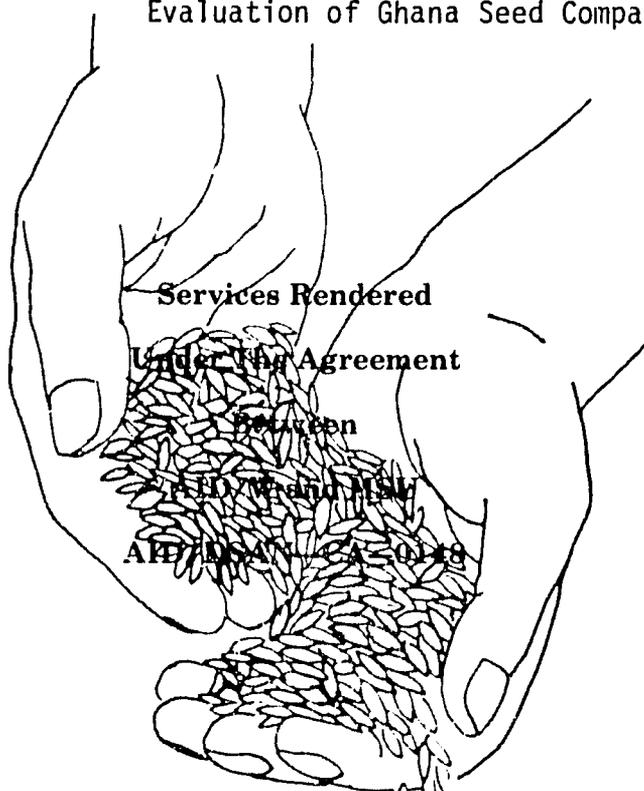


REPORT TO:

TA 84-01

USAID/Ghana
and AID/W

Report to USAID/G and AID/W
on
Review of Seed Project MIDASII
and
Evaluation of Ghana Seed Company



Services Rendered
Under the Agreement
Between
USAID and GSC
AFR/DAW/TA-84-01

February, 1984

SEED TECHNOLOGY LABORATORY
MISSISSIPPI STATE UNIVERSITY
MISSISSIPPI STATE, MISSISSIPPI



Report to USAID/G and AID/W
on
Review of Seed Project MIDAS II
and
Evaluation of Ghana Seed Company

Services Rendered
Under the Agreement
Between
AID/W and MSU
Contract AID/DSAN-CA-0148

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February, 1984

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Acknowledgements

The Consultant sincerely appreciates the assistance of the USAID/G staff, especially Mr. John Thomas, Project Manager, for providing resources and logistical support which facilitated the completion of this assignment. In addition, the staff of the Ghana Seed Company, especially Mr. Josiah Wobil, Mr. Ben Blay and others, together with the Experience Incorporated Consultants, Mr. Orris Shulstad, Dr. W. Hall and Mr. S. Sandager, are recognized for their special contributions in time and information concerning the overall seed program in Ghana.

The consultant is especially indebted to the Team Leader, Mr. Robert Wesselmann, for his friendliness and vision in outlining a successful plan of work. It was enjoyable working under his leadership.

Respectfully,

C. Hunter Andrews

REPORT SUMMARY

Title: Review of Seed Project MIDAS II and Evaluation of Ghana Seed Company

Contract: MSU/AID/DSAN-CA-0148

Consultant: C. H. Andrews
Seed Technology Laboratory

Period of Consultation: January 17 - February 17, 1984

Summary

In 1980 a re-design team spent 30 days in Ghana attempting to salvage and re-direct emphases of the original PP for MIDAS. MIDAS II was developed to reduce the scope of work and concentrate efforts on a regional level. MIDAS II called for a mid-phase review, and after on-site observations by USAID indicated that little progress was being accomplished on MIDAS, they requested a re-design once again. In fact, of the original seven components of MIDAS II, only the Seed Component and possibly small farmer credit appeared to be the only survivors of the severe economic strain in Ghana.

Thus, in 1982 two consultants from the MSU contract traveled to Ghana to examine carefully the existing conditions, perform a complete technical review of the Seed Component and make recommendations in a re-design effort. The result was Amendment No. I to the re-design effort, MIDAS II.

This report addresses the current assignment, that of evaluating Amendment No. I and reviewing the Seed Project of MIDAS II. An evaluation of the Ghana Seed Company was also conducted as well as developing add-on projects for future expansion of USAID assistance.

- / -

TERMS OF REFERENCE

The terms of reference were briefly outlined in a cable from USAID/ACCRA (unclas Accra 09417, Oct. 83). Specifically, the tasks required of the evaluation team will be to:

- A. Review the Ghana Seed Company's foundation seed and certified seed production data, financial documents, sales figures, management, organization and capability, construction program, and records of contract growers' seed production to assess the extent to which key progress benchmarks contained in the project implementation plan have been achieved.
- B. Evaluate the potential for seed production of maize, rice, and groundnuts as well as other minor crops by the Ghana Seed Company nationally for the next three to five years, particularly in relation to planned objectives for seed plant development.
- C. Assess the prospects for increasing certified seed production by contract seed growers and relate the same to the seed company's planned expansion plans.
- D. Determine if GSC's performance reveals a potential to be financially viable, independent, profit-making, and therefore, able to utilize efficiently further assistance in pursuit of such objectives.
- E. Assess if, and to what extent, the assistance provided by MIDAS has enabled the GSC to develop the institutional capacity and physical plant to make improved seed available for increased food production.
- F. Identify the GOG and GSC policies and actions concerning pricing, distribution and sales of certified seed, and provision of inputs which impact the GSC's programs. Assess the short-term and long-term effects of these policies and recommend changes and/or additional policy actions required.
- G. Assess the extent to which the existing sales and distribution activities and publicity programs of GSC assure knowledge of and demand for certified seed.

Evaluation Team

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SUMMARY OF RECOMMENDATIONS

MIDAS Evaluation, January - February, 1984

1. The PACD for USAID assistance be extended to December 31, 1985, with some modifications in the technical assistance component to allow for delays arising in the implementation plans. The planned training of participants should be completed in 1984 and 1985. Thus, additional funding will be required for the technical assistance component, but no new funding for commodities.
2. Technical assistance to the GSC should include the one-year assignment of a management accountant. This consultant would assist the accounting department in setting up a standardized system of accounts at the main office in Accra and in the regional offices.
3. The evaluation Team has revised the list of remaining commodities to be AID-procured in accord with Amendment No. 1. In view of the amount of commodities on hand and in the "pipeline", no additional commodities should be needed for the remainder of the recommended duration of AID support except possibly for the pre-fab building at Kumasi.
4. All remaining commodity purchases from the U.S. with AID funds should be executed through Experience Incorporated.
5. The Ghana Seed Company and the Experience Incorporated staff, with support from the USAID, should bend all efforts towards completing the Winneba Seed Center. The operational target date should be October, 1984. If this target is achieved, USAID should arrange a special training course with Mississippi State University, through its worldwide technical assistance contract with AID. This would provide about three weeks of seed technology training at Winneba in February 1985 for 20 to 25 GSC seed processing and quality control specialists.
6. Steps should be taken by the GSC to transfer from Winneba those items of equipment originally intended for Kumasi and Tamale, (gravity separators, indent cylinders, truck scale). Four extra wagon dryers at Winneba should be moved to Kumasi to provide interior drying capability. Supplemental electricity will be required at both Kumasi and Tamale (as specified in commodity list for Amendment no. 1).
7. USAID should consider purchasing a prefabricated building for the Kumasi plant only after the foundation has been completed and the USAID is satisfied that the necessary equipment is at site or enroute. Ideally, a short-term construction engineer who is familiar with the erection of this type of building should be engaged to oversee the operation.

8. The GSC should explore the possibilities of meeting its vehicular and spare parts needs from international donors or the countries of manufacture of the vehicles.
9. The GOG should assure the GSC an increased supply of fertilizer for the production of foundation seed and certified seed. Additional quantities may be required if further multiplication of seed under irrigation is undertaken.
10. The GSC should not expand its scope of activities to provide custom machanized farm operations. Its farm machinery operations should be restricted to facilities for the Company's multiplication of foundation seed.
11. The Government of Ghana should continue to permit flexibility to the GSC in determining prices for purchasing and selling seeds. Official market prices should be established at least four times during the year.
12. The GSC is encouraged to expand its local production of improved vegetable seeds, and the importation and sale of "exotic" vegetable seeds. Before any importated seeds are shipped from the country of origin, the GSC must be satisfied as to germinability and purity.
13. The GSC should continue its current "soft pedal" publicity approach in the mass media until its supply of rice and maize seed is more able to meet the demand.
14. The MIDAS Project Executive Committee's coordinating functions are no longer vital since MIDAS activities have been narrowed down to only the GSC. In the remaining months of its existence to September 30, 1983, its functions should be handed over to the GSC.

BACKGROUND

The MIDAS I Project was authorized and obligated in FY 76 and consisted of six basic components: (1) credit expansion, (2) fertilizer procurement, (3) processing and distribution, (4) seed multiplication, (5) small farm systems research, and (6) marketing and demonstration/extension (see MIDAS I Document). Due to four changes in governments and deteriorating economic conditions in Ghana, the national scope of MIDAS I proved too complex and was revised (MIDAS II) in August 1980. Even though the scope of MIDAS II was drastically reduced, a fifth change in GOG administration coupled with continued economic decline further impeded successful implementation. This necessitated yet another revision of MIDAS II (Amendment No. I) in which the major purpose was to improve and expand the institutional capability of the Ghana Seed Company into a viable, independent, parastatal profit-making company.

The GSC remains the sole, somewhat successful component of the original MIDAS I project and thus becomes the focus of this evaluation. In the face of yet another change in GOG administration (the sixth during Project implementation) and continuing economic crises, the GSC had managed to maintain a fairly successful performance.

EVOLUTION OF THE GHANA SEED COMPANY

In most of the developed world, the majority of seed production and supply is handled through the private sector. In the developing world, however, incentives are not great enough to encourage the development of a private sector seed industry; hence, governments (public sector) usually undertake the responsibility for producing and distributing seeds.

In Ghana, the initial attempt to provide improved seeds consisted of creating the Hybrid Maize Seed Production Unit (HMSPU) in 1961 to promote and distribute high yielding synthetic maize varieties. In 1962 the name was changed to Improved Seed Multiplication Unit (ISMU) and later to merely Seed Multiplication Unit (SMU) when it became necessary to multiply seeds of other crops as well as maize.

Throughout these early years, the GOG Seed Agencies (HMSPU, ISMU, SMU) transacted all seed production and distribution. However, in 1968, resource shortages (land, equipment, etc.) began to exert serious constraints upon such a wide-scale program, and the SMU was therefore directed to devote its primary attention to the production of foundation seed stocks from breeder seed introduced into the country from various research agencies. Thereafter, the responsibility for further multiplication of foundation seed into certified seed was shifted to the private sector farmers who became certified seed producers (growers) under contract to the SMU. In essence, this was the beginning of the core of certified seed growers in Ghana who were selected for their excellent farming capabilities to produce certified seed under contract to the SMU.

As an organizational component of the GOG Ministry of Agriculture (MOA), the SMU began to experience some typical problems of supply shortages, delays, etc., which were associated with the deteriorating economic conditions of the 1970s. Consequently, in 1978, the Supreme Military Council (SMC) of the GOG promulgated the re-organization of the SMU into a parastatal company, the Gana Seed Company (GSC), which was designed to function along commercial/private enterprise-guidelines. This autonomous "Company" would function without MOA constraints and would respond more effectively to the rising demand for seeds in Ghanaian agricultural development programs.

To accomplish its designated activities, the GSC merely assumed all existing resources, equipment, institutions, programs, etc., which had previously been assigned to the MOA/SMU. The major emphasis in this evaluation exercise will be directed towards determining the status and capability of the recently organized GSC and its ability to produce sufficient quantities of foundation seed on its strategically located foundation seed farms, and to negotiate binding contracts with certified seed growers for the production of adequate supplies of high quality certified seed for wide-spread distribution throughout Ghana. Additionally, the role of the seed processing facilities at Winneba, Kumasi,

Tamale, and Ho will be related to the success of the entire seed program.

PRODUCTION POTENTIAL OF GHANA SEED COMPANY

Total acreages devoted to the major crops (maize, rice groundnuts, sorghum) in Ghana are well documented, and seed requirements to plant these various acreages are also known (see Annex A, Table 1). However, due to the reliance by some segments of Ghanaian farmers, especially the peasantry (small farmer), on their own seeds and also due to the absence of hybrid programs in any of the crops, the actual demand levels for improved seeds are considerably lower than the requirement levels. Nevertheless, the Ghana Seed Company's (GSC) production and supply levels still fall far short of even the actual demand levels.

These shortfalls in seed supplies are attributable in the main to inadequacies in the Seed Industry Infrastructure in Ghana. To overcome this problem, the parastatal, autonomous Ghana Seed Company was authorized to exist in 1978 by a formal decree from the Supreme Military Council (SMC) at that time. It is expected (and planned) that when, over the next four years, the development plans of the GSC are implemented, the essential seed industry areas of drying, processing, storage and transport will have been developed and upgraded to a production capability that will support much higher levels of seed demand.

Production shortfalls, especially since 1981, have also been due to very adverse weather conditions which climaxed in 1983 into a situation bordering on total crop failure, especially with rice. Devastating effects were experienced with many other crops where drought drastically reduced seed yields. For example, where the national average yield for maize in 1974 when Ghana achieved a near surplus production level was about 8 bags/acre, in 1983 the average yield was down to about 3 bags/acre. Indeed, the 1983 rice crop was considered a 95% failure.

In 1981 and 1982, seed shortfalls were compensated for by a "Seed Saving Exercise" initiated by the Ghana Seed Company. Under this scheme, farmers were instructed on simple methods of saving "seed" from their own production. Rice farmers were encouraged to bring their seed stocks to the GSC for cleaning, treating, and even in some instances, for storage. Germination testing (quality control) was provided, and the Extension Service played a significant role by spreading this program information to many farmers.

To supplement the low level of 1983 in-country seed supplies, GSC resorted to "seed" importations. About 200 tons of "seed maize" were air-freighted from Nigeria to augment local supplies. These seeds arrived quite late in the season and did not make much impact as the rains ceased in early July, thus rendering all late plantings useless. In addition, the Nigerian maize tested very low in germination which led to many consumer complaints. The Food and Agricultural Organization (FAO) also brought in 79 tons of rice seeds from Sierra Leone (WARDA). These seeds also arrived too late to impact on the season. Of greater importance, however, was the fact that all of these rice seeds were found to be completely non-viable, and FAO has been advised to investigate this matter.

Production outlook and prospects appear to be improving somewhat for 1984. GSC is seeking additional certified grower participation in order to provide more seed supply to counteract unsuspected weather effects. It is anticipated that maize seed will not be imported in 1984.

The rice seed situation, however, presents a more serious problem, primarily due to the almost total crop failure in 1983. It has also been difficult to work out compensatory arrangements with growers to increase seed supplies. Therefore, GSC has requested that USAID assist in importing additional rice seed. Due to previous experience with unsatisfactory seed importation, GSC now intends to request approximately 1000 tons of rice seed from the International Rice Research Institute (IRRI), a reputable source in the Philippines.

Clearly, the long-term goal of the GSC is to produce sufficient quantities of certified seed in-country to avoid problems of quality, disease and foreign exchange. Further importation of seed will be limited to small quantities of breeder seed and testing materials from co-operating agencies. Thus, with total in-country certified seed production as a goal, GSC facilities (processing, storage, etc.) need to be quickly upgraded. Production arrangements must be made to insure good seed-grower participation for adequate seed supplies, even in bad years. Additional provisions to protect against drought seasons may be available through the MOA/Tono Irrigation Project in the Upper East Region. The GSC is pressing for additional irrigated acreage at various locations for production of foundation seed and also for seed growers to produce certified seed.

Presently, the GSC is capable of producing approximately 20% of the seed demand in Ghana. It is highly unlikely that their capability will increase significantly in the near future without assistance from USAID and/or other donor sources.

The production of foundation seed directly by the GSC does not appear to be a major constraint. Indeed, at times excess foundation seed is sold on the farmer market. A major constraint does exist, however, with the production of certified seed. This is not usually due to a limitation in number of certified growers, but more often projected acreages either fail to materialize due to limitation of equipment or other agri-in-puts (fertilizer, pesticides, water), or significant quantities of seed actually harvested are not accepted by GSC due to low quality standards (sub-germination levels). Production figures for foundation and certified seed in Tables 2 and 3 substantiate the variability of success for three seasons, 1981, 1982, 1983. It must also be pointed out that the projected production figures in these Tables may also be rather optimistic but are based upon assumptions of improved GSC services and more desirable growing seasons.

In reality, the GSC should not attempt to provide any more than 25 - 35% of the total country seed demand. Supplemental multiplication and production programs by auxiliary agencies, companies, individuals, etc., should fulfill the task of supplying the majority of farmer-used seeds. This is as it should be in most all major successful seed programs world-wide. That is, the Government (in this case the parastatal-autonomous GSC) should attempt to provide the limited supply of improved certified seeds from which the private sector then increases these seeds into adequate quantities to meet total country demand.

In the case of Ghana, however, very little, if any private sector seed activity exists; thus, the GSC is attempting to fill this void by expanding its services to all major regions and farming communities in Ghana.

This approach, then, has the tendency to lead to excessive investments in land, labor, equipment, transportation and other associated services which create additional problems of maintenance, supplies and logistics, facilities, etc. Thus, smaller, concentrated foundation and certified seed supplies are considerably more desirable, effective and efficient.

GHANA SEED COMPANY REGIONAL SEED CENTERS

Regional Centers for seed production and distribution in Ghana were identified in the early 1960's, and they are still considered as major sites today. These centralized sites are identified as Winneba, Ho, Kumasi, Tamale and Bolgatanga which are principle cities in each major geographical region in Ghana. These major seed centers serve as central collection and distribution points for those seed produced in the region, and seed-related activities are performed - drying, shelling, cleaning, treating, packaging and subsequent distribution.

During the transformation of the MOA/SMU into the parastatal GSC in 1973, all facilities, assets, personnel and responsibilities of these regional seed centers shifted to the GSC. Hence, the GSC acquired the existing foundation seed farms and all of the related seed equipment and facilities of the regional centers.

The GSC has continued over the past five years, with the assistance of MIDAS project support, to develop its foundation seed farms and the physical facilities of the seed centers in an attempt to meet the demands for foundation and certified seed which now exist in Ghana. Although the design purpose of the MIDAS I Project was to provide cooperative support for the parallel development of the primary seed centers in all five locations, it soon became obvious that this scope of activity was too ambitious. Consequently, a project revision in 1982 reduced the level of project activities and concentrated on selected seed centers where success was more likely during the proposed duration of the project. These selected regions or centers include Winneba, Kumasi and Tamale. Even though equal emphasis has not been possible at all five locations, both the GOG and the GSC have not deviated from their original concept of promoting separate but essential seed activities in all of the major regions in the country.

Description and Potential of Seed Centers to Produce Foundation and Certified Seed

In the previous discussion it was pointed out that five Regional Seed Centers now exist in Ghana. These centers possess varying capabilities for seed production and handling. They are identified as Winneba, Ho, Kumasi, Tamale and Bolgatanga and descriptions of each follow:

Winneba Regional Seed Center: The actual physical facilities of the Winneba Seed Center are located on the outskirts of the city of Winneba and consist of a newly constructed building for shelling, drying, processing and storing foundation and certified seed (primarily maize) for the Central and Western Regions of Ghana. This site has continued to receive the major emphasis as designed in the original MIDAS project, the revised MIDAS II and the Amendment No. I of MIDAS II. As it is the only completely new site, construction constraints, material shortages,

etc., coupled with a multitude of other problems have delayed completion of this unit from its originally anticipated completion date of 7/81 to a projected operational date of 12/84. At present it is considered to be approximately 75 percent complete.

The Winneba Regional Seed Center consists of four batch - type wagon dryers, one continuous-flow column dryer, one seed processing building and one conditioned seed storage unit divided into five separate storage compartments. Three contracting firms are presently working on the site in an attempt to complete the center by December 1984. They are the general contractor, a contractor for the column dryer, and one for installing the processing equipment. The wagon dryers are already functional, and the column dryer, the elevator legs, the Clipper super 68-D air/screen cleaner and the Carter-Day cylinder separators should be completely installed and operational by August 1984. When operational, this equipment has the designed capacity of cleaning about 200 bushels of maize seed per hour which is equivalent to approximately 56 bags (200 lbs.) per hour. Therefore, in an eight (8) hour working shift, the plant could clean 448 bags. Thus, if the major maize harvest season lasts for 60 days, the total capacity of the plant is 26,880 bags for the major season alone. Any minor season production can be added to this output plus the fact the plant can also clean other seeds such as sorghum, cowpeas or even rice if the necessity arises.

An impediment to the total completion of this facility has been the storage unit. The building will likely be completed by 12/84; however, an untimely fire which occurred on January 7, 1983, completely destroyed the air conditioning equipment, three chillers, fire air exchangers and five re-heaters. Unfortunately, these critical items were already on site when an uncontrolled grass fire consumed the equipment. There yet remains a major question of insurance coverage; however, the replacement items have been re-ordered by USAID. The late arrival of this equipment will probably delay the final completion of the storage unit, however, existing temporary storage will be adequate for the 1984 maize crop.

To supply seeds to this new seed center, the GSC has a 120-acre foundation seed farm which is approximately 15 km from the center. This farm has the complete capability of producing sufficient quantities of foundation seed to meet the existing demand for certified seed production. Considering an optimistic production level of 24,000 to 26,000 bags of certified seed, foundation seed production of 350 to 400 bags is quite sufficient. This yield is substantiated by actual production figures (see Appendix Table 2). Any excess foundation seed can be diverted to the market demand channels for certified seed.

Certified maize seed production for this site is provided by contract seed growers and varies considerably from year to year according to rainfall, harvested seed quality, and level of production inputs. The consensus prevails that there is absolutely no problem in acquiring sufficient growers and acreages to provide the essential production

levels of certified seed to accommodate the seed center. For example, the following table is provided to substantiate various situations of production capability.

<u>Example</u>	<u>Seed Center Capability (bags)</u>	<u>Contract Grower Potential (bag/a.)</u>	<u>Required acreage</u>	<u>Number/ac Certified Growers Req'd</u>			<u>Bags Foundation Seed Required @ 20 #/a</u>
				<u>100 a.</u>	<u>200 a.</u>	<u>300 a.</u>	
CASE I	24,000	5	4,800	48	24	16	480
(Minimum)		6	4,000	40	20	13	400
		7	3,500	35	18	12	350
CASE II	26,000	5	5,200	52	26	17	520
(Maximum)		6	4,333	43	22	14	433
		7	3,714	37	19	12	371

The 120-acre foundation seed farm can produce adequate quantities of foundation seed at production levels as low as 3.5 bags per acre. These levels are certainly within reason and are usually exceeded.

As a final addition to the Winneba Seed Center, auxiliary buildings consisting of a headquarters area, spare parts area, canteen, water tower and tank, rest house, two bungalows and a combination field house/research area are scheduled for future completion to compliment the site activities.

Recommendations

1. GSC/EI, with support from USAID, should concentrate all available resources and efforts towards completing the Winneba Seed Center. The operational target date should be o/a 10/84 with a completion date of 2/85.
2. GSC should identify 20-25 participants for a Seed Technology Training Course to be held at the Winneba Center in February, 1985. These should be plant operators and quality control personnel. GSC must show proof of adequate logistical support (per diem, transport, etc.) for the participants as well as daily transport for two instructors.

Ho Regional Seed Center: The Ho Regional Seed Center activities are relatively minor at this time, since production of certified seed in this area is practically non-existent. Thus, the main activities of this center consist simply of receiving, cleaning and storing the foundation seed produced on the satellite farms at Logba and Asikuma. A relatively simple warehouse with a storage capacity of between 400 - 600 bags of maize and one air/screen clipper No. 27 cleaner make up the facilities.

The foundation seed farm at Logba and Asikuma have actually developed production capabilities equal to, or even greater than, those at Kumasi. In reality, then, the excess foundation seed produced here are entering the certified seed market, since certified seed is not being produced.

Foundation seed production records indicate that between 300-700 bags of maize seed can be produced. This level of foundation seed production will sustain a certified seed program consisting of between 3,000 - 7,000 acres. At a production output of 5 bags of certified maize, per acre, then, this area has the capability of producing between 15,000 - 35,000 bags of certified maize.

These optimistic goals, however, will not be achieved in the near future primarily because less emphasis is being placed in this region and also the Ho Center just cannot handle such capacities. Even now, much of the foundation seed is held on location at the satellite farms and moved into the Ho Center at distribution time.

The GSC management has expressed a strong desire to develop the Ho area further, and steps are being taken to overcome the problems encountered with certified growers and certified seed production.

Recommendations

1. GSC should continue to promote the production of certified seed and attempt to obtain more reliable grower response.
2. Observation - GSC Managing Director has received verbal commitment from World Bank of approximately \$40,000 to upgrade drying facilities at Ho. If accomplished, then production output of Ho will be greatly enhanced.

Kumasi Regional Seed Center: The physical facilities of this Center are located within 5 km of Kumasi at Kwadaso and consist of older structures which yet remain from the SMU program. Kwadaso has the major responsibility of producing maize seed for the Ashanti, Brong-Ahafo, and part of the Eastern Regions. A small program in cowpea seed production is just emerging.

At present, Kwadaso has the capability of receiving, shelling, drying, cleaning, bagging and storing approximately 600-800 bags of foundation maize seed and about 4000 bags of certified seed. Even though the facilities are outdated and are dependent largely on hand labor, the Center holds promise for handling this level of seed production.

Operational capability of this Center, however, has recently been severely curtailed due to a disastrous fire which occurred in 1983. The fire apparently ignited in the Lister drying unit and subsequently destroyed the dryer, drying bins and the insulated warehouse. Six hundred bags of certified maize seed were also burned. Thus, the 4000 bag storage room was demolished which has reduced the capacity of this unit to a total of about 400-500 bags. Any overflow is presently being transferred to the Winneba site for storage. A temporary drying operation for the 1983 crop consists of six bins which can dry 45 bags of shelled maize every 72 hours. This represents about 10% of the previous capability, and the other 90% must be sent to Winneba.

The foundation seed for Kumasi (Kwadaso) are produced on two foundation seed farms - one of about 50 acres in immediate proximity to the central center facilities and one additional satellite farm of about 120 acres located at Ejura, about 65 miles from Kwadaso. These combined farms have the capability of producing adequate quantities of foundation seed necessary to meet the certified seed demand. Assuming an optimistic but reasonable certified seed production level of from 8000 to 14000 bags per year, then foundation seed production of 150 to 350 bags per year is quite adequate. This yield capability is substantiated by actual production figures (Annex, Table 2) in which yields of as much as 379 total bags have been recorded (1981). Again, any excess foundation seed can be diverted to the certified seed channels.

Certified maize seed production for this site is provided by contract seed growers, as usual, and varies between 4 to 6 bags per acre, depending upon rain, inputs, etc. General agreement exists, however, that ample numbers of growers and acreages are available to provide production goals of certified seed to supply the Kwadaso Center. The following exercise is submitted as an example of seed demands and outputs when considering either minimum or maximum output levels of the contract growers.

Example	Seed Center capacity(bags)	Contract Grower Potential (bag/a)	Required Acreage	No./Acreage Certified Growers			Bags Foundation Seed Required
				100a.	200a.	300a	
CASE I (Minimum)	8000	4	2000	20	10	7	200
		5	1600	16	8	5	160
		6	1333	13	7	4	133
CASE II (Maximum)	14000	4	3500	35	18	12	350
		5	2800	28	14	9	280
		6	2333	23	12	8	233

This strategy will be successful, however, only if the facilities which were destroyed by fire are replaced. This can be accomplished by replacing the drying and storage facility, by the addition of wagon dryers and by the re-location of the small air/screen cleaner from Tamale.

Recommendations

1. Authorization by USAID and subsequent action by GSC/EI to move the extra four wagon dryers from the Winneba site to Kumasi to provide interim drying capability until repair and replacement unit arrives.

NOTE: Supplemental electricity required as per item on procurement list of Amendment No. 1 - Transformer, substation, 500KV, 1,000/4 33V, 3ph 50HZ PF 1500 RPM.

2. USAID take action to provide a pre-fabricated clear-span metal building (approximately 40' x 80') to be installed on existing site of burned storage structure.

NOTE: Acquisition of this storage building will be contingent upon proof of intent (bill of lading) by GSC of replacement of other necessary items - lister dryer, coolers, repair of foundation, etc.

3. Approval by USAID and action by GSC/EI to repair Clipper No. 27 now at Tamale and move to Kumasi. This will double the cleaning capacity of Kumasi.

Tamale Regional Seed Center: The Tamale Seed Center is located quite near the city of Tamale and is comprised of the earlier facilities of the MOA/SMU program. This center, together with its satellite farms, produces foundation seed of rice, maize, groundnuts, and sorghum for the Northern and Upper Regions. The major effort is devoted to rice seed production, while sorghum production is practically nil. Production of groundnuts is extremely variable and practically non-existent at times.

The essential elements of this Center consist primarily of three storage warehouses of 30,000, 10,000 and 10,000 bag capacity. The 30,000 bag warehouse is usually used for rice, while the 10,000 bag areas are used for maize and groundnuts. Little seed drying is necessary at this location due to the arid conditions and low relative humidity. The seed cleaning units consist of two antique German Petkus-Linde machines which are in dire need of repair but are still used as the sole cleaning unit for rice. Consequently, the troublesome weed, Rothboella, is only partially removed from the rice seed:

The foundation seed farms for the Tamale center are located at Nyankpala (maize), Nabogo and Salaga (rice) and Nyankpala and Namongo (groundnut and sorghum). Of major concern is the fact that Tamale is falling far short of the production level necessary to sustain a viable

rice seed program. As a matter of fact, this center is producing only about 10 - 15% of the certified seed necessary to meet the local demand. The shortfall in rice seed production in recent years has been attributable to excessive drought and has created the necessity to import both foundation and certified seed.

The level of foundation rice seed production of about 800-850 bags is only sufficient for approximately 2,000 acres of certified seed. And at 5-6 bags per acre this will only yield 10,000 to 12,000 bags of certified seed, far short of a target of 30,000 to 40,000 bags annually. Groundnut and sorghum seed production appear to be adequate at present. Many farmers tend to save their own groundnut seed, thus reducing the demand on GSC, and sorghum seed just have not been promoted very much, since most attention is directed to rice and maize.

It appears that the Tamale Center can handle the necessary increase in certified seed production. Regional growers seem to be willing and less dependent on GSC for production inputs. Storage at Tamale is adequate, particularly since drying is not necessary; however, GSC must exercise some precaution with insect control. An air/screen cleaner has been identified on the equipment procurement list (Amendment No. 1) which will greatly enhance the cleaning capacity and efficiency. In addition other items of processing equipment already in country should be transferred to Tamale for effective use in the rice seed program.

Recommendations:

1. USAID approval, GSC/EI action to transfer two Oliver Gravity Tables and two Hart No. 3 Ident Cylinders plus accessory equipment from Winneba to Tamale.

NOTE: This equipment was earmarked originally for Kumasi in MIDAS I/II, but Kumasi site will not be constructed. However, Tamale will require the additional generator power, 100 KVA, 115/240 Caterpillar Model 3304 T2 Diesel as per procurement list in Amendment No. 1.

2. USAID approval, GSC/EI action to transfer Truck Scale (weigh bridge) shallow pit scale - capacity 25 tons (Fairbanks Cardinal) from Winneba to Tamale. This item was also earmarked for Kumasi and will not be needed there.

Bolgatanga Regional Seed Center: This center is located in the extreme Upper Region of Ghana and produces primarily rice seed with a small commitment to groundnuts and sorghum. It relies upon foundation seed production from its satellite farms at Nasia, Vea, Doba, Tono and Namongo. The physical facilities are rather limited, consisting solely of one storage/processing warehouse and two Petkus-Linde cleaners which are remnants of a prior commitment from a German donor program.

There seems to be little opportunity at present to add to or upgrade the capabilities at this site, and it may need to rely on assistance from the Tamale Center for cleaning seed. The low rainfall and low relative humidity in the Bolga area minimizes the necessity for drying seed; thus, the potential for producing high quality seed prevails.

The Bolga site could play a significant role in the near future in rice seed production if irrigated land from the Tono Irrigation Project becomes available. This would greatly enhance the capability of increasing the production of both foundation and certified seed.

From this evaluation there appears to be very little that can be done immediately to provide effective support to the Bolga Center. The GSC is aware of the acute shortage of rice seed production, and they have initiated action to alleviate this crisis.

ANNEX A

Demand for Certified Seed
Foundation Seed Production
Certified Seed Production

ANNEX B

Revised List of GSC Commodities to be Purchased

ANNEX C

1986 Possible Add-on Projects

Table 1. Demand for Certified Seed of Improved Varieties in Ghana

CROP	Expected ^{1/} Yield (bag/a)	Total National Acreage (000)	Seeding Rate (lb/a)	Nat'l Seed Requirement (bag)	Expected ^{2/} Farmer Replacement Rate (% per yr.)	Estimated ^{3/} Farmer Requirement (bag)	Estimated ^{4/} Farmer Demand (bag)
MAIZE	5	1,200	20	120,000	33	40,000	48,000
RICE	8	180	70	90,000	50	45,000	72,000
GROUNDNUT (UNSHELLED)	5	350	80	350,000	25	87,000	35,000
SORGHUM	4	360	15	30,000	5	1,500	1,500

^{1/} MAIZE = 200 lb/bag; RICE = 170 lb/bag; GROUNDNUTS = 80 lb/bag (unshelled); SORGHUM = 180 lb/bag

Expected yields based upon production figures supplied by GSC in optimum years of rainfall and adequate inputs.

^{2/} Expected farmer replacement rate based upon data derived from MSU development assistance.

^{3/} Estimated farmer requirement - read: expected farmer replacement rate (%) x national seed requirement.

^{4/} Estimated farmer demand based upon actual demand calculations supplied by GSC managing director.

TABLE 2. Foundation Seed Production - Acreage, Location, Production

CROP	LOCATION	ACREAGE			SEEDING RATE(lb/a)	BREEDER SEED REQUIRED (bag)			TOTAL PRODUCTION (bags/(bag/A))			\bar{x}	POTENTIAL PRODUCTION (bag/(bag/A))			\bar{x}	
		1981	1982	1983		1981	1982	1983	1981	1982	1983		1984	1985	1986		
MAIZE	WINNEBA																
	Okyereko	70	35	100	20	7	3.5	10	467(7)	171(5)	329(3)	5	600(5)	720(6)	840(7)	6	
	HO																
	Lobga	60	80	100	20	6	8	10	314(5)	546(6)	620(6)	6	700(7)	800(8)	900(10)	3	
	Asikuma	10	20	50	20	1	2	5	30(3)	105(5)	134(6)	5	250(5)	300(6)	400(8)	6	
									(344)	(651)	(754)						
	KUMASI																
	Kwadaso	25	25	12	20	2.5	2.5	1.2	128(5)	126(5)	34(3)	4	240(6)	280(7)	320(8)	7	
	Ejura	40	40	15	20	4	4	1.5	251(6)	239(6)	47(3)	5	700(7)	800(8)	900(9)	8	
									(379)	(365)	(81)						
TAMALE																	
Nyankpala	65	50	20	20	6.5	5	2	401(6)	201(4)	72(4)	5	500(5)	600(6)	700(7)	6		
BOLGTANGA																	
Tono	10	10	10	20	1	1	1	51(5)	7(.7)	2(.2)	2	315(7)	360(8)	450(10)	8		
TOTALS		280	260	307					1642	1395	1238		3305	3860	4510		
RICE	TAMALE																
	Nabogo	150	100	55	70	75	50	27.5	1116(7)	516(5)	209(4)	5	1600(8)	1800(9)	2000(10)	9	
	Salaga	-	-	100	70	-	-	50	-	-	493(5)	5	1600(8)	1800(9)	2000(10)	9	
											(702)						
	BOLGATANGA																
	Nasia	10	50	30	70	5	25	15	39(4)	335(7)	92(3)	5	1400(7)	1800(9)	2000(10)	9	
TOTALS		160	150	185					(1115)	(851)	(794)		4600	5400	6000		

Table 2. Foundation Seed Production - Acreage, Location, Production (Continued)

CROP	LOCATION	ACREAGE			SEEDING RATE(lb/a)	BREEDER SEED REQUIRED (bag)			TOTAL PRODUCTION (bags/(bag/A))				POTENTIAL PRODUCTION (bag/(bag/A))			
		1981	1982	1983		1981	1982	1983	1981	1982	1983	\bar{x}	1984	1985	1986	\bar{x}
GROUNDNUT	TAMALE															
	Nyankpala	5	10	0	80	5	10	0	28(6)	43(4)	0(0)	3	60(6)	70(7)	80(8)	7
	Namongo	<u>0</u>	<u>5</u>	<u>1</u>	80	0	5	1	<u>0(0)</u>	<u>24(5)</u>	<u>3(3)</u>	3	<u>30(6)</u>	<u>35(7)</u>	<u>40(8)</u>	7
TOTALS		5	15	1					28	67	3		90	105	120	
SORGHUM	TAMALE															
	Nyankpala	3	1	0	11	33 lbs	11 lbs	0	13(4)	2(2)	0(0)	3	15(3)	25(5)	30(6)	5
	Namongo	<u>0</u>	<u>1</u>	<u>3</u>	11	0	33 lbs	11 lbs	<u>0(0)</u>	<u>2(3)</u>	<u>12(4)</u>	3	<u>15(3)</u>	<u>25(5)</u>	<u>30(6)</u>	5
TOTALS		3	2	3					13	4	12		30	50	60	

TABLE 3. CERTIFIED SEED PRODUCTION - LOCATION, GROWERS, ACREAGE, PRODUCTION

CROP	LOCATION	NO. GROWERS			ACREAGE			SEEDING RATE(1b/A)	FOUNDATION SEED REQUIRED (bags)			TOTAL PRODUCTION bag/(bag/a)			x	POTENTIAL PRODUCTION bag/(bag/a)			x̄
		1981	1982	1983	1981	1982	1983		1981	1982	1983	1981	1982	1983		1984	1985	1986	
MAIZE	Winneba	12	18	40	240	364	970	20	24	36	97	1410(6)	1558(5)	3158(3)	5	9000(6)	10500(7)	12000(8)	7
	Ho	9	1	1	40	30	48	20	4	3	5	270(7)	183(6)	220(5)	6	3500(7)	4000(8)	4500(8)	8
	Kumasi	12	12	18	216	211	1076	20	21	21	107	1300(6)	1100(5)	4304(4)	5	12000(6)	14000(7)	16000(8)	7
	Tamale	4	20	25	18	83	280	20	2	8	28	100(6)	400(5)	1119(4)	5	3000(6)	3500(7)	4000(8)	7
	Bolga	<u>5</u>	<u>5</u>	<u>20</u>	<u>102</u>	<u>112</u>	<u>322</u>	20	10	11	32	<u>630(5)</u>	<u>600(5)</u>	<u>1447(5)</u>	5	<u>2400(6)</u>	<u>2800(7)</u>	<u>3200(8)</u>	7
Totals		42	56	104	616	800	2996					3710	3841	10248		29900	34800	39700	
RICE	Tamale	25	45	37	213	1069	314	70	106	534	157	1600(8)	6740(6)	1412(5)	6	32000(8)	36000(9)	40000(10)	9
	Bolga	<u>12</u>	<u>15</u>	<u>21</u>	<u>618</u>	<u>706</u>	<u>390</u>	70	309	353	195	<u>3830(6)</u>	<u>3532(5)</u>	<u>1880(5)</u>	5	<u>10500(7)</u>	<u>12000(8)</u>	<u>13500(9)</u>	8
	Totals	37	61	58	831	1775	704					5430	10272	3292		42500	48000	53500	
GROUND-RUT	Tamale	30	50	20	204	192	700	80	204	192	700	1230(6)	996(5)	2865(4)	5	4200(7)	4800(8)	5400(9)	8
	Bolga	<u>1</u>	<u>5</u>	<u>5</u>	<u>2</u>	<u>22</u>	<u>126</u>	80	2	22	126	<u>10(7)</u>	<u>116(5)</u>	<u>595(5)</u>	7	<u>2450(7)</u>	<u>2800(8)</u>	<u>3150(9)</u>	8
	Totals	31	55	25	206	214	826					1240	1112	3460		6650	7600	8550	
SORGHUM	Bolga	0	6	0	0	17	0	10	0	7	0	0	74(4)	0		200(5)	240(6)	280(7)	6

ANNEX B

REVISED LIST OF GSC COMMODITIES TO BE PURCHASED

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>SOURCE</u>	<u>PRICE CIF (\$000)</u>
1	Air/Screen Cleaner Clipper Model 147 BD with 13 Ft. Ht. Tandem Elevators	Blount Agri Business Group Ferrell - Ross Saginaw, Mich.	23.0
16	Replacement Cylinders for Hart No. 3 Indent Cylinder Separators Size 11 - 8 each Size 13 - 8 each	Carter-Day Eqpt. Co. Minneapolis, MN	10.0
1	Seed Treater Model S-100 SS	Seedburo Eqpt. Co. Chicago, IL	5.0
1	#5 Western Combined Maize Shelter/ Cleaner	Union Iron Works	16.0
2	Portable Bag Closers Model D, Fischbein	Dave Fischbein Company	2.5
2	Platform Scales Double Beam - Metric		1.5
2	Two Wheel Minneapolis Type Bag Truck		.40
5	Aluminium Grain Shovel		.15
3	Cast Aluminium Scoops		.03
1	Hand Electric Blower, Seedburo Model No. 9880		0.50
4	Bag Holders - Two Way Seedburo, Gripmasters Model No. 13		.80
3	Bag-Tag Staplers (ACE MODEL NO. 78200(82))		0.10
1	Air Compressor (Portable Electric) Heavy duty, capacity tank 20 gallons	Mc Master Carr Catalogue 88	<u>1.5</u>
		Sub-Total	61.48

VEGETABLE SEED PROCESSING EQUIPMENT

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>SOURCE</u>	<u>PRICE CIF (\$000)</u>
2	Wet Vegetable Seed Separator		4.0
			—
		Sub-Total	4.0

ELECTRICAL EQUIPMENT FOR KUMASI, TAMALE

1	Transformer, Substation, 500 KVA, 11,000/433V, 3ph 50 HZ PF 1500 RPM	From Code 899	40.0
1	Generator, 100 KVA, 415/240 Caterpillar Model 3304 T2 Diesel Set	From Code 899	35.0
			—
		Sub-Total	75.0

FARM MACHINERY REQUIREMENT

5	Offset-Disc Harrow, Width to be 10'-4" with notched 26" diameter blades Mounted to fit Category II 3-point Hitch (425 lbs. wt. per foot of cut) @ \$15,000	1) IH Model 770	75.0
3	Flail-Type Stalk Shredder, Four Row - 40" Capacity cutting width 168" @ 6,500		19.5
3	300 gal - 28 ft. beam 3-point Hitch - Sprayer Agitation @ \$2,000		6.0

FARM MACHINERY CONTINUED

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>SOURCE</u>	<u>PRICE CIF (\$000)</u>
5	Wagons-Running Gear and Barge Boxes 10 Ton Rated Gear @ \$3,000	1) Model RGE-10T Unverferth MC Curdy, Kalida, Ohio	15.0
2	Low Boy Trailer @ \$6,000		12.0
3	Plough-Disc Type, 4 Bottom, 28" Diameter Blades, Davis Disc Plow @ \$7,500	Tractor Plough Co. Stockton, CA Previous procurement PIO/C-0102-9-00046	22.5
3	Rear Mounted Blade for Attachment to Model 3288 IH Tractor - 9 ft. Heavy Duty (12 hp) - 3 positions Adjustable-Tilt, PIVOT, Swing @ \$3,000	Equivalent to IH Model 50 Blade	9.0
5 sets	Dual Wheels and Tires for tractors IH 3288 @ \$3,000	IH 3288 Model	15.0
2	Corn Planter, Trailing Type, 4 row Plate type - Early Riser @ \$12,000	Same as previously supplied	24.0
		Sub-Total	198.0
<u>SPARE PARTS FOR FARM MACHINERY AND TRACTORS</u>			
	Spare Parts for Fram Machinery & Tractors		50.0
		Sub-Total	50.0

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>SOURCE</u>	<u>PRICE CIF (\$000)</u>
<u>SPARE PARTS REQUIREMENT</u>			
	Spare Parts for Trucks		9.0
	Spare Parts for Crew Cab and Suburban		<u>2.5</u>
		Sub-Total	11.5
	Spare Parts for Clipper 27 Seed Cleaner At Tamale		<u>3.0</u>
		Sub-Total	3.0
<u>PESTICIDES</u>			
a. <u>HERBICIDES</u>			
500 pints	Treflan 4EC (Trifluralin)	Elanco Products	3.0
	Eradicane (EPTC)	Stauffer Chemical Co.	20.5
To be in one or 5 gallon containers	Prowl (Stomp)	American Cyanamid Co.	10.5
	Sutan	Chystal Chemical Inter-American	<u>16.5</u>
		Sub-Total	\$50.5
b. <u>INSECTICIDE</u>			
In quart or litre ship amount	equi-Bacillus Thuringiensis	Abbot Laboratories Chemical & Agric. Prod. Div.	1.1
"	Carbaryl (Sevin)	Union Carbide & Agric. Prod. Div.	6.3
"	Diazinon	Ciba-Geigy Corp. Ag. Division	6.3
"	Malathion	American Cyanamid Co.	4.2
"	Phostoxin	Degesch American, Inc.	<u>7.4</u>
		Sub-Total	25.3

EQUIPMENT REQUIREMENT FOR QUALITY CONTROL DIVISION

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>SOURCE</u>	<u>PRICE CIF (\$000)</u>
1	Tag Printer, manually operated Stielow E-10	Addressograph Errington Inc.	1.4
6	Desk Calculators, 200 volt w/printed read out tape	Canon U.S.A.	.42
2	Laboratory Scales, 3-beam	Seedburo Equip. Co.	.28
2 sets	Hand screens, 9" 12 sieves with bottom pan storage rack	Seedburo Equip. Co.	.42
10	Moisture Meters, portable, DC-9 Dole 400	"	3.5
6	Bag Triers, 9" x 1" diameter	"	.17
5	Grain Probe 40" x 1 3/4" diameter	"	.56
576	Sample Containers 1/2 gallon plastic	"	.9
5	Graduated Cylinder, 50 ml Polypropylene	Scientific Kit Inc. N.Y.	0.070
6	Erlmeyer Flask 100 ml	"	0.035
6	Erlmeyer Flask 500 ml	"	.025
120	Petri Dishes 4" diameter	Seedburo Equipment Co.	.30
1	Microscope Slides, plastic Laboratory Pack 50 slides	Scientific Kit Inc. N.Y.	0.015
5	Portable Balance, 101 gm capacity x 0.01 gram	"	.70
		Sub-Total	<u>8.795</u>

CONSULTANT TEAM'S OFFICE EQUIPMENT & SUPPLIES

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>SOURCE</u>	<u>PRICE CIF (\$000)</u>
4 doz	Legal pads, 8" x 12 1/2" canary color	Ginns	.042
15	Plain 3-ring binder, color green, 2	Vulcan Binder Cover Company	.060
48 sets	Plain tabs, standard 3-hole punched	"	.021
1	Three hole paper punch heavy duty	Ginns	.041
100 shts	Graph paper - drawing size 11 1/2 x 16 1/2	"	.020
1 doz	Assorted colors set pencils #5030023	"	.005
4 doz	No. 2 lead pencils	"	.010
300	Coin envelopes, No. 93/7/8" 8/7/8"	"	.011
2	Desk Staplers, Swingline	"	.027
2	Swingline staples	"	.007
2	Tape dispenser	"	.011
5 rolls	Cellophane tape 3/4" wide 1"	"	.005
5 rolls	Transparent scotch tape 1/2" wide	"	.009
2	Hand-held calculators, battery operated	Sears Roebuck & Company	.042
2	Aluminum rulers, 15", 8ths and 16ths	Ginns	.007
5 doz	Bic pens, blue	"	.024
5 doz	Papermate pens	"	.028
10	Refills for paper mate pens	"	.013
5	Wipe-out correction fluid	"	.008
		Year I Sub-Total	<u>.391</u>
		Year II Sub-Total	<u>.450</u>
		SUB-TOTAL	\$.841

EQUIPMENT MAINTENANCE (LOAN)

	(KUMASI)	(TAMALE)	
Mechanics tools	\$17.25	\$20.0	
Shop Equipment	<u>\$45.0</u>	<u>\$50.0</u>	
	\$62.5	\$70.0	Sub-Total <u>\$132.3</u>

SEED CENTER - RAW MATERIAL (LOAN) BAGS

Polypropylene Pellets	(NOTE: GSC would like to purchase bags instead of mfg. here)		
for the manufacture of seed bags			
	<u>\$90.00</u>		Sub-Total \$ <u>90.0</u>
Certified rice seed from IRRI			\$350.0
Foundation rice seed from IRRI			<u>33.0</u>
			Sub-Total \$383.0

PROCUREMENT OF OFFICE SUPPLIES NOT AVAILABLE IN GHANA (LOAN)

(\$000)

3.0

Sub-Total \$3.0

SPARE REPLACEMENT PARTS - SEED GERMINATORS\$2.5

Sub-Total \$2.5

FUNDING FOR PROCUREMENT OF VEGETABLE SEEDS (LOAN)\$263.0

Sub-Total \$263.0

**Funding for pre-fab building - Kumasi \$100.0

Sub-Total \$100.0

GRAND TOTAL	1,362,216
	+ <u>100.000</u>
	<u>1,462,216</u>

ANNEX C

1986 Possible Add-on Projects

Since the inception of MIDAS I, considerable quantities of vehicles, farm machinery and implements, seed cleaning and assorted accessory equipment have been procured through USAID assistance. It has become quite apparent that the GSC has neither the personnel nor facilities to provide proper maintenance, repair and supervision for this investment. Often, vehicles and equipment may remain out of service for months due to improper maintenance and repair or lack of spares.

Some relief has been experienced in recent months with the arrival of much needed spare parts. However, these have not been properly inventoried or dispersed to locations of need. Therefore, it seems quite logical that another dimension could be added to the GSC which would effectively increase its capability as a viable "Seed Company".

- I. It is suggested, therefore, that USAID consider providing assistance to GSC by establishing a repair and maintenance center, preferably located at the Kumasi Seed Center site, for the purpose of providing the much needed repair and maintenance which is presently lacking in Ghana. It is also proposed that this major maintenance and repair unit be supported by a Mobile Unit which would have the capability and flexibility to respond rapidly to emergency situations which develop at the strategic Seed Center sites. Already on the procurement list of Amendment No. 1 are two low-boy trailers which will be capable of transporting either vehicles or farm equipment from Seed Center sites to the repair unit at Kumasi when major repair cannot be performed by the mobile unit.

The establishment of such a service will assist in extending the life of vehicles and equipment already acquired by GSC. The economic analysis of the current evaluation also supports the projected need to maintain the fixed assets of the GSC.

It is conceivable that such a project could easily tie in (ribbon effect) with the on-going (ITTU and TTC projects at Kumasi). The Suame Magazine district of Kumasi could also play a significant role in supplying needed parts and repair facilities for the proposed mechanization unit.

Technical assistance (ag-mechanic) for a period of at least two years will be advisable. Such an individual may be available through existing in-country Peace Corp program, trained Ghanaian Technicians in place at Suame Magazine or from U.S. contractors.

<u>Recommendations</u>	<u>Est. Cost</u>
1. USAID provide a pre-fab structure (clear span, approx. 40' x 80' for repair and maintenance shop)	\$100,000
2. Procure mechanics tools and equipment	60,000
3. Procure and equip a mobile repair unit	50,000
4. Technical assistance contract on-site mechanic - 2 years	220,000
	<hr/>
	\$430,000

II. The Ghana Seed Inspection Service (GSIS) was originally envisioned as a necessary entity in the overall design and implementation of the Seed Industry in Ghana. Such an impartial agency is advisable for routine quality control programs, particularly when more than one seed production agency exists within a country. Until now the GSC has developed and utilized its own quality control section, since it has been the primary seed production agency within the country. It is anticipated that other production agencies may enter the seed business in the near future, particularly if seed production and distribution become a profitable venture.

The GSIS, as originally envisioned, never developed. Facilities, personnel and logistical support were delayed, and previously procured items earmarked for GSIS were subsequently incorporated in the GSC program.

The need continues to exist, however, for the establishment of the GSIS. Renewed efforts by GOG (meeting in Kumasi) indicate that interest in forming the GSIS may be revived. If this, in fact, does occur, then USAID could resume its support for this agency.

It is therefore proposed that USAID consider, as a second possible add-on project (1986), providing support to the establishment of GSIS and training for its staff.

<u>Recommendation</u>	<u>Est. Cost</u>
1. USAID provide necessary funds for procurement for equipment and supplies for a single GSIS laboratory and office in Accra.	\$50,000
2. Participant training for 2 participants (short-term - 3 mo.) per year for 2 years	\$32,000
	<hr/>
	\$82,000