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GOS/USAID FIRST EVALUATION REPORT
OF ONCAD FOOD GRAIN STORAGE

February 1979

6850209

EVALUATION TEAM MEMBERS

ONCAD

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Diourbel: Mr. Moussa M'Bow
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USAID

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Mr. Paul Rusby, Food For Peace Officer
Mr. Kenneth Steinke, ONCAD Technical Assistant
Mr. Richard Byess, Staff Assistant
Mr. Frank Donovan, Staff Assistant

INTRODUCTION

The Grain Storage Project Agreement No. 685-0209, dated 22 August, 1977, authorises the construction of 30,000 MT of foodgrain storage, the training of ONCAD personnel in storage, fumigation, and maintenance technology, and the purchase of certain equipment. The project will require 3 to 4 years to complete and will cost approximately \$4,900,000. Its purpose is to contribute to the GOS initiative to construct 120,000 MT of storage capacity for a program of medium-term storage and price stabilisation.

BACKGROUND

The Government of Senegal has embarked on an ambitious program of stimulating cereal production and marketing. Measures undertaken to reflect this policy include the grain storage program described above and several other initiatives:

- The support price of millet and sorghum was raised this year from 35 to 40 CFA/kg, making those cereals competitive with the groundnut crop as a possible source of cash for farmers.
- Fertilizer distribution to farmers was increased from an annual average of 70,000 MT to 100,000 this year.
- ONCAD has been authorized to purchase up to 130,000 tons of millet and sorghum from this year's crop, and funds have been put in place for this program. To date over 80,000 MT have been purchased, as compared with an annual average purchase of around 13,000 MT. A table showing purchases for the last 8 years is given as annex.

As a consequence of the above factors the GOS is faced with the problem of locating storage space for the enormous quantities of grain purchased this year. For this reason, the Minister of Rural Development, in a meeting with the USAID Mission Director on January 17, requested that USAID accelerate the construction program of the additional 20,000 MT of storage space to meet this need.

EVALUATION

The USAID-funded project is designed to be implemented over a three to four-year period, one tranche of warehouses totalling 10,000 tons of capacity to be completed each year. According to the Project Agreement, the GOS will collaborate with AID in an annual evaluation of the progress made in the construction and training programs. As the Project Paper states:

"Continuing evaluation is critical to the project.... it is possible, through annual evaluations to determine with reasonable accuracy the storage needs of the coming season, thus facilitating rational planning and allocation of project and GOS resources in accordance with a sound analytical basis (...)

The annual joint USAID/ONCAD evaluation will analyze storage needs based on the year's production and the amount already purchased by ONCAD (...)

The evaluation team will present their findings and recommendations for warehouse construction and modifications in the training program to AID/Dakar which, in collaboration with ONCAD, will determine the scope of the construction activity based on recommendations of the evaluation team."

USAID thus had a series of meetings with ONCAD to outline an evaluation to explore the possibility of accelerating the construction schedule as a result of this year's exceptional purchasing program. It was decided to study all of the criteria outlined in the Project Paper and Project Agreement and that the best means to verify the situation would be to visit the storage facilities in the field and note the quantity and condition of the grain stored there. The Departments of Thiès, Diourbel, and Sine Saloum were chosen for this purpose, where a significant percentage of the purchased millet is stored. Of the 78,000 tons of millet purchased through February 7, 69,000 tons were located in those three regions.

As one of the criteria for proceeding with the construction program would be to determine the adequacy of the ONCAD technical storage program, we noted the quality of the stored grain, and the handling and storage procedures; a summary of these findings and recommendations are given below.

Warehouse Visits

On January 31 and February 1, 1979, the USAID representatives visited the region of Thiès, where the regional representatives for the qualité and technique divisions from Thiès, Diourbel and Sine Saloum had gathered. Mr. Maroun, the Director of the Gestion Regionale, explained that although a large quantity of the millet purchased that year was stored in facilities of 1,000 to 2,000 tons or more which we could visit, much was also still stored at the cooperative level. We decided to visit one or two cooperatives to get an idea of that type of storage, but to limit the bulk of the field trip to visiting the large facilities.

Following the visit to Thiès two teams were formed, one to visit Diourbel and one to visit the Sine Saloum. Those visits lasted from February 5 through 8, the teams being composed of two USAID representatives and two or three ONCAD representatives per region. The trip went extremely well and the following data were established from questionnaires drawn up by Monsra Steinke and Rusby:

Region	Quantity Purchased	Quantity Seen	Number of Warehouses Visited
Sine Saloum	49,052	29,646	37
Diourbel	13,959	7,435	15
Thiès	<u>6,786</u>	<u>5,104</u>	<u>12</u>
Total	69,797	42,185	75

It is thus evident that the purchasing program is proceeding as ONCAD has reported. Aside from the 30,000 tons of storage space constructed specifically for cereals storage, 48,000 tons of millet and sorghum are stored in seed peanut warehouses under less than ideal conditions.

FINDINGS AND RECOMMENDATIONS

Warehouses Physical Structures

1. Quantity of Warehousing Available

ONCAD utilizes four categories of warehouses as follows:

- a. Metal sidewall, metal roof, vertical walls (interior bridging), constructed about 1952/53;
- b. Metal sidewall, metal roof, angle walls, (exterior bridging), constructed about 1965;
- c. Steel pillar, cement block walls, metal/asbestos roof, constructed 1977;
- d. Miscellaneous tile/brick/plaster walls with tile or tin roofs, constructed prior to 1950 and presently utilized by ONCAD.

The 1977 construction of 30,000 MT was the first construction for cereals, all other warehousing was for peanuts. This was the first tranche of 120,000 MT warehouse capacity planned by ONCAD. ONCAD's first year of serious millet purchasing has yielded 78,000 MT, and immediately creates a cereals warehouses deficit of 48,000 MT. With goals set to buy another 50,000 tons of this year's crop, the total short fall will be 98,000 tons. Any millet occupying peanut warehouses means less storage for peanuts. Consequently, on a quantitative basis alone, cereals storage is totally inadequate. Table 1 shows that the vast majority of the 78,000 MT foodgrain already purchased is stored in ONCAD rented warehouses or at peanut cooperatives. At the time the USAID 30,000 MT warehouses were planned, many people predicted that once constructed, the cereals warehouses would be used to store peanuts. The opposite is true - cereals are now occupying peanut warehouses. ONCAD badly needs more cereals warehouses.

2. Quality of Warehouses

The quantitative inadequacy of cereals warehouses has required ONCAD to rent some warehouses which they had previously released because of their poor physical conditions. The team inspected millet in some warehouses which were totally unacceptable for food grain storage. Broken,

uneven, rat-burrowed floors, rusted and/or holed sidewalls, leaking/open roofs and the absence of physical security characterized these warehouses.

Rats eat peanuts as well as millet; consequently, ONCAD losses due to rats have occurred for some time. Every warehouse we visited showed evidence of rats; no warehouse we saw was rodent-proof. Those warehouses most nearly rodent proof failed the test due to a faulty front door design. The 1965 generation of peanut warehouses of metal roof and sidewall, angle sidewalls with exterior bridging, are unquestionably the most secure from rodent and bird infiltration; the 1977 generation of cereal warehouses is second. Both designs have inadequate front door designs for rodent control. The 1977 construction has an additional design fault in that the top roof overhang is too shallow; a side wind blows rain through the louvre onto the food stack below.

The 1952 all metal generation of peanut warehouses (176 in number) is beginning to deteriorate. Roofs and sidewalls are pitted and rusted, floors and plinths are cracked and rodent-holed; door closures are badly deteriorated. A relatively small investment in repair and preventive maintenance now could add years of life to these warehouses. Unless this is done promptly, however, current building plans will barely maintain the present installed capacity, not increase it.

COMMODITY HANDLING

Training in the handling of food commodities is no less important than provision of the physical storage facilities. (On one occasion the field team witnessed some of the poorest handling procedures operating in the best designed warehouse). Very little loss is reported in traditional on-farm storage of millet in the large woven-twig bins. It follows then that, using the proper storage technics, losses in the off-farm central storage facilities can be held to a minimum. It is obvious from visiting some of ONCAD's facilities that they are aware of this fact and are making positive efforts to minimize grain losses.

The following observations pertain to commodity handling:

1. Jute Bag Availability

Finished jute bags are imported from Bangladesh. In the process of establishing a food grain reserve a heavy set aside, instead of multiple use, of jute bags will occur. The Bangladesh-Dakar pipeline is long. Very careful advance planning must be done to avoid a catastrophe due to the sudden absence of sufficient jute bags.

2. Jute Bag Re-Use System

With increased production and increased ONCAD purchases for food reserve storage, jute bags will skyrocket in value. ONCAD should anticipate this by establishing a system of control and accountability of bags. This is standard procedure in many countries.

3. Jute Bag Repair System

The best designed warehouse and the full supply of wood pallets are wasted investments if commodity is allowed to accumulate loose on the floor. The teams witnessed instances of leaking bags placed into inventory without being repaired or where rodents and insects had damaged bags in storage and allowed the product to spill out and accumulate on the floor. Another contributing factor of this problem was the mesh size of the sacks. It was observed that some millet was lost from the sacks due to the small size of the millet and large mesh size. A smaller mesh size could help in reducing the accumulation of loose commodity on the floor and throughout the stack. A universal system of bag standardization by capacity and by mesh, and a bag repair system should be implemented and supported by the necessary supplies of jute, string, and needles.

4. Standard Weight Bags

Presently bags are not filled to a standard weight. As the quality of handling improves, through a system of standard bag sizes mesh, reuse, and repair, cereals should be bagged in standard weights to substantially reduce the workload. At present, each bag is weighed upon coming into and leaving the warehouse.

5. Palletization

ONCAD is doing an excellent job of using heavy wood pallets to keep commodity about 5 inches off the floor. In most instances where we saw no palletization, we saw straw mats used instead because commodity arrived before pallets. We saw several instances where pallets were being delivered during our inspection. Unfortunately, the purpose of pallets is not well understood and quantities of loose commodity (due principally to poor quality or rodent-damaged bags) fell to the floor, blocking the air circulation through pallets, thus rendering pallets less effective.

6. Loose Commodity

For whatever cause (as discussed Item 3 above) the danger of loose commodity to attract rodents, insects, cut air circulation, and promote moisture absorption is not well understood by ONCAD warehousemen. Almost without exception loose grain is allowed to accumulate on the floor and an education campaign is required to correct this situation.

7. Insect Control

Although the use of chemicals to contain insects was extensive, the need for USAID advisor in proper warehouse sanitation measures and insect controls was very evident.

8. Rodent Control

We saw few warehouses without evidence of rodent activity. It appears that the rodent control program requires strengthening. A good example of rodent control was the 1977 constructed cereals warehouse at Gossas where rodenticide cups were placed on the floor every ten meters.

This was one of the cleanest warehouses we saw with very little loose commodity on the floor, and yet we saw about 20 dead rats. The warehouseman said he killed about 20 rats a day which come from the nearby village and enter the warehouse around the ill fitting door.

9. National Standards

We found extraordinary differences in the performance of those directly responsible for maintenance of commodity in storage. While we did see some deficient performance by personnel close to urban areas, generally speaking performance appeared to be least satisfactory in the most remote areas. Inside some of the best physical structure occurred some of the least satisfactory handling procedures. The warehousemen need to be encouraged to believe they are part of a national organization with nation-wide standards. This could be reinforced by a system of training and rewards.

TRAINING

The training program has been slow in starting, as the technical assistant has just arrived in country and training materials are in the process of being ordered. Several initiatives have nevertheless been undertaken to date:

- 16 participants have attended the KSU short course in grain storage, of whom 7 were sent in 1976 and 9 in 1978.
- three participants have been sent for long term training, in the fields of agricultural economics, grain storage technology, and warehouse and building maintenance.

KSY will provide a strong technical support for the in-country training program through providing training materials and technical assistance as necessary. ONCAD is already undertaking a training program for the warehousement (magasiniers) to staff the warehouses funded under the AID-financed projects.

In addition to the training program, the technical assistant will oversee the construction portion of the project and will give assistance, as required, in modifying and improving the ONCAD grain handling program. His immediate task is the training of several ONCAD employees who will undertake the training program themselves in the field.

Through the training program USAID and ONCAD hope to address several of the problems made evident during the course of this evaluation, through courses designed around the following themes:

Insect/rodent biology: biology, behaviour, identification, and methods of detection.

Pesticide application and safety: chemistry, application methods and equipment, safety precautions and equipment.

Warehouse management and maintenance: temperature-moisture relationships, structural maintenance and proper warehousing techniques.

Inventory control: inventory and records keeping.

TEAM RECOMMENDATIONS

1. The amount of cereal grains purchased in Senegal this year by ONCAD clearly exceeds greatly the storage space currently at ONCAD's disposal. The team recommends that ONCAD proceed with not only this year's construction program, but with the other 20,000 tons of warehousing also.
2. The 30,000 MT USAID provided warehouses should be rat and bird proof; any modifications required to achieve this goal should be made before construction begins.
3. Funds should be provided immediately to rat-proof the door closures on the 1977 foodgrain warehouses. This investment will conserve many tons of food presently in storage.
4. The 1977 and 1952 all metal warehouses, (and additional warehouses as may be individually inspected and approved), should be rat-proofed and roof, sidewalls, foundations and floors repaired so as to extend their useful life. One or two expert teams should do this repair for the entire country; the two team captains should serve on a survey team preceeding actual repairs.
5. Jute bag specifications and procurement, and stocking procedures should be re-examined to assure no break in supply of these items.
6. a. Systems for the handling, control, and accountability of empty bags should be developed.
b. Systems for the repair of jute bags should be established.

The training program should be undertaken with the following points in mind:

7. Concurrent with the standardization of bag size and its repair a system of standard bag content (weight) should be developed. This work of loading bags to a standard weight can proceed along with present responsibilities of warehousemen.
8. Education in the use of dunnage (pallets), elimination of loose commodity, and rodent control should be instituted.
9. ONCAD's standard of operation should be established and implemented nationwide; a system of rewards should be developed to encourage high standards; the ONCAD inspection force should participate in the training courses being designed.
10. An annual GOS/USAID evaluation of ONCAD foodgrain storage and handling procedures should be undertaken.

MILLET PRODUCTION AND ONCAD PURCHASES
1970-79

Year	Production (000 tons)	Purchases (000 tons)	Percentage of Production	Support Price
1970/71	635	.3	0	18
1971/72	401	2.8	0	18
1972/73	583	-	0	25
1973/74	333	30	6	25
1974/75	511	36	5	30
1975/76	795	12	2	30
1976/77	621	5	2	35
1977/78	554	NA	NA	35
1978/79	806	78	10	40

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