PD-BAQ-997

OFFICIAL PROJECT
DOCUMENT

PROJECT PAPER

RWANDA

FOOD STORAGE AND MARKETING

PHASE II

Project No. 696-0116

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number: ____

DOCUMENT CODE: 3

2. COUNTRY/ENTITY: Rwanda

3. PROJECT NUMBER: 696-0116

4. BUREAU/OFFICE: Africa — 06

5. PROJECT TITLE (maximum 40 characters): Food Storage and Marketing - II

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 02 DD 28 YY 86

7. ESTIMATED DATE OF OBLIGATION (Under 'B:' below, enter 1, 2, 3, or 4)
A. Initial FY 82 B. Quarter 2 C. Final FY 85

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

A. FUNDING SOURCE	FIRST FY 81 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	741	125	866	1733	367	2100
(Grant)	(741)	(125)	(866)	(1733)	(367)	(2100)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country		451	451		1850	1850
Other Donor(s)						
TOTALS	741	576	1317	1733	2217	3950

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) FN	130B	14C				1000		2100	
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 013 | 056 | 333

11. SECONDARY PURPOSE CODE: 154

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	BS	TECH					
B. Amount							

13. PROJECT PURPOSE (maximum 480 characters)

This project has two purposes: (A) to strengthen and expand GRENARWA's management to enable it to act as a catalyst in stimulating and assisting the marketplace to respond to regional and seasonal imbalances in supplies and prices of foodcrops (principally beans and sorghum) and, (B) to assist the GOR to determine the feasibility of long-term bean storage in Rwanda, which will in turn strengthen GRENARWA's capability to maintain a food security stock.

14. SCHEDULED EVALUATIONS
Interim MM 10 YY 83 | MM YY | Final MM 12 YY 85

15. SOURCE/ORIGIN OF GOODS AND SERVICES
☒ 000 ☒ 941 ☒ Local ☐ Other (Specify) 935 (vehic waiver

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

17. APPROVED BY
Signature: Eugene R Chiavaroli
Title: AID Affairs Officer, Rwanda
Date Signed: MM 01 DD 15 YY 83

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM DD YY

AID 1330-4 (8-79)

INSTRUCTIONS

The approved Project Data Sheet summarizes basic data on the project and must provide reliable data for entry into the Country Program Data Bank (CPDB). As a general rule blocks 1 thru 16 are to be completed by the originating office or bureau. It is the responsibility of the reviewing bureau to assume that whenever the original Project Data Sheet is revised, the Project Data Sheet conforms to the revision.

Block 1 - Enter the appropriate letter code in the box, if a change, indicate the Amendment Number.

Block 2 - Enter the name of the Country, Regional or other Entity.

Block 3 - Enter the Project Number assigned by the field mission or an AID/W bureau.

Block 4 - Enter the sponsoring Bureau/Office Symbol and Code. *(See Handbook 3, Appendix 5A, Table 1, Page 1 for guidance.)*

Block 5 - Enter the Project Title *(stay within brackets; limit to 40 characters).*

Block 6 - Enter the Estimated Project Assistance Completion Date. *(See AIDTO Circular A-24 dated 1/25/78, paragraph C, Page 2.)*

Block 7A. - Enter the FY for the first obligation of AID funds for the project.
Block 7B. - Enter the quarter of FY for the first AID funds obligation.
Block 7C. - Enter the FY for the last AID funds obligations.

Block 8 - Enter the amounts from the 'Summary Cost Estimates' and 'Financial Table' of the Project Data Sheet.
NOTE: The L/C column must show the estimated U.S. dollars to be used for the financing of local costs by AID on the lines corresponding to AID.

Block 9 - Enter the amounts and details from the Project Data Sheet section reflecting the estimated rate of use of AID funds.
Block 9A. - Use the Alpha Code. *(See Handbook 3, Appendix 5A, Table 2, Page 2 for guidance.)*

Blocks 9B., C1. & C2. - See Handbook 3, Appendix 5B for guidance. The total of columns 1 and 2 of F must equal the AID appropriated funds total of 8G.

Blocks 10 and 11 - See Handbook 3, Appendix 5B for guidance.

Block 12 - Enter the codes and amounts attributable to each concern for Life of Project. *(See Handbook 3, Appendix 5B, Attachment C for coding.)*

Block 13 - Enter the Project Purpose as it appears in the approved PID Facesheet, or as modified during the project development and reflected in the Project Data Sheet.

Block 14 - Enter the evaluation(s) scheduled in this section.

Block 15 - Enter the information related to the procurement taken from the appropriate section of the Project Data Sheet.

Block 16 - This block is to be used with requests for the amendment of a project.

Block 17 - This block is to be signed and dated by the Authorizing Official of the originating office. The Project Data Sheet will not be reviewed if this Data Sheet is not signed and dated. Do not initial.

Block 18 - This date is to be provided by the office or bureau responsible for the processing of the document covered by this Data Sheet.

ACTION MEMORANDUM

TO: Eugene Chiavaroli, AID Affairs Officer/Rwanda

THRU: Alexander R. Love, Director-REDSO/EA

FROM: Project Committee, REDSO/EA

SUBJECT Project Authorization-Food Storage and Marketing Phase II

Problem: Your approval is required to execute a grant in the amount NTE $2,121,000 from the ARDN appropriation to the Government of Rwanda for the Food Storage and Marketing, Phase II (FSM-II) project (696-0116).

Discussion: This project is the second phase of a project which was originally designed to create a system for the Government of Rwanda in which the Grenier National du Rwanda (GRENARWA) could enter the market to buy and sell haricot beans and sorghum to act as a catalyst for assuring maximum producer price and supplies and minimum consumer prices. Phase II recognizes a double role in which GRENARWA's catalytic market activities in price/supply will continue and research into storage problems related to a food security stock will commence with the intention of assisting in developing an institutional capability to manage a food security program.

GRENARWA will also undertake several experiments aimed at finding solutions to the problem of hard-shelling in beans that are stored for periods in excess of 8 months. The project will also conduct research into related operations of consumer preferences for various varieties of beans, disease resistance of bean varieties and the development of a socio-economic baseline to evaluate the marketing impact of GRENARWA.

Ultimately GRENARWA, using solutions found for avoiding hard-shelling in stored beans, will be capable of functioning as an effective managing organization for constitution, maintenance and rotation of the GOR's food security stock while continuing effective intervention as a catalyst in the marketplace to stabilize producer and consumer prices on haricot beans and sorghum.

This project is entirely consistent with the approved AID Strategy in Rwanda which is targeted at the agriculture sector. In fact this project is identified as the highest priority activity for AID in that sector.

Project beneficiaries are the small farmer producers of beans and sorghum who market their produce to GRENARWA either directly or through intermediaries such as private traders or cooperatives. Private traders also benefit from the storage capacity of GRENARWA which enables them to turn over their stocks on the selling side, virtually all bean and sorghum buyers in Rwanda can be considered to benefit from GRENARWA's price stabilization potential, though clearly only those actually buying GRENARWA produce receive a direct benefit.

AID contributions to this project will be $1 million for FY 1982 and $2.1 million over the life of the project.

The overall dollar breakdown of planned expenditure of project funds is shown in the tables below

	$000	
	1st Year	L-O-P
Technical Assistance	301	832
Commodities	327	375
Participant Training	59	259
Other	66	251
Contingency & Inflation	113	401
TOTAL	866	2,121*

*Local cost financing represents $367,000 of the total.)

The Host Country contribution is calculated to be $1,850,000 which provides salaries and operating costs of GRENARWA as well as minor in-kind contributions from the Institut des Sciences Agronomiques du Rwanda (ISAR) and the National Office for Development and Marketing of Food and Livestock Products (OPROVIA). It is anticipated that the World Food Program (WFP) will contribute $1,000,000 over the first three years of the project to assist GRENARWA's expansion of its buying operations.

The project has been reviewed from the economic, technical and environmental points of view. Although certain concerns were expressed in the process of Committee review

modifications in the project paper have been made to satisfy these concerns. The project is considered to be acceptable from the socio-economic perspective and is technically sound. An initial environmental examination (IEE) was made and a negative determination was approved by AA/AFR (see STATE 026952, attached). There are no special human rights concerns pending in Rwanda.

Of the several covenants included in the project two bear special mention. The GOR covenants to maintain its current policy of "indicative" or free market prices for staple food crops throughout the life of the project thus indicating its intent to follow price policy conducive to small farmer crop production. The GOR also covenants to preserve the management and financial viability of GRENARWA should it select GRENARWA to maintain and operate a food security stock. This shows that GRENARWA will be protected from deterioration of its financial viability should the GOR instruct it to manage a food security stock.

Two waivers for AID/W approval are in process and will be necessary for effective implementation of the project. One waiver pertains to procurement of vehicles (see Annex J of the PP) while the other will permit the continuation of the Canadian financial advisor hired under the previous project.

The principal implementing agency is GRENARWA. The large majority of the funds will be directed to GRENARWA for marketing, financial accounting and experiments in product quality control. Institut des Sciences will play a minor role in coordinating in the research aspects of the project.

Committee action reviewing this project took place in REDSO/EA in several meetings culminating with the visit of the AID Affairs Office from Rwanda in early February 1982. Committee discussion included alternative combinations to accomplish the research activities in the project, the adequacy of the financial analysis showing GRENARWA's financial viability, the role of the private sector in bean marketing, the nature of the relationship of GRENARWA and a potential food security stock, and the inadequacy of the previous project in establishing the measurable impact of GRENARWA's price stabilization activities. As noted above, the project paper has been modified in these areas of concern.

The project was included in the FY 1982 Congressional Presentation and no further notification of Congress is necessary.

The officer in charge of the project in Rwanda will be the agricultural officer. The AID/W backstop officer will be in AFR/DR/CWA.

Recommendation: That, in accordance with the authority vested in you by STATE 026952 (attached), you sign the attached PAF and thereby authorize the proposed project.

Approved _____

Disapproved _____

Date May 18 1982

Clearances:
Project Committee
REDSO:GBisson _____ Date 5 Mar 82
REDSO:CMartin _____
REDSO:LRoss _____
REDSO:LHausman _____
REDSO:PBloom _____
REDSO:ALaemmerzahl _____
Drafter:REDSO:JGraham:ts:03/08/82

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Lane/Martin/Brown

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AIDAC, NAIROBI FOR REDSO/EA

E.O. 12065:N/A

TAGS:

SUBJECT:RWANDA FOOD STORAGE AND MARKETING PHASE II PROJECT (696-0116)

REFS: A) KIGALI 03238; B) STATE 304819

1. THE AAO/RWANDA IS HEREBY DELEGATED AUTHORITY TO AUTHORIZE THE SUBJECT PROJECT, AND AUTHORIZE A GRANT NTE DOLS 2,121,000 FOR PHASE II OF RWANDA FOOD STORAGE AND MARKETING PROJECT (696-0116), WITH THE CONCURRENCE OF THE DIRECTOR REDSO/EA.

2. IN ADDITION TO NON-CONTROVERSIAL GUIDANCE IN PID APPROVAL CABLE (REF B), REDSO AND AAO ARE EXPECTED TO HAV PP ADDRESS LOGFRAME ISSUES RAISED IN BARNES/CHIAVAROLI COMMUNICATION DATED NOVEMBER 10, 1981. COPY POUCHED TO REDSO.

3. THIS HAS BEEN APPROVED. ORIGINAL POUCHED TO AAO. HAI

BT
#6952

UNCLASSIFIED

PROJECT PAPER

RWANDA

FOOD STORAGE AND MARKETING

PHASE II

Project No. 696-0116

PROJECT AUTHORIZATION

Name of Country: Republic of Rwanda

Name of Project: Food Storage and Marketing, Phase II

Number of Project: 696-0116

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, and Department of State Cable 026952, dated February 2, 1982, I hereby authorize the Food Storage and Marketing Project, Phase II involving planned obligations of not to exceed $2,121,000 in grant funds over a two year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing certain foreign exchange and local currency costs for the Project.

2. The Project will continue to strengthen and expand the National Granary of Rwanda (GRENARWA) in its marketing activities for beans and sorghum and its research activities in the food storage area. It will also assist GRENARWA in developing an institutional capacity to manage a food security program. The Project will finance long and short term technical assistance, training and related commodities.

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

4. a. Source and Origin of Goods and Services. Goods and services, except for ocean shipping, financed by A.I.D. under the Project shall have their source and origin in the Cooperating Country or in countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States or the Cooperating Country. (Two waivers are in process to permit purchase of motor vehicles and financial advisory services from Code 935 origina and sources).

b. The Project Agreement shall contain conditions precedent in substance that prior to the first disbursement of funds under the Grant, and within 60 days from execution of the Project Grant Agreement, the Cooperating Country shall, except as A.I.D. may otherwise agree in writing, furnish in form and substance satisfactory to A.I.D. the name of the official in the Cooperating Country's Ministry of Agriculture charged with the responsibility of implementing the Project on behalf of the Cooperating Country.

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

(1) that no pesticides will be procured or used in support of this project without a prior evaluation acceptable to A.I.D. which will include a risk/benefit analysis of the proposed use of the pesticide as required under A.I.D.'s environmental regulations in effect at the time of the proposed procurement or use;

(2) that the Cooperating Country shall maintain its currenty policy of "indicative" prices for staple food crops throughout the life of the Project;

(3) that prior to selecting GRENARWA as management agent for a food security stock, the Cooperating COuntry shall undertake appropriate studies and planning for such a Food Security Stock and institute appropriate subsidy mechanisms for costs related to food security stocks in such a way as to avoid deterioration of GRENARWA's financial viability;

(4) that the Cooperating Country shall assure support for the continued operations of the quality control laboratory subsequent to the termination of this project.

Signature Eugene Chiavaroli
Eugene R. Chiavaroli
AID Affairs Officer/Rwanda

Date 15 March 82

Concurrence: [illegible]
Alexander R. Love
Director, REDSO/EA

Date: 8 March 82

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete)

Amendment Number: 1

DOCUMENT CODE: 3

2. COUNTRY/ENTITY: RWANDA

3. PROJECT NUMBER: 696-0116

4. BUREAU/OFFICE: Africa 06

5. PROJECT TITLE (maximum 40 characters): Food Storage and Marketing - II

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 02 DD 28 YY 86

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)

A. Initial FY 82 B. Quarter 2 C. Final FY 85

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

A. FUNDING SOURCE	FIRST FY 81 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	741	125	866	2533	367	2900
(Grant)	(741)	(125)	(866)	(2533)	(367)	(2900)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country		451	451		1850	1850
Other Donor(s)						
TOTALS	741	576	1317	2533	2217	4750

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) FN	130B	140				800		2900	
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 013 | 056 | 333

11. SECONDARY PURPOSE CODE: 154

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	BS	Tech				
B. Amount						

13. PROJECT PURPOSE (maximum 480 characters)

This project has two purposes: (a) to strengthen and expand GRENARWA's management to enable it to act as a catalyst in stimulating and assisting the marketplace to respond to regional and seasonal imbalances in supplies and prices of foodcrops (principally beans and sorghum) and, (b) to assist the GOR to determine the feasibility of long-term bean storage in Rwanda, which will in turn strengthen GRENARWA's capability to maintain a food security stock.

14. SCHEDULED EVALUATIONS

Interim MM 01 YY 83 | MM YY | Final MM 12 YY 85

15. SOURCE/ORIGIN OF GOODS AND SERVICES

[X] 000 [X] 941 [X] Local [X] Other (Specify) 935 (vehicl waiver)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a 1 page PP Amendment.)

17. APPROVED BY

Signature: Norman Pfau

Title: Director, ARA/PD

Date Signed: MM 10 DD 14 YY 81

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM 10 DD 14 YY 81

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON D.C. 20523

ACTION MEMORANDUM FOR THE DEPUTY ASSISTANT ADMINISTRATOR FOR AFRICA

FROM: AFR/PD, Norman Cohen

SUBJECT: Rwanda Food Storage and Marketing Project, Phase II (696-0116) Increase in Life of Project (LOP) Funding

Problem: Your approval is required to increase the life of project funding of the Food Storage and Marketing, Phase II (FSM II) project (696-0116), by $800,000 to a new total of $2,900,000.

Discussion: The Food Storage and Marketing Project, Phase I was authorized in December, 1974. Its purposes are to develop a basic food marketing and storage program in Rwanda, to reduce seasonal and regional fluctuations in the price of basic food crops and to establish an efficient food storage and marketing system. Initial A.I.D. assistance was provided to finance the construction and equipping of storage facilities, technical assistance to initiate the project, and training of local staff in management practices. The project was implemented through the National Granary of Rwanda (GRENARWA).

A second phase of the project (FSM II) was authorized in May, 1982. Its purposes are to strengthen and expand GRENARWA as a catalyst in stimulating and assisting the marketplace to respond to regional and seasonal imbalances in supplies and prices of food crops and to assist the Government of Rwanda (GOR) to determine the feasibility of long-term bean storage in Rwanda. An important component of the FSM II project is aimed at finding solutions to the problems of hard-shelling in beans that are stored for periods in excess of eight months. The project will also conduct research into related operations of consumer preferences and disease resistance of various varieties of beans, as well as the development of socio-economic baseline data to evaluate the marketing impact of GRENARWA. The research activity is an integral part of two projects, Local Crop Storage (696-0107) and FSM II, and is funded jointly by both projects.

The FSM II project paper developed the total research package based on the research needs outlined in the LCS project and those identified later by an FAO mission to Rwanda. The FSM II

project estimated that the total costs for the research program would be approximately $830,000 including a university contract, local costs, contingencies and inflation, with $450,000 coming from the LCS project and the balance from FSM II. Subsequently, a PIO/T was prepared with the help of an agricultural economist financed under the REDSO/ESA Technical Support to the Mission (TSM) agreement with the Mid America Consortium of Universities, which estimated that a research contract with a U.S. university would cost approximately $809,000.

The contracting process, which began in late 1982, culminated in a contract with the University of Minnesota in the amount of $1,504,699, negotiated down from the university's original proposal of $2,009,699. The final figure of $1,504,699 is the minimum considered necessary to fulfill the scope of work of the request for technical proposals. Since only $450,000 is still available in the LCS project, the remaining $1,055,000 must come from this project, an $818,000 increase over the budgeted amount. A $257,000 project increase is also required to provide housing for the on-site researchers outside the contract. Since no additional funds are available in the LCS project, and other FSM II project elements can be reduced by only about $275,000, an additional $800,000 must be added to this project to fund the cost overrun.

A contract was signed with the University of Minnesota on November 4, 1983 and the first resident researchers arrived in Rwanda in January, 1984.

The mission project committee has carefully reviewed the project requirements with the Rwandan implementing agencies and has determined that the minimum budget requirements are as follows:

Project Elements	PP Estimate (Dols 000)	Revision
1. U. Minn Research Contract (an additional $450,000 is available through the LCS Project).	237	1,055
2. Housing for U. Minn.		257
3. Other technical assist (commercialization, accoun audit)	595	633
4. Training	259	199
5. Commodities	375	401
6. Operating Costs	251	205
7. Contingency and Inflat	383	149
Total	$2,100	$2,894
New requirement FSM II	$2,894,000	
Currently obligated FSM II	-2,100,000	
Additional requirements	794,000 rounded to 800,000	

The following provides an indication of the most significant differences between original estimates for the university research contract and the final contract costs:

a) The PIO/T estimated 78 months as the time required to carry out the research at a cost of $800 per month per person. The contract estimated it would take 94 months to carry out the research and actual salaries range from $1,300 to $1,450 per month, based on salaries earned by candidates as graduate assistants, etc. at the university.

b) The PIO/T estimated the project support staff costs to be $39,500. Actual contract costs were $126,983. The PIO/T requested a project coordinator (10 months) and a secretary (10 months). The contract calls for an on-campus project director (16 months), accountant (24 months), secretary (16 months) and scientific support staff (8.5 months), and 10 months of in-country local support.

c) Allowances were estimated to be $109,400 in the PIO/T. Actual costs were $95,300. The PIO/T estimate includes housing, utilities and guard services. The contract amount does not include these services, which are being funded outside of the contract.

d) International travel and transportation costs were estimated to be $63,250. Actual costs were $133,413. The contract provides home leave, R and R, where applicable and transportation of HHE, POV and consumables, none of which were provided in the PIO/T.

e) In-country travel and transportation was estimated to be $44,100. Actual costs were $69,381. Vehicle operation and maintenance is included in the PIO/T estimate, but not in the contract amount. Vehicle operation and maintenance is funded by the project outside of the contract.

f) Allowances were estimated to cost $31,800. The actual costs were $95,307. The contract provides post differential, COLA and education allowance for all in-country staff. PIO/T provided them only for the research manager.

g) The PIO/T estimated the cost of consultants to be $122,500 for a period of 12 months. The contract cost for consultants was $195,539 for 18.5 months.

h) In addition, these costs were not included in the PIO/T: Pre-departure training, $37,500; In-country and on campus supplies and expenses, $45,860; Inflation and contingency, $116,328 (contingency only).

The Host Country contribution is calculated to be $1,850,000 which provides salaries and operating costs of GRENARWA as well as minor in-kind contributions from the Institut des Sciences Agronomiques du Rwanda (ISAR).

The project has been reviewed from the economic, technical and environmental points of view. The project is considered to be acceptable from the socio-economic perspective and is technically sound. An initial environmental examination (IEE) was made and a negative determination was approved by AA/AFR. There are no special human rights concerns pending in Rwanda. No conditions or covenants are necessary relative to this amendment. The requirements of Section 611(a) of the Foreign Assistance Act have been met.

The possibility of a cost overrun was discussed with AFR/CA and PD in November, 1983, when the U. of Minnesota contract was being negotiated. It was agreed with the desk that funding for

the cost overrun would be requested from the Rwanda FY 84 OYB by reducing the amount to be obligated for the first-year of the Cropping Systems Improvement Project (696-0110) by the amount of the overrun. The desk has prepared an Advice of Allowance making funds available for FSM II instead of CSIP.

Congressional Notification: A Congressional Notification is now in process and the AID REP/Rwanda will not obligate these additional funds until advised that the CN has cleared Congress.

Recommendation: That you approve an amendment to the Project Authorization for the Rwanda Food Storage and Marketing Project, Phase II (696-0116) to increase the life of project funding by $800,000 to a new total of $2,900,000 by signing the attached amendment to the Project Authorization.

Approved: _____

Disapproved: _____

Date: 4/10/84

Drafted:AFR/PD/CCWAP:TCWilliams:02/28/84:632-3390:0836K

Clearances:
AFR/DP:HJohnson(draft)
AFR/PD/CCWAP:HHelman(draft)
AFR/CA:RHynes(draft)
AFR/TR/ARD:FHolmes(draft)
GC/AFR:MAKleinjan(draft)
DAA/AFR:JJohnson

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

FIRST AMENDMENT
TO
PROJECT AUTHORIZATION

Name of Country: Rwanda

Name or Project: Food Storage and Marketing Phase II

Number of Project: 696-0116

1. Pursuant to section 103 of the Foreign Assistance Act of 1961, as amended, the Food Storage and Marketing Project, Phase II (the "Project") was authorized on May 18, 1982. That authorization is hereby amended as follows:

a. In paragraph 1, the phrase "planned obligations of not to exceed $2,121,000 in grant funds over a two year period from the date of authorization," is deleted and the phrase "planned obligations of not to exceed two million, nine hundred thousand United States dollars ($2,900,000) in grant funds over a three year period from the date of initial authorization," is substituted therefor.

2. The authorization cited above remains in force except as hereby amended.

Alexander R. Love
Deputy Assistant Administrator
Bureau for Africa

7/10/84
Date

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GLOSSARY

OPROVIA	National Office for Development and Marketing of Food and Livestock Products
GRENARWA	Grenier National du Rwanda
ISAR	Institut des Sciences Agronomiques de Rwanda
LCS	Local Crops Storage
CLUSA	Cooperative League of the USA
Commercant	Small scale shopkeeper
FSM I	Food Storage and Marketing - Phase I
FSM II	Food Storage and Marketing - Phase II
WFP	World Food Program
PNAP	Project National d'Ameliorization de Pomme de terres
CRS	Catholic Relief Services
FAO	Food and Agriculture Organization
MINAGRI	Ministry of Agriculture (Rwanda)
MINASODECO	Ministry of Cooperatives (Rwanda)
ITAL	Institute of Food Technology
CIAT	Centre International de Agricultura Tropical
AAO	AID Affairs Officer
REDSO/EA	Regional Economic Development Service Organization/East Africa
GOR	Government of Rwanda
PACD	Project Activity Completion Date
TSM	Technical Support for Missions
MIAC	MidAmerica International Agricultural Consortium

I. SUMMARY AND RECOMMENDATIONS

A. Face Sheet - (See previous page)

B. Recommendations: This project paper recommends that AID assist the Government of Rwanda (GOR) in a project which will build upon Phase I of the Food Storage and Marketing project to continue to strengthen the GOR parastatal GRENARWA (National Granary of Rwanda) in its role as a marketplace catalyst in beans and sorghum and will prepare GRENARWA to become the GOR manager of a food security stock by addressing the storage problem of bean hard-shellling. AID will provide grant funding in the amount of $2,100,000 from FN funds over the life of the project. No special conditions on the part of the GOR are considered necessary for the successful implementation of the project.

Two waivers (detailed in Annex J), for project vehicles and to employ a Canadian accountant will need to be authorized to permit effective implementation.

Summary

C. Project Description

The FSM project is the second phase of a project which was originally designed to create a system in which GRENARWA could enter the market to buy and sell haricot beans and sorghum to act as a catalyst for assuring maximum producer price and supplies and minimum consumer prices. Phase II recognizes a double role in which GRENARWA's catalytic market activities in price/supply will continue and research into storage problems related to a food security stock will commenc with the intention of assisting in developing an institutional capability to manage a food security program.

GRENARWA will also undertake several experiments aimed at finding solutions to the problem of hard-shelling in beans that are stored for periods in excess of 8 months. The project will also conduct research into related operations of consumer preferences for various varieties of beans, disease resistance of bean varieties and the development of a socio-economic baseline to evaluate the marketing impact of GRENARWA.

Ultimately GRENARWA, using solutions found for avoiding hrad-shelling in stored beans, will be capable of functioning as an effective managing organization for constitution, maintenance and rotation of the GOR's food security stock while continuing effective intervention as a catalyst in the marketplace to stabilize producer and consumer prices on haricot beans and sorghum.

D. Summary Findings

The Project paper includes appropriate technical, economic and social analyses which support implementation of the project. The project has been thoroughly reviewed with appropriate GOR authorities. The project meets all applicable Statutory Criteria and is ready for the immediate commencement of implementation activities upon authorization.

E. Issues

No project issues stemming from either the FSM I evaluation or the PID approval process remain as the PP has addressed all such concerns. The only consideration remaining is the continued participation of the World Food Program in financial support of this second phase. WFP contributed $1.0 million during the first phase toward constitution of the buying fund. The local WFP office has indicated its desire to continue contributions to the second phase at the level of $1.0 million over three years. Their participation will greatly enhance the viability of GRENARWA while the implications of their non-participation would lengthen the time required to achieve mobility and reduce its role in food security stock management. (See Economic Analysis and Financial Annex L-2 for further discussion.)

II PROJECT DESCRIPTION

A. BACKGROUND.

1. Overview.

Rwanda is classified among the 25 relatively least developed countries (RLCD's) in the world; it is also Africa's most densely populated country with preliminary figures from the 1978 national census indicating that the population is growing at 3.1% per year. Rwanda is afflicted with all of the logistical problems of a poor, landlocked country and possesses no signigicant mineral deposits. Its primary resources are its relatively good soil, abundant rainfall, and diligent population. Rwanda is a country of approximately 800,000 small subsistance-level farms. Although food production goals established in the first two Five Year Development Plans have for the most part been realized, this has been largely due to exploitation of marginal and pasture lands and not to increases per hectare yields. The data suggests that over the last five years acreage yields per hectare have decreased, though primarily because marginal lands have come under cultivation. There is now very little uncultivated arable land left to exploit, however, so that continued territorial expansion no longer represents a viable response to mounting population pressure. As farms are continually forced to support more and more people, real incomes of farmers are declining, along with already low nutritional levels. Within the social and cultural setting of present day Rwanda, the government is beginning to carry out its options to diminish the high rate of population growth (see AID MCH/FP Project Paper 696-0113). At the same time it is searching for ways to increase its agricultural production to provide food and income to meet the needs of its predominantly rural population.

Rwanda is virtually always in a marginal food deficit situation, despite frequent rains and good soils which permit two crops a year. Rwanda agriculture is extremely vulnerable to climatic variabilities and periodically experiences severe production deficits. Production deficits, both normal and extreme, are generally area specific, with other regions of the country continuing to have usual and excess (to the regions' needs) production.

The Government of Rwanda (GOR), faced with a burgeoning population and a subsistence base of food production has developed an overall food production strategy which recognizes the interrelation of (A) food crop production

activities, (B) agronomic research, (C) marketing storage and distribution, (D) food security stock and (E) agricultural information as it relates to research, distribution and identification of potential at-risk food deficit populations.

A combination of the various existing AID inputs, the activities proposed by this project complement each other in support of the government's overall food strategy described above. AID's activities include (1) FSM I, (2) the Local Crop Storage Project, (3) the Catholic Relief Services (CRS) and Cooperative League of the USA (CLUSA) local silo projects, and (4) the recently approved Agricultural Survey and Analyses Project.

The activities of the other donors largely address food production, either as elements of integrated rural development project or in specific single commodity food production projects such as potatoes (PNAP). AID is presently studying the feasibility of participating in a crop intensification project, one with a heavy emphasis on crop and farm systems research.

2. AID Involvement in Food Storage and Distribution.

Originally AID selected the food storage and distribution sector for concentration of resources. It should be noted that AID is a major donor in this sector and is expected by the GOR and the donor community to continue in this role.

A. Project. 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.

B. FSM Evaluation Conclusions. The FSM evaluation recently completed by AID (Annex F of FSM II PID) concluded that GRENARWA (Grenier National du Rwanda) continues to be relevant and appropriate to the development needs of Rwanda, especially recognizing the continuing pressure of Rwanda's growing population on the land, the limited resources and infrastructure, and the growing problem of increasing the availability of food at reasonable prices.

GRENARWA has been effective as a newly created institution. Dealing with private traders, cooperatives, and farmers, GRENARWA purchases beans and sorghum at harvest, stores them under controlled conditions and releases them in food deficit areas as demand, evidenced by rising prices, increases. By purchasing at harvest when food crop prices are low and selling when prices are rising, GRENARWA provides the competition needed to induce the private trader to offer a more advantageous price to producer and consumer.

GRENARWA has become the leader in providing storage advice and services to those Rwandan government and non-government organizations involved in food storage. The experience GRENARWA has obtained in the five years of active operations has put it in an excellent position to play a leadership role in dealing with national policy issues in food storage and marketing.

The FSM I project achieved its purpose of establishing an efficient food storage and marketing system. GRENARWA's rapid and effective response to a serious regional food shortage in 1980 testifies to its operational capabilities.

GRENARWA's storage practices utilize the available technology and are satisfactory. A problem unforeseen when the project was originally designed concerns the effect of long-term storage on bean cookability and the resulting reduction in potential resale value. After 6-8 months in storage, beans harden and more cooking time is required. Consumers may also perceive a taste difference in stored beans.

GRENARWA has also had a notable impact in reducing consumer prices for: (1) those consumers who bought directly from its warehouses at lower prices; (2) those consumers who bought in the markets where GRENARWA released its stocks (GRENARWA sells a large portion of its stock to small private traders who, competing amongst themselves, generate downward pressures on bean and sorghum prices); and (3) non-government (i.e., cooperatives, community centers, schools) and government (i.e. prisons, military) organizations who received lower bids from traders competing with GRENARWA to fill contracts.

GRENARWA, has however, been hampered by the lack of an effective survey and information mechanism to determine with precision the extent of excess and/or deficit production by region which would permit an aggressive program for movement

of food supplies among regions. In the case of Rwanda, where emergency food imports of any magnitude are impossible to carry out, it is especially vital to have complete information on production throughout the country in order to be able to anticipate regional or country-wide shortages so that measures can be taken to prevent possible famine.

3. Local Crop Storage Projects.

As the focus of GRENARWA was on food storage and distribution at the national and regional level, AID then selected local storage and distribution as the target for additional activity. The GOR developed a plan to provide each of the country's 143 districts or "communes" with local grainstorage facilities and a marketing mechanism. AID has made several responses towards the achievement of this goal. In 1975 under an AID grant to CRS a program of construction of local grain silos was begun in selected communes in Rwanda where Catholic Missions were established. Twenty-one silos have been constructed, four of which were financed by AID. The CRS experience indicated that it is feasible to build and operate storage units at the mission level and suggested that the program be broadened and adapted to other communes without the organizational structure provided by the presence of a Catholic Mission.

As a second step in developing a program for local grain storage and marketing, AID financed under an Operational Program Grant (OPG) with CLUSA a project undertaken jointly with the U.N. Capital Development Fund to construct seven storage centers in communes where cooperatives already exist with AID providing technical assistance. The purpose of the project was to develop a storage and market mechanism which would increase income of participating farmers, reduce storage losses and strengthen rural institutions (cooperatives) to provide new services to the local population.

The CLUSA project, which took place over a three-year period beginning in January 1979, represents the pilot phase of the Local Crop Storage project (696-0107). The two projects have very similar purposes, outputs and inputs and differ only in magnitude. The LCS project includes an important research component which examines certain technical and economic aspects of bean production and storage. The research component of this activity will now be done in close coordination with research proposed in the FSM II project.

4. Agricultural Sector Data and Analysis.

While AID's major emphasis during the 1970's was on food storage and marketing, it soon became evident to AID that progress must be made in related components in order to support investments made in production by other donors and in storage and distribution by AID. With this in mind AID has financed the Agricultural Survey and Analysis project which seeks to generate a reliable and up-to-date profile of agriculture in Rwanda, and to provide the GOR with the capability to collect and analyze agricultural information on its own in years to come. The purpose of the project is to strengthen the capability and performance of the GOR in data collection, processing, analysis, planning and management in the agricultural sector.

5. Other Production Related Activities.

The final components of the food sector, food security stock and agronomic research will largely be addressed by other donors, although AID will have nominal participation in each component. In food security, the FAO, at the GOR request, has taken the lead and completed two studies aimed at defining the required food stocks. AID will participate insofar as the FSM II project will, through bean hard-shell research, contribute to the efficient storage of food security stocks. Also, to the extent that AID has assisted in the creation and continued growth of GRENARWA (proposed as the GOR's agent for food security stock management) AID is again a participant in the food security stock component.

Basic food crop production research has long been the domain of ISAR assisted by Belgian technical assistance. The Belgian investment in agronomic research is such that is should not be duplicated nor can it be displaced. Rather AID's role in this component consists of utilizing ISAR as a research agent in selected technical studies under the Local Crops Storage project and again under this proposed project.

6. Pricing Policy.

A final element in the background of this proposed project is the change in GOR price policy as it relates to staple food prices. During most of the period of FSM I the GOR followed a policy of fixed producer and consumer prices which, though officially announced, were not enforced. The effect of fixed prices on GRENARWA, a parastatal, was to place it in a disadvantageous position vis-a-vis commercial traders who could flout fixed prices with ease. Although GRENARWA did on occasion evade fixed prices, its impact on price stabilization was reduced because it could not announce its prices when they were below the minimum price set by the GOR.

In the summer of 1981, during the FSM I evaluation process, the GOR determined that staple food prices would henceforth be considered indicative (similar to the U.S. "manufacturer's suggested retail price"). The effect of this change has permitted GRENARWA the same latitude in pricing as has always been available to the traders, and it allows GRENARWA to announce its prices on the radio, increasing its price and supply stability effects, thus enhance the former's competitive position. It remains to be seen during this proposed project what effect this change will have in assisting GRENARWA to reach its desired percentage of market turnover.

B. Program and Sector Goal.

AID Rwanda's program goals and the goal of this proposed Phase II FSM project continue to be to increase the availability of food to meet the needs of Rwanda's population.

Project Purpose

This project has two purposes: (A) to strengthe and expand GRENARWA's management to enable it to act as a catalyst in stimulating and assisting the marketplace to respond to regional and seasonal imbalances in supplies and prices of foodcrops (principally beans and sorghum) and (B) to assist the GOR to determine the feasibility of long-term bean storage in Rwanda, which will in turn strengthen GRENARWA's capability to maintain a food security stock.

End of Project Status.

By the end of the project, GRENARWA (within the National Office for Development and Marketing of Food and Livestock Products--OPROVIA) will be capable of functioning as an effective managing organization for constitution, maintenance and rotation of the GOR's food security stock whil continuing effective intervention as a catalyst in the marketplace to stabilize producer and consumer prices on haricot beans and sorghum.

Outputs and Inputs.

Project outputs are a direct outgrowth of the specific recommendations from the recent evaluation of the current FSM project and subsequent AID analysis. Achievement of the outputs is expected within the four-year life of the project. This time frame is believed realistic, based on the progress GRENARWA has already made under the first phase FSM

project and the analyses and conclusions of the evaluation. Inputs are linked with each output in this narrative analysis and presented in chart form in Table II found in the Financial Analysis (Section III-D).

Output #1

Effective Functioning System for Marketing Information and Marketing Output Discussion.

The project proposes to develop the GRENARWA marketing department into an effective unit by improving its marketing information system and expanding its marketing activities. An improved market information system will facilitate the free flow of information in the marketplace as well as assist GRENARWA to maintain and rotate the food reserve stock as it relates to marketing. It is envisaged that the department will provide market information for radio broadcasts and specific advertising of GRENARWA warehouses and silos. At the end of the project, a functioning quality control laboratory will have been set up in OPROVIA to which GRENARWA will have access. This laboratory will be responsible for monitoring the quality of stored products and its activities in experimenting on the long-term storage on bean quality and suggesting methods for resolving the hard shell problem will help maintain quality. Also the department will help GRENARWA determine what services (i.e., fumigation and crop storage advice) the private sector requires. The department will also undertake marketing surveys and other special analyses to clarify the role of the private traders, cooperatives and other non-speculative storage and marketing organizations with a view towards providing services or advice to assist them in functioning more efficiently.

GRENARWA's expansion of trading activities with local foodcrop storage units should assist them in operating more effectively in the marketplace, thus contributing to an improved competitive environment for trading activities. GRENARWA has recently increased its dealings with these units which are comprised of producer and consumer cooperatives, mission, local silos, etc. For example, in 1979, less than two percent of GRENARWA's purchases were from these non-speculative organizations; in 1980, as a result of vigorous marketing efforts by project staff, about 18 percent was purchased from them. As the number of such groups increases, efforts to collaborate with them should be increased to pass a higher percentage of GRENARWA's potential benefits directly to the producers and consumers. The non-speculative groups tend to

purchase and sell foodstuffs at prices more favorable than found in local markets. When GRENARWA buys directly from a producer cooperative, the benefits of its market purchase price are passed directly to the member producer. By the same token, GRENARWA's sales to non-speculative groups result in the groups' members paying less for the food. Thus, expanding GRENARWA's linkages with these organizations will increase the magnitude and number of benefits passed directly to producers and consumers. These small non-governmental organizations will gradually increase their percentage of the market place in terms of buying and selling of food crops. Nevertheless, the majority of trading by GRENARWA for the forseeable future will be with private traders (see Social Soundness Analysis) who benefit from using GRENARWA as a back-up purchaser.

Inputs.

The expatriate director of GRENARWA, who managed its marketing, departed at the end of 1981. His duties have been assumed by his Rwandan counterpart. However, the evaluation and AID concluded that the services of a marketing advisor will be required over the next three years.

The marketing advisor will work with the marketing department staff (enlarged to three Rwandans) to develop the market price information system and make the marketing system more efficient. Five months of short-term TA to assist in the design of market surveys is included to supplement the staff's on-the-job training.

As the marketing staff develops, formal training will be required. Twelve months of training is envisaged for the marketing chief and six months each for the two assistants. The courses, selected with the marketing advisor, will be in market information gathering and dissemination, marketing and economics. One participant will be selected for long-term training in marketing economics in the U.S.

Commodities required by the department (i.e., office machines, marketing materials, etc.) will be funded by the project. Two vehicles are included to help the department implement its intensified market information-gathering effort. Sufficient space exists at GRENARWA's headquarters for the additional staff

The quality control laboratory will be provided with short-term expert technical assistance and a long-term graduate student, salaries for local personnel, vehicle support and laboratory equipment.

An expected result of having more accurate and useful market information and an effectively functioning accounting department (see Output paragraph 2) is that GRENARWA will increase the size of its food reserve to approximately 80 percent (or a total of 8,000 MT) of its end of project storage capacity, which is also the level FAO presently recommends as the size of Rwanda's food security stock. In order to efficiently manage and turn over the reserve to avoid food storage losses, more trucks are required to transport the food from purchase points, to warehouses and then to buyers. Given the estimated increase in volume expected (3,000 MT) and transport conditions in Rwanda, an additional three trucks (MT each) are proposed for project funding.

Output #2

Effectively Functioning Accounting Department

Output Discussion

The project proposes to develop the accounting department into an effective unit by improving its financial analysis and control procedures.

The effectively operating accounting department will assist GRENARWA management in making decisions which will help it be as financially self-sufficient as possible as it operates the proposed food security stock.

Inputs

As was recommended in the evaluation and verified by the PP team, one long-term financial advisor will be funded to work closely with the existing accounting staff. The advisor will stay for approximately two years and provide on-the-job training for the accounting staff. Limited funds are provided for two months of short-term training for the department chief in accounting, probably in an auditing firm. One long-term participant will be nominated for training in business administration in the U.S. The department will require a few commodities. Funding is also included for an annual external audit.

GRENARWA will also require increased buying funds as it expands its medium-term food reserve. The World Food Program (WFP) and Swiss aid, who have contributed to its buying fund during Phase I have been approached to provide these resources. The local WFP office indicated a willingness to participate in the buying fund in the order of $1.0 million over the first three years of the project, an amount which should both reconstitute the buying fund to its original size and permit GRENARWA to have the resources to approach its target of 15 percent of market turnover. WFP necessarily must develop its own internal documentation but has indicated that with AID's provision of technical assistance for Phase II WFP participation is reasonably firm. The Swiss declined to continue participation due to funding constraints and shifts in program emphasis.

Output #3

Capability to Perform Research to Improve Storage and Marketability of Foodcrops

Output Discussion

Since the mid-1970's, AID in Rwanda has made an important contribution toward developing the country's food storage and marketing capabilities at the communal level through the CRS silo project and the Cooperative Grain Storage (CGS) and Local Crop Storage (LCS) cooperative silo projects and at the national level through the FSM project. Although these efforts have been successful, the projects have suffered from a lack of concrete knowledge about local storage and marketing conditions and food preferences. The LCS and FSM II projects propose to do applied research which will allow more thorough monitoring and evaluation of both projects' performance in the future. A list of these research activities with a brief description of each is presented in Section II C below.

Inputs.

Enhancement of the research capability under the FSM II project will be coordinated with other efforts being financed by the Local Crop Storage project. Under the LCS project, a PIO/T has been developed for appropriate technical assistance to undertake both technical and socio-economic studies. FSM II will provide additional assistance which will focus on consumer preferences and provide a socio-economic

baseline and monitoring system for the project. This research will be undertaken under the umbrella of ISAR, the Rwandan agronomic research institute. This PP recommends that the recently authorized Technical Support for Missions (TSM) contract with Midamerica International Agricultural Consortium (MIAC) be utilized to develop a coordinated research proposal that both serves the needs of the two projects and is able to be implemented from an academic source of expertise. Such research has been costed out on a basis of one long-term agricultural economist and three graduate assistants. Certain specialized research activities will require specific technical assistance from ISAR, such as the identification of bean varieties and insect resistant varieties. Two participants will be selected for long-term training in the U.S. in agronomy and in farm systems research to enhance continued research under this project. Funding will also be reserved for local assistants, vehicles and other survey expenses.

C. Detailed Project Description

The FSM project is the second phase of a project which was originally designed to create a system in which GRENWARA could enter the market to buy and sell haricot beans and sorghum to act as a catalyst for assuring maximum producer price and supplies and minimum consumer prices. Phase II recognizes a double role in which GRENARWA's catalytic market activities in price/supply will continue and research into storage problems related to a food security stock will commence with the intention of assisting in developing an institutional capability to manage a food security program. This project description presents the principal institutional agents, describes their activities and relates back to the input - output analysis presented above.

OPROVIA (National Office for Development and Marketing of Food and Livestock Products)

OPROVIA was created by the GOR to meet the long-felt need to organize domestic marketing of food and livestock products. The mandate of OPROVIA includes stimulation of production, as well as promotion and marketing at both wholesale and retail levels; OPROVIA's objectives are relatively ambitious and cover a range of possible activities. All of its budget comes from outside the structure of the MINAGRI in the form of the funding for development projects, and self-generated funds, e.g., sale of imported food aid.

In the 2nd Five Year Development Plan (1977-81), OPROVIA's role is expansively defined as promoting food crop production at all levels and assuring distribution and sale to urban centers. OPROVIA, with limited resources has decided that it has no direct role to play at the level of the small farmer, whose needs should be serviced by the Extension Service (MINAGRI), or, at the commune level, by the Cooperatives (MINASODECO), and other non-speculative organizations.

At present, OPROVIA has concentrated its efforts on the sale of certain local food crops and the distribution of food aid given to Rwanda by several countries and international organizations particularly the European Economic Community (EEC). OPROVIA also supervises a group of small projects dealing with livestock including cattle ranches, abattoirs, and the national dairies.

When GRENARWA is integrated with OPROVIA in early 1982, the latter's role will be extended to cover all food crops throughout the country and it may be asked to concentrate on promoting increased productivity. OPROVIA has approved the new organizational structure which will be required by the integration of GRENARWA and other livestock projects.

GRENARWA

GRENARWA was originally created as the operational entity for management of the price stabilization fund. The general organization chart can be found in Annex I. To attempt to stabilize prices in its work of upholding minimum prices, GRENARWA deals with private traders, cooperatives and farmers, purchases beans and sorghum during the harvest period, stores them under modern, controlled conditions and then transports and sells them as the demand increases into the hungry season in those deficit areas which have the greatest need, as evidenced by rising prices. GRENARWA affects prices in the market by increasing competition through changing the available supplies of beans and sorghum. Annex I also presents the organization of marketing in Rwanda.

GRENARWA currently markets approximately 8 to 10% of total bean commercialization. As the AID funded local crops storage program is not yet extensively operational, the bulk of commercialization is through private traders. Past practice and experience has shown that GRENARWA must market close to 15% of total bean commercialized to be able to significantly influence market prices nationwide. This expanded marketing

thrust will also increase GRENARWA's annual utilization of its present (1981) storage of 10,000 metric tons capacity to about 80% or 8,000 metric tons. GRENARWA should also reach out to formalize links with cooperatives and local storage facilities as well as with private traders. The basic procedures GRENARWA follows in order to stabilize prices are in place and functioning. What remains is to effectively utilize GRENARWA's present physical infrastructures and to refine its price stabilization procedures. To do so, however, requires further development of GRENARWA's marketing and financial staff and of the management support systems of data collection and analysis, and financial control procedures.

Research

The research to be undertaken in this project will be done by an appropriate team of researchers. It is recommended that at least one researcher have background in quantitative analysis in order to manage the statistical analyses in these studies. The results are of interest to both the LCS and FSM II projects, but the primary beneficiary of each activity will be named. As noted above, this research plan will be further developed by utilizing the recently approved TSM with MIAC, which will define the best strategy for serving the research needs of the project with the academic skills available. Those activities funded by LCS are described in further detail in that project document.

1. Inventory of the methods and conditions of indigenous storage of food grains and pulses in Rwanda.

2. Evaluation of the quantity stored and the losses from the different methods over time. These two topics are interrelated and will be undertaken by LCS. A literature review will be done; a pilot study with a sample of farmers on the quantity of produce stored and its conditions at frequent intervals will be conducted; and a general survey of on-farm storage of grains and pulses, calculating quantities stored and losses will also be done.

3. An inventory of bean varieties now being grown and of local and regional preferences will be done by LCS with technical assistance from ISAR.

4. LCS will also conduct a consumer survey of local preferences of bean varieties. Despite the importance of beans in the Rwandan diet, no systematic national survey of bean varieties has been done. Myths abound about the local populations' preference in beans, but none has documented these

preferences yet. This information will help local storage units make decisions about interregional trade and will help GRENARWA in its commercial activities.

5. Consumer acceptability trials of GRENARWA beans will be conducted by FSM II to determine the criteria necessary for acceptable long-term storage of beans. The study will evaluate the influence of different periods and conditions of storage of dry beans on consumer acceptability. Bean samples at different moisture contents will be distributed to farm women on a bi-monthly basis in order to get their opinions about acceptable bean quality. Participants for this survey could conceivably be located through the CRS nutrition centers or through communal health and social workers.

6. LCS will set up experiments to identify bean varieties that are resistant to pests of stored grain (particularly Acantho Celides Obtecus) as one means of reducing the losses in beans that have to be stored for longer periods (4 to 5 months) on farms. Technical assistance will be provided by ISAR on this task.

7. Provision for socioeconomic studies is included in both the LCS and FSM II projects. A lesson learned from both initial phases is that no adequate baseline exists from which to measure project impact over time. The Agricultural Survey and Analysis Project, financed by USAID, is undertaking a national survey of agricultural production and marketing including data on field areas, yields, tools, livestock, patterns of crop association and use of labor. A sample of approximately 715 households or 0.6% of the population are to be included in the survey. Furthermore, the Ministry of Planning is expected to begin a household budget survey with this same sample. It is expected that much of the data called for in the LCS socioeconomic studies will be tapped by this survey, albeit in less depth. It is recommended, therefore, that the socioeconomic research done by this project benefit from the Ag Survey's advance work. Researchers from this project could gather extra information as needed from a small number of households already surveyed and hence improve the country's socioeconomic base at less cost, or they could adapt the Ag Survey's methodology for a new sample if the existing sample proves inadequate for LCS and FSM II's needs. It is recommended that the socioeconomic studies also include: (a) at the household level, identification of who has control over the grains and pulses produced, and other members' rights of access to these; the main reasons for selling grains and pulses, related to seasonal variations, and the center of control over money generated; (b) identification of harvesting practices which contribute to damage of beans and grains (e.g. allowing them to dry in the field).

Information also needs to be gathered on small farmer behavioral patterns which would include commercial activities and food consumption habits and preferences. The relationship between farmers, cooperatives (including silos), traders and GRENARWA needs to be examined in some detail and will provide the basis for increased linkages with cooperatives and community silos.

Aside from more general socioeconomic data which needs to be gathered on the populations participating in the LCS and FSM II projects, a baseline study needs to be designed which will enable impact over time. This study should include information in all current commercial transactions of farmers and traders, especially with GRENARWA and silos and examine the perceptions held by individuals of these organizations. Provision should be made for periodic revisits to these people by the researchers in order to update the information and enable changes over time to be monitored. A control group of farmers and traders who currently have no dealings with GRENARWA should be included in the sample.

To coordinate research activities under ISAR, a research committee, comprised of GOR, GRENARWA, and AID representatives will be established to implement the research recommended. The committee will review the scopes of work, request bids, evaluate proposals, and award research contracts. It is foreseen that Rwandan institutions supplemented by appropriate technical assistance, will undertake the research in conjunction with that research envisaged under the LCS project.

Food Security Stock

The GOR has determined that a food security stock is an integral element of a global concept of food security, in so far as it completes a system of food crop production; commercialization, storage and distribution; and warning information concerning at-risk populations. The food security stock element of this strategy has been identified by a visiting FAO team as 6,000 MT of sorghum and 2,000 MT of haricot beans. (Further discussion of the FAO studies is located in the Financial Annex L-2.) Current bean storage constraints (see Research above) limit the proposed security stock of haricot beans to 2,000 MT. These tonnages have been arrived at by calculating probable at-risk populations in times of crop failures and determining the amount of food necessary to last until the next harvest or until international relief efforts could be mobilized.

The at-risk populations are located along a north-south axis parallel to the Nile-Congo crest and storage facilities required for the food security stock would likely be constructed in that area to reduce distribution time and costs in time of a food emergency. Constitution and management of the food security stock will likely evolve on OPROVIA (GRENARWA) as the institution with the most experience in food storage and handling.

The GOR has recognized that the establishment of a food security stock has social benefit implications that would bankrupt a commercially viable organization and that subsidies for this type of activity are essential. In this context GOR's selection of GRENARWA as management agent for the food security stock will require the GOR to subsidize that element of GRENARWA's operations.

III. PROJECT ANALYSES

A. Technical Assistance

This analysis will present technical information which will validate the implementational and experimental activities to be undertaken by this Project. Of special interest are those activities related to bean storage and quality.

1. Present Dry Bean Storage Situation

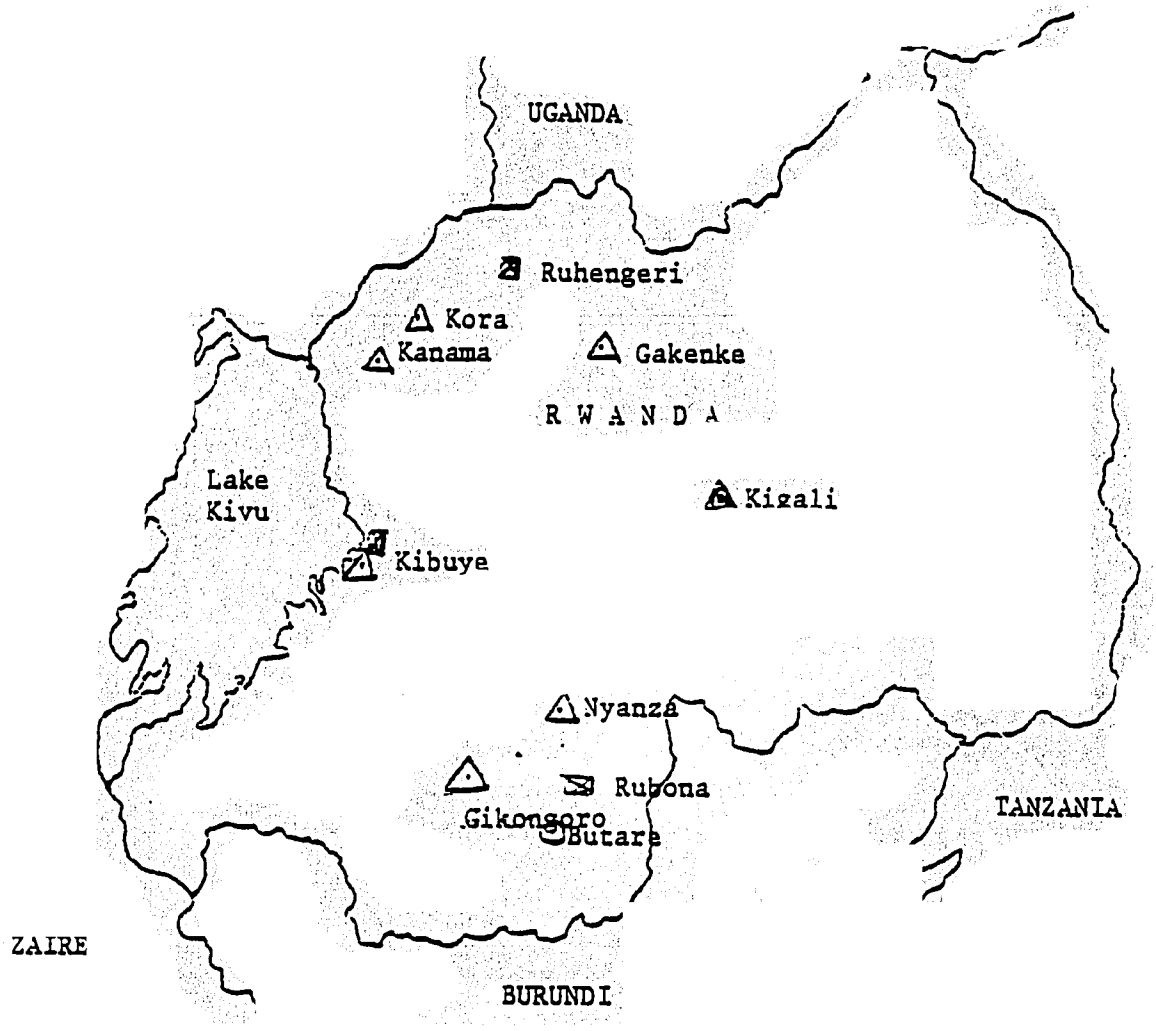
GRENARWA's reported experience to date is that under the storage conditions prevailing in the country beans become unacceptable after 8 months of storage. Consumers notice:

(1) cooking time is substantially increased, decreasing its attractiveness for the fuel-short population;

(2) there is a difference in appearance in beans stored for long periods and this has been related to the hard-to-cook problem.

It is also known that the long cooking times needed for softening of beans may lower the nutritional value through destruction of vitamins, the binding of certain aminoacids, or by leaching out the water-soluble nutrients.

Visits were made to storage units located at different climatic areas in the country (see map), and stored beans were submitted to temperature, moisture content measurements and visual examination of general conditions. The presence of weathered, field damaged grains, impurities and foreign matter was disregarded. (See Technical Annex L-1 for details of field visits.)



Storage Units Visited

Kigali: AID mission; Team Headquarter

Butare: ISAR (Institute of Agronomic Sciences of Rwanda)

ISAR Meteorological Stations closer to the storage units sampled

2. Storage of Dry Beans: Conditions and Suggestions

A good control of insects was observed in all the storage units visited. The high level of insect damaged beans observed in almost all the samples taken seems to indicate that techniques of storage currently in use at the producer level are inefficient as far as insect control is concerned. Action at the producer level to improve storage techniques presently in use is highly desirable.

The design of the new GRENARWA warehouses are satisfactory. However ventilation is not controllable, so fumigation of the entire warehouse at one time is practically impossible, and air passages between office areas and warehouse also would make entire warehouse fumigation dangerous. Fumigation of commodities in those warehouses are, however, routinely carried on by covering the stacks with gas-tight sheets sealed to the floor. The buildings are not rat-proof. Birds and rats do not seem, apparently, to be a problem. However, in Kora warehouse, when four layers of bags were taken from one of the stacks, rodent droppings and signs of rodent gnawing were observed. Stacking and housekeeping were generally satisfactory. Stacks did not have identification tags. (We had to rely on the informations given by the warehouse manager.) Pallets were too low and had grain and dust accumulated underneath. Removal of empty pallets for sweeping does not seem to be a frequent practice. No live insects were, however, observed.

Moisture content of all the samples taken was too high for safe storage during extended periods of time. With adequate sun drying the moisture content could be lowered to approximately 11%. However, presently this type of drying would have to be done at the producer level. At this moisture content beans could be safely stored in CRS or LCS type of silos for at least 12 months, provided the structures were properly water-proofed. Since part of GRENARWA stock is bought from those non-profit organizations, GRENARWA would also benefit from better drying. Drying, however, also means loss of weight, and the producer probably will not be willing to do it unless properly convinced and compensated for the loss. One other aspect to be considered is that at the ambient relative humidities occurring in Rwanda, the beans packed in the jute or polypropylene bags currently being used by GRENARWA, will take up moisture from the air.

Research already done in other countries indicates that, to obtain acceptable cooking times, the moisture content of the beans needs to be kept between 11-13 percent and the storage temperatures below 20 degrees centigrade. Of the five GRENARWA warehouses visited in different areas of the country, only in Kora was the temperature of the product within this range. Coincidentally, it is also known that the beans stored in that warehouse remain acceptable for a longer period of time.

Based on those considerations, experimental activities (See Annex L-1) are proposed in which a selected mixture of Rwandan beans will be dried to moisture contents of 11, 13 and 15%, packed in moisture-proof bags and taken to Kora warehouse to be stored for a maximum period of 24 months. Samples will be taken at 2 month intervals and submitted to cookability and consumer acceptability tests, among others.

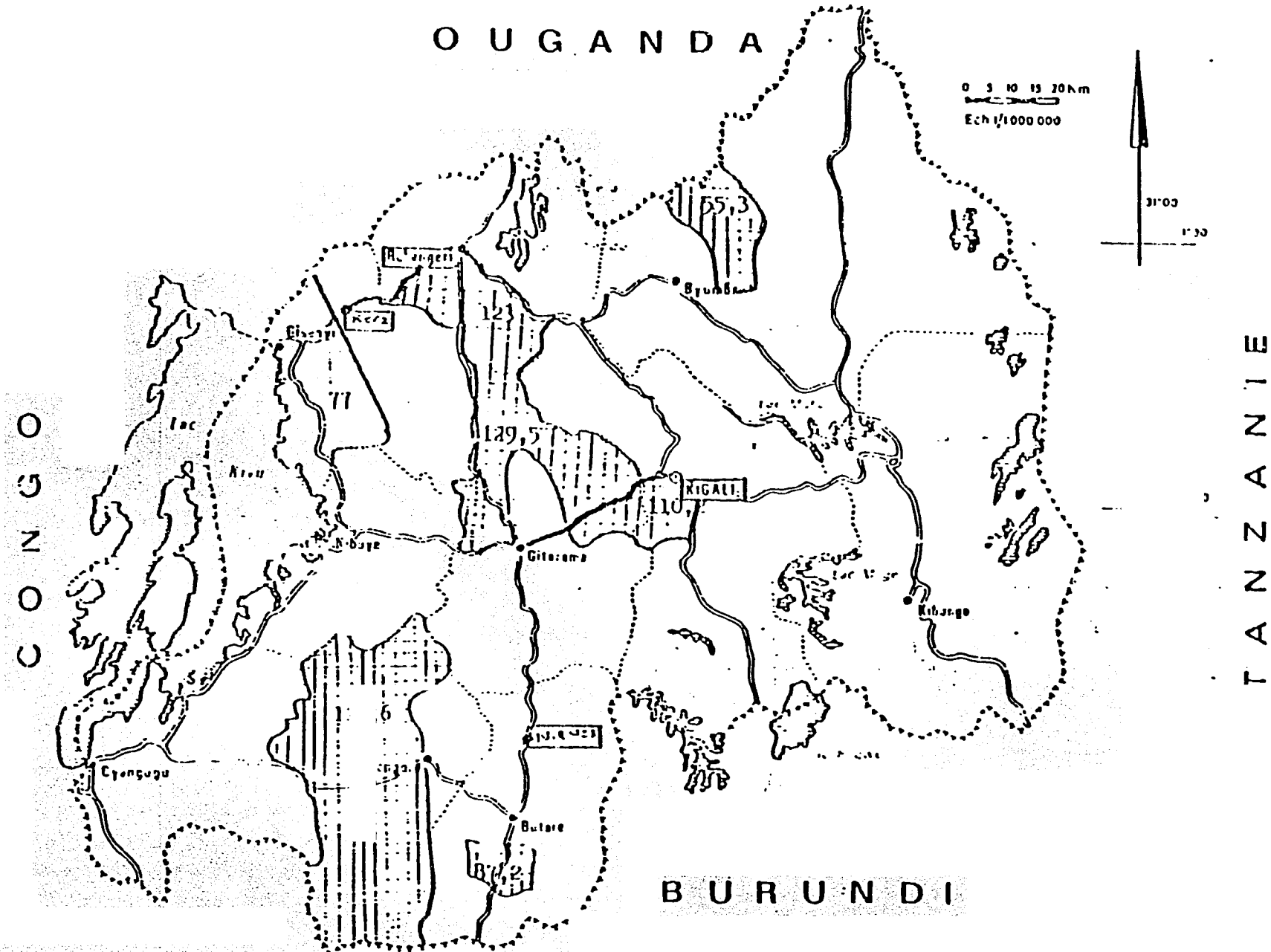
If the proposed solution is technically sound and economically feasible, other warehouses could, in the future, be constructed more to the south, where high altitude regions with climatic conditions similar to Kora occur. (Shaded areas in the following map show the areas of the country where the population is deficient in calories and proteins.)

In a second experiment, simple methods for reducing the cooking time of hard-to-cook beans will be sought and a third experiment will focus on the possibility of using periods of relatively low temperatures to cool bulk stored beans by means of forced aeration. If successful, such an approach will make feasible long-term storage of grains through much of the country.

3. GRENARWA Quality Control Laboratory

GRENARWA at present has no means to concretely evaluate the quality of the products stored in their warehouses other than visual examination and rough moisture content determinations made with Dickey John rapid moisture-meters.

GRENARWA's current marketing problems and the necessity of improving the storability of dry-beans (required by the GOR plan for long-term storage) stresses the necessity of development of a quality control laboratory at GRENARWA/OPROVIA headquarters in Kigali, which will monitor the quality of the products stored and improve storage techniques currently in use.



zones sensibles

Population totale "sensible": 710.[illegible] (x 1 000) en 1978

To operate this quality control laboratory the following personnel be employed for the duration of the project:

1 Rwandan agronomist or biologist with special training in grain storage;
2 Rwandan assistant agronomists with a short training course in grain storage
1 American graduate student (2 years)
1 Lab technician

The team could undertake the experimental studies proposed above, provided that 6 months of technical assistance by an expatriate grain storage specialist/dry bean technologist is made available. An agricultural engineer would also be needed during two months for the development of a simple bean drier.

Routine work for the quality control laboratory personnel will include the following tasks:

Monitor changes in the products stored in the several warehouses.

- Maintain a record on the problems experienced in the storage units, their causes and solutions

Monitor calibration of moisture meters.

Set up a regular inspection, sampling and recording system (storage units should be inspected at least once a month).

Set up a periodical training program for warehouse managers.

Provide grain storage and fumigation advise to other organizations or traders, as available.

Continued evaluation of storage methods and facilities.

4. Linkages with International Institutions

Linkage with the grain storage group of the Instituto of Tecnologia de Alimentos (ITAL) (Institute of Food Technology), Campinas, Sao Paulo, Brasil, which has conducted research trials on storage of dry beans, is recommended and will be carried out through correspondence, exchange of bean samples for research, etc.

A connection with the Centro International de Agricultura Tropical (CIAT) from Columbia, on dry beans will also be pursued to assure that the maximum benefit of research conducted elsewhere is brought to bear on problems specific to Rwanda. Again such a liaison will be limited to correspondence, literature and exchange of bean samples for research purposes.

B. Economic Analysis

1. Economic Overview

Rwanda is one of the most densely populated and poorest countries in the world. The country is landlocked and dependent for its international trade on one long supply route (1,700 Km) through Uganda to the port of Mombasa in Kenya. The economy is largely subsistence agriculture oriented.

During the first four years of the current development plan (1977-91). Rwanda achieved relatively rapid economic growth in a climate of financial stability. The 1977-80 annual rate of economic growth is estimated to have averaged five percent. Prudent Government of Rwanda financial policies, both internally and externally, together with several favorable external developments and increased coffee production, resulted in a marked improvement in the government budget and balance of payments. Although inflationary pressures have persisted, these have been primarily due to the frequent disruptions to the external supply route and large seasonal fluctuations in the prices of domestic food-stuffs.

As noted in the FY 83 Annual Budget Submission, Rwanda is not self-sufficient in food production. It is estimated that the average Rwandan receives, including foodstuff imports, only 80-86 percent of the Food and Agricutural Organization recommended daily calorie intake and only 73 percent of the protein intake, making nutrition one of Rwanda's primary health concerns. This translates into roughly 65,000 MT of food imports or increased production to meet minimum requirements. In 1980, commercial basic foodstuffs imports amounted to 27,000 MT and grant food assistance programs totalled about 10,000 MT. Foodstuff imports continued to account for about 30 percent of the total value of imports (c.i.f.).

Even with the continuation of the GOR's prudent economic development policies, Rwanda will continue to face great difficulties. With world coffee prices forecast to remain depressed, the country will suffer a deterioration in the external terms of trade. The volume of exports is projected to remain practically unchanged and the balance of payments (BOP) position is forecast by the IMF to deteriorate significantly in 1982-83, continuing a trend started in 1981. Government budgetary receipts will also be adversely affected, causing difficult trade-off decisions to be made regarding the allocation of foreign exchange for basic foodstuff imports or for more productive items. Moreover, increases in domestic food production have virtually reached the limit using existing technologies. 1/

The GOR is aware of the implications of these prospects and reiterated that it will continue to maintain overall financial stability so as to consolidate the basis for continued economic and social development. The IMF notes this policy stance for financial stability is all the more important because Rwanda's development strategy requires good government supply and demand management practices. Increased foreign donor assistance will be essential in order to assist the GOR to consolidate gains made and to continue its present prudent and relatively successful development strategy.

To this end, the GOR has approached the USG to provide continued assistance to GRENARWA in order that it will be able to effectively fulfill the role envisaged when it was created. That is for GRENARWA to contribute to the achievement of the GOR's food and agricultural goals by acting as a catalyst in stimulating and assisting the marketplace to respond to regional and seasonal imbalances in the supplies and prices of foodcrops, principally beans and sorghum. Achievement of this element of the GOR's overall strategy will result in Rwanda having a more efficient and effective nationwide marketing system.

1/ Due to the lack of available land, any increases in food production will come from placing marginal lands in production, putting land now used for export crop production into foodcrop production, and improving existing farm technology.

2. Least Cost Analysis

Since this project is the second phase designed to complete the development of the national storage and marketing institution GRENARWA created by the first phase, a least cost approach was utilized.

(a) Benefits

There are three major categories of benefits. They are those related to (i) increased purchases and sales, (ii) better marketing and financial control and; (iii) research results.

(i) Increased Purchases and Sales

GRENARWA will benefit from increased marketing activities (purchases and sales) because it will contribute directly to improve its financial viability. As noted in the financial analysis, GRENARWA, with AID and WFP support, is expected to be able to make a profit after depreciation in year four, and increase purchases and sales by 25 percent over 1979-80 levels.

By the same token, increased purchases and sales means more producers and consumers are being affected by GRENARWA's high purchase and lower sale prices for beans and sorghum. A more detailed discussion of these benefits appear in the social soundness analysis (II.c).

Private traders also benefit from GRENARWA's increased purchase activities. For the private trader GRENARWA acts as a ready market for beans and sorghum and as an efficient storage facility. These two factors allow traders to buy and sell more rapidly (e.g. higher turnover) and reduce their losses associated with the storage of sorghum and beans. Because both factors contribute towards a greater profit per kilo of beans and sorghum handled, the trader can afford to pay higher prices to producers to take advantage of this situation. This would result as the traders competed to purchase more beans and sorghum to sell to GRENARWA.

(ii) Better Marketing and Financial Control

GRENARWA benefits from improved marketing and financial controls because it will enable GRENARWA management to make better decisions. The GOR benefits because GRENARWA, as the nation's expert on food storage and marketing, is better able to undertake the GOR assigned tasks (e.g. meet local food shortage) and offer useful information

and recommendations with regard to GOR policy decisions in the food storage and marketing sector. For example, an effectively operating GRENARWA will be well prepared to assure an additional responsibility such as the management of a food security stock. The GOR will also have in GRENARWA the only organization with a capability to respond efficiently and effectively to regional food storage.

(iii) Research Results

The research results expected will not only enable GRENARWA to function more effectively, it will enable other organizatons, including AID projects, dealing in food storage and marketing to improve their activities. To the degree that the research results contribute to reducing time of old beans, the country as a whole benefits from reduced fuel wood used. Because bean consumption is important in Burundi, eastern Zaire and southern Uganda, these areas will also benefit from results of bean research financed by this project.

Additional project benefits include the expected expansion of GRENARWA's fumigation and crop storage advise services to government and non-government organizations requesting assistance. These services will probably be expanded as part of the marketing department's effort to increase the participation of cooperatives in bean and sorghum marketing. Other project beneficts are related to increased employment around GRENARWA warehouses as the volume handled increases, and increased education participants received for the projects' education and training programs.

(b) Cost and Alternatives

The estimated cost of the project in current dollars is U.S. $2.100 million for AID, U.S. $1.0 million for WFP, and an additional real cost of U.S. $0.279 million for the GOR. Thus, for a total estimated cost of U.S. $3.379 million, it is expected that GRENARWA will be a self-financing, price and supply stabilization institution capable of assuming further responsibilities such as the management of food security stock.

There are no alternative GOR organizations to GRENARWA which would readily assume that role. By the same token, the private sector has not been able to fulfill all the needs of the marketplace. In the future it is foreseen that as a result of GRENARWA's catalytic role in stimulating the market place the private sector, including cooperatives can assume GRENARWA's role. At such a time GRENARWA would probably narrow

its role to that of being the nation's food security stock manager. However, until that time, GRENARWA remains the most effective and efficient Rwandan organization to act as a catalyst in stimulating and assisting the marketplace to meet the needs of the country.

The result of this review confirms that this project, as designed, is the least cost alternative to achieving the phase II project purposes.

The analysis reviewed GRENARWA's recent experience and projected various paths, with the proposed objectives. Given the present status of events in Rwanda, the most likely path is compared against possible alternatives to GRENARWA.

C. Social Soundness Analysis

Sociocultural Context

Rwanda has some comparative advantages over other developing countries. It is one of the few contemporary African nations which inherited a common language and sociocultural system. Ethnic composition of the country is 90 percent Hutu, 9 percent Tutsi and one percent Twa. The traditional differences between the minority pastoral Tutsi who used to dominate the majority agricultural Hutu are declining since the Hutu took over political control. Moreover, conservative policies have increased per capita income from poorest in the world at $72 in 1973 to seventeenth poorest at $190 in 1979, and economic growth in the 1977-80 period averaged about five percent according to IBRD.

Nearly 95 percent of Rwanda's population is dependent upon small, subsistence-level farms averaging one hectare in size. Technology is traditional. Diversification of crops and livestock production provides a hedge against crop failure and resulting deprivation. Typically, a combination of starchy grains, beans or peas, starchy roots and bananas are produced along with some livestock. Coffee, tea, pyrethrum, chincona and bananas and sorghum in the form of beer serve as cash crops. The traditional Rwandan farm was largely a

* Included are AID's and WFP's contribution which could be use for alternative purposes (e.g. opportunity cost).

self-sufficient unit. What a farmer lacked in his own production he acquired through a system of bartered exchange, both of goods and services. Monetized marketing, a more recent innovation, was introduced with the advent of coffee into the system, and today food crops may also be sold for cash.

With population increasing at a rate of 3.1 percent per year, Rwanda has barely been able to increase food production equal to that of population growth, and this has been done by increasing the amount of land cultivated, not by increasing yields. However, of 1.25 million hectares cultivable, 0.9 million hectares are under cultivation already.

Despite Rwanda's mild climate which allows two growing seasons, regional temporary food shortages are common, and some locations regularly are deficit in food crops. With no technical package available to increase yields to date and soil fertility diminishing quite rapidly, the possibility of major food crises in the near future is very real. That GOR recognized this possibility is evident by its continued support of GRENARWA and by its decision to set up a food security stock within the country.

The Project

FSM II is the second phase of a project which was authorized in late 1974. The social soundness analaysis was based upon GRENARWA's performance to date and an evaluation of its ability to achieve the new project goals stated above.

In order to evaluate the social soundness of FSM II, certain features of GRENARWA's should be kept in mind: 1) GOR, to date, expects GRENARWA, even after its merger with OPROVIA, to be a financially-viable institution active in the commercial sector and not playing a social welfare role. 2) GRENARWA was designed as a national storage institution with the implication that its impact would be on a macro-level. The assumption in the original project document was that, if GRENARWA was involved with 15 percent of the beans marketed countrywide, the project would be able to have an effect on prices nationally. Evaluations of the project have suggested that GRENARWA become more directly involved with small farmers, and efforts have been made to do so. 3) The preceding two features of GRENARWA make it difficult to measure the project according to the usual social soundness guidelines. Benefits cannot easily be divided into direct or indirect, but rather

must be viewed along a continuum with an important spread effect. Even with relevant base-line information available, which is not the case for GRENARWA, it is difficult to evaluate the impact of a national-level project on individuals so that an analysis of the "micro-level" can be but tentative.

Beneficiaries and Impact

As bean prices become stabilized over time and more beans are cultivated and marketed, all bean buyers in the country, or virtually the entire population, will benefit from the project. Likewise, if a regional or national food shortage occurs, a large segment of the population will benefit from GRENARWA's food security activities. A brief review of GRENARWA's history will pinpoint past beneficiaries of the project and will enable some prediction of future trends. (See Annex L-3 for details and assumptions.)

All bean production is by peasant small-holders on farms located across Rwanda's hilly countryside. There are few urban concentrations or major markets, and farmers auto-consume 60-80 percent or more of their production. Surplus is usually marketed in small quantities to "walking" traders who sell it to traders with Toyota trucks who either move it around the countryside themselves, sell it to larger merchants or sell it to GRENARWA. As a result, GRENARWA's early marketing activities have dealt primarily with traders in order to build up a buffer stock necessary to stabilize prices.

In 1977 almost 98 percent of the bean purchases were in the range of 1-10 tons, indicating that traders were the major suppliers. Bean purchases from traders varied between 91 percent in 1978 to 88.1 percent in 1979 to 99.45 percent in 1980, while sorghum purchases from traders showed a downward trend: 97 percent in 1978 and 1979; 81.3 percent in 1980.

It has been noted that GRENARWA's intervention in a region bids producer prices upwards, although the extent of this varies according to production and total quantity it purchases, but significant drops in prices occur when GRENARWA stops buying. Thus, individuals who sell to traders who resell to GRENARWA profit even though not to the same extent as if they marketed directly to GRENARWA. Moreover, all producers in a region may profit through a shadow effect if traders are forced to become more competitive.

Based on the assumption that the average farm familiy sells 150 kgs. of its production per year and GRENARWA purchases about 4,000 MT of beans annually, then roughly 26,500 families or about 133,000 people benefit fairly directly, although the effect is lessened by traders' interventions. The number of beneficiaries from GRENARWA's sorghum purchases has not been estimated because there is such great variability in local production of sorghum, and consequently also in quantities marketed.

GRENARWA's sales activities involve a broader spectrum of clients with a variable, but substantial, portion of its activities being with public service institutions, WFP and emergency aid. Quantification of beneficiaries of those institutional sales is difficult. GRENARWA's direct sales efforts have concentrated on several traditionally deficit prefectures with the majority of transactions during the hungry months of October and November for beans and mid-April to mid-June for sorghum. Of total bean sales, in 1979 about half and in 1980 three quarters were made to these deficit areas. GOR estimates a bean consumption figure of 100 grams per day per capita during shortage periods. Assuming a two-month shortage period, this translates to approximately 167,000 beneficiaries per 1,000 tons of beans sold (3kg/month/person) or to approximately 322,000 beneficiaries in 1979 and 398,000 in 1980. It is difficult to calculate the beneficiaries from sorghum sales because, except in times of real need, most sorghum goes into beer production. As with the production side, there are presumed to be far more indirect beneficiaries since GRENARWA's intervention in moving produce in deficit areas at strategic times seems to force greater competition among traders and lowers consumer prices in the market in general.

GRENARWA currently markets approximately eight to ten percent of total bean commercialization. Given that its goal at the end of the project is to market 15 percent or more of the total, there is room for a 30-50 percent increase in the number of beneficiaries if only bean sales and purchases are considered and institutional transactions such as with WFP, prisons, etc., are excluded.

It is also difficult to evaluate the direct impact of GRENARWA on the traders. Although traders seem to make a lower profit per transaction as a result of GRENARWA's interventions, the existence of these national storage facilities provides a ready secondary market and allows traders to have a more rapid turnover of stock. Traders may also

benefit by the fumigation services of GRENARWA. Despite some complaints about GRENARWA, traders seem eager to continue their transactions with it, and the negative effects do not seem to be important. Thus, aside from the number of producer and consumer beneficiaries already identified, the number of traders directly involved must be added as well.

An important component of FSM II is research into improved storage facilities and means to reduce the quality loss of beans as a result of hardshell phenomenon. Positive results will have a widespread effect. Individuals will profit nutritionally if the hardshell problem is resolved, and the country will profit by a reduced cooking time for beans through less deforestation (most of Rwanda's rural energy needs are supplied through wood). GRENARWA and other storage organizations also will profit through reduced storage losses, and being able to store beans for longer time periods means it will be better able to intervene effectively in the marketplace as well as in time of regional famines.

In order to have a more direct impact on producers/consumers, GRENARWA has been advised to increase its commercial activities with cooperatives and community silos, and efforts have been made to do so. Between 1978 and 1980, purchases from these organizations jumped from two percent to eighteen percent of the total. As the number of these organizations increases, GRENARWA will be able to develop better linkages with them, and transactions may increase by 100 percent over 1980's level by the end of the project.

A long term benefit of FSM II will be GRENARWA's strengthened institutional capacity to manage a food security stock. Food crises in Rwanda are usually localized, although sometimes national, and usually of short duration, so that by the time outside sources of emergency food can be mustered, the crisis has passed. If the food security stock that the GOR currently envisages is put in place, close to a quarter of the Rwandan population could benefit over a two-month period, and the number could rise or fall according to the severity of the crisis.

Participation

Most bean farmers are small-holders, so it is not financially advisable for GRENARWA to try to deal directly with the producers which would entail much greater operating costs. Instead, GRENARWA has encouraged participation by increasing its transactions with cooperative and parish silos, local cooperatives and with petty traders, because the benefits are likely to pass more directly to the population rather than

through middlemen. FSM II plans to develope further linkages with cooperatives and community silos and set up buying and selling contracts with them. Through the LCS project, farmers will be given the organizational and educational skills with which to increase their bargaining position and take a more active role in determining prices.

Now that GOR has dropped a fixed price policy on food crops, GRENARWA will be able to systematically provide farmers with market information over the radio and through signs at the warehouses. This information will give the farmer more bargaining power and choice of options when buying or selling food crops, giving him a greater decision-making role in life.

The quality control element of FSM II will allow the farmer a great deal of participation in project activities. To date, GRENARWA's biggest problem is effectuating a turnover f beans without a loss. In FSM II, consumers will be asked to participate in flavor preference tests using beans that have been stored under different conditions in GRENARWA warehouses. In this way, local women will help decide the appropriate criteria to be used for long-term bean storage.

Sociocultural Feasibility

The project is feasible from the overall sociocultural perspective. Farmers and traders have been buying and selling beans for some time, and FSM has given them more opportunity to do so. In addition, FSM II will concentrate on narrowing the profit margin of traders to the benefit of producers and consumers. The coordinated applied research and quality control studies to be undertaken by LCS and FSM II aim to improve existing storage conditions and bean varieties, not necessarily to suggest new ones.

When GRENARWA's management capabilities are strengthened during FSM II, the institution will have the skills to manage a food security stock, especially is the applied research element is successful. Although GRENARWA will have joined OPROVIA, the GOR still supports the former as an semi-autonomous institution, and GOR's national policy is to promote improved storage conditions in the country, both at local and regional levels.

D. Financial Analysis and Plan

GRENARWA's financial position has improved markedly over its early years and is moving toward being financially self-sustaining. The planned donor assistance is expected to enable GRENARWA to reach financial self-sufficiency during the life of the project.

1. Financial History

Given the problems and difficulties of creating an institution "from scratch," it is not surprising that GRENARWA had substantial financial losses in its early years. Cumulative losses during 1975-78 totalled over Rwf. 52 million (U.S. $571,000), while during 1979-80 losses declined to Rwf. 18 million (U.S. $197,000). Losses over the five year period are roughtly 15 percent of total contributions to GRENARWA of nearly U.S. $5 million. Of these losses, roughly one third is attributable to depreciation; one third is attributable to an extraordinary loss due to bean "hard shell" problems from the early years; and the remainder is attributable to the marketing operations. When the growth of the organization is taken into account (loss or profit expressed as a percentage of operating budget), recent financial improvement is even more striking. Losses averaged roughly 95 percent of the operating budget for the 1976-78 period and only 10 percent during the 1979-80 period.

(a) Capitalization

GRENARWA was initially funded by the GOR and AID. Later, the Swiss and World Food Programme (WFP) contributed cash. By 1981, donor and GOR contributions to GRENARWA's operating, buying fund, and infrastructure budgets totalled Rwf 320 million (U.S. $3.6 million). AID provided 49 percent of the total while the GOR, WFP and Swiss contributed 16, 28 and 7 percent, respectively. Most of AID's resources (82 percent) went to infrastructure development, including building, equipment and vehicles. GRENARWA now has warehouses in each of Rwanda's 10 prefectures (provinces). All the Swiss and WFP support went to the operating expense and buying fund, accounting for 66 percent of that total. Given GRENARWA's cumulative losses by the end of 1980 (see Annex L-2, Table 2) of roughly Rwf 70 million (U.S. $761,000), the other donor support has softened the severity of its losses. GRENARWA, like most other Rwanda's parastatals, has received no direct GOR budgetary support beyond the initial start-up contributions. (The GOR has contributed more than was required by the Pro Ag.)

(b) Operating Expenses

GRENARWA's operating expenses, excluding its trading activities, rose as it expanded. The construction of warehouses, acquisition of a vehicle fleet andd recruitment of personnel increased costs by 36 percent per year between 1977 and 1980. A constraint of the operating cost structure has been the relatively large percent of fixed costs to total costs, which averaged almost 50 percent during 1976-80. Management has been working to reduce this percentage and anticipates that it will decline to roughly 42 percent in 1981. The major operating cost components are salaries (28 percent), transport (20 percent), and depreciation (18 percent). As GRENARWA's infrastructure development program finished in December 1981, future operating costs are not expected to rise significantly during the life of this project.

(c) Commercialization

GRENARWA's bean and sorghum trading activities have improved substantially over the early years. In 1976 only 1,163 MT were purchased and 28 MT were sold. This has increased to almost 5,000 MT bought and 3,000 MT sold in 1980 (see Table 4, Annex L-2). 1/ Although national marketed production and figures in Rwanda are suspect and vary substantially by source, the volume handled by GRENARWA is believed to be around 10 percent of marketed bean and sorghum production.

Quantity losses from the drying of bean and sorghum between buying and selling, thefts, spillage, and weighing differences were below 3 percent in 1979 and 1980, reflecting well on GRENARWA's ability to store its commodities. However, there were quality losses of having to sell beans from previous years at a reduced price because of a decline in consumer acceptability (specifically due to the development of hardshell) after storage over long periods.

1/ The stocks carried over are usually disposed in the following several sales periods. For example, 1976-77 beans carried over were sold during 1978-79.

Since the decline in the quality of the beans is only one of several factors for having to sell them at a reduced price (other factors include excess supply in an area, etc.) it is difficult to make any exact calculation of losses due to quality decline alone. During 1978-80 period, the estimated financial loss buying prices less selling price, of having to sell "old" beans at a reduced price was Rwf 12.5 million (U.S. $136,000).

Beans sold are the largest revenue generator. However, on a per kilo basis, sorghum contributes the most. It is noted that the FAO recommendation to the GRZ is to maintain a larger sorghum security stock than that of beans (see Annex L-2). The profit (revenue less cost of sales) per kilo of sorghum is roughly Rwf 6, while on "new" beans sold is Rwf 3 and for old beans, Rwf 10. Thus, it is to GRENARWA's financial advantage to maximize sorghum and "new" bean sales, while minimizin "old" beans sales by keeping bean purchases close to anticipated sales for the season. This is the marketing stragety that GRENARWA has begun in 1981 and will continue to pursue until the problems related to bean "hardshell" are ameliorated substantially.

The difficulty of predicting bean demand relataive to when GRENARWA must purchase the beans remains a major stumbling block for management. Given the uncertainty of the minor second bean harvest (July), GRENARWA is obliged to purchase most of its beans during the first harvest (January-March). Estimations of the size of this harvest are notoriously bad, but it is of course impossible to predict the size of the second harvest at the time when most buying must be done. If the second harvest is good, then demand is greatly reduced during the sales season (October-December), or "hungry months," before the next major harvest. Demand is reduced for GRENARWA beans, which have then been in stock 6 to 10 months, and are considered inferior to the fresher second harvest beans. An even larger disturbance factor on the market is the clandestine importation of beans from neighboring countries. Even if the means existed to accurately predict the size of harvests within the country, large scale but unofficial importations (and sometimes exportations) make it impossible to predict demand during the "hungry months," often resulting in unsold stocks and financial losses as those beans develop the "hardshell" problem.

On the basis of the foregoing analysis of GRENARWA's financial situation, it is projected that the major components of operating costs (salaries, transport and depreciation) will continue to increase, though at a slower rate than in the past, while the possibilities of increasing revenue remain dependent on high quality decision making.

Since revenue is a function of both turnover and the sales margin, it is essential to turnover at a margin sufficient to cover costs. Any reduction in margin, however, will reduce further the price and supply stabilization impact GRENARWA is achieving. Thus, the focus should be on increasing turnover to expand that impact. Up to 1980, GRENARWA's sales never exceeded 5,000 tons, partially due to lack of storage capacity and partially, the lack of sales outlets. Storage capacity is now 10,000 tons, and every effort should be made to increase turnover accordingly. Some of the problems involved in increasing sales have been discussed above. A more intensive study of the possibilities for increasing sales, especially with cooperatives, will be made under FSM II. This re-emphasizes the importance of effective marketing and financial control sections to the financial viability of GRENARWA.

2. Financial Projections

A general model specifying GRENARWA's financial relationships was utilized to provide an internally consistent set of projections. The various possible scenarios depicting possible paths that GRENARWA could take are detailed in Section 4 of the economic and financial annex (L-2).

The time period of the analysis is four years--the length of the project. By then, it is suspected that the GOR will have made a decision regarding GRENARWA's exact role with regard to the management of a food security stock. At that time, it will be necessary to re-evaluate GRENARWA's future. Thus, there is little usefulness in extrapolating the projection beyond year four.

GRENARWA's impact on price and supply stabilization has, as noted earlier, not been quantified. However, the impact is directly related to the quantity GRENARWA handles (purchases plus sales) and the "threat" of GRENARWA entering the market. The second component is virtually unquantifiable, however, it is related to the volume handled. For example, if GRENARWA looks like it will be able to be very active in trading, the commercants will be less

inclined to try to extract excess profits for fear of GRENARWA entering the market and driving down prices. Thus, the quantity (purchases plus sales) GRENARWA handles is believed to be a useful and descriptive indicator of its price and supply stabilization impact.

GRENARWA, without AID, WFP, or additional GOR support, is believed to be able to yield a profit before depreciation in two years, and yield a profit after depreciation in roughly nine more years (see Scenario 2, Annex L-2). The total quantity handled (e.g. stabilization impact) would be around 9,370 MT by year 4. This is an eleven percent decrease when compared to the 1979-80 average. Thus, a slight decline in GRENARWA's stabilization impact will occur as it works to reach a financially self-sufficient position. Once that has been achieved, GRENARWA's stabilization impact will increase. The cash flow constraint is the factor determining the rate at which GRENARWA recovers from its earlier "growing" problems.

If GRENARWA receives FSM II support, two major impacts are expected from the AID provided assistance. First, it was assumed that the AID provided TA could increase bean and sorghum sales by 5 percent per year above the level when GRENARWA did not have AID support. The impact of the increased sales effort would begin in year 2. Sales increases are projected at this level because, as noted in the social soundness and financial history analysis, it does not appear to be that easy to increase sales.

The other impact of the AID support will be to reduce the per unit losses on "old" beans. This result is expected from the improved market departments' sales efforts and practical results coming from the bean quality research which will easily and inexpensively improve bean quality (i.e. stack beans differently for better ventilation). The "old" beans margin were assumed to improve Rwf +0 in year 1, Rwf +1 in year 2, Rwf +3 per kilo in year 3; and Rwf +5 per kilo in year 4. These assumptions are believed to be very conservative, but justifiably so in light of the uncertain marketing environment GRENARWA operates in (See Annex L-2 for expanded discussion).

Thus, GRENARWA, with AID support and no other support, is expected to yeild a profit after depreciation in year five (see Scenario 7, Annex L-2). The total quantity of beans and sorghum handled (purchased and sold) would be a less than ten percent decline from the 1979-80 level. Again, cash flow problems are the constraining factors to GRENARWA's

marketing operations and slowing its return to financial self-sufficiency. The expected impact of AID assistance, under these conservative assumptions, is to return GRENARWA to a solid financial position in roughly half the time, (when compared to no AID assistance), with only a slight decline in its stabilization impact.

If GRENARWA obtains WFP support with the FSM I project, it is expected that its financial position would improve markedly and its stabilization impact by year four would increase by 25 percent (see Scenario 11, Annex L-2). GRENARWA would be able to yield a profit after depreciation in year four of Rwf 2.6 million (U.S. $28,000). The WFP cash contribution will directly ease GRENARWA's cash flow problems and increase the impact of AID's assistance. Having attained this self-financing position, GRENARWA could be able to continue to expand its operations and its stabilization impacts.

3. Security Stock Implications

If the GOR discussions regarding the development of the food security stock crystalize in the next year and GRENARWA receives the responsibility for its development and management, additional financial assistance above the AID and WFP support would be required to enable GRENARWA to attain both the stabilization and food reserve objectives. The GOR already acknowledges that the maintenance of a food reserve is not a self-financing venture and has entered a line item for such a stock in the new five year plan.

Based on the model developed above, GRENARWA could by year four build and manage a bean reserve of 2,000 MT; a sorghum reserve of 6,000 MT (as recommended by FAO); and increase its levels (see Scenario 8 Annex L-2). The estimated cost in current dollrs to the GOR over the next four years for this food reserve, assuming AID and WFP assistancce, is an additional U.S. $1.55 million to the U.S. $279,000 provided as part of FSM II. This would cover the additional buying funds required (U.S. $902,000) to purchase the necessary quantities of beans and sorghum and cover the addditional cost (U.S. $648,000) GRENARWA would incur as a result of developing and managing the food reserve.

If the GOR would decide to assign GRENARWA the responsibility of developing and managing a food reserve without additional financial assistance, GRENARWA will experience serious cash flow and other financial problems. In fact, by year four GRENARWA's stabilization impact would decline by roughly fifty percent and the food reserve would only be about 4,000 MT versus the goal of 8,000 MT (see Scenarios 12 and 13 Annex L-2).

4. Conclusion

The results of the financial projections support the view that GRENARWA can become viable from a financial point of view, particularly when combined with the expected WFP assistance. Furthermore, as GRENARWA approaches and achieves a financially self-sustaining position, its market stabilization impact is expected to have increased by roughly one quarter over 1979-80 levels.

Projections also suggest that if the GOR assigns GRENARWA the responsibility to constitute a food security stock, it can do so during the next four years, but additional GOR or other donor assistance is required.

4. Financial Plan

The total financing for the project is $3,950,000, of which AID will supply $2,100,000 and the host country institutions will supply $1,850,000. Associated with the project is a $1 million contribution from World Food Programme to the GRENARWA buying fund by WFP. Table I (page 41) indicates the cost of AID inputs by fiscal year showing the FX/LC breakdown. As expenditures under this project will only commence in the third quarter of FY 1982 it is expected that the expenditure rate will be as follows:

	$'000
FY 1982	312
FY 1983	932
FY 1984	550
FY 1985	230
FY 1986	78
	$2,100

The host country contribution is shown in Table II (page 45). As it totals the equivalent of $1,850,000, it represents 47% of the total project and thus is consistent with the requirements of Section 110(a) of the FAA.

The additional recurrent budget implications of the project are extremely limited given the financial autonomy and the viability of GRENARWA. Existing staff and operations will be continued post-project on the same basis as present. Completion of research activites by expatriates at ISAR will leave behind six experienced enqueteurs whose salaries (a total of $10,800 p. a. in uninflated 1981 dollars) will be absorbed by donors or by the GOR. Continued operation of the quality control Lab in OPROVIA/GRENARWA is projected to be approximately $40,000 per annum (in uninflated 1981 dollars).

TABLE I

	PY I LC	PY I FX	PY II LC	PY II FX	PY III LC	PY III FX	PY IV LC	PY IV FX	Total	Combined
I. Technical Assistance										
LT										
1. Marketing Advisor	13	89	13	95	13	99	--	--	39	283	322
2. Financial Advisor	13	73	13	74	--	--	--	--	26	147	173
3. Grad. Assistants (2)	19	39	19	40					38	79	117
									103	509	612
ST.											
Marketing		20		30						50	
Lab. Advisor		30		20		10				60	
Ag. Eng.				30		30				60	
Evaluation								30		30	
Audit		5		5		5		5		20	
	45	256	45	294	13	144	--	35	103	729	832
II. Training											
LT (4 MS)		20		60		60		20		160	
ST											
US - Grain Storage		8		16						24	
3rd Country Fin.		3								3	
US Marketing		20		36						56	
US Fumigation		8		8						16	
		59		112		60		20		99	259

	UNIT	PY I LC	PY I FX	PY II LC	PY II FX	PY III LC	PY III FX	PY IV LC	PY IV FX	Total LC	Total FX	Combined
III. Commodities												
1. Vehicles												
Sedans (6)	at 7		42								42	
Trucks (3)	at 55		165								165	
Spares 15%			31								31	
2. Research equipment			5								5	
3. Lab equipment			25								25	
4. Office Furniture		15								15		
5. Household Furniture			30								30	
6. Storage demo				10	10	10	10			20	20	
7. Shipping and fee					4		4				22	
Line 2, 3, 6 - 47%		15	312	10	14	10	14			35	340	375
IV. Operative Costs												
Research												
1. Residual to LCS					40						40	
2. Salaries		11		11						22		
3. Per diem		14		15						29		
4. Supplies Research		3		3						6		
5. Vehicle opns (incl in grad. assist.)												

	PY I		PY II		PY III		PY IV		Total		
	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	Combined
B. Lab											
1. Salaries	11		11		12		12		46		
2. Per diem	7		7		7		7		28		
3. Supplies	5	5	5	5	5	5	5	5	20	20	
4. Vehicle Opns.		10		10		10		10	--	40	
	51	15	52	55	24	15	24	15	151	100	251

	PY I		PY II		PY III		PY IV		Total		
	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	Combined
Sub totals	111	642	107	483	47	233	24	70	289	1,428	1,717
V. Contingency 10% all items except IV.A	8	64	8	44	5	23	2	7	23	138	161
Sub total	119	706	115	527	52	256	26	77	312	1,566	1,878
VI. Inflation on all items except IV.A											
FX 10% (1st y 5%)		35		53		54		25		167	222
LC 15% (1st y 5%)	6		18		17		14		55		
Total	125	741	133	580	69	310	40	102	367	1,733	
		866		713		379		142		2,100	2,100

TABLE II

Host Country Contribution $'000

	1982	1983	1984	1985	Total
I. GRENARWA					
A. Salaries					
1. Direct	61	63	65	67	256
2. Contract	69	72	74	76	291
B. 1982 Investment	96				96
C. Operating Costs *	206	206	206	206	824
II OPROVIA					
Access to Lab	14				14
III ISAR					
Value of Coordination		5	5	5	20
Inflation 15%		52	113	184	349
Total	451	398	463	538	1,850

* Does not include amortization of warehouses provided under FSM I

Funding of the continuation of laboratory operations is included as a convenant for the GOR which may seek to include it as an element of its food security stock management subsidy. It may also be that OPROVIA/GRENARWA will perceive sufficient commercial value from laboratory operations (in improved capability to preserve bean quality) that they may wish to participate in lab operations funding. In either case, the annual operating sum is not of such significance as to cause concern in the structure of the GOR budget.

Table III (page 47) shows the inputs contribution to output in the project. Although the largest percentage of the inputs is directed to the "marketing" output it should be noted the significant portion goes to the quality control laborataory which serves as an aid to both marketing information and data collection for research.

E. Environmental Concerns

An initial environmental examination recommending a negative determination was submitted with the PID and accepted as part of the PID approval process.

TABLE III

'000

Output / Input	Type: Marketing		Accounting	Research	Total
TA	542	(131)	193	97	832
TRG	136	(-)	43	80	259
COMM	345	(53)	15	15	375
OC	158	(138)		93	251
		(322)			
Cont/Inf (percentage)	263	(72)	56	64	383
Total	1,444	(394)	307	349	2,100
Percentage	69%	(19%)	14%	17%	100%

(Quality control lab included in brackets)

IV. IMPLEMENTATION ARRANGEMENTS

A. Implementing Agents

This project will require the coordination of three implementing agencies, two from the host country (GRENARWA and ISAR) and USAID. The realms of responsibility are fairly distinct and careful monitoring by USAID should ensure efficient implementation.

1. GRENARWA

Although GRENARWA is to be subsumed in OPROVIA for policy and organizational purposes, it will retain financial and management autonomy. GRENARWA will continue to operate as in Phase I, buying, storing, distributing and selling beans and sorghum. Operational methods have become routine through experience. Technical assistance to GRENARWA will be provided by PSC contractors under contract to AID physically placed in GRENARWA. Organized training for GRENARWA participants will follow regular AID PIO/P procedures. All commodities to be provided to GRENARWA will be procured under AID regulations. GRENARWA is developing a working relationship with OPROVIA in order to preclude unnecessary development of duplicate facilities. Access of GRENARWA to the laboratory in the new OPROVIA headquarters which will include certain GRENARWA-provided equipment is an example of such sharing. GRENARWA will also designate one office to be responsible for maintaining an informational exchange relationship with ISAR so that research findings by ISAR are readily available to GRENARWA and data accumulated by GRENARWA is readily available to ISAR.

2. ISAR (Institut des Sciences Agronomiques du Rwanda)

As the Institute which is responsible for basic scientific agronomic research in Rwanda, ISAR will provide an institutional framework in which the joint research team funded from FSM II and LCS will operate. ISAR has been conducting basic research to improve production of pyrethrum, dry-beans, soybeans, peanuts, cowpeas, cassava, sweet potatoes, bananas, avocados and cereals. All the necessary microbiological, chemical and entomological analyses are done in Butare where the Central Administration, several departments and

Laboratories are located. With a limited number of researchers, already inadequate considering the diversification of research activities, the possibility of starting a new line of research on storage and technology of dry beans is scarce.

Thus, while ISAR can provide some technical assistance to the project, the overall execution and management of research activities will lie with an expatriate team and their Rwandan counterparts. ISAR has had only limited experience with socioeconomic studies; further, it suffers from a lack of personnel. Thus, USAID has agreed to sign a contract with ISAR to provide a research assistant to coordinate AID-funded research.

3. Role of USAID

AAO/Kigali will perform in-country project monitoring on the same basis as other USAID project activities in Rwanda. The U.S. Marketing Advisor in GRENARWA, in addition to assisting the GOR Project Director, will consult regularly with the AAO.

REDSO/EA will supply periodic technical and project implementation related services to the project such as (1) review of PILs and contract documents (2) periodic review of the project by the appropriate REDSO staff and (3) staff to assist in the mid-term formative project evaluation (see evaluation arrangements).

4. Procurement Plan

The commodity component of this project is relatively small and will be procured under the project in the manner described:

Vehicles - 6 Sedans and 3 10-MT trucks for GRENARWA. Because of lack of maintenance facilities and spare parts for U.S. vehicles in Kigali, a waiver request is submitted as an annex to this paper to permit local procurement of vehicles in Rwanda from code 935 origin (Western Europe or Japan). Total estimated cost: $42,000 for Sedans and $155,000 for the trucks plus $31,000 spare parts.

Office equipment - (See list in Annex G) This equipment will be procured locally by purchase order if items are available and/or cheaper than procurement in Kenya with shipping included.

Research and Laboratory Equipment - The project will procure necessary scientific equipment to assure the proper functioning of the research activities and the quality

control laboratory. The list of equipment is attached as Annex G. USAID will issue a PIO/C using AAPC as procurement agency for all that equipment which is to be procured in the U.S.

Furnishings for the house of the U.S. Marketing Advisor costing about $30,000 will be purchased locally, in Kenya, or in the U.S.

5. Financial Procedures

Financial procedures will be detailed in Project Implementation Letters to be issued by AID/Rwanda. The Procedure which has been approved by both the GOR and AID on other projects is to provide an advance sufficient for approximately one month, to be replenished upon receipt from the implementing agent of a report on the use of funds already advanced, and a request detailing expenditures to be covered by the replenishment.

B. Implementation Plan

Timing (month of Project)	Action	Agent
0	PP authorized	REDSO/EA
1	Grant agreement signed	GOR/AAO
2	CPs met	GOR/AAO
2	PIO/T issued for marketing Advisor	AAO
2	PIO/C issued on vehicles	AAO
2	PIO/C issued on office equipment	AAO
2	PIO/T to amend LCS research PIO/T to add appropriate research assistance	AAO/ISAR
2	PIO/T to extend financial advisor	AAO
2	PIO/C for QC lab equipment	AAO
2	PIO/P for QC lab chief participation	AAO/GRENARWA
4	PIO/T for QC lab TA	AAO
4	PIO/R for 1st LT participant	AAO
4	Office equipment arrives for use	GOR/AAO
5	Marketing advisor at post	AAO
5	Vehicles arrive for use	GOR/AAO
5	QC Lab chief to U.S.	
6	Research activities begin	AAO/ISAR
8	ST training for chief accountant	
	IT Participant to U.S.	AAO
9	QC Lab chief returns	GRENARWA
11	QC Lab equipment arrives	AAO/GRENARWA
	QC Lab TA arrives	AAO
12-14	QC Lab graduate student arrives	AAO/GRENARWA
	QC Lab equipment test	GRENARWA
16	QC Lab operational and	GRENARWA
17	1st batch beans stored	GRENARWA
22	Mid project evaluation	
24	Ag eng TDY to design/ install model silos	GRENARWA
30	Research activities end	ISAR
30	Financial advisor departs	GRENARWA
41	Marketing advisor departs	GRENARWA
47	Final evaluation	AAO/GOR
49	PACD	

C. Evaluation Arrangements

Several levels of evaluation are planned for this project including the following:

1. Baseline data - Appropriate baseline data will be developed as part of the project's research element in conjunction with that data being developed in both the Local Crop Storage project and the Agricultural Analysis and Marketing Project.

2. Monitoring, inspection and audits - 1) Members of AID and GRENARWA staff will visit selected warehouse operations to ascertain if operations are proceeding smoothly and to discuss problems. 2) GRENARWA books and records will be audited annually by an internationally accepted audit firm. Financial accounts maintained at local bank branches are also subject to government audit.

3. Formative Evaluation - A mid-term formative evaluation by AAO/GOR assisted by REDSO/EA is planned mid-project, perhaps employing one outside consultant (a specialist in grain storage). Any modifications in the project can be made subsequent to this evaluation.

4. Summative Evaluation - A final evaluation is planned a few months before the project terminates, probably using a two-three member outside team, which has been provided for in the project budget.

D. Conditions, Covenants and Negotiating Status

1. Conditions Precedent

The project agreement will include the following condition precedent: 1) within 60 days following execution of the project agreement, the GOR will notify AAO/Kigali in writing of the name of the official in MINAGRI charged with responsibility for implementing the project on behalf of the GOR.

2. Covenants

The project agreement will include the following covenants:

a) that no pesticides will be procured or used in support of this project without a prior evaluation acceptable to A.I.D. which will include a risk/benefit analysis of the proposed use of the pesticide as required under A.I.D.'s environmental regulations in effect at the time of the proposed procurement or use;

b) the GOR will maintain its current policy of "indicative" prices for staple food crops throughout the life of the project;

c) prior to selecting GRENARWA as management agent for a food security stock, the GOR will undertake appropriate studies and planning for such a Food Security Stock and institute appropriate subsidy mechanisms for costs related to food security stocks in such a way as to avoid deterioration of GRENARWA's financial viability;

d) the GOR will assure support for the continued operations of the quality control laboratory subsequent to the termination of this project.

3. Negotiating Status

Under AAO guidance, the PP design team met with appropriate members of the GOR. Given the past interest of the GOR in GRENARWA, this proposed continuation was rapidly understood and accepted by those GOR authorities. The GOR has sent a letter dated requesting this project. There are no foreseeable obstacles to the immediate commencement of project implementation.

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Project Title & Number: Food Storage and Marketing II (696-0116)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal:	Measures of Goal Achievements:		Assumptions for achieving goal targets:
Program Goal: Increase availability of food to meet the needs of Rwanda's population.	Improved average caloric and protein intake levels by Rwanda's population.	GOR statistics on food production, distribution, and nutrition levels.	Other GOR/donor production projects achieve their goals. GOR continues sound economic and political policies.
Sector Goal: Stabilize seasonal and regional supplies and prices of food crops.	tional and local-level food-op storage systems operating fectively.	GOR records on farm and market prices; GRENARWA marketing records; Local crop storage facilities marketing records	GOR policies continue to promote working relationships between GRENARWA, local crop storage facilities and private traders.

Annex A

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Purpose:	Conditions that will indicate purpose has been achieved: End-of-Project status.		Assumptions for achieving purpose:
Strengthen and expand GRENARWA as a catalyst in stimulating and assisting the market place to respond to regional and seasonal imbalances in supplies & prices of foodcrops. Assist the GOR to determine the feasibility of long term bean storage in Rwanda, which will in turn strengthen GRENARWA's capability to maintain a food security block.	(1) Eighty percent of GRENARWA's storage capacity utilized annually. (2) Reduction in bean quality losses (3) GRENARWA reaches an acceptable state of financial and operational self-sufficiency. (4) GRENARWA handles 15 percent of marketed bean production. (5) GRENARWA has established formalized linkages with local crop storage units as buying and selling agents. (6) Research indicates feasibility of long-term storage of beans under conditions that prevail in Rwanda. (7) GRENARWA is selected as GOR agent for management of food security stock.	GOR records on farm and market prices. GRENARWA records Local crop storage units records. Research results. Existence of food security stock.	GRENARWA's marketing of 15 percent of commercialized beans is adequate to influence prices. GOR price policy continues to permit GRENARWA to buy and sell with sufficient margin. Local crop storage units increase in number and capacity to store and market, and are willing to continue working with GRENARWA. Research results can be achieved within LOP. GOR will continue in its intention to utilize GRENARWA as manager of food security stock.

N

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs:	Magnitude of Outputs:		Assumptions for achieving outputs:
GRENARWA's marketing department functioning effectively.	Three qualified Rwandans working full time in GRENARWA's marketing	GRENARWA and AID records.	GOR continues commitment to the project.
GRENARWA's accounting department functioning effectively.	Functioning market information system in GRENARWA. Improved financial analysis and control procedures in GRENARWA.	Evaluations and audits. Research reports.	
Increased linkages with local crop storage units.	Increases by percent GRENARWA's purchasing and selling activities with local crop storage units.		
Research findings recommending how to reduce bean quality losses and how to meet consumer preferences for beans stored for varying periods.	Research reports recommending reasonable cost methods for reducing stored bean losses and for increasing consumer preference for the stored beans.		

W x

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Inputs:	Implementation Target (Type & Quantity)		Assumptions for providing Inputs:
AID:	(See detailed Project Budget)	Project records.	Project is approved and funds are available.
M. :eting: - commodities - long-term TA - short-term TA - training and training materials			
Finance: - commodities - long term TA - short term TA - training and training materials			
Research: - commodities - short-term TA - training and training materials			
GOR:			
Staff, operating expenses and housing for LT AID-financed TA			
WFP:			
Operating fund contributions			WFP will participate

5C(1) - COUNTRY CHECKLIST

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

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

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

   The social soundness and Economic analyses demonstrate that the direct beneficiaries of the project will be the rural poor.

2. FAA Sec. 113. Has particular attention been given those programs, projects, and activities which tend to integrate women into the national economies of developing countries, thus improving their status and assisting the total development effort?

   Yes. (See Kigali 3202)

3. FAA Sec. 481. Has it been determined that the government of the recipient country has failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or

   There is no indication that narcotic drugs or other controlled substances are slipped from Rwanda to the U.S. It has not been determined that Rwanda has failed to take the necessary steps to prevent such shipment in the future.

	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?	
4.	FAA Sec. 620(b) If assistance is to a government, has the Secretary of State determined that it is not dominated or controlled by the international Communist movement?	The Secretary of State has so determined
5.	FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government?	No.
6.	FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?	No.

7. FAA Sec. 620(2), 620(f), 620D; Continuing Resolution Sec. 511, 512 and 513; ISDCA of 1980 Secs. 717 and 721. Is recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos or Vietnam? (Food and humanitarian assistance distributed directly to the people of Cambodia are excepted.) Will assistance be provided to Afghanistan or Mozambique without a waiver? Are funds for El Salvador to be used for planning for compensation, o for the purpose of compensation, for the confiscation, nationalizatio acquisition or expropriation of any agricultural or banking enterprise, or property or stock thereof? No.

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

9. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action of U.S. property? No.

10. FAA Sec. 620(k). Does the program furnish assistance in excess of $100,000,000 for the construction of a No.

7x

productive enterprise, except for productive enterprises in Egypt that were described in the Congressional Presentation materials for FY 1977, FY 1980 or FY 1981?

11. 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? — N/A

12. FAA Sec. 620(m). Is the country an economically developed nation capable of sustaining its own defense burden and economic growth and, if so, does it meet any of the exceptions to FAA Section 620(m)? — No.

13. FAA Sec. 620(o); Fisherman's Protective Act of 1967, as amended, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters, — N/A

a. has any deduction required by the Fisherman's Protective Act been made?

b. has complete denial of assistance been considered by AID Administration?

14. FAA Sec. 620(q); Continuing Resolution Sec. 518. (a) Is the government of the recipient country in default for more than six months on interest or principal of any AID loan to the country? (b) Is the country in default exceeding one year on interest or principal on any U.S. loan under a program for which the Continuing Resolution appropriates funds?

No.

15. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, 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 annual "Taking into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operationsl Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

N/A

16. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they

No

9X

been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

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

There is no chronic arrears situation though Rwanda has from time to time been slow in meeting its U.N. obligations.

18. FAA Sec. 620A; Continuing Resolution Sec. 521. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime?

No.

19. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA?

No.

20. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or

No.

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?

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY.

1. Development Assistance Country Criteria.

a. FAA Sec. 102(b)(4). Have criteria been established and taken into account to assess commitment progress of the country in effectively involving the poor in development, on such indexes as: (1) increase in agricultural productivity through small-farm labor intensive agriculture, (2) reduced infant mortality, (3) control of population growth, (4) equality of income distribution, (5) reduction of unemployment and (6) increased literacy.

While reliable data are difficult criteria on commitment to involving the poor in development have been established and it has been determined that Rwanda's commitment in this regard meets AID standards. (See Rwanda CDSS).

b. FAA Sec. 104(d)(1). If appropriate, is this development (including Sahel) activity designed to build motivation for smaller families through modification of economic and social conditions supportive of the desire for large families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development,

The AID program in Rwanda is almost entirely concentrated on increasing well-being while encouraging smaller families. The looming food/population crisis itself has alerted the GOR to the impact of population growth to the extent that it has accepted a food security stock program. Such awareness may evolve into a practical awareness of the problems of continued population growth.

assistance to urban poor and through community-based development programs which give recognition to people motivated to limit the size of their families?

2. Economic Support Fund Country Criteria.

a. FAA Sec. 502B. Has the country (a) engaged in a consistent pattern of gross violations of internationally recognized human rights or (b) made such significant improvements in its human rights record that furnishing such assistance is in the national interest? N/A

b. FAA Sec. 532(f). Will ESF assistance be provided to Syria? N/A

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

d. FAA Sec. 620B. Will ESF be furnished to Argentina? N/A

5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual funding sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Fund.

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

A. GENERAL CRITERIA FOR PROJECT.

1. Continuing Resolution Unnumbered; FAA sec. 634A; Sec. 653(b).

   (a) Describe how authorizing and appropriations Committees 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 amount)?

   This project has been included in the FY 82 CP.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

   No construction is projected. Other planning and cost estimates appear reasonably firm.

3. FAA Sec. 611 (a)(2). If further legislative action is required within recipient country, what is the basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

   No further legislative action is required.

4.	FAA Sec. 611(b); Continuing Resolution Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973?	N/A
5.	FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?	N/A
6.	FAA Sec. 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.	The project is not susceptible of execution as a part of a regional or multi-lateral project. It will, however, be coordinated with other donors.
7.	FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations;	The project will actively discourage monopolistic practices and will strengthen the development of non-speculative institutions such as cooperatives in the purchasing and selling of beans and sorghum.

(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).

It is unlikely that US private trade and investment will interest itself in the commercialization of small quantities of beans in Rwanda.

9. FAA Sec. 612(b), 636(h); Continuing Resolution Sec. 508. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

The GOR is contributing its share of local currency.

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

There is no US owned foreign currency in Rwanda.

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicabale procurement rules allow otherwise?

Yes, AID regulations in procurement will be followed

12. Continuing Resolution Sec. 522. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?

N/A

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria.

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing

Marketing procedures utilizing non-speculative institutions such as cooperatives will strengthen the role of cooperatives operating among the rural farmers.

countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: (include only applicable paragraph 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 (a) extent to which activity is specifically designed to increase productivity and income of rural poor; 103A if for agricultural research, full account shall be taken of the needs of small farmers, and extensive use of field testing to adapt basic research to local conditions shall be made; (b) extent to which assistance is used in coordination with programs carried out under Sec. 104 to help improve nutrition of the people of developing countries through encouragement of increased production of crops with greater nutritional value, improvement of planning, research, and education with respect to nutrition,

(103) The project is designed to reinforce marketing of beans and sorghum in Rwanda. It will also broaden the institutional base to permit the marketing agent to respond to the GOR's stated desire to institute and manage a national food reserve of beans and sorghum.

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; and (ii) extent to which assistance provides advanced education and training of people in developing countries in such disciplines as are required for planning and implementation of public and private development activities.

(5) [106; ISDCA of 1980, Sec. 304] for energy, private voluntary organizations, and selected development activities; if so, extent to which activity is: (i) (a) concerned with data collection and analysis, the training of skilled personnel, research on and development of suitable energy sources, and pilot projects to test new methods of energy production; (b) facilitative of geological and geophysical survey work to locate potential oil, natural gas, and coal reserves; and (c) a cooperative program in energy production and conservation through research and development and use of small scale, decentralized, renewable energy sources for rural areas;

particularly with reference to improvement and expanded use of indigenously produced foodstuffs; and the undertaking of pilot or demonstration of programs explicitly addressing the problem of malnutrition of poor and vulnerable people; and (c) extent to which activity increases national food security by improving food policies and management and by strengthening national food reserves, with particular concern for the needs of the poor, through measures encouraging domestic production, building national food reserves, expanding available storage facilities, reducing post harvest food losses, and improving food distribution.

(2) [104] for population planning under sec. 104(b) or health under sec. 104(c); if so, (i) extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.

(4) [105] for education, public administration, or human resource development; if so, extent to which

(ii) technical cooperation and development, especially with U.S. private and voluntary or regional and international development, organizations;

(iii) research into, and evaluation of, economic development process and techniques;

(iv) reconstruction after natural or manmade disaster;

(v) for special development problems, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development, especially small laborintensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

c. [107] is appropriate effort placed on use of appropriate technology? (relatively smaller, cost-saving, labor using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor.)

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of

Yes. Rwanda will contribute 25% of total project costs.

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)?	
e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed?"	N/A
f. FAA Sec. 281(b). Describe extent to which program recognized the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.	The research component intends to rely extensively on Rwandan research institutions to help solve technical and socio-economic problems.
g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	Yes. The marketing institution is effectively financially viable in the sphere of activities.

2. Development Assistance Project Criteria (Loans Only)

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

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

3. Project Criteria Solely for Economic Support Fund.

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

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

ANNEX D

REDBO FILE

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[illegible] 44819 3210123
[illegible] ZZH
[illegible] NOV 81
[illegible] WASHDC
[illegible]/AMEMBASSY KIGALI 3062
[illegible]/AMEMBASSY NAIROBI 9618

[illegible] STATE 304819

[illegible]: N/A

[illegible]: FOOD STORAGE AND MARKETING II PID - SECOND REVIEW

[illegible] A) KIGALI [illegible]. B) STATE 256595, C) CHIAVAROLI-[illegible]ELECON 11-6-81

[illegible] REVIEWED AND APPROVED REVISED PID NOVEMBER [illegible] COMMENDED AAO/RWANDA FOR DEALING EFFECTIVELY [illegible]ISSUES RAISED REF. B.

[illegible]ETTER FOLLOWS PROPOSING CERTAIN REVISIONS IN EOP'S [illegible]TATEMENT OF PURPOSE. ADDITIONAL ISSUES SUGGESTED [illegible] CONSIDERATION IN PP ARE (A) PERMANENCE OF GOR [illegible]NCIATION OF EFFORTS TO SET PRICES OF BEANS AND OTHER [illegible] CROPS, (B) DEGREE OF DEVELOPMENT OF COOPERATIVES [illegible] OTHER NON-SPECULATIVE INSTITUTIONS WITH WHICH [illegible]ANDA IS EXPANDING ITS DEALINGS, AND (C) FURTHER [illegible]NITION OF GRENARWA-OPROVIA RELATIONSHIP.

[illegible] IT MAY BE DESIRABLE PRIOR TO COMMENCEMENT OF PROJECT [illegible]TIVITIES TO ESTABLISH EVALUATION BASELINE BY SELECTING [illegible]PRESENTATIVE CULTIVATORS OF BEANS AND OTHER FOOD CROPS, PERHAPS IN CONJUNCTION WITH AGRICULTURAL SURVEY AND ANALYSIS PROJECT. AAO SHOULD BE AWARE OF POSSIBILITY OF DRAWING ON BEAN-COWPEA CRSP IN CONNECTION WITH RESEARCH INTO BEAN STORAGEPROBLEMS. HAIG

[illegible]

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Status of Recommendations from Evaluation of FSM I

The following is a presentation of the various recommendations made in the evaluation and the status of action as related to each recommendation.

Q. 1) GRENARWA should continue to place the highest priority on developing close working relationships with the non-speculative organizations that directly serve the producers and consumers.

A. GRENARWA, during the final stages of FSM I, has continued to emphasize relationships with the non-speculative organizations. One of the Project outputs in FSM II is an increase of these linkages as an element of more efficient marketing, thus continued attention will be paid to developing such relationships.

Q. 2) GRENARWA needs to secure technical assistance in accounting through to the end of the project. A highly qualified person who can continue to train a Rwandan counterpart is required.

A. Action accomplished. FSM II intends to fund continued technical assistance in accounting for the first 24 months of the project.

Q. 3) The co-director of the project should receive training in financial management prior to the departure of the expatriate advisor.

A. With the inclusion of additional technical assistance in accounting (who will train counterpart staff) the co-director (director of FSM II) can focus his attention on management with the assurance that sound accounting procedures are being followed.

Q. 4) The expatriate director should gradually withdraw from day-to-day project management in order to focus on larger issues (e.g., research needs, implementation problems, financial analysis and management information needs, transport, communications policy, coordination with other organizations, developing a sales promotion section in OPROVIA, preparing manuals, etc.). It would be preferable to set up an office away from the GRENARWA office building for this work.

A. This recommendation was fully operational during the final phase of FSM I.

Q. 5) The GOR should be requested to consider assigning a Rwandan counterpart to work in the marketing section of OPROVIA. The justification is the same as for 4.

A. Assignment of such an individual will take place subsequent to the formal GOR approval of the reorganization of OPROVIA/GRENARWA.

Q. 6) If there is sufficient interest, GRENARWA should establish regular communication with prefectural authorities and community leaders to increase the understanding of its objectives.

A. Appropriate steps to enhance communication with local authorities will be taken in the context of developing relationships with non-speculations organization (see paragraph 1 above).

Q. 7) Efforts should be made by GRENARWA management to work with other institutions such as the Institute for Statistics and Applied Economics, funded by OCAM to assemble and analyse its own and other available grain price data useful for developing recommendations for improvements in the current price policy. Short-term technical assistance may be required.

A. FSM II includes a marketing advisor whose task will include assembly and analysis of data for pricing and marketing.

Q. 8) GRENARWA should, with ISAR assistance, begin the process of improving the calibration of the moisture meters and identifying the equipment and personnel required to carry out the long-term research.

A. Analysis for FSM II has already commenced this process. In addition research activities in FSM II, as coordinated with LCS, will identify and utilize appropriate equipment and personnel for research.

Q. 9) Preliminary research trials addressing the bean quality question should be continued and refined, if possible, by using more precise measuring equipment (e.g., scales and moisture meters). For example, marked sacks containing beans of different humidity levels can be placed in various locations in the sacks, and subsequently examined over various time periods.

A. Research in FSM II, as coordinated with LCS, will continue and refine research findings on bean storage.

Q. 10) As soon as possible, GRENARWA management should coordinate with USAID and the Local Crop Storage project to plan a study to examine the relationship between storage conditions and cooking time of beans. The study should provide data to improve storage practices and thus decrease losses due to a decline in the quality of beans.

A. The analysis for FSM II establishes the necessary coordination with LCS to assure that research into bean storage and cooking is appropriately undertaken. (See technical analysis of PP).

Q. 11) GRENARWA should review, revise where necessary and codify a written moisture content policy for buying, sorting, and storing beans which should be circulated to warehouse managers.

A. The proposed FSM II project will further verify the moisture content policy which will then be utilized as an element in selecting beans for storage at warehouses and silos.

Q. 12) GRENARWA should continue to improve the efficiency of field staff supervision, radio communications, trucking produce, etc. in order to maintain strict control over transport and travel expenses.

A. During the final phase of FSM I, GRENARWA has continued surveillance of management to increase efficiency of operations. Such activities will be continued in FSM II.

Q. 13) In conjunction with the integration of GRENARWA/OPROVIA should assume a major leadership role in developing policy and coordinating activities in the areas of storage and marketing of food crops.

A. GRENARWA has been merged as a unit of OPROVIA but retains autonomy in the storage and marketing of sorghum and beans. With the emergence of a proposed food security stock, GRENARWA appears to be the GOR's selected agent of implementation.

Q. 14) Technical assistance should be supplied in sales promotion for 1982-1983.

A. FSM II provides for a marketing advisor for 1982 - 1983, and 1984.

Q. 16) The section d'Etudes et Programmes of OPROVIA should be provided with the means to equip and put into operation its information service which should furnish information to: non-speculative marketing and storage units, the government, and the general population (particularly through radio broadcasts).

A. Upon merger of OPROVIA and GRENARWA, appropriate steps will be taken to continue encouraging relationships with the non-speculative institutions. (see paragraph 1 above).

Q. 17) A survey to estimate potential grain yields approximately one month before the harvest should be carried out in order to set suitable grain prices. It is understood that the MINAGRI will conduct such a survey; if not, GRENARWA should initiate its own.

A. MINAGRI indicated that such a survey might be possible under the Ag Survey and Analysis Project and that, in any case, GRENARWA would not be the appropriate agent to undertake the survey.

Q. 18) A commission should be established with representatives of all the organizations concerned, to carry out market surveys and present its recommendations to the government. Based on these recommendations, the price policy may be revised (e.g., to reflect seasonal and regional differences) and broadcast by radio.

A. With the termination of fixed prices, the implementation of this recommendations has been suspended.

Q. 19) GRENARWA should be able to exercise the freedom to establish a buying program based upon market studies and estimates of sales which promote its financial viability.

A. With the termination of fixed prices, GRENARWA has the necessary flexibility to operate as a commercial enterprise.

Q. 20) The sales promotion sector should be considered as a priority and should be placed at an appropriate level in OPROVIA's organization.

A. The inclusion of marketing advisor in FSM II should assure appropriate attention to sales promotion within GRENARWA/OPROVIA.

Q. 21) Where appropriate, USAID should take the necessary steps to initiate and coordinate the various research activities cited in this evaluation.

A. The technical analysis for FSM II has traced the lines of coordination between FSM II/LCS in regard to research activities.

A. Marketing Advisor

The incumbent will:

- Assist the GRENARWA/OPROVIA management to assure the smooth functioning of the marketing department, especially as regards the purchase, transfer, and sales of food crops in a timely manner and at the right price.

- Assist the GRENARWA marketing department to increase sales, in order to guarantee satisfactory rotation of the Strategic Food Reserve and other GRENARWA stocks.

- Design and supervise studies of the Rwandan Food-Crop marketing structure, especially with regard to the role of the private sector.

- Design and supervise studies of consumer acceptability of stored beans, including questions of regional preference, consumer resistance to beans after prolonged storage, etc.

- Work with GRENARWA Marketing Department to increase purchases and sales through non-speculative intermediaries (cooperatives and other locally based groups), in order that GRENARWA buying and selling operations will more directly affect the producer and consumer.

Advise Government of Rwanda officials on Food Crop Marketing and Price policy.

-Improve and generally upgrade GRENARWA's systems of gathering, analysing and disseminating market and price information.

Required Reports

The following reports will be required of the incumbent:

1. A quarterly status report of project activities completed and anticipated within the next quarter.

2. An annual report on all phases of the work in which the advisor is engaged.

3. A completion of assignment report due within one month of completing his/her assignment in Rwanda. Five copies of all reports are required in both English and French. The format of the reports will be determined in discussions between the contractor, AAO/Rwanda and the GOR.

Experience

Previous practical work in a grain cooperative which was responsible for handling grain, soybeans, beans or other legumes. At least 5 years managing a grain marketing cooperative or private enterprise.

B. Financial Advisor

Scope of Duties

The Contractor will provide accounting expertise to meet the objectives outlined above. His duties will be to provide accounting and financial technical assistance and training to the GRENARWA management staff as follows:

(a) assist project management to accurately analyze operating margins, cash flow, etc., in order to help assure the future financial viability of GRENARWA;

(b) institute coordinated accounting procedures between GRENARWA and its parent organization, OPROVIA;

(c) build on previous work in development of GRENARWA financial records--with special attention to improvement of quarterly and annual financial statements;

(d) assure that the Rwandan staff and management are familiar with and able to utilize the accounting procedures to be applied in accomplishing the above.

(e) complete the writing of a comprehensive "handbook" or reference document for the GRENARWA accounting system which can be referred to by local employees after the advisor has gone, as well as a comprehensive review of the GRENARWA system. The documents should contain specific examples of problems that may be confronted, and step-by-step guidance to their solutions;

(f) the accountant will report directly to the Project Manager of the Food Storage and Marketing project; and

(g) assist Project Management with other administrative and financial/accounting questions as may be required.

C. Grain Storage Specialist (Short Term

(a) Advise on dry-bean drier design and operation.

(b) Test effect of drying on dry-bean quality.

(c) Advise on Quality Control Laboratory equipment set-up and operation.

(d) Supervise set-up of Exp 1 & 3 and do periodical checkings

(e) Participate on the writing of the final report.

(f) Advise on rat proofing of KORA Warehouse.

Office Furniture - Acct + Mktg

Quantity	Item	Unit Cost USA$	Total
2	Fireproof storage cabinets	490	980
1	Transformer 220/6 and 12 V	75	75
1	Portable radio	600	600
8	Filing cabinets (2 drawers)	410	3,280
5	Filing cabinet (4 drawers)	620	3,100
8	Office desks	550	4,400
16	Office chairs	54	864
	Conference table	800	801
8	Conference chairs	--	680
	Prices for local procurement in Rwanda of all office furnitu		14,779
	Rounded to		15,000

LIST OF EQUIPMENT

Quality Control Laboratory and Research Activity

QUANTITY	ITEM	BRAND	PRICE/UNIT	TOTAL PRICE
1	Air-Oven	Blue-M	700.00	700.00
1	Analytical balance (max, 160 g)	Mettler	2500.00	2500.00
1	Precision balance (max. 10 kg)	Mettler	2500.00	2500.00
10	Dessicators			
1	Bates Laboratory Aspirator		1755.00	1755.00
1	Boerner Sample divider with 2 extra pans		460.00	460.00
2	Bean cooker		300.00 (e .)	600.00
6	Hot plate		200.00	1200.00
1	Water distiller		1000.00	1000.00
1	Water demineralizer		50.00	50.00
1	Motomco Moisture Meter	Motomco	600.00	600.00
1	Dickey-John Moisture Meter	Dickey-John	450.00	450.00
4	Thermo Hygrographs		500.00	2000.00
2	Electronic Thermometers (potentiometers)		400.00	1800.00
4	5" sampler		8.00	36.00
2	63" grain drier		146.00	292.00
1	Pelican sampler		65.00	130.00
2	Deep bin driers		170.00	340.00
2	Thermo sampler torpedo		140.00	280.00
4	Cast Aluminim scoops		10.00	40.00
90	Aluminum cans			
(sets) 2	Sorghum sieves		48.00	96.00
(sets) 2	Soybean sieves		34.00	68.00
(sets) 2	Corn sieves		21.00	42.00
1	Buret stand	Thomas 2011-D10	50.00	50.00
2	Support stands	Thomas 8835-N35	13.00	26.00

QUANTITY	ITEM	BRAND	PRICE/UNIT	TOTAL PRICE
2	Solid bottom pans		6.00	12.00
2	Weevil sieves		12.00	24.00
1	Magnifier-Universal	Burroughs Muner 1-1819	90.00	90.00
2	Bunsen Burner	Thomas	10.00	20.00
2	Clamps	(2820-C-10)	4.00	8.00
2	Clamp holders	Thomas (2826-F-20)	2.50	5.00
4	Metal stands		10.00	40.00
2	Dip Shaft Hygrometer	Burroughs	132.00	264.00
2	Container Hygrometer	Burroughs	65.00	130.00
2	1/2 quart sample pan	Burroughs	15.00	30.00
2	3 quart sample pan	Burroughs	16.00	32.00
2	7 quart sample pan	Burroughs	24.00	48.00
4	Triangle Pan	Burroughs	7.00	28.00
2	Sling Psychrometers	Fisher	30.00	60.00
1	Stereo Zoom Microscope	Fisher Model 561-B1	730.00	730.00
1	Illumination for Stereo Zoom Microscope	Fisher BL31-33-6101	78.00	
4	Daylight flourescent tube	Fisher B1 31-31-03	3.30	
2	Black light with replacements	Seedburo	200.00	

Additional Equipment

Experiment No. 1

1	Grain drier		5000.00	5000.00
1	Circular chart recorder + recording thermometer	Burroughs	260.00	260.00
1	Monometer		350.00	350.00
1	Anemometer		390.00	390.00
	Prices Rounded to			25,000.00

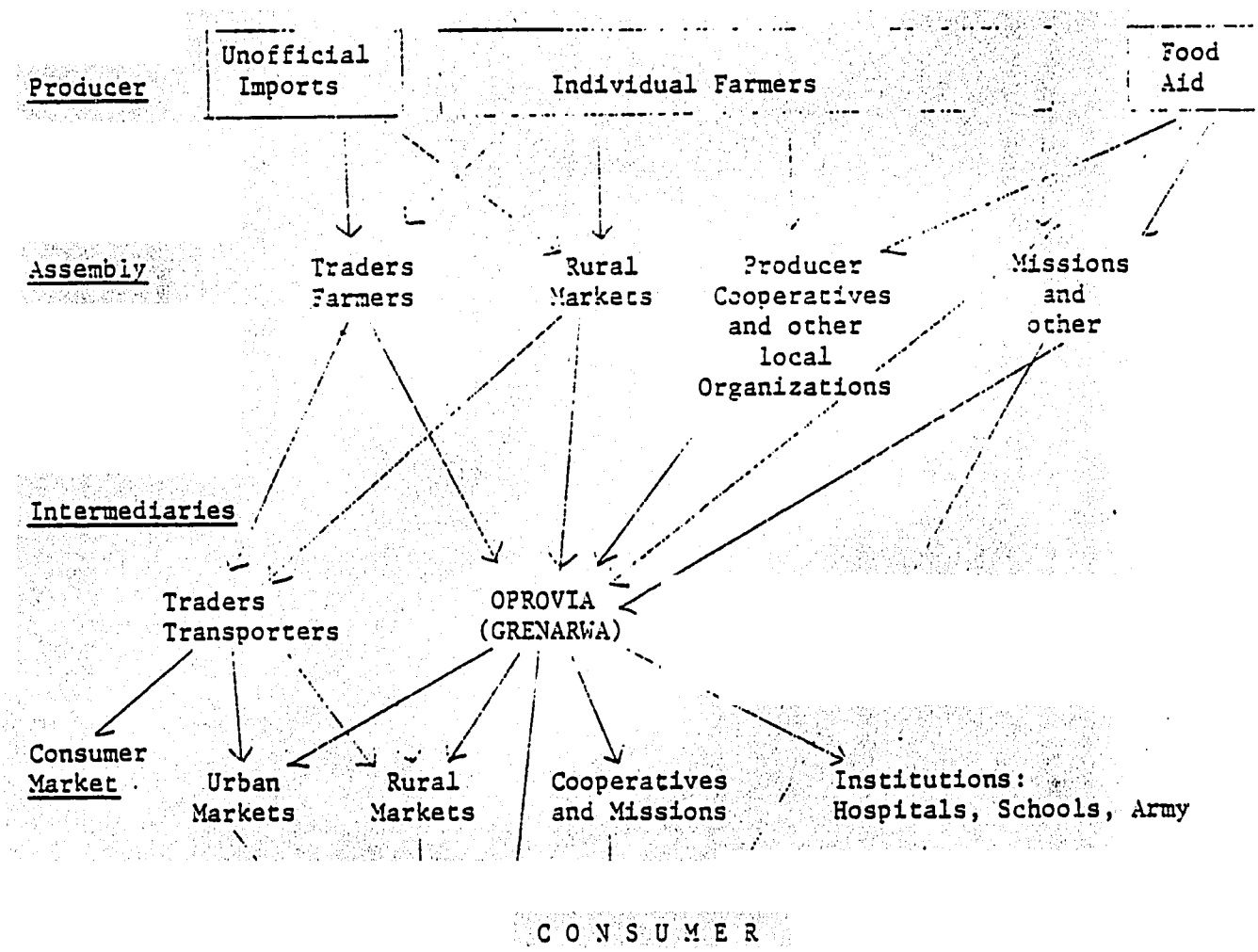
Research Plan Cost Attribution

$'000

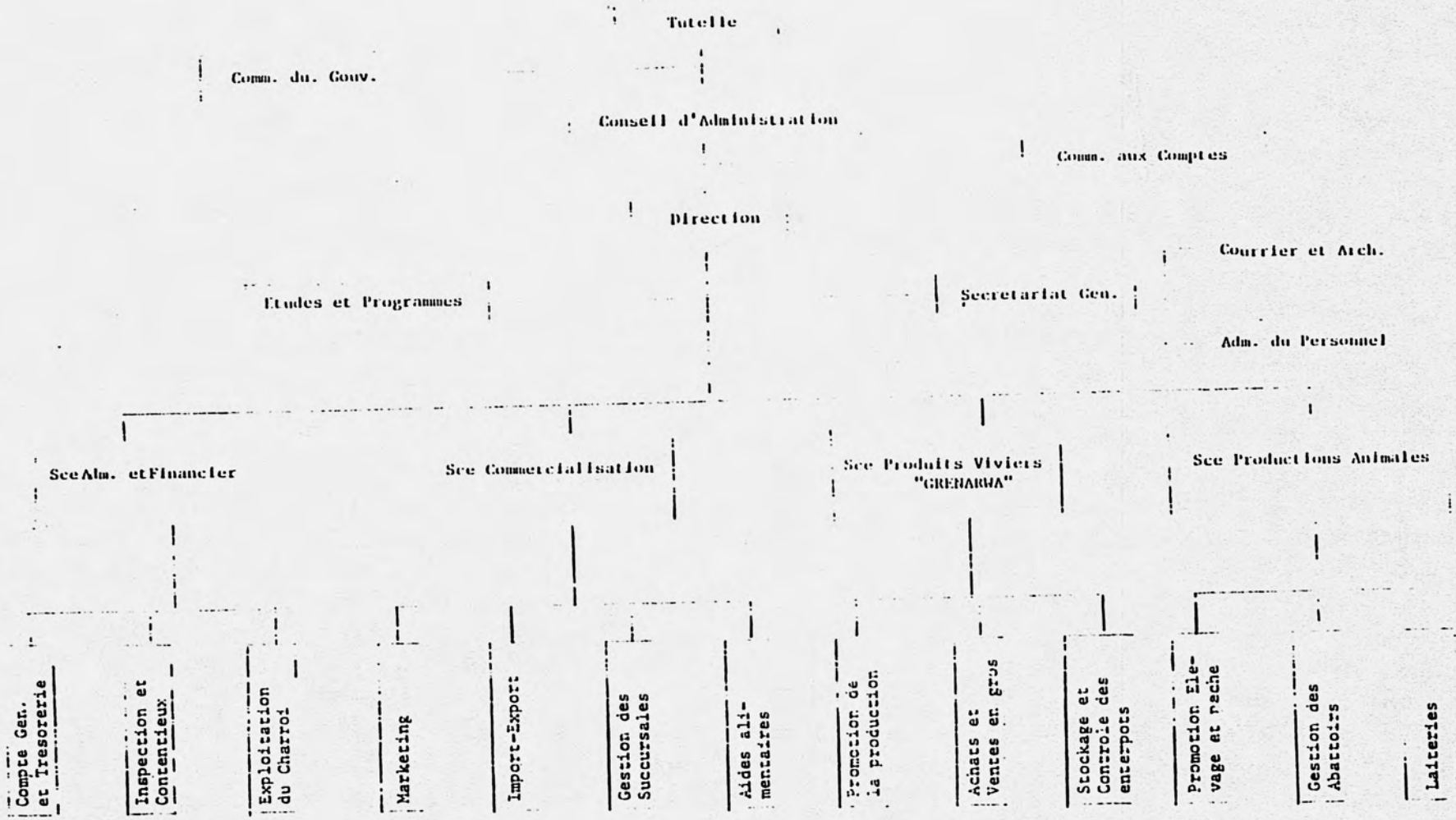
	LCS	FSM II	TOTAL
1. Technical Assistance			
(a) LT	220	-	220
(b) Graduate Researchers	134	67	201
2. Commodity/Vehicles/ Equipment	59	8	67
3. Local Costs/Operating Costs	-	57	57
4. Contingency/inf	37	40	77
TOTAL	450	172	622

	Econ	G. S.	Total
1. Salaries			
a) Economist, 30,000/yr x 2	60,000		
b) Researchers, 800/mo x 24 x		38,400	
			98,400
2. Travel/Transportation			
(a) International Travel + per diem			
Economist (family of 4)	10,000		
Researcher x 2		5,000	
(b) R & R	6,600		
(c) Shipment HHE	13,750		
(d) Air freight	6,000	2,000	
(e) Storage HHE	2,000		
(f) In-country per diem			
Economist 116 days x $56	6,500		
Researchers 232 days x $56 x 2		26,000	
(g) Vehicle operation 5,000 per vehicle per year	10,000	20,000	
	54,850	53,000	107,850
3. Allowances			
(a) Housing (rental, utilities, guards) economist	35,000		
2 - researchers 800 x 2 x 24		38,400	
(b) Post differential + COLA 31%	18,600		
(c) Education Allowances 2 x 1900 x 2	7,600		
(d) Setting up allowance x 2		4,000	
	61,200	42,400	103,600
4. Commodities			
(a) Household furniture	30,000		
(b) Vehicle - Sedan 7000 x 3	7,000	14,00[illegible]	
(c) Spares 15%	1,050	2,10[illegible]	
(d) Equipment & Supplies	5,000		
	43,050	16,10[illegible]	59,1[illegible]
5. Overhead			
(a) One economist (except vehicle, furniture + house rental) 30% of 146.050	43,815		
SUB TOTAL	262,915	149.900	412,8[illegible]
Contingency 10%			37,1[illegible]
TOTAL			450,0[illegible]

ORGANIZATION OF MARKETING IN RWANDA



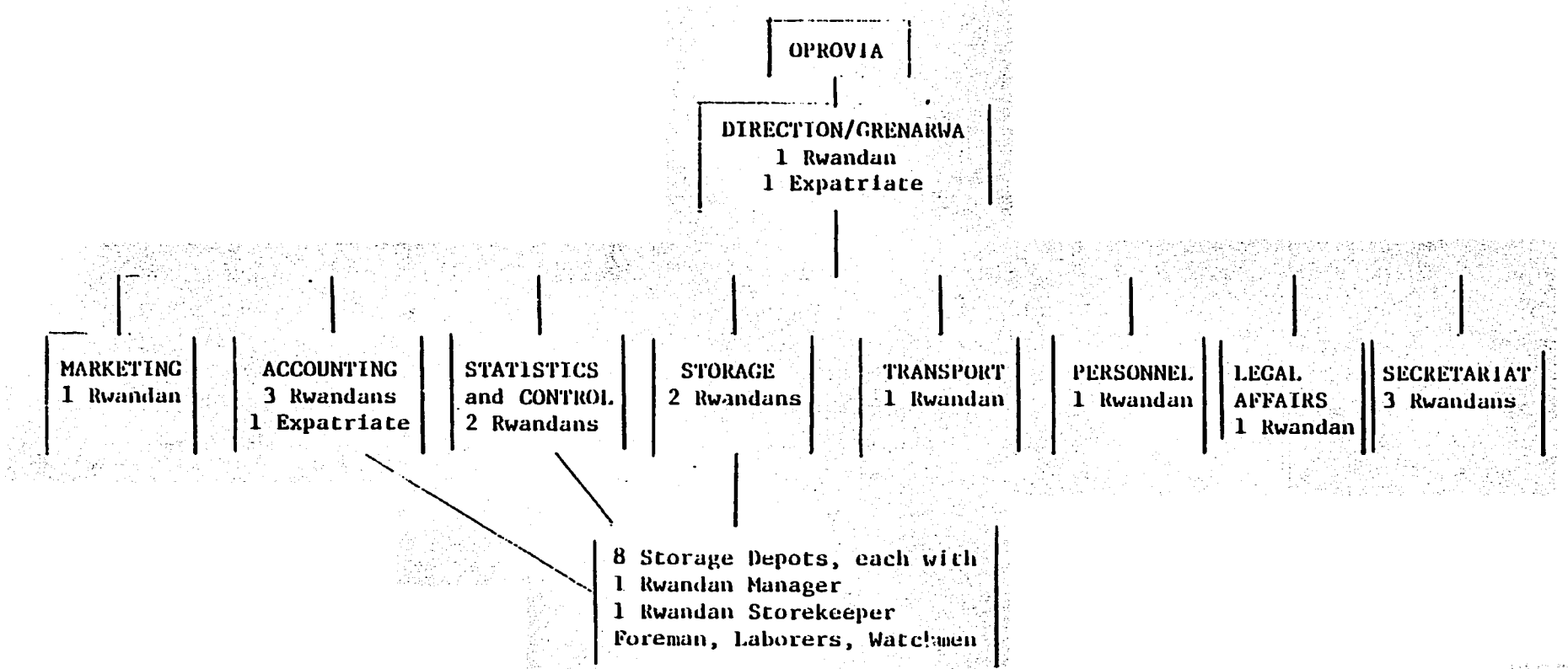
Organigramme de l'Office National pour le Developpement et la Commercialisation des Produits Vivriers et des Productions Animales "OPROVIA" (A.P. No. du).



PRESENT

ORGANIZATIONAL DIAGRAM OF

GRENARWA



ORGANIGRAMME DE L'ISAR

COMITE DE DIRECTION

DIRECTION GENERALE

- Departement LABORATOIRES
  - CHIMIE
    - Chimie du sol
    - Chimie Generale
  - TECHNOLOGIE
    - Chimie Industrielle
  - Microbiologie
  - DEFENSE DES CULTURES
    - Phytopathologie
    - Entomologie
- Departement AMENAGEMENT DU MILIEU
  - PEDOLOGIE
    - Cartographie
    - Fertilisation
  - CLIMATOLOGIE
  - GENIE RURAL
    - Physique du sol
    - Irrigation, Drainage
    - Machines Agricoles
- Departement PRODUCTION VEGETALE
  - PLANTES VIVRIERES
  - PLANTES ECONOMIQUES
  - PLANTES HORTICOLES ET AUTRES CULTURES
  - SYLVICULTURE
  - ESSAIS EN MILIEU RURAL
- Departement PRODUCTION ANIMALE
  - ZOOTECHNIE
    - Selection et Elevage Sevins
    - Selection et Elevage autres especes
  - AGROSTOLOGIE
  - ESSAIS EN MILIEU RURAL
- ADMINISTRATION CENTRALE ET DIRECTION DES STATIONS
  - Services Generaux
    - Bibliotheque
    - Secretariat
    - Comptabilite
    - Entretien Heca-poste et nisa-mentise-tion rie
  - 1 Rubona
  - 2 Songa
  - 3 Ruhanda
  - 4 Rwerere
  - 5 Tamiya
  - 6 Karama

ANNEX J

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 Agent:	Project Paper
c.	Project:	Food Storage and Marketing II (696-0116)
d.	Nature of Funding:	Grant
e.	Description of Commodities	Three 10 Ton Trucks Six Small Sedans
f.	Approximate Value:	238,000
g.	Probable Origin:	France, Japan and Brazil
h.	Source:	Rwanda

Discussion: Section 636(i) of the Foreign Assistant 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 common 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-existant. 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: _____

DISAPPROVED: _____

DATE: _____

ADDITIONAL DETAIL FOR FINANCIAL TABLES

A. Estimated Budget - Marketing Advisor

1. Compensation		
(a) Salary (36 months) (including one month language training at FSI) at FS 02 rate $40,000 per annum.	120,000	
Add: Provision for 5% increase in salary following completion of first year	4,200	
(b) Post Differential (35%)	31,000	
(c) Cost of Living Allowance	6,000	
Total Salary and post differential		161,200
2. Allowance in Cooperating Country		
(a) Education (2 children at "Away from Post" rate for 2 years)	25,400	
(b) Housing, furniture, utility and guard payments are to be provided by the project	39,000	
		64,400
3. Travel and Transportation		
(a) Within U.S. (Travel to Washington D.C. and per diem at FSI)	500	
(b) International (Return)		
Airfare		
U.S. - Rwanda - U.S. (Family of 4)	10,000	
Airfreight (UAB)	5,500	
Surface Freight (HHE)	25,000	
PVO	3,000	
Consumables	5,000	
Storage	750	
(c) Within cooperating and Third Country	-0-	
		49,750
4. Subsistence of Per Diem		
(a) Within U. S.	-0-	
(b) International	3,750	
(c) Within Cooperating and Third Country	4,750	
		8,500

5. Other Direct Cost		
(a) Health & Life Insurance	525	
(b) R & R travel	12,000	
(c) Precontract Costs (passport, visa, inoculations etc.)	500	
(d) Physical Examination	400	
(e) Communication & Miscellaneous (Report Typing, Reproduction, etc.)	750	
		14,175
6. FICA		
U. S. Government share which is not payable to the Contractor	7,500	
		321,775

B. Financial Advisor

1. Compensation 35,000 pa including 10% increase 2nd year	73,500
2. Allowances	
(a) Housing 13,200 pa	26,400
(b) Education 4,500 pa	9,000
	35,400
3. Travel and Transportation	
(a) International ticket 2,500 x 2 1/2	6,250
(b) Airfreight	5,500
(c) HHE	25,000
(d) POV	3,000
(e) Consumables	5,000
(f) Storage	1,000
	45,750
4. Per diem	1,500
5. Other direct costs	
(a) Ins	350
(b) R & R	5,250
(c) Misc	500
	6,100
TOTAL	162,250

C. FSM II Graduate Researcher

1. Salary - 800/mo x 24	19,200	
2. Travel and Transportation		
(a) International travel + per diem	2,500	
(b) Air Freight	1,000	
(c) In-country per diem 232 x $56	13,000	
(d) Vehicle operation 5000 x 2	10,000	
	26,500	
3. Allowances		
(a) Housing (rental, utilities, guards) 800 x 24	19,200	
(b) Setting up allowance	2,000	
	21,200	
4. Commodities		
(a) Vehicles (sedan)	7,000	
(b) Spare parts 15%	1,050	
	8,050	
TOTAL		74,950

D. FSM II Graduate Student Quality Control Laboratory

Salary - 800/mo x 24	19,200	
Travel and Transportation		
(a) International Travel + per diem	2,500	
(b) Air freight	1,000	
(c) In-country per diem 116 x $56	6,500	
	10,000	
3. Allowances		
(a) Housing (rental, utilities, guards) 800 x 24	19,200	
(b) Setting up allowance	2,000	
	21,200	
TOTAL		50,400

E. Quality Control Lab

1. Facility (OPROVIA)

2. Personnel

(a)	TA for setting	6 pm	60,000
(b)	Ag Eng.	2 pm	20,000
(c)	Graduate Assis	24 pm	50,400
(d)	Agronomy Lab C	48 pm x 306	14,688
(e)	Agronomy Asst/	48 pm x 213 x 2	20,448
(f)	Lab Technician	48 pm x 213	10,224
			175,760

3. Commodities

(a)	Vehicles - 2 sedans	14,000
(b)	15% spares	2,100
(c)	Equipment (see list Annex G)	25,000
(d)	40% shipping + 7% procurement fee	14,000
		55,100

4. Operating Expenses

(a)	Vehicle - $5,000 x 2 x 4 years	40,000
(b)	Local staff per diem (2 wks per mo x 442)	26,880
(c)	Beans - 250 bags, 100 kg - $25	6,250
(d)	Lab operating costs/supplies $5,000/yr	20,000
		93,130

TOTAL 323,990

Technical Annex

The following experiments will be performed under the direction of the OPROVIA/GRENARWA quality control laboratory. It should be noted that the three experiments are designed to run concurrently i.e. during slack times in one experiment manpower and equipment is to be available for other experiments, thus the overall work load on the staff of the lab will not exceed the time available.

Experiment No. 1:

Title: Consumer cookability of dry beans of different moisture contents stored in moisture proof bags.

Objective: To evaluate the maximum time of storage related to cookability and consumer acceptance of dry beans, at different moisture contents, packed in moisture-proof bags, stored in a region with favorable low temperature and unfavorable high relative humidity.

Material and Methods: One hundred and ten, 90 kg bags of newly harvested selected mixture of Rwandan dry beans will be thoroughly mixed, divided in three equal lots and dried to 11, 13 and 15% moisture contents. Drying will be performed in such a way that the temperature in the grain mass never exceeds 40-42°C. If infested, the grain will be fumigated. The dried, cooled and insect-free beans will be packed in 90 kg polyethylene or polyethylene lined moisture proof bags, and transported to the GRENARWA warehouse in Kora where they will be stored for a maximum period of 24 months. The warehouse will be rat proofed and fumigated with phosphine prior to the beginning of this study.

The experiment set-up will require:

- 36 90 Kg bags of dry beans with 11% M.C. divided in lots of 12 bags each.
- 36 bags with 13% M.C. divided in lots of 12 bags each.
- 36 bags with 15% M.C. beans, divided in lots of 12 bags each.

The nine lots will be placed in locked wire mesh cages (openings a little less than 1/2") and surface treated with malathion 2%. All the bags and cages should be properly identified.

Ambient temperature and relative humidity in the warehouse will be registered by thermohygrographs periodically checked.

Sampling will be done at 2 month intervals during the 24 month period of storage at each sampling occasion one 90 kg bag will be taken from each of the 9 cages. Beans with same moisture content will be thoroughly mixed, 20 kg separated for lab tests and the remaining 250 kgs bags packed in small bags and used for consumer acceptability tests to be conducted through women extension agents (social workers, health workers and agronomists) working at the commune level.

Laboratory tests

1. Moisture Content: will be determined according to USDA consumer and marketing service, GR instruction 916-6/1204 air oven method for corn and beans (103°C, 72 hours, 3 replicates of 15 g each).

- Fat Acidity: determined according to AOAC rapid method 14073

- Cooking Time: (C T_{50}) determined using a modified Burr bean cooker.

- Flavor Test: will be evaluated by a panel of 10 persons, using samples cooked to the same texture, using open-kettle method. Panel selection should be done using a triangle test.

- Identification of Varieties: The mixture of varieties utilized in this trial will be properly identified and quantified in relation to percentage of total mixture.

Experiment No. 2:

Title: Influence of pre-soaking on cooking time of dry beans.

Objectives: To reduce cooking time of dry-beans with the purpose of saving energy, reduce nutritional losses and increase marketability of hard-to-cook beans.

Material and Methods:

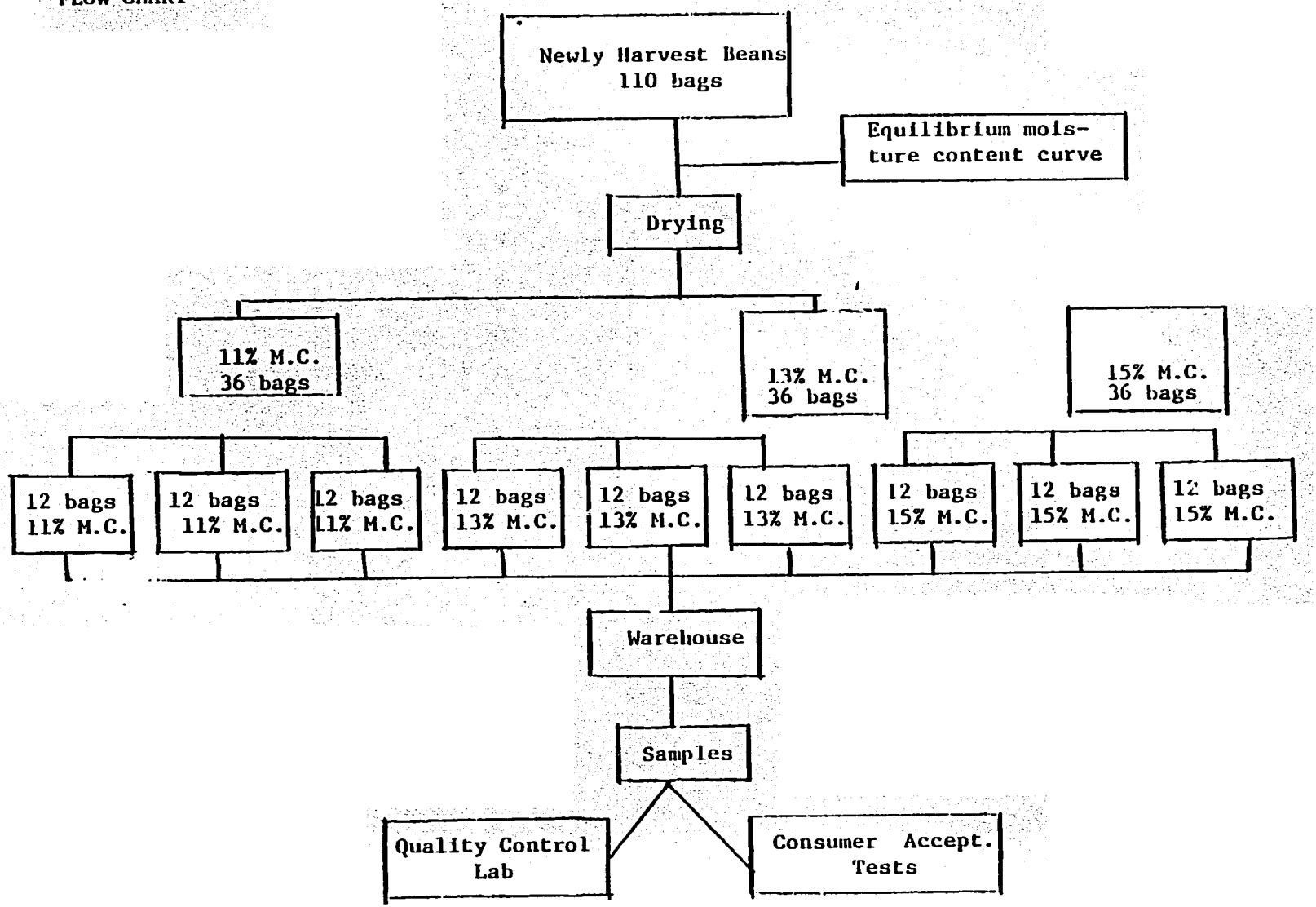
Products: Twenty kg each of two mixtures of Rwandan dry beans, one consisting of uniform sized varieties and another consisting of different sized varieties, stored for different periods of time under storage conditions commonly found in the country. Background of the products utilized in the test should be known.

Treatments:

1) Cooking in tap water

FLOW CHART

EXPERIMENT NO. 1



Experiment No.

Personnel.

1 Expatriate Technical Advisor	5 months
1 Agronomist or Biologist	38 months
1 Agricultural Engineer	2 months
1 Lab Technician	36 months
2 Assistant Agronomist	36 months
1 Graduate Student	24 months

Experiment No. 1

Material	Use	Price US$
Glassware	Physical and Chemical Analysis	2,000.00
Reagents	Chemical Analysis	2,000.00
Miscellaneous (aluminum foil filter paper, detergent, etc	Physical and Chemical analysis, clearing agent safety devides	500.00
Insecticides and Fumigants	Chemical control of insects	200.00
Dry beans	Testing material	300.00
Polyethylene bags	Packaging material	130.00
Wiremesh cages	Protection experiment	180.00
		5,310.00

2) Cooking in deionized water

3) Soaking in tap water for 6 hours followed by rinsing and cooking in tap water

4) Tap water 12 hours, rinsing, cooking in tap water

5) Deionized water 6 hours, rinsing, cooking in deionized water

6) Deionized water for 12 hours, rinsing, cooking in deionized water

7) Tap water for 6 hours, rinsing, 1% NaCl solution for 6 hours, rinsing, cooking

8) Tap water for 6 hours, rinsing: 0.5% sodium bicarbonate solution for 6 hours, rinsing, cooking

9) Tap water 6 hours, .25% sodium bicarbonate solution for 6 hours, rinsing, cooking

10) Deionized water for 6 hours, 1% sodium chloride solution for 6 hours rinsing and cooking

11) Deionized water for 6 hours, .5% sodium bicarbonate solution for 6 hours, rinsing and cooking

12) Deionized water for 6 hours, .25% sodium bicarbonate solution for 6 hours, rinsing and cooking

Each treatment will have at least 3 replications.

Tests:

Flavor: best treatments in reducing cooking time will be submitted to flavor tests, using a panel of at least 10 persons, previously selected by their ability to differentiate flavors.

Minerals: tap water should be analysed for contents of Ca, Mg, Fe and Cu.

Personnel

1 Expatriate Technical Adviser	1 month
1 Biologist or Agronomist	8 months
1 Lab Technician	8 months
1 Chemist	2 weeks

Experiment No. 3

Objective: To evaluate the possibility of using forced aeration as a means of improving the storage condition of dry beans stored in bulk.

Justification: In experiments undertaken elsewhere in LDC's it has been observed that forced aeration has a favorable effect on the flavor, texture and cookability of bulk stored dry beans. The technique consists of using periods of low ambient temperature to lower the temperature of the grain mass. Aeration of dry grain may be carried on even with air with high relative humidity, provided the ambient temperature is at least 6°C lower than the air in the intergranular space in the grain mass. This technique of aeration is based on the specific moisture of the air, rather than the relative humidity.

An additional advantage of aeration is the elimination, or considerable reduction, in the necessity of chemical control of insects. Once the temperature of the grain is lowered below 17° the great majority of the stored products insects do not reproduce. Based on those considerations, and having in mind the high relative humidities prevailing in the country, a pilot scale experimental trial to be set up in two warehouses located in areas with different climatic conditions.

Material and Methods:

Product: Forty tons of newly harvested dry beans dried to 11% moisture content.

Storage: The product will be stored in 10 ton bins located at Kora and at Nyanza warehouses during a maximum period of 24 months. At each location, 2 bins will be installed, one of them provided with an aeration system calculated to deliver an air flow of 9-12 m^3/h/ton. The hours of aeration should be automatically registered.

Operation of Aeration System: The thermostat should be set at 18°C; after the initial cooling the hygrostat set should be lowered to a relative humidity high enough to allow about 9-12 hours of aeration a week. A "typical day" for each month of the year must be known, in order to determine the appropriate setting for the hygrostat, on a monthly basis, for normal years.

Sampling: Will be done at 2 month intervals during the 24 month period of storage. At each sampling occasion, a 120 kg sample will be taken from each bin, 20 kg separated for Lab tests and the remaining 100 kg packed in small bags and used for consumer acceptability tests to be conducted through woman extension agents (social workers, health workers and agronomists) working at the commune level.

Laboratory Tests: Same as experiment No. 2.

Personnel

1 Expatriate Technical Advisor	2 months
1 Agricultural Engineer	4 months
1 Rwandan Agronomist or Biologist	38 months
2 Rwandan Assistant Agronomists	36 months
1 American Graduate Student	12 months
1 Lab Technician	24 months

Experiment No. 3

4 10 ton Metal Silos

4 Thermostats

4 Hygrostats

Temperature Control Equipment

Cookability of Beans - General Discussion

Cooking quality of dry beans is a function of variety, moisture content, temperature and period of storage. Different varieties lose cookability at different rates under the same storage conditions, the rate of loss increases with increase in moisture content, temperature, and period of storage. The decrease in cookability is accompanied by an increase in cell acidity, darkening of the seed coat and increase in hardness.

Decrease in cookability in beans is related to physical and/or biochemical changes occurring in the testa and/or in the cotyledons after maturation in the field.

Drying of beans to low moisture content (around 8-10%) can cause a delay in the uptake of water, proportional to the degree of dessication. A possible explanation would be an increasing level of hilar disfunction and differences in stage of sensitivity of counterpalisade layers of individual seeds to the surrounding free water. The amount of water absorbed when calculated as a percentage of the fresh weight, decreased with increasing storage time. However if correction is made for the solids lost, by calculating water absorption as grams of water bound to 100 gram dry matter after soaking, the difference $1^{o}N$ water uptake between fresh and stored beans fell within experimental error.

The transport of water through the hilum is slower than the rate of diffusion through the seed. This makes the hilum function as a bottleneck, reducing the rate of imbibition. Fresh and aged seeds do not differ in water imbibition characteristics.

There is an increase in the structural hardness of the seed coat during storage. However, the mechanism involved and the extent in which this fact per se affects softening of beans during cooking remain unclear. The hardness of the cotyledons is associated with transformations in the middle lamella. The middle lamella is composed of pectic substances associated with divalent cations as calcium and magnesium and proteins. Those divalent cations would bridge and support the pectinaceous matrix between bean cells and the transposition, by ion exchange mechanism, or removal of those divalent cations by a methal chelating agent, as phytic acid, would allow softening of the middle lamella and separation of cells during soaking and cooking. A high content of lignin in the middle lamella would increase the cotyledonary hardness.

Decrease in cookability during aging would be due to hydrolitic cleavage of phytin by phytase forming inorganic phosphate, that cannot act as a Ca and Mg precipitant at the pH of the beans. Increase in the pH value slightly above seven by addition of an alkali would restore the cookability of aged beans due to the precipitation of CA and Mg phytinates.

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RESULTS OF FIELD VISITS

		Sample	Moisture Content %	Temp.
1.	Nyanza GRENARWA (warehouse)	1981 - 2nd crop Origin : Nyanza area	12.6	22 C
2.	Nyanza (warehouse)	1981 - 1st crop Origin : Nyanza area	12.8	23 C
3.	Nyanza (warehouse)	1980 - 1st crop Origin : Zaire		
4.	Gikongoro GRENARWA (warehouse)	1981 - 1st crop Origin : Gikongoro area	12.9	26 C
5.	Kora GRENARWA (warehouse)	1981 - 1st Crop Origin : Zaire (Jute bags) inside stack (four layers removed)		20 C
		upper part of stack		18 C
		lower part of stack	18.1	18 C
6.	Kora (warehouse)	1981 - 1st crop (polypropylene bags)	16.7	18 C
7.	Kora (warehouse)	1980 - 1st crop Origin : Zaire	15.7	18 C
8.	Kanama (CRS silo)	1981 - 1st crop	22.2	24 C
9.	Kibuye GRENARWA (warehouse)	1981 - 2nd harvest Origin : Zaire (harvested in May,	15.4	23 C

Visual Condition of Bea

1. Nyanza: 1981 2nd crop. Origin : Nyanza area. No molds. Beans apparently in good condition. No live insects. Moderate level of insect damaged grains.

2. Nyanza: 1980 1st crop. Origin : Zaire. Musty smell. Discoloration problem. No live insects. High level of insect damaged grains.

3. Gikongoro: 1981 1st crop. Musty smell. No live insects. Low level of insect damaged grains.

4. Kora: 1981 1st crop, jute bags. Beans from inside the stack and outside lower layer were in better condition than beans on upper part of the stack. Beans from upper part of the stack with strong musty odor. Beans from lower part of the stack with a fresher smell than beans inside stack. Nc live insects present. Low percentage of insect damaged grains.

5. Kora: 1981, 1st crop. Polypropylene bags: beans with appearance equivalent to beans from 1981 1st cro packed in jute bags taken from inside and from outside of stack, but with less discoloration problem. No live insects present. Low level of insect damaged beans.

6. Kora 1980 1st crop - beans from Zaire packed in jute bags: beans dull and of a darker and more unifor coloration. Musty smell. No live insects present. Moderate level of insect damaged grains.

7. Kanama RS silo): - beans with strong smell, mixture of insecticide and slightly deteriorated odor. No insects alive. High level of insect damaged grains.

8. Kibuve arehouse): 1981, 2nd harvest: beans from Zaire (harvested in May, received in warehouse in June) - no musty odor. No live insects. High

Financial Analysis

Introduction and Summary

This financial analysis examines the impact of the FSM II project on GRENARWA. Also, included is the effect of WFP assistance and a digression examining various implications regarding the development of a security stock.

The time period of the analysis is four years--the life of the FSM II project. By the end of the project, it is expected that GRENARWA's role will be modified to include the management of a food security stock. At that time, another financial analysis should be undertaken to determine the possible effects on GRENARWA.

The results of the financial projections support the view that GRENARWA can become viable from a financial point of view, particularly when combined with the expected WFP assistance. Furthermore, as GRENARWA approaches and achieves a financially self-sustaining position, its market stabilization impact is expected to have increased by roughly one quarter over 1979-80 levels.

Projections also suggest that if the GOR assigns GRENARWA the responsibility to constitute a food security stock, it can do so during the next four years, but additional GOR or other donor assistance is required.

Analysis of GRENARWA

This analysis examines GRENARWA's history and forms the basis for future projections regarding the FSM II project. It builds upon the financial review contained in the FSM I evaluation attached to the FSM II PID. Reviewed here are GRENARWA's capitalization, operating costs, and commercialization. However, before proceeding, three constraints to the analysis must be detailed.

Up to late 1980 GRENARWA suffered from serious financial control problems, which impact on the accuracy of GRENARWA's financial records. This situation arose because the first accounting system installed by the Peace Corps provided accountant (from 1976-78) was inadequate. After his departure in 1978 a replacement could not be found until July 1980. During this gap in expatriate assistance, the Rwandan Chief accountant embezzled funds believed to be around Rwf 4.0 million (US$55,000).* The lack of a communications system to transfer information on cash and stock levels between the warehouses and the central office further aggrevated the financial control system. Until 1979, GRENARWA could not accurately determine its inventory unless every single sack was weighed because the sacks were not of a standard capacity. For instance one stack of beans included 60, 80 and 90 kilo sacks. Thus, the quality of the inventory, purchase, and sale figures are subject to error. This situation has improved with the standardization to 90 kilo bags during 1979.

Most importantly, GRENARWA operates in a very risky and uncertain environment. The lack of information on plantings, impact of the weather, harvests, smuggling in from Uganda and Zaire and out to Burundi, makes it very difficult to accurately project the environment GRENARWA will be operating in, let alone how GRENARWA management's crucial selection of buying and selling prices affect its future financial viability. Two other organizations (TRAFIPRO and CECOBM**) which also sought to deal in bean storage marketing and price stabilization have ceased those aspects of their operations as a result of heavy losses. The risks to GRENARWA are delinated in the commercialization section below.

Although of the financial and inventory control problems cannot be accurately quantified, the PP team and GRENARWA management believe the figures presented represent the best available and reflect the correct order of magnitudes. The uncertainity with respect to the fiscal projections are compensated by what are believed to be conservative assumptions regarding future marketing activities.

*The accountant was caught and convicted in 1980. See FSM I evaluation attached to PID for more details.

**TRAFIPRO was funded by the Swiss, while the CECOBM was part of an IBRD financial project.

A. Capitalization

GRENARWA was initially funded by the GOR and USAID. During 1977-78 the Swiss and World Food Program (WFP) concluded GRENARWA and its objectives were worthy of additional support and contributed to its buying and operating funds. By end-1980, contributions to GRENARWA's capital totalled almost Rwf 320 million (US$3.5 million). Table 1 summarizes donor and GOR transfers by major categories. USAID provided 49 percent of the total while the GOR, WFP, and Swiss contributed 16 percent, 28 percent, and 7 percent, respectively. Only in 1979 did GRENARWA generate a surplus on its trading activities which amounted to roughly 9 percent of the capital contributed that year.

Most of AID's monies (60 percent) went towards buildings and materials, including vehicles, equipment, etc. In fact, AID accounted for 82 percent of all resources allocated to the development of GRENARWA's physical infrastructure. The importance of the WFP and Swiss support should not be under-rated. Of GRENARWA's total buying and operating fund contributions--in essence cash transfers--66 percent (Rwf 116 million) came from other donors. Given GRENARWA's cumulative losses by the end of 1980 (see Table 2) of roughly Rwf 70 million (US$761,000) the other donors support has softened considerably the severity of its trading losses.

The GOR's contributions to the project since 1977 have been negligible, after having provided the agreed to "start up" costs.[1/] With GRENARWA's present trend of cumulative losses (31 percent of total capital contributed in five years), [2/] it becomes important that continued outside financial assistance be identified until GRENARWA achieves a healthier financial position. Its financial picture has improved; losses during 1975-78 totalled over Rwf 50 million, while 1979-81 losses are projected to total about Rwf 18 million.

The WFP has expressed its interest in contributing roughly US$1.0 million over a three year period. Central to its determination for its continued support was USAID's determination to continue support to GRENARWA via the FSM II project.

In summary, virtually all of GRENARWA's growth in assets has come from donor and GOR contributions. Because GRENARWA is not financially stable at this time, continued contributions are expected to enable it to develop and refine its operating procedures to the point where it could be financially self-sufficient.

[1/] The GOR has contributed everything it was supposed to according to the Pro Ag, and has provided additional storage facilities and other support beyond what was agreed to.

[2/] This figure is biased upward in that GRENARWA did not put "on the books" warehouses received control of in 1980 until 1981. Thus, accounting for this factor, GRENARWA's cumulative losses declined to roughly 17% of contributed capital.

TABLE 1. Summary of Capital Contributions to GRENARWA, 1975-1980.

Category/Year	1975	1976	1977	1978	1979**	1980	Total	%*
A. Buying Funds	4,675	18,693	47,408	10,223	40,027	39,000	160,026	49
U.S.	-	13,442	23,408	-	-	-	26,850	(23)
GOR	4,675	5,251	-	-	-	-	9,926	(6)
WFP	-	-	-	10,223	40,027	39,000	89,250	(56)
Swiss	-	-	24,000	-	-	-	24,000	(15)
B. Operating Funds	325	19,098	5,702	126	9,153	16,666	51,070	16
U.S.	-	-	5,376	126	7,411	15,011	27,924	(55)
GOR	325	19,098	326	-	1,129	-	20,878	(41)
WFP	-	-	-	-	613	1,655	2,268	(4)
Swiss	-	-	-	-	-	-	-	-
C. Buildings and Materials	13,054	27,990	27,987	19,511	15,014	16,630	117,186	36
U.S.	8,025	15,435	22,958	19,511	13,914	16,630	96,473	(82)
GOR	5,029	9,555	5,029	-	1,100	-	20,713	(18)
WFP	-	-	-	-	-	-	-	-
Swiss	-	-	-	-	-	-	-	-
D. Total (A+B+C)	18,054	62,781	81,097	29,860	64,194	72,296	328,282	101
U.S.	8,025	28,877	51,792	19,637	21,325	31,641	161,247	(49)
GOR	10,029	33,904	5,355	-	2,229	-	51,517	(16)
WFP	-	-	-	10,223	40,640	40,655	91,518	(28)
Swiss	-	-	24,000	-	-	-	24,000	(7)
E. Total (%)**	100	100	101	100	99	100	100	
U.S.	44	46	64	66	33	44	49	
GOR	56	54	7	-	3	-	16	
WFP	-	-	-	34	63	56	28	
Swiss	-	-	30	-	-	-	7	

Source: GRENARWA financial statements and discussions with management.

*May not total 100 due to rounding, numbers in parenthesis are percentage of category total.

**GRENARWA has a surplus of roughly Rwf 6.0 million in 1979. This is 9.3 percent of capital contributions during that year.

TABLE 2. Summary Capitalization of GRENARWA, 1975-1981.

	1975	1976	1977	1978	1979	1980	1981 (Estimates)
A. Capital							
Carry-over	0	9,595	73,524	125,210	110,486	180,760	227,798
Annual Addition	10,000	71,241	75,030	37,768	116,687	118,708	108,597
Cumulative Total	10,000	80,836	143,534	162,978	227,173	299,468	336,395
B. Profit (Loss)							
Carry-over	0	(186)	(7,312)	(23,514	(51,543)	(46,413)	(70,355)
Annual Addition	(186)	(7,126	(15,202)	(29,029)*	5,400	(23,942)	4,774**
Cumulative Total	(186)	(7,312)	(22,514)	(51,543)	(46,413	(70,355	(65,581)
C. Debt							
Accounts Payable	219	0	830	949	2,627	1,315	1,366
D. Capital (end of year)	9,595	73,524	125,210	110,486	180,760	227,798	269,448

Source: GRENARWA financial records, primarily A/L sheet and discussions with management.

*Operating loss for 1978 was Rwf 10,733,000. The additional losses are attributable and extraordinary loss due to stock quality losses. The old stock was revalued at Rwf 1 per kg from an average of about Rwf 20 per kg.

**Profit before amortization. GRENARWA projections are that 1981 will roughly break even.

B. Operating Expenses

GRENARWA's operating costs (see TABLE 3), excluding bean and sorghum purchases, sales and losses, rose dramatically during the 1976-1980 period. This is expected since GRENARWA was expanding its operations as designed under FSM I and its amendments. The building of new warehouses, acquiring a vehicle fleet and expanding personnel increased costs roughly 230 percent between 1977 and 1980 (36 percent per annum).

The important constraint of GRENARWA's operating costs structure is the relatively large percentage of fixed costs to total costs, which has averaged almost 50 percent during 1976-1980. Management has been working to reduce this percentage and anticipates that in 1981 the percentage will decline to roughly 42 percent. The largest proportion of fixed costs is salaries, averaging 54 percent of total fixed costs over 1978-80.

For the purpose of extrapolating future operating cost projections the major components of GRENARWA's costs are reviewed. These are salaries, transport and travel, and depreciation.

Salaries: In 1980 the salaries of the head office personnel and permanent warehouse staff amounted to Rwf 7.7 million (US$85,000). An additional Rwf 3.1 million was paid to temporary labourers raising the total to Rwf 10.8 million or approximately 28 percent of total operating costs. Given that there are several permanent staff vacancies which need to be filled, inflation, and decreed government wage increases, these costs, both fixed and variable, will increase at an annual rate of not less than 10 percent per annum (See 1980 FSM I evaluation). This rate of increase, however, remains below Rwanda's average annual inflation rate of 14%.

Transport and travel: Transportation costs, including maintenance insurance and fuel, were Rwf 7.8 million or 20 percent of total operating costs in 1980, an increase of 52 percent over 1979. Three factors accounted for most of the increase. Firstly, the use of the new vehicles purchased in 1979 increased from 25 to 48 vehicle months in 1980. Also, two more vehicles were purchased in 1980, all contributing to increased costs for insurance, fuel, and maintenance. Secondly, in addition to the increased volume of fuel used, the price of fuel rose sharply. The late 1979 fuel shortages resulted in the 1980 price rises. GRENARWA's fuel bill jumped from Rwf 1.2 million (US$13,000) in 1979 to RWF 2.5 million (US$27,000) in 1980--a 108 percent increase. Finally, maintenance costs increased more sharply than would be expected in view of the increased use of the vehicles, inflation, and increased age of the vehicle fleet. The increase between 1979 and 1980 of 170 percent of Rwf 2.5 million caused management to investigate fraud. Although inconclusive, the changing of service garages has brought 1981 maintenance costs down to more reasonable levels.

TABLE 3. Summary of GRENARWA Operating Costs, 1976-1980 (in Rwf 000)

Fixed Costs	1976	1977	1978	1979	1980
1. Salaries	2,174	3,222	3,749	6,030	7,746
2. Operating expenditures	154	1,282	1,321	2,696	4,362
3. Vehicles	385	497	808	1,636	3,064
4. Maintenance	2	159	71	68	305
5. Office supplies	76	120	137	-	-
6. Market studies	-	30	13	-	-
7. Miscellaneous	643	399	41	424	1,536
S/Total	3,436	5,709	6,140	10,854	17,013
Variable Costs					
8. Labour	357	1,463	986	2,798	3,105
9. Per diem	15	346	26	168*	185*
10. Interest	200	300	-	-	-
11. Transport	-	38	176	1,436	4,743
12. Transport	1,355	1,429	244	2,080	
13. Storage materials	210	807	367	1,796	1,578
S/Total	2,139	4,386	2,050	8,278	9,613
Total fixed and Variable costs	5,576	10,095	8,197	19,132	26,627
Depreciation					
14. Warehouses	684	1,622	1,815	1,980	1,980
15. Storage equipment	20	277	448	970	1,303
16. Office equipment	19	17	18	(under 18)	95
17. Furniture	44	51	58	39	124
18. Vehicles	262	373	195	3,461 (33% rate)	3,652
S/Total	1,031	2,342	2,535	6,452	7,154
Total Costs	6,607	12,437	10,733	25,584	33,782

*25%/75% under 2

1. Salaries include head office and warehouses. 2. Operating expenditure - rent, utilities, medical caisse sociale etc. 3. Vehicles - maintenance, insurance, fuel for head office transport. 8. Labour - temporary staff at warehouses. 11. Transport to and from warehouse. 12. Transport - between warehouses. The transfer of '76 purchases took place in '77. To reflect true costs for '77 purchases, 50% of trans cost is allocated to '76. 13. Storage materials - insecticides, fumigants. 16. Depreciation of storage equipment includes sacks.
Source: GRENARWA financial statements and discussions with management.

On the bright side, the increased transportation costs in 1980 were more than offset by a decline in the use of outside (hired) transport by 30 percent to Rwf 1.5 million and an increase in revenue from transport services provided intermittently to WFP and OPROVIA for the delivery of emergency food. Thus, although total costs rose by Rwf 2.6 million, transport revenue increased by Rwf 4.1 million, resulting in an overall decline of Rwf 1.5 million. This decline is unlikely to continue in the future. The possibilities for increased revenue from transport services appear limited. GRENARWA, however, remains ready to sell its transport services when its vehicles are underutilized (e.g., on back hauling from one area to another, etc.).

Total transportation cost increases are expected as GRENARWA's volume handled increases. However, the per unit transport charges are not expected to rise appreciably above the 1980 level.

Depreciation: Estimated depreciation in 1980 was Rwf 7.2 million (US$79,000) or 18 percent of total operating costs. Vehicle depreciation (three year life) accounts for over half of the total. If GRENARWA did not replace its vehicles and used OPROVIA's its costs would be decreased, but the chances of such a development are minimal (in 1980 OPROVIA purchased GRENARWA transport services). Warehouse depreciation totalled 28 percent of total depreciation in 1980. This will increase in 1981 with the addition of two new warehouses, warehouse extensions, managers houses, and an office building. Future depreciation rates are extrapolated to increase by roughly Rwf 3.0 million in 1981 and level off after that.

C. Commercialization

GRENARWA's bean and sorghum trading activities have improved substantially over the earlier years of the project. TABLES 4 and 5 summarize the quantities bought and sold during the 1976-80 period. In 1976 only 1,163 metric tons were purchased and 28 tons were sold. This has increased to almost 5,000 tons bought and over 3,000 tons sold in 1980. Quantity losses, which could only be determined since 1978, have been consistently below the FSM I EOPS level of 5 percent. During 1979 losses were 3.8 percent and in 1980 they were 2.9 percent of the value of purchases. However, these losses are not insignificant in value. Stock losses for 1980 were valued at Rwf 4.9 million, which represents 13 percent of total operating costs. These figures represent weight losses from the drying out of beans between the buying and selling season, as well as thefts, spillage, weighing differences, etc., but do not include the quality losses of having to sell beans from previous years at a reduced price because of a decline in consumer acceptability (specifically due to the development of hardshell) after storage over long periods.

Since a decline in the quality of the beans is only one of several possible reasons for having to sell them at a reduced price (other factors being surplus of beans available, too high a buying price, etc.), it is difficult to make an exact calculation of losses due to quality decline alone.

TABLE 4 shows the average buying and selling prices and margins of produce turned over within a year, and of produce stored for over a year. For the latter, it is assumed that the difference in price is directly related to the length of time in storage and the consequent decline in consumer acceptability.

In 1978 the average selling price of old beans (1977 harvest) was Rwf 2 per kilo. The margin on this transaction was Rwf + 1.54. That was a particularly fortunate year. During 1979 and 1980 the margins on beans sold the following year were Rwf - 12.39 and Rwf - 6.99, respectively. The loss on only beans have averaged Rwf - 9.7 per kilo, almost half its average purchase price. Total "quality" losses over the three year period were Rwf 12.5 million (US$136,000).

In sum, losses due to a decline in "quality" are substantial. In view of the uncertain market conditions prevailing in Rwanda, it is likely that a certain quantity of beans will have to be carried over from one year to the next, thus priority must be given to research on how beans can be stored for long periods without a substantial reduction in quality or consumer acceptability. Sorghum quality losses have not been a problem since it seems to store well for more than a year.

TABLE 6 summarizes the impact of its trading activities on GRENARWA's annual profit and losses. Bean purchases and sales have not contributed to profit in any year except 1979. This, however, was in major part due to larger sales of beans which had been in stock from previous years; revalued at a book value of Rwf 1 per kilo, and sold at Rwf 5-20 per kilo. Sorghum trading has been a consistent revenue generator for GRENARWA. (The 1978 evaluation report had recommended the increase of sorghum tradin to help GRENARWA's weak financial position). An analysis of bean and sorgh margins is the consistent leader. It averaged Rwf +7.9, while new beans averaged RWF +5.0 and old beans averaged Rwf -9.7. The financial implication is that if GRENARWA wants to improve its financial position, then it should reduce its bean trading activities to reduce carry-over and increase those of sorghum. The other factor favoring sorghum is that the average purchase price of sorghum is Rwf 5 below that of beans.

The weak trading history in beans has cost GRENARWA dearly. TABLE 7 compares the loss estimates between TABLES 2 and 6 (a reflection of the problems with the records) and compares the largest cummulative profit/loss as a percentage of contributed capitalization. Although the figure has leveled off during 1979-80, it is misleading since inflows of capital offset GRENARWA losses.

TABLE 4. GRENARWA Average Purchase and Sale Prices of New and Old Beans, 1977-1980.

	Purchases			Sales								
				New Stock				Old Stock				
	Quantity	Value	Price/Kg	Quantity	Value	Price/Kg	Margin	Quantity	Value	Price/Kg	Margin
1976	1,163,334	25,368,432	21.81	28,150	691,750	24.57	2.76	N/A	-	-	-
1977	2,875,594	60,388,874	21.00	1,486,000	34,344,976	23.11	2.11	N/A	-	-	-
1978	718,939	14,376,750	19.99	697,600	17,619,027	25.26	5.27	1,139,686	25,688,522	22.54	1.54
1979	3,327,162	72,207,829	21.70	3,167,170	87,140,127.5	27.51	6.81	672,911	6,722,978	7.70	12.20
1980	4,901,426	134,332,588	27.41	2,922,183	88,455,660.5	30.27	2.86	246,845	3,629,935	14.71	6.99

Estimated losses on old stock:

1979	10,728,076
1980	1,725,446
TOTAL	12,453,522

[1] This figure is higher than might be expected because it includes sales to prisons at 25 Rwf/kg and sales to WFP at 24 1/4 Rwf/kg.

TABLE 5. Bean and Sorghum Sales and Purchases

	1978		1979		1980		1980 (% excluding Emergency aid)
			BEAN SALES (ton)				
Individual	192	(10.46 %)	426	(10.55 %)	211	(6.66 %)	(12.4)
Non-speculative organizations	158	(8.61 %)	315	(7.80 %)	230	(7.26 %)	(13.6)
Public services	381	(20.75 %)	1,946	(48.18 %)	647	(20.42 %)	(38.2)
WFP	505	(27.50 %)	339	(8.39 %)	360	(11.36 %)	(21.2)
Emergency Aid	-	-	-	-	1,471	(46.43 %)	
Commercants	600	(32.68 %)	1,013	(25.08 %)	249	(7.86 %)	(14.7)
	1,836	100 %	4,039	100 %	3,166	100 %	
			BEAN PURCHASES				
Individuals	52	(7.23 %)	430	(11.72 %)	11	(.22 %)	
Non-speculative organizations	14	(1.95 %)	7	(.19 %)	16	(.33 %)	
Commercants	653	(90.82 %)	3,231	(88.09 %)	4,874	(99.45 %)	
	719	100 %	3,668	100 %	4,901	(100 %)	
			SORGHUM SALES (tons)				
Individuals			314	(37. %)	331	(35. %)	
Non-speculative organizations			27	(3 %)	27	(3. %)	
Public services			33	(4 %)	-		
WFP			-	-	109	(11. %)	
Commercants			482	(56 %)	481	(51. %)	
			856	(100 %)	948	(100 %)	
			SORGHUM PURCHASES				
Individuals	28	(3. %)	49	(3 %)	7	(.4 %)	
Non-speculative organizations	-	-	-	-	336	(18.3 %)	
Commercants	830	(97 %)	1,572	(97 %)	1,494	(81.3 %)	
	859	(100 %)	1,621	(100 %)	1,837	(100 %)	

TABLE 6. Summary Profit and Loss of GRENARWA 1975-81 (in Rwf 000)

	1975	1976	1977	1978	1979	1980	(6 month 1981***
A. Revenue							
Sales: bean	-	693	34,204	46,752	93,863	92,085	
sorghum	-	-	-	419	18,570	29,165	
sorghum flr.	-	-	-	-	-	-	
S/Total	-	693	34,204	51,171	112,433	121,250	
Cost of goods sold:							
Beans: begin stock	-	-	24,758	52,273	1,335	4,310	50,845
purchases	-	25,368	60,389	14,377	72,208	134,333	
losses ****	-	(1,047)	(3,044)	(4,424)	(2,711)	(4,268)	
end stock	-	24,758	52,273	24,530	4,310	50,845	49,067
S/Total	-	610	32,874	42,130	69,283	87,789	
Sorghum:							
begin stock	-	-	-	-	11,429	31,755	40,510
purchases	-	-	-	11,785	31,952	31,119	
losses	-	-	-	171	456	661	
end stock	-	-	-	11,243	31,755	40,510	14,452
S/Total	-	-	-	542	10,694	22,354	
Total Cost of goods sold:		610	32,874	42,672	79,977	110,143	
Margin	-	83	1,330	8,499	32,456	11,107	
Other Revenue	0	1	142	671	2,582	6,337*	
Total Revenue	0	84	1,472	9,170	35,038	17,949	
B. Costs							
Fixed	159	3,937	5,709	6,141	10,854	17,014	
Variable	8	2,139	4,386	2,056	8,278	9,613	
S/Total	167	5,576	10,095	8,197	19,132	26,627	
Depreciation	20	1,031	2,342	2,536	6,452	7,155	
Total Costs	187	6,607	12,437	10,733	25,584	33,782	
C. Extraord Loss	-	-	-	23,195**	-	-	
D. Profit (Loss)	(187)	(6,523)	(10,965)	(24,758)	9,454	(16,338)	4,774

*of the revenue Rwf 5.4 million were for selling transport services during 1980 food shortage.

**write off of old beans bought during 1976-77 because of bean hardshell problem.

***as of December 10, 1981, GRENARWA believes it will break even in 1981.

****as a part of purchases.

Source: GRENARWA's financial records (primarily the profit/loss statement and discussion with management.

TABLE 7. Comparison of Profit/Loss Estimates, 1975-1980 (in Rwf 000).

	1975	1976	1977	1978	1979	1980
A. Table 2*	(186)	(7,126)	(15,202)	(29,029)	5,400	(23,942)
B. Table 6**	(187)	(6,523)	(10,165)	(24,758)	9,454	(16,338)
C. Difference (A-B)***	-1	603	4,237	4,271	4,054	7,604
D. Difference 95% of capitalization	****	1.0	3.4	3.9	2.2	3.3
E. Largest cummulative profit/loss figure as % of capital-ization profit	1.9	9.6	15.5	32.1	20.2	20.8
F. Operating expenses as a % or largest loss	100.0	87.3	81.8	36.6	-	141.1

*Primary source asset and liability statement
**Primary source profit/loss statement
***Discrepencies due to errors, omissions, and repeated charges in accounting practices
****= x .01%

As a parastatal, GRENARWA's operating costs should in theory have been covered by the surplus from its trading activities. Since a large percentage of the operating costs are fixed (almost 50% in 1980 with 30% viable costs and 30% depreciation), it would help to maximize bean and sorghum inventory turnover. However, a major difficulty has been in finding sales outlets. Even if inventory turnover could be increased, any beans stored over 12 months generally have to be sold at a loss, implying that bean purchases should be kept to the level of anticipated sales.

The problems of trying to keep bean purchases close to anticipated sales and finding sales outlets will continue into the future. One constraint to GRENARWA management is the lack of bean production information. Since no scientific production estimates are made neither GRENARWA nor the GOR can accurately predict the bean harvest. The ability to forecast harvests is essential if realistic buying prices are to be set. For example, in 1980 the Ministry of Agriculture, in the belief that the first bean harvest was very poor and serious food shortages would result, instructed GRENARWA to buy a large reserve at the prevailing high price of 30 francs a kilo. As it turned out, the harvest was not as bad as predicted and GRENARWA had to dispose of some beans at a loss, while others remained unsold. If the Ministry of Agriculture had had more accurate yield estimates, this situation would probably not have arisen.

A related constraint to the first is the lack of knowledge of the second harvest's production and uncontrolled imports. TABLE 8 diagrams the relationships of the bean and sorghum harvests. Since the first bean harvest is the main one, GRENARWA is obliged to constitute the majority of its stocks at this time (to avoid the risk of failure in second harvest). If the second harvest is good, the demand for the first harvest beans will be reduced. A related problem which had serious financial consequences for GRENARWA in 1980 was the influx of beans from Zaire during the selling season. Beans enter in from Zaire when traders are able to use Rwanda's relatively "hard" currency to purchase beans cheaply at black market rates. This drove down the price of beans which had already been purchased at too high a price because of inaccurate production information.

The case for having accurate production estimates at first harvest is even stronger, given the impossibility of predicting second harvest yields and bean imports from Zaire and Uganda. No reliable information is available on prices in bordering countries.

The financial implications for GRENARWA are clear, however the solution is difficult. If GRENARWA is to approach financial self-sufficiency and trade beans in the present environment, it has to increase

TABLE 8. Rwanda Bean and Sorghum Crop Cycle

Period	Month: Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Major Harvest for beans												
Minor Hungry Period for Beans												
Major Hungry Period for Sorghum												
Minor Harvest for Beans, Major Harvest for Sorghum												
Major Hungry Period for Beans												

Source: PP Team discussions with GRENARWA

its bean and sorghum volume by a more effective marketing effort and reducing bean "quality" losses. Otherwise, GRENARWA will require repeated financial infusions to avoid bankruptcy. GRENARWA could try to increase its margins, however, it would be reducing its price and supply stabilization impact.

An analysis of available market price information also reveals the general marketing environment it operates in. The market information collected by GRENARWA from 1977-1979 for beans and sorghum is presented in TABLE 9 and 10 respecively. TABLE 11 presents an analysis of quarterly market average prices, quarterly ranges, and intermarket ranges for beans from 1977-1979. Finally, a five-year time series for the Kigali markets presenting yearly and quarterly average and range prices for beans from 1975-1979 is in TABLE 12.

In spite of certain problems with the reliability and completeness of the data, the following observations can be made:

- From 1977 to 1979- the first quarter has consistently represented the lowest price range for beans and the lowest quarterly average--a result of the harvesting of the major bean crop from late January to March. (TABLE 9).
- The highest range for beans is consistently in the fourth quarter.
- The highest average was in the first quarter in 1977 and 1978. (1979 data is incomplete, but the figures available suggest that this would be the case for this year, too). (TABLE 11).
- The highest monthly bean prices are generally in November. From January through July, prices fluctuate considerably, but from July to November, there is a steady upward trend to a peak in November, and then a decline in December--probably in anticipation of the new harvest coming in. (TABLE 9).
- Regional price differences for beans are considerable, even for the same month. For example, in November 1977, there was a 17 franc difference between Kicukiro (33 Rwf) and Kibingo (50 Rwf). In January 1978, there was a 27 franc difference between Byumba (11) and Nyamirambo (38); in September 1979, there was an 18 franc difference between Kibingo (21) and Rugogwe (39). (TABLE 9).
- Prices for sorghum peak in June, and decline quite sharply through July and August. From September to June of the following year, there is generally a fairly steady increase in price (TABLE 10).

TABLE 9. Average Monthly Prices for Beans 1977-1979

		1977												1978												1979											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
KIGALI	NYARUGENGE	-	-	-	-	25	25	25	23	23	31	36	36	28	31	27	25	30	32	32	36	34	38	39	46	27	28	29	31	20	36	38	-	-	-	-	-
	NYAMIRAMBO	-	-	-	-	24	26	27	27	28	32	41	40	38	33	27	28	30	30	29	30	30	36	36	42	28	28	28	29	29	30	34	-	-	-	-	-
	KICUKIRO	-	-	-	24	21	21	25	30	30	32	33	40	28	23	22	22	21	22	23	34	29	31	-	40	-	-	20	26	24	27	33	-	-	-	-	-
	REHERA	-	-	-	-	-	23	25	25	31	30	40	38	30	21	21	20	20	22	24	25	37	35	-	-	-	-	20	-	-	-	-	30	-	-	-	-
KIBUNGO	KIBUNGO	20	14	19	25	23	17	18	27	30	33	50	43	21	23	28	30	20	18	18	21	21	25	29	41	-	13	14	21	18	19	18	21	21	21	-	20
	KABARANDO	-	-	-	-	25	16	21	26	29	39	40	47	24	22	28	30	21	25	19	21	26	-	36	38	14	14	20	16	23	21	24	22	23	-	-	-
GITARAMA	NYANZA	20	24	24	24	20	19	27	24	27	32	36	30	21	21	21	21	20	23	21	27	27	28	35	34	23	23	25	23	25	26	33	36	37	-	-	-
	RUGOGWE	-	-	-	-	19	19	24	25	26	30	35	31	24	23	25	20	21	25	25	27	-	30	41	38	22	24	19	24	30	31	34	42	39	37	33	33
	RUHANGO	-	-	-	-	15	21	21	19	27	37	38	29	22	20	19	22	20	29	24	26	31	31	35	34	23	23	25	24	22	29	33	39	35	-	-	-
BYUMBA	BYUMBA	14	-	-	27	23	28	24	22	24	28	-	27	11	14	20	18	21	23	19	19	25	29	-	-	16	18	22	-	-	-	-	-	-	-	-	-
GICENYI	KORA	-	-	20	21	21	26	29	25	22	25	-	31	26	20	21	22	23	27	25	26	28	27	40	28	18	20	21	25	26	39	29	31	32	37	38	-

- = no information
Source: GRENARWA

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TABLE 10. Average Monthly Market Prices for SORGHUM 1977-1979

		1977												1978												1979											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
KIGALI	NYARUGENGE	-	-	-	-	25	25	16	15	19	20	20	29	33	32	37	38	43	44	34	29	31	35	34	37	44	35	38	43	38	34	37	-	-	-	-	-
	NYAMIRAMBO	-	-	-	-	50	67	17	20	-	28	30	35	37	37	47	49	49	60	41	29	32	41	36	48	31	44	43	33	37	36	29	-	-	-	-	-
	KICUKIRO	-	-	-	-	-	21	14	19	16	15	13	16	19	18	21	22	24	28	13	15	15	15	-	18	-	-	20	23	24	33	30	-	-	-	-	-
	RENERA	-	-	-	-	-	21	-	-	11	10	13	16	18	19	20	25	23	23	17	23	14	16	-	-	-	-	20	-	-	-	-	-	-	-	-	-
KIBUNGO	KIBUNGO	-	-	-	-	-	17	17	15	13	23	13	19	22	25	29	32	26	25	19	14	17	21	24	26	-	27	28	33	30	34	23	26	19	17	17	-
	KABARANDO	-	-	-	-	-	-	11	12	10	19	-	24	26	22	27	35	26	21	20	19	23	-	24	25	-	22	26	27	32	38	19	20	31	-	-	-
GITARMA	NYANZA	19	18	19	19	19	20	16	14	13	13	16	17	16	18	20	21	22	22	16	16	17	18	18	20	20	20	21	21	24	24	21	21	23	-	-	-
	RUGOGWE	-	-	-	-	21	10	16	14	14	16	18	18	20	20	22	24	24	24	17	19	-	19	21	21	22	21	22	23	25	26	23	23	23	26	32	38
	RUHANGO	-	-	18	22	23	23	15	12	17	15	17	15	17	19	23	23	19	26	15	15	17	18	18	17	19	20	23	24	22	27	27	19	21	22	-	-
BYUMBA	BYUMBA	-	-	-	-	32	33	21	18	15	18	-	29	27	18	23	26	28	26	18	14	17	24	20	-	20	23	25	-	-	-	-	-	-	-	-	-
GICENYI	KORA	-	-	18	22	20	26	26	27	17	23	-	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- = No information

Source: CRENARWA

TABLE 11. Analysis of Three Month Market Average Prices (Beans)

Market	Quarter 1977 1	2	3	4	Quarterly Range	Quarter 1978 1	2	3	4	Quarterly Range	Quarter 1979 1	2	3	4	Quarterly Range
NYARUGENGE	–	25	25	34	25–34	29	29	34	41	29–34	28	32	38+	–	
NYAMIRAMBO	–	25	25	38	25–38	33	29	32	38	29–33	28	29	34+	–	28–34
KICUKIRO	–	22	26	35	22–35	24	22	29	35	22–29	20+	26	33+	–	20–33
REMERA	–	23	27	36	23–36	24	21	29	35	21–29	20+	–	30+	–	20–30
KIBUNGO	18	22	25	42	18–42	24	23	20	32	20–24	14+	19	20	22	14–27
KABARANDO	–	21	25	42	21–42	23	25	22	37	22–25	17+	20	23	–	17–23
NYANZA	23	21	26	33	21–33	21	21	24	32	21–34	24	25	35	–	24–35
RUGOGWE	–	19	25	32	19–32	24	22	26	36	22–26	22	28	38	35	22–38
RUHANGO	–	18	22	35	18–35	20	24	25	33	20–25	24	26	36	–	24–36
BYUMBA	14	26	23	28	14–28	15	21	20	29	15–20	19	–	–	–	–
KORA	20	23	25	28	20–28	22	24	26	32	22–26	20	30	31	37+	20–37
Range	14–23	18–26	22–28	28–42	14–42	15–33	21–29	20–34	29–41	15–34	14–28	19–32	20–38	22–37	14–38
Quarterly Average	19	22	29	35		24	25	26	34		21	26	32	31	

+Based on incomplete information – i.e., data for one or two months unavailable.

TABLE 12. Analysis of Three Month Average Kigali Market Prices (Beans) (RWF/KG - 1975/79)

MARKET	YEAR	1	2	3	4	Yearly Range	Yearly Average	4 Year Range
NYAMIRAMBO	1975	29	35	28	30	29-35	31	
	1976	20	21	27	27	20-27	24	
	1977	-	25	27	38	25-38	30	
	1978	33	29	32	-	29-32+	31	
	1979	28	29	-	-	28-34	31	
Quarterly Average		27	28	29	32		29	20-38
Quarterly Range		20-33	21-35	27-32	27-38			
NYARUGENGE	1975	26	26	26	30	26-30	27	
	1976	27	25	25	27	25-27	26	
	1977	-	25	25	34	25-34	26	
	1978	29	29	34	-	29-34+	31	
	1979	28	32	-	-		30	
Quarterly Average		28	27	28	30		28	25-34
Quarterly Range		26-29	25-29	25-34	27-34			
KICUKIRO	1975	24	21	27	29	21-29	25	
	1976	23	20	29	29	20-29	25	
	1977	-	22	28	35	22-35	28	
	1978	24	22	29	-	22-29+	25	
	1979	-	26	-	-			
Quarterly Average		24	22	28	31		26	20-25
Quarterly Range		23-24	20-26	27-29	29-35			
Overall Average		26	25	28	31			
Overal Range		20-33	20-35	25-34	27-38			20-38

- = not available
+ for 9 months to September 30, 1978

- The analysis of the Kigali markets shows that in the two major markets, Nyamirambo and Nyarugenge, there has been a tendency for yearly average prices to increase from 1976-79. This would be expected, given an increase in urban population and in the wage level. (TABLE 12).
- For all three Kigali markets, the highest quarterly average was price of beans in the fourth quarter. Somewhat surprisingly for Nyarugenge and Kicukiro, the second quarter average was lower than the first quarter. This may be explained by the high prices in early January before the beans are harvested and transported from the countryside to the city markets. (TABLE 12).
- Although the data available is not sufficient to indicate trends, it is noteworthy that the yearly ranges for 1977, 1978, and 1979 were 36 (14-50), 35 (11-46) and 29 (13-42) respectively. These figures do suggest that there has been some decline in price fluctuation. Also, the data collected are in those areas where GRENARWA did not have substantial trading activities.

The above market price discussion suggests that, other things being equal, GRENARWA should do most of its purchasing in the first quarter. However, a large supply of beans is not generally available before March. The beans are harvested and dried in late January and February, and then pass through one or two 'middlemen' before being sold to GRENARWA. Furthermore GRENARWA has difficulty in handling more than 300-400 tons a week. Thus, it is obliged to make some purchases in the second quarter.

Although it might seem uneconomical for GRENARWA to buy second harvest beans, which are more expensive, consumer preference for these beans is so much greater (due primarily to their freshness) that they can be sold for a higher price and a margin equal or greater than on first harvest beans can generally be achieved.

Since bean prices are usually highest in November, GRENARWA should plan to concentrate its sales in this month, given the constraints of transport cost, handling capacity of the warehouses, etc. For sorghum, sales should be concentrated in June. Since the data suggests there is a relative shortage of sorghum in the two major Kigali markets (Nyamirambo and Nyarugenge), intensified sales efforts should be directed at those markets.

It must be emphasized that the above analysis is based on incomplete and sometimes questionable data. Also, its value is limited in that it does not indicate quantities purchased. Thus, though the price may be very high in a certain market, very few purchases may be made, the consumer preferring to substitute another food item or go elsewhere to make a purchase. However, the overall analysis clearly shows that

considerable interregional and seasonal price differences exist, and these would appear to be greater than market conditions (differences in yields, consumer preference, etc.) would warrant. Given that GRENARWA has at present only seven direct outlets, if it is to be really effective, it must increase its contacts with producers and consumers via cooperatives and other 'non-speculative' organizations. It is recognized that attempts to fulfill the social aims of the project--i.e., raising the producers' price and lowering the consumers' price by reaching them directly--may in some cases be in conflict with the aim of financial viability and a balance must be found between the two.

D. Summary and Conclusions

On the basis of the foregoing analysis of GRENARWA's financial situation, it is clear that the major components of operating costs (salaries, transport and depreciation) will continue to increase, though at a slower rate than in the past, while the possibilities of increasing revenue remain uncertain.

Since revenue is a function of both turnover and the sales margin, it is essential to turnover at a margin sufficient to cover costs. Any reduction in margin, however, will reduce further the price and supply stabilization impact GRENARWA is achieving. Thus, the focus should be on increasing turn over to expand the stabilization objective. Up to 1980, GRENARWA's sales never exceeded 5,000 tons, partially due to lack of capacity and partially the lack of sales outlets. Maximum capacity is now 10,000 tons, and every effort should be made to increase turnover accordingly. Some of the problems involved in increasing sales have been discussed above (i.e. the uncertainty of obtaining Government contracts and lack of production information which has caused GRENARWA to buy at too high a price). However, a more intensive study of the possibilities for increasing sales, especially with non-speculative organizations, will be made under FSM II. This re-emphasizes the importance of effective marketing and financial control sections to the financial viability of GRENARWA.

Projections of GRENARWA Activities

With GRENARWA's operating history reviewed, a general model describing the various relationships can be specified. The important questions to be answered are (a) what is GRENARWA's future with and without continued AID support; (b) what would the impact on GRENARWA be if WFP did not provide the US$1.0 million; (c) what would the impact on GRENARWA be if it had to develop the food reserve; (d) what are the cost implications to the GOR for the above scenarios; and (e) what can AID expect from this investment of resources.

The previous section showed that the variables which should be altered in the future are: (a) the quantity of beans and sorghum purchased annually; (b) the quantity of "old" and "new" beans and sorghum sold annually; and (c) the average margins on the "old" beans sold annually.*

Basic Model

To provide an internally consistent set of projections, GRENARWA's financial relationships were summarized into a linear model. Equations (1) thru (6) describe GRENARWA as a profit maximizer subject to the constraints of cash flow, sales as a function of purchases plus inventory, and losses. Although the model has profit maximization as its objective, other factors can be included (i.e., minimum stock levels for a food reserve) to examine their impact on GRENARWA's future.

The review of GRENARWA's operating history suggests that these linear relationships are a satisfactory description of its operating environment. Theoretically, variable costs could increase as a proportion of volume as volume increases (e.g. a monotonically increasing relationship) due to the increased local competition, hence higher wages, for temporary labourers. However, because GRENARWA's warehouses are small (1,000 MT average) and scattered throughout the country, and under and un-employment are prevalent, the impact on local labour markets is not believed to be significant.

Another area where a non-linear relationship would be expected is in market price obtained by GRENARWA as its sales increase. This would imply GRENARWA is an oligopolist firm in the marketing of beans and sorghum. To date there is no conclusive evidence that GRENARWA has such effect everywhere it operates, nor even in a majority of places. Thus, it is questionable how much GRENARWA would experience a non-linear revenue function. For this reason, it is believed a linear revenue function is a suitable description of GRENARWA over the range of trading activities covered by this analysis.

*In order to reduce "quality" losses.

(1) $\text{MAX } \overline{\Pi} = (V^S_{OB} \; Q^S_{OB} + V^S_{NB} \; Q^S_{NB} + V^S_S Q^S_S + R_O) - (FC + VC \; (Q^B_S + Q^S_S + Q^S_{OB} + Q^S_{NB} + Q^B_B) + V^B_S Q^B_S + V^B_B Q^B_B)$

(2) Subject to:

$$C \geq FC + VC \; (Q^B_S + Q^S_S + Q^B_B + Q^S_{OB} + Q^S_{NB}) + V^B_S Q^B_S + V^B_B Q^B_B$$

(3) $Q^S_S \leq Q^B_S + Q^I_S - Q_B$

(4) $Q^S_S \leq Q^B_B + Q^I_B - Q_S$

(5) $Q_B = 0.029 \; Q^B_B$

(6) $Q_S = 0.029 \; Q^B_S$

Where:

$\overline{\Pi}$ = profit

V^S_{OB} = sale price of old beans*

Q^S_{OB} = quantity of old beans sold

V^S_{NB} = sale price of new beans

Q^S_{NB} = quantity of new beans sold

V^S_S = sale price of sorghum

Q^S_S = quantity of sorghum sold

R_O = other revenue in Rwf 000 (see annex for definition)

C = cash available to purchase commodities and pay fixed and variable costs

FC = fixed costs (see annex for definition)

VC = variable costs (")

Q^B_S = quantity of sorghum bought

Q_B^B = quantity of beans bought

V_S^B = purchase price of sorghum

V_B^B = purchase price of beans

Q_S^I = quantity of sorghum in stock (inventory)

Q_B^I = quantity of beans in stock (inventory)

Q_B = quanity of beans lost

Q_S = quantity of sorghum lost

(7) $MAX\ II = 15\ Q_{OB}^S + 27.70_{NB}^S + 26\ Q_S^S + 2.582 - (12{,}914 + 0.93(Q_S^B + Q_S^S + Q_{OB}^S + Q_{NB}^S + Q_B^B) + 18Q_S^B + 23\ Q_B^B)$

(8) $MAX\ II_{NB} = 27.7\ Q_{NB}^S - 0.93Q_{NB}^S - 0.93Q_B^B 23Q_B^B$*

(9) $MAX\ II_{NB} = 26.8\ Q_{NB}^S - 23.9\ Q_B^B$

(10) $MAX\ II_{NB} = 2.9\ Q^S{}_{NB}$

(11) $MAX\ II_{OB} = 14.1\ Q_{OB}^S - 23.9\ Q_B^B = -9.8\ Q_{OB}^S$

(12) $MAX\ II_S = 25.07\ Q_S^S - 18.93\ Q_S^B = 6.1\ Q_S^S$

*Because other revenue (R_0) and fixed costs (FC) are constants, they can be dropped from this segment of the analysis.

The cash flow constraint specifies that GRENARWA's costs related to the purchase and sale of beans and sorghum, fixed costs, and variable costs must be covered by the cash on hand at the start of the year. This is a strict assumption, but captures GRENARWA's operating problems. From the review of GRENARWA's operating environment it was found that GRENARWA should buy the bulk of its beans during the first half of the year and that the bulk of bean sales are concentrated late in the year (November-December), thus implying substantial cash outlows before cash inflows (see TABLE 8). The situation for sorghum is different. This major selling period is just before the major buying period, implying less of a cash flow problem. However, sorghum has been the less important commodity of the two. It accounted for less than 25 percent of total revenue during 1980--the year it contributed most to total revenue. This cash flow assumption makes GRENARWA's trading projections conservative, but it is not believed to be a significant drawback since GRENARWA operates in a very uncertain environment and this financial assumption will keep GRENARWA's potential losses down.

The last significant feature of the model is related to the setting of purchase and sales prices for the commodities (e.g., the margin). Presently, GRENARWA is believed to have some impact in localized areas on market prices because it buys at above average market prices and sells at below average market prices. By keeping the present "margins" and maximizing profit in this model, GRENARWA is essentially maximizing profit subject to the less than optimum margin. However GRENARWA will be continuing whatever social welfare impact its "margins" were having on the local markets.

Substituting historical values (1978-80) for the variable in equation (1) reveals several important relationships.* Equation (7) shows the average purchase and sale prices of beans ("old" and "new") and sorghum, as well as fixed costs and the variable cost factor. To determine the contribution to profit of "new" beans, "old" beans and sorghum, the overall equation was reduced to the individual commodity profit functions. Equation (8) presents the individual profit function for "new" beans sold. It can be seen in equation (9) that the revenue generated from the sale of a kilo of new beans sold is Rwf 26.8 and the cost of the sale of beans is roughly 23.9** Thus, the margin on "new" bean sales is Rwf +2.9 per kilo (equation 10). Using the same methodology, equations (11) and (12) present the

*Since 1981 data was not available, the model will project from 1980. This will not significantly effect the analysis since GRENARWA management have projected 1981 to be roughly a break even for GRENARWA, hence no substantial improvement or decline in its over-all financial situation.

**Note: fixed costs have not been allocated in this segment of the analysis. And the cost of sales includes all variable costs (purchase price, labour, transport, losses, etc.) This differs from GRENARWA's method of calculating cost of sales in TABLE 4, but the format used in this analysis is more traditional and is a better reflection of the true cost of sales.

revenue, cost and margin for "old" beans and sorghum sold. The margin on "old" beans sold can be calculated since the cost of beans purchased is the average cost of the previous year's purchases. These equations restate the findings of the previous section. The most profitable commodity is sorghum, followed by "new" bean sales, while it would be in the best financial interest to reduce "old" beans sales to zero.

The implications of the model are present in Figure 1 and 2. Figure 1 diagrams the revenue and cost lines of the commodities. Since they are all divergent, GRENARWA can increase revenue by increasing sales of sorghum and "new" beans, but (on average) never for "old" beans. Also, since more revenue per unit can be made on sorghum, GRENARWA should maximize sorghum sales then concentrate on selling "new" beans Figure 2 presents GRENARWA's total revenue and cost functions. Point A is the point where GRENARWA's marketing of sorghum has reached its maximum and point B is where the marketing of GRENARWA's beans has reached its maximum. Thus, in this model, the constraint on total revenue is a function of how many "new" beans and sorghum GRENARWA can manage to sell, while minimizing "old" bean sales. Discussions with GRENARWA management confirm this view of GRENARWA's operating environment. The location of these points on Figure 2 or level of sales, and be manipulated by having a more effective marketing department.

Finally, this analysis concludes that it is in GRENARWA's best financial interest to dispose of the "old" beans because they constrain cash flow and will only cost GRENARWA money to maintain them. Because of this conclusion, it will be assumed that GRENARWA will dispose of its "old" bean stock as soon as possible (e.g., before selling its "new" beans) to reduce its losses from keeping beans over eight months. This assumption will also be applied to sorghum to assure stock turn-over.

Once GRENARWA moves past point B on Figure 2, it will experience a decline in profits because it will not be able to sell all the beans it purchases, hence will carry stock over into the following year and lose money. Its alternatives when it reaches point B are to hold (i.e., put it in a bank) the available cash until the next year's buying campaign or purchase more sorghum, if warranted by the following year's estimated market demand and supply situation.

Now that a basic model for GRENARWA has been formulated and the general implications of the model discussed, projections altering various of the revenue variables will provide insights to the possible future of GRENARWA. The entire analysis is carried out in constant 1981 prices. In general, the primary reason for allowing for inflation in an analysis is if some prices are likely to increase more rapidly than others, rather than all prices going up at the same rate. Although there is the presumption that fuel costs will increase more rapidly than any salaries, it is believed that the increased complexity in allowing for differential rates of inflation would scarcely improve the precision of the analysis. Therefore, for simplicity, the entire analysis is conducted in constant prices. Each scenario will be summarized using the traditional format of the cash flow, profit/loss, and capitalization statements rather than the format GRENARWA currently utilizes. The basic variables being altered in

In each scenario are noted after the scenario number.

FIGURE 1. Revenue and Cost Functions of Trading Beans and Sorghum

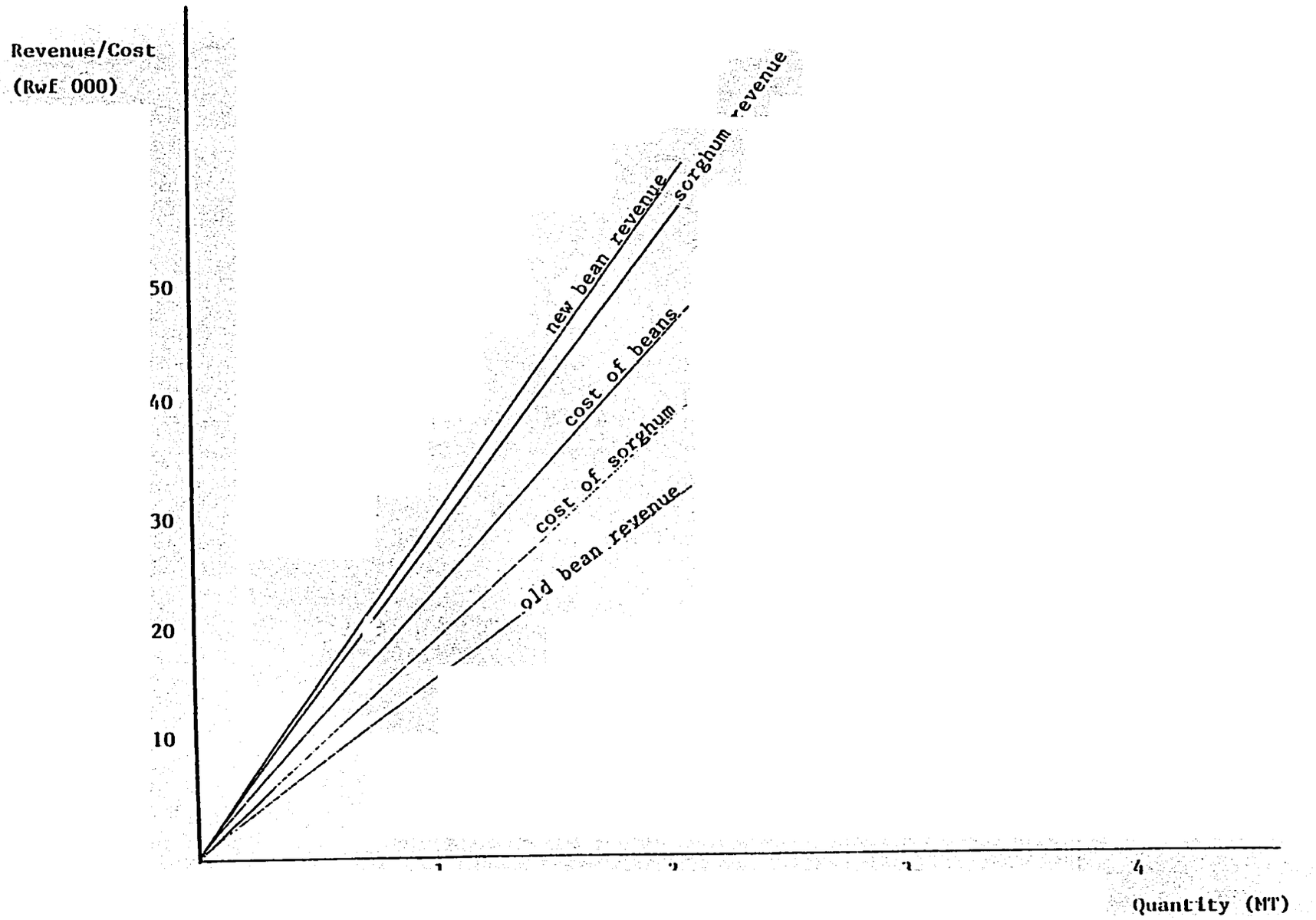
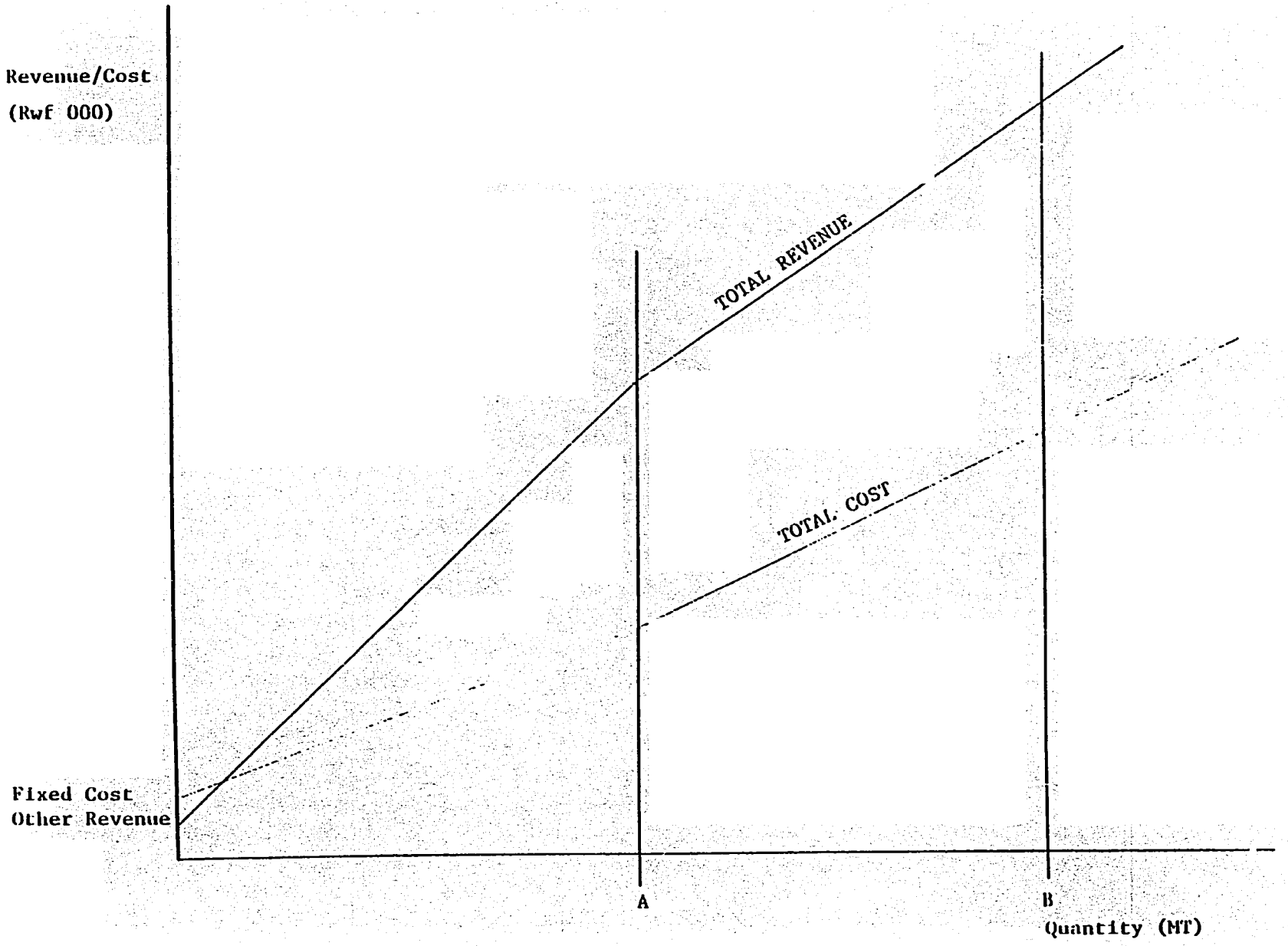


FIGURE 2. Total Revenue and Cost Curves



Scenario: 1: GRENARWA W/O AID, W/O WFP, W/O Cash Flow Constraint W/O Food Reserve Goal.

In this scenario, GRENARWA acts as a profit maximizer with its present margins. Such a situation could arise if GRENARWA would receive no AID or WFP support and management was allowed by the GOR to reduce the impact of its past trading history.

Because GRENARWA would have no AID support, no significant improvements in its marketing program is forseen--a problem pointed out in the recent evaluation of GRENARWA. Thus, it was assumed sales would not increase more than 5 percent of the previous year's level. Although GRENARWA's purchases and sales could fluctuate widely, it is believed that using an "average increase in sales over time" is sufficiently conservative. Given the difficulties inherent in such an analysis as this, the conservative sales assumption is utilized as a substitution for the more complex "probability of sales" analysis.

Under these circumstances, GRENARWA is expected to be able to generate a profit before depreciation in year 2, but not yield a profit after depreciation until roughly the end of the ninth year. This financial projection is only extrapolated four years because it is believed that the GOR will make a determination regarding GRENARWA's precise role vis-a-vis the food security program by then thus necessitating a re-estimation of GRENARWA's future. Therefore, all projections will only be made to year four, the year when major changes would most likely invalidate any extrapolations beyond that point.

GRENARWA would not carry over any stocks past year 3 (Scenario 1, TABLE 1). Its volume handled by year 4 will have declined to 87 percent of the year 1 level. This would reduce the price stabilization impact GRENARWA was having. Finally GRENARWA's total capital would have declined to 81 percent of its year 1 level. By year 4, GRENARWA's cash flow position will have improved almost by a factor of 3 over the year 1 level (Scenario 1, TABLE 2). Cumulative losses during this period would total roughly Rwf 43.3 million in uninflated Rwandan francs. The present value of this loss is US$597,000.

This projection shows that GRENARWA with no outside support and no regard for food reserve stocks would survive, although at a smaller level of operations than it is currently managing.

SCENARIO 1, Table 1: GRENARWA, W/O AID, W/O WFP, With Cash Flow Constraint Profit/Loss and Capitalization.

Project Year	1	2	3	4
A. Profit/Loss				
(MT) Beans - open stock	1,855	-	-	-
purchases	1,277	3,101	3,416	3,568
losses	37	90	99	103
sales	3,095	3,011	3,317	3,465
(Rwf) Margin - old beans	(18,179)	-	-	-
new beans	3,596	8,732	9,619	10,049
(MT) Sorghum open stock	2,391	1,396	351	-
purchases	-	-	768	1,186
losses	-	-	22	34
sales	995	1,045	1,097	1,152
(Rwf) Margin sorghum	5,592	6,375	6,692	7,027
(Rwf) Other Revenue	2,582	2,582	2,582	2,582
(Rwf) Fixed costs	(12,941)	(12,665)	(12,764)	(13,036)
(Rwf) Profit (Loss) before dep.	(19,350)	5,024	6,129	6,622
(Rwf) Depreciation	10,465	10,465	10,465	10,465
(Rwf) Total Profit (Loss)	(29,815)	(5,441)	(4,336)	(3,843)
B. Capitalization				
(Rwf) Beginning Capital	227,798	197,983	192,542	188,206
(Rwf) Contribution to Capital	-	-	-	-
(Rwf) Profit (Loss)	(29,815)	(5,441)	(4,336)	(3,843)
(Rwf) Ending Capital	197,983	192,542	188,206	184,363

SCENARIO 1, Table 2: GRENARWA W/O AID, W/O WFP, With Cash Flow Constraint Cash Flow.

Project Year	1	2	3	4
Inflows				
New bean sales	39,348	83,405	91,881	95,981
Old bean sales	27,825	-	-	-
Sorghum sales	25,870	27,170	28,522	29,952
Other revenue	2,582	2,582	2,582	2,582
Sub-Total	90,625	113,157	122,985	128,515
Outflows				
Bean	33,441	76,988	84,835	88,601
Sorghum	925	972	15,558	21,348
Fixed Costs	12,941	12,665	12,764	13,036
Sub-Total	47,307	90,625	113,157	122,985
Annual Change in Cash Flow	43,918	22,532	9,828	5,530
Cumulative Cash Flow at end of Period	90,625	113,157	122,985	128,515
Cash, Beginning of Period	47,307	90,625	113,157	122,985
Accounts receivable	7,000	7,000	7,000	7,000
Inventory	82,703			
Beans	42,005			
Sorghum	40,038			
Additions to Cash	-	-	-	-
Cash Available for Trading Activities	47,307	90,625	113,157	122,985

Scenario 2: GRENARWA W/AID, W/O WFP, W cash constraint, W/O food reserve constraint.

This scenario examines the impact of AID support without WFP or other outside support.

It was assumed AID provided TA could increase bean and sorghum sales by 5 percent per year above the level when GRENARWA did not have AID support. The impact of the increased sales effort would begin in year 2. Sales increases are projected at this level because, as noted in the social soundness analysis, it does not appear to be that easy to increase sales.

The other impact of the AID support will be to reduce the per unit losses on "old" beans. This result is expected from the improved marketing departments' sales efforts and practical results coming from the bean quality research which will easily and inexpensively improve bean quality (i.e. stack beans differently for better ventilation). Improvements in the "old" beans margin were assumed to improve Rwf +0 per kilo in year 1; Rwf +1 per kilo in year 2, Rwf +3 per kilo in year 3; and Rwf +5 per kilo in year 4. Projecting this situation without the cash flow constraint will reveal how much, how long, and under what conditions GRENARWA will be able to turn around its operations.

As expected, GRENARWA will reduce all stocks to zero by year 3, but not earn a profit after depreciation in four years (TABLES 3 and 4). GRENARWA would be able to earn a profit after depreciation in about two to three more years. Capitalization will have declined by 17 percent and will continue to do so until a profit after depreciation is made.

In this scenario GRENARWA can limp along until year 4 and the GOR would not have had to allocate any additional resources to it (other than in FSM II Pro Ag) to keep it alive. It would be in relatively better financial shape than if it did not have AID support. The present value of GRENARWA's losses would be US$560,000 versus roughly US$597,000 if no AID support was provided. The volume handled would decline as a result of the cash flow constraint making its effect felt earlier than in Scenario 1.

SCENARIO 2, Table 3: GRENARWA W/AID, W/O WFP, W/Cash Flow Constraint, w/o food reserve constraint
Profit/Loss and Capitalization

	Project Year	1	2	3	4
A. Profit/Loss					
(MT) Beans	open stock	1,855	-	-	-
	purchases	1,277	3,099	3,294	3,223
	losses	37	90	96	93
	sales	3,095	3,009	3,198	3,130
(Rwf) Margin	old beans	(18,179)	-	-	-
	new beans	3,596	8,726	9,274	9,077
(MT) Sorghum	open stock	2,391	1,396	301	-
	purchases	-	-	987	1,555
	losses	-	-	29	45
	sales	995	1,095	1,259	1,510
(Rwf) Margin	Sorghum	6,070	6,680	7,680	9,211
(Rwf) Other Revenue		2,582	2,582	2,582	2,582
(Rwf) Fixed Costs		(12,941)	(12,665)	(12,764)	(13,036)
(Rwf) Profit (Loss) before depreciation		(18,872)	4,713	6,772	7,834
(Rwf) Depreciation		10,465	10,465	10,465	10,465
(Rwf) Total Profit (Loss)		(29,337)	(5,752)	(3,693)	(2,631)
B. Capitalization					
(Rwf) Beginning Capital		227,798	198,461	192,709	189,016
(Rwf) Contributions to Capital		-	-	-	-
(Rwf) Profit (Loss)		(29,337)	(5,752)	(3,693)	(2,631)
(Rwf) Ending Capital		198,461	192,709	189,016	186,385

SCENARIO 2, Table 4: GRENARWA W/AID, W/O WFP, W/Cash Flow Constraint, w/o food reserve constraint
Cash Flow

Project Year	1	2	3	4
Inflows				
New Bean Sales	34,348	83,349	88,585	86,701
Old Bean sales	27,825	-	-	-
Sorghum sales	25,870	28,470	32,734	39,260
Other Revenue	2,582	2,582	2,582	2,582
Sub-Total	90,625	114,401	123,901	128,543
Outflows				
Bean	33,441	76,942	81,782	80,025
Sorghum	925	1,018	19,855	30,840
Fixed Costs	12,941	12,665	12,764	13,036
Sub-Total	47,307	90,625	114,401	123,901
Annual Change in Cash Flow	43,318	23,776	9,500	-4,642
Cumulative Cash Flow at end of Period	90,625	114,401	123,901	128,543
Cash, Beginning of Period	47,307	90,625	114,401	123,901
Accounts Receivable	7,000	7,000	7,000	7,000
Inventory	82,703			
Beans	42,665			
Sorghum	40,038			
Additions to Cash	-	-	-	-
Cash Available for Trading Activities	47,307	90,625	114,401	123,901

Scenario 3: GRENARWA w/AID, w/WFP, w cash flow constraint, w/o food reserve constraint.

The WFP has stated its intent to continue support to GRENARWA, if AID continues its support. Of course, their pledge is subject to the availability of funds, etc. During the PP teams discussions, WFP said it was planning to contribute about US$1.0 million equally over three years to GRENARWA's buying fund. Given that their funding approval process is similar to AID's and their submission plans are later than the one for this PP, it is assumed that WFP funding will not become available until year two of the project.

Allocating the WFP contribution over three year period starting year two means that the money has to be deflated to fit into the analysis developed here. Deflated, the WFP contribution amounts to Rwf 26.1 million, Rwf 22.2 million, and Rwf 18.8 million in year 2, 3 and 4, respectively.

The cash contributed by WFP will relieve GRENARWA's cost flow problems, by year 4, it will have a cash balance of Rwf 194.2 million (US$2.1 million), more than sufficient to launch a food security program--should the GOR decide to do so with GRENARWA (Table 21). Compared to Scenario 6 (w/AID, w/o WFP, w/o cash flow), GRENARWA is only slightly worse off. The problem arises in year 1 before WFP assistance becomes available* (Table 22). GRENARWA would need an additional Rwf 4.2 million (US$45,000) in year 1 to reach the maximum revenue it could obtain (see Scenario 6).

Again, GRENARWA would carry over no stocks from one year to the next, thus nulifying the immediate need for bean quality research for GRENARWA. In other words, GRENARWA's profitability is not dependent on the findings of the bean research.

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* Recall cash inflows or contributions must be available at the beginning of the buying campaign (Jan 1).

SCENARIO 3 Table 5: GRENARWA w/AID, w/WFP, w cash flow constraint, w/o food reserve constraint
Profit/Loss and Capitalization

Project Year		1	2	3	4
A. Profit/Loss					
(MT) Beans	open stock	1,855	-	-	-
	purchases	1,277	3,691	4,244	5,094
	losses	37	107	123	148
	sales	3,095	3,584	4,121	4,946
(Rwf) Margin	old beans	(18,719)			
000	new beans	3,596	10,394	11,951	14,343
(MT) Sorghum	open stock	2,391	1,396	301	-
	purchases	-	-	987	1,555
	losses	-	-	29	45
	sales	995	1,095	1,259	1,510
(Rwf) Margin	sorghum	5,592	6,070	7,680	9,211
000					
(Rwf) Other revenue		2,582	2,582	2,582	2,582
000					
(Rwf) Fixed costs		(12,941)	(12,665)	(12,764)	(13,036)
000					
(Rwf) Profit (Loss) before dep		(19,350)	6,991	9,449	13,100
000					
(Rwf) Depreciation		10,465	10,465	10,465	10,465
000					
(Rwf) Total Profit (Loss)		(29,815)	(3,474)	(1,016)	2,635
000					
B. Capitalization					
(Rwf) Beginning Capital		227,798	197,983	220,575	241,715
000					
(Rwf) Contribution to Capital		-	26,066	22,156	18,833
000					
(Rwf) Profit (Loss)		(29,815)	(3,474)	(1,016)	2,635
000					
(Rwf) Ending Capital		197,983	220,575	241,715	263,183
000					

SCENARIO 3 Table 6: GRENARWA w/AID, w/WFP, w cash flow constraint, w/o food reserve constraint
Cash flow

Project Year	1	2	3	4
Inflows				
new bean sales	34,348	99,277	114,152	137,004
old bean sales	27,825	-	-	-
sorghum sales	25,870	28,470	32,734	39,260
other revenues	2,582	2,582	2,582	2,582
sub-total	90,625	130,329	149,568	178,846
Outflows				
bean	33,441	91,659	105,391	126,499
sorghum	925	1,018	19,855	30,840
fixed costs	12,941	12,665	12,764	13,036
sub-total	47,307	105,342	138,010	152,485
Annual change in cash flow	43,318	24,987	11,550	8,471
Cumulative cash flow at end of period	90,625	141,678	175,392	220,586
Cost, beginning of period	47,307	90,625	141,678	175,392
Accounts receivable	7,000	7,000	7,000	7,000
Inventory	82,703			
beans	42,665			
sorghum	40,038			
Additions to cash	-	26,066	22,156	18,833
Cash available for trading activities at beginning of period	47,307	116,691	163,834	194,225

Scenario 4: GRENARWA W/AID, W/O WFP, w/o cash flow constraint and w/food reserve.

This scenario examines the impact on GRENARWA of having to build up and maintain the FAO recommended level of food reserve. The recommended level is 8,000 MT--2,000 MT of beans and 6,000 MT of sorghum. Projecting this scenario without the cash flow constraint will reveal how much it would cost to achieve this goal by year 4.

Based on the model developed above, GRENARWA could by year four build and manage a bean reserve of 2,000 MT a sorghum reserve of 6,000 MT (as recommended by FAO); and increase its stabilization impact by 30 percent over 1979-80 levels. The estimated cost in current dollars to the GOR over the next four years for this food reserve, assuming AID, is an additional US$1.55 million to the US$279,000 provided as part of FSM II. This would cover the additional buying funds required (US$902,000) to purchase the necessary quantities of beans and sorghum and cover the additional cost (US$648,000) GRENARWA would incur as a result of developing and managing the food reserve. Of the additional cost, the GOR could tap its budget or other donor organizations for support. For example the US$1.0 million from WFP would account for a substantial proportion of the cost.

SCENARIO 4, Table 7 : GRENARWA w/AID, w/o WFP, w/o flow constraint, and w food reserve
Cash flow: GRENARWA

Project Year	1	2	3	4
Inflows				
new bean sales	38,863	99,277	114,152	137,004
old bean sales	27,825	32,000	36,000	40,000
sorghum sales	25,870	28,470	32,734	39,260
other revenues	2,582	2,582	2,582	2,582
sub-total	95,140	162,329	185,468	218,846
Outflows				
beans	86,905	91,659	105,391	126,499
sorghum	37,441	41,188	47,360	43,618
fixed costs	12,941	12,665	12,764	13,036
sub-total	137,287	145,512	165,616	183,153
Annual Change in Cash Flow	(42,147)	16,817	19,953	35,693
Cumulative Cash Flow at end of Period	95,140	162,329	185,968	221,161
Costs, beginning of period	47,307	95,140	162,329	185,468
Accounts receivable	7,000	7,000	7,000	7,000
Inventory	82,703			
beans	42,665			
sorghum	40,038			
Additions to cash	89,980	50,372	3,186	---
Cash available for trading activities	137,287	145,512	165,515	183,153

SCENARIO 4, Table 8: GRENARWA w/AID, w/o WFP, w/o flow constraint, and w food reserve
Profit/Loss and Capitalization

Project Year	1	2	3	4	5
A. Profit/Loss					
(MT) Beans open stock	1,855	2,000	2,000	2,000	2,000
purchases	3,505	3,691	4,244	5,094	
losses	102	107	123	145	
sales	3,258	3,584	4,421	4,946	
(Rwf) Margin					
old beans	(18,179)	(17,600)	(13,600)	(9,600)	
new beans	4,069	10,394	11,951	14,343	
(MT) Sorghum					
open stock	2,391	3,269	4,235	5,345	6,000
purchases	1,929	2,122	2,440	2,230	
losses	56	61	71	65	
sales	995	1,095	1,259	1,510	
(Rwf) Margin					
Sorghum	6,070	6,680	7,680	9,211	
(Rwf) Other Revenue	2,582	2,582	2,582	2,582	
(Rwf) Fixed Costs	(12,941)	(12,665)	(12,764)	(13,036)	
(Rwf) Profit (loss) before dep.	(18,399)	(10,609)	(4,151)	(3,500)	
(Rwf) Depreciation	10,465	10,465	10,465	10,465	
(Rwf) Total Profit (Loss)	(28,864)	(21,074)	(14,616)	(6,965)	
B. Capitalization					
(Rwf) Beginning Capital	227,798	289,114	318,412	306,982	
(Rwf) Contribution to Capital	89,980	50,372	3,186	-	
(Rwf) Profit (Loss)	(28,864)	(21,074)	(14,616)	(6,965)	
(Rwf) Ending Capital	289,114	318,412	306,982	313,997	

Scenario 5 and 6: GRENARWA w/AID, w/WFP, w/cash flow constraint, w/food reserve

These two Scenarios determine if GRENARWA can build up the food reserve level recommended by FAO utilizing only AID and WFP resources. Because the WFP cash inflows required are less than the total required to achieve the goal (see Scenario 4), two projections must be examined--one with bean stock build up as the priority and the other with sorghum stock build up as the priority. The shortfall of WFP resources to the minimum amount needed to achieve the food reserve goal is Rwf 76.4 million (US$830,000).

Scenario 5 summarizes the result of having beans as the priority (Tables 9 and 10). GRENARWA will be able to achieve the 2,000 MT level, but only be able to stock 75 MT of sorghum. Cumulative losses totalled Rwf 91.0 million (US$9.7 million), while volume handled totalled 5,683 MT. Scenario 6 shows that 6,000 MT of sorghum can be stocked by year 4, but only 223 MT of beans (Tables 11 and 12). Cumulative losses declined to Rwf 79 million (US$86,000) while volume handled increased 38 percent to 7,824 MT. From this comparison, the implication is that with no other support than AID and WFP and with the goal of establishing a food security stock, it is better financially, food reserve, and price stabilization wise to focus on sorghum.

SCENARIO .5, Table 9.: GRENARWA w/AID, w/WFP, w/cash flow constraint, w food reserve (beans)
Profit/Loss and Capitalization

Project Year	1	2	3	4	5
A. Profit/Loss					
(MT) Beans open stock	1,855	1,287	2,000	2,000	2,000
purchases	1,325	2,060	2,060	2,060	
losses	39	60	60	60	
sales	1,855	1,287	2,000	2,000	
(Rwf) Margin					
old beans	(18,179)	(18,128	(13,600)	(9,800)	
new beans	3,596	-	-	-	
(MT) Sorghum					
open stock	2,391	1,396	1,233	326	75
purchases	-	960	362	1,297	
losses	-	28	10	38	
sales	995	1,095	1,259	1,510	
(Rwf) Margin					
sorghum	6,070	6,680	7,680	9,211	
(Rwf) Other Revenue	2,582	2,582	2,582	2,582	
(Rwf) Fixed Costs	(12,941)	12,665)	(12,764)	(13,036)	
(Rwf) Profit (Loss) before dep	(18,872)	(3,403)	(16,102)	(10,843)	
(Rwf) Depreciation	1,0465	1,0465	1,0465	1,0465	
(Rwf) Total Profit (Loss)	(29,337)	(13,868)	(26,567)	(21,308)	
B. Capitalization					
(Rwf) Beginning Capital	227,798	198,461	(184,593)	180,182	
(Rwf) Contribution to Capital	-	26,066	22,156	18,833	
(Rwf) Profit (Loss)	(29,337)	(13,868)	(26,567)	(21,308)	
(Rwf) Ending Capital	198,961	184,593	180,182	177,707	

SCENARIO 5, Table 10: GRENARWA w/AID, w/WFP, w/cash flow constraint, w food reserve (beans)
Cash flow

Project Year	1	2	3	4
Inflows				
new bean sales	-	-	-	-
old bean sales	27,825	20,592	36,000	40,000
sorghum sales	23,870	28,470	32,734	39,260
other revenues	2,582	2,582	2,582	2,582
sub-total	56,277	51,644	71,316	81,842
Outflows				
bean	33,441	50,493	51,156	51,156
sorghum	925	19,185	9,880	25,957
fixed costs	12,941	12,665	12,764	31,036
sub-total	47,307	82,343	73,800	90,149
Annual change in cash flow	8,970	(30,699)	18,108	(8,307)
Cumulative cash flow at en of period	56,277	51,644	71,316	71,842
Cost, beginning of period	47,307	56,277	51,644	71,316
Accounts receivable	7,000	7,000	7,000	7,000
Inventory	82,703			
beans	42,665			
sorghum	40,038			
Additions to cash	-	26,066	22,156	18,833
Cash available for trading activities	47,307	82,343	73,800	90,149

SCENARIO 6 , Table 11: GRENARWA w/AID, w/WFP, w/cash flow constraint, w food reserve (sorghum) Profit/Loss and Capitalization

Project Year	1	2	3	4	5
A. Profit/Loss					
(MT) Beans open stock	1,855	-	1,156	-	223
purchases	-	1,191	-	230	
losses	-	35	-	7	
sales	1,855	-	1,156	-	
(Rwf) Margin					
old beans	(18,179(	-	(7,861)	-	
new beans	-	-	-	-	
(MT) Sorghum					
open stock	2,391	3,022	3,988	4,688	6,000
purchases	1,675	2,122	2,018	2,906	
losses	49	61	59	84	
sales	995	1,095	1,259	1,510	
(Rwf) Margin					
sorghum	6,070	6,680	7,680	9,211	
(Rwf) Other Revenue	2,582	2,582	2,582	2,582	
(Rwf) Fixed Costs	(12,941)	(12,665)	(12,764)	(13,036)	
(Rwf) Profit (Loss) before dep	(22,468)	(3,403)	(10,363)	(943)	
(Rwf) Depreciation	10,465	10,465	10,465	10,465	
(Rwf) Total Profit (Loss)	(32,933)	(13,868)	(20,828)	(11,408)	
B. Capitalization					
(Rwf) Beginning Capital	227,798	194,865	207,063	208,391	
(Rwf) Contribution to Capital	-	26,066	22,156	18,833	
(Rwf) Profit (Loss)	(32,933)	(13,868)	(20,828)	(11,408)	
(Rwf) Ending Capital	194,865	207,063	208,391	208,816	

SCENARIO 6, Table 12: GRENARWA w/AID, w/WFP, w/cash flow constraint, w food reserve (sorghum)
Cash flow

Project Year	1	2	3	4
Inflows				
new bean sales	-	-	-	-
old bean sales	27,825	-	20,808	-
sorghum sales	25,870	28,470	32,734	39,260
other revenues	2,582	2,582	2,582	2,582
sub-total	56,277	31,052	56,124	41,842
Outflows				
bean	1,725	28,490	1,075	5,507
sorghum	32,641	41,188	39,369	56,414
fixed costs	12,941	21,665	12,764	13,036
sub-total	47,037	82,343	53,208	74,957
Annual cash flow	8,970	(51,291)	2,916	(33,115)
Cumulative cash flow	56,277	31,052	56,124	41,842
Cost, beginning of period	47,307	56,277	31,052	56,124
Accounts receivable	7,000	7,000	7,000	7,000
Inventory	82,703			
beans	42,665			
sorghum	40,038			
Additions to cash		26,066	22,156	18,833
Cash available for trading activities	47,307	82,343	53,208	74,957

Summary and Conclusion

The various Scenarios depicting possible paths GRENARWA could take are summarized below in a cost and benefit format. All costs are in current US dollars for easy comparison. The benefit has not been quantified.

GRENARWA's impact on price and supply stabilization has, as noted earlier, not been quantified. However, the impact is directly related to the volume GRENARWA handles (purchases plus sales) and the "threat" of GRENARWA entering the market. The second component is virtually unquantifiable, however, it is related to the volume handled. For example, if GRENARWA looks like it will be able to be very active in trading, the commercants will be less inclined to try to extract excess profits for fear of GRENARWA entering the market and driving down prices. Thus, the volume (purchases plus sales) GRENARWA handles is believed to be a useful and descriptive indicator of its price and supply stabilization impact.

GRENARWA, without AID, WFP, or additional GOR support, is believed to be able to yield a profit before depreciation in two years, and yield a profit after depreciation in roughly eight more years (see Scenario 2 Annex L-2). The total quantity handled (e.g. stabilization impact) would be around 9,370 MT by year 4. This is eleven percent decrease when compared to the 1979-80 average. Thus, a slight decline in GRENARWA's stabilization impact will occur as it works to reach a financially self-sufficient position. Once that has been achieved, GRENARWA's stabilization impact will increase. The cash flow constraint is the factor determining the rate at which GRENARWA recovers from its earlier "growing" problems.

If GRENARWA receives FSM II support, two major impacts are expected from the AID provided assistance. First, it was assumed that the AID provided TA could increase bean and sorghum sales by 5 percent per year above the level when GRENARWA did not have AID support. The impact of the increased sales effort would begin in year 2. Sales increases are projected at this level because, as noted in the social soundness and financial history analysis, it does not appear to be that easy to increase sales.

The other impact of the AID support will be to reduce the per unit losses on "old" beans. This result is expected from the improved marketing departments' sales efforts and practical results coming from the bean quality research which will easily and inexpensively improve bean quality (i.e. stack beans differently for better ventilation). The "old" beans margin were assumed to improve Rwf +0 in year 1, Rwf +1 in year 2, Rwf +3 per kilo in year 3; and Rwf + 5 per kilo in year 4. These assumptions are believed to be very conservative, but justifiably so in light of the uncertain marketing environment GRENARWA operates in (see Annex L-2 for expanded discussion).

NO.	SCENARIO DESCRIPTION				COSTS (current US $)						BENEFITS					
							CASH INFLOWS				PRICE/SUPPLY STABILIZATION			FOOD RESERVE LEVEL		
	AID Support	WFP Support	Cash Flow Constraint	Food Reserve Goal	Total Cost	GRENARWA Losses (Cumulative thru year 4)	Unspecified Source (GOR or other)	WFP	Host Country	AID	Total Volume	Bean Volume	Sorghum Volume	Total Stock	Beans Stock	Sorghum Stock
1.	No	No	Yes	No	597	597	-0-	-0-	-0-	-0-	9,371	7,033	2,338	-0-	-0-	-0-
2.	Yes	No	Yes	No	2,901	560	-0-	-0-	279	2,062	6,195	3,130	3,065	-0-	-0-	-0-
3.	Yes	Yes	Yes	No	3,730	389	-0-	1,000	279	2,062	13,105	10,040	3,065	-0-	-0-	-0-
4.	Yes	No	No	Yes	5,280	1,037	1,902	-0-	279	2,062	13,780	10,040	3,740	8,000	2,000	6.000
5.	Yes	Yes	Yes	Yes/Bean	4,751	1,410	-0-	1,000	279	2,062	6,867	4,060	2,807	2,075	2,000	75
6.	Yes	Yes	Yes	Yes/Sorgh	4,513	1,172	-0-	1,000	279	2,062	4,646	230	4,416	6,223	223	6,000

Thus, GRENARWA, with AID support and no other support, is expected to yield a profit before depreciation in year two and yield a profit after depreciation in year five (see Scenario 7 Annex L-2). The total quantity of beans and sorghum handled (purchased and sold) would be a less than 10 percent decline from the 1979-80 level. Again, cash flow problems are the constraining factors to GRENARWA's marketing operations and slowing its return to financial self-sufficiency. The expected impact of AID assistance, under these conservative assumptions, is to return GRENARWA to a solid financial position in roughly half the time, (when compared to no AID assistance), with only a slight decline in its stabilization impact.

If GRENARWA obtains WFP support with the FSM II project, it is expected that its financial position would improve markedly and its stabilization impact by year four would increase by 25 percent (see Scenario 11 Annex L-2). GRENARWA would be able to yield a profit after depreciation in year four of Rwf. 2.6 million (US$28,000). The WFP cash contribution will directly ease GRENARWA's cash flow problems and increase the impact of AID's assistance. Having attained this self-financing position, GRENARWA could be able to continue to expand its operations and its stabilization impacts.

Social Soundness Analysis

Socio-cultural context

The GOR has 4 main objectives in its development strategy: 1) to satisfy the needs of the population for food; 2) to provide better utilization of human resources; 3) to improve the collective and individual standard of living of the population; and 4) to improve the position of Rwanda vis-a-vis other countries. In order to reach the first objective GOR has taken a two pronged approach: 1) increase crop yields through agricultural production projects and 2) reduce food losses and encourage production through storage and marketing projects of which GRENARWA is one of the most significant.

With population increasing at a rate of 3.1% per year Rwanda has barely been able to increase food production equal to that of population growth and this has been done by increasing the amount of land cultivated, not by increasing yields. However, of 1.25 million hectares cultivable, 0.9 million hectares are under cultivation already. With no technical package available to increase yields to date and soil fertility diminishing quite rapidly the possibility of major food crises in the near future is very real. GOR recognizes that this possibility is evident by its continued support of GRENARWA and by its decision to set up a food security stock within the country.

Rwanda has some comparative advantages to other developing countries. It is one of the few contemporary African nations which inherited a common language and socio-cultural system. Ethnic composition of the country is 90% Hutu, 9% Tutsi and 1% Twa. The traditional differences between the minority pastoral Tutsi who used to dominate the majority agricultural Hutu are declining since the Hutu took over political control. Moreover, conservative policies have increased per capita income from poorest in the world at $72 in 1973 to 17th poorest at $190 in 1979 and economic growth in the 1977-80 period averaged about 5%, according to IBRD. Nearly 95% of Rwanda's population is dependent upon small, subsistence level farms averaging one hectare in size. Diversification of crops and livestock production provides a hedge against crop failure and resulting deprivation. Typically a combination of grains, beans or peas, starch roots and bananas are produced along with some livestock. Coffee, tea, pyrethrum, chincona and bananas and sorghum in the form of beer serve as cash crops. Beans provide the main source of protein for most Rwandans although in some areas maize, peas and sweet potatoes are important; only in towns do animal proteins play much of a role in the diet. Sorghum is usually eaten by young children and only by adults in times of need. Manioc is eaten particularly as an emergency food when other crops fail.

Despite Rwanda's mild climate which allows two growing seasons, regional temporary food shortages are common and some locations regularly are deficit in food crops. Temporary (3-6 months) country-wide food shortages also do occur, but farmers respond rapidly and usually the crisis is resolved by the next growing season. However, farmers on their own, do not have the means to transport food around the country when there is a localized crisis and national shortages require outside intervention. Technology is traditional and production operations are performed by hand with simple tools. The technique of intercropping is common for certain crops to reduce risk of failure and farmers have developed individual mixes of bean varieties which they feel will best succeed on their land. Use of organic fertilizers is limited to supply and traditionally has not been fully integrated into the farming system while chemical fertilizers are too costly to be used for food crops, but are sporadically used for coffee.

Traditional storage of grains or beans is in round or long baskets sealed with cow dung or in ceramic jars. More recently farmers have adapted the use of jute sacks and occasionally metal drums. Farmers used to store their harvests in thatched granaries located near their houses but due to increased fear of theft many farmers have switched to storage within the house itself. Several preservatives are currently in use: banana ash, cow urine, diatomaceous earth and kaolin were used traditionally while insecticides such as 2% malathion and 3% sumithion are a more recent innovation.

The traditional Rwandan farm was largely a self-sufficient unit. What a farmer lacked in his own production he acquired through a system of bartered exchange both of goods and services. Monetized marketing, a more recent innovation, was introduced with the advent of coffee into the system and today food crops may also be sold for cash. Farmers, especially the women, take their produce to small local markets where they sell goods to an intermediate center where the traders with two-ton pick-up trucks buy the goods which are transported throughout the country. As a result, sales rarely take place directly between producer and consumer. The creation of GRENARWA as a national storage institution and the construction of silos at the communal level which are run by cooperatives or parishes (LCS and CRS respectively) was done with the goal of providing more direct linkages between producer and consumer for the profit of both. Under FSM II, GRENARWA's price and supply stabilization activities are to be strengthened particularly through the diffusion of market information, and further linkages with non speculative buyers developed. In addition GRENARWA's storage facilities and institutional capabilities to manage a food security stock will be strengthened.

The Project

The FSM project was authorized in late 1974 and has been involved in marketing for the last six years only. Progress has been made towards achieving the original twin purposes of the project: a) creating an efficient food storage and marketing system for haricot beans and sorghum and b) stabilizing regional and seasonal prices of these foods. However, certain improvements remain to be made during the second phase which will increase GRENARWA's impact and allow it to achieve its new goals. These are: 1) to strengthen and expand GREANRWA's management to enable it to act as a catalyst in stimulating and assisting the market place to respond to regional and seasonal imbalances in supplies and prices of food crops (principally beans and sorghum) and 2) by assisting the GOR to determine the feasibility of long-term bean storage in Rwanda which will in turn strengthen GRENARWA's capability to manage a food security stock.

In order to evaluate the social soundness of FSM II certain features of GRENARWA's should be kept in mind: 1) GOR, to date, expects GRENARWA, even after its merger with OPROVIA, to be a financially viable institution active in the commercial sector and not to play a social welfare role. However, GOR acknowledges that the creation of a national food security stock will require outside financial intervention and probably also annual subsidies. Thus, if GRENARWA is given the responsibility to manage this stock, measures will be taken to ensure that GOR or donors subsidize the costs of it. 2) GRENARWA was designed as a national storage institution with the implication that its impact would be on a macro-level. The assumption in the original project document was that if GRENARWA was involved with 15% of the beans marketed countrywide, the project would be able to have an effect on prices nationally. Evaluations of GRENARWA have indicated the need for greater benefit incidence at the producer level. GRENARWA proposes to achieve this through intermediaries of private traders and nonspeculative organizations as the cost of operations of direct contact is prohibitive. As a result, benefits cannot easily be divided into direct or indirect but rather must be viewed along a continuum with an important spread effect. Even with relevant baseline information available, which is not the case for GRENARWA, it is difficult to evaluate the impact of a national level project on individuals so that an analysis of the micro-level can be but tentative. At the macro level the project is socially sound. With these caveats let us proceed to an examination of the social soundness of FSM II.

Beneficiaries and Impact

As bean prices become stabilized over time and more beans are cultivated and marketed, all bean buyers in the country, or virtually the entire population, will benefit from the project. Likewise, if a

regional or national food shortage occurs, a large segment of the population will benefit from GRENARWA's food security activities. Thus, a brief review of GRENARWA's history will pinpoint past beneficiaries of the project and will enable some prediction of future trends.

All bean production is by peasant small-holders on farms located across Rwanda's hilly countryside. There are few urban concentrations or major markets and farmers auto-consume 60-80% or more of their production. As a result, GRENARWA's early marketing activities have dealt primarily with traders in order to build up a buffer stock necessary to stabilize prices. Table One presents data on GRENARWA's purchases from 1978 through 1980. Data for 1981 is not yet available. In 1977 almost 98% of the bean purchases were in the range of 1-10 tons indicating that traders were the major suppliers. Bean purchases from traders varied between 91% in 1978 to 88.1% in 1979 to 99.45% in 1980 to 80% for the first six months of 1981, while sorghum purchases from traders showed a downward trend: 97% in 1978 and 1979, and 81.3% in 1980. Given certain assumptions, the number of beneficiaries can be estimated. Informed Rwandans indicate that the average farm family markets approximately 150 kg of its bean production annually. Using an average of 4,000 MT of beans purchased per year (avg. 1979 and 1980) then roughly 26,500 families seem likely to have been fairly direct beneficiaries of GRENARWA's activities or, about 133,000 people if the average family size is taken to be five. No estimation of beneficiaries of GRENARWA's sorghum purchases has been made because the supply of marketed production from producers is highly variable. It has been noted (1981 Evaluation of GRENARWA) that GRENARWA's intervention in a region bids producer prices upwards although the extent of this varies according to production and the quantity it purchases, but significant drops in prices occur when GRENARWA stops buying. Thus, individuals who sell to traders who resell to GRENARWA profit even though not to the same extent as if they marketed directly to GRENARWA. Moreover, all producers in a region may profit through a shadow effect if traders are forced to become more competitive.

Most of GRENARWA's purchasing activities have been concentrated in the normally surplus areas of eastern and southern Kigali prefecture, eastern Byumba and parts of Kibungo. Most of the beneficiaries of GRENARWA's expanded purchasing activities will also be in these areas.

GRENARWA's sales activities involve a broader spectrum of clients as seen in Table 2 for years 1978-1980. In 1977, large buyers (avg. 3,182 kg) accounted for 85% of sales, although 94% of all sales transactions were with small buyers. Bean sales to traders dropped from 32.7% in 1978 to 25% in 1979 to 8% in 1980 while sorghum sales remained fairly stable at 56% in 1979 and 51% in 1980 to traders. Bean sales to individuals remained stable at about 11% over these three years as have sales to non speculative organizations at about 7%. Sorghum

Sorghum sales to these two groups have also remained steady at approx. 36% and 3% respectively. The greatest variability is seen in sales to public services, WFP and emergency aid. It would appear that on the consumer side a majority of sales will still be to such large institutional buyers.

GRENARWA's direct sales efforts have concentrated on the traditionally deficit prefectures of Gitarama, Butare and Gikongoro, and to a lesser extent on the deficit parts of Kibuye, Byumba and Kigali prefectures. Excluding sales to major institutions such as WFP, prisons, military camps, etc. 1928 tons in 1979 and 2387 tons in 1980 of beans were sold in these six prefectures as was 800 tons in 1979 and 948 tons in 1980 of sorghum.

The vast majority of these sales were made during the normal hungry months of October and November for beans and mid-April to mid-June for sorghum. Knowing this, and following certain assumptions, the number of beneficiaries can be calculated. GOR estimates a bean consumption figure of 100 gms per day per capita during shortage periods. Assuming a two month shortage period this translates to approx. 167,000 beneficiaries per 1000 tons of beans sold (3kg/month/person) or to approx. 322,000 beneficiaries in 1979 and 398,000 in 1980. If the sorghum is used for food rather than beer, FAO suggests a daily intake of 50 gms of cereals during shortage periods or 33,333 potential beneficiaries for each 1000 tons of sorghum sold during the two month period. This translates roughly to 267,000 potential beneficiaries in 1979 and to 316,000 in 1980. However, because it is not possible to monitor the usage of sorghum sold, this calculation of beneficiaries of sorghum sales is purely theoretical. GRENARWA has installed its own mill and is now actively moving into the sorghum flour market. This translates into more direct benefits for buyers than if sorghum is bought and used for beer with a consequent loss in nutritional value. As with the production side there are presumed to be far more indirect beneficiaries since GRENARWA's intervention in moving produce in deficit areas at strategic times seems to force greater competition among traders and lowers consumer prices in the market in general.

GRENARWA currently markets approximately 8 to 10% of total bean commercialization. Given that its goal at the end of the project is to market 15% or more of the total there is room for a 30-50% increase in the number of beneficiaries if only bean sales and purchases are considered and institutional transactions such as with WFP, prisons, etc. are excluded. It is also difficult to evaluate the direct impact of GRENARWA on the private traders. Although traders seem to make a lower profit per transaction as a result of GRENARWA's interventions, the existence of these national storage facilities allows traders to have a more rapid turnover of stock. Traders also profit by GRENARWA's role as an assembly point for beans and grain, which are then treated and stored under proper conditions, so they do not have to cover as high

TABLE 1

CRENARWA'S PURCHASES

Bean Purchases

	1978		1979		1980	
Individuals	52	(7.23 %)	430	(11.72 %)	11	(.22 %)
Commercants	653	(90.82 %)	3,231	(88.09 %)	4,874	(99.45 %)
Non-speculative Organizations	14	(1.95 %)	7	(.19 %)	16	(.33 %)
	719	100. %	3,668	100. %	4,901	100. %

Sorghum Purchases

	1978		1979		1980	
Individuals	29	(3. %)	49	(3. %)	7	(.4 %)
Non-speculative Organizations	-		-		336	(13.3 %)
Commercants	830	(97. %)	1,572	(97. %)	1,494	(81.3 %)
	859	100. %	1,621	100. %	1,837	100. %

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TABLE 2

GRENARWA'S SALES

Bean Sales (Tons)

	1978		1979		1980		1980 (% excluding emergency aid)
Individual	192	(10.46 %)	426	(10.55 %)	211	(6.66 %)	(12.4 %)
Non-speculative Organizations	158	(8.61 %)	315	(7.80 %)	230	(7.26 %)	(13.6 %)
Public services	381	(20.75 %)	1,946	(48.18 %)	647	(20.42 %)	(38.2 %)
WFP	505	(27.50 %)	339	(8.39 %)	360	(11.36 %)	(21.2 %)
Emergency aid	-	-	-	-	1,471	(46.43 %)	
Commercants	600	(32.68 %)	1,013	(25.08 %)	249	(7.86 %)	(14.7 %)
TOTALS	1,636	100. %	4,039	100. %	3,165	100. %	

Sorghum Sales (tons)

	1979		1980	
Individuals	314	(37. %)	331	(35. %)
Non-speculative Organizations	27	(3. %)	27	(3. %)
Public services	33	(4. %)	-	-
WFP	-	-	109	(11. %)
Commercants	482	(56. %)	481	(51. %)
TOTALS	856	100. %	948	100. %

storage losses as they did previously. Despite traders initial complaints about GRENARWA's influence in the market place, they seem eager to continue to use GRENARWA's facilities and the private sector in Rwanda has shown itself flexible enough to cope with changing conditions. Thus, the negative effects on traders do not seem to be important. Aside from the number of producer and consumer beneficiaries already identified, the number of traders directly involved with GRENARWA must also be considered (in 1980, 400 on the producer side and 110 on the consumer side).

An important component of FSM II is applied research into improved storage facilities and means to reduce the quality loss of beans as a result of the hardshell phenomenon. The positive results expected means that a larger number of beneficiaries will be involved. Individuals will profit by a reduced cooking time for beans through less deforestation (most of Rwanda's rural energy needs are supplied through wood). GRENARWA also will profit through reduced storage losses, and being able to store beans for longer time periods means it will be better able to intervene effectively in the market place as well as in time of regional famines.* In order to increase benefit incidence at the farmer level GRENARWA proposes to increase its commercial activities with petty traders and non-speculative organizations such as cooperatives and silos. In 1978 less than 2% of bean and sorghum purchases were from these organizations and by 1980 it had jumped to 18% for sorghum, and 20% for beans in the first six months of 1981, due to vigorous marketing efforts on the part of the project. As the number of these organizations grows GRENARWA will be able to develop better linkages with them and transactions may increase by 100% over 1980's level by the end of the project. When this occurs producers and consumers will be able to more directly benefit from GRENARWA. Nor are traders expected to suffer much in light of their known adaptability to become involved in profitable alternative commercial spheres.

A long term benefit of FSM II will be GRENARWA's strengthened institutional capacity to manage a food security stock. Food crises in Rwanda are usually localized, although sometimes national, and usually of short duration so that by the time outside sources of emergency food can be mustered, the crisis has passed. If the food security stock that the GOR currently envisages is put in place, close to a quarter of the Rwandan population could benefit over a two month period, and the numbers could rise or fall according to the severity of the crisis.

Participation

GRENARWA stands at the apex of a multi-level storage system in

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*Other storage projects and organizations will also presumably make use of the research results to improve their bean storage.

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Rwanda. At the bottom, we find producers/consumers who use on-farm traditional storage for the bulk of their harvest. They may sell or trade a certain portion to "walking" traders who in turn sell it to traders who store the produce and sell it back to the farmers or sell it to GRENARWA. Farmers may also sell their surplus to local silos who will hold it as a reserve for the hungry months or sell it to GRENARWA, traders or other silos if the region has a surplus and it is not needed. Since attempts to fulfill the social aims of the project -- i.e., raising the producers' price and lowering the consumers' price by reaching them directly -- may in some cases be in conflict with the aim of financial viability, a balance must be found between the two.

Most bean farmers are small-holders, so it is not financially advisable for GRENARWA to try to deal directly with the producers which would entail much greater operating costs. Instead, GRENARWA has encouraged participation by increasing its transactions with cooperative and parish silos, local cooperatives and with unlicensed petty traders, because the benefits are likely to pass more directly to the population rather than through middlemen. FSM II plans to develop linkages with non-speculative organizations and set up buying and selling contracts with them. Through the LCS project, farmers will be given the organizational and educational skills with which to increase their bargaining position and take a more active role in determining prices.

Now that GOR has dropped a fixed price policy on food crops, GRENARWA will be able to systematically provide farmers with market information over the radio and through signs at the warehouse. This information will give the farmer more bargaining power and choice of options when buying or selling food crops, giving him a greater decision-making role in life.

The quality control element of FSM II will allow the farmer a great deal of participation in project activities. To date, GRENARWA's biggest problem is effectuating a turnover of beans without a loss. When beans are stored for long periods of time (over six months) without the proper temperature and humidity controls, the shell begins to harden and the beans take much longer to cook. Consumers have sometimes rejected GRENARWA's beans because of their hardness, their faded appearance or their taste. Under the LCS project, a study will inventory the bean varieties in Rwanda and examine regional and local preferences. In FSM II, consumers will be asked to participate in flavor preference tests using beans that have been stored under different conditions in GRENARWA warehouses. In this way, local women will help decide the appropriate criteria to be used for long-term bean storage.

Socio-cultural Feasibility

The project is feasible from the overall socio-cultural perspective. Farmers and traders have been buying and selling beans for some time.

and FSM has given them more opportunities to do so. In addition, FSM II will concentrate on narrowing the profit margin of traders to the benefit of producers and consumers. The coordinated applied research and quality control studies to be undertaken by LCS and FSM II aim to improve existing storage conditions and bean varieties, not necessarily to suggest new ones.

When GRENARWA's managment capabilities are strengthened during FSM II, the institution will have the skills to manage a food security stock, especially when the applied research element is successful. Although GRENARWA will have joined OPROVLA, the GOR still supports the former as an autonomous institution, and GOR's national policy is to promote improved storage conditions in the country, both at local and regional levels.