

1656-NS-0107

423

PROJECT PAPER

R W A N D A

LOCAL CROP STORAGE

PROJECT No. 656-0107

AUTHORIZED BY AA/AFR: March 9, 1979

MAR - 8 1979

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

FROM : AFR/DR, ^{John W. Koehring} John W. Koehring

SUBJECT: Rwanda - Local Crop Storage Project (696-0107)

- I. Problem: Your authorization of the above - cited project is required to permit execution of a grant - funded Project Agreement with the Government of Rwanda (GOR).

- II. Discussion:
 - A. Project Purpose: The purpose of this project is to establish, at the local level, a food storage and marketing system for cereals and pulses which is more favorable to small farmers; to reduce seasonal and regional price fluctuations; and, to reduce storage losses both on - farm and in local level storage units by introducing, through cooperatives, improved storage practices.

 - B. Beneficiaries: The project will construct grain storage units, improve existing cooperatives or develop new ones, and conduct training programs in or for the benefit of 40 of Rwanda's 143 communes. It is estimated that about 33 percent of the farmers (some 2,000 on the average) in a typical commune will directly benefit from the project in the sense that they will be able to utilize their local cooperative to buy, sell and store grain. Improvements in on - farm storage, however, are expected to extend project benefits to some 75 percent or more of the farmers in participating communes over the five-year life of the project.

 - C. A.I.D. and Host Country Objectives: Improvement of storage and marketing facilities is one of the highest agriculture sector goals in the Rwandan Development Plan for 1977-81. The proposed project, which has been formally requested by the GOR (see Annex D of the Project Paper), also conforms closely to AID's development objectives in Rwanda.

 - D. Project Finances: Total A.I.D. funding over the five-year project life will be \$2,573,000 (all from the Food and Nutrition appropriation). Of this amount, \$1,612,000 will be obligated in FY 1979; the remaining \$961,000 will be obligated in FY 1981, subject to the availability of funds. Project finances are treated in detail in the Project Paper (pages 38-43 and Annex I).

In addition to AID's \$2,573,000 contribution, the GOR will contribute \$294,000 for a total project cost of \$2,867,000. Inasmuch as the GOR contribution falls short of the 25 percent minimum set forth in FAA Section 110(a), a waiver of this statutory provision, by you, is required. Rwanda qualifies for such a waiver by its presence on UNCTAD's list of "relatively least developed countries." For this reason, and based on the justification set forth in the Project Paper (pages 38-39),

counsel has incorporated appropriate waiver language in the Project Authorization (PAF II).

- E. Technical, Environmental and Human Rights Considerations:
The project is technically sound. Engineering plans and cost estimates have been prepared (pp 27-32) which justify the conclusion that the project meets FAA Section 611(a) criteria.

On April 3, 1978 you approved a negative determination as recommended in an Initial Environmental Examination (IEE) prepared by REDSO/Nairobi (see Annex G(1) of the PP). During subsequent design of the project, it was determined that pesticides would be utilized and that the already approved IEE, which contains no discussion of pesticide use, would have to be appropriately revised. Accordingly, an IEE amendment, still recommending a negative determination on the grounds that the pesticides planned for use in the project are all EPA-approved for the purposes described in the Project Paper, has been prepared for your approval.

As indicated in the Project Authorization (PAF II), the Project Agreement will contain a covenant under which the GOR will agree to the use of only EPA - registered pesticides (for the same or similar purposes for which they are registered) and will ensure that such pesticides are properly distributed, stored and applied. To assist the GOR in meeting its obligations, training in the safe use, handling and storage of pesticides will be provided under the project.

There are no adverse human rights implications with respect to Rwanda or the LCS project.

- F. Condition Precedent: A \$400,000 revolving credit fund will be established for the benefit of the cooperatives assisted under the project. Purpose of the fund is to provide each cooperative with up to \$10,000 working capital for the purchase of cereals and pulses, agricultural inputs such as pesticides, and other merchandise needed by cooperators. As a condition precedent to the disbursement by A.I.D. of any monies for the revolving fund, the GOR will be required to furnish, in form and substance satisfactory to A.I.D., a detailed plan for the operation and use of the fund (see PAF II).
- G. Waivers: Annex F of the Project Paper requests a waiver of FAA Section 636(i) to permit procurement in Rwanda of one all-terrain vehicle, three 3/4-ton pick-up trucks, three small sedans and twenty 100 cc motorcycles of Code 935 origin. Counsel has incorporated into the Project Authorization (PAF II) an approval of the requested waiver.

PAF II also contains a waiver of the 25 percent host country contribution requirement as discussed in paragraph II.D. above.

- H. Congressional Notification: The FY 1979 Congressional Presentation (page 347) lists the life-of-project amount as \$1,480,000 with \$230,000 proposed for FY 1979 obligation. These figures were revised to \$2,573,000 LOP and \$1,612,000 FY 1979 obligation in a Congressional Notification which expired, without incident, January 24, 1979.
- I. A.I.D. Project Officer: The project manager in the field will be Mr. John A. Patterson, AAO/Rwanda; in AID/W it will be Mr. Ted G. Lee, AFR/DR/CAWARAP.

III. Recommendation:

- A. That you approve the negative determination on the IEE by signing Annex G(2) of the Project Paper (attached).
- B. That you sign PAF II (attached) thereby authorizing the project and the requested waivers.

Attachments: a/s

Drafted: AFR/DR/CAWARAP:TGLee:bfc:3/1/79

Clearances:

AFR/DR/CAWARAP:LBond 2/13
AFR/DR/ARD:LHoffarth -1/2
AFR/DR/ENGR:MMorgan _____
AFR/DR/SDP:BBoyd 10
AFR/DR:NCohen _____
AFR/CAWa:MMWiseman MW
AFR/DP:CWard _____
GC/AFR:ESpriggs ES
SER/COM/ALI:CRaley (Shane) 1/2
DAA/AFR:wNorth 1/2

AGENCY FOR INTERNATIONAL DEVELOPMENT
**PROJECT AUTHORIZATION AND REQUEST
 FOR ALLOTMENT OF FUNDS PART I**

1. TRANSACTION CODE
 A ADD
 C CHANGE
 D DELETE

PAF
 2. DOCUMENT CODE
 5

3. COUNTRY
 RWANDA

4. DOCUMENT REVISION NUMBER

5. PROJECT NUMBER (7 digits)
 696-0107

6. BUREAU OFFICE
 A SYMBOL: AFR B CODE: 06

7. PROJECT TITLE (Maximum 40 characters)
 LOCAL CROP STORAGE

8. PROJECT APPROVAL DECISION
 ACTION TAKEN
 A APPROVED
 D DISAPPROVED
 DE DEAUTHORIZED

9. EST. PERIOD OF IMPLEMENTATION
 YRS: 0 5
 QTRS:

10. APPROVED BUDGET AND APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 79		H. 2ND FY 80		K. 3RD FY 81	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	153	330		1,612	-	-	-	961	-
(2)									
(3)									
(4)									
TOTALS				1,612	-	-	-	961	-

A. APPROPRIATION	N. 4TH FY 82		O. 5TH FY 83		LIFE OF PROJECT		C. PROJECT FUNDING AUTHORIZED THRU	A. GRANT	B. LOAN
	D. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN			
(1) FN	-	-	-	-	2,573	-	ENTER APPROPRIATE CODE(S) 1: LIFE OF PROJECT 2: INCREMENTAL LIFE OF PROJECT	2	-
(2)									
(3)									
(4)									
TOTALS		-	-	-	-	2,573	-		

PROJECT FUNDING AUTHORIZED THRU FY 7 9

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO.	
	C. GRANT	D. LOAN
(1) FN	1,612	-
(2)		
(3)		
(4)		
TOTALS		1,612

13. FUNDS RESERVED FOR ALLOTMENT
 TYPED NAME (Char. SER/EM/END)
 SIGNATURE
 DATE

14. SOURCE/ORIGIN OF GOODS AND SERVICES
 000 341 LOCAL OTHER 935

15. FOR AMENDMENTS. NATURE OF CHANGE PROPOSED

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE	18. ACTION REFERENCE (Optional)	19. ACTION REFERENCE DATE
		MM DD YY		MM DD YY

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Country: Rwanda
Name of Project: Local Crop Storage
Project Number: 696-0107

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Grant in Fiscal Year 1979 to the Government of the Republic of Rwanda (the "Cooperating Country") of not to exceed One Million Six Hundred Twelve Thousand United States Dollars (\$1,612,000), to assist in financing certain foreign exchange and local currency costs required for the Project as described in the following paragraph.

The Project will assist in the development of a local level food storage marketing system in approximately 40 communes by constructing grain storage warehouses, training personnel at the national and prefecture level in cooperative planning and management, training personnel at the commune-level in warehouse and storage techniques, grain marketing and cooperative management, undertaking research designed to solve certain grain storage problems and establishing a revolving credit fund. A.I.D. will assist by financing the costs of technical services, construction materials and services, the credit fund and related goods and services.

I approve the total level of A.I.D. appropriated funding planned for the Project of not to exceed Two Million Five Hundred Seventy-Three Thousand United States Dollars (\$2,573,000), including the Fiscal Year 1979 funding as authorized above, and, subject to the availability of funds and in accordance with A.I.D. allotment procedures, increments during the period Fiscal Year 1980 through Fiscal Year 1981 which shall not, in total, exceed \$961,000.

I hereby authorize the initiation of negotiation and the execution of the Project Agreement by the U.S. Ambassador to Rwanda or the officer to whom such authority has been

delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate:

a. Source and Origin of Goods and Services. Except as authorized in this paragraph and paragraph d. below, and except as A.I.D. may otherwise agree in writing, goods and services financed under the Project will have their source and origin in the Cooperating Country or countries included in A.I.D. Geographic Code 941. Ocean shipping financed under the Grant shall be procured in the United States or the Cooperating Country, except as A.I.D. may otherwise agree in writing.

b. Condition Precedent to Disbursement. Prior to the disbursement of Grant funds for the revolving credit fund, the Cooperating Country shall furnish to A.I.D., in form and substance satisfactory to A.I.D., a detailed plan showing how the fund will be administered, the administrative cost of providing credit, the anticipated default rate, the mechanism and criteria for review and approval of specific loans, and the credit terms.

c. Covenants. The Project Agreement shall contain covenants providing in substance as follows:

1. The Cooperating Country agrees to furnish the land on which the storage warehouses will be constructed and agrees to select sites for the warehouses in accordance with the criteria to be set forth in the Amplified Project Description.

2. The Cooperating Country agrees to take such steps as are necessary to ensure that cooperatives organized under the Project will be legally established on a timely basis.

3. The Cooperating Country agrees to prepare, in conjunction with A.I.D., a detailed training plan.

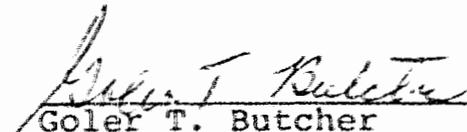
4. The Cooperating Country agrees that all pesticides used under the Project must be registered by the U.S. Environmental Protection Agency and used for the same or similar purposes for which they are registered and will take such steps as are necessary to ensure that such pesticides are properly distributed, stored and applied.

d. Waivers.

1. Based upon the justification set forth in the Waiver Annex of the Project Paper, I hereby approve a waiver of the requirement under Handbook 1, Supplement B that commodities procured with funds granted to an RLDC shall have their source in countries included in A.I.D. Geographic Code 941, to permit procurement of one all-terrain vehicle, three 3/4-ton pickup-trucks, three small sedan automobiles and twenty motorcycles, at an approximate cost of \$125,000, which have as their source and origin countries included in A.I.D. Geographic Code 935. I have concluded (1) that exclusion of procurement of the project vehicles from countries included in A.I.D. Geographic Code 935 would seriously impede attainment of United States foreign policy objectives and the objectives of the Foreign Assistance Program and (2) that special circumstances exist which justify waiver of the requirements of section 636(i) of the Act.

2. Based upon the justification set forth in the Project Paper, at pages 38-39, I hereby waive the cost sharing requirements of Section 110(a) of the Foreign Assistance Act of 1961, as amended, except that the Cooperating Country shall be required to provide financial or "in kind" contributions in the approximate equivalent value of \$293,895, as provided for in the Financial Plan Section of the Project Paper.

Date: March 9, 1979


Goler T. Butcher
Assistant Administrator
for Africa

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT PAPER FACESHEET	1. TRANSACTION CODE <input type="checkbox"/> A : ADD <input type="checkbox"/> C : CHANGE <input type="checkbox"/> D : DELETE	PP 2. DOCUMENT CODE 3

3. COUNTRY/ENTITY RWANDA	4. DOCUMENT REVISION NUMBER <input type="checkbox"/>
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5. PROJECT NUMBER (7 digits) [696-0107]	6. BUREAU/OFFICE A: SYMBOL AFR B: CODE [06]	7. PROJECT TITLE (Maximum 40 characters) [LOCAL CROP STORAGE]
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8. ESTIMATED FY OF PROJECT COMPLETION FY [8 3]	9. ESTIMATED DATE OF OBLIGATION A. INITIAL FY [7 9] B. QUARTER [2] C. FINAL FY [8 1] (Enter 1, 2, 3, or 4)
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A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FY 79	C. L/C 79	D. TOTAL	E. FY	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL (GRANT) () () () (LOAN) () () ()	745	867	1,612	1,169	1,404	2,573
OTHER U.S. 1. 2.						
HOST COUNTRY	-	61	61		294	294
OTHER DONOR(S)						
TOTALS	745	928	1,673	1,169	1,698	2,867

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 79		H. 2ND FY 80		K. 3RD FY 81	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	153	330	-	1,612	-	-	-	961	-
(2)									
(3)									
(4)									
TOTALS				1,612	-	-	-	961	-

A. APPROPRIATION	N. 4TH FY 82		O. 5TH FY 83		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED MM YY [0 8 8 1]
	P. GRANT	Q. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1) FN	-	-	-	-	2,573	-	
(2)							
(3)							
(4)							
TOTALS	-	-	-	-	2,573	-	

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 = NO
 2 = YES

14. ORIGINATING OFFICE CLEARANCE		15. DATE DOCUMENT RECEIVED IN AID/W OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
SIGNATURE John A. Peterson	Louis A. Xican	
TITLE AID AFFAIRS OFFICER RWANDA	DATE SIGNED MM DD YY 11 30 78	MM DD YY 12 06 78
DIRECTOR REDSO/EA		

RWANDA LOCAL CROP STORAGE

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GLOSSARY OF ABBREVIATIONS

AIDR	Agency for International Rural Development, a Belgian voluntary agency
BP	Banque Populaire
CLUSA	Cooperative League of the USA
CRS	Catholic Relief Services
DCP	Department of Cooperative Promotion
FSM	Food Storage and Marketing Project
GOR	Government of Rwanda
GREMARWA	National Grain Marketing Organization of Rwanda
IFB	Invitation for Bid
INRS	National Institute for Scientific Research
ISAR	Institute of Agronomic Sciences of Rwanda
LCS	Local Crop Storage Project
MINAGRI	Ministry of Agriculture
OPG	Operational Program Grant
OPROVIA	National Office for Development and Marketing of Food and Livestock Products
PVO	Private Voluntary Agency
Rwf	Rwandan Franc \$1.00 = 91.48 Rwf
TRAFIPRO	A Parastatal Merchandizing Organization

RWANDA LOCAL CROP STORAGE

1. BACKGROUND, OVERVIEW AND RELEVANCE

Rwanda represents a genuine development challenge. It is regarded by the World Bank as one of the five poorest countries in the World, with an overall per capita GDP of 110 in 1978. In the rural sector from which 95 per cent of the population derives a living, the gross value of production per capita is only \$94, with cash income under \$33. Rwanda has the highest population density in Africa, and its 4.8 million population in 1978 is growing at about 3.2 per cent per year. Population pressures, limited amounts of potential farm land, and a general lack of economic resources and infrastructure present Rwanda with a growing food problem of alarming proportion. If current trends continue, a severe food crisis is predicted by the end of the century.

Rwanda is receiving development assistance from a variety of foreign donors who are attacking various aspects of the country's food problem. In 1975 AID began a long-range program in Rwanda to improve grain storage and marketing, starting with the Food Storage and Marketing project (FSM) (No. 696-0100) aimed at creating an efficient national grain marketing institution with purchasing and storage centers located in strategic areas of the country. Specifically the project seeks to stabilize the prices of staple food (especially haricot beans and sorghum) by reducing seasonal and regional price fluctuations.

The improvement of storage and marketing facilities is one of the highest priority goals in the agriculture sector of the 1977-81 Rwandan Development Plan. The fact that the FSM project was geared to the national level gives rise to the need for a separate activity to deal with the problems of grain storage at the local level. The COR has developed a plan to provide eventually each of the country's 143 districts or "communes" with grain storage facilities and a marketing mechanism. AID has made several responses towards the achievement of this goal. In 1975 under an AID grant to the Catholic Relief Service (CRS), a program of construction of local grain silos was begun in selected communes in Rwanda where Catholic missions were established. To date 16 silos have been completed, and there are plans for 10 more to be built. Four of the 26 silos were financed by AID. The CRS experience so far has indicated that it is feasible to build and operate storage units at the mission level and suggests that the program could be broadened and adapted to other communes without the organizational

structure provided by the presence of a Catholic mission. This project will attempt such an extension through the use of storage and marketing cooperatives.

As a next step towards assisting the GOR in developing a systematic program for local grain storage and marketing, AID is financing under an Operational Program Grant (OPG) with the Cooperative League of the USA (CLUSA) a portion of a project undertaken jointly with the U.N. Capital Development Fund to construct seven storage centers in seven communes where cooperatives already exist and to develop a storage and market mechanism which will increase income of participating farmers, reduce storage losses and strengthen rural institutions to provide new services to the local population. Slightly more than half of this \$607,000 project will be provided by the AID OPG for technical assistance and training. The UNCDF share will finance construction of the storage units, equipment and revolving fund for the seven centers.

The CLUSA project, which will take place over a two-year period beginning in January 1979, is seen as a preliminary or pilot phase of the Local Crop Storage project presented in this paper. The two projects have very similar purposes, outputs and inputs and differ essentially only in magnitude, except that the LCS project will also have an important research component which will examine the technical and economic aspects of bean production and storage. It was originally hoped that the CLUSA project would begin in FY 1978 and would be well underway before the LCS project was designed and that its experience would contribute to the formulation of the latter project. Even though this schedule has slipped somewhat, the CLUSA project will still have about nine months operational experience by the time the LCS project enters its implementation phase. Thus the management of the LCS project will be heavily influenced by the early results of the CLUSA project, especially with respect to the development of a detailed training program.

Another relevant experience in Rwanda is that of AIDR, a Belgian PVO, which has built cooperative storage warehouses in Kibungo and more recently two in the Ruhengeri Prefecture. The Kibungo cooperatives are functional and play a significant role in marketing of agricultural cooperatives. The Ruhengeri cooperatives are just being organized.

The AID emphasis on the grain storage and marketing of Rwanda through two major projects and two OPGs attacks this fundamental problem at two basic levels, national and local. The present LCS

project itself addresses three agriculture sector goals of the 1977-81 Rwanda Development Plan.

- Improvement of storage and marketing facilities
- Agricultural training and extension
- Promotion of community organizations and regional development services.

The project also contributes to the number one priority of the National Plan, to increase food production and availability, through reduction of losses and by providing farmers with better prices and thus a production incentive.

2. PROJECT DESCRIPTION

Project Purpose

There are three interrelated project purposes which all serve the dual project goal of increasing real farm family incomes in participating communes and increasing food crop availability to small farmers throughout the year at more stable prices.

1. To establish a food storage and marketing system at the local level for cereals and pulses which is more favorable to small farmers.
2. To reduce seasonal and regional price fluctuations and to ensure fair weights. This will enable farmers to sell at a higher price and buy back at a lower price than at present and will eliminate or greatly reduce the problem of farmers being cheated on weight estimates of their grain by introducing systematic weighing procedures by cooperatives.
3. To reduce storage losses, reported to be significant, both on farm and in commune silos by introducing, through cooperatives, improved storage practices and use of approved insecticides. The questions of effect of long-term storage on beans and the resistance of beans to ~~attack~~ by pests will be studied in depth under the research component of the project.

Beneficiaries

Small farmers of Rwanda will be the direct beneficiaries of this project through increased incomes, improved nutrition, stabilized grain prices and a marketing system more favorable to the farmers than current practices. Farmers will not only receive a better price through the cooperative, but the very existence of the cooperative market will improve prices received by farmers from commercial traders (commercants) in the area of the cooperative.

The project will construct grain storage units, develop cooperatives and conduct training in 40 of the country's 143 communes. Coverage within communes will vary depending on size, as the communes themselves range from 9,000 to 41,000 in population and 4,000 to 100,000 hectares, the average being 33,000 people and 18,000 hectares and the preponderance being in this central group. It is estimated that farmers living within a 7 km radius of the commune warehouse will be able to use it to buy, sell and store grain, about 33 per cent of a typical commune or about 2,000 farmers on the average. However, improvements in on-farm storage will

extend coverage to 75 per cent or over the farmers in participating communes during the life of the project and a greater number thereafter. Overall it can be roughly estimated that approximately 175,000 farm families will be directly helped by the project. Estimates of economic benefits in income terms are contained in the Economic Analysis of this paper.

Elements of the Project

Project execution is based around three distinct components: construction, training and research, each to be implemented by separate procedures which are described in some detail in the section on Administrative Feasibility. Other elements which overlap the first two components somewhat are the development and operation of cooperatives, improvement of on-farm storage, and the revolving credit fund.

1. Construction - AID will finance the construction of 40 hangar-type grain warehouses of up to 100 ton capacity in 40 communes to be selected by the GOR Department of Cooperative Promotion* in consultation with the US project advisor on the basis of criteria set forth in the technical analysis of this paper. Construction will be by one or more private Rwandan contractors using a maximum of local labor and building materials.

The project will also finance the construction of six satellite grain hangars, one-half the size and capacity of the 40 larger units, two each in three larger communes which would extend the coverage provided by the principal storage unit to a much larger portion of commune's farmers. It is expected that certain larger communes might be served by two or more cooperatives which would need separate storage facilities. The introduction of satellite storage units would be on a pilot basis which could be expanded by the GOR as part of its eventual plan to place grain storage units in all 143 of the country's communes.

A related element to construction is the provision of necessary equipment and supplies for a grain buying, selling and storage operation, including weighing scales, grain-cleaning screens, moisture meters, sacks, etc.

2. Training - An essential element of this project is training, without which there would be no assurances that the grain shortage warehouses constructed under the project would be operated and managed properly. Training will be conducted at several levels under the overall direction of the GOR project manager and AID-financed project advisor.

*The GOR implementing agent for this project, referred to as DCP throughout this paper

- A. National level - Training of personnel from the project's GOR implementing agency, the Department of Cooperatives Promotion (DCP) in the Ministry of Social Affairs and Cooperatives in cooperative planning and development, financial management and operational aspects of cooperative management. This program could be called training of trainers, as it will be primarily this group in cooperation with the US project advisor who will conduct the field level training. Five members of the existing DCP staff have received long-term training (a two-year course in cooperative management) at the Pan African Institute for Development (PAID) Douala, Cameroon. AID will sponsor ten more DCP officials at the Pan African Training Center in Cotonou, Benin for 3-6 months training in cooperative management under the African Manpower Development Project (AMDP). Although separately financed, this training will contribute directly to the effectiveness of the LCS project. Under the LCS project itself it is proposed to send ten DCP staff members to PAID in Douala to a specially designed 2-3 months course in training of trainers in cooperative management which the DCP believes can be arranged with PAID.
- B. Prefectural level - Training in Kigali by the DCP of a group of prefectural delegates (supervisors) to assist in the supervision of cooperatives.
- C. Commune level (encadrements de communes) - One encadreur (rural trainer) is to be placed by DCP in each commune after completion of his own training. Some training is already provided by DCP through the Murambe Center, but the program needs to be extended. Training of 40 encadreurs is planned under the project.
- D. Cooperative personnel - Training of managers, officers and staffs of cooperatives in warehousing and storage techniques, accounting and record keeping, grain marketing and general cooperative management.
- E. Extension Agents - Some 1,500 agents and monitors are already provided at the Commune level through the Ministry of Agriculture, an average of ten per commune. In addition, MinAgri supplies one agronomist to each commune. Extension agents will not receive formal training under this project, since they are already trained by the MinAgri (a project assumption is that this training is adequate). However, MinAgri agents will be given

one-day demonstration on use of pesticides and on-farm storage techniques from the cooperative staff. It is believed that this can be done at little or no cost to the project.

Estimates of numbers of persons to be trained and approximate duration of the training are indicated in the following table:

Table - Training Summary

<u>Level</u>	<u>No. per Cooperative</u>	<u>Total No.</u>	<u>Duration in weeks</u>	<u>Total Person/ Weeks</u>	<u>Est. Cost \$000</u>	<u>Location</u>
Ministry (DCP)	-	10	12	120	40	Kigali/ Benin/ Cameroon
Prefectural	-	10	2	20	2	Kigali
Commune	1	40	6	240	24	Kigali
Cooperatives	1-2	60	8	480	25	Kigali/Local
				<u>860</u>	<u>9</u> <u>100</u>	(- 10% contingency)

It is planned that training for field level personnel will be conducted in three or four two-week sessions.

Organized training facilities in Rwanda are extremely limited, and the absence of an existing training infrastructure will impose a constraint on the project. A central Belgian-assisted GOR training center does now exist (le Centre Rwandais de Formation des Cadres) at Murambe, about an hour's drive from Kigali, but facilities are badly over-crowded, and demand far exceeds available space. It is said that any given Ministry department can only expect to place one group of trainees at this center once every year or so. The DCP does, however, currently have a 37-week training program for encadreurs (rural trainers) about half of which is spent at the Murambe Center and half at the commune level. These agents are later assigned to work in specific communes.

The GOR Department of Cooperative Promotion would very much like to establish its own training center and has sought assistance from a variety of donors including ILO. The GOR has also made a

written request of AID to construct a training center for cooperatives under this or a separate project. The design team and the AAO have determined that the construction of such a capital facility under this project would not be economically viable, as the volume of training contemplated under the project would not justify the construction of a full center with classrooms, dormitory, offices and refectory costing up to \$200,000.

Although it is not certain, there is some prospect that a cooperatives training center may be constructed in Rwanda under Swiss aid. The Swiss have indicated interest but are seeking another donor or donors on a partnership basis. If this effort is successful, it is very likely that it would satisfy the in-country training needs of this project, outside of the commune level.

Meanwhile, in order to provide interim sites for training, it is planned to use a device successfully employed by GREMARWA in the FSM project and by CRS, that of making use of parish houses and schools during vacation periods. This method, which will require advance planning and careful scheduling, can be supplemented by occasional use of conference halls provided by the GOR for short seminars.

The development of a detailed training program will be heavily influenced by the experience gained by CLUSA in the first six to nine months of its pilot project. An important element of the CLUSA OPG will be to design and implement a training program for all aspects of operations and management of cooperatives. Since the present project is a larger scale follow-on phase to the CLUSA program, the project's management will be largely guided by the results obtained by CLUSA.

3. Research - The research component of the project is designed to gather and analyze data pertaining to a number of problems affecting grain storage in Rwanda.

The research will be undertaken primarily by two Rwandan institutions, the Institut des Sciences Agronomique du Rwanda (ISAR) and the Institut National de Recherche Scientifique (INRS), both located in Butare, 100 miles south of Kigali.

The six studies specifically recommended by the design team are as follows:*

(1) Indigenous crop storage (ISAR) - Objective: to inventory the methods and conditions of local storage of food grains and pulses and to estimate the quantity stored and the losses from

*See Annex H(2) for a more detailed description of the proposed research program.

different methods over time, and to develop recommendations for reducing losses.

(2) Inventory of bean varieties (ISAR) - Objective: to study and evaluate regional and local consumer preferences of beans to facilitate orderly marketing of the crop.

(3) Resistance of bean varieties to pest attacks in storage (ISAR) - Objective: to identify bean varieties resistant to stored grain pests in order to reduce losses in beans stored on farm 4-5 months or more.

(4) Effect of storage on beans under different conditions on cookability (ISAR) - Objective: to provide data on storage factors which result in increase cooking time for beans.

(5) Estimation of crop yields in pure stands and in associations (ISAR) - Objective: to provide a methodology to managers of cooperatives to predict yields, especially beans and sorghum, before harvest and to estimate yields of crops grown in associations.

(6) Socio-economic studies (INRS), the most extensive of the planned studies representing 40 per cent of the research budget - Objective: to obtain the costs of production, use of labor, use of food, role of commercial traders, marketing of food crops, food purchases, and returns to farmers in traditional farming and with the introduction of improved technology, with special attention to food grains and pulses.

Although the basic research in the above studies will be carried out by ISAR and INRS, the latter institution will require considerable help in undertaking the socio-economic study. Accordingly the use of three expatriate research assistants in country for 15 months is planned in connection with this study. These three research assistants and a part-time research supervisor, will be provided on an intermittent basis under a contract with a US university (see discussion on Administrative Feasibility Section).

4. Development and Operation of the Cooperatives - In some cases communes selected will not have an existing cooperative around which the grain storage and marketing system could be organized. In such cases new cooperatives must be established by careful planning, and a series of project actions, including training of cooperative managers, education of prospective members, and "animation", to motivate farmers to take advantage of the cooperative's facilities and services. Project resources to accomplish this consist of the US Project Advisor, short-term technical consultants

provided in specialized fields such as training, rural credit, marketing, rural sociology, and counterpart staff of the Department of Cooperative Promotion. To understand how the cooperatives will function and how members will use them, several aspects merit special explanation:

- (A) the operational mechanics of a project cooperative,
- (B) the need for improved on-farm storage, and
- (C) the use of the revolving credit fund.

(A) The Operational Mechanics of a Project Cooperative

Cooperatives established under this project will be of the production and marketing type designed to facilitate the buying and selling of pulses and grain for their members, who will be farmers of the commune. Normally a farmer would have to join a cooperative in order to use its facilities. Initial membership fees for cooperatives in Rwanda currently run from \$2 to \$10 depending on local conditions. Individual fees are set by the cooperative manager and elected officers.

A participating farmer could use his cooperative in a number of ways:

(1) A farmer could bring produce excess to his current needs to the cooperative hangar for storage. He would be given a receipt and could collect an equal amount of produce later, paying only a storage fee of about 1 Rwf per kilogram and transport costs, if any. In return, he would receive safe, relatively loss-free storage.

(2) A farmer in need of funds could sell his produce to the cooperative and be paid in cash through the revolving fund. The cooperative would do this only when it has a known market for the produce (other members, other cooperatives or GRENARWA*), normally no problem where small quantities are concerned. The cooperative would not be allowed to "speculate", that is to buy large quantities of produce from its members without specific orders from potential buyers.

(3) The farmer who has sold his produce to the cooperative could later buy it back, normally after the coffee harvest, paying a fee of about 3 Rwf per kilogram. This margin (the difference between the buying and selling prices) will provide the

*The Rwandan National Grain Marketing Organization.

cooperative with its principal revenue. This margin can be increased slightly if needed by the cooperative and still represent a lower cost to the farmer than produce purchased in the traditional market.

(4) The cooperative can buy and sell produce in relatively large quantities, e.g. 20 or 30 tons with GRENARWA and other cooperatives, when it has specific requirements to do so. Buying transactions can be financed temporarily through the revolving fund which is then reimbursed by members who receive the produce. Selling transactions are paid in cash by the buying group, and the proceeds paid into the cooperative's account at the Banque Populaire*. CRS experience indicates that such transactions are common and feasible in Rwanda for trade in beans and sorghum, the principal crops with which the LCS project will deal.

(5) A farmer can also turn to his cooperative as a source of technical assistance and advice on production, storage and marketing questions. The cooperative manager and commune encadreur (rural trainer) will be trained under the project to help with such questions. In addition the MINAGRI extension agents assigned to each commune can be consulted.

(6) Finally, a farmer can obtain insecticides from his cooperative, mainly malathion, which will be purchased by the cooperatives under the revolving fund for use on-farm storage. The revolving fund will be reimbursed by the farmers when they pay (after the harvest) for the insecticides provided by the cooperative.

(B) Improvement of On-farm Crop Storage

At the outset we can only estimate the level of losses in traditional storage and make basic recommendations on how these losses can be overcome. For this reason, a research activity is included on the different methods of traditional storage, the losses associated with them and methods of reducing the losses**.

The elements of such a program would include:

1. Harvesting crops for storage only when they are mature.
2. Sun drying of the crops, where necessary, to bring the moisture content down to a safe storage level.

**There has been a preliminary study at ISAR, by B. Demaire (Note Technique No. 3, 1972) and in several communes a program of improved storage has been promoted.

*See further explanation on p.12.

This is usually estimated by the hardness of the grain to the teeth.

3. Cleanliness and disinfestation of the area where the grain is to be stored; that is, remove all crop and insect residues and spray or dust the area and the containers to be used.
4. Disinfestation of the crop to be stored; in this case using 2 per cent malathion dust at the rate of 1 gm per kg.
5. If the crop is to be stored for over 2-3 months, inspect the crop after this length of time and treat according to observation: no treatment necessary, dry in the sun and apply malathion as before, without additional drying.

The improvements in crop storage indicated by research results plus insect resistant varieties will be set up in demonstration form, physically or photographically, and provided to each cooperative for extension purposes.

(C) Revolving Credit Fund

The purpose of the revolving credit fund is to provide the cooperative with working capital with which to purchase pulses and cereals, agricultural inputs (particularly insecticides), and other merchandise needed by the cooperators. The cooperative can use the fund to buy a limited quantity of produce which it is certain will be sold or resold to the cooperating farmers later in the season, but would not routinely purchase grain from its members through the revolving fund, as the fund's size would not permit this (see mechanics of cooperative operations above).

It is proposed that the money be handled through the Banque Populaire (BP), a Swiss-supported rural bank in Rwanda, as it has more than 60 branches. Each cooperative will have an account at the nearest branch of the Banque Populaire, and the BP has already indicated interest in managing the fund and holding the accounts of the cooperatives.

An amount of \$400,000 has been set for the revolving fund, with this line of credit to be introduced as needed (see schedule in Financial Tables). This amounts to \$10,000 per cooperative on the average, which, after consulting with the Banque Populaire, is deemed sufficient at least on an initial basis to cover the inputs

needed by each cooperative. Should the cooperatives grow beyond the size anticipated and their capital requirements grow accordingly, it may be necessary in the last half of the project to increase the size of the revolving fund. The mid-term evaluation should consider this question and could, if appropriate, recommend that the revolving fund be expanded. In this eventuality, a PP amendment will be submitted with a justification for the increase.

A detailed plan on the operation and use of the revolving fund, including eligibility criteria, interest rate structure and management procedures, is considered necessary before the fund can be put into operation. As a Condition Precedent to disbursement under the fund, such a plan will be required, to be prepared not later than the fall of 1979 by the DCP and the US Project Advisor in consultation with the Banque Populaire.

3. PROJECT SPECIFIC ANALYSES

A. ECONOMIC FEASIBILITY

The benefits of this project are of two classes - public or social benefits (i.e. benefits to the economy) and private benefits (i.e. benefits to the farmers). The dual goals of the project are to increase farm family income in real terms by offering fair market value (correct weight and proximity to official price), for both sale and purchases and to increase cereal and pulse availability to farmers. Therefore, in the economic analysis greater weight is placed on the benefits to farmers than on the social benefits.

Rwandan agriculture has three distinct ecological zones, distinguished by their height above sea level; these zones differ in climate and to some extent in season of harvest of different grain and leguminous crops. In general the rain-fed bean harvests are in the latter half of January and first half of February (the main crop) and the latter half of July and the first half of August; a third crop is grown on the valley bottom (marais) and harvested in the latter half of October and early November. This last crop tends to be in a relatively small area and to serve as a stop gap until the January-February harvest. The major supply of beans comes on the market in January-February.

Peas are harvested at the same time as the rain-fed bean harvests but peas tend to replace other grains, sorghum and some extent beans in regions of high altitude.

There is a major harvest of sorghum in the latter half of June and early July plus a harvest in March-April. The season for marketing of sorghum thus avoids the marketing of beans.

There are other crops which cooperatives are likely to assemble and sell. These include potatoes, in the area where they are grown, peanuts (in small quantities), coffee and bananas.

The cooperatives will store some of these commodities which they will sell in the season of shortage to their cooperators. Cooperatives in deficit areas may also purchase from cooperatives in surplus areas and store the produce for a few months until it is needed by the cooperative members. For these activities the cooperatives are assumed to have at least two buying seasons a year and two storage seasons.

The cooperatives will also disseminate technology and chemicals for improved on-the-farm storage. The quantity of grain affected in this way will be much greater than that stored in the warehouse; a larger number of farm families will be involved and, on average, they will store a larger amount of produce at home than in the warehouse (based upon CRS silo experience). The sale of insecticide can be made by the cooperatives through the local markets and centers of commerce, blanketing a major part of the whole population. As an example, one of the most successful CRS silos has sold over one ton of 2 per cent malathion, sufficient to protect 1,000 tons of grain.

Grain losses in traditional storage are estimated by the percentage loss under the storage conditions used multiplied by the quantity of grain stored. There are various estimates for the percentage loss, usually with rather ill-defined storage conditions and duration.

David Dichter, a Swiss expert, at the grain storage seminar in Cotonou in 1974* stated "it is estimated in Africa south of the Sahara that 25-40 per cent of the cereal harvest is lost each year from insects, molds, rodents, etc. because of inadequate storage systems at the farm and village level. The effects of this 25-40 per cent loss are enormous if one considers the total production of the African continent".

More specifically A. P. Den Hartz comments on the need to reduce the waste of food which attains 25 per cent with traditional means of storage". This appears in the report of the FAO Programming Mission to Rwanda published in 1976**.

The World Bank in their farm models for Bugesera-Mayaga project proposal assume losses of 10 per cent of the production of beans, sorghum and maize and 5 per cent losses of peas before the project and 2½ per cent losses after the project for beans, maize and peas and 5 per cent for sorghum. The report states that these are "Ministry of Plan data, slightly adjusted but kept conservatively low".

*David Dichter, Introduction. Seminaire Ouest-Africain sur le role des volontaires dans le storage des grains au niveau de la ferme et du village. Proceedings Seminar Cotonou December 1974, GTZ Stuttgart.

**Den Hartz, A. P. Alimentation et Nutrition in Rwanda. Rapport de la Mission de Programmation FAO Vol. 2 Annexes techniques version preliminaires des documents de project: Secteur de l'alimentation et de l'agriculture FAO Rome April 1976.

USAID reports have repeatedly quoted a FAO estimate of 30 per cent loss in grain in traditional farm storage in Rwanda, but the one research study on grain storage reported by ISAR* only provides estimates of the number of beans that have been attacked, and not on the loss in weight. There is therefore a likelihood that actual grain losses in Rwanda have been significantly overstated since the high rates cited, even if accurate, apply only to grain stored over a long period (up to one year) normally a small percentage of total grain stored.

However, because of lack of quantitative information, this project includes a proposal to survey losses in traditional farm storages in Rwanda together with estimating the quantity stored.

The quantity of produce stored in the warehouse is conservatively estimated to run from 50 percent of capacity in the first year (vs 70 per cent for CRS) to 90 per cent (vs over 100 per cent for CRS, due to turnover) in the third year.

Estimate of Annual Savings in loss in one Typical Storage Warehouse
to be built under this Project

Year	Cereals Tons Stored	Pulses Tons Stored	Savings in loss, Kg.		Value of Savings RWF**	
			Loss Reduction		Loss Reduction	
			15%-1.5%	8.25%-1.5%	15%-1.5%	8.25%-1.5%
1	25	25	6,750	3,375	135,000	67,500
2	35	35	9,450	4,725	189,000	94,500
3	45	45	12,150	6,075	243,000	121,500
4	45	45	12,150	6,075	243,000	121,500
5	45	45	12,150	6,075	243,000	121,500
					1,053,000	526,500
					<u>811,510</u>	<u>85,755</u>

*Demaire, B. Essais, de preservation de dendrees enmagasinees au Rwanda en vue d'une application en milieu rurale. ISAR, Butare, Note technique No. 3, 1972.

**Weighted average.

Average Annual Production and Storage in one Commune

	<u>Production Tons</u>	<u>Estimated Storage Tons</u>	<u>Average Price 1977</u>
Beans	1,200	900	23f
Sorghum	1,150	800	14f
Peas	390	200	26f
Maize	<u>540</u>	<u>100 =</u>	<u>12f</u>
	<u>3,280</u>	<u>2,000</u>	<u>19f*</u>

The quantity produced and stored is estimated to rise by 3 per cent per year, compounded.

On-farm Storage Losses and their Reduction in an Average Commune

Year	Loss Tons		% Reduction of loss By Project	Saving In Grain Ton Level of loss		Estimated Value of Grain Saved Rwf/kg	Estimated Value of Grain Saved Rwf	
	Level of Loss			Ton Level			Level of Loss	
	10%	5%	10%	5%		10%	5%	
0	200	100	0	0	0	19	0	0
1	206	103	15	31	16	21	651,000	325,500
2	212	106	30	64	32	22	1,408,000	704,000
3	219	110	45	99	50	23	2,277,000	1,138,500
4	225	112	60	135	68	24	3,240,000	1,620,000
5	232	116	75	174	87	25	4,350,000	2,175,000
							Rwf	
							11,926,000	5,963,000
							(US Dollar Equiv.)	
							\$130,367	\$65,184

For a commune with a storage built and an extension program started in year one the more conservative level of loss savings in the warehouse would amount to US\$11,510 undiscounted over five years, assuming no real increase in the price of the grain and US\$130,367 over five years in the on-farm storage at the lowest estimated level of loss under present conditions.

*Weighted average

Apart from these direct savings, it is important to note that in a country where the average level of nutrition is less than the FAO standard, there will be a distinctly positive effect on the nutrition of the people in the areas touched by the project activities.

The improvement in the price received by farmers will encourage production of certain crops in areas where they have a comparative advantage; that is where they can be produced at lower cost than in other areas. This should increase the supply and the marketing of food and increase economic efficiency. It also carries forward a part of the GOR's plan to encourage the regional specialization within the country.

The improved price received by cooperators and the lower price paid by cooperators buying grains is of course, a transfer of income mainly from the traders. The lower price paid by cooperators buying back grains is a transfer to the poorest of the farm families in this country with the third lowest GDP/Capita in Africa (and the fourth lowest in the World) according to the 1978 annual report of the World Bank.

What will result from this increase in revenue among the farmers is difficult to predict. However, it is usually expected that an increase in income among subsistence farmers with an inadequate diet is an improvement in the quantity and quality of the diet. This in turn leads to improved health and work capacity both of which bring economic benefits to society, assuming that the work capacity can be employed.

According to MINAGRI Annual Report 1977 the following estimate can be made of the grains produced and marketed in an average commune.

Increased Income of Farmers in the Average Commune from Increase
in Price

Year	<u>Average Level of Sales Affected</u>			<u>Increase in Farm Income - 000 Rwf Average Level of Sales</u>		
	<u>Actual % of Sales Affected</u>					
	<u>5%</u>	<u>10%</u>	<u>15%</u>	<u>5%</u>	<u>10%</u>	<u>15%</u>
1	1.65	3.3	5	426	852	1,278
2	3.3	6.7	10	852	1,704	2,556
3	5.0	10.0	15	1,288	2,577	3,866
4	6.7	13.3	20	1,704	3,408	5,112
5	8.35	16.7	25	2,130	4,260	6,390
			Rwf (000)	6,390 *	12,781 *	19,202
			(US Dollar Equiv)	\$69,857	\$139,714	\$209,904

A single cooperative can serve 1,500 to 2,000 families (23.8 to 31.8%) out of an average of 6,290 families in a commune. A commune cooperative with three satellite units could serve almost the whole commune population.

The effect of the cooperative and its satellites on prices covers more than only the commodities which they sell. The CRS silos appear to affect the prices of most of the bean and sorghum (the only commodities which they handle) traded within their range of influence; this range covers about 5-6,000 families. This effect will be felt quite quickly because of the experience of the traders in the areas under the influence of the CRS silos.

If only 1/6 of the volume of trade in a commune is affected after five years and the cooperative deals in all of the major agricultural commodities traded in the area by arranging the assembly and transportation of a small but significant quantity of the produce, the savings to the farm families will be of the order of 12½ million Rwf or US\$140,000 over five years.

It is reported that farmers do not get paid for the full weight of produce delivered. Fair weights and measures used by the cooperatives are expected to bring a significant increase in

* Slight differences are due to rounding.

farmer income. The value of this saving has not been estimated.

Added to this the farmers will realize a similar saving if they need to repurchase a commodity. This applies directly to quantity of grains stored in the warehouse. This ranges from 325,000Rwf (US\$3,556) in the first year to 585,000 Rwf (US\$6,395) in the third and subsequent year. However, the overall effect of the "price stabilization" by the warehouse could be 2 to 3 times this amount or \$12,790 to \$19,185 for the commune in the third and subsequent years of life of the warehouse.

Saving to Farmers from repurchase of cereals and pulses from a Typical Cooperative

<u>Year</u>	<u>Quantity Repurchased Tons</u>		<u>Saving Rwf Per Kg</u>		<u>Saving to Farmers Rwf</u>
	<u>Cereals</u>	<u>Pulses</u>	<u>Cereals</u>	<u>Pulses</u>	
1	25	25	5	8	325,000
2	35	35	5	8	455,000
3	45	45	5	8	585,000
4	45	45	5	8	585,000
5	45	45	5	8	585,000
				Rwf	2,535,000
				(Dollar Equiv.)	\$27,711

On-Farm Storage - Use of Malathion per Commune

<u>Year</u>	<u>Quantity* Stored (Tons)</u>	<u>% Affected % Affected by Project</u>	<u>Quantity Affected (Tons)</u>	<u>Quantity of** Malathion (Tons)</u>
0	2,000	0	0	0
1	2,060	15	309	0.3
2	2,120	30	616	0.6
3	2,190	45	986	1.0
4	2,250	60	1,350	1.35
5	2,320	75	1,740	1.75
				<u>5.0 tons in 5 yrs</u>

*Assumes 3% growth per year

**Assumes one ton of malathion per 1,000 tons of grain (.001)

Using the information presented above, a financial rate of return was calculated. No economic analysis was undertaken of the return to society in general, as opposed to specific beneficiaries, and "real" prices were used instead of the shadow prices for both costs and benefits. Many strong assumptions using inadequate statistics would be required in a broad economic analysis, and preliminary studies indicate that the exercise would show a return which would be more positive than the actual situation merits. Financial analysis, on the other hand, is of special relevance to this project. First, it does not require assumptions to create shadow prices. Second, it gives a reasonable idea of the immediate profitability to farmer participants. Finally, the analysis focuses specifically on the technology involved, its level of investment, rate of flows, timing of events, etc.

The benefits accruing to users are clear; the cooperative will function as a form of savings bank to farmers who will deposit grain on account as well as sell it for cash. The primary benefits to depositors will come in the form of savings from storage losses which would otherwise accrue. Very conservative estimates of original losses have been used (8 per cent) thus reducing the potential savings, although losses have been estimated as high as 25 per cent. The second benefit to users comes in the form of extra income from the sale of stored grain. It is assumed the extra quantities involved are not sufficient to affect market price through the supply-effect. The analysis is run for five years, which represents the first phase of an intended longer program whose investments could change the situation sufficiently to alter the nature and level of benefits. For the life of the current project, a return of over 26 per cent is calculated on the invested capital; this rate is considered conservative since it is based on a lower level of savings from losses than could be assumed using loss estimates in current literature, and since the calculation does not include secondary benefits to farmers when they repurchase grain from cooperatives for their own use at a lower price than the traditional market. The rate of return calculation is included in the Financial Annex (I).

B. SOCIAL SOUNDNESS ANALYSIS

1. Project Overview

From the social perspective, the proposed project has a number of interrelated strengths. First it is a direct extension of a number of related storage activities in Rwanda (CRS silos,

CLUSA storage, FSM), and as such is based on extensive local experience. The project is also flexible, in that it provides for the utilization of different types of storage facilities, for example, and for the introduction of satellite facilities on a pilot basis. There is a comprehensive research program connected with the project which is designed to generate timely and useful data during the life of the project on a range of topics, including socio-economic family activities. The major emphasis is on the development of local participants and institutional building in the project, and there are provisions for ensuring the involvement of women in project activities. Clearly women who are household leaders on almost one-quarter of the rural farms, will be prime beneficiaries. They are also, because of their role in indigenous storage, key participants in the improvement of on-farm storage, an important component of the project. Increased family income and nutrition levels are additional benefits.

2. Issues

In the course of the project design, a number of different social issues were identified and addressed. Discussed below are the more important issues which will be dealt with in the course of project implementation.

A. Burden and Benefit Incidence

The role of the commercants (commercial traders) in the project is problematical. It is likely that commercants who are now involved in buying, selling and transporting beans and other foods will see their profit margins decrease if the project is successful. As the "burden" they may have to shoulder will result in direct benefit to the farmer (e.g. in terms of more favorable prices), such a burden is acceptable in project "incidence of benefits" terms. A more critical question, however, is the extent to which commercants may attempt to counter or undermine project purpose in the market place. Limited observation of the results of the CRS silos program, which covers a narrower spectrum of products, indicates that commercants seem to "live" with the project and not to interfere with it. To ensure project feasibility, the proposed socio-economic study will specifically monitor commercant activities in relation to project related cooperative building, marketing, transportation, etc.

B. Spread Effect

Promoting the spread of project benefit to all the members of a commune also requires further data collection and analysis. It is anticipated, based on CRS experience, that the poorest of the

poor will benefit from increased availability of beans (and other crops) and a reduction in seasonal price fluctuations in the area near the storage facility. However, how these benefits can be best spread to the farthest reaches of the commune is yet to be determined. A key question for example is whether such an additional storage facility in a large commune should be established as a separate discrete cooperative entity, or whether a (lower-order) satellite concept is more administratively and functionally appropriate. The problem of assuring the satellite's clientele a participation in the commune cooperative decision making will need to be resolved.

C. Leadership and Participation

The composition and reliability of local leadership in cooperative activities is also a topic of concern. For example, as chief administrative officer and leader among leaders, the commune bourgomeister has considerable responsibility, and power. He, and other leaders, will probably have opportunities to take unfair and/or illegal advantage of their positions, and hence must be monitored and clearly held accountable for their actions. A key feature of the proposed project is the inclusion of a mechanism to ensure election of a "college" of representatives, including local residents, to ensure local participation in cooperative activities and policy making (e.g. whether to diversify to other food crops, or whether local commercants should be allowed unlimited access to cooperative marketing and storage facilities). This approach appears to be effective in assuring democratic operation of the Banques Populaires.

D. Feasibility

As mentioned above, the project has a decided advantage from the social perspective in being based on previous local experience and in having an institutionalized information system designed to address quickly and effectively data gaps within the sphere of project activities about which relatively little is known. It should be noted that an extensive set of socio-economic studies are planned under the research component of the project. A key consideration, given these advantages is the degree to which knowledge gained in the past and present can be effectively utilized within the framework of the project during the implementation phase. For example, a clearer understanding of management constraints at the local level can be gained by analysing the success and failures of the church-mission based CRS silos, particularly those now being built outside the missions and the CLUSA initiatives in storage and

institution building. At the national level there is a coordinating role in marketing required; this might be partially or completely filled by FSM with its linkage with the Rwandan national marketing and storage agency OPROVIA/GRENARWA. The specific manner in which the information system component of the project relates to other components of the project over time should be carefully monitored in this regard, just as the specific manner in which the local crop storage component of the national storage program relates to other components of that system must be carefully conceived and monitored at the national level.

C. TECHNICAL FEASIBILITY

A. Functioning of the Cooperatives

The GOR has a rural community development program which involves setting up rural agricultural production cooperatives which are to have multiple function of:

- Providing means of conserving and marketing of surplus commodities at Government recommended prices
- increasing agricultural production
- organizing a supply for the rural population of:
 - prime necessities: hoes, salt, lamp oil, etc.
 - basic building supplies: cement, roofing nails, etc., agricultural inputs.
- providing a service for savings
- providing professional and cooperative training for members
- constituting a mutual security fund

There are now operating production and marketing cooperatives in several prefectures (see listing in Annex H4). AIDR supervised a ten-year agricultural development program in Kibungo based upon multi-purpose commune cooperatives and is now working on a three-commune project in Ruhengeri. Thus feasibility of the cooperatives

and the capability of the Rwandans, if correctly trained, to manage them has been established. These cooperatives have a general purpose clear-span warehouse for storage and marketing. The buildings are constructed with communal and hand labor, using local materials including adobe, stone and baked bricks*. GOR authorities typically insist that donors provide a somewhat higher standard of building with asbestos cement roofs, than would be built at commune expense. It has been noted that the appropriate building materials differ for different areas and that ventilation requirements also change with altitude.

The project calls for a limited amount of grain storage in bins or silos. This technology using malathion or phostoxin** as insecticide has been demonstrated in Rwanda by the CRS/USAID silo bins while FSM uses bags in flat warehouses. There is a technical problem if beans are stored for over about 11 or 12 months, particularly in sacks; the beans undergo chemical change and the cooking time is increased by 100 per cent or more. This leads to consumer resistance and so to a reduction in the price at which the beans can be sold. If care is taken to turn over the beans in five months - there are at least two production seasons a year - or ten months at the most, the chemical change of the beans with storage is not much of a problem.

Programs of improvement of indigenous storage have been carried out successfully by AIDR and the CRS project. There is also a report on recent research on this subject from Burundi. One CRS silo unit has sold one ton of malathion for protection of on-farm stored grain. Grain is traditionally stored in baskets sealed with cow dung and sometimes in clay pots. An alternative container used in Kenya is the bottle-necked gourd; this is a possibility for trial in Rwanda. In traditional storages kaolin or ashes are used as an insect repellent or insecticide. Research in Kenya has shown ashes to be quite effective while an inert dust like kaolin is likely to be much less effective. In this project an evaluation of indigenous technology will be made before any changes are made in technology, other than promotion of the existing practices of the use of ashes or malathion.

*This is an example of an appropriate technology already proven in Rwanda.

**Both EPA-approved.

A major consideration is for a cooperative to know how much grain to retain for re-sale to the cooperative members. The initial phase of the project undertaken by the CLUSA OPG should provide information on this. Because of this current lack of knowledge, the internal grain storage bins will not be constructed immediately but the warehouses will be built so that a bin of appropriate size could be installed later.

A major training effort has been built into the project to ensure that Rwandans are trained at all levels from the instructor level in the Ministry of Social Affairs and Cooperatives, to the prefectural level supervisors (delegates) and the cooperative operators in the communes. At the commune level, the managers will be trained in cooperative operation, business management and accounting, grain storage, and marketing; weighers will also be trained. The problem of lack of uniformity in sack size and the consequent lack of a uniform weight per full sack must be overcome. A standardized accounting and inventory system will be essential.

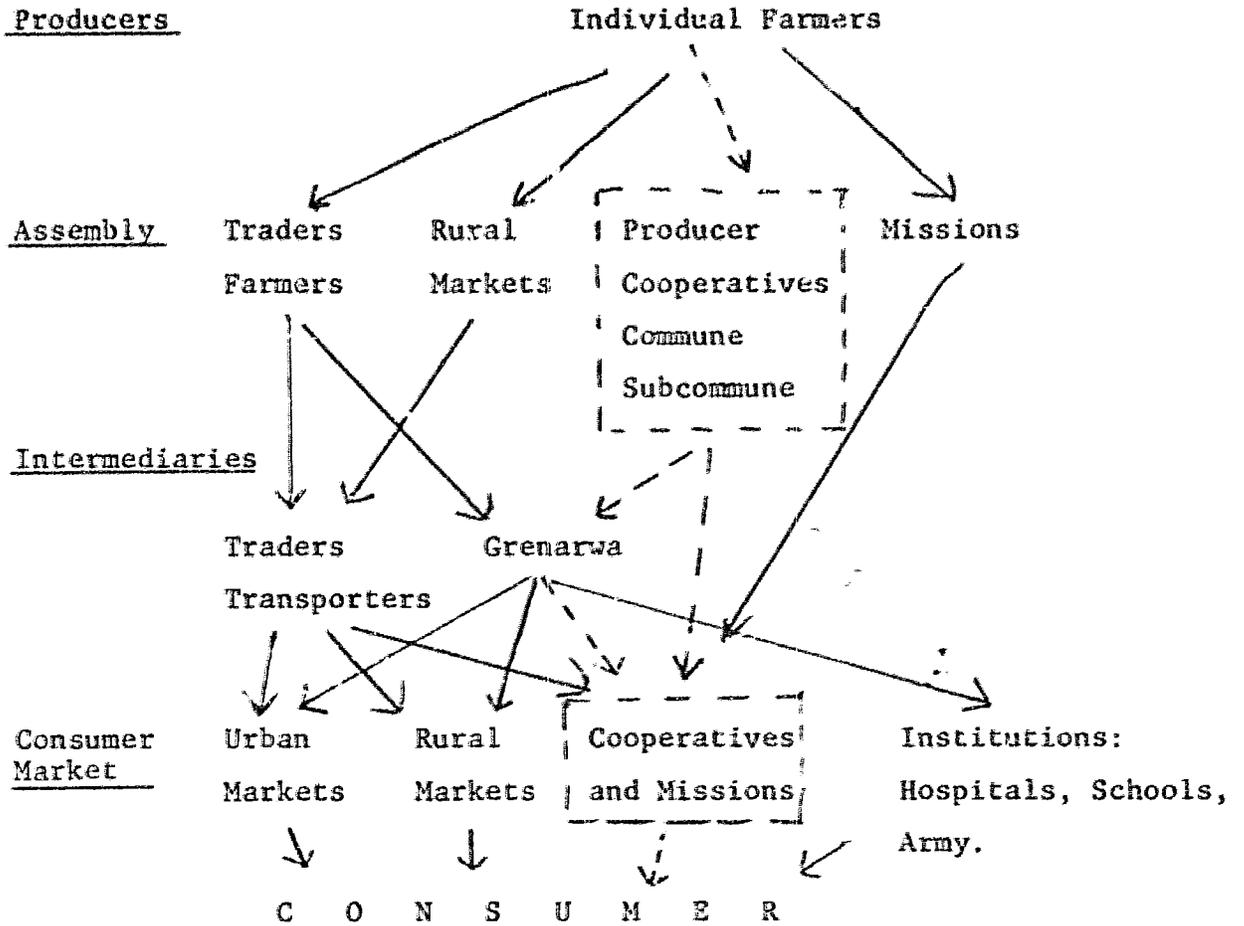
Smaller cooperatives can be operated by one person, a manager and perhaps a part-time weigher. The larger cooperatives could require up to three persons; manager (\$40-\$100 per month depending on size), warehouseman (\$30), and part-time accountant (\$20), all paid from the cooperative's margin earnings. Cooperative committee members are also to be trained in cooperative action. In this project it is proposed to use more Rwandans in this training process than have been used by AIDR. However, this project is also more wide-spread, has greater GOR participation and therefore is less dependent on expatriates.

The Marketing Schema on the following page demonstrates how the cooperatives will fit into the traditional rural trading structure of Rwanda.

B. Construction Description

The project proposes to build some 40 hangar-type storage warehouses with approximate storage capacity of 100 tons of grain. These hangars will be located in various communes of Rwanda. Although the exterior specification will be standard, the capacity of each of the storage hangars may vary from 60 tons to 100 tons depending on internal configuration and the quantity of product available to the cooperative for storage or marketing in particular communes. Although the specific communes for the proposed hangars

Marketing Schema



Broken lines ----- represent relationships developed under
LCS project.

have not been determined, actual locations will depend upon site selection criteria set forth at the end of this section. Selections will be made by the DCP, assisted by the US advisor, after consultation with Prefectural officials.

Each of the hangars will be a rectangular structure with single-slope roof structure. Proposed dimensions for each of the hangars will be about 10 m x 6 m having a height of 3 m. Although these dimensions may vary depending upon the required storage capacity, variance will be on downward rather than upward side. The GOR has standard plans and bills of material for various capacity storage hangars which are adaptable to the requirements of this project. Drawings for hangar construction are attached as Annex H(1). In most cases, it is proposed to use burnt bricks which are locally available; however, at some locations the burnt bricks are not available and transportation costs from the nearest supply source become excessive. In these cases, it is proposed to use either stones (if available) or cement blocks. Steel roof truss appears to be best suited to these structures due to lightness and ease in installation. Metal windows and doors will be used in the proposed hangars. The roof will be covered with corrugated galvanized iron (C.G.I.) roofing sheets. Since all walls are load-bearing, no columns are proposed for construction. In some volcanic areas, a full reinforced ring beam as a 'wall plate' will be incorporated in conformance with GOR's local building codes. The proposed hangar construction does not represent a departure from the normal construction practices in the country, and GOR's existing building standards and techniques will adequately meet AID technical requirements.

The proposed construction of 40 units will be over a three year period. It is proposed to build 10 in the first year and 15 in the second and third years respectively.

C. Technical Soundness

The design of storage hangars was determined after studying various grain storage facilities in the country. As the communes have not yet been selected, the site selections with respect to both size and some design aspects will vary. Once the sites are selected, the exact specifications of each storage hangar will be determined and some variations in the standard design may be required to suit site requirements. These design changes will generally conform to site/soil characteristics, placement of ventilation and availability of materials. The responsibility for preparation of final design documents (complete

IFB package) rests with the GOR Ministry of Agriculture. The proposed design facilities are relatively simple and will not require extensive inputs by the Building Section of the Ministry of Agriculture. Since a standard design exists for 100-120 ton storage hangars in the country, the Building Section of the Ministry of Agriculture should be able to prepare the final set of complete working drawings and contract documents which will permit firm cost estimating and effective competitive bidding. Preparation of construction documents will be consistent with normal and standard building contract conditions. Contract documents (contract conditions, special conditions, etc.) previously approved by AID and REDSO for the FSM project will be used for the proposed construction.

Prior AID experience with construction in Rwanda includes recently completed and on-going construction of facilities for the Food Storage and Marketing Project. This experience has demonstrated that:

1. Given the simplicity of the proposed structures, the Building Division of the Ministry of Agriculture can prepare complete IFB documents
2. There are competent Rwandan contractors available in the country to perform this kind of construction work and quality of construction is acceptable. However, due to the limited numbers of contractors the competition is not very keen and in some of the remote locations, it may be difficult to obtain qualified contractors.
3. Generally all building materials are locally available; however, shortage of some imported building commodities, e.g. cement, roofing sheets, hardware items, etc., do occur from time to time, resulting in delays in completion.

D. Basis of Cost Estimates

During construction of facilities under the Food Storage and Marketing project, shortages of reinforcing steel, structural steel, roofing materials and cement were experienced. Although the type of structure proposed for this project is simple, construction progress will depend upon timely availability of materials, in particular roofing sheets, roofing steel and cement.

Escalating transportation costs for imported building materials are a major factor contributing to an increase of approximately 2 per cent per month in construction costs. There is no likelihood that prices will drop in the foreseeable future. The current cost of construction, based on recent construction activities for a similar Belgian assisted AIDR project in Rwanda (October 1978) indicates that the cost per square meter averages Rwf 18,000 - (\$197). This figure represents the cost of building facilities outside the capital city of Kigali (a distance of approximately 100 kms.) Assuming 24 per cent inflation per year between now and the beginning of the proposed project construction, the prices of the proposed construction are broken down by phase as follows:

Estimated construction costs

<u>No. Of Hangars</u>	<u>Area Per Hangar M²</u>	<u>Total Area M²</u>	Oct 1978	Cost in RWF 000*		
			<u>Cost RWF 000 @ RWF 18,000 M²</u>	<u>Jun 79</u>	<u>Jun 80</u>	<u>Jun 81</u>
10	60	600	10,800	12,744		
15	60	900	16,200		23,704	
15	60	900	16,200			29,393
6 satellites	30	180	3,240		4,741	

Estimated total cost of 40 hangars	RWF 65,841,000
Estimated total cost of 6 satellites	RWF <u>4,741,000</u>
Estimated total construction costs	RWF 70,582,000
+ 10% Contingency	RWF <u>7,058,000</u>
Total	RWF 77,640,000
@ RWF 91.48 = US\$1.00	\$ <u>848,710</u>

*Construction completions in June 1979, 1980 and 1981 will be at costs 24 per cent per year higher than October 1978 base price of RWF 18,000 per square meter (M²).

CRITERIA FOR COMMUNE AND SITE SELECTION*

1. Construction

- Availability of qualified masons
- Availability of laborers
- Local participation

2. Transportation

- Acceptable - Road conditions and access
- Availability of local transport
 - Distance to:
 - (a) brick
 - (b) rock
 - (c) sand
 - (d) wood
 - (e) warehouse facilities
 - (f) gravel

3. Skills/Local Workshops

- Availability of carpentry, welding and other facilities for local fabrication and storage center parts.

4. Location

- Communes selected which are active in grain trading, i.e. have internal deficits or surpluses
- Proximity to market
- Proximity to Communal Offices
- Proximity to other activities of cooperatives
- Proximity to banking facilities
- Other activities and participation of local population
- Population density
- Local businessmen and private interests
- Local Government support
- Suitable terrain - leveled, well-drained, with water source nearby
- Site will not encroach on any arable land or historic monument.

*Similar criteria were used for site selection by CRS and will be used by CLUSA

D. ADMINISTRATIVE FEASIBILITY

Host Country Responsibilities

The GOR implementing agency for this project will be the Department of Cooperative Promotion (DCP) in the Ministry of Social Affairs and Cooperatives. This department is headed by a Director, F. Kayinamura, who is regarded by the AID Affairs Officer and the design team as experienced and capable. The DCP is currently staffed with 36 professionals and three secretarial staff at the Kigali headquarters and 48 personnel in the field (see current and projected organigrams in Annex J). The GOR has plans eventually to place one cooperative specialist from this department in each of the 143 communes who would initially be funded by the DCP but later transferred to the commune's budget.

Although the staffing and capacity of the DCP to conduct training is still quite limited, the department will gain valuable experience in implementing the CLUSA OPG, 607,000 dollar AID/UNDP-funded pilot phase to the presently proposed project scheduled to begin in January 1979. The DCP professional staff will also receive training under this project to supplement the DCP's existing training program. Five of the department's staff have already completed two-year courses in cooperative management at the Pan African Institute for Development in Douala, Cameroon. Under this project, it is planned to train 10 officials of DCP, probably at PAID, as instructors to teach cooperative management to commune level personnel who will be involved in cooperative operations. The section on training in the Project Description provides further details and shows how this element fits into the overall training scheme.

Cooperatives - The organization and efficient operation of commune cooperatives are a fundamental element of the project. Rural cooperatives are private organizations, supported in part by membership fees (farmers pay 200-1,000 RWF or \$2-11 to join). They are however subject to government supervision and audit by DCP and their respective prefectures. A number of cooperatives already exist at the commune level (see Annex H(5)), all trading in cereals and pulses as well as other commodities, such as coffee. There were reported to be 59 agricultural cooperatives at the end of 1977, with 29 new groups formed or in formation in 1978. However, by no means all of these engage in a wide-spread marketing function. Some are small producers cooperatives which only market the production of their membership. Others deal in industrial crop production and marketing.

At the present time a number of these cooperatives have an enclosed storage warehouse in which they assemble various crops for sale (mainly beans, peas, sorghum, maize and coffee) and sell them either to a government buying agency or to one or more "commercants". This can be looked upon as an assembly warehouse or stock. It assembles, for a certain number of farmers, the quantity of crop which they propose to sell; it offers weighing, which is recognized as honest, and presumably tries to get as near to the official prices as possible. There is currently no reliable information on the volume handled either by cooperatives or by any commune organization performing this function. This subject will be treated under the research component of this project.

The product is brought in by head load of 10-25 kg and is assembled into sacks. All of the wholesale trade in these commodities is done in sacks, which is the appropriate technology in a country like Rwanda.

The CLUSA OPG project will select seven communes which have existing cooperative structures. The LCS project will probably also initially select communes with existing cooperatives but relatively soon, in the second or third year, will venture into communes without cooperatives. This will involve organizing the cooperatives from the beginning, recruiting and educating members and training local cooperative managers. The training to be provided by the DCP under the direction of the US project advisor will be critical to the effective establishment of the new cooperatives.

The credit fund to be provided under the project for the cooperatives will be managed by the Banque Populaire (BP), a Rwandan rural credit institution operated with Swiss assistance. The BP now has some 60 rural branches in Rwanda and is considered efficient and well-run. Each participating cooperative will maintain a separate account at the nearest branch of the BP.

Contracting Procedures - There are three elements of the project for which contracts are foreseen with private institutions or firms. It is proposed that the GOR be the contracting entity in all cases.

1. Construction - The building of 40 hangar type grain storage units and six smaller satellite units will be by one or more private Rwanda construction contractors.

Preparation of final design plans, contract documents and specifications will be undertaken by the GOR, Ministry of Agriculture Building Division (Genie Rurale). This organization is responsible for construction in rural areas. Plans and designs will conform with standard building codes. A REDSO/EA engineer will advise and assist the GOR during the preparation of IFB package. The contractor for construction services will be selected using the standard COR construction contractor selection requirements, which have been used in conjunction with the AID financed Food Storage and Marketing project and conform to AID's basic contracting principles in Handbook 11. REDSO/EA engineers have reviewed preliminary plans and specifications for construction and found them satisfactory in terms of the requirements of Section 611(a). However, the final plans and specifications to be developed by GOR Genie Rurale will also be reviewed by REDSO engineers. Site selection criteria contained in this paper have been approved by REDSO. The availability of a bid package will be announced on Rwandan National radio (newspapers are not published on a daily basis in Rwanda) and prospective bidders will be prequalified to ensure that they are financially sound, capable of performing the work and are bona-fide Rwandan firms. Proposals of qualified bidders will be examined for responsiveness by the GOR Building Division of MINAGRI. The lowest responsive bidder will be awarded the contract, following REDSO/EA review and approval.

At this time, it is not certain that one contractor will bid for construction of all forty (40) hangars. It may happen that because of the size of the job one contractor may bid for several hangars, and other contractors bid for the remaining hangars. For ease in supervision and administration, preference will be given to contractors whose bids in conformance with the IFB, are for more than one hangar. The Building Division of MINAGRI will be responsible for supervision and issuance of monthly payment certificates. Since at present this division does not have a vehicle and would be unable effectively to monitor construction supervision, it is proposed that under this project a vehicle and POL costs for its use be provided. This vehicle will be primarily used for construction supervision.

2. Management of Project Implementation - While it is possible that a USAID direct-hire agricultural technician could be assigned to the project to assist the DCP in implementation, the PP team deems it preferable to pursue a course similar to

management arrangements under the CLUSA project, noting, of course, the differences between an OPG and a contract. It is considered highly desirable to contract the management advisory role to a professional US institution experienced in organization and management of cooperatives which could supply not only an experienced project manager but also home office supervision and specialized short-term consultants. The contractor would be selected either through competitive bidding or predominant capability, if the GOR decides it wants to continue the services of CLUSA based on its early performance in the current OPG. In this case a sole-source waiver would be requested in accordance with Handbook 11 (see discussion on this point in Implementation Plan). The contracting office would be the Department of Cooperative Promotion, Ministry of Social Affairs, GOR.

3. Research - The project includes an important research program to be conducted through two Rwandan institutions, ISAR and INRS, fully described in the Project Description section and research annex. The socio-economic element of the research program calls for three expatriate research assistants in country for a 15 month period and periodic planning and supervision visits by a representative of a US institution, possibly under Title XII. This would involve a host country contract with a US university for the services of the three research assistants and part-time supervisor. Separate treatment of the research element is considered necessary since the type of person selected for the position of management advisor would be an operationally oriented individual with a background in cooperatives, with the result that the independent but related research work could be neglected or even compromised if directed by the same person. The necessary coordination between these project elements will be handled by the AAO.

Role of GRENDARWA

GRENDARWA (Grenier National du Rwanda) is the national grain marketing organization established in 1975 under the AID Food Storage and Marketing Project (FSM). It will not be responsible for the management or direction of the LCS project because of the different levels of operation (national vs local), but will serve a useful role in market coordination among cooperatives and as the overall national grain marketing body whose functions cover the project's cooperatives, as well as other cooperatives and the private grain market. GRENDARWA already offers direct sales to

12-15 cooperatives weekly on credit. Although GRENDARWA is unable to supply credit to cooperatives under the LCS project, it is willing and able to act as broker to make market link-ups between cooperatives which are short of beans or sorghum and those in surplus. Additionally, GRENDARWA is a potential source of purchase of cooperative marketing surpluses, and the cooperatives could serve as national sales outlets for GRENDARWA.

In spite of GRENDARWA's coordinating role, it is likely that with the growth of the production and marketing cooperatives in Rwanda, eventually a parent organization, such as a Union of Agricultural Cooperatives, will have to be established, possibly within the next five years.

E. ENVIRONMENTAL CONCERNS

An Initial Environmental Examination (IEE) was prepared by REDSO/EA on November 23, 1977, and the recommended Negative Determination approved by the Assistant Administrator for Africa on April 3, 1978.

The IEE did not, however, take account of the fact that the project plans to make use of up to three varieties of insecticides: malathion and methoxychlor for on-farm and warehouse storage, and phostoxin for commune warehouse use. These insecticides are EPA-approved without restriction for the protection of stored grain. A revised IEE with a statement on insecticide use and an up-dated project description is included as Annex G(2) to this paper. Since both the warehouses and the activities of the cooperatives are environmentally neutral, a Negative Determination is again recommended.

4. FINANCIAL PLAN

Project Financing

The total financing for the project will be \$2,866,356 with AID contributing \$2,572,461 and the GOR \$293,895 as shown in the following summary tables. See Annex I for supplementary financial tables and a sample budget for a typical cooperative.

SUMMARY COST ESTIMATE AND FINANCIAL PLAN
(U.S. \$ 000)

<u>PROJECT INPUTS</u>	<u>AID</u>		<u>GOVERNMENT</u>	<u>TOTAL</u>	
	<u>Dollars</u>	<u>Rwanda Francs</u>	<u>of RWANDA Rwanda Francs</u>	<u>Dollars</u>	<u>Rwanda Francs</u>
Technical Services	573		114	573	114
Training	30	70		30	70
Commodities	154	5		154	5
Construction		849	135		984
Research	372	80	45	372	125
Evaluation	40			40	
Revolving Fund		400			
	<u>1,169</u>	<u>1,404</u>	<u>294</u>	<u>1,169</u>	<u>1,698</u>
<u>GOR Contribution</u>					

As shown above, the GOR-life-of-project contribution will be \$293,895 or 10 per cent of total project costs.

Rwanda is on the UNCTAD list of "relatively least developed countries" and, in fact, is noted by the World Bank as one of the poorest countries in the world. Rwanda's financial situation simply will not support a 25 percent contribution to this or most other development projects. The total national budget for the GOR in 1977 was less than \$70 million. Accordingly, a waiver of the host country 25 per cent contribution required by Section 110 (a) of FAA is requested based on Section 307 of the International Development and Food Assistance Act of 1975.

The GOR's contribution is nevertheless a not insignificant 10 per cent of total project costs. Furthermore, the GOR has already demonstrated through the FSM project its commitment both to support AID-assisted projects and to the priority treatment of the food storage and marketing sector. It is also firmly committed to the support of this project.

It should be pointed out that the GOR contribution in human terms is much greater than is reflected in the budget, because Rwandan salaries are a tiny fraction of U.S. personnel costs. If U.S. and Rwandan human participation were valued on an equal footing, based on skill levels and person/years devoted to the project, the GOR share of the project would increase markedly.

Commune Cooperative Operating Budgets

The Commune Cooperatives and the CRS silos already in existence are self-financing except for expatriate assistance (for example AIDR personnel in Ruhengeri and Catholic Fathers in the case of CRS). In trading beans, the margin for receiving, storing, and selling is about 3 Rwf/kg. If the beans are only received, sacked and sold, i.e. not stored, the cost would be less thereby increasing the earnings of the cooperative. A sample budget for a project cooperative is part of the Financial Annex (Annex I).

In this Paper it has been assumed that the margin obtained from assembly and marketing of products and from storage will continue to be sufficient to pay for the operation. If there is surplus it is normally returned to the members as a dividend.

The ability of the average cooperative to earn enough through this operation to cover all of its expenses is a basic assumption of the project, since it is neither desirable or feasible to subsidize the cooperatives' budgets from the project other than through the revolving credit fund, which is a self-perpetuating means of financing necessary inputs. Budgetary subsidy of the cooperatives would impose a major recurrent cost burden on the GOR after the termination of the AID project which is unacceptable, since the GOR plans eventually to expand this program nationwide to all 143 communes. However, with the cooperatives self-supporting, the only recurrent costs implied for the GOR to continue operations in the 40 communes which the project has entered is monitoring and supervision by DCP and the respective prefectures, which can be borne from their regular budgets. Thus actual recurrent costs to the GOR following completion of the AID project are minimal.

The issue of cooperatives' financial soundness was discussed at some length with the Swiss advisor to the Banque Populaire. The BP has had ample opportunity to observe the financial performance of many cooperatives in Rwanda and notes that the record is mixed, with numerous examples of both good and bad cooperatives (in the latter case a number of producer organizations call themselves cooperatives but do not actually function as such, thus clouding the reputation of true cooperatives).

In the BP's experience if several key factors are present, a particular cooperative is likely to be successful. These include: (1) competent, honest, well-motivated cooperative managers; (2) adequate financial resources; and (3) active participation by members.

The ICS project is designed to reinforce these positive factors. The training program and close supervision of cooperatives by the DCP, Prefectural Delegates and the U.S. project advisor will greatly enhance prospects for effective cooperative management. The existence of the revolving fund will ensure that cooperatives have financial resources available for necessary inputs. Finally, through "animation" by rural trainers (encadreurs) of the DCP, active participation by cooperative members will be encouraged.

The BP has developed a series of actions which are undertaken to avoid financial mismanagement of cooperatives. These include:

- (1) audits twice a year;
- (2) financial and technical assistance in problem cases;
- (3) exposing cases of fraud to the membership of a cooperative which leads to the firing of the manager; and
- (4) requiring three signatures for each withdrawal (cooperative manager and two elected officials) to avoid situations where a manager uses cooperative funds for private or unauthorized purposes.

GOR Price Policy:

In 1974, after a serious shortage of locally grown foods, the GOR created a National Price Commission (NPC). The NPC introduced a minimum bean price to the producer and a maximum bean price to the consumer of 20 and 25 Rwf/kg, respectively. In practice the private sector markets which handle the majority of the commodities do not adhere to these prices. In this way beans and other grains flow from areas of lower prices to areas of higher prices.

GREMARWA, being a Rwandan parastatal organization, is obliged to respect the NPC's price recommendations. Other parastatal organizations, e.g. TRAFIPRO and CPROVIA have found it impossible to work within the bean price recommendations without losing money and have abandoned trading in beans.

Observations of the effect of the government's attempt to fix producer prices in what is substantially a subsistence agriculture indicate that it is impossible to avoid low producer prices at times of surplus, but it is possible to depress prices in times of shortage if a price stabilizing stock is available. Currently in Rwanda, producer prices are below the NPC recommended level of 20f.

The effect of uniform producer/consumer controlled prices for beans is to limit the flow of beans from surplus to deficit areas by institutions that respect the price control and to favor the activities of the traders who do not respect the price control and to increase their profit. Because of lack of specificity in the pricing regulations, it is believed that one cooperative in a surplus area could quote a price of 20f/kg delivered to a cooperative in a deficit area, thus competing with the trader. The producers would

thus receive the recommended price but would have to pay the transport.

Sales by cooperatives in surplus areas to GREMARWA and purchases by cooperatives from GREMARWA could be impeded if the price control is maintained.

Ian Pattinson, in his evaluation report of the FSM project (Nov. 1978, PP 43-51) discusses the GOR pricing policy at length. He also points out that GREMARWA needs a margin of 6 Rwf/kg to cover operating cost and suffers a loss with the present NPC recommended margin of 5f. Pattinson recommends that the GOR should be persuaded "to abandon its policy of fixed producer and consumer prices for beans before the next buying season" (Recommendation No. 3). He recommends that GREMARWA be free to set prices for beans delivered to its warehouses in relation to supply and transport costs.

If the GOR accepts this recommendation, and there is reason to believe it will, the new pricing mechanism would help the flow of beans from cooperatives in surplus areas to those in deficit areas through the coordinating efforts of GREMARWA.

After due consideration, the PP team and AAO supported by the REDSO/EA Regional Legal Advisor decided against making abandonment of the government's price policy a condition precedent to this project. It was felt that this action would be undesirable and unnecessary because: 1) while helpful, abandonment of the price policy is not critical to the success of this project, since only transactions with GREMARWA are affected; 2) internal price policy is always a sensitive political issue and one that should not be dictated by another government in the form of a sine qua non for its assistance; and 3) it is very likely that the GOR will revoke this policy on its own during the life of the project.

AID EXPENDITURES BY INPUTS PER FISCAL YEAR

(U.S. \$000)

<u>PROJECT INPUTS</u>	<u>FY 1979</u>	<u>FY 1980</u>	<u>FY 1981</u>	<u>FY 1982</u>	<u>FY 1983</u>	<u>TOTAL</u>
Technical Services	132	130	111	96	104	573
Training	10	35	35	20		100
Commodities	77	21	16	41	4	159
Construction	153	342	354			849
Research	86	159	143	64		452
Evaluation			10		30	40
Revolving Fund	80	180	140			400
TOTAL	538	867	809	221	138	2,573

COSTING OF PROJECT OUTPUTS/INPUTS

(U.S. \$300)

PROJECT INPUTS

PROJECT OUTPUTS

	<u>Amount</u>	<u>Expanded Storage Capacity</u>	<u>Improved On-Farm Storage</u>	<u>Data on Storage/Marketing</u>	<u>Trained Co-Operative Personnel</u>
Technical Services	687	193	193		301
Training	100				100
Commodities	159	70	65	12	12
Construction	984	984			
Research	497			497	
Evaluation	40	10	10	10	10
Revolving Fund	400	200	200		
	<u>2,867</u>	<u>1,457</u>	<u>468</u>	<u>519</u>	<u>423</u>

5. IMPLEMENTATION PLAN

Arrangements for project implementation have already been described in some detail in the Project Description, Technical Analysis and Administrative Feasibility sections of this paper. In this section a schedule of events will be presented and a summary offered of the respective roles of various GOR and USAID entities concerned with the project.

Role of the GOR

A. Department of Cooperative Promotion (DCP) Ministry of Social Affairs will be the implementing agency. The Director of this Department, currently Mr. F. Kayinamura, will be Director of the project, assisted by the US technical advisor supplied under the project. This advisor is expected to be obtained through host country contract either with an individual or, more likely with a US organization specializing in cooperative management. Since CLUSA is implementing what is planned as the initial phase of this project under an OPG, it appears highly desirable to continue with CLUSA management through the second phase covered by this project. This would depend on CLUSA's success in carrying out the cooperative development program under its OPG. Certain specific activities in this project, especially the training program, will depend heavily on CLUSA's experience in developing a training plan during the first six months of its project beginning in January 1979. Assuming CLUSA's experience is favorable, the GOR is expected to ask to continue the services of CLUSA to furnish the US project advisor and specialized short-term consultants in the LCS project. In that event, the AAO in collaboration with REDSO will request a waiver for negotiation with a single source for technical services in accordance with Section 2.4.2., Chapter 1 of Handbook 11.

From the management standpoint the major tasks of the DCP will be (1) monitoring and audit of the private cooperatives established in participating communes and (2) planning and implementation of the training program to be conducted under the project.

B. Building Division (Genie Rurale), Ministry of Agriculture will be responsible for overseeing the construction phase (40 storage hangars plus six smaller satellite units), including preparation of final design plans, contract documents, specifications and supervision of construction. Construction of the unit will be by private Rwanda contractors using local labor and building materials.

C. ISAR and INRS will implement the research element of the project (see Project Description section and Annex H(2)). An

independent US institution or university will be contracted by the GOR to supply an intermittent research coordinator and three research assistants to INRS.

Role of USAID

A. AAO/Kigali will perform in-country project monitoring on the same basis as the FSM, CLUSA and other USAID project activities in Rwanda. The US Project Advisor, in addition to assisting the GOR Project Director, would report administratively to and would consult regularly with the AAO on the same basis as the co-director of GREWARWA in the FSM project.

B. REDSO/EA will supply periodic technical services to the project such as (1) review of IFBs by REDSO engineers and review and approval of construction contracts, (2) occasional inspection of construction on selected basis by a REDSO engineer to ensure that site selection criteria are being followed and that construction conforms to approved plans and specifications, (3) periodic review of the project training program by the REDSO Human Resource Advisor and (4) staff to perform the mid-term formative project evaluation (see Evaluation Arrangements).

Proposed Schedule of Events

December 1978	PP received and reviewed in AID/W
January 1979	Project approved and authorized
March 1979	Project Agreement signed with GOR
April 1979	Preparation of Plans and IFB document by GOR/MINAGRI for construction of storage units (hangars)
June 1979	Development of Training Plan by GOR/DCP
June 1979	Management Contract executed (CLUSA?)
June 1979	Selection of Local Construction Contractor(s)
June 1979	First 10 communes selected
June 1979	Research contract signed
July 1979	Begin research program by ISAR (field trip by US Research Coordinator)

August 1979	Project Advisor commences work on project
August 1979 - February 1980	Construction of first 10 hangars
September 1979	Five DCP staff begin 12-week training (3rd country)
October 1979	Three research assistants arrive in field to begin work with INRS
October 1979 - February 1981	Intermittent field visits by specialized short-term consultants
November 1979	Prefectural level training course for cooperative supervisors (2 weeks)
January 1980	Begin training program for cooperative personnel (series of 2-week seminars coordinated with construction schedule)
February 1980 - May 1981	Construction of second 15 hangars and six satellite units
July 1980	First ISAR Research Project completed (Inventory of bean varieties)
March 1981	Final evaluation of CLUSA OPG for first phase of LCS project
May 1981 - August 1982	Construction of third 15 hangars
July 1981	Second ISAR Research Project completed (Indigenous Crop Storage)
October 1981	Mid-term project evaluation by REDSO/EA
June 1982	Third and Fourth ISAR Research Projects completed (resistance of varieties to attack and effect of storage on cooking time)
September 1982	Fifth ISAR Research Project completed (Estimation of Crop Yields).

November 1982	Sixth Research Project completed (Socio-economic study by INRS)
January 1983 - May 1984	Project Advisor continues to supervise on-going cooperative activities. Short-term training courses for cooperative staff continue
April 1984	Independent Summative Evaluation
May 1984	Project Advisor departs post
June 1984	Project Activity Completion date
September 1984	Terminal Disbursement date

Procurement Plan

The commodity component of this project is relatively small aside from building materials for construction of the storage hangars which will be procured locally under the construction contract.

The following commodities will be procured under the project in the manner described:

(A) Vehicles - one all terrain (four-wheel drive) vehicle for the US Project Advisor, one $\frac{3}{4}$ -ton pick-up truck for the COR Project Director and staff, one $\frac{3}{4}$ -ton pick-up truck for the MINAGRI Genie Rurale which will supervise construction of the storage hangars, and 10 100 cc motorcycles for the 10 prefectural delegates. Because of lack of maintenance facilities and spare parts for US vehicles in Kigali, a waiver request is submitted as an annex to this paper to permit local procurement of vehicles and motorcycles in Rwanda from code 935 origin, (Western Europe or Japan). POL for all three vehicles and 10 motorcycles, estimated at \$4,000 per year, would be purchased locally. Because of the rigorous conditions under which they will be driven, the truck for the COR Project Director and the 10 motorcycles for the prefectural supervisors are scheduled to be replaced early in the fourth year. Total estimated cost: \$97,000 for vehicles, motorcycles and spare parts and \$20,000 for POL over five years.

In addition, the three research assistants provided under the studies component of the project will require transportation for their 15 months field work. It is proposed that the research

contract include provisions to buy three low-cost passenger sedans, e.g. Toyota Starlet or Peugeot 204, locally and sell them at the end of the 15 month period, returning the sale proceeds to AID. An allowance of up to \$1,000 per vehicle would be permitted for depreciation. Funds to purchase the cars would be advanced to the contractor upon contract execution and subtracted from the balance due to the contractor at the end of the contract, less the depreciation allowance. Vehicles maintenance, insurance and POL would be paid under the contract. This procedure has been used by AID elsewhere in Africa and has proven to be an economical way of providing transportation to contractors on less than a regular two-year tour.

B. Supplies for storage operations in 40 commune warehouses and six satellite units, including scales, grain-cleaning screen, moisture meters, sacks, etc., will be procured. This list may be supplemented by the GOR and US advisor as required. A small amount is added (\$5,000) for supplies and equipment needed for the project by the central contract office of the Department of Cooperatives Promotion. Except for sacks which will be purchased locally, this equipment will be procured in the US by a Procurement agent such as AAPC and air-freighted to Kigali. Supplies required will total about \$45,000, 90 per cent of it procured in the US.

C. Most construction materials will be of local source and origin. A limited number of items such as steel trusses, doors, door frames, roofing sheets, roofing nails and cement will be of local source, but Code 935 origin. Because these items will be purchased individually or in small lots (not exceeding \$2,500 per transaction) and because they will not be specifically imported for the project, they will be procured in accordance with the shelf item rules and therefore no waiver is necessary.

D. Furnishings for the house of the US Project Advisor costing about \$15,000 will be purchased locally or in Kenya.

6. EVALUATION ARRANGEMENTS

Several levels of evaluation are planned for this project as noted in the implementation schedule in the preceding section. Appropriate evaluation aspects will be treated in the following manner.

A. Baseline data - detailed information on the current crop storage situation in Rwanda will be compiled as part of the project's research element.

B. Monitoring, inspections and audits - 1) Members of the DCP staff and Prefectural Delegates (Supervisors) will visit selected commune cooperatives regularly to verify that operations are proceeding smoothly and to discuss problems with coop staff and members. 2) A REDSO/EA engineer will visit several construction sites in each series of hangars to be built. These visits will be coordinated through Genie Rurale, the CCR agency responsible for supervising construction. 3) Cooperative books and records are subject to audit by the DCP. Financial accounts will be maintained at local branches of the Banque Populaire which are also subject to government audit.

C. Formative Evaluation - A mid-term formative evaluation by REDSO/EA is planned early in the third year of the project, (fall of 1981) perhaps employing one outside consultant (a specialist in grain storage or cooperatives). By this time all 40 storage units should be complete and cooperatives functioning long enough to provide a measurement of effectiveness. The final evaluation of the CLUSA OPG some six months earlier should provide standards and a useful basis for comparison.

D. Summative Evaluation - A final evaluation is planned for 1984 a few months before the project terminates, probably using a three member outside team, which has been provided for in the project budget. The results of this evaluation will determine to a large extent whether additional storage units are built and cooperatives developed under an AID-funded follow-on phase to the project.

7. CONDITION, COVENANTS AND NEGOTIATING STATUS

Conditions Precedent -

The Project Agreement will include the following conditions, Precedent: 1) Within 60 days following execution of the Project Agreement, the GOR will notify AAC/Kigali in writing of the name of the official in the Department of Cooperative Promotion charged with responsibility for implementing the project on behalf of the GOR. 2) A detailed plan on the operation and use of the revolving credit fund, including eligibility criteria, interest rate structure and management procedures, is required from the GOR implementing agency (DCP) prior to first disbursement under the fund.

Covenants -

The Project Agreement will include the following covenants: 1) The GOR will provide suitable land on which to construct the storage hangars in accordance with site selection criteria. 2) The GOR will provide the legal authority for the establishment of necessary new cooperatives. 3) The GOR will ensure that EPA-approved insecticides are purchased by the cooperatives under the project revolving fund for resale to members and that all appropriate safety regulations governing the use of those insecticides are strictly observed. 4) The GOR Dept. of Cooperative Promotion (DCP) will prepare in coordination with the U.S. manager of the CLUSA OFG a training plan for this project outlining the training requirement at both the DCP and commune levels with respect to numbers of personnel and substantive material.

Negotiating Status -

The project was discussed in detail in a meeting at the Ministry of Foreign Affairs on July 31, 1978, between the USAID project design team and a Government of Rwanda delegation, representing the Ministry of Foreign Affairs, the Ministry of Agriculture, Ministry of Plan, Ministry of Social Affairs, CPROVIA and GRENARWA. All parties agreed that the project should proceed along the lines described in this PP. Subsequently, a diplomatic note (No. 84) of August 8, 1978, from the U.S. Embassy to the Ministry of Foreign Affairs outlined the major elements of the project. Replying to this note, the Ministry of Foreign Affairs responded on October 5, 1978 indicating its desire to proceed immediately to prepare the project for implementation.

LOGICAL FRAMEWORK

Rwanda Local Crop Storage

ANNEX A

	<u>Objectively Verifiable Indicators</u>	<u>Means of Verification</u>	<u>Important Assumptions</u>	
Goal :	To increase farm family income in real terms by offering them fair market value (correct weight and proximity to official price) for both sales and purchases.	Cereal and pulse production bought by project-assisted coops, at or near official prices compared to average trader prices.	National Income Statistics Statistics from Prefectures and Price Commission Records of Cooperative	No unusually adverse weather conditions reduce food production per capita below 1974 levels Reference to official prices is based on current GOR price policy. AID and others have recommended to GOR that price policy be abandoned and assumption is that this will be done during life of project
	To improve cereal and pulse availability to small farmers throughout the year at more stable prices.	Cereal and pulse production sold by project coops to members. (Sales occur primarily during "hungry season")	Project Records Market prices	GOR commitment to price stabilization at fair returns to farmers and fair cost to consumers. Commercial traders do not attempt to disrupt project.
Purpose:	To establish food storage and marketing system at the local level for cereals and pulses which is more favorable to small farmers.	Establishment of 40 storage units for a total capacity of 4,000 tons in 40 different communes. Completion of planned training at all levels	GOR Records of MINASO-COOP (DCP) and MINAGRI (Genie Rurale)	Farmers willing to utilize coop services for both storage and marketing Coops will be self-supporting from earnings received from 5 f RW/kg selling margin

To reduce seasonal and regional price fluctuations at levels which approximate official prices (ensuring fair weights).		Comparison of price fluctuations with previous years					Statistics from Prefectures and Price Commission	Sufficient operating capital available for coops to purchase all production offered for sale. GRENIARWA and/or other buyers available when needed.	
To reduce storage losses both on farm and in commune silos		Actual grain measurement and weight by cooperatives before and after storage					Records of Cooperatives Project evaluation	Farmers will apply storage methods demonstrated, including use of insecticides.	
Outputs:	1. Expanded storage capacity through coops.	1. Coops and hangars (incl satellites)	FY79	80	81	82	83	Records of Cooperatives	Farmers receptive to storage services proposed by project.
	2. Trained DCP and coop personnel	2. Coop and DCP staff trained	-	10	21	15	-	Records and Audits of GOR (DCP) Research reports by ISAR and INRR.	Receptive coops identified and developed.
	3. Improved on-farm storage and sales of chemicals	3. No. of Coop members (cumulative)	10	30	40	20	20	Prefectural inspections	Coop personnel available for training.
	4. Research data on storage/marketing related issues	4. Reduction in on-farm storage losses - tons saved per commune assuming 5% current loss	-	3,000	6,000	10,000	16,000	Mid-term project evaluation	Qualified contractors can be found and storage units built on timely basis
		5. Total malathion sold on-farm (Kgs)	16	32	50	68	87	Site inspections by GOR Genie Rurale and REDSO engineer	Typical coop will start with nucleus of about 100 and will grow during life of project to average size of 400 members.
			275	545	910	1,225	1,590		

Inputs : <u>AID</u>	<u>FY79</u>	<u>FY80</u>	<u>FY81</u> (\$ 000)	<u>FY82</u>	<u>FY83</u>		
Technical Assistance						DCP records and audits	AID/GOR make inputs available;
Project Advisor	112	100	111	96	104	Project records	contractors provide personnel
Short-term consultants	20	30	10			BP records	on timely basis
Construction						Prefecture reports	
Hangars	153	342	353			Project evaluations	MINAGRI extension agents in
Satellites		52					place and adequately trained
Research							It is feasible for coops to
Commodities	86	159	142	64			make use of revolving credit
3 vehicles, 10 motor-	64	4	4	41	4		fund through accounts at
cycles (+ replacem'ts)							Banque Populaire (BP) and
Storage supplies	13	17	12				its 60 rural branches
Training	10	35	35	20			Suitable physical facilities
Revolving Fund	80	180	140				for training available pending
Evaluation			10		30		construction of planned
							training center.
<u>GOR</u>							
Land	20	42	30				
Construction and design							
Supervision	8	17	18				
MINASOCOOP DCP salaries	14	14	14	14	14		
ISAR & INRS salaries	9	16	14	6			
Community participation	10	18	15				

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5C(1) - COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Security Supporting Assistance funds.

A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent pattern of gross violations of internationally recognized human rights?
2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics 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 U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?
3. FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?
4. FAA Sec. 620(c). If assistance is to 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) debt is not denied or contested by such government?
5. 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?

A.1. Whether viewing the GOR's 5-year Development Plan (1977-81) which is similar to the Agency's own mandates, or taking into account the Government's actions, e.g., decentralization of taxation and political autonomy to local levels, there is ample evidence to demonstrate that U.S. assistance directly benefits the needy. Rwanda has not engaged in a consistent pattern of violation of human rights.

A.2. No

A.3. Rwanda is not a part of or controlled by the international Communist movement.

A.4. No

A.5. No

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- 6. FAA Sec. 620(a), 620(f); App. Sec. 107, 114. Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Cambodia, Laos, Cuba, Uganda, Mozambique, or Angola? A.6. No

- 7. FAA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? A.7. No

- 8. 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? A.8. There has been no instance in which the GOR has had to take action in this regard.

- 9. FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason? A.9. Not applicable.

- 10. FAA Sec. 620(o); Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters,
 - a. has any deduction required by Fishermen's Protective Act been made?
 - b. has complete denial of assistance been considered by AID Administrator?A.10. Not applicable.

- 11. FAA Sec. 620(q); App. Sec. 503. (a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default? A.11. Not applicable.

- 12. FAA Sec. 620(s). "If contemplated assistance is development loan (including Alliance loan) or security supporting assistance, has the Administrator taken into account the percentage of the country's budget which is for military expenditures, the amount of foreign exchange spent on military equipment and the amount spent for the purchase of sophisticated weapons systems?" (An affirmative answer may refer to the record of the taking into account, e.g.: "Yes as reported in annual report on implementation of Sec. 620(s).") This report is prepared at the time of approval by the Administrator of the Operational Year Budget. A.12. Not applicable.

A12

Upward changes in the Sec. 620(s) factors occurring in the course of the year, of sufficient significance to indicate that an affirmative answer might need review, should still be reported, but the statutory checklist will not normally be the preferred vehicle to do so.)

13. 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?

A.13. Diplomatic relations have not been severed.

14. 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?

A.14. From time to time the GOR has been slow to meet project obligations. However, in general there is no chronic arrearage situation.

15. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?

A.15. No

16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

A.16. No

17. 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 detonated a nuclear device after August 3, 1977 although not a "nuclear-weapon State" under the nonproliferation treaty?

A.17. No

18. FAA Sec. 501. Has the country denied its citizens the right or opportunity to emigrate?

A.18. No

B. FUNDING CRITERIA FOR COUNTRY

I. Development Assistance Country Criteria

- a. FAA Sec. 102(c), (d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.

B.1.a. Reliable data are difficult to obtain. What does exist indicates that presently and during the recent past Rwanda has been barely holding its own. This has been caused by the country's general poverty coupled with questionable GOR & other donor development policies in the past. However, there is no question that the GOR has taken into account BFN criteria.

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b. FAA Sec. 104(d)(1). If appropriate, is this development (including Sahel) activity designed to build motivation for smaller families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor?

c. FAA Sec. 201(b)(5), (7) & (8); Sec. 208; 211(a)(4), (7). Describe extent to which country is:

- (1) Making appropriate efforts to increase food production and improve means for food storage and distribution.
- (2) Creating a favorable climate for foreign and domestic private enterprise and investment.
- (3) Increasing the public's role in the developmental process.
- (4) (a) Allocating available budgetary resources to development.
(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.
- (5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.
- (6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

d. FAA Sec. 201(b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?

e. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, has Congress specifically authorized such use of funds, or is assistance for population programs, humanitarian aid through international organizations, or regional programs?

B.1.b. The AID program in Rwanda is almost entirely concentrated on increasing well-being while encouraging smaller families. The looming food/population crisis itself dictates a program which helps increase food availability while decreasing the population growth rate.

B.1.c.(1) From 1974-76, the GOR undertook extensive preparatory work on a rural development plan (the cornerstone of the Five-Year Development Plan) which focuses on food crop intensification at the local farm level. This in turn is to be linked with soil conservation and supported by extension services & necessary infrastructure (rural roads, storage facilities, water, electricity). These improvements together with the development of simple health facilities, schools and training centers in rural areas are to rely as much as possible on local labor and other readily available local resources. This program got underway in 1978.

B.1.c.(2) Under present laws the first sizeable U.S. investment is nearly complete. The GOR is in the process of revising the investment code to make both foreign & domestic private investments even more attractive.

B.1.c.(3) A continuing feature of GOR's development strategy remains local universal voluntary labor & devolution of responsibility & authority to local level administrative units.

B.1.c.(4a) Under the circumstances of Rwanda's poverty & political situation vis-a-vis its neighbors especially Burundi and Uganda, the GOR is allocating reasonable resources to development.

B.1.c.(5) A good deal of authority has been delegated to local administrative units including the right to tax. An educational reform will be undertaken in 1978 which reorients all curricula to rural life & agriculture production. In addition, there are plans to revise the investment law to make domestic & foreign private investments more attractive.

B.1.c.(6) See B.1.c.(1) above.

B.1.d. Yes

B.1.e. No

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2. Security Supporting Assistance Country Criteria

B.2.a. Not applicable.

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this Section?

b. FAA Sec. 531. Is the Assistance to be furnished to a friendly country, organization, or body eligible to receive assistance?

B.2.b. Not applicable.

c. FAA Sec. 533(c)(2). Will assistance under the Southern African Special Requirements fund be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests?

B.2.c. Not applicable.

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?

B.2.d. Not applicable.

e. App. Sec. 113. Will security assistance be provided for the purpose of aiding directly 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?

B.2.e. Not applicable.

f. FAA Sec. 620B. Will security supporting assistance be furnished to Argentina after September 30, 1978?

B.2.f. Not applicable.

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5C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? IDENTIFY. HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

The standard item checklist has been reviewed for this project.

A. GENERAL CRITERIA FOR PROJECT.

1. App. Unnumbered; FAA Sec. 653(b); Sec. 671 A.1. This project was first included in the FY 79 CP. A CN maybe required because of a change in funding levels. The project is presently carried in the OYB at \$230,000.
 - (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project;
 - (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure
2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) A.2. Yes engineering, financial, and 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 A.3. Not applicable. 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); App. Sec. 101. If for A.4. Not applicable. water or water-related land resource construction, has project met the standards and criteria as per *the Principles and Standards for Planning Water and Related Land Resources* dated October 25, 1973?
5. FAA Sec. 611(e). If project is capital A.5. Yes assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?
6. FAA Sec. 209, 619. Is project susceptible A.6. No. The nature of the project does not of execution as part of regional or multi-lateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans to the maximum extent appropriate? lend itself to a regional or multilateral approach primarily because the U.S. has the predominant expertise in storage & related activities.

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7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). 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; (c) encourage development and use of cooperatives, 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.

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

9. FAA Sec. 612(b); Sec. 636(h). 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 to meet the cost of contractual and other services.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?

11. ISA 14. Are any FAA funds for FY 78 being used in this Project to construct, operate, maintain, or supply fuel for, any nuclear powerplant under an agreement for cooperation between the United States and any other country?

A.7.(a) The project deals with subsistence crops and deals therefore only with internal markets.

(b) The project will provide an incentive to private traders to be more competitive and discourage local monopolistic practices.

(c) Stabilization of prices and greater income should enhance the creation of cooperatives and local credit facilities.

(d) See b. above.

(e) Price stabilization and increased small farmer income will lead to greater agriculture efficiency.

(f) Not applicable except in supporting the credit union movement.

A.8. A local level storage program will not encourage U.S. private trade and investment.

A.9. It is difficult to ask the government of this, one of the poorest countries, to do more than provide land and pay salaries of local personnel assigned to this project.

A.10. No

A.11. No

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

B.1.a. By stabilizing prices & increasing incomes of small farmers, the latter will benefit. At the same time this should encourage the formation of small farmer groupings (cooperatives) & local credit institutions.

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ANNEX B

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b. FAA Sec. 103, 103A, 104, 105, 106, 107. [Is assistance being made available: [Include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]

- (1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers; See B .1.a above
- (2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor; B1.b.2 Not applicable.
- (3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development; B1.b.3 Not applicable.
- (4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is: B1.b.4 Not applicable.
- (a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;
- (b) to help alleviate energy problem;
- (c) research into, and evaluation of, economic development processes and techniques;
- (d) reconstruction after natural or manmade disaster;
- (e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;
- (f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

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81b

(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

d. 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 recipient country "relatively least developed"?

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

f. 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 civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

Bl.b.c. The Rwandan Government will contribute land, personnel & their salaries. However, it may be necessary to request a waiver of the 25% requirement.

Bl.b.d. Rwanda is "relatively least developed".

The project will:

- 1) encourage the development of local level institutions (e.g., coops)
- 2) lead to increased food production
- 3) train technicians
- 4) with increased food, nutritional levels should rise
- 5) see b. above
- 6) women play a key role in the agriculture sector. This project will impact on them directly in terms of agriculture production increases but any other impact on integration of women will be slight.

To the extent this project deals with agriculture, it recognizes the most important sector of the country. This is also true to the extent that the development of local institutions such as cooperatives and local credit facilities are encouraged.

Part I

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ANNEX B

B1

g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). 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; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

The project is consistent with Rwanda's Five-Year Development Plan and AID's New Directions and BHN strategy. The project will lead to increased food production through price stabilization and incentives to small farmer production. The project will have a long-term effect and provide lasting benefits. All of this as well as economic and technical analyses are contained in the Project Paper.

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

Not applicable.

2. Development Assistance Project Criteria (Loans only)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

B1.2.a. Not applicable.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

b. Not applicable.

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

c. Not applicable.

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

d. Not applicable.

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ANNEX B

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e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

e. Not applicable.

f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

f. Not applicable.

3. Project Criteria Solely for Security Supporting Assistance

B2.3.a. Not applicable.

a. FAA Sec. 531. How will this assistance support promote economic or political stability?

b. FAA Sec. 533(c)(1). *Will assistance under the Southern African Special Requirements Fund be used for military, guerrilla, or paramilitary activities?*

B2.3.b. Not applicable.

4. Additional Criteria for Alliance for Progress

4.a. Not applicable.

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

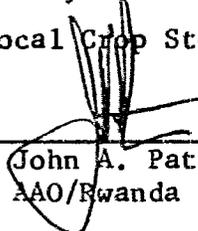
a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

b. Not applicable.

611(e) Certification
Rwanda - Local Crop Storage

I, John A. Patterson, the principal officer of The Agency for International Development in Rwanda, having taken into account, among other things, the demonstrated capacity and willingness of the Government of Rwanda to provide budgetary support for recurrent and development costs incident to A.I.D. projects in Rwanda, particularly the Food Storage and Marketing Project, do hereby certify that in my judgement the Government of Rwanda has shown both the financial and human resource capability to effectively maintain and utilize the assistance provided under the Local Crop Storage Project.



John A. Patterson
AAO/Rwanda

recd. 10/10

Y. B. NZIZA
REPUBLIQUE RWANDAISE

Kigali, le

N° /04.03.D1/CCOP/ST

3185



MINISTRE DES AFFAIRES ETRANGERES
ET DE LA COOPERATION
B.P. 179 KIGALI

ORIGINAL

Change
Amissee

Att - action

Annexe :

Ref. N° :

Objet :

Le Ministère des Affaires Etrangères et de la Coopération de la République Rwandaise présente ses compliments à l'Ambassade des Etats-Unis d'Amérique à Kigali et, se référant à sa note verbale n° 54 du 8 août 1978, concernant un programme de coopération pour supporter un projet national de stockage de vivres, a l'honneur d'informer l'Ambassade que le Gouvernement Rwandais approuve le programme d'exécution de la première phase.

Le Ministère saurait gré à l'Ambassade de bien vouloir hâter l'avancement du dossier pour que les travaux puissent démarrer aussitôt que possible.

Le Ministère des Affaires Etrangères et de la Coopération de la République Rwandaise remercie l'Ambassade des Etats-Unis d'Amérique à Kigali de son aimable entremise et saisit cette occasion pour lui renouveler les assurances de sa haute considération.

Kigali, le 5 octobre 1978.

AMBASSADE DES ETATS-UNIS
D'AMERIQUE
A
KIGALI



TRANSLATION

Republic of Rwanda,
Ministry of Foreign Affairs and Cooperatives,
P.O. Box 179,
Kigali.

Ref: No. /04.03.DI/COOP/BIL

The Ministry of Foreign Affairs and Cooperatives of the Republic of Rwanda presents its compliments to the Embassy of U.S. of America in Kigali and, in referring to its diplomatic note No. 84 of 8 August, 1978 concerning a program of cooperation to support a national project of (local) crop storage, has the honor of informing the Embassy that the Rwandan Government approves the first phase of the project.*

The Ministry will be obliged if the Embassy could proceed rapidly with the completion of project preparation so that work under the project can be begun as soon as possible.

The Ministry of Foreign Affairs and Cooperatives of the Republic of Rwanda thanks the Embassy of U.S. of America in Kigali for its useful role in arranging for this project and would like to take this occasion to renew to the Embassy the assurance of its highest consideration.

Kigali, 5 October, 1978
(Official Seal of the
Ministry)

Embassy of U.S. of America
in Kigali.

*/ This refers to the five-year program presented in the present Project Paper. The GOR is hopeful that AID will also support a second phase for the continuation of this program. ___/

R 311042Z MAY 77
FM SECSTATE WASHDC
TO RUEAHC/AMEMBASSY KIGALI 4362
INFO RUEAHI/AMEMBASSY NAIROBI 8766/67
BT

UNCLASSIFIED

STATE 124952.

AIDAC, NAIROBI FOR REDSO/EA

E.O. 11652:N/W

TAGS:

SUBJECT: REVIEW OF LOCAL CROP STORAGE PID

1. AFR PROJECT COMMITTEE REVIEWED LOCAL CROP STORAGE PROJECT PID 5/10/77. PID APPROVED FOR FURTHER PROJECT DEVELOPMENT WITH FOLLOWING CONCERNS EXPRESSED BY COMMITTEE WHICH SHOULD BE CONSIDERED IN CONTEXT FURTHER DEVELOPMENT OF PROJECT.

2. THE ROLE OF THE GOR CONCERNING THE COOPS AND STORAGE FACILITIES IS NOT CLEAR. ARE COOPS GOR ENTITIES OR ARE THEY PRIVATE? WHO WOULD BE PROJECT GRANTEE? DOES PROJECT ANTICIPATE REPLACING EXISTING PRIVATE ENTREPRENEURS? THIS SHOULD BE CLEARLY EXPLAINED.

3. ON-FARM STORAGE APPEARS BE OF POSSIBLY GREATER BENEFIT TO FARMER THAN STORAGE-MARKETING COOP SINCE MUCH OF PRODUCTION IS FOR HOME CONSUMPTION. CONSIDERATION SHOULD BE GIVEN TO WHETHER AN ON-FARM STORAGE PROJECT MIGHT BE A MORE COST EFFECTIVE ALTERNATIVE WITH LESS ADMINISTRATIVE COMPLEXITY AND REQUIREMENT FOR EXTERNAL TRAINING. SIMPLE ON FARM STORAGE USING PLASTIC BAGS STORED IN HOUSE RAFTERS HAS PROVEN EFFECTIVE AND INEXPENSIVE IN SOME COUNTRIES.

4. ARE THE COOPS WHICH WOULD PARTICIPATE IN THE PROJECT MANAGERIALLY AND FINANCIALLY SOUND? WOULD CONSIDERABLE TECHNICAL ASSISTANCE AND TRAINING BE REQUIRED TO UPGRADE THEIR MANAGEMENT TO ENABLE THEM TO EFFECTIVELY PARTICIPATE IN THE PROJECT AND ENSURE ITS SUCCESS?

5. HOW WILL THE ENTIRE GRAIN STORAGE AND MARKETING SYSTEM WORK? THIS REQUIRES A DETAILED EXPLANATION. ARE THE OPERATIONS OF THE COOP FINANCED BY THE GRAIN STORAGE FEE? THIS FEE APPEARS HIGH WHEN VIEWED IN RELATION TO THE SALE PRICE OF GRAIN AT HARVEST TIME. WILL THE COOP BUY GRAIN FROM THE FARMER AND SELL IT ON THE OUTSIDE LATER USING THE MARGIN TO FINANCE ITS OPERATIONS? WHAT IS TO PREVENT THE FARMER FROM WITHDRAWING HIS GRAIN FROM STORAGE AND SELLING IT ON THE OUTSIDE AT A HIGHER PRICE THAN WHAT HE WOULD RECEIVE AT THE COOP? WHAT

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PROCEDURES WILL BE USED TO MAKE SURE THAT CAPITAL FUNDS FOR GRAIN PURCHASES AND FUNDS FOR OPERATING EXPENSES WILL BE KEPT SEPARATE TO ENSURE LONG RANGE FINANCIAL VIABILITY OF THE COOPS.

6. WILL FARMERS CONSENT TO STORE FOOD AWAY FROM HOME? WILL THEIR VIEW OF COOP OPERATIONS DIFFER FROM THOSE SPONSORED BY THE CATHOLIC CHURCH? A CLOSE LOOK MUST BE TAKEN AT THE TECHNIQUES AND EXPERIENCE OF THE CRS AND CLUSA GRAIN STORAGE ACTIVITIES WHEN DESIGNING THIS PROJECT.

7. THE STORAGE FACILITIES APPEAR TO HAVE NO PROVISION FOR A GRAIN DRYING COMPONENT. IS THIS NEEDED? ADDITIONALLY, MENTION IS MADE OF STORAGE FACILITIES BEING HERMETICALLY SEALED. IS THIS FEASIBLE? STORAGE TECHNIQUES NEED FURTHER EXPLANATION.

8. STORAGE CONSTRUCTION COSTS APPEAR EXTREMELY HIGH; CONSIDERABLY MORE ON A PER TON BASIS THAN THAT PROPOSED UNDER THE CLUSA CPG PROJECT PROPOSAL. THIS REQUIRES A THOROUGH EXPLANATION. WHO WILL DESIGN THE FACILITIES? QUALIFIED ENGINEERS MUST REVIEW THE CONSTRUCTION PLANS AND 611(A) ISSUES MUST BE RESOLVED PRIOR TO PP SUBMISSION. ASSUME PROCUREMENT LOCAL BRICKS NO PROBLEM REGARDLESS WHERE STORAGE SITES SELECTED.

9. KANSAS STATE STUDY OF RWANDA GRAIN STORAGE SITUATION CONCLUDED THAT GREAT DEAL TRAINING REQUIRED SINCE LITTLE LOCAL EXPERTISE CURRENTLY EXISTS. MOST TRAINING SHOULD BE SCHEDULED AT BEGINNING OF PROJECT (OR IF FEASIBLE BEFORE PROJECT BEGINS) SO THAT QUALIFIED PEOPLE AVAILABLE LATER DURING PROJECT IMPLEMENTATION.

CONSIDERATION SHOULD BE GIVEN TO USING AFRICA REGIONAL TRAINING PROJECT AND/OR CRS AND CLUSA PROJECT FACILITIES FOR TRAINING.

10. CAN GOR AND/OR COOPS HANDLE RECURRENT COSTS AFTER TERMINATION OF A.I.D. PROJECT?

11. GOR 25 PERCENT CONTRIBUTION SHOULD NOT BE WAIVED PENDING FULL COSTING OF GOR CONTRIBUTION, I.E. BUILDINGS, LAND, ETC. IF WAIVER THEN BELIEVED NECESSARY A FULL JUSTIFICATION WILL BE REQUIRED ON A PROJECT BY PROJECT BASIS PER HANDBOOK 3, APPENDIX 5D.

12. WILL WAIVER OF U.S. SOURCE AND ORIGIN REQUIREMENT BE NEEDED FOR VEHICLES? THIS MUST BE EXPLAINED.

13. CDG SHOULD PREPARE SUGGESTED SCOPE OF WORK FOR PAP DESIGN TEAM. AID/W PREPARED REVIEW AND ADVISE AS NECESSARY.

14. ABOVE COMMENTS RELATE TO SPECIFIC PROJECT ANALYSIS AND CONCERNS. MISSION SHOULD BE AWARE, HOWEVER, THAT

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STATUS OF PROJECT WITH RESPECT TO INCLUSION IN
FY 79 AGENCY ONE SUBMISSION OF PROPOSED FY 79 CP STILL
TO BE DETERMINED. SUCH A DETERMINATION WILL DEPEND UPON
SEVERAL FACTORS INCLUDING (A) THE DEGREE TO WHICH THIS
PROJECT AND THE THREE OTHER PROPOSED PROJECTS ARE CON-
SISTENT WITH AID STRATEGY THAT WILL BE REFLECTED IN
THE UPDATED CAP SUBSTITUTE (B) OVERALL COUNTRY PROGRAM
LEVELS DETERMINED DURING THE FORTHCOMING ABS/ZEPD-BASED
BUDGET REVIEW AND (C) INFORMATION DEVELOPED DURING
PREPARATION OF THE PPP. DECONTROL UPON RECEIPT. CHRISTOPHER

BT
#4952

UNCLASSIFIED

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

FROM: AFR/DR

SUBJECT: Vehicle Procurement Waiver (Source/Origin)

Problem: Request for a procurement source waiver from Geographic Code 000 (U.S.A.) to Geographic Code 935 (Special Free World).

- a. Cooperating Country: Rwanda
- b. Authorizing Document: Project Paper
- c. Project: Local Crop Storage (696-0107)
- d. Nature of Funding: Grant
- e. Description of Commodities: One All-terrain Vehicle
Three 3/4-ton Pickup Trucks
Three Small Sedans
Twenty Motorcycles (100 cc)
- f. Approximate Value: \$125,000
- g. Probable Origin: France, Japan and Brazil
- h. Source: Rwanda

Discussion: Section 636(i) of the Foreign Assistance Act of 1961, as amended, prohibits A.I.D. from purchasing motor vehicles unless such vehicles are manufactured in the United States. Section 636 (i) does provide, however, that "...where special circumstances exist, the President is authorized to waive the provision of this act in order to carry out the purpose of this act." That authority has been delegated to you.

Experience with U.S.-manufactured vehicles in Rwanda (a few in the possession of the U.S. Embassy in Kigali and A.I.D.'s Food Storage and Marketing Project) indicates that frequent breakdowns are the rule rather than the exception. Minor breakdowns can prevent operation of a U.S.-manufactured vehicle for weeks while spare parts are ordered from the U.S. Even if the full range of spare parts required to maintain the vehicles were available, competent repair facilities outside the U.S. Embassy are non-existent. On the other hand, Peugeot, Toyota and Volkswagen are the largest dealers of foreign made cars in the country and carry large quantities of parts necessary for repairs and maintenance. They also have competent mechanics who have been trained in the factories of the respective manufacturers.

Primary Justification: The vehicles covered by this waiver request, which can be serviced and repaired locally, are essential to the effective implementation of the project; whereas, service capabilities and spare parts support are not available for U.S.-manufactured vehicles.

Recommendation: Based on the foregoing, it is recommended that (1) you conclude that special circumstances exist which justify the waiver of the requirement of procurement of U.S.-manufactured vehicles under the FAA Section 636 (i), and (2) you certify that exclusion of procurement from the sources requested herein would seriously impede attainment of the United States foreign policy objectives and objectives of the Foreign Assistance Program.

APPROVED: _____

[Handwritten Signature]

DISAPPROVED: _____

DATE: _____

3/5/79

memorandum

- 1 -

DATE: April 5, 1978

TO: Ted G. Lee, AFR/DR/CAWARAP *Q*

SUBJECT: Rwanda - Local Crop Storage (696-0107); Initial Environmental Examination

TO: See Distribution *LCJ*

Mrs. Butcher, AA/AFR, approved on April 3, 1978, the Negative Determination as recommended by REDSO/EA in the IEE prepared for this project.

Your copy of the documentation pertinent to this matter is attached.

Attachments:

Action Memo dated 3/30/78 from Withers to AA/AFR
 IEE Cover Sheet as approved by AA/AFR
 IEE Text and Impact Identification Form

DISTRIBUTION:

REDSO/EA, Mr. Louis Cohen (original of all attachments)
 AAO/Kigali, Mr. John Patterson (cc of attachments)
 AFR/DR/SDP, Ms. Bessie Boyd (cc of attachments)



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR AFRICA

MAR 30 1978

FROM : AFR/DR, John L. Withers *JLW*

SUBJECT: Rwanda - Local Crop Storage Project (696-0107); Initial Environmental Examination

Problem:

REDSO/Nairobi has prepared an Initial Environmental Examination (IEE) for this project and finds that a Negative Determination is warranted. Your approval of such a determination is required.

Discussion:

The PID for the Rwanda Local Crop Storage project, proposed for FY 79 funding, was approved per STATE 124952 dated May 31, 1977. Reflecting the procedures in effect at that time, the PID contained no IEE.

Following the Administrator's June 1977 decision to eliminate the PRP, instructions were issued which require that PIDs submitted for AID/W approval include an IEE. The AID/W project committee therefore asked the project designers (i.e., REDSO/Nairobi) to submit an IEE for the Local Crop Storage project as early in the design process as possible.

REDSO/Nairobi has submitted an IEE as requested (copy attached) and finds that a Negative Determination is warranted. The AID/W project committee concurs in this finding.

Recommendation:

That you approve the Negative Determination as recommended in the IEE by signing in the space provided on the attached IEE cover sheet.

Attachment: a/s

CLEARANCES:

AFR/DR/CAWARAP:GThompson (draft) *A*

AFR/DR :JKelly *JK*

AFR/DR/SDP :BBoyd *BB*

AFR/DR/ARD :WFuglie (draft) *W*

AFR/CAWA :MWiseman (draft) *M*

GC/AFR :JPatterson *JP*

DRAFT:AFR/DR/CAWARAP:IGLee:mb:3/24/78:29066 *IG*

Initial Environmental Examination

Project Location: Rwanda

Project Title: Local Crop Storage

Funding: \$1,480,000 (Grant) FY 79

Life of Project: 5 years

IEE Prepared By: REDSO/EA, Engineering, November 1977

Environmental Action Recommended: Negative Determination

Concurrence:

Madison Broadnax

Madison Broadnax

Acting Director, REDSO/EA

Boyd 3/24/78
Bessie Boyd, AFR/DR

Date:

11/23/77

Assistant Administrator's Decision:

WFB Recommendation
Approved

Date:

12/1/78

- 4 -

1. Project Description

The project is aimed directly at increasing food availability to the people of Rwanda by reducing food crop loss. The initial phase of the project will be a pilot/demonstration activity, which would provide three vehicles, five to seven small crop storage warehouses (20 to 35 MT capacity each), establishment of cooperatives and participant training. Based upon project evaluation at the end of this initial phase, the second phase would then be designed and implemented for expansion of storage facilities (approximately 30 additional warehouses), cooperatives and training.

Each warehouse would be of locally made bricks, having three to four silo vaults for bulk storage which could be hermetically sealed. A small office with a built-in concrete safe, and an area for about 18% bagged storage would also be provided. Construction would be carried out by local labor on a self-help basis, a traditional system in Rwanda.

The cooperative warehouse to be established would serve area farmers, buying from and selling to the farmers at stable prices during all seasons, thereby providing a permanent market. Cooperatives could also serve as sales outlets, commercially selling that portion of the stored crop not returned to the farmers. Previous experience with warehouses in Rwanda, some of it under an AID-funded Catholic Relief Services project, has shown that the storage provided reduces crop loss to under 3%.

Training activities will be provided to give Rwandan personnel training in operations and management of silos, storage methods, cooperative and business management practices, etc..

- 5 -

Training would take place in Rwanda, other African countries and the U.S..

II. Discussion of Impacts

A. Warehouse Construction

The Government of Rwanda (GOR) will provide the land on which the warehouses and offices will be constructed. Warehouses will be located so that they will provide storage facilities for the majority of farmers in reasonably productive areas. The land will be community owned, and will be allocated by a village committee. Site selection by local inhabitants provides for the utmost consideration of present and future land use, relation of the site to transportation facilities, and full participation by the community. Thus, negative impacts on land use will be minimized due to local involvement in construction site selection.

The construction technology using bricks is established and building materials are readily available. Good quality fired bricks are made locally throughout Rwanda. Extraction of small quantities of clay will be carried out at scattered sites throughout the country but, there will be no significant negative impact on the physical environment.

Peace Corps volunteers will supervise the actual construction using semi-skilled and unskilled village labor.

Once constructed, the warehouses will provide numerous environmental benefits. Presently, Rwandan farmers retain approximately 50% of their food crops for on-farm consumption. These crops, placed in traditional storage facilities, suffer upto 25% loss from mold, insects and rodents within two to three months after deposit. The other 50% of the crops are sold after harvesting,

- 6 -

with approximately 75% of these being subsequently bought back by the farmers during the "hungry season". Thus, provision of the warehouses will impact positively on the socio-economic and public health environments of the farm communities. Farmers will be allowed higher income due to reduced storage loss and higher prices obtained through improved marketing structures, and improved health through better year-round nutritional intake and a lowered incidence of insect and rodent infestation.

B. Establishment of Cooperatives and Training Programs

The cooperatives will be established under the GOR Ministry of Cooperatives. The training programs will provide for at least one manager and one assistant manager per cooperative warehouse. Foreign training will be provided for project leaders selected from the Ministry. The environmental benefits to be attained through the cooperatives and training are correlated with those of warehouse construction, with no negative impacts being foreseen.

III. Recommendation

The project very positively impacts on the socio-economic and public health environments by enabling small farmers to achieve higher incomes, increasing the availability of food to them on a year-round basis, and eliminating on-farm habitates for insects and rodents. There will be no impacts on land use and only minor negative impacts as a result of extraction of clay to be used as building materials. Thus, a negative determination is recommended for the project.

IMPACT IDENTIFICATION AND EVALUATION FORM

<u>Impact Areas and Sub-areas 1/</u>	<u>Impact Identification and Evaluation 2/</u>
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population _____	N _____
b. Extracting natural resources _____	L _____
c. Land clearing _____	L _____
d. Changing soil character _____	N _____
2. Altering natural defenses _____	N _____
3. Foreclosing important uses _____	N _____
4. Jeopardizing man or his works _____	N _____
5. Traffic Access _____	Y _____
6. <u>Land Use Planning</u> _____	L _____
7. <u>Squatter, other development</u> _____	N _____
B. WATER QUALITY	
1. Physical state of water _____	N _____
2. Chemical and biological states _____	Y _____
3. Ecological balance _____	N _____
4. Other factors _____	
_____	_____
_____	_____

1/ See Explanatory Notes for this form.

2/ Use the following symbols: N - No environmental impact
 L - Little environmental impact
 M - Moderate environmental impact
 H - High environmental impact
 U - Unknown environmental impact

IMPACT IDENTIFICATION AND EVALUATION FORM

C. ATMOSPHERIC

- 1. Air additives _____ N
- 2. Air pollution _____ N
- 3. Noise pollution _____ N
- 4. _____
- _____
- _____

D. NATURAL RESOURCES

- 1. Diversion, altered use of water _____ N
- 2. Irreversible, inefficient commitments _____ N
- 3. Wildlife _____ N
- _____
- _____

E. CULTURAL

- 1. Altering physical symbols _____ N
- 2. Dilution of cultural traditions _____ L
- _____
- _____

F. SOCIOECONOMIC

- 1. Changes in economic/employment patterns _____ L
- 2. Changes in population _____ N
- 3. Changes in cultural patterns _____ L
- _____
- _____

IMPACT IDENTIFICATION AND EVALUATION FORM

G. HEALTH

- 1. Changing a natural environment _____ I _____
- 2. Eliminating an ecosystem element _____ N _____
- 3. New pathways for disease vectors _____ N _____
- 4. Safety provisions _____ N _____

H. GENERAL

- 1. International impacts _____ N _____
- 2. Controversial impacts _____ N _____
- 3. Larger program impacts _____ N _____
- 4. Aesthetics _____ N _____

I. OTHER POSSIBLE IMPACTS (not listed above) -

See attached Discussion of Impacts.

Initial Environmental Examination Amendment

Project Location : Rwanda

Project Title : Local Crop Storage (696-0107)

Funding : \$2,573,000 (Grant) FY 79

Life of Project : 5 years

IEE Prepared By : REDSO/EA, AAO/Kigali

Environmental Action Recommended: Negative Determination

Concurrence : Louis A. Cohen, Director, REDSO/EA
(see PP facesheet for signature)

Bessie Boyd, AFR/DR B. Boyd

Assistant Administrator's Decision on Negative Determination

Approved [Signature]

Disapproved _____

Date 3/9/79

[Signature]
Coler T. Butcher, AA/AFR

Amendment to Initial Environmental Examination
(as approved by AA/AER on April 3, 1978)
Date of this Amendment: December 1, 1978

I. Project Description:

The project is aimed directly at increasing food availability to the people of Rwanda by reducing food crop loss. The initial phase of the project will be a pilot/demonstration activity, to be undertaken by CLUSA under an A.I.D. OPG and a UNCDF Grant. That 2-year project, set to begin in January 1979, will provide a U.S. advisor, 7 crop storage warehouse (about 80 MT capacity each), and training in cooperative management. The present project is the second phase and calls for the construction of 40 commune-level storage units, plus 6 smaller satellite units, the establishment of new cooperatives, training in cooperative management and on-farm storage, a revolving fund to finance sales and insecticides, and a research program on grain storage problems.

Each warehouse would be of locally made materials, having bulk storage which could be hermetically sealed. A small office with a built-in concrete safe, and an area for about 16% bagged storage would also be provided. Construction would include inputs (e.g., site clearing and leveling) by local labor on a self-help basis, a traditional system in Rwanda.

The cooperative warehouse to be established would serve area farmers, buying from and selling to the farmers at stable prices during all seasons, thereby providing a permanent market. Cooperatives could also serve as sales outlets, commercially selling that portion of the stored crop not returned to the farmers. Previous experience with warehouses in Rwanda, some of it under an AID-funded Catholic Relief Services project, has shown that the storage provided reduces crop loss to under 3%.

Training activities will be provided to give Rwandan personnel training in operations and management of silos, storage methods, cooperative and business management practices, etc. Training would take place in Rwanda and other African countries.

II. Discussion of Impacts:

A. Summary:

The proposed warehouse construction and the follow-on activities to be undertaken therein will have a neutral effect on the environment. The reason for this is (1) the structure itself, being of a simple design, using simple basic construction materials and not needing either water or sewerage facilities, will pose no danger to the environment nor will it improve it

~~2~~

in any significant way, and (2) the activity to be carried out therein is the simple storage of grain. The construction portion of this activity, by itself, is completely neutral.

The only aspect of the project which could have an environmental impact, is the use of pesticides in conjunction with the storage of foodcrops. The project will finance only those pesticides approved by the U.S. Environmental Protection Agency (EPA). A covenant will be included in the Project Agreement to require that only EPA-approved pesticides will be used under this activity and that all applicable safety regulations and instructions for the safe and effective use of the particular pesticide, as well as its storage, handling and formulation, will be adhered to strictly.

In order to ensure that the food storage structures will not be located in areas which would create significant environmental effects, site selection criteria have been set forth. That the criteria are effectively followed, will be verified by means of spot checks of proposed sites by a REDSO engineer. All sites will be visited by the U.S. Project Manager assigned to this project to determine that site criteria have been met.

B. Warehouse Construction:

The Government of Rwanda (GCR) will provide the land on which the warehouses and offices will be constructed. Warehouses will be located so that they will provide storage facilities for the majority of farmers in reasonably productive areas. The land will be community owned, and will be allocated by a village committee. Site selection by local inhabitants provides for the utmost consideration of present and future land use, relation of the site to transportation facilities, and full participation by the community. Thus, negative impacts on land use will be minimized due to local involvement in construction site selection.

The construction technology, using local materials, primarily bricks, is established and the building materials are readily available. Good quality fired bricks are made locally throughout Rwanda. Extraction of small quantities of clay will be carried out at scattered sites throughout the country; however, there will be no significant negative impact on the physical environment.

Construction will be by private Rwandan contractors under the supervision of the MINAGRI Division of Rural Engineering.

-4-

Once constructed, the warehouses will provide numerous environmental benefits. Presently, Rwandan farmers retain approximately 50% of their food crops for on-farm consumption. These crops, placed in traditional on-farm storage facilities, suffer up to 25% loss from mold, insects and rodents during periods of extended storage. The other 50% of the crops are sold after harvesting, with approximately 75% of these being subsequently bought back by the farmers during the "hungry season". Thus, provision of the warehouses will impact positively on the socio-economic and public health environments of the farm communities. Farmers will experience higher incomes due to reduced storage loss and higher prices obtained through improved marketing structures, and improved health through better year - round nutritional intake and a lowered incidence of insect and rodent infestation.

C. Pesticide Use:

The pesticides to be used in this project--malathion, methoxychlor and phostoxin--are all registered by the USEPA without restriction for the protection of stored grain and have been used widely throughout the world for this purpose. When used as directed by the label instructions, directions for such use having been incorporated in this IEE, there are no known instances of any adverse affects upon either man or the environment. The associated benefits of such uses have been widely documented in the scientific literature. It is important, however, particularly in the case of malathion, that the product used comply with recently developed A.I.D. specifications which minimize the content of iso-malathion, a compound which is of high mammalian toxicity.

Storage structures--walls, ceilings and floors--should be sprayed with either 2% water dispersible malathion or methoxychlor at the rate of one gal/11,000 ft² prior to storage of grain. This treatment is designed to eliminate any residual infestation of grain insects prior to the introduction of new grain. After the grain has been placed in warehouse storage, it will be fumigated with phostoxin to insure maximum practical protection from insect damage. As noted above, malathion, methoxychlor and phostoxin are registered with EPA without restriction for the protection of stored grain. Any adverse impact which could occur would be limited to individuals applying the chemicals. This risk will be minimized through appropriate instruction under the cooperative training program. Storage managers will receive special training in the use of the fumigant phostoxin to insure safe and proper use of this chemical.

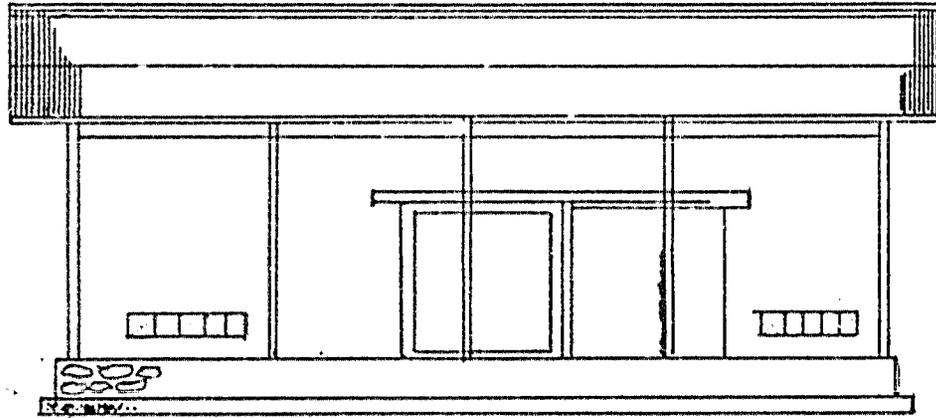
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D. Establishment of Cooperatives and Training Programs:

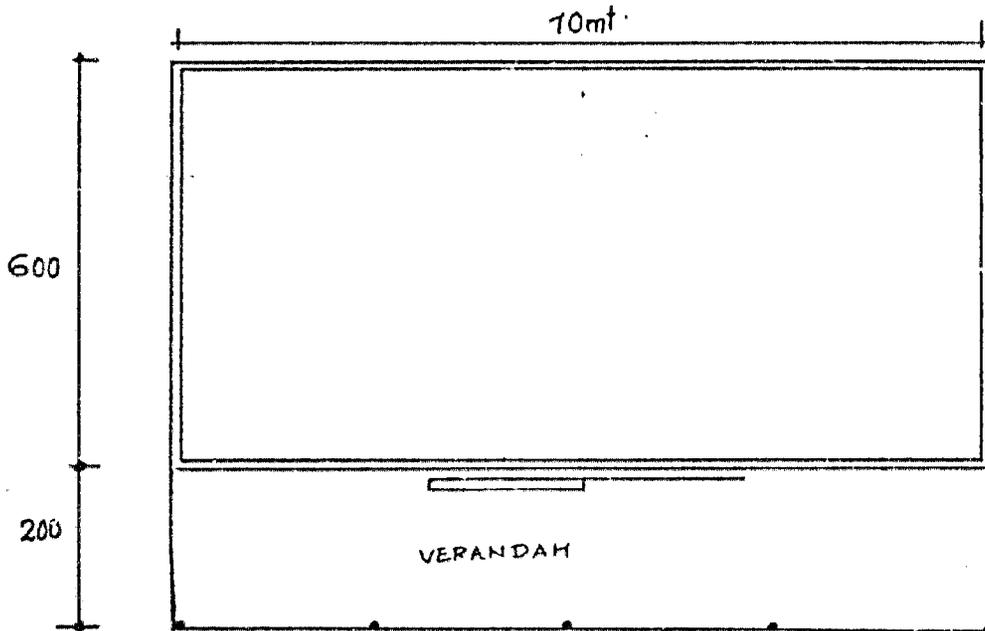
The cooperatives will be established under the GOR Ministry of Social Affairs and Cooperatives. The training programs will provide for at least one manager and one assistant manager per cooperative warehouse. Foreign training will be provided for project leaders selected from the Ministry. The environmental benefits to be attained through the cooperatives and training are correlated with those of warehouse construction, with no negative impacts being foreseen.

III. Recommendation:

The project positively impacts on the socio-economic and public health environments by enabling small farmers to achieve higher incomes, increasing the availability of food to them on a year-round basis, and eliminating on-farm insects and rodents. There will be no impact on land use and only minor negative impacts as a result of extraction of clay to be used as building materials. Thus, a negative determination is recommended for the project.

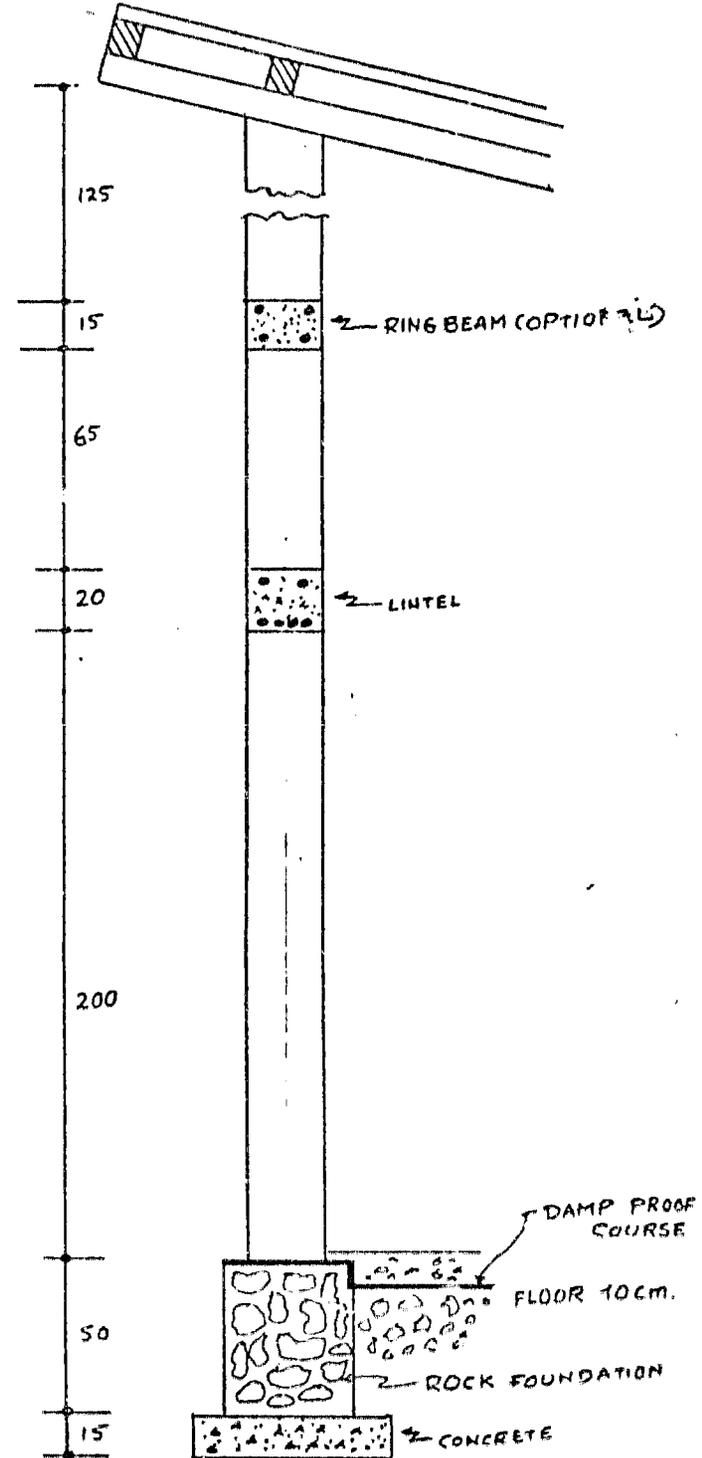


ELEVATION



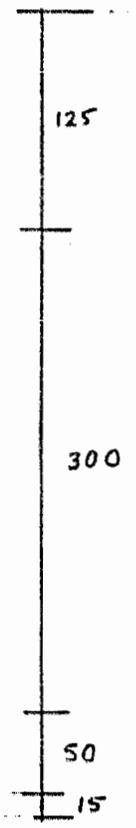
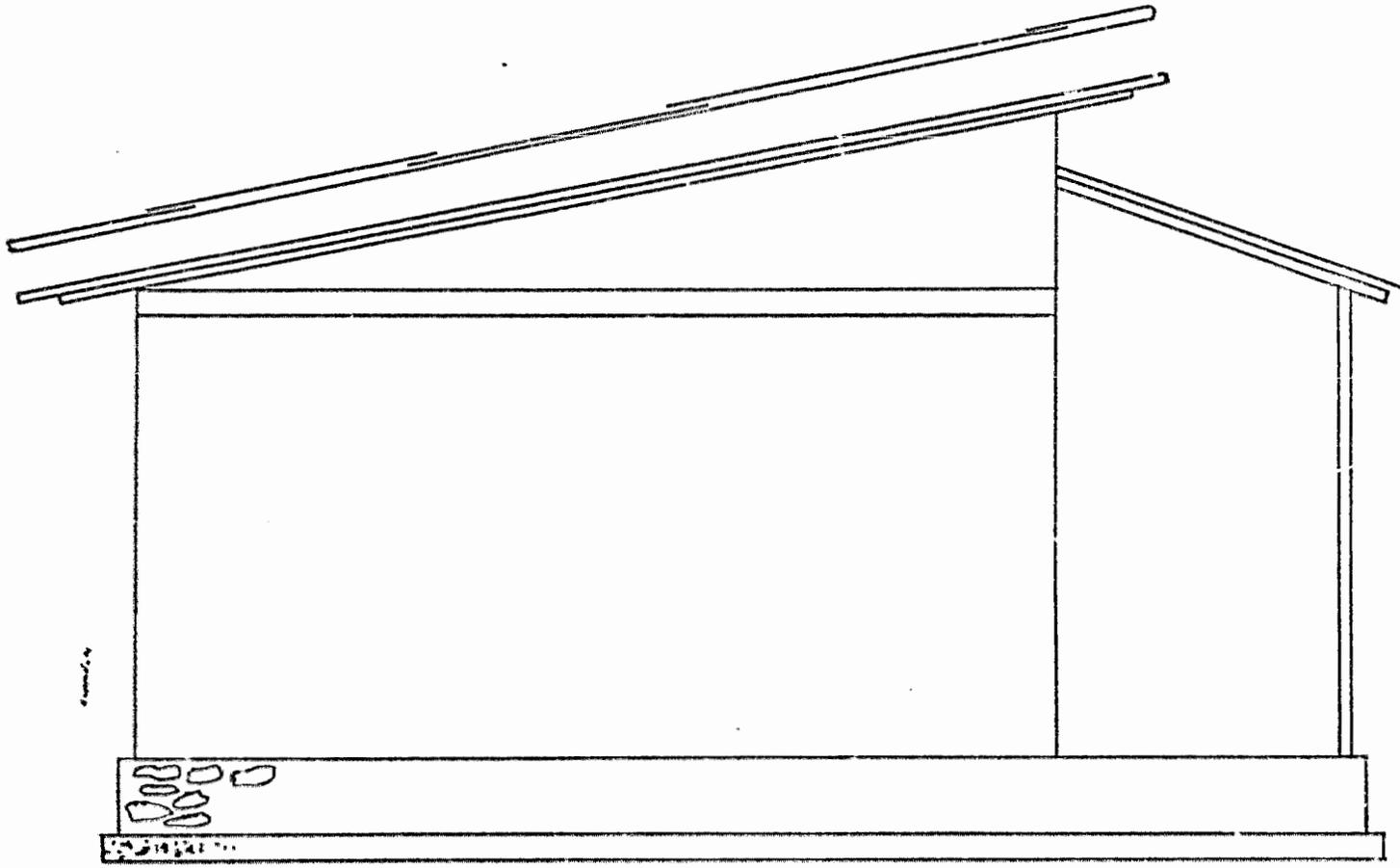
SCALE: 1m = 1cm.

PLAN



SCALE: 1m = 1cm.

-2-



SIDE ELEVATION

scale: 1mt = 2cm

ANNEX H(2)

PROPOSED PROJECT RESEARCH ACTIVITIES

The following offers additional details on the research activities proposed under the project in the Project Description.

1. Indigenous crop storage (with ISAR)

Objectives:

- (1) to inventory the methods and conditions of indigenous storage of food grains and pulses in Rwanda.
- (2) to evaluate the quantity stored and the losses from the different methods overtime.

Method:

- (1) Review the literature on studies of traditional crop storage in the region (Rwanda, Burundi*, and Eastern Zaire). Make an inventory of the approximate quantities of grains stored and the methods and conditions (location in the farm compound, etc.) in different areas of Rwanda. Review the effect of extension programs on farm storage already carried out in Rwanda and, where appropriate neighbouring countries**.
- (2) a. Starting on a colline (hill) near the ISAR station at Rubona, select a sample of farmers and conduct a pilot study on the quantity of produce stored and its conditions at frequent intervals throughout the year; this includes quantities harvested, sales and gifts, and purchases and receipts.

b. Design and conduct, with the aid of commune agricultural personnel and supervision from ISAR, a general survey of on farm storage of grains and pulses in Rwanda, estimating quantities stored and losses.
- (3) If losses appear serious by one or more methods, attempt to improve the methods, and evaluate the effect of the improvement.

* The results of a study on this subject have been recently published in Burundi

**A substantial research and extension program is underway in Kenya.

(4) Develop a program of extension to farmers, with the necessary material for delivery of the program to be used by the personnel of cooperative grain storages and the agricultural extension service.

2. Inventory of bean varieties now being grown and of local and regional consumer preferences (with ISAR).

Objective: to obtain a better understanding of producer and consumer preferences of beans in order to help in orderly marketing of the crop.

1) Prepare collections of beans and plant description and/or photographs of the varieties known to ISAR with the known names for the varieties; the same variety often has several local names. Review data at ISAR and elsewhere on consumer preferences.

2) Using the ISAR data conduct surveys at cooperative and mission storages of the bean varieties and their popularity among producers as demonstrated by the supply delivered to the storage.

3) Design and execute a small consumer survey, probably through the monitrices (woman extension workers) and the housewives in a sample of locations in Rwanda. This should include not only varieties but also hardness and cookability.

4) Prepare a report for the guidance of bean marketing cooperatives and storages on the predominant regional preferences as they affect the acceptability of beans in interregional trade.

3. Resistance of bean varieties presently grown in Rwanda to attack by pests of stored grain (particularly *Acantho Sclerides Obtectus*).

Objective: to identify bean varieties that are resistant to stored grain pests as one means of reducing the losses in beans that have to be stored for longer periods (4-5 months) on farms.

Studies by P.C. Lefevre at the Mulungu Station, Zaire, and also *Bastidas and Sanchez in Columbia indicate a market difference in bean varieties in the infestation rate of bean beetles in storage. D. Demaire at Rubona, Rwanda ** reported no reduction in infestation from the application of malathion to wulma, an indigenous variety of beans.

The cause of the resistance is not known and superficial

*BASTIDAS R,C.A. and SANCHEZ H.J.F. - Resistance of stored bean varieties to bean weevil attack in Pasto, Colombia. Tesis Ing.Agr.Pasto,Colombia Universidad de Narino, Instituto Tecnológico Agrícola 1970 56p. *Bruchus obtectus* (say) ou Bruche des haricots, INEAC Series Scientifique No.48 1950 Brussels.

**Essais de preservation des dendrees emmagasinees au Rwanda en vue d'une application en milieu rurale. Note Technique No.3, 1972, ISAR, Butare.

investigation has produced no explanation. To obtain an understanding of this resistance is likely to require a long and costly study, which is beyond the scope of this project and probably beyond the investment resources that can be justified by ISAR.

An experiment will be designed with replicated samples of beans with a known exposure to bean beetles, stored for different lengths of time under climatic conditions similar to those in indigenous storage. Resistant varieties will be identified. The results of these tests will be made into demonstration kits for use by cooperative silo personnel as part of the extension program on on-farm grain storage.

4. The effect of storage of beans under different conditions and for different durations on the cooking time of beans (with ISAR).

Objective: to provide data that will enable the minimum effect of storage on lengthening the cooking time of beans.

Observation on the "cookability" of beans have been made since Roman times. More recently H.J. Morris* at the Western Regional Research Laboratory of USDA Albany, California, reported that:

- a) a sample of fresh (pinto) beans ranged from about 15 to 40 minutes from the time the first beans and the last beans were cooked to the desired texture for eating. Fifty percent of the beans were cooked in 26 minutes.

- b) the cooking time was measured for samples of three types of beans (pinto, sanilaco and large limas). Stored at five different moisture contents and two different temperatures, stored for different lengths of time. The results showed that cooking time increased with: i) moisture content during storage, ii) temperature of storage iii) duration of storage.

The type of results obtained are shown in figure 1-4 figure 1 shows the typical distribution of cooking time for fresh pinto beans. Fig. 2 shows the relationships between the cooking time for 50% of the beans, the moisture content during storage and the duration of storage. Figure 3 shows the same relationship with the addition of temperature during storage. Figure 4 shows that pinto beans stored for 3 years at the higher temperature of (90°F) were quite "cookable" if stored at a low enough moisture content.

*H.J. Morris, Cooking Qualities of Dry Beans in proceedings 6th Annual Dry Bean Conference, Los Angeles, Cal. p. 11-p. 23 Jan. 2-4, 1963.

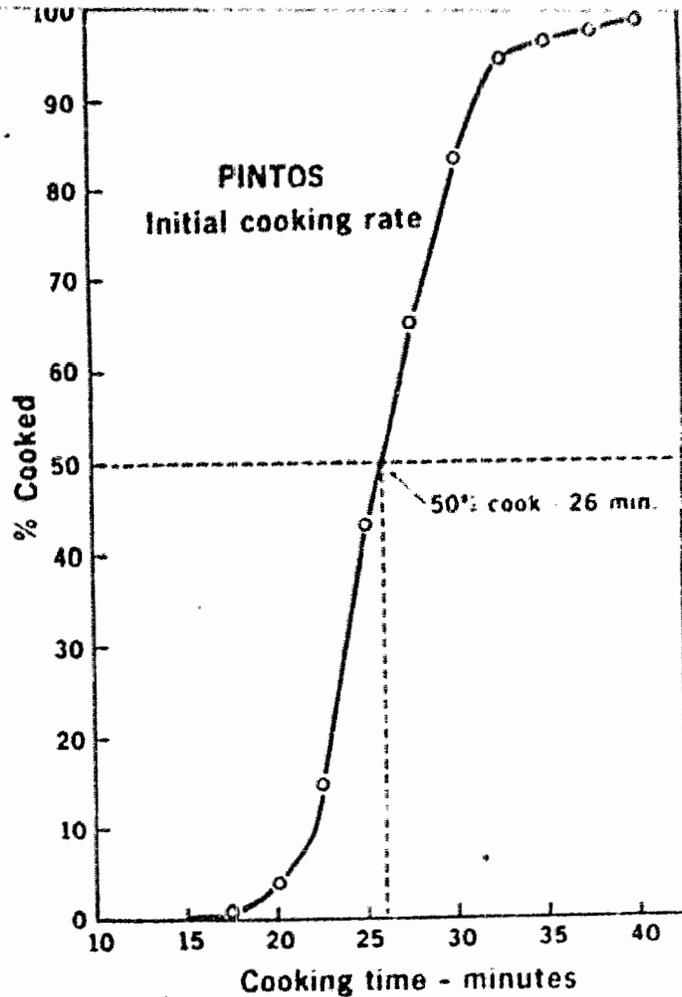


Figure 1. Typical plot of results of cooking test on a sample of pintos.

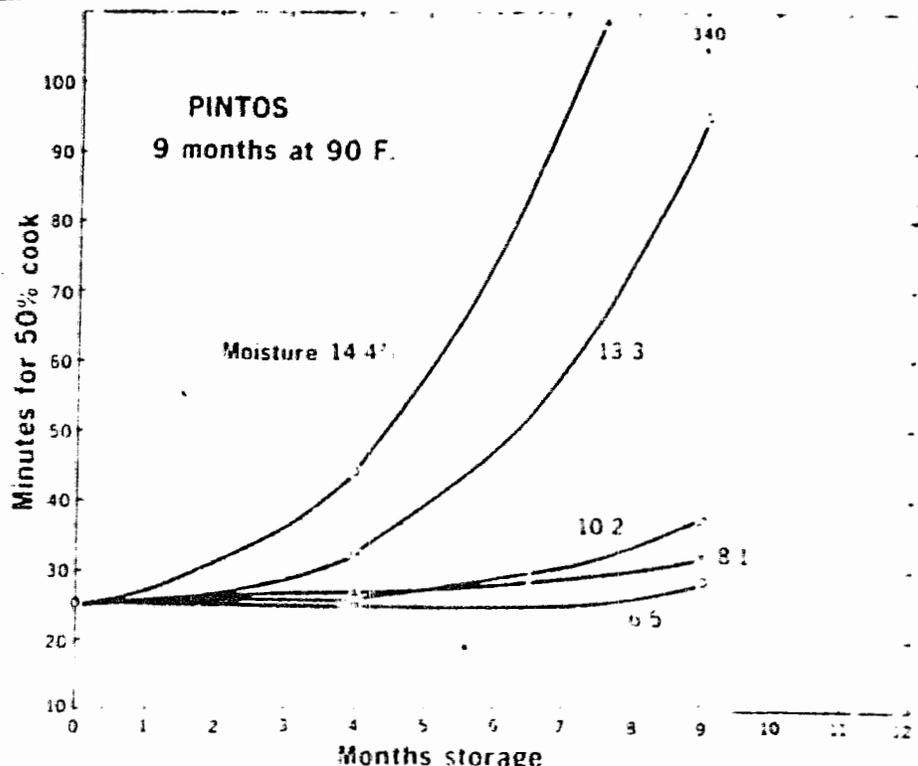


Figure 2. Results shown in Figure 4 are here plotted against time required for a 50 percent cook.

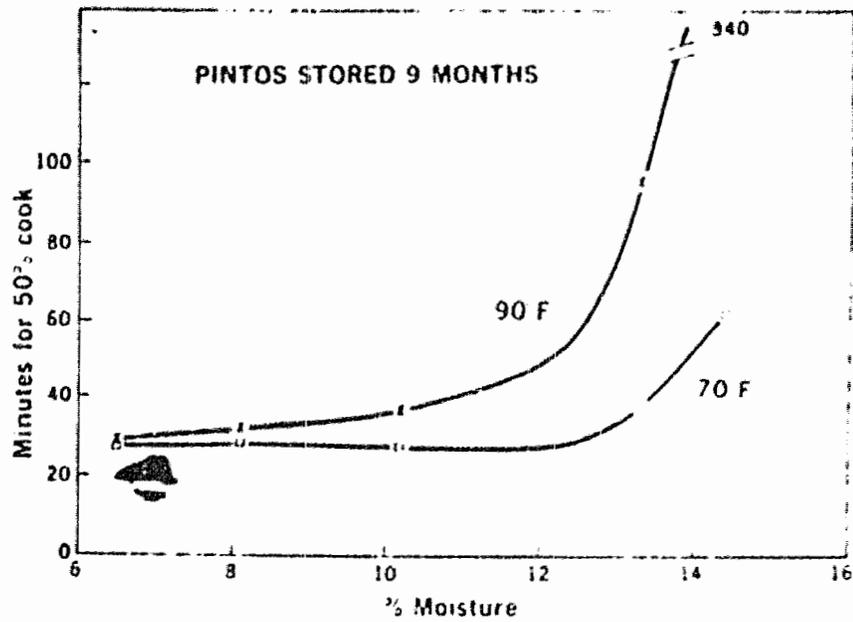


Figure 3. Results with moisture content plotted against time for a 50 percent cook.

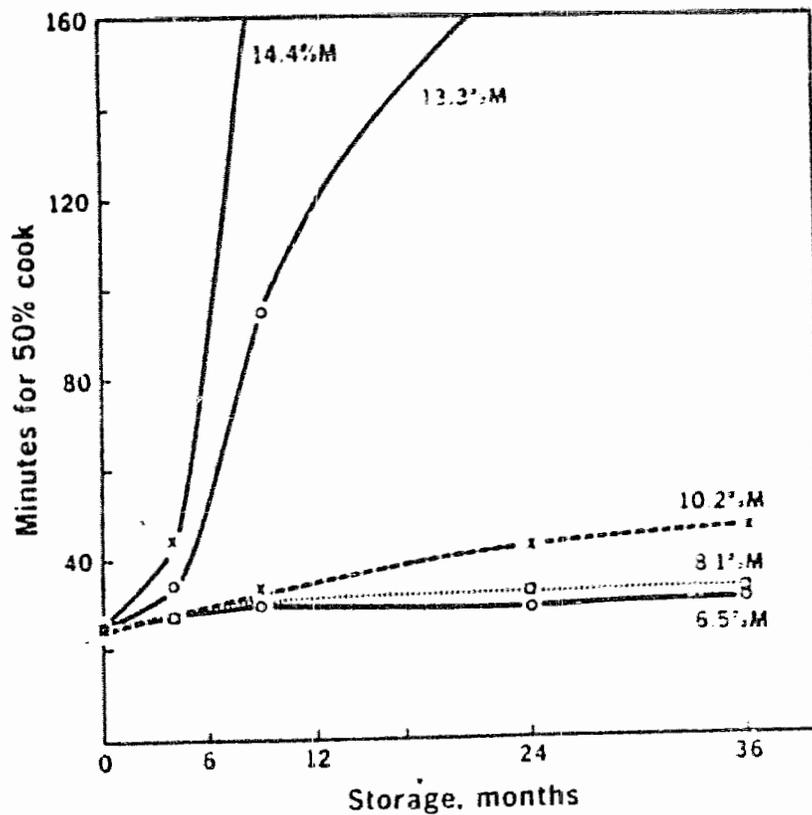


Figure 4. Three-year comparison of pintos with varied moisture content

The result with the other types of beans were similar, differing only in degree. Thus it is likely that Rwandan beans respond in a similar way. The prolonged cooking time of stored beans has already caused serious problems in consumer acceptance in Rwanda. It was believed that the problem was caused by the hardening of beans stored at too low a moisture content.

A consultant will be sought to work with ISAR to set up the necessary study in Rwanda and, if necessary, using the experimental bean cooker in California.

The studies will include storage at different moisture contents in bag and bulk storages for different periods of time. Temperatures and changes in moisture content will be recorded. The beans will then be tested as recommended by the consultant for cookability and, if necessary, for hardness. It is probable that some of these beans will be used in the consumer preference study.

The results will be used to establish the feasibility of multi-year storage of beans; for example, in a strategic reserve, and for guidance of the cooperatives and GREWARWA on the optimum conditions of storage of beans in Rwanda, in the different types of storages that are being built.

5. Estimation of crop yields in pure stands and in associations.

Objective: to provide a methodology to cooperative personnel.

1) to predict the yields of cereals and pulses (particularly beans and sorghum) before harvest.

2) to estimate the yields of cereals grown in associations.

The USDA SRS (Statistical Reporting Service) will be asked to provide information on the prediction of yields in sorghum and pulses used in the U.S. This will be combined with the methodology for estimating yields in associations to provide a method of predicting crop yields, particularly in beans and sorghum. The methodology will include a schedule of the times during the growing season at which the estimates will be made.

An approach will be made to the International Research Network, particularly ICRISAT farming systems unit, to provide an account of the system which has been developed for the measurement of yields of crops grown in irregular mixtures. This material will be adapted to Rwandan conditions in collaboration with ISAR and

circulated to the cooperative personnel.

The methodology will be tested and refined with the ISAR staff and the cooperative personnel. The result will then be written up and distributed to interested organizations. These yield estimates will be provided to the bean/sorghum storage sector and to Minagri Division of Studies, Projects and Statistics.

6. Socio - Economic Studies

Objective: to obtain the costs of production, use of labor, use of food and returns to farmers in traditional farming and with the introduction of improved technology.

In 1959 Philippe Leurquin published the results of a socioeconomic study of Rwanda. Miss Heyckens is presently making family budget studies in Ngenda, Gisenyi and Kibuye. Otherwise the data on farm economics have been gathered in the neighborhood of the ISAR station at Rubona. G. Delepierre, P. Duiker and J. Mirivel report on an analysis of some of this data in "La disponibilite et l'utilisation de la force de travail au sein de l'exploitation traditionnelle"*. This is based on a survey in 1976 by the Agricultural section in the Groupe Scolaire de Butare and on the ISAR studies of the paysannat of Muhero (1959-60) and of the Gatovu hill (1974-75).

An analysis of the work of women compared to the work of men at Gatovu was done by Miss I. Ubonabenshi* based upon some of the same data.

A study of costs of production, labor use, and the effect of introduction of improved techniques, together with family budgets and marketing was proposed by UNDP in a project "Intensification de la production vitriere par une approche integree"**. The project proposed involved farming systems trials with ISAR in various locations including the use of fertilizers, plant protection and so on; these would serve as demonstrations for extension. The

* Republic of Rwanda, Ministry of Plan and Ministry of Agriculture and Livestock production, April 1978.

* La participation de la femme rwandaise a l'effort de production, ISAR and UNR, Butare, 1977.

**Report of programming mission of FAO, Rwanda, Missions de Programmation Interessant le secteur alimentaire et agricole No. 18 April/76 Vol II Chapter VIII p.9-20.

project would also include training of cooperative workers and agricultural extension workers and provision of credit for farmers.

The proposed activity will provide information on farming systems in three or more different areas in Rwanda that will indicate the place of cereals and pulses in the farming system, physically and economically, and exchanges, both in the market and outside it, during the year. That is, the results will show the utilization, sales and gifts of cereals and pulses by farm families and their purchases of cereals and pulses. The relationship between sales of cereals and pulses and of other crops and the returns per day of work in these different activities will also be shown. The level of nutrition will also be included to indicate whether the family is disposing of surplus or whether it has to sell part of its food supply.

It is proposed to conduct this activity under the auspices of INRS, Butare, which carried out the earlier socioeconomic and nutrition studies. However, it is also proposed to request technical assistance from the Minagri, Division of Studies and Projects, which has personnel experienced in this type of study and which would also be a "consumer" of this type of research.

In this way, the study will not only provide essential data on production, consumption and marketing of cereals and pulses in some areas of Rwanda for the crop storage program, but also provide data for the design of other projects.

This activity requires part of the time of a research supervisor and three research workers with means of transportation. They will supervise 9-12 Rwandan survey workers, who may need bicycles for transportation. The survey is usually done in 2 phases; an enumeration of the farms and based on this a one-year survey of activities. The field team thus needs to be about 15 months in the field and the three research workers require a further 6 months for write-up. Data transformation should start early in the activity, probably requiring a minicomputer in Rwanda for coding the data and putting it on magnetic tape for preliminary analysis in place and for analysis in the U.S. on SPSS (a survey analysis routine). This permits the researchers to have access to tabulations during the data gathering phase and so greatly shortens the time required for analysis.

ANNEX H(3)

FOOD CROP PRODUCTION IN RWANDA

There are eight major and about nine minor food crops grown in Rwanda. These are respectively:

<u>Major Crops</u>	<u>Minor Crops</u>
Bananas	Vegetables
Sweet Potatoes	Yams (Colocases)
Manioc	Taro
Potatoes	Peanuts
Beans	Fruits
Sorghum	Yams (Ighames)
Maize	Soybeans
Peas	Wheat
	Rice
	Finger Millet (Eleusine)

The major industrial crop is coffee, with tea, pyrethrum, quinquina, sugar and cotton as minor crops.

The farms typically have between half and one hectare in rain-fed food crops with two harvests a year, a banana plantation of a quarter hectare or more, a small coffee plot (on about half of the farms) and a small kitchen garden plus land for the house. Many farms also include a small area of valley bottom land (marais) which is cropped through and outside the rainy season. The farm families thus have a nearly continuous calendar of work (see attached figure) and an excellent opportunity to adjust quite rapidly to bad harvests.

The average size of the farm family is about 4.7 people but it varies with the age and sex of the family head.

Size of Farm Family in Relation to Age and Sex of Head,
1970 Census (Vis)

<u>Age</u>	<u>Male Head</u>	<u>Female Head</u>
20	1.8	2.0
20-29	3.2	2.7
30-39	5.7	4.4
40-49	6.3	3.7
50-59	5.7	2.1
60-69	4.3	1.6
70+	3.4	1.3
Mean	5.1	2.7

Prices, Value, Workdays/ha and Return/man Day

	<u>Prices - 1977</u>			<u>Average Yield</u>	<u>Value/ha At Average Price</u>	<u>Total Value At Harvest F Rw Millions</u>	<u>Work Day/ha</u>	<u>F Rw Work Day</u>
	<u>Harvest</u>	<u>Sowing</u>	<u>Average</u>					
Banana	6.8	8.0	7.0	9.1	63,700	11,378	110	579*
Beans	18.3	27.6	23.0	0.8	18,400	3,140	150	123
Peas	21.3	29.7	25.5	0.8	20,400	1,185	150	136
Peanuts	50.0	58.0	54.0	0.95	51,300	753	200	256
Soya	20.0	28.6	24.3	0.78	18,954	90	180	105
Sorghum	9.3	18.2	13.7	1.12	15,344	1,523	170	90
Maize	9.3	14.3	12.0	1.10	13,200	718	100	132
Millet	21.6	28.4	25.0	0.60	15,000	68	100	150
Wheat	17.0	19.0	18.0	0.85	15,300	63	130	118
Rice	54.0	66.0	60.0	2.64	158,400	176	400	396*
Sweet Potatoes	4.0	6.4	5.2	7.65	39,780	2,810	300	133
Potato	8.8	14.0	11.4	6.60	75,240	1,560	320	235
Manioc	8.0	12.5	10.2	12.00	122,400	3,555	250	490*
Colocases	7.6	11.0	9.3	3.40	31,620	141	320	99
Ignames	8.0	11.4	9.7	5.40	52,380	45	320	164
Sugarcane			1.5	90.05	135,075	45		
Vegetable (modern)			30	10.90	327,000	841		
Fruit			40	16.16	646,400	842		
Coffee			120	0.65	77,760	<u>2,478</u>	**	155
						<u>31,055</u>		

* After IBRD Agricultural Study. Annex 6. 1977

**See above reference for method of calculating the returns per work day in a perennial tree crop.

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ANNEX H(2)

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In some areas up to about 20% of the farm families are headed by women and a woman has the right to farm on her own.

The crop production pattern is very complicated and most of the crops are grown in mixtures, except coffee and yam (colocases). It is thus an almost impossible task to estimate the true area planted or harvested in any crop with such a dominance of associations. Results of research by ISAR and others indicate the great superiority of production per hectare from associations rather than sole crops.

The area and production figures are thus more comparative than absolute. Figures from the IBRD sector study brought up to date (all based on the Ministry of Agriculture and Livestock Production statistics) indicate the relative profitability of the different crops.

The area in crop production on two series of farms and the physical production of one series are presented in a table below. About 84% of the sorghum and almost 90% of the bananas are made into beer and substantial quantities of beer are sold.

There have been three long term studies of farm production made by ISAR; a number of other one-year surveys have been made. However, the increase in the price of coffee from 65f to 120f/kg of dried beans in the husk (parchée) and a subsequent increase in the price of banana beer has clearly put more cash income in the hands of the farm families. This will certainly have changed consumption and probably have changed production patterns. In Rwanda the two major trends in food consumption in West Africa, increase in bread and rice consumption, are not yet very evident.

A study of 18 families on the Gatovu colline by ISAR (Delepierre) in 1974-75 and analyzed by Odette Ubonabenshi indicates the following distribution of work between men and women.

The men do most of the work in growing the coffee, while the women participate in weeding and particularly in the harvesting and post-harvest treatment.

In the production of annual food crops the women play the major role including clearing land for sweet potatoes and digging (with a hoe) the land before seeding. The men do almost half of the work in yam (igname) production and almost half of the work with manioc. Bananas appear to be a man's crop, with 61.5% of the rather small amount of work being done by men.

-4-

Division of Work between Crops and between Sexes in a
Group of 18 Families* (ISAR)

Crop Production	Men		Women		Total	%	Hours/ Family
	Hrs/yr	%	Hrs/yr	%			
Coffee	2,276	64.2	2,275	35.8	6,361	8.8	353
Bananas	769	61.5	481	38.5	1,250	1.7	69
Sw Potatoes	6,107	22.9	20,758	87.1	26,685	36.8	1,482
Potatoes	224	32.2	471	67.8	695	1.0	39
Manioc	1,049	46.4	1,211	53.6	2,260	3.1	126
Yam (Colocases)	38	16.2	196	83.8	234	0.3	13
Yam (Ignames)	107	49.5	109	50.5	216	0.3	12
Sorghum	3,868	30.9	8,652	69.1	12,520	17.3	696
Beans	4,673	25.7	13,528	74.3	18,201	25.1	1,011
Peanuts	188	25.0	563	75.0	751	1.0	42
Miscellaneous	649	31.1	1,439	68.9	2,088	2.9	116
	21,758	30.3	49,683	69.5	71,441	83.1	3,969
<u>Processing and Marketing</u>							
Sorghum beer	2,564	75.5	834	24.5	3,398	4.7	189
Banana beer	631	43.4	823	56.6	1,454	2.0	81
Sorghum beer	91	11.4	704	88.6	795	1.1	44
Manioc beer	28	19.9	113	80.1	141	0.2	8
Marketing	2,170	33.5	4,301	66.5	6,471	8.9	360
	5,484		6,775		12,259	16.9	681
	44.7%		55.3%		83,720	100%	4,650

The 18 families in Gatovu had 25 men and 34 women or an average of 1.4 men and 1.9 women per family. On average there were 3.3 children.

		<u>Hours Farming</u>	<u>Hours Proc & Marketing</u>
Working Men per family	1.39	870/man	219/man
Working Women per family	1.89	1,461/woman	199/woman
Children per family	3.28		
Workers in family	4.98	3,969/family	681/family
People in family	6.56		

*Ubonabenshi, O. La participation de la femme Rwandaise a l'effort de production. ISAR and UNR 1977

Area and Yields of Crops on Family Farms*, Area**

Muchero (ISAR 1975, 1976)

	<u>December</u>	<u>March</u>	<u>Total or Average</u>
Bananas	40.85	40.37	40.61
Coffee	21.49	21.38	21.43
Manioc	8.44	9.83	9.14
Annual Food Crops	41.65	56.81	98.46
Forage crop	<u>2.24</u>	<u>2.46</u>	<u>2.35</u>
Area harvested	114.67	130.85	171.99
Fallow	82.28	69.95	
Residence	<u>4.09</u>	<u>4.15</u>	
	<u>201.04</u>	<u>204.95</u>	

Crop Yields, Kg/ha

	1975		1976	
	<u>1st Crop</u>	<u>2nd Crop</u>	<u>1st Crop</u>	<u>2nd Crop</u>
Beans	1,320	1,832	1,532	2,027
+ Maize	1,472	-	1,863	-
+ Maize & Bananas	-	-	1,533	2,006
+ Bananas	1,194	1,225	1,275	1,577
+ Manioc	1,259	1,346	1,368	1,260
Sorghum				
+ Bananas	-	1,620	-	2,272
+ Manioc	-	-	-	1,787
Maize	1,650	-	-	-
+ Beans	1,205	-	3,276	-
+ Beans & Bananas	-	-	2,721	4,334
Peanuts	990	882	965	1,159
+ Maize	-	-	1,087	-
+ Bananas	1,116	-	1,020	903
+ Manioc	883	603	975	992
Potato	9,002	8,825	9,958	9,380
+ Bananas	-	-	4,775	8,465
+ Peanuts	-	-	6,375	-
Sw Potato	16,625	12,930	20,461	19,010
+ Bananas	-	9,437	20,552	-
+ Manioc	28,250	13,963	13,956	-

(Notes see next page)

-6-

Manioc	27,234	27,391	21,559	-
+ Bananas	-	-	18,456	-
Yams	-	-	-	31,702
Bananas	-	20,302	-	-
Coffee				271gm/tree

* Average family size. 7.1 people.

** Are is 9/100 of a hectare

Farm Family Crop Production and its Value, 1975, Mihoro (ISAR)

		<u>Price/Unit</u>	<u>F Rw</u>	<u>Percent by Value</u>
Bananas	2,614 bunches	50	11,050	10.9
Coffee	111 Kg	65*	7,215	7.1
Manioc	2,614	5	13,070	12.9
Sweet potatoes	3,704	8	29,632	29.2
Potatoes	122	10	1,220	1.2
Beans	876	20	17,520	17.3
Sorghum	1,328	12	15,936	15.7
Maize	207	12	2,484	2.4
Peanuts	51	30	1,530	1.5
Tobacco	136 plants	10	1,360	1.3
Yams	82	5	410	0.5
			<u>101,427</u>	<u>100.0</u>

Gross value of product/cap

15,368

S168

(Average value of coffee sold per farm

f2,541)

NOTE: 40.6 ares of bananas, produced 2,614 bunches, weighing about 3,650 Kg.

About 910 kg would be eaten or sold and 2,730 kg made into beer, producing about 910 liters. The total value of banana production is thus about 3,268 francs for bananas eaten or sold and about 22,500 for the beer. This adds about 17,000 francs to the gross value of crops produced, for a relatively small expenditure of labor.

*In 1978, 120 f/Kg or 13,320 f for the crop, an increase of 6,105 f over 1975 and an increase in the per capita value of production of 931 f.

Kibungo Farm Survey--Ares per crop
1974 (AIDR*)

Commune	Season	Beans	Peas	Peanuts	Soybean	Sweet Potatoes	Manioc	Potatoes	Sorghum	Maize	Banana	Total Ares exc. Banana	Total Ares Harvested Per Year
Kigarama	1st	18.72	11.43	-	0.14	6.48	4.24	1.25	18.52	2.35	137.34	64.03	201.37
	2nd	20.5	0.07	10.40	0.23	7.6	10.8	1.7	-	3.8		55.10	
		39.22	11.50	10.40	0.37	14.08	15.04	2.95	18.52	6.15	137.34	119.13	256.47
Rukira	1st	19.71	16.40	-	0.11	7.48	7.47	0.15	24.21	6.7	114.02	82.75	196.77
	2nd	21.9	0.42	10.9	0.53	6.8	6.8	0.58	1.3	5.9		54.83	
		41.6	16.52	10.9	0.64	14.28	14.27	0.73	25.51	12.6	114.02	137.58	251.6
Resumo	1st	35.14	11.88	-	0.21	3.23	4.92	0.43	32.56	8.15	125.04	98.3	223.24
	2nd	29.0	-	5.4	-	10.7	6.8	0.2	12.2	14.2		78.5	
		64.14	11.88	5.4	0.21	13.93	11.72	0.63	44.76	22.35	125.04	176.8	301.84
Birenga	1st	28.13	10.65	13.06	-	7.31	4.93	0.39	21.34	26.84	103.91	101.68	205.59
	2nd	28.8	0.12	17.6	-	7.8	9.4	1.3	5.1	5.6		75.72	
		56.93	10.77	30.66	-	15.11	14.33	1.69	26.44	32.44	103.91	177.40	281.31
Kabarondo	1st	34.92	18.60	5.22	0.21	7.86	7.99	2.07	46.41	8.33	101.45	139.47	240.92
	2nd	18.8	3.2	4.8	0.7	7.75	9.3	1.6	0.4	15.8		61.36	
		53.72	21.80	10.02	0.91	15.61	17.29	3.67	46.81	24.13	101.45	200.83	302.28
Average	1st	27.3	13.8	3.7	0.1	6.5	5.9	0.8	28.6	10.5	116.35	97.2	213.6
	2nd	23.8	0.7	9.8	0.2	8.1	8.6	1.2	3.7	9.1		65.1	
	Total	51.1	14.5	13.5	0.3	14.6	14.5	2.0	32.3	10.5	116.35	162.4	278.75

* Note: (1) Survey of 800 farmers for the first and 285 for the second season of 1974.
(2) Coffee (average 7 ares/farm), wood lot (3 ares), garden (5 ares) and residence (4 ares) are excluded.

RWANDA AGRICULTURAL SECTOR REVIEW

FOOD CROP PRODUCTION
PRODUCTION DES CULTURES VIVRIERES
 (in thousand tons)
 (en milliers de tonnes)

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Bananas	1,560	1,516	1,638	1,651	1,679	1,681	1,767	1,649	1,734	1,820	1,896
Potatoes	107	79	129	126	148	131	140	110	150	170	177
Sweet Potatoes	360	368	324	413	399	413	426	612	675	694	702
Cassava	230	233	283	345	372	350	364	360	394	415	444
Sorghum	145	123	126	156	140	144	142	121	144	155	164
Maize	53	43	41	64	56	49	55	64	67	71	77
Millet	1	1	1	2	3	3	3	2	3	2.9	3.1
Rice	0.2	1	1	1	1	2	3	2	3	1.2	3.3
Beans	132	116	146	144	144	132	133	115	163	163	172
Peas	52	46	61	65	67	55	56	51	57	57	56
Groundnuts	16	10	6	7	8	8	9	8	14	13.3	15.1
Soya							1.3	1.3	2.7	3.7	4.5
Wheat							2.4	2.8	2.3	3.0	3.7
Colocases							18.6	16.0	17.9	16.4	18.6
Ignames							5.1	4.9	6.0	5.6	5.6
Legumes modernes							7.9	20.0	13.7	21.0	28.0
Fruits							5.6	6.4	10.0	10.1	12.2
Canne a sucre							2.9	9.4	13.9	17.8	30.1

Source: Ministère de l'Agriculture et de l'Élevage

RWANDA AGRICULTURAL SECTOR REVIEW

AREA PLANTED UNDER FOODCROPS
SUPERFICIES DES CULTURES VIVRIERES

(in thousand hectares)
(en milliers d'hectares)

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Banana	130	135	137	150	152	153	156	181	190	200	208
Potatoes	17	18	17	18	21	19	19	20	23	26	29
Sweet Potatoes	48	53	61	69	67	73	74	82	87	90	92
Cassava	23	26	28	29	31	29	30	29	32	35	37
Sorghum	132	129	125	142	128	131	131	134	133	138	145
Maize	53	53	41	53	55	50	55	63	63	65	70
Millet	2	2	3	3	4	4	4	3	5	5	5
Rice	-	-	-	1	1	1	1	107	1	1	1
Beans	155	156	162	160	161	155	160	189	191	203	213
Peas	65	65	73	79	76	69	70	75	72	71	69
Groundnuts	21	15	7	8	9	9	10	12	15	14	16
Soya							1.6	2.0	3.3	4.4	5.7
Wheat							3.3	3.4	2.7	3.6	4.3
Arrowroot yams							4.4	4.8	5.2	4.8	5.5
Yams							.9	.9	1.1	1.0	1.0
Vegetables							1.2	3.4	2.0	1.8	2.6
Fruits							.4	.6	.7	0.7	0.8
Sugarcane							.05	.12	.17		
							<u>721.9</u>	<u>801.4</u>	<u>825.4</u>		

Source: Ministère de l'Agriculture et de l'Élevage

STORAGE OF BEANS

Beans produced at low altitudes are planted in March for late July or early August harvest, and again in late September through October and harvested in late December or early January. At high altitudes the September-October planting is the same but there is also a late January-early February planting, harvested in April, and a May planting harvested in late July to early August. In the marais* a bean crop may be sown from mid-June to mid-July and harvested from mid-October to mid-November.

Nonetheless, the biggest harvest is in January or early February and the second in late July and early August. To maintain supply, beans have to be stored for up to five months.

The seasonal distribution of bean consumption is known in the ten rural areas and two towns studied by Vis** and his colleagues. For most areas this shows an increase in bean consumption during and right after the two main harvests and, sometimes, a marked reduction in bean consumption before harvest. Usually sweet potatoes fill the calorie gap and the protein gap remains unfilled. In the higher areas peas supplement beans, but the January pea and bean harvests coincide. In the higher areas maize also complements the beans and peas; the maize harvest in these areas comes from mid-March to early-April. Sorghum and wheat are used in the higher areas to fill out the diet after the maize.

In the two urban areas, there is some seasonality in the consumption pattern but much less than in the rural areas.

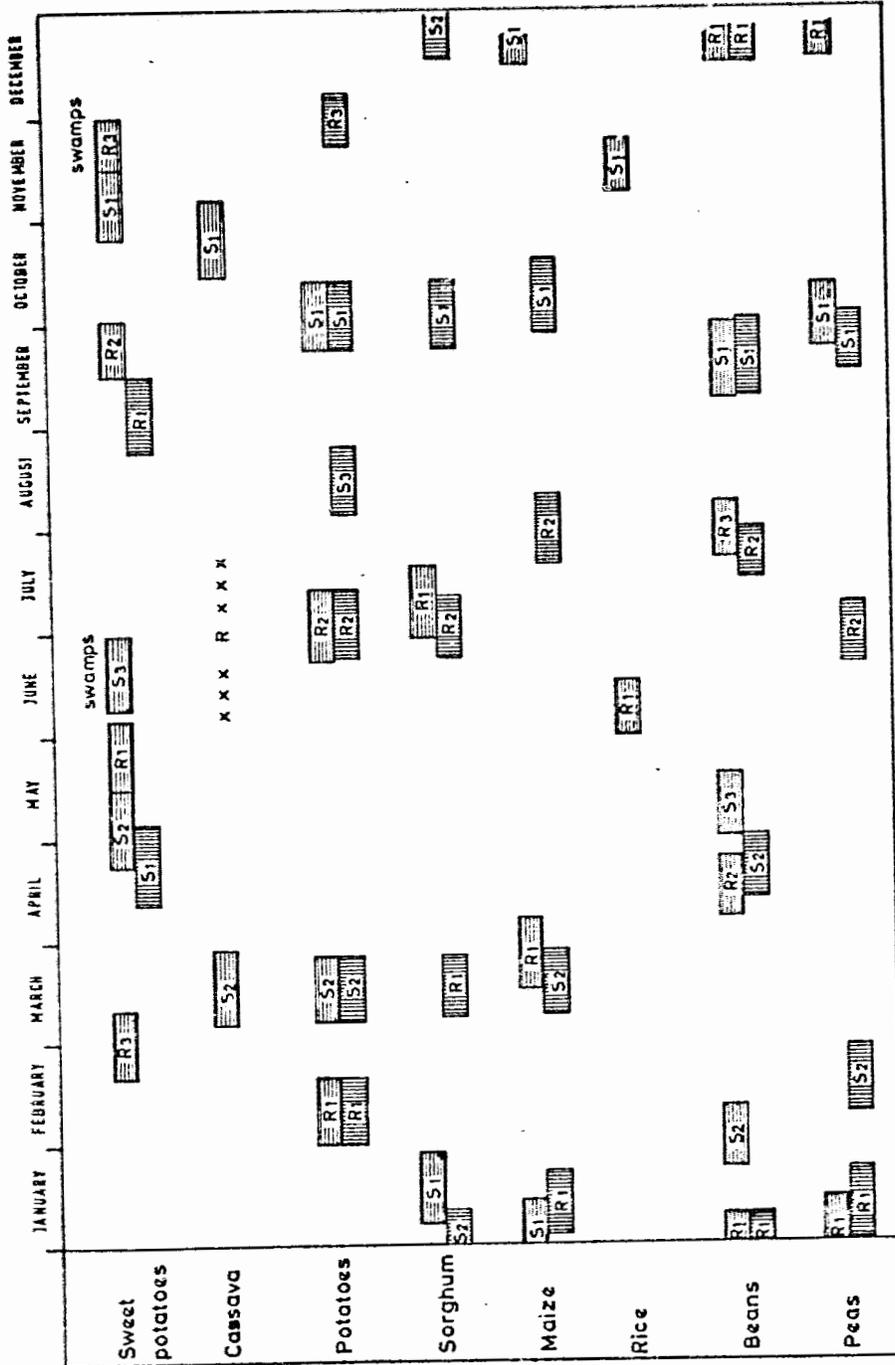
With a domestic*** production of about 135,000 tons of beans about 5,000 tons a year are eaten in Kigali and Butare. How much more is marketed? Economic Accounts 1970 proposes 12% and MINAGRI 1975, 25% (quoted by IBRD 1977). This provides a range of from 16,200 to 33,750 tons, including about 5,000 tons finding its way to Kigali and Butare. The remainder--from 118,800 to 101,250 tons in a normal year, about 20,000 tons in good and bad years--is stored on farms.

* Valley bottom land that stays moist year round.

**Vis, A Nutritional Survey in the Republic of Rwanda, p. 60-79 and 107-111.

***There is certainly a clandestine trade both ways across the borders.

SUBRHATIC FARMING CALENDAR



Low altitude High altitude

S : Sowing, planting R : Harvesting, cropping

-3-

Traditional storage methods are quoted by IBRD (1977) to have losses ranging from 10-30%. There have been storage studies made by B. Demaire* and a series of studies made at the Mulungu station in Zaire in the late 1940s by P. C. Lefevre**. The major pest of stored beans is *Bruchus obtectus* (Gay) or *Acanthosclerides obtectus* (modern nomenclature) this is a beetle with an average life cycle of 65 days and with an optimum egg laying at 24°C and cessation of egg laying below 90°C. For nymphs (grub stage) and adults the optimal temperatures are quite high, 30° and 27° respectively.

Traditional storage is in baskets sealed with cow dung or in ceramic jars. In Kenya, storage is also performed in flask-shaped gourds, which are also common (for banana bear) in Rwanda. Storage may be practiced with untreated beans, or with beans treated with ashes, a relatively effective insecticide, although inferior in effectiveness to 2% malathion at the right dosage. Cow urine is also used to discourage insect attack. The traditional on-farm storage is reported by Lefevre** to be cooler than laboratory or most warehouse storage thus reducing insect reproduction. Unfortunately neither Demaire nor Lefevre provide estimates of weight loss but only of percent of grains infested; Lefevre also provides one set of data on the number of holes per bean.

The results of Lefevre's study are extremely interesting. Certain bean varieties are almost completely resistant to the bruchid beetle***; Wulma, a high yielding black variety (with an acceptable flavor but an undesirable color)**** suffered less than 5% infested beans, probably less than 1% loss in weight, in 12 months. Other acceptable varieties also have a degree of resistance to the beetles. Lefevre reports that he found no physical factors in the beans correlated with resistance and that indigenous varieties were not uniformly resistant. Demaire reports that addition of the usual dose of malathion on Wulma beans did not significantly reduce the low level of infestation.

* Essais de preservation des dendrees en-magasinees au Rwanda en vue d'une application en milieu rurale ISAR Butare. Note Technique No. 3, 1972

** *Bruchus obtectus* (Say) ou Bruche des Haricots, Brussels, INEAC Series Scientifique No. 48, 1950 (in ISAR library)

*** Bruchid resistant beans have been reported elsewhere.

****A strain of Wulma with a light colored seed coat is in variety trials (1978). The resistance to bruchids is not believed to reside in the seed coat.

-4-

Examining the curves of the percentage of infested beans with time based on Lefevre's results, it is clear that the first 65 days life cycle, i.e. the first two months in storage presents little problem. It is after the end of the third month in laboratory storage, and perhaps longer in indigenous storage because of the lower temperature that the beetle nymphs (larvae) becomes really active; in months four and five 45% or more of the beans can become infested.

The use of ashes, in a test in the Kenya Ministry of Agriculture's Grain Storage Research Laboratory, killed 85% of the beetles. With this means it is possible that the slow down in the multiplication of the beetles would protect the beans for the five months length of the usual storage required.

Farmers are encouraged by both the ISAR and the Kenya Ministry of Agriculture to use 100 gms of 2% malathion per 90 or 100 kg of beans as a protection for three to four months. After this time a second application is required. The majority of Kenyan farmers used DDT, or an unidentified dust, which was available from some other application, as an insecticide in stored beans; although DDT is effective and lasting, it is toxic to humans and should not be used.

Malathion 2% is being used in many of the storage silos. GRENAFWA uses phostoxin fumigant in its sotrages. Correctly used both of these materials should ensure insect control for indefinite periods of time.

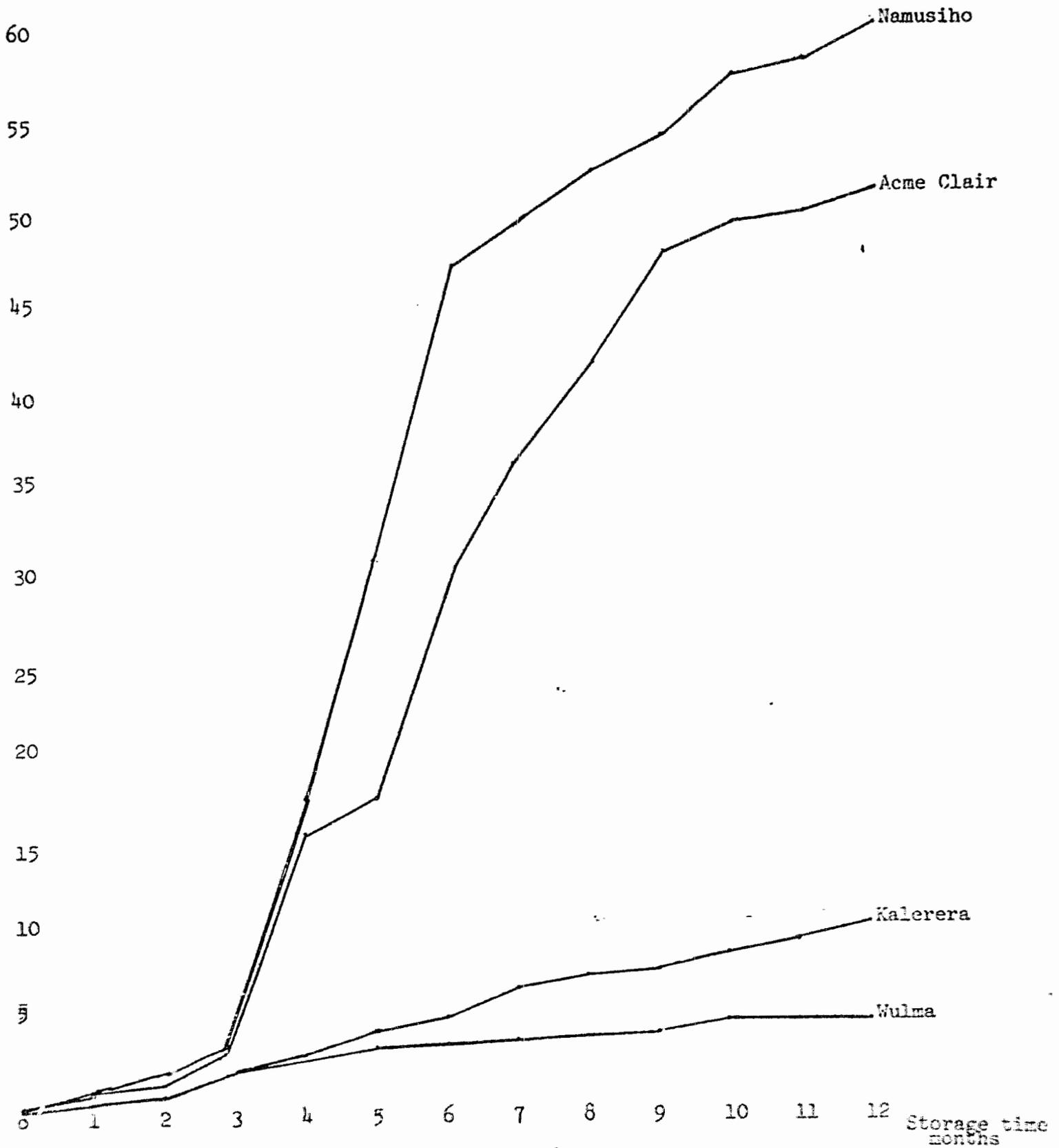
ISAR is planning to take up the question of grain and pulse storage again. The indigenous technology of storage is clearly of interest as well as an update on the susceptibility of the varieties currently grown to the beetles*. This activity could be funded under the LCS project. Low-cost storage and protection of grains and pulse on the farm is being demonstrated by the UNESCO Village Technology Unit at Karen, near Nairobi. Kenya Ministry of Agriculture, Grain Storage Research Laboratory has a research program on storage of grains and pulses in indigenous and industrial type storages.

Loss estimation for indigenous storage could be made by studying the consumption patterns of cereals (Vis, et al. 1975) relative to the harvest season. Assuming that there were minimal losses in the first three months, some estimate could be applied for losses in the fourth and fifth month. This multiplied by the consumption in the fourth and fifth months after harvest would provide an overall estimate of losses.

*This activity should be correlated with the appropriate activity in the project. Until the cause of bruchid resistance is understood, it is not safe to recommend widespread use of resistant varieties. Results of a study have recently been published in Burundi.

Infestation rate with Storage Time
Without Treatment, 4 Bean Varieties
(Lefevre)

% Beans
Infested



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If ISAR research results support this finding, farmers should be encouraged either to treat the beans which they propose to store for over three months or to take them to the storage silos.

THE COOPERATIVE MOVEMENT IN RWANDA

(Largely based on Cooperatives Seminar, Kigali--April 1976)

Principles of the Cooperative Movement

- Free and voluntary membership
- Equality of membership and democratic control (one person, one vote)
- A fixed rate of interest, 6%
- Profits equally distributed in proportion to participation, sales or purchases
- Education of Cooperators in management.

Program for Cooperatives:

- To implant a multifunctional cooperative for development in each commune
- To increase agricultural production
- To collect, conserve, and market farmers' surpluses
- To organize a supply to the population at the best prices to raise the standard of living. The supply should include:
 - (i) prime necessities--hoes, salt, fuel oil, clothes, household utensils;
 - (ii) basic building supplies--cement, roofing, nails, etc.
 - (iii) agricultural inputs--selected seeds, agricultural chemicals, tools and accessories.
- To provide a service for savings

-2-

- To provide professional and cooperative training for members
- To constitute a mutual security fund

The recommendations of the April 1976 Seminar on the Agricultural Development Cooperatives included endorsement of the above activities, emphasizing the supply of agricultural inputs, marketing, and provision of the basic consumer goods and equipment. They also recommended the creation of federal, regional or national structures based upon the local cooperatives. A national training center was also recommended, together with a substantial training program including a means to "animate" the rural population to accept development.

In spite of these recommendations, little action has been taken to implement them. The report of the cooperatives in operation as of December 31, 1977, 20 months later includes only one substantial production cooperative started after the meeting, the Cooperative pour le progres de la Commune Mugina, with 1,384 members.

There are about 22 substantial agricultural multi-purpose cooperatives, of which about 16 are working well and six very large cooperatives, each dealing with a single industrial crop. These cooperatives, each dealing with a single industrial crop. These cooperatives have 6,000 and more members. Their role in food crop marketing is unclear. There were 59 "agricultural production" cooperatives at the end of 1977; of these 15 were small agricultural production cooperatives (10-100 members) and nine general marketing cooperatives.

AIDR, a Belgian non-profit organization, is working on setting up three commune cooperatives in the north, with storages and a mixed farming (agriculture, poultry and, rabbits) program. The buildings have already been built and the pre-cooperatives are operating.

If seven of the larger agricultural cooperatives are selected by CLUSA there will be only 15 multi-purpose and perhaps the industrial cooperatives with which to start this program. Therefore, creation and development of cooperatives will be a basic element in this project. However, there are several successful examples on which to base the procedure for setting up production cooperatives, particularly the old AIDR program in Kibungo and the new program around Kulyi. CRS and CLUSA are starting to work with 17 more communes.

-3-

UNICEF has proposed to CRS to set up a workshop to review the experience to date. This will provide an important source of information for the execution of this project.

Cooperatives established up to 31 December 1977, working in Agricultural Production and Marketing

A. General Agricultural Cooperatives

KIGALI

1. Cooperative des Agriculteurs de Masaka, KAMA
988 members. Agriculture and Marketing of Agricultural Crops:
Started 22 January 1972

GITARAMA

2. Association Commune des Agriculteurs de Gitovu, ACAGI.
1,049 members. Industrial and Food Crop Production:
Started 4 May 1974
3. Cooperative de Developpement Agricole, Rutabo, C.D.A.R.
1,127 members. Industrial and Food Crop Production:
Started 14 May 1974
4. Cooperative de Agriculteurs Runda Taba, ABARUTA.
650 members. Production and Marketing of Farm Products:
Started 16 May 1974
5. Cooperative pour le Progres de la Commune Mugina, COPROCOMU.
1,384 members. Production and Marketing of Farm Products.
Started 3 November 1976
6. Cooperative Agricole de Jenda, COPAJE. 973 members.
Production and Marketing of Farm Products: Started
3 November 1975

BUTARE

7. Cooperative des Paysans de Muyaga, COPAMU. 1,416 members,
Agriculture: Started 15 May 1974
8. Cooperative pour le Progres de Paysans de Ntyazo, COPROPAN.
1,200 members. Food and Industrial Crop Production:
Started 14 May 1974

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9. Cooperative Agricole de Munyinya, CAMA. 1,043 members.
Food and Industrial Crop Production: Started 14 May 1974
10. Cooperative des Paysans de Gakoma, COPAGI. 1,243 members.
Food and Industrial Crop Production: Started 14 May 1974
11. Cooperative de Vente des Produits Agricoles, COVERPABU.
1,011 members. Marketing of Agricultural Products:
Started 19 July 1974
12. Cooperative Agricole de Mututu Mbuye, CAMUMBU.
1,735 members. Industrial Crop Production: Started
3 November 1975
13. J.M.R. Cooperative Jyambere Rwanda. 272 members. Promotion
of Farmers (Promouvoir le Farmers). Started 5 October 1977

GINKONGORO

14. Cooperative Agricole de Bushigishigi, COFRAGRIBUMU.
120 members. Food Crop Production: Started 3 November 1975
15. Cooperative TURWANY IGIHENDO TUZAMUR UBUHINZI, COTITU.
800 members. Marketing of Agricultural Products: Started
23 December 1975
16. Kaperative y'abacuruzi BADAHINYUKA ba Mubuga, KUAMU.
800 members. Marketing of Food Crops: Started
26 February 1976

CYANGUGU

17. Cooperative de Consommation de Mililizi Cyangu, COMICYA.
843 members. Marketing of Agricultural Products: Started
7 February 1974
18. Cooperative y Abahingira icyayi mu Biturage, UMACYAGI
2,700 members. Production and Marketing of Agricultural
Products: Started 22 August 1975

KIBUYE

19. Cooperative ABAHIZI, 3,463 members. Production and Marketing
of Agricultural Products: Started 5 February

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RUHENGARI

20. Cooperative Ingandurarugo de Bukonya. 368 members. Production and Marketing of Agricultural Products: Started 24 January 1969

BYUMBA

21. Union de Cultivateurs de Buyoga, U.G.B. 121 members. Production (and Marketing) of Food and Industrial Crops: Started 23 December 1975

22. Cooperative Agricole de Tumba, COOPATU, 100 members. Agricultural and Industrial Crop Production: Started 23 December 1975

B. Industrial Crop Production and Marketing Cooperatives

CYANGUGU

1. Coopthe Mwaga-Gisakura. 6,104 members. Tea Production (and Marketing): Started 22 March 1976
2. Cooperative IMPALA. 6,215 members. Coffee Production (and Marketing): Started 30 January 1954
3. Societe Cooperative de the, COOPTHE, NTEMDEZI. ? members. Tea Production (and Marketing): Started 17 May 1958
4. Cooperative de Planteurs de the SHAGASHA, Coop the Shagasha. ? members. Tea Production (and Marketing): Started 25 April 1969

GISENYI

5. Cooperative de Planteurs de Cafe de la NKORA. 5,130 members. Production and Marketing of Coffee: Started 31 March 1956

RUHENGARI

6. Association des Planteurs de Pyrethre, ASPY. 10,090 members. Cultivation (and Marketing) of Pyrethrum: Started 5 March 1968

FINANCIAL ANNEX

- I (1) Summary of Project Costs
- I (2) AID Contribution
 - (a) Technical Assistance
 - (b) Training
 - (c) Commodities
 - (d) Construction
 - (e) Research
 - (f) Evaluation
- I (3) GOR Contribution
- I (4) Commune Cooperative Operations
- I (5) Benefit Tables
- I (6) Financial Rate of Return

I (1) Summary of Project Costs (U.S. \$)

<u>Project Input</u>	<u>FY 79</u>		<u>FY 80</u>		<u>FY 81</u>		<u>FY 82</u>		<u>FY 83</u>		<u>Total</u>		<u>Total Project Costs</u>
	<u>AID</u>	<u>GOR</u>	<u>AID</u>	<u>GOR</u>	<u>AID</u>	<u>GOR</u>	<u>AID</u>	<u>GOR</u>	<u>AID</u>	<u>GOR</u>	<u>AID</u>	<u>GOR</u>	
Technical Assistance	131,675	14,250	129,919	14,250	111,363	14,250	95,888	14,250	103,831	14,250	572,676	71,250	643,926
Training	10,000		35,000		35,000		20,000				100,000		100,000
Commodities	76,800		20,800		16,000		41,375		4,000		158,975		158,975
Construction	153,240	37,662	342,037	77,101	353,433	62,672					848,710	177,435	1,026,145
Research	86,350	8,635	158,950	15,895	142,450	14,245	64,350	6,435			452,100	45,210	497,310
Evaluation					10,000				30,000		40,000		40,000
Revolving Fund	80,000		180,000		140,000						400,000		400,000
	<u>538,065</u>	<u>60,547</u>	<u>866,706</u>	<u>107,246</u>	<u>808,246</u>	<u>91,167</u>	<u>221,613</u>	<u>20,685</u>	<u>137,831</u>	<u>14,250</u>		<u>293,895</u>	
											2,572,461		<u>2,865,356</u>

I(1) Schedule of Obligations

	<u>FY 79</u>	<u>FY 81</u>
Technical Assistance	261,594	311,082
Training	45,000	55,000
Commodities	97,600	61,375
Construction	495,277	353,433
Research	452,100	
Evaluation		40,000
Revolving Fund	260,000	140,000
	<u>1,611,571</u>	<u>960,890</u>

I (2) AID Contribution (U.S. \$)

Summary of AID Costs

<u>Project Inputs</u>	<u>FY 79</u>	<u>FY 80</u>	<u>FY 81</u>	<u>FY 82</u>	<u>FY 83</u>	<u>Total</u>
Technical Assistance						
Project Advisor	111,675	99,919	101,363	95,888	103,831	512,676
Short Term Consultant	20,000	30,000	10,000			60,000
	131,675	129,919	111,363	95,888	103,831	572,676
Training	10,000	35,000	35,000	20,000		100,000
Commodities						
Vehicles	63,800	4,000	4,000	41,375	4,000	117,175
Central Office and Co-ops	13,000	16,800	12,000			41,800
	76,800	20,800	16,000	41,375	4,000	158,975
Construction						
Hangars	139,309	259,115	321,303			719,727
Satellites		51,823				51,823
Contingency	13,931	31,099	32,130			77,160
	153,240	342,037	353,433			848,710
Research						
Contract Budget	78,500	144,500	129,500	58,500		411,000
Contingency	7,850	14,450	12,950	5,850		41,100
	86,350	158,950	142,450	64,350		452,100
Evaluation						
Revolving Fund	80,000	180,000	140,000		30,000	430,000
	80,000	180,000	140,000		30,000	430,000
TOTAL	538,065	866,706	808,246	221,613	137,831	2,572,461

I (2) (a) Technical Assistance (U.S \$)
Project Advisor

	FY 79	FY 80	FY 81	FY 82	FY 83	Total
Salary	30,000	31,500	33,000	35,000	36,500	166,000
Post Differential (25%)	7,500	7,875	8,250	8,750	9,125	41,500
Overhead (25%)	37,500	39,375	41,250	43,750	45,625	207,500
	9,375	9,844	10,313	10,938	11,406	51,876
	46,875	49,219	51,563	54,688	57,031	259,376
Benefits	1,000	1,000	1,000	1,000	1,000	5,000
C.O.L.A.	3,000	3,000	3,000	4,000	4,000	17,000
Travel to Post and Return (averaged)	4,000	4,000	4,000		4,000	16,000
R & R		2,500		2,500		5,000
Air Freight and Return (averaged)	2,500	2,500	2,500		2,500	10,000
Medical Insurance and Travel	500	500	500	500	500	2,500
Temporary Lodging	4,000		4,000			8,000
Quarters Allowance	16,000	16,000	16,000	16,000	16,000	80,000
Education Allowance	8,300	8,300	8,300	8,300	8,300	41,500
Home Leave and Return		2,400		2,400		4,800
Guard Services	1,500	1,500	1,500	1,500	1,500	7,500
HHE Shipment and Return (averaged)	4,000	4,000	4,000		4,000	16,000
HHE Storage	1,500	1,500	1,500	1,500	1,500	7,500
Furniture Requirement at Post	15,000					15,000
Contingency	3,500	3,500	3,500	3,500	3,500	17,500
	111,675	99,919	101,363	95,888	103,831	<u>512,676</u>

I (2) (a) Technical Assistance (U.S.\$)

Short-Term Consultants

6 working-months at \$10,000 per month = \$60,000

	<u>Cost Per Month</u>
Salary - \$150 per day (30 days)	4,500
Transportation	2,000
Per Diem	1,500
Travel in Country	500
Insurance and Passport	100
Miscellaneous Costs	<u>1,400</u>
	<u>10,000</u>

I (2) (b) Training

Training Budget

Agency of Department Trained	Number of Trainees	Duration of Training (weeks)	Person/ Weeks	Cost \$
DCP	10	12	120	40,000
Prefectures	10	2	20	2,000
Commune	40	6	240	24,000
Cooperatives	120	10	1200	25,000
Contingency 10%				9,000
TOTAL	180	30	1580	<u>100,000</u>

I (2) (c) Commodities

Vehicles	\$ 117,175
Central Office	5,000
Co-operatives	<u>36,800</u>
	\$ <u>158,975</u>

I (2) (c) Commodities (U.S \$)
Vehicles

	Cost	Replacement in FY 82	Total
Motorcycles	1,300 x 10 = 13,000	1,300 x 10 = 13,000	26,000
Spare Parts 15%	1,950	1,950	3,900
POL (\$100 per year per motorcycle)	5,000		5,000
Inflation Contingency		<u>4,485</u>	<u>4,485</u>
	19,950	19,435	39,385
4-wheel Drive Vehicle	15,000		15,000
Spare Parts 15%	2,250		2,250
POL (\$1,000 per year)	<u>5,000</u>		<u>5,000</u>
	22,250		22,250
Pick-UP Trucks	12,000 x 2 = 24,000	12,000 x 1 = 12,000	36,000
Spare Parts 15%	3,600	1,800	5,400
POL (1,000 per year per vehicle)	10,000		10,000
Inflation Contingency		<u>4,140</u>	<u>4,140</u>
	37,600	17,940	55,540
TOTAL VEHICLES	<u>79,800</u>	<u>37,375</u>	<u>117,175</u>

I(2)(c) . Commodities (U.S. \$)

Central Office

Initial Supplies and Equipment 5,000

Cooperatives

Hangers \$800 ^{1/} Supplies x 40 32,000

Satellites \$800 Supplies x 6 4,800

36,800

41,800

1/ Estimated Cost per Unit

500 gram triple beam balance 45.00

Platform Scale 240.00

Grain moisture tester 125.00

Air Freight Approximately 100% 390.00

800.00

ANNEX I

I(2)(a) CONSTRUCTION (U.S.\$)

	<u>FY 79</u>	<u>FY 80</u>	<u>FY 81</u>	<u>FY 82</u>	<u>FY 83</u>	<u>TOTAL</u>
<u>1.</u> Hangars - RWF	10,800,000	16,200,000	16,200,000	-	-	43,200,000
Inflation - 24%	<u>1,944,000</u>	<u>7,503,840</u>	<u>13,193,201</u>	-	-	<u>22,641,041</u>
	12,744,000	23,703,840	29,393,201			65,841,041
Contingency - 10%	<u>1,274,400</u>	<u>2,370,384</u>	<u>2,939,320</u>			<u>6,584,104</u>
	14,018,400	26,074,224	32,332,521			72,425,145
<u>2.</u> Satellites - RWF		3,240,000				3,240,000
Inflation - 24% per yr.		<u>1,500,768</u>				<u>1,500,768</u>
		4,740,768				4,740,768
Contingency-10%		<u>474,077</u>				<u>474,077</u>
		5,214,845				5,214,845
TOTAL RWF	14,018,400	31,289,069	32,332,521			77,639,990
TOTAL in \$U.S. @ 91.48	153,240	342,032	353,438			848,710

	<u>No. of Units Constructed</u>	<u>Area of One Unit Sq. MT</u>	<u>Total Area Constructed Per Sq MT</u>	<u>Cost Per Sq. MT</u>	<u>Cost</u>
<u>1.</u> FY 79	10 Hangars	60	600	RWF 18,000	RWF 10,800,000
FY 80	15 Hangars	60	900	18,000	16,200,000
FY 81	15 Hangars	60	900	18,000	16,200,000
<u>2.</u> FY 80	6 Satellites ($\frac{1}{2}$ size of average hangar)	30	180	18,000	3,240,000

NOTE: Inflation is 2% per month based on October 1978 prices
 We use 18% for 1979 costs
 18% + 24% for 1980 costs
 18% + 24% + 24% for 1981 costs

2)(a) CONSTRUCTION (U.S.\$)

	<u>FY 79</u>	<u>FY 80</u>	<u>FY 81</u>	<u>FY 82</u>	<u>FY 83</u>	<u>TOTAL</u>
Hangers - RWF	10,800,000	16,200,000	16,200,000	-	-	43,200
Inflation - 24%	<u>1,944,000</u>	<u>7,503,840</u>	<u>13,193,201</u>	-	-	<u>22,641</u>
	12,744,000	23,703,840	29,393,201			65,841
Contingency - 10%	<u>1,274,400</u>	<u>2,370,384</u>	<u>2,939,320</u>			<u>6,584</u>
	14,018,400	26,074,224	32,332,521			72,425
Satellites - RWF		3,240,000				3,240
Inflation - 24% per yr.		<u>1,500,768</u>				<u>1,500</u>
		4,740,768				4,740
Contingency-10%		<u>474,077</u>				<u>474</u>
		5,214,845				5,214
TOTAL RWF	14,018,400	31,289,069	32,332,521			77,639
TOTAL in \$U.S. @ 91.48	153,240	342,032	353,438			<u>848,</u>

	<u>No. of Units Constructed</u>	<u>Area of One Unit Sq. MT</u>	<u>Total Area Constructed Per Sq MT</u>	<u>Cost Per Sq. MT</u>	<u>Cost</u>
FY 79	10 Hangars	60	600	RWF 18,000	RWF 10,800
FY 80	15 Hangars	60	900	18,000	16,200
FY 81	15 Hangars	60	900	18,000	16,200
FY 80	6 Satellites ($\frac{1}{2}$ size of average hangar)	30	180	18,000	3,240

NOTE: Inflation is 2% per month based on October 1978 prices
 We use 18% for 1979 costs
 18% + 24% for 1980 costs
 18% + 24% + 24% for 1981 costs

I(2)(e) RESEARCH

ANNEX I

RESEARCH CONSULTANT CONTRACT (U.S.\$)

Activity	<u>FY 79</u>	<u>FY 80</u>	<u>FY 81</u>	<u>FY 82</u>	<u>FY 83</u>	<u>TOTAL</u>
Indigenous Crop Storage	12,500	25,000	12,500			50,000
Inventory of Bean Var.	2,500	2,500				5,000
Resistance of varieties to attack	2,500	5,000	5,000	2,500		15,000
Effect of Storage on Cooking Time	10,000					10,000
Estimate of Crop Yields	5,000	10,000	10,000	5,000		30,000
1. Socio-economic Study		80,000	80,000	40,000		200,000
Consultants	35,000					35,000
Research Supervision	<u>11,000</u>	<u>22,000</u>	<u>22,000</u>	<u>11,000</u>		<u>66,000</u>
	78,500	144,500	129,500	58,500		411,000
Contingency 10%	<u>7,850</u>	<u>14,450</u>	<u>12,950</u>	<u>5,850</u>		<u>41,100</u>
	86,350	158,950	142,450	64,350		<u>452,100</u>

1. Socio-economic study includes allowance for vehicle expenses
- Depreciation on 3 vehicles for 15 months 3,000
 - Operating expenses for 3 vehicles for 15 months 12,000
 - 15,000

Vehicles with following costs to be included in the commodity waiver will be purchased under the research contract and sold at end of the contract term.

<u>COST</u> - 3 Sedans @ 8,000 -	24,000
Spare parts 15%	<u>3,600</u>
	<u>27,600</u>

I(2)f) Evaluation

FY 82	1 person-month @ \$10,000	\$10,000
FY 83	3 person-months @ \$10,000	<u>30,000</u>
		<u>\$40,000</u>

Monthly rate details are shown in Technical Assistance consultants Schedule.

ANNEX I

I(3) GOR CONTRIBUTION (U.S.\$)

Input	<u>FY 79</u>	<u>FY 80</u>	<u>FY 81</u>	<u>FY 82</u>	<u>FY 83</u>	<u>TOTAL</u>
TECHNICAL ASSISTANCE						
Salaries-Ministry of Social Affairs and Co-operatives	14,250	14,250	14,250	14,250	14,250	71,250
10 Prefectural Delegates - \$5,000 salary at 25% of time						\$61,250
Director and staff \$2,000 per yr	10,000					\$71,250
CONSTRUCTION						
Land Estimated 2000 per Hangar construction	20,000	42,000	30,000			92,000
design	7,662	17,101	17,672			42,435
Community participation \$1000 per hangar \$500 per Satellite	10,000	18,000	15,000			43,000
Total Construction	<u>37,662</u>	<u>77,101</u>	<u>62,672</u>			<u>177,435</u>
RESEARCH						
Staff at ISAR/INRS 10% of Research Contract	8,635	15,895	14,245	6,435		45,210
Total staff time	\$30,000					
Office Space	10,000					
Clerical time	5,210					
	<u>\$45,210</u>					
TOTAL	<u>60,547</u>	<u>107,336</u>	<u>91,167</u>	<u>20,685</u>	<u>14,250</u>	<u>293,895</u>

I (4) COOPERATIVE BUDGET Rwf (000)

	JAN.	FEB.	MAR.	APR.	MAY	JUN	JULY	AUG	SEPT	OCT	NOV.	DEC.
Sales												
Consumer Goods	520	520	520	520	520	520	520	520	520	520	520	520
Beans									500	560		
Sorghum			350	350								
Total Sales	520	520	870	870	520	520	520	520	1080	1080	520	520
Expenses												
Purchase Consumer	400	400	400	400	400	400	400	400	400	400	400	400
Purchase Beans	450	450										
Purchase Sorghum								375	375			
Operating Expense	130	130	85	85	85	105	105	130	130	90	90	90
Total Expenses	980	980	485	485	485	505	505	905	905	490	490	490
Gain or Loss for Period	(460)	(460)	385	385	35	15	15	(385)	175	590	30	30
Retained Earnings	(460)	(920)	(535)	(150)	(115)	(100)	(85)	(470)	(295)	295	325	355

Actual budget of an operating cooperative from Banque Populaire files.

Is typical of others examined and reflects patterns of operations shown in financial statements examined of this same cooperative's files.

I(5) BENEFIT TABLES

Range of Benefits from reduced loss in storage (U.S.\$)

FY	No. of Units in Operation	Total loss reduced from 25% to 2.5%	Total loss reduced from 15% to 1.5%	Total loss reduced from 8.25% to 1.5%
79	10	24,595	14,757	7,380
80	28	96,414	57,848	28,924
81	43	190,369	114,221	57,110
82	43	190,369	114,221	57,110
83	43	190,369	114,221	57,110
		692,116	415,268	207,634

Range of Benefits from increased prices

FY	Units in Operation	Price affected in 15% of quantity marketed	Price affected in 10% of quantity marketed	Price affected in 5% of quantity marketed
79	10	139,702	93,135	46,750
80	28	782,334	521,556	260,792
81	43	1,817,205	1,211,313	605,440
82	43	2,402,885	1,601,923	800,961
83	43	3,003,607	2,002,404	1,001,212
		8,145,733	5,430,331	2,715,155

Benefits from repurchase from cooperative at lower prices

79	10	35,530
80	28	139,272
81	43	274,985
82	43	274,985
83	43	274,985
		999,757

I(6)

FINANCIAL RATE OF RETURN CALCULATION (U.S.\$)

<u>FY</u>	<u>Savings to Farmers - Loss in Storage Reduced</u>				<u>Benefit to Farmers</u>			
	From 8.5% to 1.5%				From Increased Prices in 5% of Market			
	(RWF)	91.48 = U.S.	X	No. of Warehouses	(RWF)	91.48 U.S.	X	No. of Warehouses
79	67,500	738	X	10	426,000	4,675	X	10
80	94,500	1,033		28	852,000	9,314		28
81	121,500	1,328		43	1,288,000	14,080		43
82	121,500	1,328		43	1,704,000	18,627		43
83	121,500	1,328		43	2,130,000	23,284		43
				207,634				2,715,155

FY

Savings to Farmers from lower Purchase Price
at Co-operatives

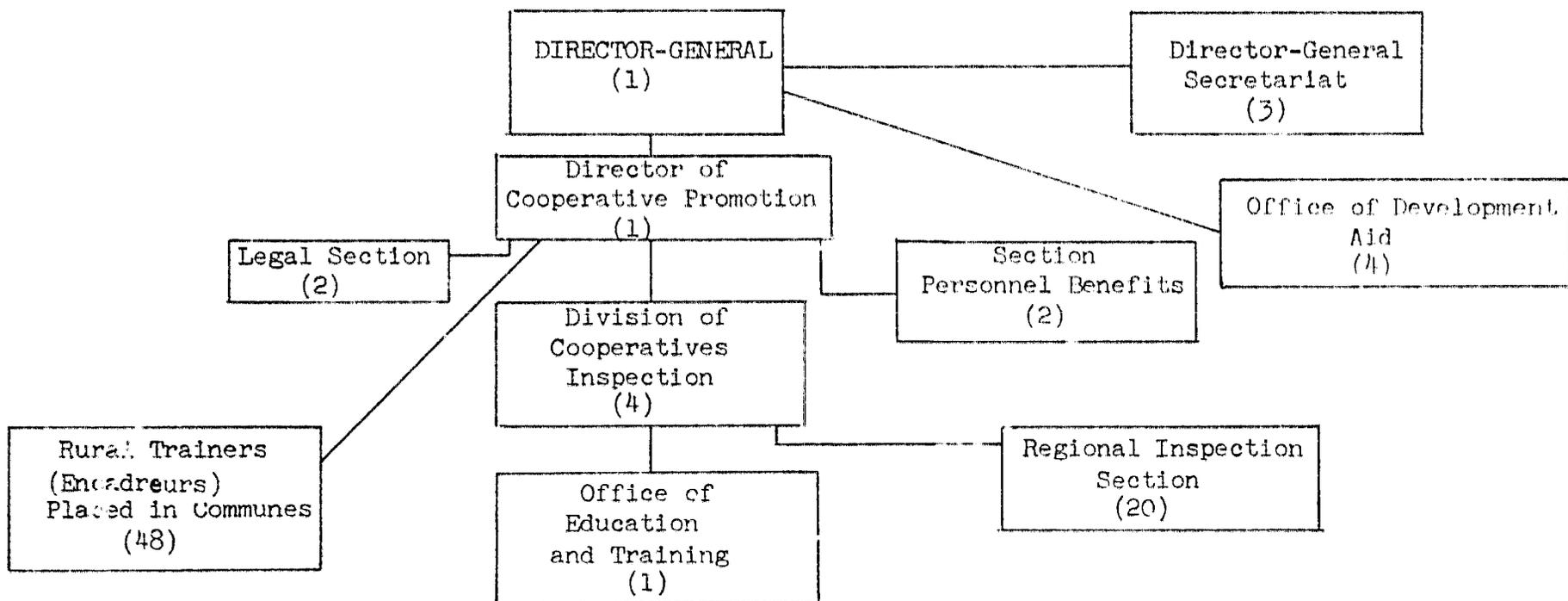
	(RWF)	91.48 = U.S.	X	No. of Warehouses	FY TOTAL GROSS BENEFITS	LESS COSTS	=	NET CASH FLOW
79	325,000	3,553		10	89,660	630,065	-	540,405
80	455,000	4,974		28	428,988	909,141	-	480,153
81	585,000	6,395		43	937,535	853,456		84,079
82	585,000	6,395		43	1,133,056	292,863		840,193
83	585,000	6,395		43	1,333,307	180,836		1,152,471
				999,757				Financial Rate of Return = <u>26.39</u>

Note: Financial Rate of Return is calculated using most conservative estimated benefits in each category. Secondary benefits to farms from reduced loss due to use of co-operative supplied insecticide used in the computation.

CURRENT ORGANIZATIONAL STRUCTURE (OCTOBER 1978)

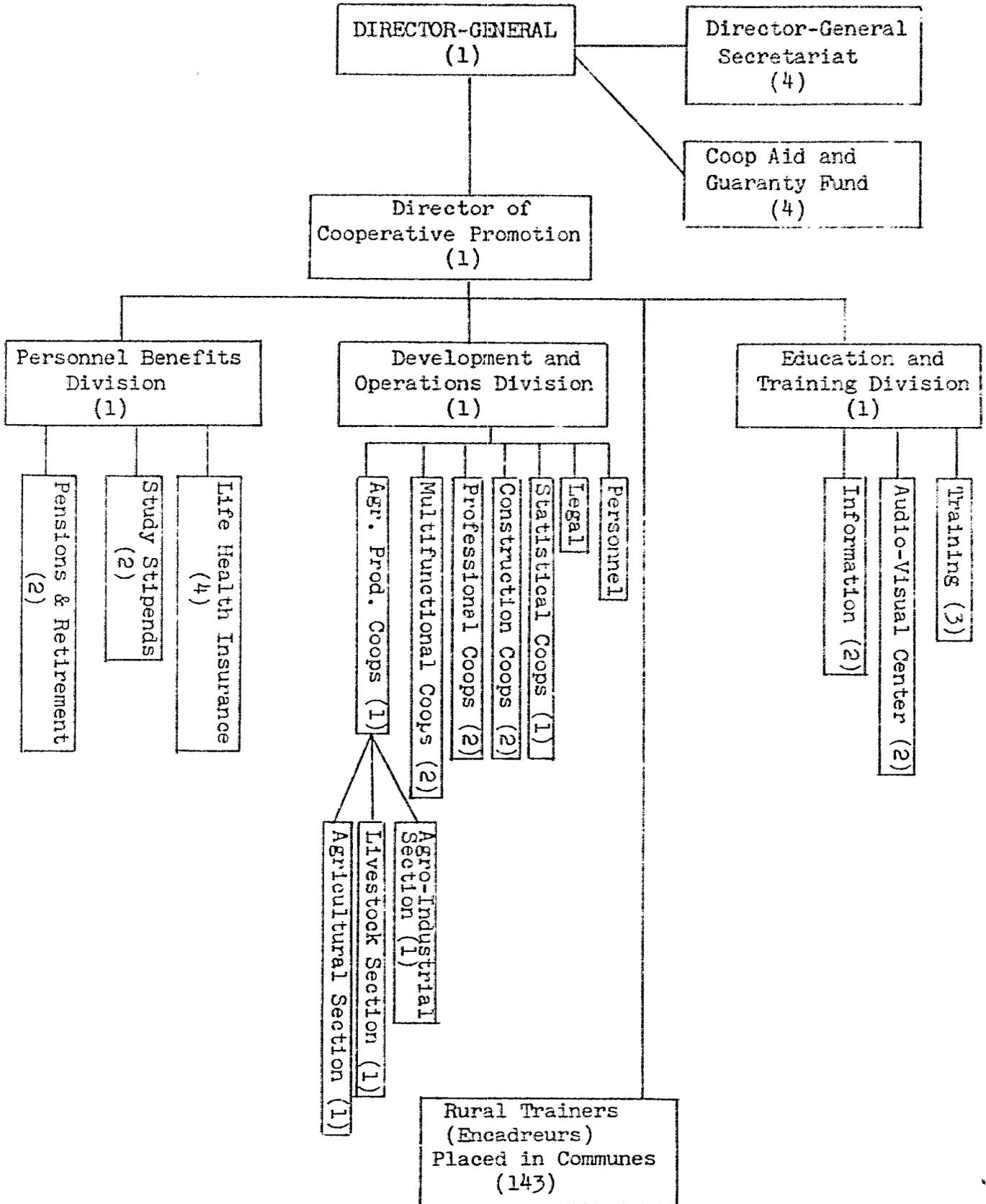
Department of Cooperative Promotion
Ministry of Social Affairs and Cooperatives

ANNEX J



(Number of personnel currently in place indicated in parenthesis)

PROJECTED ORGANIZATIONAL STRUCTURE



(Number of projected personnel indicated in parenthesis)

DRAFTPROJECT AUTHORIZATION AND REQUEST FOR
ALLOTMENT OF FUNDS

PART II

Name of Country: Rwanda
Name of Project: Local Crop Storage
Project Number: 696-0107

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Grant in Fiscal Year 1979 to the Government of the Republic of Rwanda (the "Cooperating Country") of not to exceed One Million Six Hundred Twelve Thousand United States Dollars (\$1,612,000), to assist in financing certain foreign exchange and local currency costs required for the Project as described in the following paragraph..

The Project will assist in the development of a local level food storage marketing system in approximately 40 communes by constructing grain storage warehouses, training personnel at the national and prefecture level in cooperative planning and management, training personnel at the commune-level in warehouse and storage techniques, grain marketing and cooperative management, undertaking research designed to solve certain grain storage problems and establishing a revolving credit fund. A.I.D. will assist by financing the costs of technical services, construction materials and services, the credit fund and related goods and services.

I approve the total level of A.I.D. appropriated funding planned for the project of not to exceed Two Million Five Hundred Seventy-Three Thousand United States Dollars (\$2,573,000), including the Fiscal Year 1979 funding as authorized above, and, subject to the availability of funds and in accordance with A.I.D. allotment procedures, increments during the period Fiscal Year 1980 through Fiscal year 1981 which shall not, in total, exceed \$961,000.

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the U.S. Ambassador to Rwanda or the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following essential terms and covenants and major conditions; together with such other terms and conditions as A.I.D. may deem appropriate:

a. Source and Origin of Goods and Services. Except as authorized in this paragraph and paragraph d below, and except as A.I.D. may otherwise agree in writing, goods and services financed under the project will have their source and origin in the Cooperating Country or countries included in A.I.D. Geographic Code 941. Ocean shipping financed under the Grant shall be procured in the United States or the Cooperating Country, except as A.I.D. may otherwise agree in writing.

b. Condition Precedent to Disbursement. Prior to the disbursement of Grant funds for the revolving credit fund, the Cooperating Country shall furnish to A.I.D., in form and substance satisfactory to A.I.D., a detailed plan showing how the fund will be administered,

the administrative cost of providing credit, the anticipated default rate, the mechanism and criteria for review and approval of specific loans, and the credit terms.

c. Covenants. The Project Agreement shall contain covenants providing in substance as follows:

1. The Cooperating Country agrees to furnish the land on which the storage warehouses will be constructed and agrees to select sites for the warehouses in accordance with the criteria to be set forth in the Amplified Project Description.

2. The GOR agrees to take such steps as are necessary to ensure cooperatives organized under the project will be legally established on a timely basis.

3. The Cooperating Country agrees to prepare, in conjunction with A.I.D., a detailed training plan.

4. The Cooperating Country agrees that all pesticides used under the Project will be registered by the U.S. Environmental Protection Agency and used for the same or similar purposes for which they are registered and will take such steps as are necessary to ensure that such pesticides are properly distributed, stored and applied.

d. Waiver.

Based upon the justification set forth in the Waiver Annex of the Project Paper, I hereby approve a waiver of the requirement under Handbook 1, Supplement B that commodities procured with funds shall granted to an RLDC/have their source in countries included in A.I.D.

Geographic Code 941, to permit procurement of one all-terrain vehicle, three 3/4-ton pickup-trucks, three small sedan automobiles and twenty motorcycles, at an approximate cost of \$125,000, which have as their source and origin countries included in A.I.D. Geographic Code 935.

I have concluded (1) that exclusion of procurement of the project vehicles from countries included in A.I.D. Geographic Code 935 would seriously impeded attainment of United States foreign policy objectives and the objectives of the Foreign Assistance Program and (2) that special circumstances exist which justify waiver of the requirements of section 636(i) of the Act.

Date: _____

Goler T. Butcher
Assistant Administrator for Africa

Clearance: