the regional pesticide advisor. The second evaluation at the end of the project will serve to indicate the successful completion of the project; but, more importantly it will indicate the readiness of the agricultural research system to undertake the business of agricultural research and the extent to which it has developed working linkages with the extension services through preliminary FSR type research. This team should include an agricultural research administrator, an extension specialist and other expertise as may be desirable.

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UNCLASSIFIED  
Department of State

ANNEX A

INCOMING  
TELEGRAM

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ACTION AID-03

ACTION OFFICE AFDR-06  
INFO AFIA-01 AFOP-06 PPCE-01 PPPB-03 GC-01 GCAF-01 GCFL-01  
PPDC-01 FM-02 STAG-02 CASI-01 AGRI-01 STFA-01 RELO-01  
MASI-01 /032 AZ X28

INFO OCT-00 COPY-01 INR-10 AF-00 EB-06 /064 W  
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FM AMEMBASSY KAMPALA  
TO SECSTATE WASHDC 6622  
INFO AMEMBASSY NAIROBI

UNCLAS SECTION 01 OF 03 KAMPALA 1068

AIDAC

C O R R E C T E D C O P Y U R N 1668 VICE 10671

NAIROBI FOR RECSO

E.O. 12356: NA  
SUBJECT: MANPOWER FOR AGRICULTURAL DEVELOPMENT - 617-1013

1. SUMMARY: THE MANPOWER FOR AGRICULTURAL DEVELOPMENT PROJECT TO BE DESIGNED OVER THE NEXT TWO MONTHS WILL FOCUS ON REFRESHER TRAINING OF SENIOR LEVEL UGANDAN SCIENTISTS AT LEADING INTERNATIONAL AGRICULTURAL RESEARCH CENTERS, U.S. LAND GRANT UNIVERSITIES, AND OTHER RESEARCH AND EDUCATION INSTITUTIONS CONCERNED WITH AGRICULTURAL DEVELOPMENT. PROGRAMS WILL TYPICALLY BE DESIGNED FOR THREE TO FOUR MONTHS DURATION WITH THE TRAINING PRIMARILY FOR MEMBERS OF THE FACULTY OF AGRICULTURE, MAKERERE UNIVERSITY, SCIENTISTS AT THE MAJOR RESEARCH STATIONS, AND SOME EXTENSION AND EDUCATION OFFICERS. COMMODITIES OF AN ESSENTIAL NATURE WILL BE INCLUDED TO REHABILITATE THE UNIVERSITY FARM AS AN ESSENTIAL COMPONENT TO PERMIT CONTINUING RESEARCH AND TEACHING BY FACULTY MEMBERS AT MAKERERE. SOME RESEARCH AND TRAINING EQUIPMENT ALSO WILL BE PROVIDED TO THE SERERE RESEARCH STATION. LIMITED LONG TERM TECHNICAL ASSISTANCE WILL BE PROVIDED TO COORDINATE AND ASSIST IN DEVELOPING THE VARIOUS TRAINING PROGRAMS AND IN THE MANAGEMENT OF THE FARM AND OF THE PRINCIPAL RESEARCH STATION. SUPPORT WILL ALSO BE GIVEN FOR YEARLY IN-COUNTRY SEMINARS BY MAJOR INTERNATIONAL RESEARCH CENTERS AND U.S. SCIENTISTS AS WELL AS FOR IN-COUNTRY RESEARCH GRANTS. ESTIMATED COST OF THE PROJECT IS USDOL 8.3 MILLION. END SUMMARY.

2. USAID HAS OVER THE PAST FEW MONTHS CONTINUED ANALYZING A STRATEGY AND DEFINING SUBJECT PROJECT DESCRIPTION FOR PRESENTATION IN A PROJECT PAPER. WE HAVE REVIEWED PREVIOUS MATERIALS PREPARED BY IADS, 1980; INTERNATIONAL DEVELOPMENT RESEARCH CENTER; PIO, JULY 1982; AND SEVERAL OTHER STUDIES COMMISSIONED BY THE MISSION. A MAJOR THEME IN ALL THESE MATERIALS IS THE URGENT NEED TO DEVELOP REFRESHER AND RETRAINING PROGRAMS FOR SENIOR LEVEL PROFESSIONALS AT THE FACULTY OF AGRICULTURE, MAKERERE UNIVERSITY, AND THE RESEARCH, EXTENSION AND EDUCATION SERVICES OF THE MINISTRY OF AGRICULTURE. ON THE BASIS OF OUR ANALYSIS AND INVESTIGATIONS CONDUCTED OVER THE PAST YEAR, A PROJECT ADDRESSING THIS PRIORITY NEED WILL BE DEVELOPED DURING THE NEXT TWO MONTHS AND IS OUTLINED BELOW.

3. PROBLEM: THE SENIOR LEVEL SCIENTISTS AND PROFESSORS RESPONSIBLE FOR CONDUCTING RESEARCH AND TEACHING ON UGANDAN AGRICULTURE HAVE BEEN UNABLE TO MAINTAIN CONTACT WITH THEIR PEERS IN SUBJECT MATTER DISCIPLINES OF THEIR SELECTED PROFESSIONS. THIS PROFESSIONAL ISOLATION HAS BEEN A LIMITING FACTOR SINCE THE EARLY 1970'S. SCIENTISTS HAVE BEEN UNABLE TO KEEP CURRENT IN RESEARCH METHODOLOGIES, TECHNOLOGIES AND OTHER DEVELOPMENTS IN THE FIELDS OF RESEARCH AND TEACHING. OPPORTUNITIES HAVE BEEN EXTREMELY LIMITED FOR SCIENTISTS TO PARTICIPATE IN PROFESSIONAL MEETINGS, OBTAIN PROFESSIONAL JOURNALS AND ACCESSING UP-TO-DATE LIBRARIES. IN ADDITION TO THE INHIBIT

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ITY TO KEEP IN CONTACT WITH PEER SCIENTISTS, TRAINING EQUIPMENT AND LABORATORIES HAVE BEEN POORLY MAINTAINED WITH ONLY A SMALL QUANTITY OF NEW MATERIALS BEING ADDED TO THE EDUCATIONAL FACILITIES DURING THE PAST THIRTEEN YEARS.

4. GOAL/PURPOSE: THE OBJECTIVE OF THIS PROJECT IS TO TRAIN A COHORT OF SENIOR LEVEL PROFESSIONALS WHO WILL FORM A LEADERSHIP GROUP RESPONSIBLE FOR PLANNING AND IMPLEMENTING AN ACCELERATED AGRICULTURAL DEVELOPMENT PROGRAM. THIS LEADERSHIP GROUP WILL BE COMPOSED OF SENIOR LEVEL SCIENTISTS FROM THE UNIVERSITY AND THE RESEARCH AND EXTENSION SERVICES OF THE MINISTRY OF AGRICULTURE. THE TRAINING OF SENIOR PROFESSIONALS OF THE THREE INSTITUTIONS WILL PROVIDE THE FOUNDATION FOR AN INTEGRATED APPROACH TO DEVELOP PROGRAMS DIRECTED TOWARD SOLVING PROBLEMS HINDERING ADVANCEMENT OF AGRICULTURE IN THE COUNTRY. THE NETWORKING APPROACH UNDERTAKEN BY THE UNIVERSITY AND THE MINISTRY OF AGRICULTURE IN COOPERATION WITH THE INTERNATIONAL AGRICULTURAL RESEARCH CENTERS AND U.S. AGRICULTURAL INSTITUTIONS WILL PROVIDE A SOUND BASIS FOR THE GOVERNMENT AND MISSION TO DEVELOP FUTURE AGRICULTURAL DEVELOPMENT PROGRAMS. IN OUR VIEW, THE TRAINING OF SCIENTISTS AND ORGANIZING OF A RESEARCH PROGRAM UNDER THIS PROJECT WILL LAY THE NEEDED GROUNDWORK TO DEVELOP A FARMING SYSTEMS RESEARCH ACTIVELY THAT FITS WELL INTO THE AGRICULTURE RESEARCH/EXTENSION NETWORK BEING ESTABLISHED THROUGHOUT EAST AND SOUTHERN AFRICA.

5. PROPOSED PROJECT DESCRIPTION: TRAINING-THE MAINPOWER TRAINING ENVISIONED IS OF THE REFRESHER AND RETRAINING TYPE WHERE SENIOR LEVEL SCIENTISTS WILL PARTICIPATE IN PROGRAMS FOR THREE TO FOUR MONTHS DURATION. IT IS PLANNED TO DIRECT THIS SHORT TERM TRAINING TO RESEARCHERS, PROFESSORS AND EXTENSION OFFICERS CURRENTLY HOLDING PH.D., M.S. AND B.S. DEGREES. WE ARE CONSIDERING ONLY A LIMITED NUMBER OF REFRESHER TRAINING PROGRAMS FOR PROFESSIONALS AT THE B.S. LEVEL. THE PROPOSAL CALL FOR REFRESHER TRAINING TO BE CARRIED OUT AT THE INTERNATIONAL AGRICULTURAL RESEARCH CENTERS, U.S. LAND GRANT UNIVERSITIES AND OTHER RESEARCH AND EDUCATION INSTITUTIONS CONCERNED WITH AGRICULTURAL DEVELOPMENT. RESEARCH LEVEL TRAINING WILL BE PRIMARILY FOCUSED ON CROP CROPS AS MAIZE, SORGHUM, MILLET, BEANS, OILSEEDS AND ROOTS AND TUBERS. WE SEE AGRICULTURAL EXTENSION TRAINING BEING CARRIED OUT AT STATE LEVEL EXTENSION SERVICE OFFICES. THIS EXTENSION OFFICER TRAINING COULD ALSO BE IMPLEMENTED IN CONJUNCTION WITH USDA TRAINING PROGRAMS. EACH INDIVIDUAL TRAINING PROGRAM WILL REQUIRE CAREFUL COORDINATION WITH IN-COUNTRY WORKLOADS OF SCIENTISTS AND PROFESSORS AND THE WORKLOADS OF SCIENTISTS AT THE INSTITUTIONS PROVIDING THE REFRESHER TRAINING. THIS MEANS THAT UGANDAN PROFESSIONALS WILL BE AVAILABLE FOR TRAINING DURING SUMMER HOLIDAYS, SEMESTERS WHEN THE TEACHING LOAD IS MINIMAL AND OFF SEASONS FOR RESEARCH WORK AT THE EXPERIMENTAL FARMS. MISSION HAS ALREADY CONTACTED THE DEAN, FACULTY OF AGRICULTURE, RESEARCH AND EXTENSION DIRECTORS AND REQUESTED A MATRIX DETAILING THE TYPE AND DURATION OF TRAINING FOR EACH PRI

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ANNEX A

INCOMING  
TELEGRAM

PAGE 01 NAMPAL 01067 02 OF 03 271003Z 0683 027210 A100114  
ACTION AID UD

NAMPAL 01067 02 OF 03 271003Z 0683 027210 A100114  
QUIRED THROUGHOUT THE LIFE OF THE PROJECT.

ACTION OFFICE AFDR-06  
INFO AF(A-D) AFDP-06 PPCE-01 PPPB-03 GC-01 GCAR-01 GCJ1-01  
PPOC-01 FM-02 SIAG-02 EAST-01 AGRI-01 STFA-01 RELO-01  
MAST-01 /037 A2 X28

INFO OCT-00 COPY-01 INR-10 AF-00 EB-00 /064 W  
-----162255 280819Z /81

R 271000Z APR 83  
FM AMEMBASSY NAMPALA  
TO SECSTATE WASHDC 6623  
INFO AMEMBASSY NAIROBI

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AIDAC  
NAIROBI FOR REDSO

6. THE PROPOSAL WILL REQUIRE A FIVE YEAR EFFORT WITH NUMBERS AVAILABLE FOR TRAINING AS FOLLOWS: FACULTY OF AGRICULTURE, 37 PROFESSIONALS; RESEARCH SERVICE, 25 SCIENTISTS AND ABOUT 10 EXTENSION AND EDUCATION OFFICERS. TRAINING PROGRAMS WILL INVOLVE ABOUT 12 TO 14 PROFESSIONALS PER YEAR. OVER THE LIFE OF THIS PROJECT, SOME PERSONS MAY GO FOR MORE THAN ONE SHORT TERM COURSE. WE SEE TRAINING PROGRAMS DEVELOPED TO INCLUDE LIBRARY SEARCHES, CONSULTATION BETWEEN UGANDAN PROFESSIONALS AND MAJOR PROFESSORS OF U.S. UNIVERSITIES, CONDUCTING OF SEMINARS, ASSISTING WITH FIELD RESEARCH PROGRAMS AND OTHER JOB TYPE TRAINING EFFORTS. INDIVIDUAL TRAINING PROGRAMS WILL STRESS ACTUAL PARTICIPATION IN REFRESHER AND UPDATING ENDEAVORS FOCUSING ON METHODOLOGIES AND PRACTICAL TECHNOLOGIES

7. INCOUNTRY SEMINARS AND RESEARCH: THE PROJECT WILL PROVIDE LIMITED ASSISTANCE FOR ONE PROFESSIONAL SEMINAR TO BE HELD EACH YEAR DURING THE LIFE OF THE PROJECT AND FUNDING OF A RESEARCH GRANT PROGRAM. THE PROJECT WILL PROVIDE FUNDING FOR A NUMBER OF SHORT TERM CONSULTANTS FROM THE INTERNATIONAL AGRICULTURAL RESEARCH CENTERS AND THE U.S. UNIVERSITY COMMUNITY FOR THE PURPOSE OF ORGANIZING AND CONDUCTING IN-COUNTRY SEMINARS ON TOPICS OF IMMEDIATE IMPORTANCE TO AGRICULTURAL DEVELOPMENT IN THE COUNTRY. AS FOR THE RESEARCH GRANT PROGRAM, SMALL GRANTS WILL BE MADE TO INVESTIGATE PERTINENT PROBLEMS AFFECTING RAPID DEVELOPMENT OF AGRICULTURE. THE GRANTS WILL BE PROVIDED TO UNIVERSITY SCIENTISTS TO UNDERTAKE RESEARCH INTO PROBLEMS OF THE FOLLOWING NATURE: COST OF PRODUCTION STUDIES, LABOR CONSTRAINTS ON SMALL DIVERSIFIED FARMS AND INTEGRATED PEST MANAGEMENT SCHEMES. THE GRANTING OF FUNDS TO SCIENTISTS FOR RESEARCH WILL FOLLOW THE LONG ESTABLISHED PROCEDURES SET FORTH BY MAKERERE UNIVERSITY.

8. TECHNICAL ASSISTANCE: THE PROPOSED TECHNICAL ASSISTANCE COMPONENT OF THE PROJECT WILL INCLUDE THREE SENIOR PROFESSIONALS. ONE PROFESSIONAL WILL SERVE AT MAKERERE UNIVERSITY IN THE CAPACITY AS PROJECT COORDINATOR WITH RESPONSIBILITY FOR PREPARING PARTICIPANT DOCUMENTATION, PROVIDING FOLLOW-UP ACTIONS ON TRAINING PROGRAMS BEFORE DEPARTURE AND AFTER RETURNING AND COLLABORATING IN THE DEVELOPMENT OF THE TEACHING AND RESEARCH REHABILITATION PROGRAM AT THE FACULTY OF AGRICULTURE. A SECOND PROFESSIONAL WITH FARM MANAGER SKILLS WILL SERVE AT THE KABANYOLO RESEARCH AND TRAINING FARM (PART OF MAKERERE UNIVERSITY). THE INCUMBENT WILL BE RESPONSIBLE FOR ASSISTING IN THE SUPERVISION AND MANAGEMENT NEEDED TO REHABILITATE PRIORITY COMPONENTS OF THE FARM WHICH ARE REQUIRED TO DEVELOP PRACTICAL STUDENT TRAINING AND IN-SERVICE TRAINING WORKSHOPS FOR RESEARCH AND EXTENSION OFFICERS. THE THIRD U.S. PROFESSIONAL WILL SERVE AT THE SERERE EXPERIMENT STATION. RESPONSIBILITIES WILL INCLUDE THE PROVIDING OF ASSISTANCE TO THE STATION MANAGEMENT IN REHABILITATION OF THE RESEARCH PROGRAM, AID IN TRAINING RESEARCH OFFICERS OF THE MINISTRY OF AGRICULTURE AND ASSISTANCE IN DESIGNING AND CONDUCTING OF IN-SERVICE TRAINING SESSIONS FOR EXTENSION OFFICERS. WE ANTICIPATE THAT THE THREE U.S. TECHNICAL ASSISTANCE PROFESSIONAL WILL BE RE-

9. COMMODITIES: THE COMMODITY COMPONENT OF THE PROJECT WILL INCLUDE LABORATORY SUPPLIES AND MATERIALS AND LIMITED FARM EQUIPMENT NEEDED TO DEVELOP A TRAINING INFRASTRUCTURE AT THE KABANYOLO RESEARCH AND TRAINING FARM. IT IS ALSO INTENDED TO PROVIDE A LIMITED NUMBER OF PRIORITY LABORATORY AND FIELD EQUIPMENT ITEMS AND MATERIALS TO THE SERERE EXPERIMENT STATION SO THAT RESEARCH AND IN-SERVICE TRAINING CAN BE CONDUCTED ON A SELECT NUMBER OF FOOD CROPS. WE SEE THE MAJOR PORTION OF THE COMMODITIES BEING ITEMS NEEDED TO SUPPLEMENT THE CURRENT INVENTORY OF EQUIPMENT AND OTHER ITEMS REQUIRED TO COMPLEMENT THE PRESENT OPERATING EQUIPMENT. A CERTAIN PORTION OF THE FUNDS WILL BE RESERVED TO UPGRADE THE LIBRARY AT MAKERERE WHICH IS GROSSLY OUT OF DATE.

10. FUNDING: WE ESTIMATE THAT AID CONTRIBUTION TO THE PROJECT AT USDOLS 6.3 MILLION. THIS INCLUDES (1) 360 PERSONS MONTHS OF TRAINING AT ABOUT USDOLS 5,000 PER MONTH-TOTAL USDOLS 1.8 MILLION; (2) TECHNICAL ASSISTANCE OF 13-15 PERSON YEARS TOTALLING APPROXIMATELY USDOLS 2.3 MILLION; (3) COMMODITIES OF USDOLS 2.0 MILLION; (4) SHORT TERM TECHNICAL ASSISTANCE AND IN-COUNTRY SEMINARS, USDOLS 100,000; AND (5) IN-COUNTRY RESEARCH GRANTS USDOLS 100,000. THESE ESTIMATES WILL BE FURTHER REFINED DURING PROJECT DEVELOPMENT.

11. COOPERATIVE AGREEMENT: WE PLAN ON SECURING THE U.S. TECHNICAL ASSISTANCE THROUGH THE COOPERATIVE AGREEMENT/CONTRACTING MODE. OUR INTENTIONS ARE TO CONTACT A NUMBER OF U.S. UNIVERSITIES WITH A STRONG INTERNATIONAL DEVELOPMENT COMMITMENT AND REQUEST THEM TO SUBMIT AN EXPRESSION OF INTEREST AS TO THEIR CAPABILITIES FOR CARRYING OUT THE IMPLEMENTATION OF THE MANPOWER TRAINING PROJECT.

12. THE PP DESIGN WILL BE SCHEDULED TO COMMENCE TOWARD THE END OF MAY. SEPTEL WILL REQUEST SPECIFIC STAFF AND PROPOSE A PRECISE DATE. WE CURRENTLY ENVISION THE DESIGN TEAM TO CONSIST OF THE FOLLOWING: PROJECT OFFICER AND TEAM LEADER (REDSO); AGRICULTURE RESEARCH OFFICER (AID/L); EDUCATION/TRAINING SPECIALIST (AID/W); AGRICULTURAL ECONOMIST (REDSO); BEHAVIORAL SCIENTIST (REDSOGLV AND SUPPLY ADVISOR (REDSO). DESIGN IS ESTIMATED TO TAKE ABOUT 4; 233 ( 2850 5-4-GET COMPLETION NO LATER THAN THE END OF JUNE.

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ANNEX A

INCOMING  
TELEGRAM

PAGE 01 KAMPAL 01067 03 OF 03 271038Z 0888 027216 AID0115  
ACTION AID-00

ACTION OFFICE AFDR-06  
INFO AFEA-01 AFDP-06 PPCE-01 PPPB-03 GC-01 GCAF-01 GCFL-01  
PPDC-01 FM-02 STAG-02 SAST-01 AGRI-01 STFA-01 RELO-01  
MAST-01 /032 A2 X28

INFO CCT-00 COPY-01 INR-10 AF-00 EB-08 /064 W  
-----162374 280820Z /11

R 271000Z APR 83  
FM AMEMBASSY KAMPALA  
TO SECSTATE WASHDC 6824  
INFO AMEMBASSY NAIROBI

UNCLAS SECTION 03 OF 03 KAMPALA 1088

AIDAC  
NAIROBI FOR REDSO

13. GIVEN THE ELEMENTS OF THIS PROJECT AS DESCRIBED ABOVE, AND BASED ON PAST AND CURRENT ANALYSIS OF THE AGRICULTURE SECTOR UN-  
DERTAKEN, WE BELIEVE THE PROJECT CAN BE EFFECTIVELY DESIGNED AND NEGOTIATED IN A TIMELY MANNER TO MEET FY 83 OBLIGATION REQUIREMENTS. THE COMPONENTS NOW INCLUDED FOR FURTHER DEVELOPMENT IN THE PP, AND THE APPROACH TO BE FOLLOWED, WERE ALL CONTAINED IN THE PID THAT WAS APPROVED LAST YEAR. WE ARE NOW LIMITING THE NUMBER OF INSTITUTIONS ORIGINALLY PROPOSED FOR ASSISTANCE, AS WELL AS ACTIVITIES, AND TAKING A MORE FOCUSED APPROACH TO CONCENTRATE OUR RESOURCES ON THE PRIORITY TRAINING NEED. THIS WILL ALSO REDUCE THE STAFF TIME AND REQUIREMENT FOR PROJECT IMPLEMENTATION. ON THE BASIS OF THIS MORE NARROWLY DEFINED PROJECT, WHICH IS BOTH CONSISTENT WITH, AND WITHIN THE CONFINES OF, THE APPROVED PID, WE WILL BE PROCEEDING TO FULL PP DESIGN WITHIN THE NEXT SEVERAL WEEKS. CONSISTENT WITH DOA 140 REVISED AND RELYING ON THE EXPERTISE RESIDING IN THE FIELD, WE PLAN TO APPROVE THE PROJECT HERE WITH REDSO CONCURRENCE. WE FEEL THERE ARE NONFUNDAMENTAL ISSUES WARRANTING A DIFFERENT REVIEW PROCESS AND WILL NEED TO MOVE QUICKLY UPON COMPLETION OF PP DESIGN TO OBLIGATE FUNDS THIS FISCAL YEAR.
14. REDSO CONCURS IN PROJECT DESIGN AS OUTLINED IN THIS MESSAGE.
15. PLEASE PASS COPY OF THE CABLE TO AFR/TR LAND HOLDCROFT. BEYER

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INCOMING TELEGRAM

A N E M B A S S Y N A I R O B I USAID FILE CODE

ACTION

U N C L A S S I F I E D

REDSO FILE

ANNEX A

INFO

18317887 MAY 18

DIR

SECRETARY WASHDC

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1460 KUMBA/AMEMBASSY NAIROBI 3527

REDSO

RHUCG

RIG/A

UNCLAS STATE 133489

RIG/II

PROG

RFHC

AIDAC, NAIROBI FOR REDSO/ESA

AGR

E.O. 12355: N/A

HNP

PRJ

EXO

SUBJECT: UGANDA MANPOWER FOR AGRICULTURAL DEVELOPMENT -

GSO

217-2123

PCR

RF

REF: KAMPALA 1068

CHRON

CR

1. AFRICA BUREAU HAS REVIEWED REPTEL CLARIFYING MISSION CONCEPT OF SUBJECT PROJECT ON MAY 4. BUREAU INDICATE AGREES ON APPROACH AS OUTLINED AND CONCURRED WITH FIELD ANTICIPATION OF PP. SUGGEST MISSION CONSIDER FOLLOWING CONCERNS RAISED AT PC MEETING.

EMB

DCM

ECOM

CFU

2. BUDGET. HAVE NOTED INCREASE IN LCP FUNDING PRESENTLY AT USDOLS 6.3 MILLION. FYI IT WAS NOTED THAT TECHNICAL ASSISTANCE COSTS MAY BE UNDERESTIMATED AND SHOULD BE EXAMINED DURING FE DESIGN. K. JACOBSON IS SURVEYING CURRENT T.A. COST ESTIMATES. END FYI. RECOMMENDATIONS CONCERNING FY 83 PROJECT OBLIGATION LEVEL WILL FOLLOW IN REPTEL AFTER FURTHER CONSULTATION BETWEEN AEA/EP, AEA/EA AND AEP/ED/EAP.

TOTAL

3. PURPOSE. REVISED PURPOSE INDICATES THAT PROJECT WILL POSITIVELY INFLUENCE NATIONAL AGRICULTURAL

DATE REC'D

5-16

POLICIES, BUT IT DOES NOT DESCRIBE LINKAGES AMONG RESEARCH, EDUCATIONAL INSTITUTIONS, AND MINISTRY OF AGRICULTURE NECESSARY TO DO SO. RECOMMEND THAT PROJECT PAPER CLEARLY DEFINE SUCH LINKAGES OR DELTE INTENDED IMPACT ON NATIONAL POLICY FROM THE PURPOSE.

DATE DUE

NAW

4. RESEARCH ACTIVITIES. PC CONCERNED ABOUT POLICY CONTEXT WITHIN WHICH WE INITIATE RESEARCH TRAINING AND RESEARCH GRANT PROGRAM. RECOMMEND THAT RESEARCH EFFORT NOT BE STARTED WITHOUT CONSIDERATION OF EXTENSION SERVICE AND END USERS. EP SHOULD ADDRESS THE CURRENT LACK OF AGRICULTURAL RESEARCH PRIORITIES IN ORDER TO ASSURE EFFICIENT RESOURCE USE AND TO ASSESS WHETHER LONG-TERM OUTPUTS WILL BE FLEXIBLE ENOUGH TO SUPPORT FUTURE PRIORITIES. MISSION SHOULD CONSIDER STEPS TO ENSURE THAT RESEARCH AND TRAINING DIRECTIONS ARE TAILOR TO DOMESTIC NEEDS AND INTERNATIONAL MAR IF CONDITIONS. FE SHOULD ALSO EXAMINE LINKAGES BETWEEN RESEARCH EFFORTS AND EXTENSION TO ASSURE THAT RESEARCH RESULTS STIMULATED BY RESEARCH TRAINING AND NETWORKING CAN BE RAPIDLY DISSEMINATED. RECOMMEND SPECIFICALLY

ACTION

TAKE

INITIALS

DATE 16 May 83



18 MAY 83  
FOR: 1942  
ON: 13099  
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INCLUDING A REQUIREMENT IN MID-PROJECT EVALUATION TO DETERMINE IF NATIONAL PRIORITIES HAVE BEEN SET AND IF TRAINING SHOULD BE REVISED ACCORDINGLY. EVALUATION WILL ALSO INFORM ANY FOLLOW-ON EFFORT TO EXTEND NEW TECHNOLOGIES.

5. TRAINING. PC CONCURRED THAT TRAINING CAN BE USED AS A CORE INCENTIVE FOR TECHNICAL PROFESSIONALS, BUT PC EXPRESSED CONCERN OVER LACK OF TRAINING FOR AGRICULTURAL ADMINISTRATION AND MANAGEMENT CADRE. RECOMMEND THAT MISSION CONSIDER SOME TRAINING FOR UPPER LEVEL PERSONNEL IN MINISTRY OF AGRICULTURE TO FACILITATE FORMULATION OF AGRICULTURAL RESEARCH POLICY AND LINKAGE WITH SCIENTIFIC COMMUNITY RECEIVING FULL OF TRAINING.

6. COOPERATIVE AGREEMENT. APPROPRIATENESS OF T.A. PROCUREMENT METHOD SUGGESTED IN REFTEL QUESTIONED BECAUSE IT MAY REQUIRE MORE WORK FROM MISSION THAN A CONTRACT WHILE TAKING EQUAL TIME TO EXECUTE. RECOMMEND THAT MISSION USE A STANDARD UNIVERSITY CONTRACT UNDER TITLE XII, THUS ALLOWING TIGHTER CONTROL OVER PROJECT ACTIVITIES THAN UNDER A COOPERATIVE AGREEMENT. BIFAD

HAS CONFIRMED THAT A STANDARD UNIVERSITY CONTRACT WOULD REQUIRE ABOUT THE SAME TIME TO NEGOTIATE AS A COOPERATIVE AGREEMENT.

7. COMMODITIES. RECOMMEND A THOROUGH ASSESSMENT REGARDING DESIGN OF EQUIPMENT AND FUNDING NECESSARY TO ESTABLISH VIALLE RESEARCH AND TRAINING STATIONS. PARTICULARLY AT SNEARE. SHOULD NEEDS EXCEED AVAILABLE FUNDS, MISSION MAY DECIDE TO FOCUS ON EQUIPMENT NECESSARY FOR KEY CROP RESEARCH IN ONE OR TWO COMMODITIES. SHULTZ

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PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project:  
From FY 1983 to FY 1987  
Total U. S. Funding \$8,020,000  
Date Prepared: June 1983

Project Title & Number: UGANDA-MANPOWER FOR AGRICULTURE DEVELOPMENT (617-0103)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																					
<p>Program or Sector Goal: The broader objective to which this project contributes: To assist the GOU in its recover program to stimulate small farmer agricultural production.</p>	<p>Measures of Goal Achievement: Food crop production by small farmers has increased by percentage attributable to revised ag research capability</p>	<p>Production statistics</p>	<p>Assumptions for achieving goal targets: Next investment on parallel basis is to upgrade extension capability to link rehabilitated ag research to small farmer producer.</p>																					
<p>Project Purpose: To assist the GOU to rehabilitate and redirect its agricultural research capability in food crop* production.</p> <p>*Preliminary farming systems approach</p>	<p>Conditions that will indicate purpose has been achieved: End of project status. The agricultural research capability of Uganda in food crops has been restored through retraining, re-equipment and rehabilitation and is poised to recurrence major agricultural research initiatives in food crops.</p>	<p>Project evaluation</p>	<p>Assumptions for achieving purpose: 1. Existing human resources adequate to carry on ag research 2. Training of extensionists sufficient to form basis of linkage with research</p>																					
<p>Outputs: 1. Trained staff 2. Research stations rehabilitated and re-equipped 3. Research priorities established 4. Joint research coordination system 5. Research linked with extension 6. Faculty of Agriculture re-equipped 7. Ministry of Agriculture re-equipped.</p>	<p>Magnitude of Outputs: 1. 87 2. 2 3. One system 4. One system 5. 5 cross trained extensionists 6. 2 locations 7. One location.</p>	<p>Project evaluations controllers records receiving reports</p>	<p>Assumptions for achieving outputs: 1. Trained personnel available 2. Research stations available 3. MOA - Makerere collaborate formally or informally 4. Ministry Reg. Cooperation cooperation cooperates at Serere station facilities on millet/sorghum 5. Security situation remains tolerable</p>																					
<p>Inputs:</p> <table border="1" data-bbox="327 1108 524 1293"> <thead> <tr> <th></th> <th>U.S.</th> <th>GOU</th> </tr> </thead> <tbody> <tr> <td>1. Technical Expertise</td> <td>X</td> <td></td> </tr> <tr> <td>2. Training</td> <td>X</td> <td>X</td> </tr> <tr> <td>3. Research stations</td> <td></td> <td>X</td> </tr> <tr> <td>4. Equipment</td> <td>X</td> <td></td> </tr> <tr> <td>5. Operating Costs</td> <td>X</td> <td>X</td> </tr> <tr> <td>6. Research grants</td> <td>X</td> <td></td> </tr> </tbody> </table>		U.S.	GOU	1. Technical Expertise	X		2. Training	X	X	3. Research stations		X	4. Equipment	X		5. Operating Costs	X	X	6. Research grants	X		<p>Implementation Target (Type and Quantity) See budget PP Section 4</p>	<p>Controller's records Ministry of Agriculture records Makerere records PP annexes ;</p>	<p>Assumptions for providing inputs: GOU has local currency to provide to project Technical assistance can be recruited in face of difficulties</p>
	U.S.	GOU																						
1. Technical Expertise	X																							
2. Training	X	X																						
3. Research stations		X																						
4. Equipment	X																							
5. Operating Costs	X	X																						
6. Research grants	X																							

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## 5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481; Second CR FY 83 Sec. 133. Has it been determined that the government of the recipient country has failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to 983 U.S. Government personnel or their dependents, or from entering the U.S. unlawfully? No
  
2. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such No

3. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? No
4. FAA Sec. 532(c), 620(a), 620(f), 620D; FY 1982 Appropriation Act Secs. 512 and 513. Is recipient country a Communist country? Will assistance be provided to Angola, Columbia, Cuba, Laos, Vietnam, Syria, Libya, Iraq, or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver? No
5. ISDCA of 1981 Secs. 724, 727, 728 and 730. For specific restrictions on assistance to Nicaragua, see Sec. 724 of the ISDCA of 1981. For specific restrictions on assistance to El Salvador, see Secs. 727, 728 and 730 of the ISDCA of 1981. N/A
6. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property? No

7. FAA Sec. 620(1). Has the country failed to enter into an agreement with OPIC?
- (b) If so, has any deduction required by the Fishermen's Protective Act been made.
8. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters?
- (b) If so, has any deduction required by the fishermen's Protective Act been made?
9. FAA Sec. 620(q); FY 1982 Appropriation Act Sec. 517. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill appropriates funds?
10. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or

No

N/A

No

other resources which the country has spent on military equipment? Reference may be made to the annual "Taking into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB". This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

N/A

11. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

No

12. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?

The UN payments are up-to-date as far as USAID/Uganda is able to determine.

13. FAA Sec. 620A; FY 1982 Appropriation Act Sec. 520. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime?

No

14. FAA Sec 656. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA?

No

15. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device, after August 3, 1977? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan).

No

16. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Session of the General Assembly of the U.N. of Sept. 25 and 28, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account?

Yes, the AID Administrator has taken this into account in programming funds for Uganda. Taking into consideration memo, 1/28/83.

17. ISDCA of 1981 Sec. 721. See special requirements for assistance to Haiti.

N/A

UNDING SOURCE CRITERIA FOR  
COUNTRY ELIGIBILITY

Development Assistance  
Country Criteria

a. FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy?

No

Economic Support Fund  
Country Criteria

a. FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest?

N/A

b. ISDCA of 1981, Sec. 725(b). If ESF is to be furnished to Argentina, has the President certified that (1) the Govt. of Argentina has made significant progress in human rights; and (2) the provision of such assistance is in the national interests of the U.S.?

N/A

c. ISDCA of 1981, Sec. 726(b). If ESF assistance is to be furnished to Chile, has the President certified that (1) the Govt. of Chile has made

N/A

significant progress in human rights;  
(2) it is in the national interest of  
the U.S.; and (3) the Govt. of  
Chile is not aiding international  
terrorism and has taken steps to  
bring to justice those indicted in  
connection with the murder of  
Orlando Letelier?

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only:

- B.1. applies to all projects funded with Development Assistance Funds,
- B.2. applies to projects funded with Development Assistance loans, and
- B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY

CHECKLIST UP

TO DATE? HAS

Yes

STANDARD ITEM

CHECKLIST BEEN

REVIEWED FOR

THIS PROJECT?

Yes

A. GENERAL CRITERIA FOR PROJECT

- 1. FY 1982 Appropriation Act  
Sec. 523; FAA Sec. 634A;  
Sec. 653(b); Second CR FY 83,  
Sec. 101(b)(1).

(a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project;

A notification was sent to the appropriate Committees on July 15, 1983. No funds will be obligated until the Congressional waiting period expires.

(b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that amount)?

Yes

(c) If the proposed assistance is a new country program or will exceed or cause the total assistance level for

No

- the country to exceed assistance amounts provided to such country in FY 82, has a notification been provided to Congress?
- (d) If the proposed assistance is from the \$85 million in ESF funds transferred to AID under the Second CR for FY 83 for "economic development assistance projects", has the notification required by Sec. 101(b)(1) of the Second CR for FY 83 been made?
2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be  
 (a) engineering, financial or other plans necessary to carry out the assistance and  
 (b) a reasonably firm estimate of the cost to the U.S. of the assistance?
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?
4. FAA Sec. 611(b); FY 1982 Appropriation Act Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973?
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S.

No

N/A

yes

Yes

No further legislative action is required.

N/A

assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?

N/A

6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

No

7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

This project will rehabilitate Uganda's agricultural research capability thus improving the technical efficiency of agricultural production

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

Equipment will be procured from private enterprise in the U.S.

9. FAA Sec. 612(b), 636(h);  
FY 1982 Appropriation  
Act Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.
- The GOU is contributing as much as possible in local shillings and in kind and exceeds the 25% contribution required by Sec. 110 a.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?
- No
11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?
- Yes.
12. FY 1982 Appropriation  
Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?
- The assistance is not for the production of any commodity for export
13. FAA 118(c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16? Does the project or program take into consideration the
- Yes

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problem of the destruction of tropical forests?

14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom);

N/A

15. FAA Sec. 128; Second CR FY 83, Sec. 101(b)(2). Has an attempt been made to finance productive facilities, goods, and services which will expeditiously and directly benefit those living in absolute poverty under the standards adopted by the World Bank?

The rehabilitation of Uganda's agricultural research capability will have a positive long-term benefit on the small farmer in Uganda who is now living in absolute poverty.

B.

FUNDING CRITERIA FOR PROJECT  
1. Development Assistance  
Project Criteria

- a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical

The rehabilitation of Uganda's agricultural research capability will assist the rural poor farmers to produce more agricultural produce which they frequently market through the existing cooperative systems.

assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

b. FAA Sec. 103, 103A, 104, 105 106. Does the project fit the criteria for the type of funds (functional account) being used?

Yes. (103)

c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?

The technological packages which will ultimately evolve from the rehabilitated agricultural research activities will emphasize labor using techniques.

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?

Yes

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the

N/A

recipient country "relatively least developed"?

f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

Yes

g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in government processes essential to self-government.

The re-training of the 87 trained professionals in agriculture will stimulate the use of these intellectual resources in rehabilitating their country's agricultural research capability

2. Development Assistance Project Criteria (Loans only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.

N/A

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than

N/A

20% of the enterprise's annual production during the life of the loan?

c. ISDCA of 1981, Sec. 724 (c) and (d). If for Nicaragua, does the loan agreement require that the funds be used to the maximum extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624(g)?

N/A

d. Second CR FY 83, Sec. 134. If the recipient country has an annual per capita gross national product greater than \$795 but less than \$1,285, will the loan be repayable within 25 years following the date on which funds are initially made available? If it has an annual per capita GNP greater than or equal to \$1,285, within 20 years?

N/A

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic or political stability? To the extent possible, does it reflect the policy directions of FAA Section 102?

N/A

b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities?

N/A

c. FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of,

N/A

or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to non-proliferation objectives?

d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

N/A

e. Second CR FY 83, Sec. 101(b)(1). If ESF funds to be utilized are part of the \$85 million transferred to AID under the Second CR for FY 83 for "economic development assistance projects", will such funds be used for such projects and not for non-development activities including balance of payments support, commodity imports, sector loans, and program loans?

N/A

5C(c) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? Yes
  
2. FAA Sec. 604(a). Will all procurements be from U.S. except as otherwise determined by the President or under delegation from him? Yes
  
3. FAA Sec. 604(d). If the cooperating country discriminates against certain insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? Yes
  
4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or N/A

product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.)

5. FAA Sec. 604(g). Will construction or engineering services be procured from firms of countries otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one or these areas?

No

6. FAA Sec. 603. Is the shipping excluded from compliance with . requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent that such vessels are available at fair and reasonable rates?

No

7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the

A Title XII University contract will be utilized.

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fullest extent practicable? If the facilities of other Federal agencies will be utilized, are they particularly suitable not competitive with private enterprise, and made available without undue interference with domestic programs?

8. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U. S. carriers be used to the extent such service is available?

Yes

9. FY 1982 Appropriation Act Sec. 504. If the U.S. Government is a party to a contract for procurement, will the contract contain a provision authorizing termination of such contract for the convenience of the United States?

Yes

B. Construction

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional service to be used?

N/A

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

N/A

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3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million (except for productive enterprises in Egypt that were described in the CP)?
- N/A

C. Other Restrictions

1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?
- N/A

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?
- N/A

3. FAA Sec. 620(b). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the communist-bloc countries?
- Yes

4. Will arrangements preclude use of financing:
- Yes

a. FAA Sec. 104(f); FY 1982 Appropriation Act Sec. 525: (1) To pay for performance of abortions

as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; (4) to lobby for abortion?

Yes

b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property?

Yes

c. FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs?

Yes

d. FAA Sec. 662. For CIA activities?

Yes

e. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained?

Yes

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f. FY 1982 Appropriation Act, Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel?

Yes

g. FY 1982 Appropriation Act, Sec. 505. To pay U.N. assessments, arrearages for dues?

Yes

h. FY 1982 Appropriation Act, Sec. 506. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)?

Yes

i. FY 1982 Appropriation Act, Sec. 510. To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields?

Yes

j. FY 1982 Appropriation Act, Sec. 511. Will assistance be provided for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?

No

k. FY 1982 Appropriation Act, Sec. 515. To be used for publicity or propaganda purposes within U.S. not authorized by Congress?

Yes

INSTITUTIONAL ANALYSES: EDUCATION,  
RESEARCH, EXTENSION

I. EDUCATION

A. Makerere University and Kabanyola Farm

Makerere University began as a technical college in 1921. It was established as Makerere College in a special relationship with the University of London in 1949 and became one of the three colleges of the University of East Africa in 1963. When that university was dissolved in 1970, it became the autonomous Makerere University, Kampala.

Agricultural instruction began at Makerere as early as 1922 as a three-year diploma course taught largely by officers of the Uganda Department of Agriculture. It became a full fledged Faculty of Agriculture, awarding the London B.Sc. degree in Agriculture in 1961. It took students, in roughly equal numbers, from each of the three East African countries of Kenya, Tanzania and Uganda through 1971. Through 1964 this intake fluctuated between 15 and 20 students per year.

1. Period of Transition (1965-1972)

In 1965, USAID provided the services of two agricultural educators to visit the Faculty and make a "Requirements Analysis" of the needs of the Faculty in terms of physical facilities, staffing and long-range program development. A general agreement of donor cooperatives for the development of the university were major factors in the creation of a period of rapid development and dynamic change made possible by a large amount of international support, both in funds and staff, eventually involving USAID, NORAD, CIDA, ODA, UNICEF, and the Rockefeller and Ford Foundations.

USAID signed a project agreement with the University of East Africa in June 1964, in which it provided support to the Faculty of Agriculture. On this basis a contract was signed with West Virginia University (WVU) later that same year. Under this contract, WVU first provided a senior agricultural advisor to work with the Faculty in the development of a long range program of development and assistance. Subsequently amendments to that contract made possible the assignment of staff members to the Faculty to assist the Faculty in revising its curriculum, increasing its undergraduate enrollment, developing in-resident postgraduate training and contributing to the planning and execution of relevant research projects.

A further program was initiated in 1971 when a contract was signed between USAID and West Virginia University as prime contractor for a consortium consisting of WVU, Ohio State University and North Carolina Agricultural and Technical State University. The chief purpose of this contract was to assist the Makerere University, Faculty of Agriculture to expand its educational and research capabilities at the postgraduate level. Under these contracts, 15 staff members contributed 41 person years to the Faculty's activities between 1964 and 1973. Funds were provided in both contracts to purchase selected equipment and for related costs for specific research projects.

USAID provided funds for fellowships for higher degree training of Ugandan participants as part of Makerere's staff development plan.

The combined efforts of the financial and staff contributions by the various donors, as well as the goodwill and rapid expansion of local government and university financial support made possible a period of dynamic growth and institutional evolution to make the Faculty into a much more effective instrument in the agricultural development of East Africa. The institution which evolved was eventually one designed best to serve the specific local needs rather than a copy of a system from elsewhere. This was a result of constructive and synergistic blending of staff from a broad range of nationalities and backgrounds.

Through the influence of staff from many backgrounds and the long dedicated work of the Undergraduate Studies Committee, the curriculum was thoroughly revised to make it as relevant as possible to the needs of East Africa. The curriculum was divided into more discrete elements in a course unit system designed to provide flexibility by serving as building blocks in the creation of relevant options and better cooperation with other faculties, while ensuring continuity of the teaching program in spite of staff changes. The combination of more frequent evaluation through course examinations, along with comprehensive examinations, provided for better stimulation of learning throughout the three-year period. A seven week period of intensive training in practical skills was added during vacation periods.

Traditionally the Faculty of Agriculture had awarded a sprinkling of higher degrees, but these were for part time research done by its own staff or staff working at research

stations. At the same time that the number of postgraduate students was greatly increased the quality of such training was improved by emphasis on full time, in-residence training involving postgraduate course work and examinations in addition to the thesis research. Development of residence facilities for postgraduate students at the University Farm encouraged the choice of more applied research and topics for thesis research which were oriented to field production. The provision to staff of grants for specific production-oriented research also made it possible for postgraduate research to be integrated into ongoing, relevant research programs.

## 2. Decade of Decline and Survival (1973-1982)

During the years as Uganda progressively descended into deeper economic and political difficulties, and its various institutions, including many of international reputation in the University, were nearly destroyed, the Faculty of Agriculture is still carrying on remarkably well and Kabanyalo is still active but at a reduced level and with difficulty. Throughout this period, graduates have been evaluated by external examiners who have declared that the standards have remained relatively high. It has been only during the past four years, with the war and its subsequent consequences, that research and postgraduate training, along with the related facilities, have seriously declined.

## 3. Current Status

There are 37 staff members still in the Faculty and there are only 14 unfilled positions. These faculty members have remained at the university through the period of difficulty. These are experienced and highly qualified staff. Unlike some organizations, the Faculty has apparently not lowered its standards to fill vacancies, which are now about 27 percent of the establishment.

Like most facilities in the University, there has been little physical damage from the war but most equipment is out of order due to failure to obtain spare parts. The new research wing has never been fully utilized as it was just nearing completion when the problems started. Similarly, at Kabanyalo there are severe problems with the water pumps so it is difficult to provide water to the student laboratories and dormitories. The farm machinery is in a bad state of repair. There has been no major looting and with repair and/or replacement of non-operating equipment and machinery, it would not be very difficult to bring the facilities back to operating

condition. The problems do not appear insurmountable and the basic structures are sound.

The major changes or improvements which have been described above have remained intact and in some instances have been improved upon. The same course unit system is still in use. The practical training period during vacations has been increased from seven to eight weeks, and a two-week case study requirement has been added to the other practical training programmed for the second year. The requirement of conducting a special project during the vacation period between the second and third years remains a well organized exercise, providing relevant information and experience. While research has just about ground to a halt due to lack of funds and equipment the nature of the projects proposed for financing demonstrates that the same mission-oriented, production research philosophy remains.

#### 4. Recommendations

a. During the past ten years, the staff who have remained in Uganda have suffered from almost total isolation from the world scientific community. Funds will be made available for short-term, specialized refresher training. Such training will include the international agricultural research centers involved with commodities of importance to Uganda and also the U.S. agricultural universities.

b. The practical understanding of concepts taught in the classroom has been greatly impeded by the severe determination of the teaching laboratories and the loss or non-functioning of most laboratory equipment. To a lesser, but serious, degree classroom teaching is limited to lack of functioning visual aid equipment and office supplies and equipment. Commodity imports to alleviate this problem will include: spare parts, laboratory equipment and supplies, vehicles, projectors, training materials, books and professional journals.

The development of Kabanyolo as a production facility must be seen as a temporary expedient and as a necessary stage in the gradual expansion of research activities. An agricultural faculty must have a field research facility or else its staff and post-graduate research will tend to concentrate largely in the laboratory. Such a facility is also essential to make possible the harnessing of the great resource of highly skilled manpower found in the University faculty for the solution of high priority agricultural production problems.

It is necessary to restore the excellent field labs, crop and animal research equipment to the state of excellence achieved by 1972. To accomplish this, spare parts, laboratory and farm equipment, field plot equipment, refrigeration for germ plasm storage and some expendable supplies are needed.

c. During the life of the project there will be a need for a senior, experienced educator to provide new ideas and leadership in new directions. He will assist the staff in curriculum changes, where necessary, staff retraining programs and the detailed list of commodities to be supplied.

A farm manager will be provided under the project who is highly experienced and skilled in research station management, crop and animal production as well as equipment operation and maintenance. He will be assigned for up to three years during which time he will also train Ugandan understudies.

d. The Faculty of Agriculture can remain a dynamic force in Uganda's agricultural development. This means that new initiatives responsive to the changing needs should be expected. Better coordination of the agriculture research in Uganda is needed. To accomplish this coordination and cooperation between the Faculty and Ministries of Agriculture and Animal Resources, workshops and seminars will be held at Makerere on a semiannual or annual basis. If required experts from outside Uganda will be provided as short term consultants.

There will be a need for specialists in various fields of agriculture, including research, extension and education throughout the life of the project. Up to 15 person-months of these services will be provided.

#### B. Bukalasa and Arapai Agricultural Colleges

1. In 1954, an Agricultural Productivity Committee recommended the establishment of three training institutions. Bukalasa Agricultural College was established near Bombo to provide two-year certificate training in the "tall grass" ecological zone; Arapai Agricultural College was established in 1957, near Soroti, to provide similar training in the "short grass" ecological zone; and the Veterinary Training Institute at Entebbe to provide a two-year certificate program. Selected students could complete a third year and receive a diploma from each of these institutions.

In 1963, USAID signed a technical assistance contract with West Virginia University to provide faculty at the three

institutions. During the time between 1963 and 1971, 23 WVU staff members were assigned to the project. Thirty-five Ugandans were sent to the U.S. for degree training.

The certificate holder enters the civil service as an Agricultural Assistant and a diploma holder enters as an Assistant Agricultural Officer. About 90 percent of the 1979 graduates were posted with the Extension Service.

The quality of extension work at the village level in Uganda depends importantly on the training given at Bukalasa and Arapai. These two colleges also provide refresher courses for their graduates whenever development projects are undertaken. This retraining function is especially relevant in the rehabilitation period.

## 2. Recommendation

The principal at each of the two agricultural colleges is an Agricultural Officer. The need for in-service training and a reorientation to their jobs is extremely important. Ugandans are acutely aware that their intellectual development has been in cold storage for the past decade. There is a need for refresher training for the two principals and this will be undertaken under this project.

## II. RESEARCH

### A. Historical Review

Uganda's farmers have traditionally adopted many new crops and incorporated them into their farming systems. For example, the banana was probably brought to Uganda more than 300 years ago, and in the course of time was adopted as a staple food by a large section of Uganda's population. Similarly, crops such as cassava, sweet potatoes and peanuts, which originated in the Americas, were brought to Uganda at various times and are now widely grown by large numbers of farmers. During the process a rudimentary form of experimentation was carried out by the farmers who selected the better adapted strains, and adopted production methods best suited to local conditions.

By 1908 the Ministry of Agriculture was formed, with headquarters in Kampala, but it was not until 1920 that any research stations were established. In 1937 the headquarters of the Research Division of the Ministry of Agriculture was transferred to Rwanda, about 13 miles north of Kampala. For

the drier and generally less fertile "short grass" area north and east of River Nile, Serere Research Station in Teso District was operational by 1922, and assumed the full responsibilities of a Research Station in 1962. A certain amount of research and multi-locational variety screening was carried out by the Agricultural Colleges at Bukalasa and Arapai, and at the District Farm Institutes throughout the country.

In 1972 the Cotton Research Corporation handed over the Namulonge Research Station to the Uganda Government. Since then, in addition to research on cotton, experimentation on annual food crops and pastures has also been carried on.

In the last 1950's, the East African Agriculture and Forestry Research Organization, which formed part of the East African Community, established a research unit at the Serere Experiment Station for work on sorghum and millets.

Although parts of Uganda did suffer from periodic food shortages, usually due to the occasional failure of the rains, in general the country as a whole was never deficient in food, as production kept pace with the increase in population. There was therefore little incentive to devote much research effort to food crops as large increase in production often proved very difficult to market. Nevertheless, although the main research emphasis was placed on the export crops such as cotton, coffee and tea, there was a significant program of crop diversification, especially towards food crops which had some export potential.

A considerable amount of breeding and agronomic work was carried out with beans and peanuts in the 1960's. Maize was also a focus of attention and rust resistance was incorporated into the improved composites and varieties. Work at Serere resulted in the release of "Serena" sorghum, a variety which proved popular throughout East Africa. Progress has been slow on the improvement of the important finger millet crop. Useful breeding work on cassava was accomplished at Serere to incorporate resistance to the mosaic virus disease.

Food crops research was also carried out by the Makerere Faculty of Agriculture at Kabanyolo and considerable attention was given to grain legumes including cowpeas, soybeans, phaseolus beans, and pigeon peas. Some selections were carried out with maize and sorghum. Intercropping studies were conducted with some of the cereals and legumes.

During the 1950's and 1960's the Ministry of Agriculture became involved in a number of schemes to introduce mechanization to the Ugandan farmers. A large number of tractors and implements were imported and tractor hire services set up in almost all parts of the country. However, the economic studies which were carried out indicated that the real costs of both the tractor hire services and the cooperatives were considerably higher than the farm-gate value of the main crops grown. In contrast, a very useful program of research and development in ox cultivation was undertaken at the Serere Research Station. Particular attention was given to the development of improved low cost implements for plowing, harrowing, planting, weeding and spraying. It was followed up with a large program to encourage small farmers to buy their own implements according to their needs and to train oxen and handlers. With the aid of various credit schemes, large numbers of small farmers throughout the east and north of Uganda did adopt ox cultivation and were able to plant larger areas and carry out more timely operations. In general these programs were considered to have been highly successful.

Since the mid-1970's the organization of research within the Ministry of Agriculture has moved away from the grouping of research workers by discipline towards the organization of research by commodity or crop type. It was considered that this would provide a more effective joint effort towards improved crop production.

In order to strengthen the position of the Research Division within the Ministry, the formation of the post of Chief Agricultural Research Officer has been approved. This officer will report directly to the Commissioner for Agriculture Development, Production and Administration.

#### B. Recommendations

The research program operated by the Research Division has steadily declined over the past decade due to the failure of the Government to provide adequate levels of support and to the uncertainties associated with the previous regime. That there is any significant research still underway is largely attributable to the dedication and resourcefulness of individual research officers working to maintain professional standards under almost impossible conditions. Nevertheless, the deterioration of facilities, equipment, vehicles and machinery necessitate a concentrated effort over at least the life of this project to regain a semblance of a viable research structure.

Since the food crops in the Serere Research Stations mandate are complementary to those at Makerere/Kabanyola, it has been selected to receive assistance under this project.

1. The drastic deterioration of agricultural research facilities over the past decade has had a very adverse effect on the caliber of the research work conducted. It is essential that this situation be rectified as soon as possible for future research to be effectively carried out. The major constraints involve a lack of equipment, machinery and vehicles, together with appropriate maintenance and repair facilities and a scarcity of basic inputs for field and laboratory experiments. Library services and materials are totally inadequate. There is serious concern over the lack of a constant water and power supply. This project will provide limited funds to purchase the essential commodities to reduce these constraints.

2. The research staff at Serere Research Station has not had the opportunity to meet with scientists outside Uganda nor to keep up to date on research techniques and methodologies. The immediate implementation of a comprehensive retraining program is not only essential to raise the morale within the Serere staff but will prove critical to the success of future programs. Upon return from refresher training programs, the research staff will direct its attention towards the most urgent activities and important food crops which have a maximum potential for increasing production at the farmers' level.

There are important links between the Uganda research community and numerous external agencies. The country's problems in agricultural research and development are by no means unique. They are very similar to those of other regions in Africa with comparable agro-climatic, economic and social conditions. There are many international agricultural research centers whose work is very relevant to Uganda's needs. These include ICRISAT, IITA, ILCA, CIAT and CIMMYT. Close and continuing links with the appropriate centers will enable Uganda to make use of their germ plasm, technical expertise, research information and training facilities.

Useful liaison will be formed between the Faculty of Agriculture at Makerere University, research staffs at the Uganda Research Stations and universities in developed and developing countries through the planned semi-annual research workshops.

3. The research staff is near full strength but many members are young and lack qualifications and training for their positions. To provide on-the-job training and guidance to the staff members an agricultural advisor will be provided for three years. He will work closely with the Station Director to assist in coordinating the research activities of the Crop Research Units. During the period of rehabilitation of the research station he will assist in the operation, maintenance and repair of the existing equipment and facilities

The post for the Chief Agricultural Research Officer (CARO) has been recently established, but has not been filled due to the lack of availability of an experienced, well qualified officer. The CARO will have a component administrative staff, including an accountant and a research systems analyst. The final influence of the Office, and thus of the Research Division will depend to a large extent upon the caliber of the CARO himself. All funding and budget allocations within the Research Division will be the direct responsibility of the CARO. The project will provide the services of a research advisor for three years to assist in the setting up of this office and to provide on-the-job training and guidance to the CARO after he is appointed.

The implementation of a farming systems research (FSR) program will be greatly dependent upon the technology generated from a sound research system. The FSR will provide the essential link between the research scientists and the farmers. It is proposed that this project will re-initiate the research programs which will become the basis for an FSR. The scientists at Makerere University and Serere Research Station should form the initial FSR group and would serve as a training model for further groups to be developed. These FSR teams would eventually be located throughout the country in all agro-climatic zones, in association with the nearest research or training facility. It is expected that these teams would be staffed from both the research and extension departments of the Ministry of Agriculture.

During the life of this project, it is expected that agricultural research will be reorganized and geared to identifying and overcoming the major constraints of the farmers. This should lead to greater emphasis being given to FSR in the major agro-climatic zones.

III. EXTENSION

A. Historical Development

Prior to independence the extension service performed two main functions of (1) enforcing the laws relating to extension and (2) teaching farmers to adopt new methods of agricultural production. The farmer saw the extension staff as agents of the government and the majority of the farmers did not want extension agents visiting them for fear of being reported to the government for contravening any of the agricultural by-laws. After independence, in 1962, extension workers stopped functioning as law enforcement officers and were encouraged to work directly with farmers and develop local leaders among farmers.

Much of the research conducted within Uganda has not been particularly oriented toward the needs of the farmers to increase agricultural production and productivity. Two of the stations of the Ministry of Agriculture are primarily concerned with export crops and only one with food crops. The research at Makerere was conducted mostly on food and feed crops and livestock.

Nearly all of the research programs have been at a standstill for the past decade due to lack of equipment and supplies as well as lack of new knowledge from outside sources. If the country is to achieve its rural development goals, the University and research stations must be rapidly re-oriented and re-equipped to become the kind of innovative and productive institutions which can furnish the technology required from applied research and education.

Uganda is facing a number of constraints to its ability to provide meaningful research to the agricultural sector. First its research workers have not had the opportunity to keep up with current research techniques and methodologies. Its scientific manpower has not necessarily become a constraint because of insufficient numbers. Second the scientists have not been able to carry out research because of the insufficient, and in some cases complete lack of support to conduct research. For example their salaries are extremely low, there is no farm of laboratory equipment, the library facilities are practically non-existent. A third constraint is that research carried out in the past was in many instances not oriented toward removing farmers' constraints.

These constraints on agricultural research have profound implications for Uganda's extension programs. They have not been able to respond to the needs of the farmers because there are not new technical packages to give the farmer. In addition the extension service staffs are immobile because of lack of available transport. There is currently a dearth of agricultural inputs for the farmers to purchase, but this is being corrected with various commodity import programs. Thus neither research nor extension can have a substantial impact on production levels unless these problems are addressed. Assistance to Uganda must therefore, be oriented toward re-establishing the research and educational institutions to provide technology well adapted to the various crops and site specific environments. Once this is done, it will become the responsibility of the extension services to disseminate these research findings as technical packages to farmers.

The effort begun with this project will strengthen the capacity of Makerere University to provide education to university students who will become future extension research or education staffs. It will re-train staffs at Makerere University, one Ministry of Agriculture research station, two colleges of agriculture and head office extension staffs.

Initial efforts will focus on re-training staffs for research on food crops research, extension staff leaders and rehabilitating the research facilities at Kabanyola Farm and the Serere Research Station.

#### B. Current Status

The Extension Service reached its peak of field activity during 1971-72 but gradually deteriorated until the liberation war, at which time the service became almost non-operational. The lack of foreign exchange, the war, and post-war looting has stripped the service of means of transportation, demonstration materials such as fertilizer, insecticides and office equipment. Inflation has further exacerbated the situation so that most civil servants cannot survive on their government salary. Lack of transport has eliminated supervision of field staff. It is easy to understand the lack of commitment of staff when they have no method of transportation, and an extremely inadequate salary.

C. Recommendations

There has been an absence of a continuing education program for staff. There is a need for in-service training and a reorientation to their extension duties. In order to initiate the retraining of the extension staff, five of the senior staff from headquarters will be given refresher training under this project. Upon their return to Uganda they will begin to hold in-service training for the more senior officers of the extension service throughout the country.

To facilitate their tasks of retraining a limited amount of office equipment will be provided to the headquarters staff of the Ministry.

REHABILITATION REQUIREMENTS

A. MAKERERE UNIVERSITY, KAMPALA:

A new wing built at the Faculty of Agricultural and Forestry was never commissioned, in other words, never considered completed. An inspection of the building revealed the following:

1. Drafting Room - Many electrical accessories and wall outlets are required. Electrical fixtures for the tracing tables are missing. The false ceiling needs some new attachments to keep it in place.

2. Biology Laboratory - The present floor outlet electrical system needs to be replaced as present system floods, producing a dangerous situation with chances of electrocution during use. The room basically needs an entire system of electrical accessories, wall outlets and fixtures.

3. The refrigeration unit for the cold rooms in the Animal Science Room and Crop Science Room needs to be repaired/replaced. There are glass panes missing on nearly all the classrooms. New screens for ventilation are required around the ceilingwall intersections in most of the classrooms.

4. There are roof leaks over several classrooms. These are major roof leaks where the new wing has been tied to the old structure. Due to slight separation of the new and old buildings for various reasons, it appears that cracks in the roofing material also developed. Rain water now seeps through the cracks and floods some of the classrooms and hallway. The water tank on the roof leaks and should be repaired as water finds its way through the ceilings to the classrooms. New roof drains for rain water run off are required as old ones are rusted through.

5. There are locks missing from many doors.

6. The plumbing to the new wing also needs to be checked. There are many leaky faucets and sink traps.

7. The main fuse terminal for the wing should be checked for short circuits.

8. There are three green houses. Glass, screens and new frames of wood or aluminium will be required. Also plumbing connections, and electrical connections and accessories are required. Some concrete work for floor beds and work tables to hold potted plants will be necessary. The second green house called Soil/Sands could be workable with replacement of some windows, benches, electrical accessories and wiring. The third green house called Crop/Soils requires only glass panes.

9. The security light fixtures for the buildings are now beyond repair and 8 new fixtures are required.

10. The side entrance doors to the wing require 2 wooden security doors to prevent exit of goods through the opening in the bars of the security gates.

11. The storm water drainage system that drains water from the roofs and paved areas need to be cleaned; presently plugged with dirt, leaves and garbage.

12. Plumbing in the toilets of all the wings need repairs/replacing. (5 toilets total).

13. Main entrance door needs new hinges and dead bolts. Present doors are secured in place by a few nails.

14. Many rooms and hallway could use some paint to restore a respectable look to the educational institute.

B. KABANYOLO FARM:

The Kabanyolo Farm was inspected and the following is a list of findings:

1. Drawing Office - Some windows are broken, roof leaks, most of the electrical fixtures and accessories are missing. Windows require security bars.

2. Workshop No. 1 - Some windows are broken, electrical wiring and accessories are required for entire workshop. Doors are required to separate doorless rooms. Security bars are required for all window areas. Screened storage area requires stronger wire or bar security system.

3. Workshop No. 2 - Needs installation of doors to provide security for equipment. New work benches required. Electrical wiring required, conduit now exists without wiring.

4. Piggery (new) - Needs all electrical wiring and accessories. Needs all plumbing, water outlets and water reservoir. Walls need to be plastered and roof needs patching. Gutter for manure collection needs to be redesigned. Galvanized pipe for pens needs to be procured and installed. Basically this piggery is in the shell stage of construction, or about 75% completed.
5. Grain Storage Silos - Need additional mechanical equipment to be operational such as sweep augers and loading augers. One auger used for returning grain to the Grist Mill needs to be re-aligned.
6. Cross Flow Dryer - Needs to be rehabilitated. Outside cage needs to be rebuilt as present one has deteriorated beyond repair.
7. Feed Grinding Mill (Building) - Building in good repair but needs security bars, some windows, exhaust fans and electrical fixtures and accessories.
8. Farm machinery storage yard - needs security fence.
9. Milking Parlor - Milk cooling tank needs refrigeration unit either repaired/replaced. New vacuum pump may be required, new vacuum tank, hoses and milking machines required. Electrical accessories and fixtures are required. The teaching laboratory located in the same building needs a work bench, windows, sink, and paint. Drainage for the milk parlor needs to be rehabilitated. Stantions need 8 automatic feed hoppers.
10. Spray Race - Needs new spray nozzles in the spray area. New high velocity pump required along with foot valve. Screen for filtering returning chemicals required along with some concrete work on the drain.
11. Weigh Bridge - Present weigh bridge serviceable, only replacement of missing balance weights are required to make this scale functional. Scale manufactured by W&T Avery Limited, Birmingham, England, Capacity 4000 Lbs. Type 4220 ABA, Serial No. B561245. Portable scale for piggery required.
13. Old Piggery - If the old piggery is to be rehabilitated in lieu of the new piggery it requires some concrete work. Needs special wire paddocks for sows. Urine drains need rehabilitation work. Hog House needs work and the pig wire fence rebuilt.

14. Potable Water System

West Valley Boreholes - 3 Electric pumps are required, 10 H.P. 415 volts. 1 Standby pump diesel 10 - 15 H.P. required.

East Valley Borehole - 1 10 H.P. electric pump 415 volts required. 1 Standby diesel pump 10 - 15 H.P. required.

For irrigation 1 - 10 H.P. electric pump required, 415 volts. This pump will provide water from the storage pond now existing however, a new pump house must be built for security of the pump. Security measures must also be made for the existing pump over the borehole. The present water supply piping must be checked for leaks and plugged sections.

15. Auxiliary Power Generator - A small diesel generator 15 - 20 KW could be utilized for the milk cooling unit and milking machines. [A larger unit could be desirable if more electrical accessories need to be operated during power outages].

16. Poultry Houses - All need some screens, security wires and shade devices. Water Storage tank of 1000 liters required for the chick house with 50 feet of water supply pipe.

17. Poultry Teaching Lab - Needs electrical accessories (switch, outlets). Egg storage room needs small air conditioner 10-12000 BTU. Defeathering machine needs drive belt. Gas piping for pin feather burning machine needs to be checked for leaks. Transformers (1500W) are required for the 3 freezer/refrigerators that are 110 volt. Incubator needs to be checked for necessary repairs and servicing.

18. Chicken Brooding House - Needs screens, gas lines need to be checked, electrical accessories are required. Water connections have faucets missing. Electrical Brooder should operate but needs to have all electrical wiring checked.

19. Animal Science Laboratory - Needs window panes, doors, electrical accessories, some plumbing fixtures and roof repairs.

20. Crop Production Laboratory - Needs window glass, doors, electrical accessories, circuit breaker, fluorescent tubes, security bars, and plumbing accessories.

21. Green house - Needs glass panes in roof, screen for walls and a new mist propagator. One Greenhouse is merely a

shell and needs to be completely rebuilt. A breeding cage also is a shell (pipe frame) and needs to be completely recovered with fine screen mesh.

22. Crop Protection Building - This building requires new doors, complete electrical accessories and fixtures, some plumbing accessories and security bars on all windows.

23. Seed Technology Laboratory - Needs all electrical accessories, plumbing accessories and security bars on the windows. The seed storage rooms needs air conditioners (4), 12-15000 BTU if those presently installed do not operate.

24. Meteorological Station - Needs a security fence around the perimeter, security light and a new Stevenson Screen.

25. Lecture Laboratory - Needs some windows, electrical accessories and security bars.

#### C. SERERE AGRICULTURAL RESEARCH STATION:

1. Methane Gas Generating Plant, made in England by the Aerogen Co. Ltd, Anstey Mill Lane Works, Alton Hampshire England. Generator Serial Number M4/13567. This plant has not operated since 1966; it has been cannibalized of some parts and at present needs drive belts, drive shaft, sprockets, drive chain and perhaps a few more pieces not immediately noticeable. The unit should be repaired; though, if necessary, a replacement could be considered. The small building housing this unit needs some rehabilitation. The electrical wiring needs to be checked, if necessary replaced. The explosion proof lamp needs to be rewired and hung properly. Electrical fuse and switch box needs to be repaired/replaced. The roof needs several new panels.

2. Soils Laboratory - The Soils laboratory is structurally sound and in good condition. The items that need repair/replacement are inside the laboratory and consist of the following. New work tables/tops are required. These can be made of wood and should be painted with an acid/alkaline resistant paint. The present work benches have been there for many years and deterioration has occurred near the sink. The sink should be reset, faucets and plumbing at the sinks should be replaced as present ones are beyond repair. The electrical system in the building needs to be checked for short circuits. Some new wiring may be required. The present room for chemical tests needs to have the 4 ventilating hood areas repaired and

ventilating hoods replaced. These areas can be built with local materials. The fumehood fan needs to be repaired/replaced.

3. Green Houses - The major work required to restore the green house is the installation of glass panels. Some concrete work required to build up the growing beds. Some cable will be required to operate the window vents in the glass roofs.

4. 1st Insectory - Ceiling needs to be replaced and the entire electrical system should be replaced as wire coverings have eroded. The fuse box and circuit breakers need to be replaced as they have been ruined by the elements of nature. New work table tops are required, though the table legs are metal and reusable.

5. 2nd Insectory - Ceiling needs repair, (approximately a one square meter area of plaster). The roof leaks in that area and some roof tiles need to be replaced. No other repairs required.

6. Seed House - One Cold room needs a new refrigeration unit consisting of motor and compressor only. Some fibre board ceiling panels required. The second cold room needs to have insulation and panelling on all walls ceiling and floor. The insulated door is on-site and can be used. The refrigeration unit is also available and functional, therefore only insulation and installation costs are required to make this cold room functional.

7. Lighting - A complete security lighting system is required for the Research Center with the number of light fixtures to be determined.

8. Small Sales Office - used for selling produce could use some minor repair such as paint and roof work. Building is about 3 meters square with produce cages.

9. Breeding Cages - These are used for cross pollination of plants. Some new fine screen mesh is required for the 3 cages.

10. Meteorological Station - Replacement of a sunshine recorder and automatic rain gauge is required.

11. Workshop - Electrical wiring needs some rehabilitation. Electrical accessories such as switches, outlets and light fixtures are required. Sheet metal roofing

sections are required over the Lathe room. The rest of the building is in good repair. Carpenter shop needs work benches and the small building needs to be extended. New gasoline pumps are required. Underground gasoline storage tanks should be checked for leaks.

12. Drying Floor - Present facilities for drying should be rehabilitated.

13. Building That Houses Grinding Equipment for Grain and Seeds

Electrical accessories/wiring needs to be rehabilitated/renewed. Five electrical motors are required to operate the grinding equipment to make them functional, 1 -20 H.P., 2 - 10 H.P. and 2 - 5 H.P. Motors, building is in good repair.

14. Potable Water System - At present, water is obtained from 4 different borehole sources all located approximately 1 KM from the HQ. Two of the boreholes are pumped by submersible electric pumps from a depth of 250 -300 feet. These pumps should be replaced by new 15 H.P. electric submersible pumps. The 3rd borehole has a 15 H.P. diesel pump which should be replaced by a new 15 H.P. electric pump. The 4th borehole should have a new hand pump installed.

Two new 15 H.P. pumps should also be installed in the pump house of the filter plant which will require new filter materials and some rehabilitation. Storage capacity needs to be increased by addition of a new water storage tank. A new roof is required on the present storage tank. All water supply piping needs to be checked for leaks, cracks and plugged sections.

15. Standby Generators - To operate the cold room and other laboratory equipment only, 1 - 20 kw generator is sufficient. If additional electrical requirements are added, would recommend 2 - 20 Kw generators.

16. Unfurnished House for Senior Staff - There are two houses that are/were under construction and their conditions are as follows:

(a) One house is a shell that needs doors, windows, electrical accessories, plumbing, paint and plaster or about 70% completed including servants quarters.

(b) One house is also a shell requiring all of the above but only 60% completed.

17. Fencing - The entire campus is in need of fencing wire for protecting gardens and marking pastures for cattle.

18. Cattle Dip - Present cattle dip is too deep and requires fill in bottom of the dip tank. The sides of the dip tank need to be raised to prevent surface drainage water from entering the tank.

19. Weigh bridge - A new weigh bridge/scale is required for weighing cattle, etc. Presently no scale available on Station.

20. Milking Parlor - Needs new water/feed troughs and milking machine attachments. Vacuum pump needs minor repairs but is functional. Milk cooling room should be located near milk parlor. New cooling tank required. Hand milking parlor needs concrete work and new holder/stations for the cattle. These can be made from local wood timbers.

21. Entire barn area needs paint, and concrete work.

#### D. 611(a) DETERMINATION

The rehabilitation activities on all buildings to be financed under this grant are at the following locations.

1. Serere Agriculture Research Station at Serere.
2. Makerere Faculty of Agricultural Engineering Wing. Kampala.
3. Kabanyolo Farm at Kabanyolo, a part of the Makerere University Faculty of Agricultural Engineering.

The cost is based on REDSO/ESA Engineers review of the proposed repairs to existing buildings and comparing costs of recent similar repairs at other locations in Uganda.

The cost for the repairs includes a price escalation that should be current. A 10% contingency has been added to the project costs to compensate for the unpredictability of local prices, material escalations and uncertainties which might arise due to off-shore procurement and transportation.

The physical condition of the buildings were inspected by REDSO/ESA engineer and found to be in such condition that the

cost estimates are reasonably firm to accomplish the work. The requirements of section 611(a) of the FAA are accordingly satisfied.

S C O P E S . . . O F W O R K

A. Duties - Team Leader/Faculty Advisor

The main responsibilities of the Team Leader will include:

1. Serving as administrative and program leader of the project and assist in organizing and coordinating the rehabilitation process at MU/FAF the University Farm and SRS.
2. Provide assistance in the selection of FAF staff for in-service training, plan their programs and ensure a phasing process which will allow continuity of the ongoing teaching and research program.
3. Assist in the procurement of commodities for the project and develop procedures for maintaining adequate inventory control and security.
4. Provide leadership and coordination in organizing conferences and in-service training at MU for FAF staff, extension and research personnel.
5. Provide direction and counsel to FAF staff on research proposal written for funding by the project.
6. Plan the scope of work and organize the itinerary for short term specialists necessary during the project period.

Qualifications:

A Ph D in some phase of Agriculture is required with four (4) or more years of experience in a developing country and a university setting. Leadership ability and personal attributes will be necessary to work with Ugandan and Technical Assistance colleagues in performing the administrative, supervisory and coordinating functions of this project.

**B. Duties - Farm Management Specialist**

1. The main responsibility will be to serve as a farm management advisor to the Dean of the College (Faculty) and the Uganda farm managers in the rehabilitation of the teaching and research farm.
2. Assist in the procurement of commodities and develop procedures for maintaining inventory control for all goods received at the farm.
3. Assist in the selection of Uganda personnel from the farm for in-service training, plan their programs and assist in the training of Uganda managers and FAF students.
4. Supervise and assist in the teaching and research programs and in repair and maintenance of machinery and equipment.

**Qualifications:**

A Masters degree in Agriculture is required with experience in farm management and experiment station supervision and operations. College teaching and research experience is preferred with three years of experience in a developing country is required.

**C. Duties - Agricultural Advisor**

1. Provide leadership, supervision and coordination to SRS during the rehabilitation process.
2. Assist in the selection of research staff at the Station in-service training, plan their programs and coordinate training with the Chief Research Officer and the Team Leader of the project.
3. Assist in the procurement of commodities and develop procedures for maintaining inventory control for all goods received at the Station.

**Qualifications:**

A Masters Degree in Agriculture is required with preference given to candidates with a Ph.D. Advisor should have considerable experience in research station administration and management with practical knowledge in experimental plots, data collection and research evaluation. Experience in research and teaching methodology is preferred with four years experience in a developing country required.

**Agricultural Research Advisor**

**Duties -**

1. Advise the Chief Agriculture Research Officer (CARO) in planning, coordination and implementation of agriculture research at Kawanda, Namulonge and Serere Research Stations, the National Research Centers.
2. Assist in the selection and program planning of the MAF staff for in-service training.
3. Assist the Agricultural Advisor and the Director of Serere Research station developing and implementation of the station research program.
4. Serve as the professional linkage between the MAF Research program and the research program at MU/FAF.
5. Assist the Team Leader in the coordination and administration of the project.

**Qualifications -**

Ph D with experience in organizing and conducting agricultural research. Leadership ability and personal characteristics to work effectively with colleagues in directing the national research effort. Four or more years of professional experience in a developing country.

### Short Term Technical Assistance

Short term specialist will be required to participate in conference, seminars and specialized disciplines as the project develops. Specialist such as audio visual and teaching experts, specialized crop and animal experts, specialist in writing research proposals, curriculum development and program evaluation may be needed. Sixteen (16) person-months of short term technical assistance is provided during the life of the Contract.

The farm manager of 25 years is retiring and a young inexperienced man with a diploma has assumed the farm management position. To help in the maintenance and rehabilitation this project allows for two PVO volunteers to be located at Kabanyolo and two at Serere.

#### Duties -

1. Work closely with the Station Director, Farm Manager and the Expatriate Agricultural Advisors in the physical rehabilitation of the station.
2. Work closely with the mechanics in repair and alterations of farm machinery and provide on the job training in machinery and farm implement repair.
3. Work closely with the station carpenters in repair and maintenance of building and provide on the job training in construction.

#### Qualifications -

Have considerable practical knowledge and mechanical ability in the operation and maintenance of machinery. Know construction technique and be able to use construction tools, and have knowledge of farm management.

MAKERERE UNIVERSITY  
FACULTY OF AGRICULTURE AND FORESTRY

[APPENDIX 1.]

PROPOSED VISITS TO U.S. AND INTERNATIONAL AGRICULTURAL RESEARCH CENTERS

NAME	HIGHEST DEGREE	RANK AND DISCIPLINE	DEPARTMENT	YEARS EXPERIENCE (Fulltime)	DESIRED INSTITUTION	LENGTH OF ATTACHMENT (Months)
J.R. BIBANGAMDAH	M.Sc.	ASSOCIATE PROFESSOR Agricultural Development Economics	AGRIC.ECONOMICS	11	Ohio State Cornell Univ. 1984-85	2 2
J.M. OPIO-ODONGO	Ph.D.	SENIOR LECTURER Rural Sociology	"	7	University of Kentucky Cornell Univ. 1984-85	2 2
L. WABWIRE	M.Sc.	LECTURER Agricultural Cooperatives & Credit	"	10	Cornell Unv. Univ. Wisconsin (Madison) 1983-84	2 2
L. MSEMAKWEI	M.Sc.	LECTURER Economics & Econometrics	"		Massachussets Institute of Technology 1984-85	4
A.I. FENDRU	M. Sc.	LECTURER Production Economics & Farming System	"	4	Michigan State University 1985-86	4
E.W. RUGUMAYO	Ph.D.	SENIOR LECTURER Processing and Storage	AGRI. ENGINEERING	13	University of Texas, Austin 1984-85	3

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NAME	HIGHEST DEGREE	RANK AND DISCIPLINE	DEPARTMENT	YEARS EXPERIENCE (Fulltime)	DESIRED INSTITUTION	LENGTH OF ATTACHMENT (Months)
E. ZIWA	M.Sc.	LECTURER Agricultural Cooperatives & Credit	AGRI. ECONOMICS	3	Cornell Univ. Univ. Wisconsin (Madison) 1983-84	2 2
I.O. UMA	Ph.D.	SENIOR LECTURER Soil and Water Engineering	AGRI. ENGINEERING	10	IITA, IBADAN Nigeria 1983-84	4
Z. OLUM	M.Sc.	SENIOR LECTURER Farm Mechanization	"	10	ILCA, Addis Ababa, Ethiopia	4
J. SENTONGO- KIBALAMA	M.Sc.	LECTURER Farm Power and Machinery	"	1	(IRRI) 1983-84	4
L.L. KASISIRA	M.Sc.	LECTURER Farm Mechanization	"	1	ICRISAT 1984-85	2
H.S.K. NSUBUGA	Ph.D.	ASSOCIATE PROFESSOR Animal Health & Production	ANIMAL SCIENCE	9	ILCA, Addis Ababa, Ethiopia 1984-85	4
J.S. MUGERWA	Ph.D.	PROFESSOR Animal Nutrition	"	14	CIAT 1983-84	4
G.H. KIWUWA	Ph.D.	ASSOCIATE PROFESSOR Animal Breeding and Genetics	"	16	ILCA, Addis Ababa Ethiopia. 1983-84	4
I. OKELLO-UMA	Ph.D.	SENIOR LECTURER Dairy Management & Food Processing	"	10	Unv. California, Univ. Wisconsin, Madison. 1983-84	4

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NAME	HIGHEST DEGREE	RANK AND DISCIPLINE	DEPARTMENT	YEARS EXPERIENCE (Fulltime)	DESIRED INSTITUTION	LENGTH OF ATTACHMENT (Months)
M.W. OKOT	M.Sc.	SENIOR LECTURER Poultry Production	ANIMAL SCIENCE	7	Ohio State Univ. 1986-87	4
G.R.E. KAKUSYA	Ph.D.	LECTURER Productive Physiology	"	3	Texas Univ. A & M Agric. Expt. 1985-86	4
F.B. BAREEBA	Ph.D.	LECTURER Animal Nutrition	"	3	Animal Nutrition Lab USDA, Beltsville, Maryland. 1984-85	4
Y.J. AJEANI	Ph.D.	LECTURER Animal Nutrition	"	3	Virginia Polytechnic Texas A & M Univ. 1986-87	4
C.M. MUNYADUNTU	Ph.D.	LECTURER Mineral Nutrition & Pasture Utilization	"	3	CIAT 1984-85	2
J.C.M. DDUNGU	Ph.D.	PROFESSOR Horticulture	CROP SCIENCE	15	DAVIS/Riverside 1983-84	3
J.K. MUKIIBI	Ph.D.	PROFESSOR Plant Pathology	DEAN	16	CIMMYT, MEXICO 1984-85	4
D.S.O. OSIRU	Ph.D.	SENIOR LECTURER Crop Physiology	"	10	ICRISAT 1983-84	3
K. OGWAFO	Ph.D.	SENIOR LECTURER Agric. Entomology	"	1	IITA 1985-86	3
S.A. OWERA	Ph.D.	LECTURER Plant Pathology	"	2	Univ. California Davis. 1985-86	3

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NAM	HIGHEST DEGREE	RANK AND DISCIPLINE	DEPARTMENT	YEARS EXPERIENCE (Fulltime)	DESIRED INSTITUTION	LENGTH OF ATTACHMENT (Months)
R.L. ADUPA	Ph.D.	LECTURER Biometrics	CROP SCIENCE	2	Michigan State University 1986-87	3
ADIPALA- EKWAMU	M.Sc.	LECTURER Plant Pathology	"	3	Univ. California, Davis; 1986-87	3
D.B.A. RUYOOKA	Ph.D	ASSOCIATE PROFESSOR Wood Industries	FORESTRY	3	Univ. California, Berkeley. 1985-86	4
J.S.O. EPILA	Ph.D.	LECTURER Forest Entomology	"	3	University of Idaho 1985-86	4
M.A. CHAUDHRY	M.Sc.	SENIOR LECTURER Forest Silviculture	"	8	University of Georgia 1986-87	4
J.Y. KITUNGULU-	Ph.D.	ASSOCIATE PROFESSOR Soil Fertility/ Chemistry Nitrogen Fixation	SOIL SCIENCE	12	CIAT IITA 1985-86	4
D.S. NUDUULI	Ph.D.	LECTURER Nutrition Biochemistry	"	3	CIAT/IITA 1983-84	4
M.A. BEKUNDA	M.Sc.	LECTURER Soil/Plant Analysis	"	2	Michigan State 1986-87	3

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NAME	HIGHEST DEGREE	RANK AND DISCIPLINE	DEPARTMENT	YEARS EXPERIENCE (Fulltime)	DESIRED INSTITUTION	LENGTH OF ATTACHMENT (Months)
V.O.A. OCHIWOH	M.So.	LECTURER Soil Fertility	SOIL SCIENCE	3	Univ. California, Davis. 1986-87	4
Names unknown		FARM MANAGER (1) ASST. FARM MANAGER(2)		-	CIMMYT Training in Experiment Station Management	3

HEADQUARTERS

NAME	DEGREE	RANK - POSITION	TYPE OF TRAINING
P. Sibyetekerwa	B.Sc.	Deputy Commissioner of Agriculture (Production)	USDA-Course TC 140-1 May-July 1984 2-3 US Universities 3 months
T.K.L. Isabirye	B.Sc.	Extension Agri. Officer	USDA -Course TC 110-5 - <u>Development and Operation of Agricultural Extension Program. Section II Sept. Nov. 1984</u> 2 -3 US Universities. 3 months
J.H. Apell	B.Sc. M.Sc.	Assistant Comm. of Agri. Education and Training	USDA - Course TC 110 -15 April - June 1984 <u>Training of Trainees for Agric. and Rural Development</u> 2-3 U.S. Universities. 3 months
A. NYAMWEGYENDAHO	B.Sc. M.Sc.	Senior Agricultural Officer- Adult Educ.	USDA - Course TC 110-16 - June - Aug. 1984 <u>Vocational Agric. Education Systems in Countries.</u> 3 months
J. OMODING	B.Sc. M.Sc.	Principal Arapai Agric. College	USDA - Course TC 110 - 15 <u>Training Trainees for Agriculture and Rural Development</u> - 2-3 U.S. Universities. 3 months
A. MUKASA - KIGGUNDU	B.Sc. M.Sc.	Director of Kawanda Research Station	USDA - Course TC 140-24 <u>Management of Research Faculties and Organization.</u> 3 months
E. BYAJIEHANGA	B.Sc. M.Sc.	Director of Namulonge Research Station	USDA - Course TC 110-14 <u>Application and Diffusion of Agricultural Research Results to the Community Level</u> - July-September, 1984 - 2-3 U.S. Universities. 3 months

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SERERE RESEARCH STATION - RESEARCHERS' LIST

AS AT 27TH MAY 1983

NAME	HIGHEST DEGREE	RANK AND DISCIPLINE	DEPARTMENT	YEARS EXPERIENCE (Fulltime)	TYPE OF TRAINING & INSTITUTION	LENGTH OF ATTACHMENT (Months)
Y.W. MWAULE	B.Sc. M.Sc.	Director			USA - Research Management & Administration 1983-84	
N.J.K. NANGOTI	M.Sc.				USA, IRRI, IITA- New Fertilizer Technology 1983-84	3
G.W. OTIM NAPE	B.Sc.				IITA - Plant Pathology 1983-84	3
B. ODONGO	B.Sc.				WEST INDIES OR CIAT OR CIBC TRINIDAD OR USA - Entomology especially in pest control, Biological control methods. 1985-86	3
T.E.E. AREKE	B.Sc.				ICRISAT/IITA/USA Plant Breeding 1984-85	3
RICHARD MOLO	B.Sc.				ICRISAT/USA - Pest Control 1984-85	3

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NAME	HIGHEST DEGREE	RANK AND DISCIPLINE	DEPARTMENT	YEARS EXPERIENCE (Fulltime)	TYPE OF TRAINING & INSTITUTION	LENGTH OF ATTACHMENT (Months)
OCITTI-P'OBWOYA	B.Sc.				USA/IITA/CIAT - Root Crops Agronomy 1984-85	3
AKOU ALPHONS	DIP AGRIC.	DX - Training			USA OR INCRISAT - Farm Machinery (Animal Drawn) 1985-86	3
D.W. WAMAJJE	B.Sc.				USA, Texas A&M - Study Tours 1984-85	3
E. EKOCHU-OKELLO	B.Sc.				USA - Intergrated Pest Control or Cabean Controls 1984-85	3
P.O. PIDO	M.Sc.				USA - Animal Nutrition 1984-85	3
ESELE, J.P.E.	B.Sc.				ICRISAT - Cereal Crop Pathology, Disease Resistance, Host/Parasite Relations. 1985-86	3
ORYOKOT, J.	B.Sc.				IITA/CROPPING SYSTEMS RESEARCH - ZAMBIA Conservation and Utilization of Plant Genetic Resources. 1985-86.	3

NAME	HIGHEST DEGREE	RANK AND DISCIPLINE	DEPARTMENT	YEARS EXPERIENCE (Fulltime)	TYPE OF TRAINING & INSTITUTION	LENGTH OF ATTACHMENT (Months)
J.R. ORELLO	B.Sc.				ADDIS ABABA/ICRISAT Crop Genetic - Resources Conservation and Utilization. 1985-86	3
G. EPIERU	Ph.D.				Applied Taxonomy of Insects, Lab Techniques of Rearing 1984-85	3
L.K. SERUNJOGI	B.Sc.				ARIZONA, ICHRISAT - Plant Breeding. 1985-86	3
OCHIENG MBUYE G.	B.Sc.				CYMMIT OR MICHIGAN UNIV. Farming Systems. 1985-86	3
J. EBIYAU	B.Sc.				ARIZONA OR ICHRISAT - Plant Breeding . 1986-87	3
H. OKURUT- AKOL	B.Sc.				MEXICO - Crop Protection (Entomology). 1985-86	3
DAN OJUR	DIP AGRIC.	Farm Manager			USA - Farm Management & Machinery. 1984-85	3
MICHEAL ECODU	A.A. (R)				USA OR NETHERLANDS - Plant Protection (Entomology)	3

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NAME	HIGHEST DEGREE	RANK AND DISCIPLINE	DEPARTMENT	YEARS EXPERIENCE (Fulltime)	TYPE OF TRAINING AND INSTITUTION	LENGTH OF ATTACHMENT (Months)
F.X. KOMA ALIMU	B.Sc.				New Technology in Fertilizer, Use in Plant Nutrition. 1983-84	3
BUA ANTON	B.Sc.				Soil Chemistry in Relation to Oil Crops Production (Agronomy) 1986-87	3
BWOLO BULAFU	B.Sc.				Groundnut Breeding 1986-87	3
V.M. ZAKE	B.Sc.				ICRISAT - Plant Breeding. 1986-87	3
B.W. KHIZZAH	B.Sc.				ICRISAT - Plant Breeding. 1986-87	3
ADRAMA	B.Sc.				Animal Breeding- (No plan) 1987-88	3
MWAGA	B.Sc.				IITA - Soils 1987-88	3
ONENANYOLI	M.Sc.				IITA - Oil Crops 1987-88	3
M.A. ACIDRIA	M.Sc.				IITA - Plant Breeding 1983-84	3

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Commodity List - Detailed SpecificationsI. Makerere University/Kabanyolo Farm

## A. Farm Machinery, Equipment, Supplies and Spare Parts

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <u>Qty</u> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1. Tractor, with diesel engine; row-crop fenders; syncho-range transmission; dual remote-cylinder control; rear rockshaft with 3-point hitch; category 2; rear axle, 3 3/8 inches diameter, 113 inches long; front tires, 9.5L-15, 6 PR, rear tires 15.5-38, 8 PR; adjustable axle, regular tread, swinging drawbar. John Deere 4040 or equivalent.                                                                                                                                                                              | 2          |
| 2. Disk plow, two way, mounted, five furrow, with 3 1/2 x 16 inch two way remote cylinder and hoses, 28 x 1/4 inch alloy steel disks, category 2 hitch. International Harvester 1-46 or equivalent.                                                                                                                                                                                                                                                                                                                              | 2          |
| 3. Disk harrow, offset, 12 foot cut, 32 disks, 22 inch cone disks, wheels with 9.50-14 inch, 6 PR implement tires, with remote cylinder and 180 inch hoses. John Deere 225 or equivalent.                                                                                                                                                                                                                                                                                                                                        | 2          |
| 4. Planter, plateless unit, for use on 5 x 7-inch toolbar, regular runner openers and smooth rubber-tire press wheels, with herbicide attachment, regular-rate sorghum attachment, knife coverers, 5 x 7-inch x 22-foot toolbar, with hydraulic marker, integral hitch with lateral adjustment for category 2, gauge wheels and shanks, rear rig with three quick return spring trip shanks, rig-mounted shields, 6-inch general purpose sweeps, hubs with 6.70-15 inch, 4 PR tires, parking stand. John Deere 80 or equivalent. | 6 units    |
| 5. Cutter, rotary, integral category 2 hitch, flat blades, mast for 3-point hitch, with rear gauge wheel, wear shoes included. John Deere 307 or equivalent.                                                                                                                                                                                                                                                                                                                                                                     | 2          |

	<u>Qty</u>
6. Cultivator, row crop, front mounted, 6 row 28 to 30 inch, quick-return spring - trip sharks, rear rig with three quick return spring trip sharks, rig mounted shields, 6-inch general purpose sweeps.	1
7. Mower, rear mounted, 7-foot cutterbar with malleable rock guards and snap-in ledger plates, 7-foot knives with armored sections. John Deere 350 or equivalent.	1
8. Rake, side-delivery with category 2 hitch. John Deere 650 or equivalent.	1
9. Sprayer, knapsack, stainless steel, 3 1/2 gallon capacity.	1
10. Thresher, peanut, soybean, with 5hp. gasoline engine, trailer mounted. Seedburo model KPT-30 or equivalent.	1
11. Meter, moisture, seed, all purpose for 240 volt, 50 HZ, standard set of conversion charts. Stemlite model or equivalent.	1
12. Envelopes, coin, open ends style, 2 1/2" x 4 1/4", 28 lb. stock.	10,000
13. Bags, kraft paper	
a. Size No. 2, 4 1/8"x2 9/16"x7 13/16"	6,000
b.     " No. 3, 4 5/8"x3 1/16"x8 3/8"	4,000
c.     " No. 5, 5 1/4"x3 7/16"x10 11/16"	4,000
d.     " No. 6, 6"x3 3/4" x10 3/4"	2,000
14. Toolset, Snap-on No. 6300BGSB or equal	1 set
15. Husker-sheller, portable corn/maize, for mounting on 3-point hitch, category 2, with 540 PTO speed. Huban unit No. 101-005-EX or equal.	1
16. Mower, self propelled, 8hp. gasoline engine, two wheel drive, rotary and sickle bar. Gravely or equal.	2

		<u>Qty</u>
17.	Harrow, spike-tooth, six-foot, 40-tooth section, 18-foot, three-section, one folding evener, for three 40-tooth sections. John Deere or equal.	3
18.	Helmets, welding, fiber glass, 2" x 4 1/4" cover lens, McMaster - Carr 5423T25 or equal.	5
19.	Goggles, welding. McMaster-Carr 5446T4 or equal.	
20.	Glove, welders. McMaster - Carr 9745T1 or equal.	5 pr
21.	Holder, arc welding electrode. McMaster-Carr 7939A9 or equal.	2
22.	Lug, ball point type, 1/0 capacity cable. MaMaster-Carr 7866A11 or equal.	4
23.	Cable, arc welding, cable size 1/0 McMaster-Carr 7817A14.	75
24.	Clamp, portable ground, 200 amp., 1/0 capacity.	2
25.	Chisel and Brush, McMaster-Carr 7954A11	4
26.	Welding rods, electric, No. 10, 3/32". McMaster-Carr 7973A411 or equal.	50 lbs
27.	Welding rods, electric No. 10, 1/8". McMaster-Carr 7973A412.	50 lbs
28.	Welding rods, electirc No. 10, 5/32". McMaster-Carr 7973A413.	50 lbs
29.	Ox-carts.	2
30.	Ox plows with 2 spare shares.	2
31.	Tool set, 48 piece plant maintenance, in case. McMaster-Carr 6748A11.	1
32.	Volt/ohm-milliammeter Sears Roebuck 34 GT 5190 or equal.	1

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33. Counters, hand tally. McMaster-Carr  
1707T5 or equal. Qty 10

TRACTOR TYPE: INTERNATIONAL 744.  
ENGINE NO.: D12D555116  
CHASSIS NO: 3145810R1

PARTS REQUIRED:

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
34.	3 145 715 R91	1
35.	5 3717 DA	2
36.	3 145 650R2	1
37.	3 223894R1	1
38.	3 223890R91	1
39.	3 134919R2	1
40.	3 145 897R1	1
41.	3 148 987R1	1
42.	3 058003R1	1
43.	3 08005R1	1
44.	3 145625R2	1
45.	3 145624R4	1
46.	3 055281R91	1
47.	3 136459R91	1
48.	3 132428R91	1
49.	3 220458R1	4
50.	3 140090R22	1
51.	3 145163R92	2
52.	3 146371R94	2
53.	3 140003R1	2
54.	314000R1	1
55.	3 140008R1	2
56.	3 140009R2	2
57.	523861R2	1
58.	3 140707R2	1
59.	3057346R91	1
60.	3141807R92	12
61.	3 145310R92	1
62.	3145311R92	1
	Steering box complete	1
	Ball shift lever	2
	Lever gear shift, high range.	1
	lever gear shift, low range	1
	Rod shifter	1
	Ball shifter lever	1
	Lever, shifter	1
	Driver's seat complete	1
	Manifold exhaust	1
	Gasket	1
	Elbow exhaust	1
	Muffler	1
	Gauge oil	1
	Oil filter	1
	Fuel filter	1
	Clamp	4
	Hood, engine	1
	Link lower	2
	Link, check	2
	Fork for levelling spindle	2
	Spindle levelling R.H	1
	Ring set	2
	Spacer	2
	Crank levelling	1
	Pivot R.H.	1
	Link pins	12
	Top link	1
	Fender L.H.	1
	Fender R.H.	1
	Supporting bracket high range	1
	Supporting bracket low range lever	1

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2 M/F 135 TRACTORS:

CHASSIS NO.

ENGINE:

135 163206 cm  
135 438574 m

152 UA 225 100D  
152 363 863 D

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
63.	885 856 m91 Radiator	2
64.	897 455 ml Hose	6
65.	186 968 ml Hose	6
66.	1850 544 ml Tap	2
67.	1884278 m91 Cap	2
68.	1884278 m91 Air cleaner	1
69.	26273 Starter	1
70.	54935777A Cable	2
71.	54939856 cable	2
72.	54935778 cable	2
73.	35648 switch and key	2
74.	57403A control box	2
75.	894418 ml Fuel gauge	2
76.	36047 F Ammeter	2
77.	54028714 Battery dry	2
78.	54935775 Harness	2
79.	1882984 m92 Screen	2
80.	1882982 m92 Door	2
81.	897824 m91 Support R.H.	2
82.	897825 m91 Support L.H.	2
83.	880252 m91 Panel L.H.	2
84.	880251 m91 Panel R.H.	2
85.	880254 m91 Plate	1
86.	1882985 ml Panel	1
87.	31358322 liner	6
88.	30854 Seal	2
89.	37416751 Housing	1
90.	82112 Piston	6
91.	84957 Kit	9
92.	85036 A Bearing(-)0-010	3 sets
93.	58703A Bearing(-)0-010	3 sets
94.	41312154 Pump	2
95.	58293 Kit	3
96.	0202016 Hose	2
97.	34821422 Hose	4
98.	0180110 Clip	6
99.	0180108 Clip	6
100.	2641311 Pump	1
101.	? Pump injector	1
102.	2871182 Dynamo	2
103.	31141425 Pulley	4
104.	82886 Set	4

	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
105.	82887	Set	4
106.	890982 ml	Belt	4
107.	892862 ml	Bearing	2
108.	1853164 ml	Screw	12
109.	353430	Nut	12
110.	890302 m91	Plate 11"	4
111.	195175	Bearing	6
112.	1884289 ml	Cap	4
113.	1851800 m91	Bearing	4
114.	887135 ml	Bolt	20
115.	826749 m91	Drag link	4
116.	826753 m91	Drag link	4
117.	892231 m91	Drag link	4
118.	1860325	Seal	4
119.	184134 m91	Link	2
120.	1884720 ml	Rod	2
121.	1884342 ml	Leveling box	2
122.	882753 m91	Link L.H.	4
123.	182632 m91	Link R.H.	4

PARTICULARS OF TRACTORS FOR PART NOS. 125-171

<u>Engine Numbers</u>	<u>JD 2020</u>	<u>JD 2030</u>	<u>MF 135</u>
(a) Model	T24961	T34342	152 UA 249156
(b) Serial	06850T	206042, 206041, 206043	
(c) Type	M53TR	4219DR06	
<u>Chassis Numbers:</u>			
(a) Serial	048R 48T	138288T, 138287T 138287T	
(b) Type	T5R 3C	T5R 3C	135-175904M

<u>NO.</u>	<u>ITEM</u>	<u>QTY</u>
	<u>JOHN DEERE 2020 TRACTOR</u>	
125.	Bearing thrust, T17464T	2
126.	Packing "O" ring, R34733R	2
127.	Element oil filter R28271R	2
128.	Disc brake with facing, AT 22034	2
129.	Packing inside diameter, T22102T	2
130.	Packing outside diameter, T22103T	2
131.	Link drop, AT 19849T	2
132.	Short lift link (R.H. and L.H.) T22004	4
133.	Strap, ground, AT 18702T	4
134.	Tubes for front tires, 600x16	8

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<u>NO.</u>	<u>ITEM</u>	<u>QTY</u>
135.	Pressure valve	1
136.	Clutch plates	2
137.	Central valve	1
138.	Lock pin	1
139.	Diaphragm	1
140.	Rollers	2
141.	Cover gasket	1
142.	Side plate gasket	1
143.	Piston rings	4
144.	Block brass	2
145.	"O" ring kit	1
146.	Timing cover seal	1
147.	White seal	2
148.	Clutch bearing	1
149.	Clutch screws	3
150.	Nuts	3
151.	Fan belt	1
152.	Tie rod ends left and right	2

JOHN DEERE 2030 TRACTOR

<u>NO.</u>	<u>ITEM</u>	<u>QTY</u>
153.	Hose lower water, T22500	2
154.	Hose upper water, T22533	2
155.	Clamps, AR 21840	4
156.	Cap radiator, AT 27585	2
157.	Disc clutch, AT 32207	2
158.	Disc with facing, AT 17464	2
159.	Bearing thrust, T 17464T	2
160.	Bearing axle	2
161.	Link drop, AT 19849T	2
162.	Short lift link (R.H. and L.H.) T2200T	4
163.	Hosing floating brake	2
164.	Packing outside diameter, T22103T	6
165.	Packing inside diameter, T22102T	6
166.	Clutch plate (disc type), AT32209	2
167.	Batteries (diesel, 70 amps, 12 Volts) AT29158	2
168.	Battery cables, 140 amps, AT 24751	2
169.	Switch starters with keys, AR53452	2
170.	Sway blocks, L.H. T30277	2
171.	Sway blocks, R.H. T30276	2
B.	Generator, diesel electric, 25-35 KVA, 240/440 volt, 50 HZ, electric start with switching gear compatible with electrical	1

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Qty

system already in place. This generator will serve as a standby/auxillary unit. Detailed specifications to be developed later.

- C. Pumps for potable and irrigation water.  
All electrical pumps for 415 volts, 50 HZ  
10 Hp. electric  
10-15 Hp. diesel standby  
Specifications will be developed later. 2
- D. Repairs and/or equipment for milking parlor,  
and piggery.  
  
Specifications will be developed later.
- E. Office equipment and supplies, audio-visual  
equipment.
  - 1. Typewriter, electric, 240 volt, 50 HZ. 8  
13.5 inch paper capacity, dual pitch,  
correcting IBM Selectric III or equivalent  
with Bookface Academic and Courier 10  
typing elements.
  - 2. Copier, capable of printing up to 20 2  
copies per minute, using plain paper,  
takes paper stock sizes 8" x 10" to  
8 1/2" x 14". Xerox 3100 or equivalent.
  - 3. Projector, 16 mm sound; self threading; 1  
reel size 2000 ft maximum; sound; reverse  
and still picture device speeds, with 2  
speakers. Bell & Howell model 2592-B  
or equivalent. 5 spare lamps to be  
included.
  - 4. Projector, 35 mm slide, manual slide 2  
  
changer, semi-automatic push button on  
projector, remote control forward/reverse  
and focus, with case. Eastman Kodak  
Ektagraphic AF-2 or equivalent. 10  
spare lamps to be included.
  - 5. Projector, overhead, aperture 10" x 10", 2  
stage 13 1/4" x 13 1/4", 600 watt lamp,  
240 volts, 50 Hz, 10 spare lamps to

		Qty
	be included. Bell and Howell model 301 L or equivalent.	
6.	Trays, rotary slide, capacity of 80 cardboard mounted 2 x 2 slides. Must fit item 4. Kodak B-80 or equivalent.	10
7.	Sheets, transparency film, 10" x 10" x 0.005" thick, 100 sheets per package.	5 pkg
8.	Label maker, for 1/4" and 3/8" plastic tape.	3
9.	Tape, self-adhesive vinyl, 3/8", red	10 rolls
10.	" " " " blue	10 "
11.	" " " " green	10 "
12.	" " " " yellow	10 "
13.	" " " 1/4", red	10 "
14.	" " " " blue	10 "
15.	" " " " green	10 "
16.	" " " " yellow	10 "
17.	Camera, 35 mm, including zoom telephoto lens and flash attachment.	2
18.	Film, 35 mm, 36 exposure, Kodachrome II or equal.	20 rolls
19.	Calculator, printer/display with memory. Texas Instruments TI5142 or equal.	6
20.	Calculator, Texas Instrument TI5120 or equal.	6
21.	Roll, plain paper for TI5120 calculator.	20 rolls
22.	Roll, plain paper for TI5142 calculator.	20 rolls
23.	Roller, ink for TI5142 calculator.	6 rollers
24.	Roller, ink for TI5120 calculator.	6 rollers

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	Qty
25. Mimeograph, electric and hand operated. 240 volt, 50 Hz. Gestetner or equal.	1
26. Stencils for item 24 above.	500
27. Ink blank mimeograph for item No. 24 above.	20 tubes
F. Transport, including trucks, pickups, bus and spare parts.	
1. Truck diesel engine, dual rear wheels and tires, stake bed, 7 to 10 ton capacity.	1
2. Pickups, diesel engine, 1/2 to 3/4 ton capacity.	3
3. Station wagon, 5 passenger, diesel engine.	2
4. Bus, diesel engine, 50-60 seat capacity.	1
5. Motobikes, agricultural, 125 cc engine.	4
6. Bicycles	5

SPARE PARTS FOR MOTOR VEHICLES

I. VOLKSWAGEN (BEETLE) UVR 518 - MODEL 1971

Chassis No. 1112796332  
Engine No. AD 218276  
Power Capacity 1584cc

<u>REQUIRED</u>	<u>Qty</u>
7. Engine No. 1600	1
8. Flashers	2
9. Shock absorbers	4
10. Tyres size 165 x 15 (including tubes).	5
11. Petrol gauge	1
12. Clutch plate	1

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	<u>REQUIRED</u>	<u>Qty</u>
13.	Rear bumper	1
14.	Driving mirrors	2
15.	Coil (ignition)	1
16.	Cut-out	1
17.	Battery - 9 plates (12V)	1
18.	Jack + 1 tool kit	1
19.	Alternator	1

FIAT BUS UWZ 295 MODEL 130A - 1979

Chassis No. 12281  
Engine No. 003370

	<u>REQUIRED</u>	<u>Qty</u>
20.	Tyres and tubes size 900 x 20.	7
21.	Batteries (12V) ?plates	2
22.	Sets universal joints with rubber bushes for propello shaft.	3
23.	Shock absorbers	4
24.	Complete unit exhaust pipe	1
25.	Sets of springs - 2 front and 2 rear.	2+2
26.	Starter motor	1
27.	Door locks with handles - passenger's and driver's doors.	1+1
28.	Head lights	2
29.	Sets parking lights with bulbs	4
30.	Sets of brake shoes - 1 set rear and 1 set front.	1+1
31.	Wheel cylinders - 2 rear and 2 front	2+2
32.	Oil filters and 2 diesel filters	2+2
33.	Ex-L cables	2
34.	7-ton Jack + 1 tool kit	1 set

	<u>REQUIRED</u>	<u>Qty</u>
35.	Set of rubber bushes for rear stabilizer	1 set
36.	Fan belts	2
37.	Sponge rubber for cushions and Brown plastic covers for	63 seats
38.	Hand brake (complete unit)	1
39.	Propeller shaft hanger with bearing	1
40.	Driving mirrors (left and right)	2
41.	Pressure plate with clutch plate	1
42.	Set drag links	1 set
43.	Hydraulic power steering unit	1
44.	Sliding window	1
45.	Engine mounting (for front and rear)	2+2
46.	Set gear box mounting	1 set

TOYOTA HIACE UVO 530 - MODEL RH/15/B/B - 1969

Chassis No. 24386  
Engine No. 2R1505322

	<u>REQUIRED</u>	<u>Qty</u>
47.	Tyres and tubes size 700 x 14 or	5
48.	Gear box	1
49.	Carburettor	1
50.	Alternator	1
51.	Cut-out	1
52.	Propeller shaft	1
53.	Battery - 9 plates (12V)	1
54.	Head lights and rear lights with 8 bulbs	4

	Qty
55. Flasher unit	1
56. Clutch plate and pressure	1
57. Master cylinders (for clutch and brakes)	1+1
58. Shock absorbers	4
59. Tie rods	
60. Windscreen	

BEDFORD UWY 481 - MODEL 1980 U.K.

Chassis No. 601110  
Engine No. 6493471

<u>REQUIRED</u>	Qty
61. Tyres and tubes size 900 x 20	7
62. Motor wiper and 2 wipers	1
63. Sets of front springs	2
64. Battery (12V) ? plates	1
65. Alternator	1
66. Head lights	2
67. Pair of driving mirrors	1
68. Shock absorbers (for front and rear)	4
69. 7-ton hydraulic Jack + 1 tool kit	1
70. Oil filters and 2 diesel filters	2
71. Engine mounting (front)	2

BEFORD UWQ 460 - MODEL 1975

Chassis No. 722667  
Engine No. 6374048; 5422 cc

	<u>REQUIRED</u>	<u>Qty</u>
72.	Tyres and tubes size 900 x 20	7
73.	Steering rod + 1 steering	1
74.	Gear box	1
75.	Batteries (12V) ? plates	2
76.	Shock absorbers (for front and rear)	4
77.	Sets of springs - for front wheels and should be complete	2
78.	Master cylinder	1
79.	Compressor	1
80.	Wiper motor + 2 wipers	1
81.	Fan belts	2
82.	Head lights	2
83.	Rear indicators + bulbs	2
84.	Deef repair	1
85.	Self-starter	1
86.	7-ton hydraulic Jack + 1 tool kit	1
87.	Oil filters and 2 diesel filters	2
88.	Hand brake	1
89.	Engine mounting (front)	2
G.	Laboratory equipment and supplies including such items as microscopes, glassware, chemicals, incubators, balances and refrigerators.	

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Note: The following items, number 1 through 178, are described in Fisher Scientific 1983 catalog. These catalog numbers are for reference only and equivalent commodities are acceptable. All items electrically operated must be for 240 volts, 50 Hz.

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
1	Micromaster Microscope Model EL	FS19300	25
2	Micromaster Microscope Model EM	FS19300-1	25
3	Stereomaster II Microscope	FS19762	25
4	Bulb for overseas use	FS19764-1	25
5	Micromaster CK Micro- scope	FS19556-2P	5
6	B&L Spectronic 20	07-143-1	3
7	Meter, pH/m V/Ion Acumet 830	13-636-831	5
8	Meter, digital 125 pH	13-641-506	5
9	Catorimeter, adiabatic oxygen bomb	04-349-2	1
10	Mill, general purpose	08-415-2	3
11	Digestion unit, rapid	13-160	1
12	Fume removal system for item No. 11	13-161	1
13	Scale, Mettler 5000g electronic	01-913-340	3
14	Oven, controlled atmosphere moisture, model 496	10-496-1	3
15	Sterilizer	14-460-10	1
16	Incubator, shaking	15-453-200	1

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
17	Circulator, constant temperature immersion	13-874-176	4
18	Heating multi-mantle	11-473	6
19	Hotplate, stirring	11-493-211M	6
20	Hotplate, extra capacity	11-496-6B	3
21	Hotplate, economical student	11-496-70	6
22	Labels, self adhesive, 3/4" x 1 1/2"	11-863E	2 cases or 5000 labels
23	Pens, scientific technical	13-383-1	3 packs (36 pens)
24	Pens, marking felt tip	13-382-50	3 packs (36 pens)
25	Pens, marking felt tip	13-382-51	3 packs (36 pens)
26	Pencils, laboratory marking	13-380-15A	3 packs (36 pens)
27	Pencils, laboratory marking	13-380-15B	3 packs (36 pens)
28	Still, Barnstead classic	09-026D	2
29	Pump, vacuum	01-183-12	3
30	Blenders, 14 speed	14-509-101	4
31	Sieve, microsets	14-306A	12
32	Replacement mesh inserts for item 31	14-306B	2 packs
33	Evaporator, rotary vacuum	09-548-151B	1
34	Mortars, porcelain	12-961C	2 cases (16)

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
35	Pestles	12-961-5C	2 cases (16)
36	Dissecting set	08-855	24
37	Goggles, impact	11-401-10	24
38	Block digesters	13-163-10	40
39	Perchloric acid	A-229-S	160 lbs
40	Acetone	A-19	80 L
41	Hydrochloric acid	A-144	19.5 gal.
42	Sulphuric acid	A-300C	90 L
43	Orthosphoric acid	A-242	15 L
44	Nitric acid	A-200C	75 L
45	Lactic acid	A-162	12 L
46	Acetic acid	A-38C	75 L
47	Ammonium hydroxide	A-669C	75 L
48	Ethyl alcohol	A-407	200 L
49	Butanol-Iso	A-397	16 L
50	1-Butanol (n-Butyl alcohol)	A-399	20 L
51	Methanol	A-936	12 L
52	2-propanol (iso-propyl alcohol)	A-426-S	20 L
53	Glycerin white	G-31	16 L
54	Glycerin jelly	G-35	16 L
55	Ethyl ether	E-138	12.5 Kg
56	Petroleum ether	E-139	20 L
57	Iso-Amyl alcohol	A-393	16 L

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<u>Item No.</u>	<u>Description</u>	<u>Cat. No.</u> <u>Fisher</u>	<u>Qty</u>
58	Ethyl acetate	E-124	20 L
59	Chloroform	C-605	16 L
60	Benzene	B-414	30 L
61	Hexane	H-344	12 L
62	Xylene	X-4	20 L
63	Congo red	C-580	25 gm
64	Canada balsam	SO-C-30	100 ml
65	Cetyl alcohol	A-438	500 gm
66	Crystal violet	C-581	150 gm
67	Cupric oxide	C-472	1 Kg
68	Cupric sulphate	C-495	2 Kg
69	Citric acid	A-940	3 Kg
70	Tartaric acid	A-315	500 gm
71	Toulene	T-289	6 L
72	Turpentine spirits	O-174	8 L
73	Thymol crystals	T-185	600 gm
74	Triethanolamine	T-414	6 L
75	1-4 Butanediol Diglycidyl ether	17116	1.5 Kg
76	Pectin (citrus)	2569-P	1 Kg
77	Dextrose (D-glucose)	D-16	10 Kg
78	Xylene	X-3-S	20 L
79	Cornmeal agar	B 11132	1 Kg
80	Dextrose agar	B 11165	1 Kg

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>QTY</u>
81	Dextrose broth	B 11167	1 Kg
82	Dextrose starch agar	B 11171	1 Kg
83	Dextrose Trypose agar	B 11175	1 Kg
84	Sodium Molybdate	S-336	1.5 Kg
85	Calcium acetate	C-46	1.5 Kg
86	Calcium carbonate	C-64	3 Kg
87	Calcium nitrate	C-109	3 Kg
88	Calcium chloride- dihydrate	C-79	3 Kg
89	Calcium chloride- hexahydrate	C-78	3 Kg
90	Calcium hydroxide	C-97	3 Kg
91	Sodium chloride	S-671	10 Kg
92	Sodium acetate	S-209	6 Kg
93	Sodium carbonate (anhydrous)	S-281	3 Kg
94	Sodium phosphate (dihydrate)	S-381	3 Kg
95	Sodium meta-phosphate	S-333	12 Kg
100	Sodium dithionite	S-310	6 Kg
101	Sodium dichromatic	S-234	10 Kg
102	Sodium dithionate	S-290	100 gm
103	Sodium bicarbonate	S-631	10 Kg
104	Sodium lactate	S-326	3000 ml
105	Sodium sulfite	S-430	3 Kg
106	Sodium sulfide	S-426	5 Kg

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
107	Manganese chloride	M-87	3 Kg
108	Manganese dioxide	M-108	3 Kg
109	Malachite green	A-779	500 g
110	Mannitol (-D)	M-120	3 Kg
111	Mercuric chloride	M-156	3 Kg
112	Mercuric oxide	M-174	3 Kg
113	Mercuric iodide	M-166	3 Kg
114	Mercury	M-141	6 lb.
115	Magnesium carbonate	M-29	600 gm
116	Magnesium sulphate	M-65	3 Kg
117	Methyl red	M-296	60 gm
118	Methylene blue	M-291	100 gm
119	Methylene violet	O-359	5 gm
120	Methylene green	M-295	5 gm
121	1-Octanol	A-402	500 ml
122	2-Octanol	O-269	3000 ml
123	Benzine	B-264	20 L
124	Orcein	O-268	60 gm
125	Olive oil	O-112	1 L
126	Orange G	O-267	25 gm
127	Castor oil	O-46	3 L
128	Cedarwood oil	O-40	500 ml
129	Celite	C-211	6 Kg
130	Celite	C-212	1 Kg

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<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
131	Oxalic	A-219	1 Kg
132	Carborundum powder	C-192	500 gm
133	B-Carotene	3702	5 gm
134	Congo red	A-795	500 gm
135	MacConkery agar	B11390	5 lb
136	MacConkery broth	B11397	5 lb
137	Malt extract agar	B11402	2 lb
138	Malt extract broth	B11405	2 lb
139	Nutrient agar	B11472	2 lb
140	Nutrient broth	B11479	2 lb
141	Potato dextrose agar	B11550	1 lb
142	Yeast extract	B11930	5 lb
143	1, 10, Phenanthroline ferrous sulfite	P-69	100 ml
144	Fuchsin basic	F-98	10 gm
145	Eriochrome black T	E-512	25 gm
146	Infusorial earth	I-22	12 Kg
147	5-Dimethylamino-1- naphthalenesulfuric	11218	25 gm
148	Sodium reference standard	SO-S-130	500 ml
149	Potassium reference standard	SO-P-351	500 ml
150	Calcium reference standard	SO-C-191	500 ml
151	Iodine solution, WIJS	SO-I-106	4 L
152	Alundum RA-1139.	C-218	3 Kg

12K

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
153	Safety pipet filler	13-681-50	5
154	Pipet cleaning set	13-350-111A	1
155	Respirator for non-toxic dust	13-994-20	240
156	Respirator for acid gases	13-994-22	30
157	Mask for non-toxic particles	11-875-54	600
158	Respirator for organic vapors/acid gases	13-994-15	5
159	Replacement filter for item No. 158	13-994-17	100
160	Lens tissue cloth	11-997-50	6 pac
161	Filter paper, Whatman- 5 1/2cm #1	09-805D	10 pk
162	" " " - 12 1/2cm #1	09-805F	"
163	" " " - 15cm #1	09-805G	"
164	" " " - 18cm #1	09-805G	"
165	" " " - 24cm #1	09-805J	"
166	" " " - 27cm #1	09-805K	"
167	" " " - 32cm #1	09-805L	"
168	Cotton	07-885A	1 pk
169	"	07-885B	"
170	"	07-885C	"
171	"	07-885D	"
172	Anti-static spray	14-432-100	12
174	" "	11-129-530B	1 lb
175	" "	11-129-530C	1 lb

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
176	Corkstoppers	07-785	3 pk
177	Stopper, rubber	14-132	2 pk

Refrigerator/freezer, household, 16 to 18 cu. ft.  
two door, frost free, 240 volts, 50 Hz.

Freezer, upright, 24 cu. ft., 240 volts, 50 Hz.

H. Agricultural chemicals - insecticides, herbicides,  
fertilizers and animal health supplies.

		<u>Qty</u>
1.	Ammonium sulfate, not less than 20.5% nitrogen	2 tons
2.	Urea, not less than 42% nitrogen.	2 tons
3.	Triple superphosphate, not less than 40% available phosphoric acid.	2 tons
4.	Muriate of potash, not less than 50% as K <sub>2</sub> O	2 tons 2 tons
5.	Nilzan	150 liters
6.	Delnav	100 liters
7.	Ascarizine powder	40 Kg
8.	Camprol	50 Pkgs
9.	Milking salve	140 Kg
10.	Sulfadine, injectable, 33 percent	5 liters
11.	Sulfadine, 16 percent	40 liters
12.	Atropine sulphate	80 Pkts
13.	Oxytetracycline HCl	20 liters
14.	Xylotox 3 percent injectable	4000 ml
15.	Deltahydrocortizone	5000 ml

		<u>Qty</u>
16.	Terramycin Pink-eye powder	50 bottles of 25gm ea
17.	Rogor 50%	50 L
18.	Endorsulfan, e.c. 35%	50 L
19.	Pirimicarb, a.i. 70%, w.p.	25 Kg
20.	Furadan, 5% granules	50 Kg
21.	Fenitrothion, 50% e.c.	50 L
22.	Ethylene Dibromide	100 Kg
23.	Dithane M-45-	100 KG
24.	Benomyl	50 Kg
25.	Karathane w.p.	25 Kg
M.	Books and periodicals. Books	

	<u>Title</u>	<u>Author(s)</u>	<u>Publisher*</u>	<u>Qty</u>
1.	College Zoology	Booolootain & Stilas	Mac	1
2.	Imm's General Textbook of Entomology, Vol.1-2	Imms, <u>et al</u>	C & H	1
3.	Physiology of Flowering Plants	Street & Opik	CBS	1
4.	Anatomy & Physiology of Farm Animals 3rd ed.	Frandsen	L & F	1
5.	Fundamentals of Ecology 3rd ed.	Odum	CBS	1
6.	Elementary Soil & Water Engineering 2nd ed.	Schwab <u>et al</u>	W	1
7.	Farm Machinery & Equipment	Smith & Wilkes	McG	1
8.	Animal Nutrition	Maynard <u>et al</u>	McG	1

\*See list of abbreviations of publishers at end of this list.

	<u>Title</u>	<u>Author(s)</u>	<u>Publisher*</u>	<u>Qty</u>
9.	Crop Production: Cereals and Legumes	Bland	Acad Pr	1
10.	Agricultural Insect Pest of the tropics	Hill	CUP	1
11.	Farm Business Management: the Decision Making Process 2nd ed.	Castle & Becker	Mac	1
12.	Farm Management in Africa: the Principles of Production and Planning	Upton	OUP	1
13.	Farm Planning & control 2nd ed.	Barnard & Nix	CUP	1
14.	Animal Nutrition: The Use of Feedstuffs in the Formation of Live-stock Rations, 2nd ed.	Crampton & Harris	WHF	1
15.	Breeding & Improving of Farm Animals 7th ed.	Warwick & Legates	McG	1
16.	Dairy Cattle Feeding & Management 6th ed.	Etgen & Reaves	W	1
17.	Food Science, 3rd ed.	Potter	AVI	1
18.	Agronomy of the Major Tropical Crops	Williams	OUP	1
19.	Crop physiology	Ed. by Evans	CUP	1
20.	Fundamentals of Plant-Pest Control	Roberts	WHF	1
21.	Economics of Agricultural Development	Mellor	CrUP	1
22.	Economics of African Agriculture	Levi & Havinden	L	1

\* See list of abbreviations of publishers at end of this list.

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	<u>Title</u>	<u>Author(s)</u>	<u>Publisher*</u>	<u>Qty</u>
23.	Agricultural Development & Economic Growth	Southworth & Johnston	CUP	1
24.	Agricultural Price Analysis 5th ed.	Shepherd	ISUP	5
25.	Administrative Action: the Techniques of Organization & Management 2nd ed.	Newman	P-H	1
26.	Forest Resource Economics	Gregory	W	1
27.	Forest Volume Estimation & Yield Prediction Vol.1 & Vol.2		Unipub	1
28.	Forest Fire: Control & Use 2nd ed.	Brown & Davis	McG	1
29.	Forest Pathology	Boyce	McG	1
30.	Forest & Shade Tree Entomology	Anderson	W	1
31.	Forest & Range Policy	Dana & Fairfax	McG	1
32.	Forest Resource Management: Decision Making principles	Duerr <u>et al</u>	HR&W	1
33.	Introduction to Meteorology 3rd ed.	Pettersen	McG	1
34.	Introduction to Crop Physiology	Milthorpe & Moody	CUP	1
35.	Introductory Mycology 3rd ed.	Alexopoulos & Mims	W	1
36.	Nature & Properties of Soils	Brady	Mac	1
37.	Microbiology, text 4th ed.	Pelczar <u>et al</u>	McG	1

\* See list of abbreviations of publishers at end of this list.

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	<u>Title</u>	<u>Author(s)</u>	<u>Publisher*</u>	<u>Qty</u>
38.	Introduction to Agricultural Economic Analysis	Bishop & Toussaint	W	1
39.	Marketing of Agriculture Products, 5th ed.	Kohls & Uhl	Mac	1
40.	Handbook of Pulp & Paper Technology 2nd ed.	Britt	VNR	1
41.	Genetics	Farnsworth	H-R	1
42.	Plants: An Introduction to Modern Botany 3rd ed.	Gruelach & Adams	W	1
43.	Physiology of Flowering Plants 2nd ed.	Street & Opik	UP	1
44.	Poultry Production 12th ed.	Nesheim <u>et al</u>	L&F	1
45.	Physiology of Reproduction & Artificial Insemination of Cattle 2nd ed.	Salisbury <u>et al</u>	WHF	1
46.	Plant Pathology 2nd ed.	Agrios	AcadP	1
47.	Principles of Plant Breeding	Allard	W	1
48.	Tropical Pasture & Fodder Plants	Bogden	L	1
49.	Properties & Management of Soils in the Tropics	Sanchez	W	1
50.	Saws: Design, Selection Operation, Maintenance	Willston	MF	1
51.	Dictionary of Agricultural & Food Engineering	Farrall & Basselman	I	1
52.	Farm Power & Machinery Management 7th ed.	Hunt	ISUP	1

\* See list of abbreviations of publishers at end of this list.

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	<u>Title</u>	<u>Author(s)</u>	<u>Publisher*</u>	<u>Qty</u>
53.	Farm Chemicals Handbook		M	1
54.	Fungi: An Advanced Treatise, 4 Vols.	Ainsworth & Sussman	AcadP	1
55.	Fungus Diseases of Tropical Crops	Holliday	CUP	1
56.	Animal Agriculture: the Biology, Husbandry & Use of Domestic Animals	Cole & Garrett	WHF	1
57.	Fundamentals of Food Processing Operations: Ingredients, Methods & Packaging	Heid & Joslyn	AVI	1
58.	First Things First: Meeting Basic Human Needs	Streeton	OUP	1
59.	Economics of Develop- ment: Empirical Investigations	Yotopoulos & Nugent	Har-kow	1
60.	Fundamental Methods of Mathematical Economics 2nd ed.	Chiang	McG	1
61.	Handbook of Applied Hydrology: A Compendium of Water Resources Technology	Chow Vente	McG	1
62.	Handbook of Laboratory Safety	Steere	CRC Pr	1
63.	Genetics of Livestock Improvement 3rd ed.	Lasley	P-H	1
64.	Leading Issues in Economic Development 3rd ed.	Meier	OUP	1

\* See list of abbreviations of publishers at end of this list.

	<u>Title</u>	<u>Author(s)</u>	<u>Publisher*</u>	<u>Qty</u>
65.	Plant Disease: An Advanced Treatise, How Pathogens Induce Disease. Vol.4	Horsfall & Cowling	AcadP	1
66.	Plant Disease: An Advanced Treatise, How Disease Develops in Populations. Vol.2	Horsfall & Cowling	AcadP	
67.	Plant Disease: An Advanced Treatise, How Plants Suffer from Disease. Vol.3	Horsfall & Cowling	AcadP	1
68.	Physiological Plant Pathology. Vol.4	Heitefuss & Williams	S-P	1
69.	Systems View of Planning	Chadwick	Per	1
70.	Systems Behavior 3rd ed.	Beishon	H-R	1
71.	Poverty Curtain: Choices of the Third World	Mahbub	CI.UP	1
72.	Theory of Econometrics: An Introduction Exposition of Econometric Methods 2nd ed.	Koutsogiannis	B&N Int	1
73.	Why Poor People Stay Poor: Urban Bias in World Development	Lipton	HUP	1
74.	Redesigning Rural Development: A Strategic Perspective	Johnston & Clark	JH	1

\* See list of abbreviations or publishers at end of this list

<u>Abbrev.</u>	<u>Publisher</u>
Mac	MacMillian
C&H	Chapman & Hall
CBS	Contemporary Biology Ser.
L&F	Lea & Febiger
W	Wiley
McG	McGraw
AcadP	Academic Press
CUP	Cambridge Univ. Press
OUP	Oxford Univ. Press
WHF	W. H. Freeman
AVI	
CrUP	Cornell Univ. Press
L	Longman
ISUP	Iowa State Univ. Press
P-H	Prentice Hall
HR&N	
VNR	Van Nos Reinhold
H-R	Harper-Row
UP	University Park
MF	Miller Freeman
I	Interstate
M	Meister Publ. Co.
S-P	Springer - Verlag
Per	Pergamon
CIUP	Columbia Univ. Press
B&N Imp	B & N Imports
HUP	Harvard Univ. Press
JH	Johns Hopkins
M	Methuen Inc.
Mer	Merriam
ASP	Agric. Sci. Pub.
ASA	American Society of Agronomy
UP	Univ. Park

Journals - three year subscriptions, one copy of each.

1. Journal of Nutrition
2. Journal of Animal Science
3. Journal of Dairy Science
4. Poultry Science
5. Canadian Journal of Animal Science
6. Journal of Soil Science
7. Soils and Fertilizers
8. Fertilizer Research
9. Journal of Soil and Water Conservation
10. Forest Science
11. Commonwealth Forestry Reviews
12. Unasylva

13. Forest Abstracts
14. Agro-Forestry
15. Journal of American Society of Agricultural Engineers
16. Transactions of the American Society of Agricultural Engineers
17. Yearbook of the American Society of Agricultural Engineers
18. Journal of Food Science
19. Transactions of the British Mycological Society
20. Physiological Plant Pathology
21. Journal of Theoretical Biology
22. Annals of Applied Biology
23. Phytopathology
24. Crop Science
25. Plant Breeding Abstracts
26. Field Crop Abstracts
27. Agronomy Journal
28. Bulletin of Entomological Research
29. Review of Plant Pathology
30. World Development
31. Economic Development and Cultural Change
32. American Journal of Agricultural Economics
33. Journal of Agricultural Economics
34. Food Policy
35. Modern African Studies
36. Journal of Rural Sociology

N. Building and farm renovation.

1. Glass, all 3mm thick.

<u>Size</u>	<u>No. of Pieces</u>
6" x 34"	400
24" x 24 "	15
24" x 30"	40
24" x 36"	98
24" x 40"	3
24" x 50"	6
24" x 60"	50
24" x 72"	3
24" x 84"	100
30" x 30"	620
30" x 40"	800
30" x 48"	2
30" x 36"	4
30" x 48"	10

Glass, all 6mm thick.

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<u>Size</u>	<u>No. of Pieces</u>
48 1/2" x 72 1/2"	5
24" x 36"	2
50" x 60"	2

3. Putty, steel 340 Kg

4. Paint, varnish and turpentine

	<u>Qty in Litres</u>
White emulsion	2000
Cream emulsion	500
Green emulsion	50
Gray emulsion	200
Light green emulsion	25
White gloss	200
Cream gloss	25
Grey gloss	150
Green gloss	25
Baby blue gloss	25
Dark blue gloss	50
Black gloss	25
Pink gloss	10
Undercoat white	200
Clear varnish	75
Turpentine	100
Yellow gloss	4
Pink emulsion	2000

5. Polly filler 100 Kg

6. Sandpaper 80 grit 100 sheets

7. Paint brushes

6 inch	20
3 inch	5
2 inch	5

3. Pipe and pipe fittings

	<u>Number</u>
Union, 3/4"	15
Nipples, 1/2"	20
Stop cock, 1/2"	15
Stop cock, 3/4"	5
Plug, 1 1/2"	4
Bib tap, 1/2"	26

146

	<u>Number</u>
Trap "P" type, 1 1/2"	4
Bottle trap "P" type, 1"	10
Ball valve L/P, 1/2"	2
Ball valve, 3/4"	2
Gate valve, 1/2"	10
Gate valve, 3/4"	4
Gate valve, 1 1/2"	2
Pipe, G.I. 1/2", 20 ft. length	25
Pipe, G.I. 3/4", 20 ft. length	1
Pipe, G.I. 1", 20 ft. length	12
Copper nut, 1/2"	24
Flexible tube, 1/2"	18
Solvent cement, liter	1
Elbow, G.I. 1/2"	30
Union, G.I. 1/2"	15
Union, G.I. 1'	8
Bend, G.I. 1"	12
Socket, G.I. 1"	10
Nipples, G.I. 1"	10
Elbow, G.I. 1"	6
Gate valve, 1"	2
Pipe, G.I., 1 1/2"	15
Bends, G.I. 1 1/2"	20
Union, G.I. 1 1/2"	8
Nipple, G.I. 1 1/2"	10
PVC pipe, 1 1/4", length	1
Boss white, tins	2
Thread tape, rolls	5
Socket 1 1/2"	4
Socket 3/4"	2
Copper pipe, 3/4", 10 ft. length	2
Compression fitting, 3/4"	8
Copper tee, 3/4"	4
Elbow, G.I., 3/4"	8
Elbow, copper 3/4"	4
Elbow, G.I. 1 1/2"	6
9. Hardware	
Hinges - to be riveted	10
Heavy duty bolts	4
Mortice locks (Union)	10
Steel door lock	1
10. Electrical fittings	
Conduit, metal, lengths	10
Socket, outlet flush, 13 Amp	25

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	<u>Number</u>
Socket, outlet, 13A	15
Flexible cable, roll	2
Top plug	10
Lampholder, pendant, shrouded	10
Consumer unit, complete, 12 way	2
Consumer unit, complete, 6 way	2
Consumer unit, complete, 9 way	1
Flourescent fitting, complete twin, 5 ft.	25
Flourescent fitting, complete single 5 ft.	10
Switch, 2 gang, 1 way flush	5
Bulbs, Bayonette, 100 watt	25
Circuit breaker, 30 amp	20
" " 20 amp	6
PVC cable, 2.5 mm <sup>2</sup> T/E roll	1
" " " single green roll	5
" " " black "	5
" " " red "	5
" " 1.5 mm <sup>2</sup> " red "	5
" " " black "	5
" " " green "	5
Space bar saddle, 3/4"	20
M.K. boxes, twin	10
Flourescent tubes, 4 ft.	25
" " 5 ft.	50
Switch, 1 gang, flush	5
" 2 gang, "	5
Wall brackets	3
Top plugs, 13 Amp	4
Chokes, 65 watts	25
Tube starter (40W-80W)	25
Circuit breaker, 15 amp	6
" " 10 amp	5
Socket outlet, 13 amp, twin flush	20
Switch, flush, 2 gang, 2 way	10
" " 4 gang, 2 way	2
" " 1 gang, 2 way	4
11. Steel for water tank	
Mild steel plate 1/8" x 4' x 8', pieces	4
" " 1/16" x 4' x 8', "	1
Angle iron, 1 1/2" x 1 1/2" x 20' "	2
Round bars, 5/8" x 40 ft. "	100
12. Tools and supplies	
Hacksaw blades, 24 tpi, 12 in. No.	35
Welding electrodes, 10 gauge	30 Kg

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a) Climatology Equipment:

<u>No.</u>	<u>Qty</u>	<u>Item</u>
81.	2	Sets of thermometer supporting brackets, US \$ 1.5 each
82.	4	Maximum ordinary sheathed thermometers in 0C, US \$ 20.0 each
83.	4	Minimum ordinary sheathed thermometers in 0C, US \$ 4.0 each
84.	4	Ordinary thermometers for wet and dry bulb temperatures, US \$ 5.0 each
85.	2	Wet bulb reservoirs, US \$ 0.5 each
86.	1	Gun Bellani radiometer plus well, US \$ 80.0 each
87.	8	Rain measuring glass, in metric units, US \$ 3.0 each
88.	8	Standard rain gauge, 5"0, US \$ 4.0 each
89.	2	Duvdevani Dew gauge (W 5750), US \$ 100.00 each
90.	2	Earth thermometer, 10 cm (T5920) US \$ 18.0 each
91.	2	" " 20 cm (T5924) US \$ 20.50 each
92.	2	Earth thermometer, 30 cm (T5929) US \$ 22.0 each
93.	2	" " 50 cm (T3580) US \$ 62.50 each
94.	2	" " 100 cm (T3582) US \$ 80.0 each
95.	4	Pens for hygrothermograph (T6586) US \$ 1.00 each
96.	"	" " (T9228) US \$ 1.0 each

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<u>No.</u>	<u>Qty</u>	<u>Item</u>
97.	2	Bottles ink, violet (T6566) US \$ 0.5 each
98.	2	" " green (T6586) US \$ 0.5 each
99.	8	Soil moisture units - w of each for 15, 30, 60 and 90 cm
100.	2	Recording thermohygrographs and 100 charts
101.	1	Spare pen arm for thermohygrograph (T9236)
102.	1	" " " " (T9240)
103.	4	Humidity elements (T9248), US \$ 1.5 each
104.	2	Humidity cam spring (T9252), US \$ 1.5 each
105.	2	Hygrometric tables (T8558), US \$ 0.5 each
106.	2	Sunshine transparent templates, US \$ 1.5 each
107.	1	Sunshine recorder and 300 sunshine charts
108.	1	Dines recording rain gauge and 200 charts (W5556)
109.	1	Cup-counter Anemometer in Km/s (W1208/2)
110.	2	Piche evaporimeter, US \$ 2.50 each
111.	2	Self recording rain gauges and charts
112.	3	Soil thermometers with copper cables
113.	150	Meteorological data publications

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II. Serere Research Station

A. Farm Machinery, Equipment and Supplies.

			Qty
1.	Tractor	- See I.A.1	2
2.	Diskplow	- " I.A.2	2
3.	Disk harrow	- " I.A.3	2
4.	Planter	- " I.A.4	2
5.	Cutter	- " I.A.5	6 units
6.	Cultivator	- " I.A.6	2
7.	Thresher	- " I.A.10	1
8.	Envelopes	- " I.A.12	1
9.	Bag#	- See I.A.13	10,000
	No.2		
	No.3		6,000
	No.4		4,000
	No.5		4,000
	No.6		4,000
10.	Toolset	- See I.A.14	2,000
11.	Mower	- " I.A.16	1 set
12.	Harrow	- " I.A.17	2
13.	Helmets	- " I.A.18	3
14.	Goggles	- " I.A.19	5
15.	Gloves	- " I.A.20	5
16.	Holder	- " I.A.21	5
17.	Lug	- " I.A.22	2
18.	Cable	- " I.A.23	4
19.	Clamp	- " I.A.24	75 ft.
20.	Chisel	- " I.A.25	2
21.	Welding rod	- " I.A.26	4
22.	" "	- " I.A.27	50 lbs
23.	" "	- " I.A.28	50 lbs
24.	Oxcarts	- " I.A.29	50 lbs
25.	Oxplows	- " I.A.30	2
26.	Counter	- " I.A.33	2
27.	Sprayer, motorized		10
28.	Sprayer, tank type, knapsack, 3 1/2 gal. cap.		5 5
29.	Tapes, measuring, Metri-English graduations, 30 m/100 ft., McMaster- Carr No. 6835A54 or equal.		10
30.	Thresher, plot, Vogel type, trailer mounted, 9 hp air cooled gasoline engine.		1

		<u>Qty</u>
31.	Thresher, peanut/soybean, trailer mounted. Seedburo Model KPT-30 or equal.	1
32.	Moisture meter, seed, with standard set of moisture conversion charts, 240 volt, 50 Hz. Steinlite 400-G or equal.	1
33.	Bag, kraft, made with waterproof glue for corn/sorghum tassel bags, 13 3/4" x 6" x 4".	50,000
34.	Bag, glassine/parchment, waterproof glue, ear shoot bags.	25,000
35.	Envelopes, coin, kraft paper 2 1/2" x 4 1/4".	50,000
36.	Twine, cotton, size No. 48, 1/2 lbs ball. McMaster-Carr 1931T19 or equal.	10
37.	Jack, hydraulic, 3 ton capacity. McMaster-Carr No. 8803T13 or equal.	4
38.	Jack, hydraulic, 12 ton capacity McMaster-Carr No. 8803T19 or equal.	1
39.	Jack, heavy-duty floor, 4 ton capacity, Sear Roebuck No. 28GT1206N or equal.	1
40.	Gauge, tire pressure. Snap-on YA 111A or equal.	2
41.	Tube, inner for tires, repair kit.	5
42.	Vise, machinist's, stationary base, 5 inch, 8 inch opening.	2
43.	Grease gun, lever operated, 16 oz. capacity, nozzle for hydraulic fittings.	4
II.	B. Generator, diesel electric 240/440 volts, 50 Hz, 25-35 KVA, electric start, with switching gear compatible with	1

Qty

existing electrical system. This generator will serve as a standby/auxillary unit. Detailed specifications to be developed later.

II. C. Pumps for potable water supply. All electrically driven pumps to be supplied for 240/440 volts 50 Hz.

- |    |                          |   |
|----|--------------------------|---|
| 1. | 15 hp submersible pumps  | 2 |
| 2. | 15 hp centrifugal pumps  | 2 |
| 3. | 15 hp diesel driven pump | 1 |
| 4. | Hand pump                | 1 |

Specifications will be developed later.

II. D. Renovation of soils lab, insectory, green house, seedrooms, cattle dip tanks and roof tiles.

Specifications will be developed later.

II. E. Office equipment and supplies, and audio-visual equipment.

- |     |                      |                               |            |
|-----|----------------------|-------------------------------|------------|
| 1.  | Typewriter           | See I.E.1                     | <u>Qty</u> |
| 2.  | Copier               | " I.E.2                       | 2          |
| 3.  | Projector            | " I.E.4                       | 2          |
| 4.  | Trays                | " I.E.6                       | 1          |
| 5.  | Label maker          | " I.E.8                       | 5          |
| 6.  | thru 13-Tape         | " I.E.9 thru 16 10 rolls each | 3          |
| 14. | Calculator           | " I.E.19                      | 6          |
| 15. | "                    | " I.E.20                      | 6          |
| 16. | Roll                 | " I.E.21                      | 10         |
| 17. | "                    | " I.E.22                      | 10         |
| 18. | Roller               | " I.E.23                      | 6          |
| 19. | "                    | " I.E.24                      | 6          |
| 20. | Mimeograph           | " I.E.25                      | 1          |
| 21. | Stencils for item 20 | " I.E.26                      | 500        |
| 22. | In for item 20       |                               | 20         |

tubes

F. Transport, including trucks, pickups, station wagons, motorbikes and bicycles.

- |    |        |           |   |
|----|--------|-----------|---|
| 1. | Truck  | See I.F.1 | 1 |
| 2. | Pickup | See I.F.2 | 3 |

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			<u>Qty</u>
3.	Station Wagon	" I.F.3	2
4.	Motorbikes	" I.F.4	4
5.	Bicycles	" I.F.5	5
6.	Spare parts for existing transport	1 lot	

G. Laboratory equipment and supplies including such items as microscopes, glassware, chemicals, incubators, balances and refrigerators.

Note: The following items, number 1 through 200 are described in Fisher Scientific 1983 catalog. These catalog numbers are for reference only and equivalent commodities are acceptable. All items electrically operated must be for 240 volts, 50 Hz.

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
1.	Micromaster microscope, Model EL.	FS19300-1	5
2.	Stereomaster II microscope.	FS19762	2
3.	Bulb for overseas use	FS19764-1	2
4.	Micromaster CK microscope.	FS19556-2P	1
5.	Meter, pH/mV/Ion	13-636-831	2
6.	Mill, general purpose	08-415-2	1
7.	Scale, Mettler 5000g, electronic	01-913-340	1
8.	Sterilizer	14-460-10	1
9.	Heating, multi-mantle	11-473	2
10.	Hot plate, economical	11-496-70	6
11.	Labels, self-adhesive 3/4" x 1 1/2"	11-863E	5000 labels
12.	Pens, marking felt tip	13-382-50	1 pack

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
13.	Pens, marking felt tip	13-382-50	1 pack
14.	Pencils, laboratory marking	13-380-15A	1 pack
15.	" "	13-380-15B	1 pack
16.	Still, Barnstead classic	09-026D	1
17.	Blenders, 14 speed	14-509-101	4
18.	Sieve, micro sets	14-306A	4
19.	Replacement mesh inserts for item No.18	14-306B	1 pack
20.	Mortars, porcelain	12-961C	8
21.	Pestles, porcelain	12-962-5C	8
22.	Dissecting set	08-855	6
23.	Goggles, impact	11-401-10	12
24.	Petri dishes, Pyrex	08-747C	144
25.	Beakers, pyrex, 50ml	02-540G	48
26.	Beakers, pyrex 100ml	02-540H	48
27.	" " 250ml	02-540K	48
28.	" " 600ml	02-540M	36
29.	" " 1000ml	02-540P	24
30.	" " 2000ml	02-540R	8
31.	Beakers, pyrex 4000ml	02-540	6
32.	Burets, 10ml	03-693A	2
33.	" 25ml	03-693B	6
34.	" 50ml	03-693C	6

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
35.	Burets, 100ml	03-693D	6
36.	Cylinders, graduated 5ml	08-550A	12
37.	" " 10ml	08-550B	20
38.	" " 25ml	08-550C	20
39.	" " 50ml	08-550D	20
40.	" " 100ml	08-550E	20
41.	" " 250ml	08-550F	36
42.	" " 500ml	08-550G	18
43.	Filter paper, Whatman 9cm	09-825B	1000
44.	" " " " #5	09-830A	1000
45.	" " " " #40	09-845C	1000
46.	" " " " #42	09-855C	1000
47.	" " " " #44	09-860B	1000
48.	Bottles, washing, 8 oz.	03-409-22B	6
49.	Water bath	15-491-1	1
50.	Support for item 49	15-481-6	1
51.	Bottles, amber	02-983-B	36
52.	Micro slides	12-549	10 gross
53.	Cover glasses	12-541B	10 oz.
54.	Oven, lab	13-245-231G	1
55.	Timer	06-661	1
56.	Ruler, 12"/300mm	12-090	12
57.	Ruler, 1M	12-095	12

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<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
58	Lens	12-045	10
59.	Thermometer	14-985E	10
60	Borer, cork	D7-845C	1
61.	Tongs, beaker	02-620	2
62.	Lactic acid	A-162	1 liter
63.	Cupric sulphat	C-495	500 gm
64.	Formaldehyde	F-79-P	4 L
65.	Ethyl alcohol	A-407	20 L
66.	Sulfuric acid	A-300C	15 L
67.	Potassium cyanide	P-226	500 gm
68.	Mercuric chloride	M-156	500 gm
69.	Sodium hypochlorite	So-S-291	4 L
70	Orthophosphoric acid	A-242	15 L
71	Chloroform	C-605	4 L
72	Aniline flue	A-967	25 gm
73	Bismark Brown Y	1742-C	25 gm
74	Carbol fuchsin Stain	So-C-34	500ml
75	Crystal violet	C-581	25 gm
76	Rosin B	E-514	25 gm
77	Erythrosin B	E-513	25 gm
78.	Fuchsin basic	A803	100 gm
79.	Gram's stain	G-146	1 gm
80.	Mercuric iodine solution, gram	SO-1-96	250 ml

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<u>Item No.</u>	<u>Description</u>	<u>Risner Cat. No.</u>	<u>Qty</u>
81.	Iodine	I-35	100 gm
82.	Methylene blue solution (Loeffler)	SO-M-82	500 ml
83.	Neutral red	N-129	25 gm
84.	Nigrosine	3536-F	100 gm
85.	Phloroglucinol	P-101	100 gm
86.	Safranin O	S-670	25 gm
87.	Rose Bengal	O-4431	100 gm
88.	Canada Balsam	SO-C-30	100 ml
89.	Xylenes	X-3-S	20 L
90.	Clove oil	O-55	100 ml
91.	Cedarwood oil	O-40	500 ml
92.	Silica gel	S-156	25 lb
93.	Plasticine	P-148	5 lb
94.	Toluene	T-289	6 L
95.	Dextrose	D-15	3 Kg
96.	Ethyl Ether	E-138	2 1/2 Kg
97.	Carbon tetrachloride	C-186	6 L
98.	Hydrochloric acid gal	A-144	6 1/2
99.	Tetrachlorethane	O-4585	1 L
100.	Sodium iodide	S-322	100 gm
101.	Naphthalene	N-134	1 Kg
102.	Acetone	A-19	4 L
103.	1,4-Dioxane	D-53	1 L

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<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
104.	Benzene	B-414	6 L
105.	Potassium hydroxide	So-P-208	1 L
106.	Ammonium Chloride	A-649	1 Kg
107.	Phenol	A-91	500 g
108.	Pyridine	P-369	500 ml
109.	Methanol	A-936	1 L
110.	Nutrient agar	B11476	1 lb
111.	Potato Dextrose aga	B11550	1 lb
112.	Yeast extract	B11929	1 lb
113.	Beef extract	B11857	1 lb
114.	Corn meal agar	B11132	1 lb
115.	Sucrose	S-5	500 gm
116.	Maltose	M-74	500 gm
117.	Starch, soluble	S-516	100 gm
118.	Calcium carbonate	C-63	3 Kg
119.	Glycerin	G-33	500 ml
120.	Acetic acid	SO-A-36	1 L
121.	Osmic acid	A-235	1/4 gm
122.	Chromic trioxide	A-100	100 gm
123.	L-Asparagine	A-912	100 gm
124.	Potassium Phosphate	P-284	500 gm
125.	Magnesium sulfate	M-63	500 gm
126.	Sodium chloride	S-640	500 gm
127.	Sodium nitrate	S-342	3 Kg

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
128.	Potassium chloride	P-330	500 gm
129.	Ferrous sulfate	I-149	3 Kg
130.	Ferric chloride	I-86.	3 Kg
131.	Potassium nitrate	P-263	500 gm
132.	Calcium nitrate	C-108	3 Kg
133.	Ferric sulphate	5093	500 gm
134.	Potassium iodide	P-410	100 gm
135.	Tween-20	CS-279-3M	500 ml
136.	Ethyl acetate	E-130	1 L
137.	Silver nitrate	S-486	100 gm
138.	Sodium hydroxide	S-612	3 Kg
139.	Ammonium hydroxide	A-667	2.5 L
140.	Nitric acid	A-200	15 L
141.	Nitric acid (fuming	A-202	500 ml
142.	o-Phosphoric acid	A-242	2.5 L
143.	Petroleum ether	E-139	1 L
144.	Boric acid	A-73	500 gm
145.	Sodium bicarbonate	S-631	3 Kg
146.	Barium chloride	B-34	500 gm
147.	Lanthanum chloride	L-9	50 gm
148.	Acacia	G-85	500 gm
149.	Cobalt chloride	C-371	100 gm
150.	Magnesium sulphate	M-67	3 Kg
151.	Ammonium molybdate	A-674	500 gm

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<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
152.	L-Ascorbic acid	A-61	25 gm
153.	Antimony potassium tartrate	A-865	500 gm
154.	Carborundum	C-190	500 gm
155.	Ammonium flouride	A-665	500 gm
156.	p-Nitrophenol	N-105	100 gm
157.	Sodium citrate	S-467	3 Kg
158.	Sodium hydrosulfite	S-309	500 gm
159.	Mercuric iodide	M-166	100 gm
160.	Hydrogen peroxide	H-312	4 L
161.	Potassium iodide	P-410	100 gm
162.	Sodium potassium tartrate	S-387	500 gm
163.	Mercuric oxide	M-173	100 gm
164.	Sulfur	S-594	500 gm
165.	potassium dichromate	P-186	500 gm
166.	Ammonium sulphate	A-701	3 Kg
167.	Stannous chloride	T-163	500 gm
168.	Magnesium metal	M-7	100 gm
169.	Barium chloride	B-31	500 gm
170.	Ammonium vanadate	A-714	100 gm
171.	Potassium phosphate	P-284	500 gm
172.	Ammonium acetate	A-637	500 gm
173.	Sodium carbonate	S-636	3 Kg
174.	Eriochrome Black T	E-512	25 gm

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
175.	Ethylenediamine tetra-acetic acid	E-478	500 gm
176.	Potassium ferricyanide	P-232	100 gm
177.	Triethanolamine	T-350	500 ml
178.	Phenolphthalein	CS-291-4M	100 ml
179.	Ferrous ammonium sulphate	I-71	500 gm
180.	Diphenylamine	D-91	500 gm
181.	Sodium dithionite	S-309	500 gm
182.	Flask, Erlenmeyer 50 ml	10-040C	48
183.	" " 125 ml	10-040D	48
184.	" " 250 ml	10-040F	18
185.	" " 500 ml	10-040H	6
186.	" " 1000 ml	10-040K	6
187.	" " 4000 ml	10-040P	4
188.	Flask Erlenmeyer, filter 250 ml	10-180D	6
189.	" " " 500 ml	10-180E	6
190.	" " " 1000 ml	10-180F	6
191.	Flask, flat bottom, 250 ml	10-035C	6
192.	" " " 500 ml	10-035E	6
193.	" " " 1000 ml	10-035F	6
194.	" " " 6000 ml	10-035J	4
195.	Funnel, polypropylene 65 mm	10-320B	100
196.	" glass 75 mm	10-322E	48
197.	Flasks, Kjeldahl 500 ml	10-111B	36

<u>Item No.</u>	<u>Description</u>	<u>Fisher Cat. No.</u>	<u>Qty</u>
198.	Dish, evaporating glass 80x45mm	08-710A	24
199.	" " porcelain 75mm	08-690B	24
200.	Bottles, weighing	03-415E	12
200A.	Stoppers, rubber	14-132	2 Pk
200B.	Stoppers, cork	07-785	3 Pk

The following items, No. 201 through No. 211 are described in the Central Scientific Catalog. These catalog numbers are for reference only and equivalent commodities are acceptable.

		<u>Cent. Sci.</u>	<u>Qty</u>
201.	Counter, bacterial colony	44311-000	1
202.	Pan, dissecting	53256-000	2
203.	Wax, dissecting	53258-000	5 lb
204.	Pin, insect, single mount, No. 1	54120-001	1 Pk
205.	" " " " No. 2	54120-002	1 Pk
206.	" " " " No. 3	54120-003	1 Pk
207.	" " " " No. 4	54120-004	1 Pk
208.	" " " " No. 5	54120-005	1 Pk
209.	" " " " No. 6	54120-006	1 Pk
210.	Net, butterfly	54032-002	6
211.	Brush, Camel's hair	10940-001	24

H. Agricultural chemicals - insecticides, herbicides, fertilizers and animal health supplies.

1. Ammoniumsulfate, not less than 20.5 % nitrogen.

Qty

2 tons

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	<u>Qty</u>
2. Urea not less than 42% nitrogen	2 tons
3. Triple superphosphate, not less than 40 % available phosphoric acid.	2 tons
4. Muriote of potash, not less than 50% K2O	2 tons
5. Calcium ammonium nitrate.	2 tons
6. Calcium cyanide, not less than 21 % nitrogen.	2 tons
7. Mixed fertilizer, to contain 15% nitrogen 15% P2O5 and 15% K2O.	2 tons
8. Boron micronutrient, to contain not less than 50% B2O3.	50 Kg
9. Copper micronutrient, to contain not less than 50% Cu.	50 Kg
10. Iron micronutrient, to contain not less than 30% Fe.	50 Kg
11. Manganese micronutrient, to contain not less than 40% Mn.	50 Kg
12. Molybdenum micronutrient, to contain not less than 40% Mo.	50 Kg
13. Zinc micronutrient, to contain not less than 50% Zn.	50 Kg
14. Atrazine, 4 lb/gal flowable	100 L
15. Alachlor, emulsifiable Concentrate (4lb/gal)	100 L
16. Krovar II, containing 53% fromacil and 27% diuron.	50 Kg
17. Roundup, 80% a.i. W.P.	50 Kg
18. Gramoxone (Paraquat)	100 L
19. Cotoran, 50% W.P.	100 KgM

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Books and Periodicals

	<u>Books Titles</u>	<u>Author</u>	<u>Publ</u>	<u>Qty</u>
1.	Concise Oxford Dictionary of Current English	Sykes	OUP	1
2.	Breeding Field Crops	Poehlman	AVI	1
3.	Biometrical Genetics	Mather & Links	M	1
4.	Farm Machinery & Equipment	Smith & Wilks	McG	1
5.	Crop Production: Cereals and Legumes	Bland	Acad	1
6.	Agricultural Insect Pests of the Tropics	Hill	CUP	1
7.	Agronomy of the Major Tropical Crops	Williams	OUP	1
8.	Introduction to Meteo- rology, 3rd ed.	Petterssen	McG	1
9.	Principles & Procedures of Statistics: A Bio- metrical Approach, 2nd ed.	Steel & Torrier	McG	1
10.	Webster's New Collegiate Dictionary		Mer	1
11.	Principles of Plant Breeding	Allard	W	1
12.	Statistical Tables for Biological, Agricultural & Medical Research, 6th ed.	Fisher & Yates	L	1
13.	Citrus Industry, Vol I, II, & III	Reuther, <u>et al</u>	ASP	1
14.	Physiological Aspects of Crop Yield	Eastin	ASA	1

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<u>Titles</u>	<u>Author</u>	<u>Publ</u>	<u>Qty</u>
15. Plants: An Introduction to Modern Botany 3rd ed.	Greulach & Adams	W	1
16. Physiology of Flowering Plants 2nd ed.	Street & Opik	UP	1
17. Nature and Property of Soils	Brady	Mac	1

Periodical/journals - One three-year subscription to each of the following:

1. Biometrika
2. Phytopathology
3. Tropical Plant Pathology
4. Journal of Animal Science
5. Journal of Farm Management
6. Journal of Genetics
7. Australian Journal of Experimental-Agriculture and Animal Husbandry
8. Tropical Agriculture
9. Indian Journal of Root Crops
10. Crop Science
11. Experimental Agriculture
12. Indian Journal of Agriculture Science
13. Nature
14. Agricultural Research Pathology
15. Plant and Soil
16. Indian Journal of Horticulture
17. Euphytica
18. Indian Journal of Genetics and Plant Breeding
19. Soil Science
20. Netherlands Journal of Agricultural Science
21. Proceedings of American Society of Horticultural Science
22. Agronomy Journal
23. Plant Physcology
24. Canadian Journal of Plant Science
25. Bulletin of the Entomological Society of America
26. Journal of Insect Physiology
27. Pesticide Science
28. Tropical Pest Control

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III. Agricultural Research Office - Entebbe

A. Office equipment and supplies.

	<u>Qty</u>
1. Typewriter, electric, 240 volt, 50-Hz. 13.5 inch paper capacity, dual pitch, correcting, IBM Selectric III or equal with Bookface, Academic and Courier 10 typing elements.	2
2. Copier, capable of printing up to 20 copies per minute, using plain paper, takes paper stock sizes 8"x10" to 8 1/2"x14". Xerox 3100 or equal.	2
3. Mimeograph, electric and hand operated 240 volts/50Hz. Gestetner or equal.	1
4. Stencils for item No. 3 above.	500
5. Ink, black mimeograph, for item No. 3 above.	20 tubes
6. Calculator, printer/display with memory. Texas Instruments TI5142 or equal.	4
7. Roll, plain paper for TI5142 calculator.	15 rolls
8. Roller, ink for TI5142 calculator.	4 rollers
9. Cabinets, filing, 4 drawer for legal size folders.	5

B. Transport

1. Station wagon, diesel engine, 5-6 seat.	3
2. Motorbikes, agricultural, 125cc engine	4
3. Bicycle	10

C. Rehabilitation of one house.

D. Furniture for one house.

## PESTICIDE MANAGEMENT REVIEW

With regard to pesticides and herbicides all USAID assistance under this project for the procurement, use, or both of pesticides and herbicides will be for research. As such Section 216, 3(b) (iii) of AID's Environmental Regulations apply and exempt this project from Section 216, 3(b) (1) and a risk/benefit analysis is therefore not required. The basic aim of the research will be to determine the safest and most appropriate EPA-approved pesticides and incorporate them into an integrated pest management scheme.

This project will assist the GOU in determining more precisely the extent of pest infestation in cultivated crops, the level of infestation at which control measures are to be recommended, the various biological and mechanical control practices that might be used as a last resort, the most effective chemicals to control pest outbreaks and weed infestations that have both minimal user hazards and environmental impact.

### Crops

The major cereals--maize, finger millet and pearl millet; root and tuber crops--cassava and sweet potatoes, legumes--peanuts and soybeans, and oil crops--sesame and sunflowers will be the principal crops considered under this project. The objectives of the research will be to reduce losses due to insects, diseases and weeds. Research will be conducted on the use and application of agricultural chemicals, breeding for resistance and integrated pest management. The chemical compounds and the amounts to be provided under this project are found in the attached list.

To reduce the personal hazard to any of the individuals who apply or direct the usage of these chemicals, protective clothing will be purchased under the project. The technical advisors at the Kabanyola Farm, Makerere University and the Serere Research Station will instruct any and all applicators of the precautions necessary to be carried out to protect themselves. The agricultural chemicals will be applied through the use of knapsack sprayers and dusters and in a limited amount with ultra high volume misters. The persons applying these chemicals will be taught the proper methods of mixing or diluting the chemicals and the project safeguards.

Intercropping and multicropping are common farming systems throughout Uganda. This is one approach to integrated pest management. The research staffs at Kabanyola and Serere will conduct research trials at these stations as well as at selected sites at government institutes on cropping methods aimed at reducing losses due to insects, diseases and weeds. Along with research on the control of crop pests through these farming methods, integrated pest management will be studied.

The potable water supplies at Serere and Kabanyola are from bore holes. There is little likelihood that there will be any runoff of water containing any of the applied agricultural chemicals. Furthermore, it is not anticipated that any of these chemicals will enter the ground water system. There are wild bees in the area surrounding Serere but they are not cultured by any of the farmers. It is anticipated that the insecticides used in relation to this project will have a very minimal effect on bees and other beneficial insects.

Protective clothing will be provided under this project for those persons who are directly responsible for the application of any of the hazardous chemicals. This will include elbow length rubber or neoprene gloves, disposable underliner gloves (cloth or plastic), long pants, long sleeved shirts (or coveralls), laboratory coats, wide brimmed hats for doing overhead spraying and disposable surgical masks. The protective clothing guidelines are given in the following table:

PROTECTIVE CLOTHING GUIDELINES

	Disposable Surgical Mask	Elbow Length. Gloves (Neoprene or Rubber)	Disposable Liners (Plastic or Cloth)	Long Pants	Long Sleeved Shirts	Widebrimmed Hat	Boot Shoe
Mixing/Loading Concentrated EC		X	X	X	X		X
Mixing/Loading Concentrated Dusts	X	X	X	X	X		
Applying Dilute Chemicals (ECs) at Ground Level		X	X	X	X		X
Applying Diluted Chemicals (Water Soluble) at Shoulder Level		X	X	X	X		X
Applying Dusts/ Granules		X	X	X	X		X

- (1) Disposable items such as masks and gloves should be thrown away after each use.
- (2) Clothing should be adequately washed after each use. When mixing/loading highly toxic chemicals (i.e. oral LD50 1-150 mg/kg range), perhaps double (i.e. 2 shirts) protective clothing should be worn as should a surgical mask.

## ACTION MEMORANDUM FOR THE DIRECTOR, USAID/UGANDA

FROM: James A. Graham, Project Officer, REDSO/ESA

SUBJECT: Uganda - Manpower for Agricultural Development - 617-0103

I. Problem: Your approval (as provided under Delegation 140, Revised) is requested for a grant of \$9,000,000 to Uganda from Section 103 of the FAA (ARDN) appropriation for the Manpower for Agricultural Development Project (617-0103). It is planned that \$7,500,000 will be obligated in FY 1983.

II. A. Discussion: Uganda's agricultural institutional capabilities in research, training and extension at one time were unexcelled in Africa, supporting a high level of agricultural production by the country's small farmer cultivators. The agricultural research system, for example, functioned on a series of well equipped, well managed stations upon which one could find a cadre of very well trained professionally motivated scientists, many of whom received much of their training from the Makerere University Faculty of Agriculture. The disturbances of the 1970's have left the agricultural system with dilapidated facilities, looted equipment, and chronically inadequate operating budgets. Remarkably, a very high proportion of fully qualified researchers and faculty staff remain, but these professionals are distressingly out-of-touch with the scientific developments in their own fields which have occurred during the past decade. In such conditions the agricultural institutional system is incapable of either producing new technological packages or attracting or retraining new human resources to perform research, training or extension functions.

This project is designed to assist the GOU to address critical constraints in agricultural institutional support to research, extension and training. The GOU is cognizant that the agricultural institutional support system of the 1960s cannot, and perhaps should not, be duplicated with present resources. Consequently, the GOU looks upon the present rehabilitation process as an opportunity to focus agricultural research, extension and training more clearly on food production by small farmers and less exclusively on cash crops. Retraining envisioned in this project will commence this process of refocussing agriculture research and training and assist in the reinforcement of linkages between research and extension. The proposed activity depends very substantially on the existing systems of administration both in the Ministry of Agriculture and in the Faculty of Agriculture at Makerere. The human resource capabilities are high and, as a result, the expert

technical assistance will be kept to a minimum. Training envisioned in the project will consist exclusively of retraining of those staff whose skills are dated, but not forgotten. Commodity inputs include only those items essential to restore the respective work locations to a level where the retrained staff can recommence the process of agricultural research. Thus, the project purpose can be stated as assisting the Government of Uganda to rehabilitate, retrain and redirect its agricultural manpower and institutional support capability in food crops production. This project is directly supportive of AID's strategy of increasing agricultural productivity, development and adaptation of appropriate technology and the transferring of such technology to the small farmer as expressed in the Uganda CDSS.

The principal beneficiaries of this project will be the agricultural support institutions of the Ministry of Agriculture and Forestry and Makerere University, the retrained staff (87) of the Ministry and Faculty, the 400 Faculty of Agriculture students, and the 1,500 farm families who depend on the rehabilitated research stations for their livelihood. However, the secondary beneficiaries will ultimately be a large portion of the two million small farm families in Uganda whose return to productivity depends significantly on a revitalized agricultural research capability.

B. The AID funding for the project will amount to \$9,000,000 over the five year life of project. The funding will be obligated in increments, the 1st increment to be \$7,500,000 which will be provided in FY 1983.

Planned expenditures are shown below:

	First Year	LOP	\$'000
Technical Assistance	775	2,417	
Commodities	2,228	2,720	
Participants	328	1,058	
Other/including contingency & inflation	1,603	2,805	
Total	4,934	9,000	
AID Local Cost Financing (non-add)	77	479	
Grand Total	4,934	9,000	

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PROJECT AUTHORIZATION

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Manpower for Agricultural Development Project (617-0103) grant funds over a two year period from date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project. The planned life of the Project is five years from the date of initial obligation.

2. The Project will assist the Government of Uganda to rehabilitate agricultural institutions in research, teaching and extension in Uganda through the retraining of agricultural research and teaching staff, rehabilitation and re-equipping of agricultural research, teaching and office facilities, support for individual agricultural research proposals, retraining of extension staff, and the development of linkages between agricultural research and extension activities. It is planned that the A.I.D. grant will provide financing for retraining, technical assistance, facilities rehabilitation, a small grant research program, and commodities and equipment.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and other major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a. Source and Origin of Commodities, Nationality of Services

Commodities financed by A.I.D. under the Project shall have their source and origin in the Cooperating Country or in countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing. The suppliers of commodities or services (including ocean shipping) shall have the Cooperating Country or countries included in A.I.D. Geographic Code 941 as their place of nationality, except as A.I.D. may otherwise agree in writing.

b. Conditions Precedent

Prior to the disbursement of funds for rehabilitation of housing for AID-financed technical assistance advisors and to disbursement of funds for the services of such advisors, or to

the issuance of any commitment documents with respect thereto, the Cooperating Country will provide, in form and substance satisfactory to A.I.D.:

1) Evidence that specific houses acceptable to A.I.D. have been identified and assigned for each advisor and assurances that such housing will remain committed for Project use for the entire life of the Project; and

2) A rehabilitation plan for the house or houses for which disbursement is sought which includes a list of repairs to be made, the materials required for such repairs, the planned arrangements for receipt and safekeeping of repair materials, a repair schedule, an identification of the persons who will be responsible for making the repairs, and how and by whom the repairs will be supervised.

3) Prior to the disbursement of funds for rehabilitation or re-equipping of agricultural research, teaching, and office facilities, or to the issuance of any commitment documents with respect thereto, the Grantee will provide, in form and substance satisfactory to A.I.D., a rehabilitation plan for such facilities which includes a list of repairs to be made and new equipment or repair parts required; materials required for such repairs; planned arrangements for receipt and safekeeping of repair materials, new equipment, and repair parts; a schedule for repair and re-equipping; an identification of the persons who will be responsible for making repairs or installing equipment; and how and by whom repairs and equipment installation will be supervised.

c. Covenants

1. The Cooperating Country agrees to fill the position of Chief Agricultural Research Officer (CARO) in the Ministry of Agriculture within nine (9) months of the date of the signature of this Agreement, unless A.I.D. agrees to a later date in writing.

2. The Cooperating Country covenants and agrees to take the necessary measures to insure that adequate secure storage space is made available at the Serere Research Station and the Kabanyolo Farm to insure that equipment financed by A.I.D. under the Project is protected from theft, unauthorized use, or damage from the elements.

The Government of Uganda will provide the equivalent of \$3,008,940 to pay for local salaries and other local costs. This contribution is sufficient to satisfy the requirements of Section 110-a of the FAA.

C. The project has been analyzed from the socio-economic, technical and environmental perspectives and has been found to be sound. A Categorical Exclusion from environmental analysis under Reg. 16 was approved concurrently with the PID and concurred in by the AFR Bureau Environmental Officer (State 171908, State 199005). No human rights issues are involved with regard to this project.

D. The project includes an Implementation Plan which has been carefully reviewed by AID and which was developed with the full cooperation of the host country entities involved. Given this coordination, it is expected that the Ministry of Agriculture and Forestry and Makerere University will conscientiously undertake their responsibilities for project implementation.

E. Based on the information and analyses contained in the Project Paper, the financial, engineering and other planning requirements of FAA Section 611(a) are considered satisfied. The project also complies with all other statutory requirements. See Statutory checklist (Annex C of PP).

F. The field officer responsible for the project is Willie Cook (ADO/USAID/Uganda) and the AFR/PD backstop officer is Thomas Lofgren.

G. This project is being authorized without having received an FAA Section 636(i) waiver for the \$605,000 of vehicles required for the project. The appropriate waiver request has been submitted to AA/AFR for approval and is expected prior to obligation of funds.

III. The Congressional Notification was submitted to Congress on July 15, 1983 and expired on July 31, 1983 without Congressional objection.

IV. Recommendation: That you sign the attached Project Authorization, and thereby approve, under Delegation 140,

Revised, the life of project funding of \$9,000,000 for the subject project.

Concurrence: JWKoehring Pursuant to resolution of inquiry posed in State 215155.  
John W. Koehring,  
Director, REDSO/ESA

Date: 7 - 15 - 83

Drafted by: JAGraham:bk:07/15/83

Cleared by: PScott (draft)  
CMartin (subs)  
DCowles (draft)  
JAnderson (draft)  
PBloom (Draft)

3. The Cooperating Country agrees that the educational status of farm managers at the Kabanyolo Farm should be upgraded, the Farm Manager position to M.Sc. and the two Assistant Farm Managers to B.Sc. Within the first year of the Project, the Cooperating Country will submit to A.I.D. a definitive plan for upgrading these positions.

4. The Cooperating Country agrees that the housing made available by it for the technical assistance advisors financed by A.I.D. under the Project will be made available for as long as such housing is required for the Project and that no agency of the Government of the Cooperating Country shall in any way interfere with or hinder the occupancy and use of the housing units by the technicians to whom they are assigned.

5. The Cooperating Country agrees that responsibility for the sorghum and millet research activities at Serere Research Station will be transferred from the Ministry of Regional Cooperation to the Ministry of Agriculture within six (6) months of the date of signature of this Agreement, or by such later date as A.I.D. may agree to in writing.

6. The Cooperating Country agrees that it is desirable to ensure that the Kabanyolo Farm has an assured source of funds to meet essential farm operating costs and, in this regard, agrees that steps will be taken to permit the farm to have first claim on revenue generated from the sale of produce therefrom, such funds to be reserved to meet the necessary operating expenses of the farm, including the capitalization of a fund for periodic repair, maintenance and replacement of farm equipment. The Cooperating Country will provide a written report to A.I.D. on the steps which have been taken in this regard no later than six (6) months from the date of signature of this Agreement.

Approved: Walter A. Coker

Disapproved: \_\_\_\_\_

Date: 15 August 1983