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CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) — PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
Smallholder Agricultural Development	679-0001	Zaire

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 83-9

[X] REGULAR EVALUATION [ ] SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES	6. ESTIMATED PROJECT FUNDING	7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY 81	A. Total $ 4627	From (month/yr.) September 1981
B. Final Obligation Expected FY 82	B. U.S. $ 3000	To (month/yr.) April 1983
C. Final Input Delivery FY 85		Date of Evaluation Review

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
See Attached		

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- [ ] Project Paper
- [ ] Financial Plan
- [ ] Logical Framework
- [ ] Project Agreement
- [ ] Implementation Plan e.g., CPI Network
- [ ] PIO/T
- [ ] PIO/C
- [ ] PIO/P
- [ ] Other (Specify) _____
- [ ] Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. [ ] Continue Project Without Change
- B. [ ] Change Project Design and/or [ ] Change Implementation Plan
- C. [ ] Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

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12. Mission/AID/W Office Director Approval

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Date: 20 JUN 83

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INTERIM EVALUATION OF USAID PROJECT 679-0001

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(1) As set forth in the Project Paper

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EVALUATION SUMMARY

This project is an imaginative effort to cope with the problem of agricultural commodity collection and producer incentives. The assumption was made that considerable slack resources of both labor and land exist in the farm sector, and that these could be brought into production if appropriate incentives existed. The argument was advanced that, if smallholders could count on prompt payment for produce at the time of harvest, even a modest price would bring forth considerable increased production. The findings by the evaluation team, although preliminary, suggest that the assumption is valid. In fact, both total production and marketing have risen in the project area as a direct consequence of the project. The first harvest has now been brought in, farmers are beginning deliveries to the warehouses, and the early returns are very encouraging. The warehouse construction is 75% on target for the project. Out of a total of 20 warehouses to be built or refurbished, 15 have been completed. These warehouses are currently (May, 1983) being filled with grain. The first unit was filled within two days. The construction of the Training Center is nearly completed.

The evaluation concludes that the system envisaged will allow a storage and marketing cooperative to function successfully over time if the following assumptions are satisfied:

(1) The necessary revolving funds are provided;
(2) The gross margin receipts and internal earnings are fully reinvested;
(3) A long-term plan of expansion is made and implemented;
(4) The quality of managers selected is sufficient to satisfy basic standards of prudence and probity. Recommendations are made to help achieve these necessary elements.

A full and quantitative financial and economic analysis was not undertaken because of the excessive number of assumptions which would have had to be made. However, certain qualitative conclusions can be advanced:

(1) Financial analysis: with the present scale of the project (i.e. not assuming re-investment and gradual expansion), the system will have to operate within the storage limit of 1200 T, assuring the necessary revolving fund can be found. If so, and given the assumed ratio of commodity purchase, at prevailing prices, and investment of the fund off-season, the system can generate nearly Bolo 10,000 net margin annually. Even without discounting this gives a very low rate of return.

(2) Economic analysis: However, from the point of view of benefit to the economy, which includes benefits not captured by the system, a much different picture emerges. The total additional production of all commodities may be as much as doubled which when priced at real prices gives an extra value to the economy of some Bolo 150,000 annually. Over ten years the extra value to the economy, given the investment, is well above 10 percent even when discounting is taken into consideration. No significant impact on inter-sectoral migration is believed to exist, however.

RECOMMENDATIONS

Research

1. Estimation must be made of the expansion potential of produce so as to estimate needs for increased storage capacity.

2. Replicate on an expanded basis the farmer practices inquiry carried out by the evaluation in order to monitor farmer receptivity and practices (up-date annually). In this regard, CARE should pursue a course of action either with the Director of Agriculture Statistics or another organism to develop lines of questioning and to begin baseline data collection as soon as possible. Some points of consideration should be current farming practices, particularly in seed handling, effects of the project on women, and a system of monitoring changes in income, marketing, production, labor, and family composition. This information should be used to propose further activities, using consultancies as necessary.

3. Evaluate OCV's current assembly costs as a guideline toward long-term project development

4. Identify possible additional services that the storage marketing cooperative system could provide.

5. Review the business and corporate law in the Congo in order to identify alternative business institutions under which the cooperative entity could be incorporated; the object being to move beyond the current system of administrative fiat.

6. USAID/Zaire should provide a road engineer to appraise the current road and bridge situation, to estimate further deterioration and to propose project interventions.

7. Examine cheaper alternative storage methods.

Management/Personnel

1. Establish a permanent core of support staff to the managers of the storage/marketing systems. These include a secretary and bookkeeper for each of the three districts.

2. Provide training to the managers in business and financial principles.

3. Propose and develop plan for long-term expansion of storage/marketing network and for expansion of services provided enabling a 12-month working cycle.

4. CARE/Congo should modify the scope of work for the cooperative development specialist to include the terms of reference and training

activities of a full-time one year (or more) consultant for training in cooperative development and management.

5. The Project Director was to have been an experienced manager with training in economics, cooperatives and/or marketing. The current director does not meet these qualifications and assumes little project responsibility. CARE/Congo and the GPRC should define the management role of this individual and a strategy of on-the-job training should be developed to delegate project responsibilities.

6. Questions persist as to the appropriateness of naming zone chiefs in the project. Territorial and hierarchical conflicts have been created between zone chiefs and the agricultural sector chiefs. Further clarification of needs and roles should be undertaken by CARE/Congo and the GPRC. It is possible that existing sector chiefs would be sufficient to carry out the relevant project activities.

7. A plan for Congolese personnel assignments after PACD should be drawn up. These include the project director, construction supervisor, and area zone chiefs. This should define their roles and responsibilities in relation to the cooperative system (to be developed).

Training

1. On-the-job training with CARE Seed Farm Manager should be supplemented with some formal training in personnel management, inventory control, equipment maintenance scheduling, commodity procurement planning.

2. No provision has been made for a Training Center manager who would be responsible for building and grounds maintenance and possibly greater management duties. On-the-job and formal training should be provided in personnel management, scheduling of routine maintenance, procurement planning. Depending upon the GPRC structure which will exist post-CARE, one possibility would be that the project director who is to receive housing on the Training Center campus would assume this management function.

3. The GPRC is currently looking for a project seed research agronomist. Depending upon the skills of this employee, on-the-job training in seed testing and multiplication should be supplemented with short-term formal training in seed research and experimentation and in management of commodities and personnel. IITA is one possible source for the former training.

4. Extension agents who will follow tests must be trained in field plot experimentation and extension techniques. Village-level demonstrations of improved production methods, primarily the use of improved varieties and methods of seed drying and storage should be part of the training program.

Financial

1. Need to enlarge revolving fund to $300,000 to meet current storage

capacity. If further storage capacity is created, the fund must be increased accordingly.

2. Need to keep revolving fund and other revenues in an interest-bearing account. Need to establish checks and balances to ensure proper handling of funds on behalf of the cooperatives.

3. Need to establish an agreement in principle to a cost-plus reimbursement as a basis for charging OCV for services: recommendation: a 2% premium on agreed storage costs in order to finance expansion.

Training Center

1. A plan for managing the Training Center post-CARI needs to be negotiated with the Ministries of Health and Agriculture. Issues of maintenance and coordination need to be addressed.

2. A schedule of tariffs and center regulations and responsibilities should be drawn up for use of the Center. The management of scheduling and provision of services should be developed.

Seed Farm

1. CARE/Congo should identify other sources of genetic material this year for rice multiplication. In general, CARE/Congo should consider obtaining seedstocks from sources in addition to CRAL.

2. CARE/Congo should define more clearly the relationship to CRAL and develop a plan of limited technical assistance to CRAL which is realistic in scope.

3. USAID/Zaire should program or plan to program an extension of the project for a minimum of three additional years with requisite funding to maintain technical assistance.

I. BACKGROUND

The Congo, like most sub-saharan countries, has incurred mounting food deficits since independence. The country is well endowed with the natural resources necessary for crop production: long growing seasons, ample and good soil, and sufficient moisture. The country is sparsely populated, and less than 2 percent of the arable land is under cultivation. It has an unusually large urban population (nearly 40%) compared to other African countries. Only Zambia is more urbanized in sub-saharan Africa.

The food deficit appears to be the result of policy factors and under-investment in the agricultural sector. Since 1978, the Office des cultures vivriers (OCV) has had a statutory monopoly on food marketing within the country. It is responsible for the collection, assembly, transportation and distribution of basic non-perishable food commodities, including maize, rice and peanuts. The office is underfinanced and has an inadequate fleet of trucks, no local network of storage facilities, and suffers high operating costs, in part because the highway system is poorly developed. The burden is in large part shifted to producers who must wait up to six months for OCV trucks to collect produce and pay farmers at the farm gate. The upshot is an unsurprising lack of incentive to farmers to produce for the market.

The present project is an imaginative effort to cope with the commodity collection and producer incentive problems. The assumption has been made that considerable resources - labor and land - exist in the farm sector which could be brought into production if appropriate incentives existed. The argument was advanced that if farmers could count on prompt payment for produce at the time of harvest, even a modest price would bring forth considerable production. Once the produce is purchased, a system would be needed to store the produce until OCV could collect it. The project concept proposed and realized was a locally managed network of storage units, possessing a revolving fund of sufficient size to fill the warehouses with produce bought from farmers, who had delivered it to the storage units and had been paid on the spot. OCV would replenish the fund when it collected the produce.

Since 1982, the USAID-financed - CARE-implemented project has brought into being a pilot activity in one region of the Congo to test this hypothesis. Although no pre-project study was made in the target area to determine actual marketing and production or to determine whether resources were in fact under-utilized, the preliminary findings by the evaluation team suggest that the assumption is valid. In fact both total production and marketing have risen in the project area as a direct consequence of the project. (1)

The grant project intends to build or rehabilitate 30 warehouses (37 ton average capacity, together with one of 90 ton capacity) in three districts in the Niari region (Divenie, Mayoko and Mossendjo). (2) Construction is more or less on schedule; all of the 15 units have been completed in Mossendjo, several have been

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begun in Mayoko, and those in Divenie are scheduled to begin shortly. The project was announced before the crop now being harvested was planted, and construction of several units was begun at planting time. This activity seems to have given farmers confidence in the seriousness of the project, and plantings appear to have increased as a consequence. The first harvest has now been brought in, farmers are beginning deliveries to the warehouses, and early returns are very encouraging. The first unit was filled within two days.

The system will be managed on a district basis as a cooperative. The following analysis will focus on the district of Mossendjo, but will generalize its conclusions to the program as a whole; there is no essential difference among the three areas in terms of management, capacity or fundamental structure of agriculture. The primary crop does vary in the three districts among peanuts, rice and corn.

Rather than operate in a complete data vacuum, the evaluation team undertook a small sample survey of farm facilities in the village where the first complete marketing cycle had been completed under the project. A simple questionnaire of no more than five questions was introduced to the head of household (or spokesman, in every case a wife) by the enumerator, a university student who was doing research in Mossendjo. Twenty-one households, about one third of the family units in the village (every second house was visited on the road), were selected . The results indicate that the preliminary project publicity, followed shortly by tangible construction activity at the warehouse sites positively influenced planting decisions. All but three of the farm units increased their number of plantings. At one of these households, sickness was the cause of the decision. Futhermore, virtually every household reported they had the necessary labor to produce more than their current production if incentives were introduced. These results strongly support the underlying assumption of the project: resources are available.

In sum, the project has every prospect of realizing its objective of having a positive production and marketing impact if basic financial and business management guidelines are followed. (3) Whether the entity falls into a framework of coop ownership and management is uncertain. This is not a likely consequence of the management scheme now being put in place. Recommendations are made towards a more collaborative framework, one providing incentives to membership and possibly a wider scope of activity than presently planned.

A long term business development plan is needed so that financial and other steps may be taken during the LOP to lay foundations to this end. A list of needed research actions is included.

II SUSTAINABILITY.

A. Organization

The model of organization for the cooperative system of storage/marketing warehouses presented below is derived from a paper developed by the Congolese project director of the Ministry of Agriculture.

The farm product storage system will be owned and operated by the district cooperatives, the local arm of the national cooperative system. At the district level, (there are three districts within the project) a board of directors will be selected through election and appointment. The elected members will include the president and the secretary of the local union (the union of village level cooperatives, called groupements), whose constituency will include the members of the groupements. The Government appoints one representative from the district administration (likely a party member), and the district chiefs of OCV, agriculture and cooperatives. The board will meet at least twice a year just before collection of produce from farmers and just before the sale of produce to OCV.

Each of the three districts will have an executive committee of the Board which will provide actual leadership of the operation and their unanimous agreement will be required for all decisions. This committee will include one president and one secretary (elected from the representatives) and one district party representative.

The primary responsibility of the executive committee will be to monitor the revolving fund which contains the operating capital of the system (provided under the project and supplemented by OCV) and which will be replenished by the sale of stored produce to OCV. All checks drawn against the account must include signatures of the entire executive committee. The committee will determine all questions of expenditure and revenue including collection, purchases of needed supplies, transport, scheduling of grain deliveries, reimbursements to farmers, marketings to OCV and payment, and keeping of accounts and records. However, no one on the executive committee will be full-time, and as of the time of writing no provision had been made for a more permanent support staff.

Within each district there will be a network of storage units (hangars), each having a capacity of 25 tons if built under the project, 40 tons if an existing unit was rehabilitated under the project, and one unit of 90 tons in Mossendjo, also rehabilitated. In all three districts a total of 1200 tons of capacity will become available as a result of the project. There will be [illegible] hangars in Mossendjo district, seven in Myoko and eight in Divenie (see Table 1). At each hangar the local cooperative will provide a warehouse manager, paid by the system, who will be full-time during the storage period and responsible for the day-to-day condition of the stored produce. The Government is making available, in addition, civil servants for the positions of area zone chief. Each will be responsible for the following activities at approximately five

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hangars: monitoring deliveries, payments to farmers, weighing, monitoring condition of stored produce including the conservation procedures and release to OCV (see Figure 1).

Collection days will be announced at each hanger a week or two in advance. At the appointed time the area zone chief, a clerk and the warehouse manager together with the necessary laborers will process the bags delivered by the farmers, make payment on the spot and then begin to organize the storage. Produce will be rebagged into uniform lots, stitched shut and fumigated. The area zone chief will make routine checks to ensure that storage controls are maintained.

The annual storage cycle will begin in February. At that time the board of directors will meet to plan an inventory of supply needs and the financial program. The buying schedule will be announced in April and sacks, needles and cord will be distributed. Crops will be delivered by farmers in May-June. In July full fumigation will be carried out. Each month the supervisor will check the condition of produce in each hanger. Sales to OCV can occur at any time, but any one hanger will be emptied at a single visit. Orders for the following years sacks will be made in September. By year's end the entire inventory will be moved and the revolving fund replenished.

It is likely that the operation will produce a small surplus each year, $3600 for all three districts, assuming 100% use of storage capacity. Growth can only come with the construction of additional storage units; any further production by farmers in excess of storage capacity will encounter the same problems which led to the project in the first place.

Although formally a locally controlled cooperative venture, in fact the cooperative (and in particular the local village level units) seems to have very little influence upon the management of the system. The entity represents a body of district senior cooperative persons and government officials. This situation relects the weakness of the cooperative movement (less than 20% of the farmers are members), whose lack of both focus and incentive must discourage participation. So feeble is the system that the government itself styles the local entities as pre-coops. There seems to be no program to progress to a higher level and no pretense is made that in any forseeable future the system will be farmer owned and operated . In this context the project objective to strengthen farmer pre-cooperatives to take on added responsibility for marketing crops - [illegible] considered.

The project, as outlined ab[illegible] direction. Given the weakness of [illegible] Government plan for their development, [illegible] management effort needed to operate [illegible] little ground for optimism that [illegible] hopes originally placed in them. On [illegible] plan being put into place could [illegible]

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TABLE 1

Project Warehouses in Project Zone (3 districts)

1) Mossendjo District: (15 warehouses)

8 x 40 ton = 320
6 x 35 ton = 210
1 x 90 ton = 90
TOTAL 620 tons

2) Mayoko District: (7 warehouses)

4 x 40 ton = 160
3 x 35 ton = 105
TOTAL 265 tons

3) Divenie District: (8 warehouses)

8 x 40 ton = 320 tons total

TOTAL CAPACITY OF PROJECT ZONE: 1,205 tons.

Figure 1

Planning Calendar for Typical Warehouse

Feb - March	Planning + Scheduling of Marketing Year	-paperwork
April	Announce Schedule	-paperwork -agents (per diems) -mobylettes
April	Sack Distribution	-truck +driver +fuel +repairs -paperwork (receipts)
May-June	Weighing + Recording Sack Standardizing	-needles and cord -agents (per diems) -paperwork -mobylettes
	Additional Transport here for villages without warehouse	-motor cycles -TRANSPORT
May-June	Storage into Warehouse	-Malathion -Warehouse Repairs and maintenance.
July	Fumigation of Warehouse	-materials & equipment -transport materials (light truck) -agents (Z.C.) per diems.
July-Nov	Storage Monitoring	-agents per diems -motorcycles
Sept.	Sack Ordering	-paperwork -travel expenses
	Year-round Financial Paperwork	-District Union

supporting actons were taken. These include:

a) training of members of the executive board in practical principles of financial and business management;
b) development of a long-term plan to spread and deepen the storage (and coop assembly) capacity to reach (1) more farmers and, (2) a growing volume of produce. This includes creative use of the gross margin generated annually to construct new units and finding the necessary financing for the revolving funds;
c) establish appropriate control over the use of the discretionary funds available to the system;
d) identify and perfect a legal instrument which will allow the district management to function more as a business entity in coop form, able to make loans, assume debt, and make contracts. Coop members might be made shareholders in such a system and additional incentives to membership provided i.e. distribution of some returns, access to credit.
e) widen scope of system (1) give it a year-round function, (2) make greater use of revolving fund between storage periods.
f) establish in each district a permanent office including a secretary to keep records, attend to orders.

Taken together these steps would strengthen management while moving the pre-coops towards a business-oriented entity. Ultimately, a hired manager would be preferable to a part-time bureaucrat. But this must await a time when the system generates enough money to justify permanent professional management;

A final recommendation: steps must be taken to safeguard the revolving fund and annual earnings so that neither they nor the interest they generate can be diverted to private purposes. Ideally the funds should be kept in such a way that access and use are open to public scrutiny.

B. Personnel

Both CARE and the GPRC contribute personnel to the project. Because of personnel problems in CARE/New York, there have been delays in fielding long-term technical assistance in the project. CARE-New York has since taken action to rectify these problems. While the GPRC has assigned personnel in a timely manner, not all personnel qualifications have been met. Some clarification of roles and responsibilities are needed for all personnel to meet project objectives.

1. CARE Personnel

a. Long-term Technical Assistance

The technical assistance required under Phase I of the project, the Senior Project Advisor (SPA) and the Director of Construction (DC), has been provided by CARE. The initial SPA arrived on project

July 1982; he was replaced in January 1983 by the current SPA. The DC arrived on project March 1982; he will complete his contract June 1983. A replacement is being sought.

Under Phase II of the project, CARE will provide a Seed Farm Manager (SFM) and a Seed Farm Research Agronomist (SFRA). The SFM has been identified and should arrive on project July 1983. CARE is still recruiting the SFRA with a target arrival date of October 1983.

b. Short-Term Technical Assistance

Under Phase I two months of technical assistance in each of the fields of rural road upgrading, crop improvement, and rural technology were scheduled. These consultants were to provide information for further project activities. Also foreseen were eight months of technical assistance in crop storage and cooperatives development.

Phase II called for the provision of a Seed Extension Consultant for six months to develop a curriculum for teaching farmers improved techniques of planting, harvesting, and storage of improved seeds. This consultant would also work with extension workers to improve their delivery of information to farmers.

To date neither the rural roads nor the rural technology consultant has been provided by CARE. CARE/Congo did not engage a rural roads consultant because private companies and the GPRC had improved their road maintenance at outset of the project. Since that time the public and private maintenance of rural roads in the project area has decreased. Gully erosion on some roads is becoming severe. Bridge maintenance is another consideration.

As for the rural technology consultancy, CARE was under the impression that no post-Phase II funds would be available for new activities and thus did not pursue it. A grain storage specialist was on-site September-October 1982 to assess crop storage needs, to advise on the design and construction of warehouses, and to develop a training course in principles and techniques of grain storage.

In June - July 1983 a consultant is scheduled to develop a training strategy for cooperative development.

2. Congolese Government Personnel

Under Phase I of the project the GPRC was to provide a Project Director, a Construction Engineer, and five Zone Chiefs. The Project Director was named January 1982. A GPRC Construction Engineer was not named; however, a Congolese construction supervisor was hired by CARE. Three zone chiefs have been assigned in the areas where project activities are on-going.

Under Phase II of the project the GPRC will provide one seed production specialist and the farm manager. The latter has been

identified and should be on-site in July 1983. The GPRC is still recruiting for the seed production specialist position.

In addition to the GPRC personnel support programmed in the project paper, when seed farm activities begin 8 farm workers and 2 tractor drivers will be provided by the GPRC. Also, all GPRC agriculture sector chiefs and monitors (extension workers) are currently available to the project.

3. CARE/Congolese Staff Roles and Responsibilities

There is little detail in the project paper on staff roles and responsibilities, though in principle all long-term technical assistants have GPRC counterparts. In reality the GPRC counterparts are inexperienced and need technical and management structured on-the-job and formal training. As the long-term roles of these government officials (principally the Project Director, the construction engineer and the zone chiefs), are as yet undefined, it is difficult to structure the necessary training programs.

To date however, project technical assistants have provided no structured training to counterparts. Roles have fallen out somewhat spontaneously and major responsibilities have been borne by CARE personnel.

There have been two Senior Project Advisors to date in the project. Reports of poor relationships with the Congolese and poor administrative performance resulted in the reassignment of the first advisor in January 1983, and the termination of his contract in April. Consequently, personnel roles and responsibilities were never properly defined. The subsequent advisor inherited a poorly defined but established system and has as yet not tried to change it. As the post-CARE roles of GPRC staff have not been defined, and as the advisor is not an experienced personnel manager/administrator, a laissez-faire system of management has developed.

The advisor is aware of the need for the development of a plan for future personnel needs, which ultimately depend upon project progress toward decentralized cooperatives. Once defined, on-the-job and formal training programs must be instituted. It is likely that the Senior Project Advisor will need CARE/Brazzaville and possibly external support to institute these changes.

It is often easier for technical assistants to do the work themselves than to train and coordinate work with counterparts. Another common fallacy is the notion that "being there" represents on-the-job training. CARE/Congo needs to work through a long-term management plan for these activities with the GPRC and structure personnel training according to short-term and long-term objectives.

Whether or not a core management staff is required for further cooperative activities, management systems must be instituted for the seed farm and the training center. Some formal training in

personnel management, inventory controls, bookkeeping, equipment and facility maintenance, scheduling, and procurement planning should be provided. More specific recommendations are presented in the training section of this report.

Another aspect of training and defining of roles and responsibilities needs to be considered - the involvement of extension agents in this project. The extension agents in the project area are not sufficiently trained to carry out seed farm multilocational trials nor to extend improved farming practices.

4. CARE Support Staff

Beyond the problems in personnel recruitment which were previously mentioned, CARE has been efficient in procurement, and on-site staff report good backstopping from CARE/Brazzaville.

C. Financial analysis

The following analysis lays a foundation to evaluate the total financial returns to the development investment made by all contributors - US Government of the Congo and CARE - although in practice three separate financial entities will exist, one in each district. The fundamental unit of analysis will be the 'typical' hangar (35 ton capacity) containing an optimum and not untypical produce mix - 66% peanuts, and 16.5% each of maize and paddy. It will be assumed that each hangar will be used to capacity for four months. All hangar costs will be considered variable over the year and depreciation costs will be included.

Certain district costs have been distributed among the hangars on an equal basis; supervisory salaries and administration. These costs will be the same regardless of the size of warehouse and increases in scale will have a much less than proportionate effect upon costs. Only the very modest incremental costs of malathion and fumigant in accordance with increased volume will add to the cost per basic analytic unit. A break-even point will be calculated, per kg stored, and then a 1.25% premium will charged to OCV for the storage service. The costs of servicing the revolving fund will cancel out as purchases and sales will equal one another.

At the project level, a calculation will be made of the total cost of transport to service all the hangars. The project includes a $50,000 five ton truck, and a driver cost of $400 annually. The alternative of hiring a vehicle for the necessary 90 days of transport per year will be costed and the effect noted upon net margins. Finally, the desirability of keeping the revolving fund in an interest bearing account will be reviewed.

The life of the warehouse is in excess of 20 years and their individual cost is $20,000 if no economies are attempted in their construction. It is argued that their cost could be halved in any new project (with no loss in capacity). Roofs will have to be

replaced in 20 years in which case an annual depreciation of $14 per building would have to be made. On the attached pages, separate calculations are made to produce items 1-8 appearing in Appendix 2. Using these sub-totals a final cost of annual operation per warehouse is calculated. When divided by the kilos stored in the warehouse (35000) the cost per kg/yr is found to be .02 cents. This is the amount which must be charged to OCV to break even at the hangar level. An important charge which remains to be considered is transport among units.

The project truck will last no more than five years. Considering its annual operating cost, salvage value and the fact that it is used no more than 90 days annually it is important to consider the alternative of hiring the service. Partial budgets have been prepared to evaluate this possibility. (Appendix 3). The incremental costs of transport are .09 cents per kg and .06 cents per kg if owned or rented respectively. Not surprisingly, transport cost is several times of the cost of all other components. These charges, added to the cost per hangar of .02 cents per kg, yields a figure of .12c/kg if owned or .08c/kg if hired. Inasmuch as the full cost will be passed on by the storage unit there is an advantage to using the more costly method if OCV will accept the 25% premium. In this case the owned truck alternative adds one cent per kg profit to the storage system.

	owned truck		hired truck	
cost per hangar	.02		.02	
cost of transp		.09		.06
total cost		.12		.08 per kg per yr.
+ .25% premium		.03		.02
Price charged OCV		.15 (52 CFA)		.10 (35 CFA)

Now, considering that 1,200,000 kg is stored in the entire system, the net margins will be $3600 and $2400 respectively. There is a clear advantage of $1200 to the system for owning a truck, if the OCV will agree to it.

This is not a large annual return to the investment in the project, and underlines the necessity to invest the revolving fund between seasons. If kept in the local bank paying the allowed 3% annually (2% effective for eight months) the fund will earn project management a total of $6000 annually before taxes. The gross margin to the project will be therefore $9600 annually.

Good management requires that some provision be made for replacement of the warehouses, although these have a useful life of up to 30 years. Experience gained during their construction argues that replacements may be considerably cheaper than the original building; economies are possible in layout, finishing, removal ramps and in recruitment of local volunteer labor. Whereas the present buildings cost about $20,000 (depending upon how one evaluates contributed labor), the builders believe certain changes could

produce the equivalent volume at up to half the cost.

In addition an argument can be advanced in favour of replacing present structures with a more dense network of smaller units - of 20t capacity, which greatly increases farmer's access to outlets and whose individual cost could be as low as $5000.

For these reasons project management should be made aware of the need for ultimate replacement and the alternatives and a determination should be made fairly early as to how to use the gross annual margin in a productive manner consistent with long-term needs. Management could opt, for example, for a program of long-term replacement of the 35 t structures with the cheaper construction together with an expansion of the system to include the smaller units, using some mix of capital investment and sinking funds.

To the extent possible, full cost of replacement should be included in the cost of storage and paid by the ultimate user, and expansion paid from the gross margins generated by the system. As new warehouses are built, additional revolving funds must be made available from outside of this project.

The system outlined will allow a storage and marketing cooperative to function over time if the following assumptions are satisfied:

a) necessary revolving fund is provided;
b) the gross margin receipts and internal earnings are fully reinvested;
c) a long-term plan of expansion is made and implemented; and,
d) the quality of managers selected is sufficient to satisfy basic standards of prudence and probity.

III. Progress towards the Objectives of the Project

A. Technical Review

1. A Cooperative Agreement was signed between USAID/Zaire and CARE for Phase I of this project on 15 September, 1981. The agreement for project execution was signed by CARE and the GPRC on 29 December, 1981. The major project outputs under Phase I were:

a. Storage facilities built or refurbished;
Verifiable Indicators
(1) 9 warehouses built
(2) 11 warehouses refurbished
(3) grain purchased and stored.

b. Training Center built and in operation with crop storage personnel trained;
Verifiable Indicators
(1) structure completed
(2) training package developed
(3) training in operation

c. Pre-cooperatives strengthened;

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Verifiable Indicators
(1) cooperative membership increased by 80%

d. Technical analyses performed and baseline data gathered.
Verifiable Indicators
(1) 3 feasibility studies documented
(2) a baseline data gathering procedure developed and data collected.

2. Progress to Date

a. Warehouse construction and use

The warehouse construction is 75% on target for the project. Out of a total of 20 warehouses to be built or refurbished, 15 have been completed. These warehouses are currently (May 1983) being filled with grain.

Delays in construction were due to minor slippage in procurement and transport, and to an underestimation of the time required to find sand and gravel locally for construction.

Bricks for the warehouses were made by villagers; this process can only take place during the dry season (June - September). In September 1982 a grain storage consultant advised the project on warehouse design. Architects in Brazzaville completed the plans in October and construction was begun by the end of October, 1982.

The project has made excellent progress in the six months of actual construction. With the exception of minor, correctable faults in construction, the warehouses are impressive structures.

While the evaluation team was on site the first season of collection and payment was begun. Farmers seemed pleased with timely payment for their grain and the opportunity to store their grain in the warehouse.

b. Training Center & Project Housing Construction and Use

The construction of the Training Center is nearly completed. It consists of the following:
(2) 3-bedroom villas
(1) 2-bedroom duplex
(1) office building
(1) teaching complex with large classroom, kitchens, bathrooms, and (4) 6-person capacity bedrooms.
(1) water tower.
The center was constructed using mostly local material and labor.

Training is one of the key components of this project and includes both professional training of project staff and technical training of warehouse managers, extention agents and farmers.

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(1) Professional training of project staff

It is unclear at the time of this evaluation what personnel will be required to sustain project activities after CARE technical assistance is withdrawn. The proposed idea is that cooperatives will be functioning on a local level to such an extent that marketing decisions will not require GPRC project staff. Under this idea an accountant would suffice on the district level to make purchases, keep books, and coordinate local marketing. Whether or not this is probable remains to be seen as the "Groupements" are embryonic "pre-cooperatives", and training has not yet begun in cooperative development and management.

GPRC personnel will, however, be needed for future management of the seed farm and the training center. A Congolese farm manager has been identified and will begin work summer 1983.

Recommendation 1
On-the-job training for the CARE Seed Farm Manager should be supplemented with some formal training in personnel management, inventory control, equipment maintenance scheduling, commodity procurement planning, etc.

Recommendation 2:
The Project Director was to have been an experienced manager with training in economics, cooperatives and/or marketing. The current director does not meet these qualifications and assumes little project responsibility. CARE/Congo and the GPRC should define the management role of this individual and a strategy of on-the-job training should be developed to delegate project responsibilities.

Recommendation 3
Questions persist as to the appropriateness of having zone chiefs in this project. Territorial and hierarchical conflicts have been created between the zone chiefs and the agricultural sector chiefs. Further clarification on offices and roles should be undertaken by CARE/Congo and GPRC. It is possible that existing sector chiefs would be sufficient to carry out project activities.

Recommendation 4
No provision has been made for a training center manager who would be responsible for building and grounds maintenance and possibly greater management duties. On-the-job and formal training should be provided in personnel management, scheduling of routine maintenance, and procurement planning. Depending upon the GPRC structure which will exist post-CARE, one possibility would be that the project director who is to receive housing in the Training Center Campus would assume this management function.

Recommendation 5
The GPRC is currently looking for a project seed research agronomist. Depending upon the skills of this employee, on-the-job training in seed testing and multiplication should be supplemented

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with short-term formal training in seed research and experimentation (e.g. IITA) and in management of commodities and personnel.

(2) Technical Training

More training has been offered in the technical area to date than in the training of professional staff.

(a) Principles and techniques of grain storage: CARE contracted a 2-month consultancy with a grain storage expert in September October, 1982; this consultant developed a training manual and conducted a course in the principles and techniques of grain storage for 15 Congolese participants. This initial training which included two days of practical application in techniques of fumigation involved the zone chiefs, some officials of the OCV and the Ministry of Agriculture and some warehouse managers.

The training manual "Cours de Formation sur les Techniques de Stockage Moderne" was reproduced for further distribution. Extracts from this manual were reproduced in a separate and more simplified, pictorial manual, "Aides Memoires", for distribution to warehouse managers. This second manual will be revised as the drawings are more appropriate to American farmers and do not depict Africans or women in the farm and warehouse activities.

In April 1983 the three zone chiefs were re-trained in principles of grain storage, this time under the tutelage of the senior project advisor. In May 1983 a 3-day simplified course was offered to the 15 warehouse managers with emphases placed upon weighing and standardizing sacks, proper stacking, and warehouse bookkeeping

(b) Cooperative development: a consultant in cooperative development will arrive June - July, 1983 to develop a strategy for training farmers and managers. As the sustained success of this project depends upon farmer commitment to their cooperatives and management, training in alternative uses of cooperatives and management techniques should be offered to farmers, warehouse managers and core-level managers.

Recommendation

A full-time technical assistant in cooperative development is recommended for at least one year, with terms of reference and training strategy to be provided by the short-term consultant arriving in June 1983. Training programs should be developed for full participation by women.

It should be noted that insufficient understanding on the part of farmers of the value of grain warehouses resulted in delays in warehouse construction in the first year of the project. While farmer interest has increased as construction has been realized and particularly as first season collections and payments have begun, the full value of cooperative marketing has not been discussed with farmers as yet.

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(c) Seed farm experimentation: One activity of the seed farm will be the multi-locational testing in the Niari region of existing Congolese seedstocks of rice, maize, and peanuts, and the identification of appropriate production themes for extension farmers.

Recommendation

Extension agents who will follow the tests must be trained in field plot experimentation and extension techniques. Village-level demonstrations of improved production methods, primarily the use of improved varieties and methods of seed drying and storage should be part of the training program.

(3) Training center operations

The mode of sustained operation of the Training Center has not been negotiated with GPRC. Beyond the management of the physical plant mentioned earlier in the training section, the greater issue of control must be addressed. The Training Center was built through the cooperation of two ministries, Health and Agriculture, for use by the health and agriculture sector projects in Mossendjo. As long as CARE is involved, center management poses no problems because both the health and agriculture projects in question are managed by CARE.

Recommendation 1

A plan for managing the Training Center post-CARE needs to be negotiated with the Ministries of Health and Agriculture. Issues of maintenance and coordination need to be addressed. The training center, being a one-of-a-kind facility in the region, could be made available to other organizations for training, lodging, and services.

Recommendation 2

A schedule of tariffs and center regulations and responsibilities should be drawn up for use of the center. The management of scheduling and provision of services should be developed.

c. Pre-cooperatives strengthened

As construction has been the primary focus of the first project year, cooperative membership has not increased. May 1983 marked the first time that the warehouses have been used and nursery impressions of farmer interest are favorable. Beginning in June, 1983, CARE and GPRC will place emphasis upon the development of cooperatives through an initial consultancy which will develop a training strategy. As recommended in the training section of this report, a long-term technical assistant in cooperative development should be engaged to carry out this strategy.

d. Technical analysis and baseline studies

Three feasibility studies were to have been undertaken to identify area needs for rural road upgrading, crop improvement and rural technology. A feasibility study on crop improvement was

conducted which resulted in a project amendment to increase funding to include the development of a seed farm and extend the PACD.

As discussed in the personnel section, neither rural road upgrading nor rural technology has been examined in detail. CARE/Congo decided from discussions with AID to focus energy and resources upon those activities which seemed most acceptable to AID given funding constraints. As recommended earlier, the USAID/Zaire road engineer should appraise the current situation and suggest appropriateness of project intervention. In addition, baseline data was to have been gathered for production data, demographic information, and descriptions of current farming practices. Some sociological data has been collected in the project area and discussions have been in progress since December 1982 with the Directeur des Statistiques Agricoles in the MOA to develop and execute a questionnaire in the region. Very little information has been collected on the farming system in the area and possible alternatives in grain storage.

Recommendation 1:

CARE should pursue a course of action either with the Directeur des Statistiques Agricoles or another organism to develop lines of questioning, and to begin baseline data collection as soon as possible. Some points of consideration should be current farming practices, particularly in seed handling, effects of the project on women, and a system of monitoring changes in income, marketing, production, labor, and family composition.

Recommendation 2

CARE/Congo should identify all major constraints within the farm marketing system in conjunction with baseline data collection and monitoring and should propose further activities accordingly,using consultancies as necessary to develop these activities.

Recommendation 3

USAID/ZAIRE should provide a road engineer to appraise the current road and bridge situation, to estimate further deterioration and to propose project interventions.

e. Phase II: Construction and operation of seed farm.

An amendment to the project was signed 29 August 1982 which extended the PACD to 30 September 1985 and authorized the establishment of a seed farm. Outputs for the amended project include:

- 40 ha seed farm
- multilocational variety trials
- assistance to CRAL in maintaining genetic integrity of breeder seed.
- education of local farmers in seed appreciation
- increase in yield/hectare for participating farmers
- enhancement of quality control of CRAL breeder.

- training of two GPRC Technicians in seed production and seed farm management.

To date CARE/Congo is on schedule for implementing this amended phase of the project. A CARE consultant drew up a commodity list and procurement of two tractors, one truck, farm implements, and fertilizer has begun. Plans for constructing and renovating existing buildings for farm storage and housing have been completed and work should be completed by December 1983. Local staff have been identified.

The GPRC has designated someone to begin work this summer as the farm manager.

CARE has also engaged a counterpart Seed Farm Manager who is to arrive on project July 1983. It is expected that peanuts will be planted on schedule in October 1983.

As the Mossendjo seed farm is dependent upon CRAL for foundation seed stocks, the evaluation team visited CRAL in Loudima. Due to drought stress all of their rice crop was lost this year. It was difficult to assess on such a short visit whether or not CRAL has the expertise or the means to supply good genetic material on a dependable basis to the project.

Recommendation 1

CARE/Congo should identify other sources of genetic material this year for rice multiplication. In general, CARE/Congo should consider obtaining seedstocks from sources in addition to CRAL.

One of the outputs of the amended project is to provide assistance to CRAL in maintaining genetic integrity and improving quality control. To do this in any meaningful way would require long-term technical assistance to CRAL itself which is not within the scope of this project.

Recommendation 2

That CARE/Congo define more clearly its relationship to CRAL and develop a plan of limited technical assistance to CRAL which is realistic in scope.

The evaluation team concurs that three years are not sufficient to establish a seed farm and the technical and management skills necessary to sustain it. The implementation plan for this phase of the project is not realistic. Several more years of supervised training and hands-on experience will be necessary to successfully transfer the necessary skills. As in other facets of this project, management training is paramount.

Recommendation 3

USAID/ZAIRE should program or plan to program an extension of this project for a minimum of three additional years with adequate funding to maintain technical assistance.

III. B. Economic Review

1. The problem and methodology

The economic analysis presented in the Project Paper represented best estimates, which seemed reasonable at a time when no experience and little on-farm knowledge was available from the project area. In the year since the beginning of the project government and expatriate persons have had an opportunity to become familiar with local conditions, the state of agriculture, the realities on-farm and, in a preliminary fashion, farmer responses to the opportunities afforded them by the availability of storage and prompt payment for their produce upon delivery.

It is worth recalling the fundamental assumption upon which the project rests: considerable slack resources are available within the sector, in particular labor, which could produce more if the appropriate incentives came into play. Farmers in the area have historically produced a marketed surplus. During the last years of French rule the district of Mossendjo delivered 1000 tons of peanuts, 1200 tons of paddy and over 40 tons of maize to market. This production was the consequence of a persistent and extensive production promotion effort including supervised extension and effective marketing arrangements. Although data since independence are poor, production appears to have fallen steeply in all three crops so that in 1981 marketings were 100 tons, 100 tons and 25t for peanuts, paddy and maize respectively. These represent the OCV collection figures, and while some additional marketings were made through the private system, it seems evident that total production is well below pre-independence levels.

Production and marketable surplus are the function of market incentives on the one hand and inputs, principally labor, on the other. It seems clear that the incentives provided during the French era have withered. The former market structure simply doesn't function. Also, supervised extension has stopped completely. The argument has been advanced that the effective labor force on-farm has declined. The proporcion of rural persons has declined from 85% to 53% in 20 years in the Niari area and some shift in sex ratio in favor of women has occured as well. There is also evidence that the average age of the farm work force has risen. Still, the level of production losses cannot be fully explained by an absolute decline in labor. It is likely that the lack of marketing incentives has played at least an equal role.

Experience elsewhere in sub-saharan Africa supports the argument that the traditional production system, largely dependent upon female labor for seeding and cultivation, is capable of marked increases in production to the degree that the manpower needed to open and clear fields is available. (That ample fertile land is available in the Congo is beyond challenge: only 2% of the arable land is now under cultivation). It appears that the bulk of male out-migration is often short term, and this population may be available at time of land clearing. Therefore, it is easy to

overstate the effective impact of migration upon production potential.

No effort was made when the project was planned to measure either of the above factors - market incentive or labor supply - in support of the basic hypothesis. Fortunately, the timing of the evaluation coincided with the first delivery by farmers of their peanut crop to the Idzendi hangar. This hangar is believed to service farmers within a radius of five kilometers (or about 30 km sq) and to include about 500 farm sites. Farmers are not resident at their fields, and the local living pattern is one of the small hamlets of up to 100 families. Idzendi has perhaps 60 households. (4)

An enumeration of 21 households (every second house on one side of the main street) was carried out at the direction of the team by a college student resident in Nsundjo who had recently completed research in the area. A short questionnaire of five questions was used (Appendix 4) and an interview took no longer than 15 minutes. Respondents were the male head of household or his spokesman. In nearly of 75% of the cases, the respondent turned out to be a wife. This was fortunate in that they are good judges of the potential for extra production at their farm sites. The enumeration took one full day.

The questionnaire format followed the one developed by Collinson in east Africa, based upon the recall method, which has proven effective. Four key questions were asked; availability of farm labor, ability to increase output with the present force, gross production of peanuts (the basic cash crop in Idzendi) last season and the current season, and out-migration from the farm. The student misunderstood this last question and only obtained an estimate for the period since the beginning of the project rather than a net figure for the past five years as intended. A fifth question was added by the Congolese: are you a member of the local coop? After the questionnaires were returned the results were reviewed by persons knowledgeable with local conditions and pronounced reasonable and consistent with their understanding.

In brief the results include the following insights. The typical farm (16 of 21) has two adult workers and often one working child and had lost one person (an adolescent child) this year as an out-migrant. In only one case did such a farm hire in labor (only one person). Two farms had only one adult person. Three farms had three; two of these were the only polygamous households in the sample. Each of these typical farms had one field, but no effort was made to estimate size. On these 21 sites, 128 bags of peanuts were produced last year and 160 this year. (5) The jump in production (the levels retained for seed and consumption remained relatively unchanged) was explained by the promise to pay on the spot. Several respondents reported that they decided to grow more as soon as the hangar was begun since this act represented a serious effort by the government. Without a single exception the 21 respondents reported they could further increase production as long

as the incentives justified the effort. Four of the 21 reported that illness had prevented them from engaging in commercial production, an indication of the economic cost of poor health conditions.

On the 21 farms, 30 family members had left the work force for one reason or another - school, jobs or marriage in the last year. Unfortunately the enumerator failed to learn the number returning as new wives or from school. In sum, the 21 farms had a total work force of 66 persons, but a further 30 had become unavailable this year; it is likely that a net decline in labor took place; however, production still increased. The basic assumption of the project appears justified. Appendix 5 includes a summary of the findings of the enumeration.

2. Economic returns to the project

Given the information base available it is impossible to quantify basic or incremental production and thus the flow of benefits consequent to the project. Neither base-line nor follow-up studies exist. The small survey conducted at Idzendi is suggestive but too limited to permit generalizations. Nevertheless, early marketings at the hangars and this study seem sufficiently encouraging to conclude that both extra plantings and additional marketings have occured as a result of the project. The Idzendi study indicated the possibility of a doubling of plantings in the case of peanuts. Lacking knowledge of private commercial activities, we cannot make any statement as to the overall trend in marketings apart from the likelihood that they have increased, and possibly doubled overall. It is likely the OCV will receive a far larger share of overall production as a consequence of the presence of the hangar network.

If the interviews are to be believed, there remains a slack of available labor resources in the system to permit yet further increases. The project has completed or rehabilitated 15 warehouses to date, containing a total storage capacity of nearly 700 tons. It seems reasonable to assume, based once again on the Idzendi results, that most if not all of this capacity will be utilized this year and at least half of the production was due to the presence of the new marketing arrangements.

There seems to be good ground for optimism that the full capacity of the entire network will be utilized when completed, and that this capacity, about 1200 tons in gross volume, will become a new limit to total area marketings (plus the unmeasured private trade).

Measured in financial terms, the full investment will produce a gross margin, from all sources, of about $10,000 annually, not a robust return to nearly a $ 2,000,000 investment. However, when the secondary and economic benefits to society are included (which are difficult to measure) it is possible to impute a far greater rate of return. First, given the presence of superior storage there will be

an undoubted reduction in commodity losses due to rodents, bugs or moisture. Second, plantings will rise and the total amount of produce available to the community will increase. The project will not capture this margin, but society will benefit directly. For example, peanuts sell at $ 334 per ton. Our best estimate is that this year 200 tons will be marketed as a direct consequence of the project , or a marginal increment to the economy of $66,800. We have no idea what the increment will be from paddy and maize, but it will be positive. In ten years, assuming the system is fully utilized, the marginal production value to society will almost certainly be in excess of $ 1,000,000 across all three crops. In such a case, the C/B should be very positive and IRR be well above 10%. The number of assumptions necessary to make a calculation are such as to make any number of little value, but the direction seems clear and supportive of the project.

Footnotes

1. The limiting factor in Congolese agriculture is labor, followed by capital (essentially hand tools). At this point land is abundant and not a limited factor. The economic issue at stake in the project is the presence of surplus labor. Farm units are operated as fields, each under the management of one wife. Labor is provided by the entire adult family but operations are sex-specific; clearing is largely male; planting and cultivation, female; harvesting is shared by both. Considerable leakage of labor occurs as numbers of persons quit agriculture and go to cities. The actual numbers involved is unknown, but a net out-migration, likely of young adults, is certain. What is critical, and unmeasured, is the net effort of this migration upon the residual labor force and ultimately upon potential production.

2. The figure includes 10 warehouse sites added after the original project paper, and financed by the CPRC.

3. We have no persuasive information, however, to suggest that present incentives are sufficient to slow, let alone reverse, net outmigration from the district - an effect claimed in the original project paper.

4. No hard evidence differences in income are available, however, housing, clothing, consumption practices appear homogeneous. Ample land appears available to all households.

5. Bags range from 30-35 kg each, as weighed at the warehouse. The bags are of a standard size commonly used by farmers.

APPENDIX 1

Technology Transfer

Executive Summary - 679-0001 (Smallholder Agricultural Development)

1. What constraints did this project attempt to relieve?

Phase I of this project seeks to improve the marketing system available to the small farmer in the upper Niari valley of the Congo (1). The major constraint to increased marketed production and income appeared to be post-harvest losses as a result of long delays (up to six months) in the collection of produce by the state marketing organization, OCV.

2. What technology did the project promote to relieve this constraint?

The project introduced two interventions to alleviate this constraint. First, it supported the construction of a network of rural warehouses where farmers could store their crops without fear of post-harvest crop loss. These warehouses are to be managed by a local cooperative group representing farmers and government representatives. The warehouses will be fumigated with appropriate chemicals to ensure against loss of produce from insects or rodents. The project has gone one step further and introduced a direct marketing intervention. Within the cooperative system a revolving fund has been established so that farmers can be paid for their produce at harvest when the crops are stored. The fund is replenished when the marketing organization, OCV, collects the produce from the cooperative's warehouse. The dual objective of this approach was: 1) to capture the production lost to insects and rodents; 2) to increase farmer incentives to produce more crops for the market. Both of these objectives would serve to increase small farmer income.

3.What technology did the project attempt to replace?

Traditional storage systems in the project area were comparatively ineffective. Both the lack of means and the lack of knowledge about storage systems had constrained the development of more effective systems. The marketing system which existed was too unreliable to stimulate increased small farmer production. The project interventions improved both the reliability and effectiveness of these systems.

4. Why did project planners believe that intended beneficiaries would adopt the proposed technology?

The proposed project interventions reduced the risk of loss to the farmer. The production process of the farmer was not changed; however, he was ensured prompt payment for his produce. The

(1) Only Phase I of the project was far enough in progress to evaluate its performance in the transfer of technology. Phase II includes the construction and operation of a seed farm with distribution of improved seeds through the cooperative system.

warehouses were built in close proximity to the farmer's fields (usually within 5 km) so that transport would not be a major obstacle. In other words, farmers had much to gain and nothing to lose.

5. What characteristics did the intended beneficiaries exhibit that had relevance to their adopting the proposed technology?

The farmers had used primitive, traditional storage systems. Preliminary surveys had shown that farmers were anxious to try a system which would reduce losses and increase income.

6. What adoption rate has this project achieved in transferring the proposed technology?

Preliminary returns from the current marketing season (1983) show that produce marketed has increased more than two-fold over last year. Although part of this increase may be explained by a reduction in post-harvest losses, the farmers reported that they have increased plantings in response to the assurance that produce will be purchased in a timely manner. This appears to demonstrate that both surplus labor and land resources exist which can be applied to the production process when appropriate incentives exist.

7. Has the project set forces into motion that will induce further exploration of the constraint and improvements to the technical package proposed to overcome it?

The project expects the cooperative warehouses to realize net revenues on the sales of produce. These earnings could be reinvested in additional warehouses and eventually in other means benefiting cooperative members.

8. Do private input suppliers have an incentive to examine the constraint and come up with solutions?

The project has used private suppliers to provide materials for the construction of the warehouses. Any further construction of warehouses would continue to stimulate this activity. No other constraints appear susceptible to solution by private input suppliers.

9. What delivery system did the project employ to transfer technology to intended beneficiaries?

The project methodology is to further develop and utilize the existing pre-cooperative system in the rural project area. Through formal and applied training in cooperative development, the project intends to develop a local institution which can carry out the activities of warehouse management, construction and marketing.

10. What training techniques did the project use to develop the delivery system?

At this stage of the project, training in fumigation and warehouse management has been given to the project personnel and

cooperative warehouse managers. The evaluators recommended training specifically in cooperative business and financial management.

11. What effect did the transferred technology have upon those impacted by it?

The project has only been in operation for a year and a half and has affected one marketing season. Based upon the preliminary returns of this marketing season, marketed production and farmer income appear to have increased significantly over last year's marketing season. When all returns from this marketing season have been recorded, more precise analysis of the value of these increases will be possible.

APPENDIX 2

Summary of Operating Costs/Average Warehouse/Year

1) Salary of Warehouse Manager:	214
2) Fumigation:	200
3) Malathion Dusting:	100
4) Marketing Paperwork Forms:	32
5) Weighing and Storage Supervision:	62
6) Stored Grain Monitoring:	45
7) District Union Accountant:	68
8) Roof replacement:	14
TOTAL:	$735

$735 - 35,000 kg/warehouse = $0.021/kg

A. Basic Assumptions

a) average warehouse capacity = 35 tons mixed grain.
b) warehouse if filled to 100% of capacity.
c) average grain mix composition:

66% peanuts x 35 = 23 tons
16.5% rice x 35 = 5.8 tons
16.5% corn x 35 = 5.8 ton
Total = 35 tons

d) 350 CFA = $1.00
e) use 1983 OCV prices for grain:

Peanuts: 117 CFA/kg - 350 x 1000 = $ 334/ton
Rice: 70 CFA/kg - 350 x 1000 = $ 200/ton
Corn: 65 CFA/kg - 350 x 1000 = $ 186/ton

f) There are 15 average warehouses in the initial zone of project activity.

B. Calculation of Revenue per Warehouse

Peanuts :	23 tons x $ 334 =	$ 7,682
Rice :	5.8 tons x $ 200 =	$ 1,160
Corn :	5.8 tons x $ 186 =	$ 1,079
average per warehouse	TOTAL	$ 9,921

C. Calculations Operating Costs/Average Warehouse/Year

1) Salary of Warehouse Manager:
10,000 CFA/month base salary

APPENDIX 2 cont

plus 0.25 CFA/kg/month storage
35,000 kg x 0.25 CFA = 8,750 CFA/month
(base salary) + 10,000
18,750 CFA/month

Assume average storage duration of 4 months
18,750/month x 4 months = 75,000 CFA
75,000 ÷ 350 = $ 214/storage year.
(for four months)

Operating Costs (Cont).

2) Fumigation (2 CFA/kg est. cost):
35,000kg x 2 CFA = 70,000 CFA
70,000 CFA ÷ 350 = $ 200/warehouse/yr

3) Malathion Dusting (1 CFA/kg est. cost):
35,000 kg ÷ 35,000 CFA = $ 100/warehouse

4) Marketing Paperwork Forms (local estimates):
500,000 CFA/3 yr. supply
500,000 - 3 = 166,667 CFA/yr.
166,667 - 350 = $ 476/yr.
$476 ÷ 15 = $32/yr/warehouse

5) Weighing and Storage Supervision Perdiems:
125 supervisor days x $ 7.50/day = $ 937.50
$ 937.50 ÷ 15 = $ 62/warehouse/yr (4 months)

6) Stored Grain Monitoring:
1.5 monitoring days/month x $ 7.50/day agent perdiem
$ 750 x 1.5 = $ 11.25/month
x 4 months
$ 45/storage year

7) District-level Administration (District Union accountant):
60,000 CFA salary/month x 12 months = 720,000/yr
720,000 CFA - 350 = $ 2,057/yr
$ 2,228 ÷ 15 = $68/yr/warehouse

8) Roof Replacement per Warehouse: (assume 25 tons)
41 sheets roofing x 2,500 CFA/sheet =
100,000 CFA/warehouse ÷ 350 = $286/20yrs = $14 per year

APPENDIX 3

Cost Local Truck Rental vs. Use Project Truck

A. Amortization of Project Truck

-initial cost of truck = $ 50,000 x 350 = 17,500,000 CFA

17,500,000 CFA initial cost
4,000,000 CFA resale value after 4 years
13,500,000 = value to be amortized over four years.
13,500,000 ÷ 4 = 3,375,000 CFA/year

B. Vehicle Operations Costs

-project vehicle operation costs = $5,000/month
-vehicle driver salary = 50,000 CFA/month
50,000 CFA ÷ 350 = $ 143/month

$ 5,000 = vehicle
+143 = driver
$ 5,143 total cost/month vehicle

$ 5,143 x 350 = 1,800,050 CFA/month.
$ 1,800,050 CFA/month vehicle operations
$ 1,800,050/month x 2 months = 3,600,100 CFA/2 months

C. Total Project Vehicle Cost

4,375,000 yearly amortizing
+ 3,600,000 2 month vehicle operating cost.
7,975,100 total 2 month cost

7,975,100 ÷ 350 = $ 22,786/2 months

D. Local Truck Rental Costs

-Assume 25 working days/month
-Assume 2 months transport to complete marketing.
77,000 CFA/day truck rental
+12,000 CFA/75 liter diesel fuel/day
89,000 CFA total rented truck cost/day
x 50 involved in 2 months of transport

4,450,000 CFA ÷ 350 = $ 12,714/2 months rental

E. Rental Truck vs. Project Truck : (per 2 month use)

Project Truck : $ 22,786/2 months

Rental Truck : $ 12,714/2 months

APPENDIX 3 (cont.)

Calculations for Project Truck Analysis

Assuming Project Truck

$ 46,786 - 600,000kg = $ 0.0779/kg (4 months storage)

$ 0.0779 x 125 = 0.0975

$ 0.0975 x 350 = 34 CFA/kg

Assuming Rental Truck

$ 36,714 - 600 kg = $ 0.061

$ 0.061 x 1.25 = $ 0.07648

$ 0.07648 x 350 = 26.770 CFA/kg

APPENDIX 4 (1)

Farm Survey Questionnaire

1. a) List persons available to work on your farm:

wives _____
adult children _____
other relatives _____

Total _____

b) How many workers do you regularly hire to meet routine needs on your farm. Total _____

Total normal work force _____

2. If there was good reason to produce more crops next season how much more land (or crop) could you cultivate with your present work force?

estimate ha or & ha
or estimated bags of your major crop

____ _____

3. What important crops do you usually grow - and what total production (in bags) do you usually get?

crop	Total bags	share used at home	Share usually lost in storage	Share usually sold
maize				
manioc				
yam				
peanuts				
rice				
other				

4. a) How many adult family members have left for work elsewhere - on a permanent basis (not available for normal farm work in your farm)?

b) How many do you expect to leave in the next year?

(1) For head of household or person who can speak for him or herself.

APPENDIX 5

PRODUCTION OF PEANUTS BY NUMBER OF BAGS 1

	1982				1983			
Number of Households	sold	seed	consumption	total	sold	seed	c.	total
1	4	1	0.5	5.5	9	1	1	11
2	-0-	illness			4	1	0.5	5.5
3	5	2	1	8	16	2	1	19
4	6	2	1	9	17	2	1	20
5	-0-	away from home			13	1	1	15
6	4	1	2	7	4	1	0	5
7	-0-	illness			12.5	1	1	14.5
8	5	1	0.5	6.5	14	1	1	16
9	4	1	0.5	5.5				
10	2	2	0	4	2	2	0	4
11	-0-	discouraged			4	1	0	5
12	-0-	illness			10	1.5	0.5	12
13	12	1.5	0.5	14	17	1.5	0.5	19
14	6	1	0	7	9	1	0.5	10.5
15	4	1	1	6	7	1	1	9
16	6	1	1	8	7	2	1	10
17	7	1.5	1	9.5	14	1.5	1	16.5
18	4	1	0	5	14	1	0	15
19	11	2	1	14	14	3	1	18
20	10	1.5	1	12.5	15	2	1	18
21 (2)	8	0.5	0.5	9	14	1.5	1	16.5
Total				128				260

1 Sample collected from the groupement/cooperative at Idzendi

2 This household had 2 wives but all other households had only one wife