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PW (2)

DEPARTMENT OF STATE
BUREAU OF INTERNATIONAL ORGANIZATION
WASHINGTON, D.C. 20523

PROJECT PAPI

Proposal and Recommendations
For the Review of the
Development Loan Committee

GHANA - MIDAS Program for Small Farmer Development

641-11-999-067

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

UNCLASSIFIED
AID-DLC/P-2149
March 24, 1976

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: GHANA - MIDAS Program for Small Farmer Development

Attached for your review are the recommendations for authorization of a loan to the Government of Ghana of not to exceed Ten Million United States Dollars to develop an institutionalized, coordinated system to provide improved agricultural inputs and services to small farmers on a timely and regular basis. Inputs and services provided under the project are: improved on-farm storage, credit, fertilizer, seeds, intermediate technologies, and extension and marketing services.

The loan is scheduled for consideration by the Development Loan Staff Committee on March 29, 1976 at 2:30 p.m. in Room 3886 NS; please note your concurrence is requested at the end of the meeting. If you are a voting member a poll sheet has been enclosed for this purpose.

Development Loan Committee
Office of Development Program Review

Attachments:
Summary & REcommendations
Project Analysis
Annexes

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT PAPER FACESHEET TO BE COMPLETED BY ORIGINATING OFFICE	1. TRANSACTION CODE (X) APPROPRIATE BOX <input checked="" type="checkbox"/> ORIGINAL <input type="checkbox"/> CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE	PP DOCUMENT CODE 3
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2. COUNTRY/REGIONAL ENTITY/GRAANTEE	3. DOCUMENT REVISION NUMBER
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4. PROJECT NUMBER 641-0067	5. BUREAU A. SYMBOL AFR B. CODE 01	6. ESTIMATED FY OF PROJECT COMPLETION FY 18 0
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7. PROJECT TITLE - SHORT (STAY WITHIN BRACKETS) <input type="checkbox"/> MIDAS Program for Small Farmer Devel. <input type="checkbox"/>	8. ESTIMATED FY OF AUTHORIZATION/OBLIGATION A. INITIAL ^{NO. YR.} 7 6 B. FINAL FY 7 9
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9. SECONDARY TECHNICAL CODES (MAXIMUM SIX CODES OF THREE POSITIONS EACH)					
011	043	014	019	012	

10. ESTIMATED TOTAL COST (\$000 OR EQUIVALENT, \$12 _____)						
A. PROGRAM FINANCING	FIRST YEAR			ALL YEARS		
	B. FY	C. L/C	D. TOTAL	E. FY	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	11,758.7	95.5	11,854.2	34,365.7	414.6	34,780.3
(GRANT)	(1,758.7)	(95.5)	(1,854.2)	(4,365.7)	(414.6)	(4,780.3)
(LOAN)	(10,000)		(10,000)	(30,000*)		(30,000*)
OTHER 1. Peace Corps	75		75	225		225
U.S. 2.						
HOST GOVERNMENT		2,660	2,660		16,778	16,778
OTHER DONOR(S)						
TOTALS	11,833.7	2,755.5	14,589.2	34,590.7	17,192.6	51,783.3

11. ESTIMATED COSTS/AID APPROPRIATED FUNDS (\$000)										
A. APPROPRIATION ALPHA CODE	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE	FY 76		FY 77		FY 78		ALL YEARS	
			D. GRANT	E. LOAN	F. GRANT	G. LOAN	H. GRANT	I. LOAN	J. GRANT	K. LOAN
FN	102	010	1,854.2	10,000	54		1,363	10,000	4,780.3	30,000*
TOTALS										

12. ESTIMATED EXPENDITURES	162	10,000	271		1,268	10,000
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13. PROJECT PURPOSE(S) (STAY WITHIN BRACKETS) CHECK IF DIFFERENT FROM PID/PPP

To develop an institutionalized, coordinated system to provide improved agricultural inputs and services to small farmers on a timely and regular basis. Inputs and services provided under the project are: improved on-farm storage, credit, fertilizer, seeds, intermediate technologies, and extension and marketing services.

14. WERE CHANGES MADE IN THE PID/PPP FACESHEET DATA NOT INCLUDED ABOVE? IF YES, ATTACH CHANGED PID AND/OR PPP FACESHEET. Yes No

15. ORIGINATING OFFICE CLEARANCE	16. DATE RECEIVED IN AID/W. OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
SIGNATURE	
TITLE (for) <i>Quasi L. Daniels III for</i> Director, USAID/Ghana (Ref. Accra 2107)	DATE SIGNED
	NO. DAY YR.

AID 1330-4 (5-75)

* PP revisions will justify subsequent \$20,000 in loans.

**GHANA MANAGED INPUTS AND DELIVERY OF AGRICULTURAL SERVICES PROGRAM
FOR SMALL FARMS DEVELOPMENT
(MIDAS)**

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ABBREVIATIONS

ADB	Agriculture Development Bank
AID/G	AID Grant Funding
AID/L	AID Development Loan Funding
BOG	Bank of Ghana
BP	British Petroleum
CSIR	Council for Scientific and Industrial Research
DAP	Development Assistance Plan
DERPS	Division of Economic Research and Planning Services
FAAD	Farmer Associations and Agribusiness Development
FLO	Farm Loan Office
FY	Fiscal Year
FYP	Five Year Plan
GFC	Ghana Fertilizer Company
GNTC	Ghana National Trading Corporation
GOG	Government of Ghana
MEP	Ministry of Economic Planning
MOA	Ministry of Agriculture
MSU	Mississippi State University
MT	Metric Ton
NRC	National Redemption Council
OFY	Operation Feed Yourself
PP	Project Paper
PPT	Planned Performance Tracking Chart
PRP	Project Review Paper
SFDP	Small Farmer Development Program
SMU	Seed Multiplication Unit

TVA	Tennessee Valley Authority
UAC	United African Company
UG	University of Ghana
USAID/G	USAID/Ghana
UTC	United Trading Company

I. SUMMARY

Borrower:

Government of Ghana

Grantees/Implementation Agents:

Ministry of Economic Planning (MEP)

Agricultural Development Bank (ADB)

Bank of Ghana (BOG)

Ghana Fertilizer Company (GFC)

Ministry of Agriculture (MOA)

University of Ghana (UG)

Proposed Amount of Loan:

U.S. \$10.0 million

Terms of Loan:

AID Standard Concessional Terms:

40 years with grace period of 10 years;

2 percent interest rate during grace period;

3 percent during remaining 30 years;

Repayment in U.S. dollars.

Proposed Amount of Grant:

U.S. \$4.7802 million

Financial Plan:

FY 1976 Obligations:
(\$000)

	<u>Foreign Exchange</u>	<u>Local Cost</u>	<u>Sub-Total</u>
A.I.D. Loan	\$ 10,000.0	-	\$ 10,000.0
A.I.D. Grant	1,758.7	95.5	1,854.2
GOG Contribution (FY 76-77 expenditures)	-	6,586.0	6,586.0
SUB-TOTAL	\$ 11,758.7	6,681.5	18,440.2

Purpose of Project:

To develop an institutionalized, coordinated system to provide improved agricultural inputs and services to small-scale farmers on a timely basis, particularly in areas served by ADB's new Farm Loan Offices (FLOs).

Project Development Team:

USAID/Ghana:

Augustus Chinbuah, Economic Specialist

Louanne Douris, International Development Intern

Michael Fuchs-Carsch, Agricultural Economic Advisor

Oleen Hess, Food and Agriculture Officer

AID/W:

Rene Daugherty, Program Economist, AFR/DP

Alvin Harding, Agricultural Economist, TA/AGR

Kenneth Sherper, Agricultural Economist, AFR/DS

John Wooten, Project Design Officer, AFR/DS

Date of Submission:

December 23, 1975

Currency Equivalents:

U.S. \$ 1.0 = Cedi 1.154

A. Description of Project:

The Agricultural Assessment of the DAP has identified one overall constraint which must be overcome before agricultural production of the Ghanaian small-scale farmer can be significantly increased. This constraint is the lack of coordinated effort on the part of the institutions serving farmers to provide agricultural inputs and services to large numbers of small-scale farmers on a regular and timely basis. Further sub-sector studies have pointed out the particular problems faced by these farmers in specific sub-sectors. These are insufficient access to credit, fertilizer, improved seeds, marketing, applied research, extension services and intermediate technology. In addition, there is need to improve the mechanism for developing and testing agronomic and storage practices which are relevant to small-scale farming.

In response to these problems, this project is designed to strengthen the capability of existing institutions which are now serving the agriculture sector to extend their services to more small-scale farmers in order to increase their production and incomes. The institutions to be affected are both private and public, in concert with a recommendation in the DAP that, in addition to the Ministry of Agriculture, all relevant institutions be used if USAID is to actively assist the Government of Ghana in implementing a small farmer development strategy.

The project consists of six basic components: credit expansion, fertilizer procurement, processing and distribution, seed multiplication, small farm systems research, marketing and demonstration/extension including

appropriate emphasis on the role of women. Therefore the impact on the small farmers will be of a broad nature. The outputs of the fertilizer and seed multiplication components will be made accessible to as many farmers as possible. The credit component will provide funds specifically to small farmers cultivating 10 acres or less so that they will be able to afford and purchase these inputs. The extension/demonstration component will be geared specifically towards the small farmer. The marketing and research components will also be geared towards the needs of the small farmer but, unlike the previous components which will be implemented nationwide, will be undertaken on an experimental basis in a limited geographical area before replication to other areas in Ghana. Special efforts will be expended on integrating and coordinating the work programs of all implementing institutions/agencies to achieve maximum impact of all components.

The seed multiplication, research and extension/demonstration components will be implemented by the Ministry of Agriculture with support from the University of Ghana in respect of the extension/demonstration component. The credit, fertilizer and marketing components will be implemented by the Agricultural Development Bank (ADB), the Ghana Fertilizer Company (GFC) and the Bank of Ghana (BOG), respectively. The BOG will have the additional roles of managing the foreign exchange allocations to the program and in advancing working capital requirements to the ADB in amounts equal to local currency generated by the sale of small farm equipment, fertilizer, etc.^{1/} imported under successive loans in support of this program.

^{1/} Raw materials required for domestic production of tools and equipment at the intermediate technology level.

A Permanent Advisory Committee will be established under and chaired by the Ministry of Economic Planning to coordinate the project components, monitor progress and make recommendations for ongoing program adjustments. It will be responsible for ensuring that the project resources will be effectively used to attain the project purpose, with special emphasis on reaching the small-scale farmer. Committee members will include representatives from the Ministry of Economic Planning, Ministry of Agriculture, Bank of Ghana, Agricultural Development Bank, Ghana Fertilizer Company and USAID/Ghana.

The project has a six-year development period which consists of three two-year phases. The PP seeks approval and authorization of a \$10.0 loan and a \$4.78 million grant. The loan will be obligated and disbursed over Phase I (FY 76-77). The grant will be obligated and disbursed over the life of project. The PP also seeks commitment for two additional loans of \$10.0 million each and a grant of \$1.13 million to be obligated for disbursement during Phase II (FY 78-79). Although a Phase III (FY 80-81) is envisaged in the development period, the PP does not seek firm commitments at this time.

Summary Judgment:

Based on the analysis contained herein, the Project Development Team recommends that an initial loan be authorized in FY 1976 for the amount of \$10,000,000 to the Government of Ghana, that a grant in the amount of \$4.8 million be authorized, and that \$1.854 million of the grant be obligated in FY 1976 to the various grantees for Phase I of the project to develop a coordinated system which will provide requisite agricultural inputs and services to small farmers on a regular and timely basis. The need for such a system, as well as the appropriateness of the strategy of developing

and strengthening the capabilities of both private and public institutions, has been well documented in the Agricultural Assessment of the DAP. The need for the loan has been demonstrated in Section III.D. The capacity of the implementation agents to implement the project effectively has been demonstrated in Section IV.A.

The project meets all applicable statutory criteria as shown in Annex H, and has been certified by the Mission Director as a reasonable project which can be effectively implemented by various action agents (Annex I).

B. Project Issues:

A meeting was called on December 12, 1975 by the Commissioner, Ministry of Economic Planning, with all GOG implementing agencies and USAID participating to discuss policy and issues of the MIDAS project proposal. Prior to this, the Commissioner of Agriculture and agency representatives met with USAID to review operating plans and outstanding issues. This meeting confirmed MOA's support for the program and facilitated joint action with ADB and other agencies. Over the past year, USAID and the participating agencies of the Government of Ghana reviewed survey reports prepared on the various components of the MIDAS/Small Farmer Development Project and designed these into an integrated, coordinated development project. The implementing agencies of the government are in agreement with the technical design of the project. A few points, mostly policy, required clarification so that the project proposal document could be completed for authorization by AID/Washington. Confirmation or clarification of government views on the following points, plus any it may have

identified, were requested to facilitate USAID's moving ahead:

1. The Government of Ghana's interest and concurrence in AID's proceeding with approval of the project with its commitment to the concept of focusing project activities on assisting Ghana's small farmers in increasing their production and income and improving their general welfare. GOG, including all implementing agencies and MEP, approved the proposal and agreed that action should be taken to obtain AID/W approval as rapidly as possible following which the project and loan agreements could be prepared and signed. The GOG intends to have the project featured in its new Five Year Development Plan which will be issued in early 1976.

2. The establishment of an inter-agency project coordinating committee, its role, functions, responsibility and authority--an essential function since coordination and integration of the project's component activities from the national down to the local village level are imperative to the success of the project. The GOG concurred in the importance and the establishment of the committee and appointed an MEP officer as chairman with representatives from each of the implementing agencies. The committee's role, functions, responsibility and authority will be specifically determined in meetings of the committee, but indications are they will be in line with the role as described in the PP. The Commissioner of Agriculture emphasized the importance of having local coordinating committees in each of the areas where ADB branches and FLOs were to be established,

3. Increasing the interest rate of ADB loans and the spread between the interest rate paid by the ADB for working capital and the interest rate ADB charges on its loans. The current interest rate on

loans and the spread allowed the ADB are inadequate to finance its operations and develop a viable credit institution. The spread is more important than the maximum interest rate.

All implementing agencies and the MEP agreed that the ADB required an adequate spread between cost and return on working capital. The specific spread and lending rates were not stated but in previous discussions a minimum spread of 3-3½ percent and a lending rate to small farmers of between 10 and 12 percent were specified. Discussions and indications were to the effect that final figures would fall within these ranges. The Commissioner stated acceptable rates would be specified by GOG. They require the approval of the Supreme Military Council. The rates will be stated in the project and loan agreement.

4. The policies relating to fertilizer pricing, uniform pricing rates, subsidies, mark-up rate for distributors/marketers, distribution/marketing arrangements, and management plans. These matters were discussed at this meeting and at the meeting called December 11, 1975 by the Commissioner, Ministry of Agriculture, with all implementing agencies and USAID attending.

At the MOA meeting the Commissioner acknowledged that the subsidy had to be reduced and subsequently eliminated. He stated top level reviews were under way and indicated all subsidies would be eliminated for large rice and other farmers, and that periodic reductions would be made on subsidies for small farmers. Otherwise a drastic price increase could have adverse effect on current levels of use as well as expanded use by small farmers.

The problem of uniform prices is also being considered by GOG and GFC and action is expected soon. However, the possibility that the market price

would be increased sufficiently to cover transportation/handling to distant points but still maintain a uniform price was discussed. In this way the farmers nearer Accra would subsidize the farmers further away. This would still leave the problem that distributors may be unwilling to transport fertilizer to distant points to sell for the same price that it brings close to Accra.

The need for a mark-up rate was recognized as necessary if distributors/marketers were expected to participate in the distribution/marketing system. USAID proposed an 18 percent mark-up, but a decision was not reached. This along with the other points above were all part of the package being considered at top level.

The GFC representative and the MOA have agreed that the MOA will continue to distribute the first few ship loads of fertilizer as in the past until the GFC is organized to handle distribution and work out agreements with distributors/marketers.

The GFC is negotiating with potential technical/managerial partners and expects to select one soon in order to complete its management plans.

Both the MOA and MEP urged the GFC to complete and present its proposals on all the above points to the GOG so that the fertilizer company and its program could effectively proceed.

5. The Ministry of Agriculture arrangements for implementing small farm systems production trials and field extension/demonstrations. The MOA will pay particular attention to the Extension Service implementing this activity and assure that appropriate support is provided the field service to do so. It will also provide ADB with extension/marketing, and

supervised credit service to the farmers in the service areas of the ADB's new Farm Loan Offices.

6. Bank of Ghana. Arrangements for allocation of credits generated from sale of imports of commodities financed under the loan and the assurance of advances to ADB to meet scheduled requirements for funding. The BOG agreed that it would advance to the ADB on appropriate time schedules the cedi equivalent of the foreign exchange cost of commodities imported under the loan. The terms and timing will be worked out and included in an agreement between BOG and ADB as part of the loan agreement.

Similar agreements will be developed between the GFC and GOG relative to subsidy rebate, working capital, mark-up and price differential.

II. BACKGROUND

A. Setting:

The agricultural sector in Ghana produces about 45 percent of GDP and about 70 percent of foreign exchange earnings (about 50 percent of which is from cocoa export^{1/}) and employs about 55 percent (4.8 million) of the population. There are an estimated 857,000 holdings or farms producing crops on about 6 million acres of a total land area of 56 million acres. The majority (82 percent) of these holdings are less than 10 acres each and account for only 32 percent of total land area cultivated; however, these small holdings produce about 80 percent of national food crop requirements. On the basis of number of production units, agriculture can be described as "small-scale." The typical Ghanaian farmer operates about five acres of land and has adapted his production practices to a relative abundance of land and labor, meager capital resources, and to soils which become rapidly exhausted if farmed intensively without proper fertility restoration and conservation practices. Most of these small holders participate at least to some degree in the cash economy through marketing small production surpluses. Their productivity is low with small crop yields which have remained static or declined over the last decade. They practice traditional production techniques using primitive tools and implements generally on multi or intercropping systems.

During the past decade the emphasis in the agricultural sector was on acreage expansion through the development of large-scale, capital intensive,

^{1/} Ghana is the world's largest cocoa producing and exporting country.

public production units to stem increasing foreign exchange requirements for food imports and rising food prices. This approach required large amount of domestic and foreign capital and scarce managerial resources, but contributed little to domestic food production. The food import bill continued to increase as world transport costs increased and world prices for these products began to rise.

In 1972, the present government, the National Redemption Council (NRC), published a "White Paper" ^{2/} announcing a policy of reorientation which seeks "self reliance" for Ghana. The key elements of the new policy were increasing agricultural production, containing the balance of payments problem, and reducing the budget deficit. To achieve its primary objectives of increasing agricultural production, the NRC launched the "Operation Feed Yourself" (OFY) program. The strategy of this program was to make Ghana self-sufficient in grain crops, especially maize, rice and groundnuts, by subsidizing agricultural credit and inputs (e.g., fertilizer, equipment and seeds), granting a five-year tax exemption to new farmers and agricultural businesses, ^{3/} and increasing guaranteed minimum farm-gate prices for rice and maize, the major cereal crops. A major component of the production strategy was to increase the acreage under cultivation, ^{4/} in general, and under large-scale private production units, in particular. The capital-intensive private rice farms in the Northern Region succeeded in achieving the production goals set for them; however, the adverse effect of this strategy on equity, employment, and

^{2/} "White Paper on Government Economic Policy," June 1972.

^{3/} Cocoa is exempt from this tax holiday.

^{4/} An estimated 20-25 million acres of uncultivated area has production potential.

foreign exchange costs has been so substantial that OFY has shifted its focus to increasing the acreage under cultivation by small-scale farmers and increasing crop yields on these farms by increasing the availability of fertilizer, chemicals, improved seeds, credit and other services. To date this program has been successful in reaching a small percentage of these farmers through group credit schemes for major crops such as rice and maize with which to purchase the other inputs. The majority of the small-scale farmers, however, are not being provided with improved inputs.

In March 1974, the NRC established a National Economic Planning Council and initiated work on the preparation of a Five-Year Economic Plan for the 1975-80 period. A statement of the objectives and macro economic framework of the Plan was issued in January 1975, "Guidelines for the Forthcoming Five-Year Plan" (FYP). The paper defines the agricultural sector as having the highest potential for 1) increasing production to meet domestic food requirements, thereby reducing food imports; 2) diversifying exports, thereby increasing foreign exchange earnings; and 3) creating employment opportunities for an increasing population. To realize these objectives the Government of Ghana (GOG) will, in the forthcoming FYP, support 1) low capital input agricultural programs emphasizing labor intensive, small farmer development; 2) an integrated approach to agricultural development, emphasizing decentralized planning and proper cooperation and coordination at all levels; and 3) a price structure which gives farmers incentives to be more productive. The final Plan is expected to be published in early CY 1976 detailing the elements of the GOG's strategy to increase agricultural production. Projections of the demand for and supply of food over a twenty-year period (1975-1995) are derived in Annex 0.

Agricultural Credit ^{5/}

The Agricultural Development Bank (ADB) is the principal source of credit for the agricultural sector. It was established in 1965 as the Agricultural Credit and Cooperatives Bank and was renamed in 1967. Its major functions include providing credit for the development of agriculture and agri-business, promoting agricultural enterprises and operating savings accounts. The operations of the bank are directed by a Board of Directors consisting of seven members representing the Ministries of Finance and Agriculture, the Bank of Ghana (the Central Bank), and the Department of Cooperatives. The Chairman of the Board is also the Managing Director of the ADB; the General Manager is also a member.

The central office is located in Accra. There are 13 branch banks strategically placed around the country and eight Farm Loan Offices (FLOs) extending limited service to a few outlying rural areas, to assist applicants in completing applications, inspection of the farms, preparation of certain field reports, collection responsibilities and technical advice to farmers in cooperation with the MOA's extension field personnel.

All loans are processed by the branch banks but must be submitted to the central office for final approval. The total period from application to the initial disbursement can be from two to six months. Reflecting this cumbersome approval procedure, the total number of employees is 516 of which 237 are located in the central office in Accra. One hundred and twelve (112) are considered senior staff and the remainder are considered

^{5/} The following section taken from R. Karsk, E. Schroepfer, J. Lovorn, "Assessment of Small Farmer Credit in Ghana," AID, May 1975.

junior or support staff.

The ADB operates three types of loans:

- 1) Short-term loans granted to enable borrowers to meet production costs of their crops;
- 2) Medium-term loans for purchase of farm equipment, livestock, irrigation equipment and setting up agro-businesses; and
- 3) Long-term loans for new and extensive schemes or for improvements of existing ones.

In FY 1967, AID initiated a project (040) to assist the ADB in improving its organization and operations and thus enable it to extend credit either directly, or indirectly through cooperatives, to farmers in the major production areas of Ghana. This project lasted until FY 71 after which time AID assistance to the ADB continued indirectly through the Economic Development Management Project (062). Under these projects AID provided technical assistance and participant training in accounting, management and agricultural credit. In addition, during the period FY 1966-71, USAID loaned the GOG, for the ADB, the cedi equivalent of \$3,539,760 from PL 480 Title I sales for agricultural development loans including small farmers.

Approximately 60 percent of all loan funds in 1974 were made to 32,951 small farmers (94 percent of all farmers reached) through group schemes. The ADB faces two major problems which limit its servicing of small-scale farmers. These are insufficient capital resources and insufficient outreach to remote rural areas. The annual flow of funds into the ADB consists of subventions from the Ministry of Finance, funds from the BOG,

and savings and deposit accounts, as well as from loan reflows. Most of its existing loan capital is tied up in medium- and long-term investments of two years or more, reducing the amount available for short-term production loans. Prior to June 1975, the GOG had, as part of its OFY program, imposed an interest rate ceiling of 6 percent on ADB loans to farmers. This represented about a 60 percent subsidy on agricultural loans, given an estimated 15 percent cost of capital. The interest rate paid on funds from the Treasury and BOG was 5.0 percent, leaving only a marginal spread to cover the costs of loan servicing. These costs had been estimated to be in excess of three percent of the value of loans to farmers. The capital situation was further aggravated by the low rate of collection on outstanding accounts of state corporations and large agrobusinesses--44 percent in 1974. In 1974, arrears on these loans were 63 percent of all loans made by ADB in that year. Arrears on loans made to state corporations and large agrobusinesses amounted to 8.0 million cedis and 1.2 million cedis respectively. The value of all loans made in 1974 was 14.7 million cedis. These problems, particularly the bad debts of state corporations and large agrobusinesses, have led to ADB's lack of working capital and the need for higher subventions from the Treasury and the BOG. USAID/Ghana has been informally advised that the ADB has arranged for repayment of the delinquent debts of state corporations and that initial payments were made in September 1975.

In June 1975 the interest rate ceilings on loans to farmers and on savings deposits were raised to 8.5 percent and 7.5 percent respectively.

A further increase in the interest rate to 12 percent is being considered which would enable ADB to cover its costs of loan servicing. However, by streamlining and decentralizing its operational procedures, ADB will be able to significantly reduce these costs.

Most of the loans that the Bank processed in 1974 involved "group schemes," a program initiated in 1968 in which loans are made to farmers for a particular crop on a group basis. The methods of providing credit have been either to advance these farmers cash or to provide a voucher or chits with which to purchase required items. Experience shows that these procedures reduce the costs of loan servicing, insure that credit is properly used and, by using social group pressure, increase the rate of loan repayment. However, the majority of Ghana's small-scale farmers do not have access to the credit they need. It is estimated that many small-scale farmers may have to travel up to 100 miles to file an application with ADB. Once submitted, the application must be approved on all three organized levels--the FLO, the Branch Office, and the Central Office--a process which may take well over three months.

In 1974, the ADB requested USAID/G to make an assessment of small farm credit and recommend methods to improve and expand credit service. An AID-financed agricultural credit survey team made several recommendations for AID assistance. The recommendations form the basis for the credit component of the project.

Fertilizer

The use of chemical fertilizer in Ghana has fluctuated greatly in recent years primarily because of varying foreign exchange availabilities

and ad hoc and untimely procurement procedures. However, demand appears to be continuously increasing. Presently the MOA imports all of the fertilizer coming into Ghana except the requirements related to specific development projects. A significant amount of MOA fertilizer imports are financed under AID program loans. The Deputy Director of Agriculture in charge of Extension is responsible for distributing fertilizer to regional depots where agricultural extension agents then distribute it to farmers.

The major types of fertilizer imported into the country are ammonium sulphate, 15-15-15 and 20-20-0.

Since 1968 the GOG has placed about an 87 percent subsidy on the CIF price of fertilizer. To evenly distribute the incentives for using fertilizer the MOA sells the products it imports at the same price throughout the country, an action which provides no incentive for private firms to participate in distributing fertilizer. When the subsidy program was started it was the intent of the GOG to absorb only the distribution costs. Since then, however, there have been increases in CIF, handling, overhead and distribution costs, but no increase in the price to farmers. These increases, combined with the increase in use of fertilizer, have resulted in a very substantial fertilizer cost to the GOG. There have, however, been indications recently that this situation might change. For example, USAID/G has been informally advised that the GOG will be eliminating the fertilizer subsidy on all rice production in the Northern Region by the 1977 major planting season. This represents a significant policy change since rice farmers in Northern Ghana use approximately 40 percent of all fertilizer imported.

The benefits of the subsidy on fertilizer have only accrued to a small number of farmers. The majority of Ghana's small farmers cannot share in this benefit because of tough competition from large farmers. Problems of fertilizer availability to small-scale farmers have been due to the late arrival of imported fertilizer, an inefficient internal distribution system, the lack of appropriate mixtures of fertilizer relative to Ghana's soil and small holders' crop requirements, and insufficient field demonstrations by extension personnel showing farmers the profitability of proper use of fertilizer and other practices on various crops.^{6/}

In 1972, USAID/G was requested by the MOA to support a study by the Tennessee Valley Authority (TVA) to review the fertilizer situation and to provide guidance for future activities that would lead to improved and increased fertilizer usage. A series of TVA studies resulted in recommendations for a national fertilizer program. Based on these recommendations the GOG in August 1975 established the Ghana Fertilizer Company which will replace the MOA as the major fertilizer importing and distributing agent. These recommendations form the basis for the fertilizer component of the project.

Seed Multiplication

The Seed Multiplication Unit (SMU) of the MOA is responsible for activities related to the import, production, certification, testing and distributing of improved agricultural seeds in Ghana. Under its program, the SMU distributes a limited quantity of grain seeds to a small proportion

^{6/} This latter point will be addressed by the Extension/Demonstration Component discussion.

of Ghana's farmers. The GOG is subsidizing the costs of seeds. The farmers pay one-third and three-fourths respectively of actual production/distribution costs for maize and rice seeds. Cocoa farmers, most of whom are small holders, receive seedlings free of charge.

Distribution of improved seeds is (like fertilizer) carried out through the agricultural extension service. Presently the extension agents in the various districts determine the seed needs of farmers within the district. These needs are conveyed to the regional officer in charge of extension who further relates them to the Regional Director of Agriculture. The Regional Director consolidates all seed needs for the region and a letter of request is transmitted to the chief of the SMU. The delivery of seed takes the same route in reverse, with the extension agents ultimately delivering seeds to the farmer. This procedure causes delays (up to two to three months) in providing the farmer with seeds, and because of poor storage and transport facilities, the seeds are often damaged by heat and moisture or rodents. In several cases the seed has been lost before delivery to the farmer because of poor storage and transport facilities and security.

The SMU has steadily increased the supply of certified seeds (most notably rice, maize and groundnuts with less attention to semi-arid cereal grains and edible legumes) over the past five years. Increased emphasis will be given these crops. The University of Illinois has been assisting the GOG with research/testing of soybeans to identify the varieties best adapted to Ghana, and in early CY 1976 will conduct a survey and help design a national soybean production and processing

program. Soybeans will be added to this component of the project as soon as the soybean research and production activity reaches the point and demands dictate that soybean seed multiplication be carried out. Soybeans will also be included in the field trials component along with appropriate efforts on production expansion.

SMU faces several problems additional to a poor distribution network in its efforts to increase the availability of improved seed. It has inadequate equipment (tractors and implements), drying, cleaning, processing and testing facilities, and trained staff for regulating the quality of foundation and certified seed. Lack of these facilities, staff and an efficient and effective distribution network are the most important bottlenecks to increasing the supply and variety of high quality of seeds.

The GOG has recognized for several years that its seed multiplication program needed revising. It was the consensus of many that what Ghana needed was the participation of a private seed company in its seed program. Accordingly the GOG sought help in indentifying problems connected with encouraging private participation in its seed program. It requested USAID/Ghana to conduct a comprehensive study to design an appropriate seed program. Due to the bleak prospects for hybrids and the resulting lack of interest expressed by most seed companies contacted, the GOG decided to strengthen the present SMU and encourage the participation of indigenous certified seed growers and private distributors in its program.

Small Farm Systems Research

In Ghana, agricultural research is undertaken by the numerous member institutions of the Council for Scientific and Industrial Research (CSIR).

and the Universities,^{2/} governed by the National Council for Higher Education which are all independent of the MOA. Coordination between the CSIR, the Universities and the MOA is limited and minimally effective. Since their priorities are largely focused on basic research, there is little applied agronomic research and appropriate research results are not readily communicated to farmers. Most of the training of agriculturalists is undertaken at the Faculties of Agriculture at Kumasi and Legon. Some are trained overseas and upon completion of training researchers are generally assigned to member institutes with specific duties. Communication between the institutions is limited with little awareness of work being done by others. There appears to be adequate budgetary resources, land for research stations and laboratories which are relatively well equipped. Therefore rather than budget and physical facilities, the major problem is the focus of the research effort. Agronomic research requires substantially more focus on problems applicable to the needs of the small farmer and coordinated with and properly extended by the extension service.

The Agricultural Sector Assessment of the DAP underscores the critical need to increase understanding of the inter-relationships between cultural, sociological, ecological, biological, agronomic and economic factors that typically underlie the activities of small farm systems in Ghana. The research component of this project addresses the need for a problem-oriented, applied, multi inter-disciplinary research capability within the MOA. This component, through close coordination with CSIR institutes and other research organizations, will take research results flowing from the institutes and adapt

^{2/} University of Ghana at Legon, University of Cape Coast, and the University of Science and Technology at Kumasi.

them through the problem-oriented research program for application to the smaller farmers' situation.

Marketing^{8/}

The marketing system in Ghana is complex and comprised of various channels, both private and public. The traditional private sector basically consists of small traders (primarily women) selling produce either on the farm, on the roadside, at local feeder markets, and to a lesser extent at major rural and urban feeder (i.e., wholesale and assembly) terminal markets. The produce is typically transported from farm to feeder markets in headloads by women. Farmers' wives are the major sellers and the bulk of produce is also purchased by women traders who purchase in bulk and transport produce by lorry to wholesale markets.

It has frequently been argued that the private trading system, dominated by women, is antiquated and non-economic. Consequently, various public sector marketing programs have been initiated by public institutions. In 1968 the State Food Distribution Corporation was organized to provide marketing services to farmers, purchasing produce at the guaranteed minimum price when open market prices fall below the guaranteed price. Due to insufficient funds and storage facilities, these institutions handle only a small percentage of produce^{9/} and have not been effective.

The deteriorating conditions of many roads, the inadequate feeder roads network, and an aging vehicle fleet causes erratic commodity flows, frequent seasonal scarcities and high transport costs. Limited access to credit for

^{8/} Following taken from the Agricultural Sector Assessment of the DAP, pp. 162-172.

^{9/} The Food Distribution Corp. currently handles less than 5 percent of food production.

on-farm storage facilities, rodents, insect and heat/humidity spoilage problems make it difficult for farmers to store produce at harvest periods for sale during scarcity periods. These factors and an overall lack of market/information suggest that improving the marketing system, particularly regarding the flow of commodities from the farm gate to wholesale markets, may be an effective way of increasing small farmer production and incomes in the short run. The marketing component of the proposed project will support experimental programs to provide increased marketing services to more small farmers.

Extension/Demonstration

Agricultural information and related services are provided to farmers through the Extension Service and the Home Extension Unit of the MOA. In Ghana, most agricultural activities on small farms (other than cultivating cash crops, clearing and burning) are carried out by women. The 1970 census data suggest that of the 2.3 million women over the age of 15, about 80 percent are in some way involved in farming. Moreover, during the past decade, women accounted for about 92 percent of the total increase of all persons employed in agriculture as the rural men sought employment in urban areas. As a result, women made up about 60 percent of the agricultural work force in 1970. In many areas of Ghana, women are expected to remain on the farm and have had very little or no access to informal schooling or technical assistance in improved farm practices. As a result, an increasing amount of farm production activities are carried out by women who have little chance to improve their productivity. These problems of low productivity are compounded when one considers the women's roles as mother, wife, water carrier, fuel gatherer, marketer of produce and cook. The (male) extension agents of the Extension Service commonly deal with the rural farm men who transmit farming information

to the women farmers. The Home Extension Unit which began in 1970 is traditionally involved in women's extension activities such as nutrition, food processing, home management, etc., but is increasingly extending its efforts into the production of crops for both home consumption and marketing purposes. It is supported with limited assistance from the Home Science Department of the University of Ghana in developing appropriate materials and information to include in its extension program. This assistance is generally in the form of technical support and laboratory facilities.

Both the Agricultural Extension Service and Home Extension Unit are faced with several problems in their programs to effectively assist farmers. The principal difficulties center on limited availability of appropriate applied small farm research results, insufficient materials and equipment to conduct demonstrations, inadequate program evaluation, and more importantly, too much involvement in the distribution of inputs, leaving little time for extending information, farm visits and organizing demonstration programs.

The problem of the extension agents' involvement in the distribution of inputs has been recognized by the MOA. The Agricultural Assessment pointed out that the MOA has overtaxed its own capability by trying to provide farmers with all inputs and services required for increased production. It currently imports and distributes fertilizer, produces, multiplies and distributes seeds, provides limited extension services, distributes other requisite inputs such as farm implements, pesticides, etc., and purchases and markets major food crops at guaranteed minimum prices. The Assessment recommended that the MOA turn over more of the direct production activities,

distribution and marketing functions to the private sector. The GOG in considering this recommendation is endeavoring to encourage organizations and institutions outside the MOA to become more involved in the activities. With appropriate actions by government to encourage and provide incentives to the private sector, the burden on the MOA should be reduced adequately to permit greater flexibility and quality of response to the needs of the small farmers.

MIDAS will also provide inputs, services and support for two additional proposed USAID-supported projects--District Planning and Rural Development and Farmers' Associations and Agribusiness--which will be essential to the success of these projects, and the impact and development which all three projects are designed to accomplish.

Balance of Payments

Ghana's development effort in recent years has been hampered by a shortage of foreign exchange relative to requirements. This resulted from a number of factors. First, Ghana is over-dependent on cocoa as an earner of foreign exchange; second, Ghana possesses an industrial structure that is overly-dependent upon imported equipment and raw materials; and third, until the successful rescheduling of pre-1966 suppliers' credits in March 1974, Ghana faced a massive external debt burden. More recently, rapidly increasing petroleum prices have emerged as a major new complication of the problem (and more than offset the debt relief provided by the 1974 rescheduling).

Table 1 presents a projection of Ghana's balance of payments position over the period 1976 to 1980. It was developed from the projections made by the IBRD in their report (No. 638a-GH) of May 19, 1975. Imports are

projected at a level estimated to be sufficient to sustain a real rate of growth in Gross Domestic Product of 4-5 percent in 1976 and rising to 5-7 percent by the end of the decade. It is further assumed that a) these imports will be carefully kept in line with the production needs and necessary consumption requirements of the economy, b) real imports of food will remain constant from 1976-1980 (only slight real increases are allowed for in the importation of other consumer items), c) there will be substantial effort towards import substitution and possibly a realignment of exchange rates, and d) there will be a relatively stable pattern of external payments.

Given their critical nature, some comment needs to be made concerning the realism of these assumptions. Will Ghana make the difficult decisions and sacrifices necessary to attain moderate growth in Gross Domestic Product over the remainder of the decade?

The GOG responded positively to the failure of the import licensing system in 1974. In September of 1974 when the GOG became aware of the crisis it sharply reduced by half the value of unutilized licenses and imposed higher compulsory deposit margins upon letters of credit. Simultaneously the Bank of Ghana was instructed to undertake a thorough review of the import situation. The 1975-76 Budget Statement announced increases in import duties and licensing levies for a wide range of consumer goods. Though it is still too early to know the impact of these actions upon the quantity and quality of imports, they clearly reflect a determination to contain imports to a level which can be financed.

The Government of Ghana is also determined to restructure the import bundle in line with the production needs of the economy and to expand export

earnings. It has indicated (in the FY 76 Budget Statement) that in undertaking this effort considerable reliance will be placed upon the small farmer.

Outside the area of balance of payments management, there is other evidence that the Government of Ghana is willing to make difficult decisions in support of a solution to its economic problems. The Budget for FY 76 recognized the dangers of substantial deficit finance and provides for some \$123 million in additional revenues.^{10/} The rate of interest on loans to agriculture, lending rates in general, and the rate paid on savings deposit has been raised.

There is thus considerable evidence that Ghana's economic policy is moving in the direction assumed by the IBRD. However, even with these actions and the sacrifices they imply, Ghana will require considerable multilateral and bilateral external assistance and additional private foreign investment if the rate of growth assumed is actually to be attained (see "Resource Shortfall" of Table 1).

As can also be seen in Table 1, Ghana's assumed external payments commitments, while absolutely large, amount to only a small percentage of Ghana's projected export earnings. (5.3 debt service ratio in 1976.) This fact must be interpreted with caution, however, as most of the debts were incurred for projects which are not productive of foreign exchange (or domestic income), and consequently must be serviced from other (unstable) foreign exchange earnings (e.g., cocoa). This feature of Ghana's debt burden has resulted in an expressed desire of the government to borrow only

^{10/} This will facilitate increased expenditures for agriculture and supporting infrastructure.

for activities where the loan will be directly self-liquidating. While this is, of course, difficult to attain in actual practice without reducing overall assistance levels, there are indications that the government is being much more careful in its borrowing. In negotiating the recent (FY 1974) AID program loan (O17), the government insisted upon a restricted list of eligible imports. Raw materials, freight and insurance were specifically excluded at the GOG's insistence.

In lieu of the debt service ratio, a better measure of Ghana's need for concessional assistance can be found in the percentage of the resource shortfall that is accounted for by the need to meet external commitments. As Table I reveals, this percentage is substantial in the case of Ghana. The less concessional the assistance bundle, the more difficult it will be to fully close the resource gap, thus permitting moderate economic growth.

The substantial external payments commitments which Ghana currently faces, the need to build reserves, and the potential instability of foreign exchange earnings presents a strong case that multilateral and bilateral assistance extended to Ghana should be as concessionary as possible.

USAID/Ghana's agricultural sector strategy which aims at improving the income and productivity of the small Ghanaian farmer must take into account the difficult balance of payments position which Ghana seems likely to face over the remainder of the decade. This results from the fact that the overall balance of payments position will have a substantial impact upon the availability of the inputs and supporting infrastructure which the small farmer requires in order to increase his productivity and income.

At the same time, the small farmer will play an important role in determining the state of Ghana's overall balance of payments position over

the remainder of the decade. It is the Ghanaian small farmer who must produce the goods to meet the incremental demand for food which will allow the level of food imports to remain constant in real terms over the remainder of the decade. It is the small farmer who must play an important role in producing the agricultural raw materials which are currently imported if this import substitution is to be accomplished at a minimum cost in terms of imported capital equipment (as the IBRD assumes in its import projections).

USAID's agricultural sector strategy in support of improved income and productivity for the Ghanaian small farmer is thus closely linked with Ghana's overall balance of payments problems. Given the magnitude of the projected resource shortfall, our efforts to assist the small farmer cannot ignore the strong possibility that Ghana, from its own foreign exchange resources, may be unable to provide the small farmer with all the inputs (fertilizer, equipment and spare parts) and infrastructure which he requires. U.S. concessionary lending is specifically directed towards the importation of items required to increase the impact and support the efforts on the small holder's behalf. Such assistance would, in turn, lay the basis for a sounder balance of payments position in the future in that by increasing the productivity of the small farmer, Ghana's dependence on imports will be reduced and its export potential enhanced.

In summary, USAID's agricultural sector strategy remains clearly focused upon the improvement of the income and productivity of the Ghanaian small farmer. At the same time, however, the strategy recognized the importance of the balance of payments constraint which must, of necessity, be considered

(given its critical nature) as a part of any sectoral strategy. This recognition in no way implies an intent to undertake concessionary lending as part of a multilateral effort to eliminate Ghana's resource shortfall.^{11/} Rather, this recognition concerns itself solely with the fact that the balance of payments, in the absence of sectorally-directed concessional lending, may frustrate efforts to reach and assist the small farmer. This concern is entirely in line with Option Three of the DAP for FY 1976-FY 1980 as reviewed and approved.

^{11/} The lending proposed herein (\$10.0 million in FY 1976 and FY 1977, and two additional \$10.0 million for FY 1978 and FY 1979) would close only a very small proportion of Ghana's FYs 1978 and 1979 resource gap.

Table I

Summary of Ghana's Projected Balance of Payments Position - 1976-1980

(Millions of Current Dollars)

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Imports (including non-factor services) ^{12/}	-1032	-1140	-1265	-1404	-1560
(of which petroleum and petroleum products)	(190)	(209)	(230)	(-253)	(1278)
Exports (including non-factor services)	980	1092	1160	1284	1423
(of which cocoa)	(493)	(535)	(523)	(553)	(585)
Balance on goods and non-factor services	<u>-52</u>	<u>-48</u>	<u>-105</u>	<u>-120</u>	<u>-137</u>
Factor Services (excluding interest on public debt) Net ^{13/}	0	2	5	9	11
Workers' remittances	-	-	-	-	-
Private transfers (Net)	-10	-11	-12	-12	-13
Private Direct Investment	15	15	15	15	24
External Payment Commitments:					
A. Interest on public debt	-21	-16	-18	-21	-24
B. Repayment of public and medium/long-term loans	-11	-11	-12	-12	-14
C. IMF drawings/facility	-4	-4	-15	-14	-14
D. Other short-term debts	-16	-16	-16	-16	-
Total External Payment Commitments	<u>-52</u>	<u>-47</u>	<u>-61</u>	<u>-63</u>	<u>-52</u>
Accumulation of Reserves	-38	-28	-34	-38	-42
Resource shortfall ^{14/}	<u>-137</u>	<u>-117</u>	<u>-192</u>	<u>-209</u>	<u>-209</u>
External Payments Commitments as a percent of exports	<u>5.3</u>	<u>4.3</u>	<u>5.3</u>	<u>4.9</u>	<u>3.7</u>
External Payments Commitments as a percent of resource shortfall	38.0	40.0	31.8	30.1	24.9

^{12/}

Imports required to support real Gross Domestic Product growth of 4-5 percent in 1976 with growth accelerating toward 5-7 percent by the end of the decade.

^{13/}

Slightly positive due to interest payments on accumulated reserves.

^{14/}

Resource shortfall could be reduced somewhat by eliminating allowance for accumulation of reserves. Since cocoa is expected to remain the major foreign exchange earner over the remainder of the decade and a devaluation is assumed in the projections, it seems more realistic to allow for an accumulation of reserves in computing the resource shortfall.

Source: IBRD Report No. 638a-GH

B. Historical Development of Project

In the late 1960s and early 1970s, the primary focus of U.S. assistance to Ghana centered around macro economic policy and program lending in support of its balance of payments. Direct assistance to agriculture was limited to a modest amount of grant funding for a number of technical assistance activities.

With the rise of the NRC to power in January 1972, this approach became less appropriate in the light of new political and economic circumstances. This resulted from a number of factors. First, the NRC repudiated a number of pre-1966 suppliers' credits which resulted in a suspension of new assistance commitments until the successful debt rescheduling of 1974. Secondly, the NRC became reluctant to borrow except for directly productive (foreign exchange generating, output increasing, etc.) and tangible purposes, precluding loan financing for important elements of program lending such as the import of raw material. Thirdly, the NRC placed a substantial emphasis upon agricultural development. OFY was launched to create not only self-sufficiency in the production of food and industrial raw material, but also an awareness of the importance of agriculture to the Ghanaian economy and to future improvements in economic welfare. Though the initial effort focused upon increased production through acreage expansion and thus tended to emphasize large-scale farming, there has been a growing awareness of the importance of small-scale Ghanaian farmers, including women farmers. Over time, the GOG has come to realize that the small farmer is an important part of the development equation which cannot be ignored if self-sustaining economic growth is to become a reality and the welfare of Ghana's poor is to be improved.

U.S. agricultural assistance strategy has evolved over time in line with the Congressional Mandate to reach the rural poor and with the changes in GOG priorities outlined above. In the FY 1974 Congressional Presentation, a cereal development project was proposed. This project was to have focused upon increasing production of rice and maize by small holders as a contribution toward self-sufficiency in food. The proposed strategy was to provide technical assistance to assist in providing improved seed, fertilizer, production incentives and marketing services to small holders. In conjunction with this, a program loan was proposed to support the import of inputs essential to small farmers.

By the time the FY 1975 Congressional Presentation was prepared, further discussions with the GOG and a growing concern with nutrition led to the inclusion of legumes development in the proposed project. Agricultural credit, agronomic research and extension services began to receive attention as possible targets of U.S. technical assistance. An agricultural production loan was proposed at this time to provide foreign exchange for the import of commodities required by the agricultural sector. This loan was expected to generate local currency support for agreed upon projects and programs (including their capital elements).

In conjunction with the FY 1975 Development Assistance Plan (DAP) an agricultural sector assessment was undertaken. This assessment provided considerable insights into the constraints of the Ghanaian small holder. Given the small farmers' practice of intercropping two or more crops on a single small field, concentrating on grains and legumes alone would be inappropriate. Rather, what was required was a comprehensive approach which

would focus upon the constraints which restrict small farmer production of grains, legumes and other food crops such as roots, tubers and plantains which are also important components of the Ghanaian diet. The Sector Assessment identified a number of broad constraints to small farmer development which AID support could help ameliorate and all of which highlight the need for regular, timely availability of agricultural inputs and services through a system which is accessible to large numbers of small-scale farmers. At the request of the GOG, further sub-sector studies were made and provided recommendations for AID assistance in increasing the availability of agricultural credit, improved seeds and fertilizer to small-scale farmers on a national basis. Based on recommendations in these studies and extensive discussions with representatives of the GOG, the grains and legumes project was considerably refocused and expanded into a multi-faceted project to develop a coordinated approach to the systematic delivery of appropriate technology, inputs and services to small farmers who do not currently have access to them. Reflecting this expansion and refocus, the title of the project was amended to MIDAS, Managed Inputs Delivery and Agricultural Services for Small Farmer Development. The project will provide grant funding for a number of technical assistance activities which address key constraints affecting small farmer production, and loan financing for the import of inputs critical to expanding production in the small-farm sector. Local currency generated by the sale of some of the imported items will provide additional support to elements of the project.

The goal on which this project should impact is increasing the production on small holdings, leading to increased incomes and welfare on the part

of small-scale farmers. The purpose of the project is to develop an institutionalized, coordinated system to provide improved agricultural inputs and services to small-scale farmers on a regular and timely basis. The project will achieve its purpose by developing and improving coordinative links between important institutions and farmers they are serving. If, through this coordinated effort, such inputs are made available to and used by small-scale farmers, their production and incomes should increase.

C. Detailed Description

The Agricultural Assessment of the DAP has identified one overall constraint which must be overcome before agricultural production of the Ghanaian small-scale farmer can be significantly increased. This constraint is the lack of a coordinated effort on the part of the institutions serving farmers to provide agricultural technology, inputs and services to large numbers of small farmers in a regular and timely manner. Further sub-sector studies have pointed out the particular problems faced by these farmers. These are insufficient access to credit, fertilizer, improved seeds, tools and marketing and extension services. In addition, there is no mechanism currently functioning to develop and test agronomic practices and other innovations which are relevant to small-scale farming.

In response to these problems, this project will strengthen the capability of existing institutions which are now serving the agriculture sector to extend their services to more small-scale farmers in order to increase their production and incomes. In concert with recommendations in the DAP, all relevant private and public institutions, including the MOA,

should be used if USAID is to effectively assist the GOG in designing and implementing a small farmer development strategy.

The project consists of six components: credit expansion, fertilizer processing and distribution, seed multiplication, small farm applied research, marketing and demonstration/extension. The seed multiplication, research and demonstration/extension components will be implemented by the MOA. The credit, fertilizers and marketing components will be implemented by the ADB, the recently organized Ghana Fertilizer Company (GFC) and the Bank of Ghana (BOG), respectively. The BOG will have the additional roles of managing the foreign exchange allocations to the program and of advancing annual working capital requirements to ADB in amounts equivalent to currency generations under successive loans. A Permanent Advisory Committee will be established to coordinate the project components, monitor progress and make suggestions for ongoing program adjustments. It will be responsible for overall project coordination in ensuring that the project resources are effectively used to attain the project purpose, with special emphasis on reaching the small-scale farmer. The Food and Agriculture Officer will work closely with the Committee. Committee members will include representatives from the Ministries of Agriculture and Economic Planning, BOG, GFC, ADB and USAID.^{15/}

The program has a six-year development period over which donor assistance will be required. The development period consists of three phases: Phase I of 20 months (FY 76-77), Phase II of two years (FY 78-81) and Phase III also of two years (FY 80-81).

^{15/} More detail regarding project management is included in the sections on Administrative Arrangements and Implementation Plan.

The activities during Phase I are largely organizational and will assist implementing agencies in establishing the program's structure. During Phase II an expanded rate of program development is envisaged leading to an accelerated rate of build-up of small farmers participating in the program during Phase III.

This document seeks approval and authorization of \$10.0 million in loan funds and \$4.780 million in grant funds. The loan will be obligated in FY 1976 and disbursed during Phase I whereas the grant will be obligated and disbursed over the life of project. This document has been prepared on the understanding that \$20 million in loan funds will be given for disbursements in Phase II, i.e., FY 1978 and 1979, subject to an assessment of progress during Phase I, to the availability and appropriation of funds by AID/W, and to a request from GOG. Although Phase III is envisaged in the development period this document does not seek any commitments for funds at this time. A significant portion of the three loans, \$27.5 million (\$8.44 million from the first loan) will be used to import fertilizer, project support commodities, small farm equipment and raw materials required for the local manufacture of intermediate technologies. The sale of these import items will generate an equivalent amount of local currency (cedis), which will be channeled to the ADB to finance the annual incremental working capital requirements of its expanded small farmer credit operations.

1. Credit Expansion

In 1974 ADB requested USAID/Ghana to make an assessment of small farm credit in Ghana and recommend methods to improve and expand credit service.

An AID-financed agricultural credit survey team proposed that ADB:

- (a) increase the number of its Farm Loan Offices (FLOs);
- (b) decentralize loan approval authority and servicing activities;
- (c) streamline procedures and operations;
- (d) develop an appropriate staff training program;
- (e) provide supplemental working capital for its small farm lending program;
- and (f) be relieved of making loans to state corporations and take steps to arrange timely repayment of these loans as well as loans to large farmers.

ADB and the GOG have accepted these suggestions and they form the basis for this component of MIDAS.^{16/} Taking these steps will make ADB a financially more viable institution and will extend its outreach to the more remote rural areas of Ghana.

The objective of this component is to streamline and expand ADB's small farmer credit operations, through its expanded small farm credit operations, so that larger numbers of farmers will have regular and timely access to small loans and annual production credits. It is expected that after five years ADB's expanded small farmer lending program will reach about 68,000 new small farmers with short- and medium-term credit averaging about \$435.00^{17/} per year per participating farmer. Credit will be provided to farmers in cash for labor or pre-harvest stress period consumption, and in-kind if credit is required to purchase production inputs. The latter will utilize the chit system in which farmers are given expense vouchers or chits with which to purchase these inputs from the various distributors, who

^{16/} As reported above, ADB and the GOG have already taken steps to secure repayment on overdue loans to state farms.

^{17/} Due to inflation and expanded farmer production operations, the average loan size is expected to increase to \$870 in year six. See Annex C for the projected credit requirements of a typical participating farmer.

will in turn exchange the chits or vouchers for cash at ADB.

The project will retain the existing 13 branch offices and 8 FLOs, and expand credit availability and accessibility by establishing 39 new FLOs in outlying rural areas over a four-year period--nine FLOs in the first year and ten each in the second through fourth years of the project. The Senior Project Officer at the FLOs will have increased loan approval and servicing authority. Procedures and documentation will be streamlined to enable faster action on loan applications and loan disbursement.

In addition to the Senior Project Officer, each FLO will have two loan officers who will provide pre-loan and follow-up servicing to small farmers in determining the amount of credit they require for specific purposes, and in completing the necessary application forms. A marketing/extension officer from the Extension Service, coordinating closely with the ADB FLOs, will determine the amounts and types of fertilizer, seeds, pesticides, etc., required by the farmers served, and being part of the Extension Service, will integrate actions with the Extension Service and Home Extension Division of the MOA to ensure that credit and inputs are properly utilized. Additionally, these agents will work closely with the distributors of fertilizer, seed and intermediate technology relative to the expected demands for their respective inputs to ensure that farmers receive these inputs in a timely manner. Also, they will work within the marketing structure to provide timely information to farmers and traders to encourage a smooth and profitable flow of farm produce to wholesale/retail markets.

An in-service training program will be organized to meet the needs of an expanded and reoriented credit institution. In the past, advanced

degree staff training was provided abroad for the main office senior staff, and two to three weeks on-the-job training was provided for mid-level staff. The training program will expand ADB's training into a continuing concept rather than a one- or two-week terminal event. Office and training space has been made available at the Tema Branch Office which is approximately 18 miles from the main office in Accra. Training at this site will consist of comprehensive courses for regional managers, regional project officers and farm loan officers. Training will be conducted by the Bank staff with technical assistance from AID in setting up the program's course content, in training methodology, and in conducting the training program. Course contents will include (a) developing annual objectives and strategies for achieving them; (b) carrying out organizational research and evaluation activities; (c) developing short-term courses as required; and (d) performing all loan-making and follow-up activities.

Inputs by AID over Phases I and II for the credit expansion components include (a) loan assistance to finance the establishment costs (including field vehicles and office equipment) of 39 new FLOs and the purchase of two bullion trucks; (b) grant assistance for approximately five person-years of U.S. technical assistance, and four person-years of participant training. In addition, an equivalent amount of the local currency generations from the sale of fertilizer and small farm equipment intermediate technology imported under the loan element of this project (approximately \$27.5 million) will be provided for supplemental working capital for ADB's small farmer lending program. GOG incremental contributions represent recurrent costs of the FLOs and ADB's headquarter costs associated with ADB's staff training,

evaluation and market service/extension programs. These costs are expected to be recovered from the spread between ADB's lending and borrowing rates on funds flowing to and from the expanded small farmer credit program.^{18/}

AID loan assistance over Phases I and II will finance the establishment costs of 39 new FLOs including \$546,000 for office equipment, (i.e., typewriters, tables, chairs, communication equipment, etc.), \$448,000 for 78 vehicles with spare parts, and \$240,000 for two bullion trucks with spares, to handle the increase in funds to be transported as a result of expanded operations. Currently ADB hires police protection in transporting funds between its various offices. Considering the increases in funds to be transported and the increases in the cost of this protection over greater distances, investments in two bullion trucks in the first and third year of the project is viewed as the best cost and least risk alternative.

AID loan assistance for these items in Phase I (i.e., for the first 19 new FLOs) consists of \$266,000 for office equipment, \$218,000 for 38 vehicles, and \$120,000 for one bullion truck. All vehicles will include spare parts. In addition, \$8.44 million will be provided for supplemental working capital from local currency generated from the sale of fertilizer and small farm implements which will be imported under the first phase (Phase I) loan.

^{18/} It has been estimated that at a spread of 6 percent between ADB's borrowing and lending rates, each FLO will be able to recover its operating costs and bad debts (assumed at 4 percent with the group schemes and increased follow-up servicing) when 1,100 farmers are reached with an average loan of \$430 per year.

^{18.25}

AID grant assistance for the life-of-project to fund U.S. technical assistance and participant training includes \$140,000 for two person-years for a farm loan specialist, \$140,000 for two person-years for a credit training specialist, \$64,000 for eight person-months for an evaluation consultant, \$64,000 for eight person-months for a marketing consultant, \$72,000 for four person-years of participant training for management and training personnel, and \$46,800 for two vehicles and furnishings for long-term U.S. technical assistance.

GOG contributions over the life-of-project includes \$2,400,000 for recurrent operating costs (including salaries) for 39 new FLOs, and \$300,000 for incremental headquarter costs associated with the expanded evaluation, training and market/extension programs.

2. Fertilizer

In 1972, USAID/Ghana was requested by the MOA to support a study by the Tennessee Valley Authority (TVA) to review the fertilizer situation and provide guidance for future activities that would lead to increased and improved usage of fertilizer. A series of TVA studies resulted in recommendations for a national fertilizer blending and distribution program. Based on recommendations in these studies the GOG recently (summer 1975) established the Ghana Fertilizer Company which will (a) develop an advance purchasing system for bulk fertilizers; (b) blend and bag the fertilizer into types and quantities which are appropriate for all Ghana's farmers (with special emphasis on small farmer requirements); and (c) ensure that the finished product is distributed on an orderly and timely basis, extending to more remote areas to permit greater accessibility to small-scale farmers.

The GFC is a joint venture with the GOG and foreign partners, yet to be selected, who have some experience in the production and distribution of fertilizer. The GOG owns 60 percent of the shares^{19/} and the foreign partners will own the remaining 40 percent. The Board of Directors have been appointed. A management director and other management/administrative staff will be appointed when the technical partner is selected. The Board consists of representatives from the BOG, the Capital Investment Board, ADB, AGIP, National Investment Bank and the MOA. The representative of the BOG is currently serving as chairman. The company has acquired a site in the Tema port where it will install facilities for unloading bulk fertilizer direct from ships and for blending and bagging as it is unloaded. The bulk handling and bagging facility is currently (December 1975) being purchased under the FY 1975 AID program loan and is expected to be ready for the first fertilizer shipment in early CY 1976. This bulk handling and bagging facility will be temporary for the first year while more permanent building and storage facilities are established. In CY 77 GFC will require assistance to purchase mixers, weighers and conveyors which will be used to blend granulated fertilizer elements into appropriate mixes.

The objective of GFC is to procure, process, package and distribute fertilizer throughout Ghana at the lowest possible prices commensurate with a viable operation. This encompasses timely procurement, distribution, warehousing and sale of fertilizers at numerous outlets throughout Ghana

^{19/} The state ownership of the company is divided among the National Investment Bank (10%); Bank of Ghana (20%), the ADB (20%) and AGIP Ghana, Ltd. (10%).

where it will be readily accessible to farmers. The short-term marketing plan will be to commence business with a minimum cash outlay.^{20/} Distribution and storage costs make up a significant portion of the total cost of marketing fertilizer; therefore, initially GFC will procure bulk fertilizer at the most advantageous prices possible and establish a bagging operation at Tema. Fertilizer will then be distributed to the warehouses currently operated by the MOA. In the long run, the GFC will construct its own warehouses (wholesale terminals), relieving the MOA of the burden of handling fertilizer and releasing its extension personnel to conduct expanded educational activities for more small holders.

The GOG had determined that the subsidy on fertilizer must be eliminated and is making plans to this end. Indications are that the subsidy will be eliminated for large-scale rice and other farmers in the near future and reduced periodically over time for small farmers. The MOA plans to continue distribution of subsidized fertilizer as, when and where subsidies are eliminated, the plan is to turn distribution over to private commercial firms. Until that time the GOG/MOA feels distribution should be handled by the MOA rather than rebate the cost of subsidies to the GFC/commercial firms.

The present thinking is that as subsidies are eliminated, fertilizer will be sold wholesale from the MOA/GFC warehouses to a group of Ghana-based commercial firms which have distribution agreements with GFC, and which have adequate warehouses, transport facilities, and as many as 1,000

^{20/} A cash-flow analysis for GFC is included in the Financial Plan and is attached as Annex C. A detailed marketing plan proposed for GFC is provided as Annex D.

marketing outlets throughout the rural areas of Ghana.^{21/} This group will include the quasi-government Ghana National Trading Corporation (GNTC), present MOA distributing outlets, AGIP, BP, Shell, the various state crop development boards (e.g., the Grains Development Board) and farmer cooperative societies. The distributors would then sell fertilizer to farmers at mark-up prices, reflecting the various transport and storage costs incurred by the distributors and reasonable profit. Profit margins will be set and monitored by the GOG, resulting in a uniform price of fertilizer per zone, unlike the present pricing policy which has a uniform price throughout the country.

Currently GFC is planning to construct wholesaling terminals in three zones of Ghana: Zone 1 at Tema, to supply the Central, Volta and Eastern Regions; Zone 2 at Kumasi to supply the Brong-Ahafo, Ashanti and Western Regions; and Zone 3 at Yapei to supply the Northern and Upper Regions. The commercial outlets will either provide their own facilities or rent GFC facilities to transport the fertilizer. Large farmers will be eligible to purchase direct from the Tema plant or any of the three wholesale terminals. To ensure that sufficient fertilizer will be available for retail to small farmers, the GFC will package adequate fertilizers in quantities that are appropriate for small holdings.

Part of the personnel GFC requires to initiate its portside operations will be seconded from the fertilizer operations of the MOA. A principal difficulty will be in training this personnel in operating new equipment that will be required, and in selling fertilizers throughout Ghana. To

^{21/} TVA studies of market operations of the major companies in Ghana revealed more than adequate storage and transport (truck, rail and barge) facilities to handle projected fertilizer requirements in the next four-five years.

reach these objectives, in-house training programs will be developed and carried out, with AID assistance, beginning in early CY 1976. These programs will be initiated by a TVA consultant currently in Ghana who will be using limited visual aids and training materials also provided by the FY 1975 AID program loan. As a part of its efforts to promote sales, the GFC, its outlets, and the MOA's extension and research programs will jointly sponsor a "grass roots" educational program to create among small-scale farmers an awareness of the need for fertilizer. Providing basic agronomic information will form the basis for this educational program which will consist of demonstrations, farmer meetings, farm visits and field days. As the demand for fertilizer increases, GFC plans to employ additional staff to coordinate the agronomic services campaign. The GFC and its outlets will work closely with the extension personnel at the MOA and the FLOs to determine the demands for fertilizer in various regions in an orderly and timely fashion.

The GFC, working with the MOA, will be responsible for determining which of its products are for resale at the subsidized price to eligible farmers and areas, and which products are for resale at non-subsidized prices, (e.g., fertilizer used on rice crops in the Northern Region).

To ensure that the objective of timeliness in fertilizer procurement and distribution is met, the National Fertilizer Company which was established in 1971 will be reactivated and expanded. It will comprise

research and extension arms of the GOG, GFC and its outlets, and farmers, and will serve as a coordinating group for all interests related to fertilizer. It will advise the GOG relative to import and research needs and pricing policies, and the GFC relative to the grades and ratios that should be produced relative to its distribution systems and processes. This committee will function as a working committee and will meet at least once per quarter.

This component of the project will assist the GFC with its organizational development, fertilizer marketing and distribution process, engineering requirements and staff training. The project will provide (a) loan assistance to purchase mixers, weighers and conveyers for the permanent facility to be constructed in the second year of the project and to supplement its working capital available for the import of fertilizer; and (b) grant assistance for additional training materials, U.S. technical assistance and participant training. GOG/GFC incremental contributions represent the construction costs of warehousing facilities and the recurrent operating costs of the expanded fertilizer blending and marketing operations.

AID loan assistance for the life-of-project includes \$750,000 to purchase the mixers, weighers and conveyers for the permanent facility and \$20.0 million as foreign exchange to import fertilizer. AID loan assistance in Phase I consists of the \$750,000 for blending equipment and \$6.5 million as foreign exchange to import bulk fertilizers. GFC will borrow the local currency from the commercial banks to purchase the foreign exchange required for fertilizer imports.

AID grant assistance for the entire project will provide \$4,000 for additional training materials and a total of \$440,000 for 5.5 person years of U.S. technical assistance which includes 2 person-years for a fertilizer marketing/distribution specialist; 2 person-years of a demonstration/trials specialist; 6 person-months for an engineering consultant; five person-months for an agronomist/marketing/training consultant, and \$46,800 for two vehicles and furnishings for long-term U.S. technical assistance. In addition, grant assistance in the amount of \$32,000 will finance 16 person-months of participant training which includes 3 person-months each for the production manager and sales manager of GFC, and 10 person-months of management/technician training for the engineering manager.

GOG/GFC incremental contributions over Phases I and II will provide \$500,000 for the construction of the permanent blending facility to be constructed at Tema and about \$3.4 million in recurrent operating costs of the new company (including salaries, maintenance of facilities and vehicles). The GOG will arrange for foreign exchange for fertilizer imports which are not met by AID assistance. A portion of this requirement will probably be funded by ongoing and new donor assistance activities such as the FAO Increased Food Production Through Fertilizer Use program, the IBRD's Sugar and Oil Palm Production project, and the Ghanaian/German Agricultural Development project, all of which have significant fertilizer import components. The local currency required for a revolving fund to finance annual operating costs will be provided by the commercial banking system.^{22/}

^{22/} More detail on the revolving fund is provided in the Cash Flow Analysis for GFC, Annex C.

3. Seed Multiplication

In August 1973, the GOG requested USAID/Ghana to support a study to assess the seed program of the SMU and to make recommendations for improving and expanding the availability of improved seeds throughout Ghana. Following an analysis by Mississippi State University, the GOG decided that it would seek assistance in strengthening the SMU and would encourage the participation of indigenous private certified seed growers in its seed program. The study made several recommendations regarding the organization, staffing and facilities of the SMU. The GOG has accepted these recommendations and they form the basis for this component of the project.

The objective of this component is to assist the SMU in expanding and improving its seed production and processing activities and to enable it to distribute on a wider scale through the fertilizer marketing channels larger volumes and varieties of high quality seeds to farmers.

The SMU is currently being organized into three sections for operational purposes. These are foundation seed, certified seed and seed testing/certification sections. Each will be headed by a well trained section chief. The foundation seed section will multiply breeder seed to a quantity required for a large-scale production of certified seed. The certified seed section will organize, monitor and inspect production of an increasing number of contract certified seed growers. The seed testing section will enforce the provisions of the Seed Law (enacted in 1972) which establishes seed certification regulations and standards. The SMU, with AID assistance, will improve the organization, management, staff and facilities at three foundation seed facilities (one each at Winneba, Kumasi and Tamale), two

certified seed facilities^{23/} (one each at Winneba and Kumasi), and a seed testing facility in Accra.

Staff training is an essential element of the new and expanded operations of the SMU. Seed production, processing and distribution requires knowledge and skills which are not part of the usual background and experience of agronomists or other plant science specialists, agricultural engineers and economists. Ghana has some manpower with background and experience in these areas but most require additional training on the job and abroad. With AID assistance, the SMU will be able to provide its staff with requisite in-depth professional training, operational technical training, and on-the-job training in a number of disciplines related to seed technology, plant pathology, plant breeding and agricultural engineering.

The marketing network of the SMU is also currently being reorganized to distribute seeds more efficiently to farmers in outlying rural areas. In this respect, the SMU will establish distribution agreements with the same outlets which GFC will use to distribute fertilizer. The SMU will distribute seeds on a wholesale basis to these firms at strategically placed wholesaling terminals. As with fertilizer, large farmers will be able to purchase seeds at these terminals. These firms will then transport the seeds, using their own transport and storage facilities, to their outlets for retail sale to small farmers. To ensure that sufficient seeds will be available for retail to small holders, the SMU will package seeds in quantities that are appropriate for small holdings. The SMU will work

^{23/} The German technical assistance program is presently developing a certified seed processing facility and competence at Tamale.

closely with the extension/research personnel of the MOA and the CSIR and the market/extension agents at the FLOs to determine the demand for various crops/variety of seeds in the regions/districts of Ghana. The SMU, its outlets and the GOG will establish prices at which the seeds will be sold in each region, allowing for the transport and storage costs incurred by SMU and its outlets.

The project will improve the capability of the SMU to handle, transport, clean, dry, test and store increased quantities of seed by providing adequate facilities at strategic locations in Ghana. The project will also provide for additional funds through supplemental Project Papers. It is expected that new crops such as soybeans will be introduced into the program as conditions warrant and demand dictates. The specific types of equipment which AID will provide are listed in Annex E. The Mississippi State University has worked with the SMU in preparing the detailed design and required equipment for each facility.

Inputs by AID over Phases I and II for this component include (a) loan assistance to equip the foundation and certified seed processing facilities and the seeds laboratory; (b) grant assistance for the purchase of the foundation seed farms production equipment, tractors and machinery, and vehicles for seed certification and seed transport; and (c) approximately 3 person-years of U.S. technical assistance and approximately 10.5 person-years of participant training. The GOG contribution to this component represents the construction costs and recurrent operating costs of the six facilities.

More specifically, total AID loan assistance to equip the facilities consist of \$233,000 for foundation seed drying, processing and storage, \$256,800 for certified seed drying, processing and storage equipment, and \$17,500 for seed testing equipment. Of these amounts, Phase I loan requirements are \$206,100.

Total AID grant assistance will provide \$175,000 for seed production farm machinery; \$57,500 for 5 pickup vehicles with spare parts; \$150,000 for five 14-ton trucks (one per production facility); \$80,000 for 10 person-months for agricultural engineer consultants; \$140,000 for 2 person-years for an organization and management consultant; \$8,000 for one person-month for a seed technology consultant; \$70,000 for 2 person-years for a seed processing specialist; \$46,800 for two vehicles and furnishings for long-term U.S. technical assistance; and \$196,000 for 113 person-months of participant training to be distributed in seed technology, plant breeding and agricultural engineering.

The specific GCG contributions for this component consist of \$657,600 for the construction of three foundation seed facilities; \$856,800 for the construction of two certified seed facilities; \$69,800 for the construction of a seed testing laboratory, and \$1,102,100 for the recurrent and operating costs of these facilities.

4. Small Farm Systems Research

A major bottleneck to providing the Ghanaian small-scale farmer with appropriate agronomic information is that research which is undertaken by the various institutions needs to be much more applied to farmers' conditions

and problems. Research, properly designed to address and eliminate some of the constraints the small farmer faces, is essential to stimulating an increase in the production on small holdings. To understand the role of technology in rural development, it is imperative to understand the nature of the interactions of technology with physical, socio-cultural and economic factors, level of institutional development, availability of trained manpower and the existing physical infrastructure. These interactions have profound implications for the steps necessary to develop technology which is suited to specific conditions, the means of communicating technology to the rural people who must make decisions relative to their production and consumption patterns, and the forms of social organization which must evolve to make use of the technology developed. An understanding of the nature of these interactions must form the basis for a research program strategy. Appropriate research, responsive to all of these factors, can seldom be conducted by one or two researchers isolated from the mainstream of research communication. Instead, an interdisciplinary team of researchers is required to insure that all these factors are considered as the research program is planned and initiated.

This component of the project is essentially a pilot activity. The objectives are (a) to assist the MOA in establishing an applied, multi inter-disciplinary research capability, and (b) to improve and expand the coordinative links between the MOA's research unit and other institutions which are providing production-related services to the Ghanaian small holder. This component will be managed by the Division of Economic Research and Planning Service (DERPS) of the MOA. It is designed to gather basic

data and test improved farm practices on small holdings. It will focus on applied socio-economic and agronomic research which will be used to help determine the demand for and appropriate mixes of various inputs as well as the small farm production constraints as seen by the small farmer.

The area in which this component will be sited will be the same district in which the marketing component of this project and possibly the same district in which the proposed FY 1977 District Planning and Rural Development Project will be implemented. This will be either in the forest/savannah zone in the Brong-Ahafo Region, the Ashanti Region or possibly the Western Region. Since little is known about the mechanics of small farm systems in Ghana, this approach of focusing a concentrated effort in one district will (a) significantly improve and expand the institutional infrastructure serving the small farmers of this district, (b) develop technological input packages and interventions relevant to the socio-economic and ecological situations of the small farmers, and (c) provide valuable information on the management of small farm systems--information which will be readily adaptable to other areas of Ghana.

This component will establish a research station within the district that will be staffed by an eight-person multi-disciplinary research team of Ghanaian and U.S. scientists. The applied research effort will encompass:

- a. Agronomy - cropping and farming systems, mixed/inter/mono cropping and production practices;
- b. Agricultural economics - the economics of research results and of proposed innovations on farms, incomes, farm management and marketing;

- c. Rural sociology - identifying the sociological/cultural factors affecting the adoption of new practices and technology, and the formulation of new means for coping with inhibiting factors;
- d. Extension - developing methods and materials for extending research results to farmers, establishing two-way communication between research and production to assure that research focuses on small farm problems, and to assure appropriate farmer feedback for future research activities;
- e. On-farm storage - identifying, developing and testing new structures and systems which can be easily and cheaply constructed and implemented by farmers and which will reduce on-farm waste and losses.
- f. Entomology and pathology - short-term consultancy will be obtained as the need arises in these areas;
- g. Animal sciences - small animal management and production consistent with small farm resources, goats sheep, swine, poultry, rabbits. Some attention may be required for cattle in the areas where oxen farming is practiced.
- h. Fisheries - inland fish production, ponds, streams, lakes, etc.
- i. Environmental analysis--identifying and monitoring environmental impacts of intensified farming activities and designing and promoting environmentally sound practices in agriculture.

By establishing the research station and activity in the forest/savannah transitional zone, the findings are expected to have maximum replicability and transferability to both the forest and savannah zones.

Given the experimental nature of this component, all AID inputs will be grant-funded over Phases I and II except for investment costs which will

be funded from Phase I loan. They include (a) approximately \$640,000 for 13 person-years of U.S. technical assistance (4 person-years for a farm systems specialist, 4 person-years for an agronomist, 4 person years for a farm storage specialist, 5 person-months for an etomologist, and 5 person-months for a plant pathologist); \$40,200 for furnishings for long-term U.S. technical assistance; (b) \$72,000 for 4 person-years of participant training (2 person years each for an agronomist and a farm systems specialist); (c) \$40,000 for vehicles with spare parts; \$30,000 for laboratory and office equipment; \$2,000 for survey equipment; and (d) \$32,000 for field surveys.

The GOG contribution will consist of (a) \$72,000 for 12 person-years of Ghanaian senior field staff (4 person-years each for a rural sociologist, farm management and marketing specialist; (b) \$96,000 for 20 person-years of support staff, including a livestock specialist, a veterinarian, an extension specialist and a fisheries specialist, \$28,400 for clerical staff and \$69,600 for operating costs of the research station over the life-of-project.

5. Marketing

The Agricultural Sector Assessment of the DAP has identified improvements required in the marketing system, particularly regarding the flow of commodities from farm gate to wholesale markets, as the most effective way of increasing farm incomes and agricultural production in the short run. It has also indicated lack of information on Ghana's marketing system as a problem requiring further research. The traditional marketing system consists of large numbers of small traders, many of whom are women. Their

margins are high because marketing costs and risks are high. Given the lack of information on the types of market mechanisms or systems which are appropriate in Ghana, it is necessary to analyze in considerable depth the marketing problems of small holders and traders in order to design and test interventions which would make marketing services more accessible to these farmers in a regular and timely manner.

The objective of this component of the project is to improve the understanding of the structure and functioning of the traditional food crop marketing system in Ghana which will enable the design and execution of more effective marketing interventions to the private sector. This objective will be accomplished by establishing a district pilot marketing program designed to increase the services which small traders and farmers' associations provide by reducing the marketing costs and increasing competition within traditional marketing channels. Marketing costs should be significantly reduced by providing credit for improving transport, storage and handling facilities in village markets. The specific types of interventions and assistance will be determined after careful study of the marketing structure within the pilot area.

This component will be implemented by the Development Finance Department of the BOG. Faced with serious balance of payments problems, the BOG established this department in 1969 to actively seek out, finance and manage development projects which have the potential to provide products for the internal market, that are suitable substitutes for current imported items. Among others, the Department is presently supporting grain distribution and warehousing projects with private traders, a cassava farm, a

cattle development project and a brick manufacturing firm. Credit will be extended to a few selected traders through a current bill financing scheme which the BOG initiated for small traders.

The pilot activity will be implemented in the forest/savannah zone of the Brong-Ahafo or Ashanti Region or in the Western Region in the same area as the small farm applied research component of this project, and possibly in the same district as the proposed District Planning and Rural Development Project. An initial field baseline survey will be conducted to determine the extent to which farmers are being provided the required marketing services and by whom these services are provided. Following this survey a few (approximately 3-5) small traders and/or farmer cooperative/marketing associations will be selected to participate in the program. Care will be taken that this component does not negatively impact on women traders who will be considered when participating traders are selected. Traders/associations will be offered the opportunity to obtain credit from BOG's private trader financing scheme at prevailing commercial interest rates (currently about 12 percent) for working capital to purchase trucks, tractors and trailers and to establish modest assembly/storage facilities. They will make all operational and management decisions and will act as independent businessmen. All incremental costs to the trader/association, including labor and operational expenses, will be paid by the trader/associations and derived from income earned in buying and selling commodities. It is also probable that the traders/associations will become involved in the delivery of production inputs to the farmers in the area. Traditional marketing channels by experience have developed a method or

system which development agencies took years to discover--the integration of marketing, credit and supply. Purchasing farm produce both at the farm gate, at roadside markets or wholesale/terminal markets is only one of the services which they provide. As the private trader/association buys farm produce, they sell building materials, production inputs, consumer goods (fabrics, radios, bicycles, etc.) and also provide credit to finance the purchase of these items when credit from other (more affordable) source is unavailable. In this respect, particular attention will be given to maximizing both the receiving and delivery services of the participating traders/associations.

While the traders/associations will be expected to make their own management decisions, they will be required to allow an area marketing specialist, assigned to this component, to fully observe and review (not manage) their operations, to include monitoring of prices and operating expenses. This will be done periodically in annual three-month follow-up surveys which the BOG will organize during the second through fourth years of the project. The purpose of these surveys will be to (a) determine the effects that increasing traders' mobility and access to credit are having on their marketing operations, and (b) to serve as ongoing evaluations to identify required program adjustments. At the end of the project there will be a final evaluation survey to determine the impact of this component on marketing services in the area and to determine the suitability of replication and diffusion of similar activities in other areas of Ghana.

Given the experimental nature of this component all inputs will be grant funded by AID. These include \$135,000 for baseline, follow-up and

impact-evaluation surveys; \$80,000 for 10 person-months of U.S. technical assistance (a marketing specialist consultant); \$65,000 for Ghanaian staff (area marketing specialists and a marketing coordinator); one vehicle for Ghanaian support staff and U.S. consultants; \$20,000 for miscellaneous expenses; and \$160,500 for equipment and facilities, (i.e., transport trucks, trucks and trailers, construction of assembly points and equipping them with scales, crop dryers, tools and equipment).

6. Extension/Demonstration

The primary objectives of this component are (1) to expand the field demonstration programs of the Extension Service and the Home Extension Unit of the MOA using appropriate fertilizer mixes and improved seeds and cultivating practices, and (2) to strengthen the capabilities of the Home Extension Unit, supported by the Department of Home Sciences of the University of Ghana, to serve more women in their roles as farmers, farm laborers and home managers.

In early 1975, the Extension Service with USAID support conducted 50 demonstrations on small farmers' fields demonstrating the profitability of the proper use of appropriate fertilizer mixes and improved seeds and cultivating practices. These demonstrations were conducted under the guidance of a TVA technician currently in Ghana. The fertilizer element of this component will enable the Extension Service to increase to 200^{24/} the number of fertilizer/seed demonstrations it can conduct annually on a national basis. This will be directly related to the other components of the project in encouraging the proper use of fertilizer, seeds and agronomic practices through demonstrations on farmers' fields. By showing the direct

^{24/} An additional 100 fertilizer/seeds demonstrations will be conducted by the Home Extension Unit (discussed below in this section).

applicability of these inputs to their specific situations, and by providing requisite credit with which to purchase these inputs, it is anticipated that small farmers will have adequate incentives to purchase these inputs and to increase their agriculture production.

The demonstrations will be conducted primarily with maize, millet, sorghum, food legumes, vegetables, yams, cassava, cotton and other traditional food and cash crops principally produced by small farmers. AID will provide grant funding for the fertilizer and seed requirements the first year and for training aids and demonstration materials required during the project. In addition, the short-term agronomist/marketing specialist consultant and the TVA technicians under the fertilizer component will assist with planning and organizing an appropriate training course for the extension agents. The GOG will provide for the remaining fertilizer/seed requirements and the continuing costs of operating these services, (e.g., extension agent salaries and transportation).

The objective of the Home Extension Unit is to help improve the living standards of farm families by (a) encouraging improved nutrition through the production of foods which are rich in protein and vitamins, (b) encouraging improved storage, processing and preservation techniques to minimize food losses and to increase food availability throughout the year, and (c) extending information on improved management techniques of the farm and household resources. The program which started in 1970 is now staffed by 15 supervisors and 57 field extension workers. The field extension agents are graduates (certificate holders) from the MOA's agricultural college at Kwadaso. Project activities are now undertaken in 14 districts, 55 sub-districts and 280

villages throughout Ghana.

Each field worker is expected to reach 3 villages during the first year of being placed in a sub-district. Within each sub-district (10-18 villages), 30 women and 20 youths are expected to participate in the program. During each ensuing year, the field worker is expected to reach one additional village, i.e., 20 additional women and 10 additional youths in these villages. Eventually the program will have a total coverage in all of Ghana's 58 districts with about 250 sub-districts.

Field workers are supported, supervised and evaluated by district supervisors who in turn are responsible to the headquarters in Accra, staffed by three professionals.

Annual work programs of field workers consist of five phases. During January/February individual agents teach village groups the principles of nutrition in relation to food production and diet improvement. Follow-up demonstrations are held at group meetings and in individual compounds and households. During March/June, the major planting season, field workers advise and demonstrate improved practices in producing staple food crops and legumes, vegetables, fruits, poultry, rabbits, goats and sheep. This is done through group discussions and demonstrations as well as intensified follow-up visits to individual holdings. During July/August, demonstrations focus on improved practices regarding processing of all crops, on-farm storage and preservation of products consumed by the household. During September/November, the minor crop season, agriculture extension work is concentrated on improvements in off-season cultivation; also principles of improved home management practices are intensified and possibilities for

the application of intermediate technologies in the home and on the farm are explored.

The Unit receives support from the Department of Home Science at the University of Ghana. This support includes research backstopping for field activities, development of instructional materials and intermediate (labor-saving) farm/home technologies, and short-term training programs for field workers. However, due to the unavailability of sufficient laboratory space and facilities, research materials and equipment, the University has been unable to provide expanded support to the Unit.

The major limiting factors to increasing the capability of the Home Extension Unit, working together with the Department of Home Science at the University, are (a) the limited number of trained agents that are available; (b) inadequate vehicles to transport staff, materials and equipment to the various project sites; (c) inadequate demonstration and training materials for farm demonstrations and staff training; and (d) inadequate facilities for demonstrations.

In late FY 1975, AID provided \$50,000 in grant assistance ^{25/} to the Home Extension Unit and the Department of Home Science to establish the first stage of a workshop/laboratory on the campus of the University, 10 farm/demonstration centers in rural areas/villages, and to organize training workshops to be held at the University. This was expected to be the first phase or year of a five-six year program to significantly expand

^{25/} FY 1975, Women in Development Project authorized in June 1975

the coverage of the Unit and the support it receives from the University. The first evaluation of this activity is scheduled for May 1976. Subject to this evaluation this component of the project, in addition to providing materials to the Extension Service, will continue AID assistance initiated in the FY 1975 Women in Development project.

Specifically, the Home Extension Unit will be provided grant assistance to (a) establish an additional 40 farm/home demonstration centers over the life-of-project (10 per year during the FY 77-80 period); (b) purchase vehicles, demonstration/training materials; (c) complete the establishment of a workshop/laboratory on the University over Phases I and II; (e) purchase fertilizer and seeds to conduct 100 demonstrations the first year on farmers' fields; and (f) 60 person-months of participant training.

Total AID grant assistance under this component, including assistance to the Extension Service, the Home Extension Unit and the Department of Home Science, consists of the following:

Extension Service - \$12,000 for equipment and demonstration materials (training aids, fertilizer and seeds);

Home Extension Unit - \$60,000 for 30 farm/home demonstration centers, 220,000 for 22 vehicles with spare parts, and \$51,900 for equipment and demonstration materials (training aids, fertilizer, seeds and hand tools);

Department of Home Science - \$29,700 for laboratory equipment, garden tools, training aids and research support, \$16,000 for training workshops (2 workshops per year for five years), \$8,700 for physical additions to the workshop/laboratory, and \$12,900 for evaluation activities. (i.e., collection of baseline data and evaluations.)

The GOG contributions to this component largely represents the remaining costs of demonstration materials (fertilizer and seeds - \$37,200;- and the recurrent costs of all three elements - approximately \$1,093,700).

Given the size and scope of the project, it is possible that unforeseen requirements for short term expert technical advice may develop in any number of areas including: assistance to the Project Coordinating Committee in management, coordination and/or information exchange techniques, or assistance in broader evaluation of the response of the marketing system to production increases resulting from the project. For this purpose, therefore, the project financial plan includes \$300,000 for approximately 36 man months of short term consultant services to be contracted for over the life of the project as the specific need arises.

III. Project Analyses

A. Technical Analysis and Environmental Assessment

Increasing production and incomes, and realizing more equitable distribution of the benefits of development in the rural areas, require that all small farmers, not just the more progressive, have access to improved production inputs, delivery and receiving services and systems, information, credit, and rational marketing systems. However, it is possible that small farmers could have access to all or part of these services but not to a technological package* appropriate to their needs. It is also possible that the technological package has been developed but that the requisite inputs are not available to the farmers. In Ghana, the prime need is to develop and disseminate a proven, adapted and profitable technological package for small farmers. This package should be based on improved cultural and resource management techniques, ready availability and access to production inputs, and the credit with which to purchase these inputs. The project will focus on these prerequisites.

Applied Small Farm Research

Research, properly designed to address and remove the constraints to improving the production, income and welfare of the rural poor, is essential to the growth, development and stability of Ghana which is faced with a high population increase and a net decrease of per capita nutritional level and income, particularly in the rural areas.

Some technology exists for extending to small farmers but a substantially increased technology package is required, both in quantity

* The term "technological package" as used herein refers to tested agronomic information, inputs and requisite credit which are easily accessible by small farmers. Although the farmer should have access to those components in a timely manner, these components are not necessarily prepackaged together.

and quality, to achieve the project goal. To develop an improved technological package for Ghana's small farmers, a systematic and coordinated problem-oriented research effort on production, storage and marketing systems adapted to the physical, ecological and climatic conditions, and institutional and socio-cultural factors is required. The Ministry of Agriculture is now developing a capability in applied multi-interdisciplinary approaches to study small farm systems in Ghana. The applied small farm research component endeavors to strengthen this capability.

The initial intent was to grant fund the entire component. However, the MOA preferred to fund the Ghanaian staff salaries, provide the research station and available facilities and some of the operating costs, and utilize the grant funds for research expertise unavailable to the MOA.

The effort will focus on the precise identification of the critical constraints to be overcome in improving the farmers' productivity, in setting priorities in organizing agricultural research and establishing coordination between research efforts to assure that inter-relationships are considered in dealing with a single crop, and between various crops and farming systems, and the physical, biological and social science aspects involved. Otherwise, purely technical solutions would likely result, having limited influence on farm level profitability.

Regardless of its scope or focus, biological/agronomic research does not and cannot stand or operate alone. Therefore, it will be a component part of an integrated development design. Cooperating with the other disciplines, it will start by obtaining a sound knowledge of the existing farming systems and the constraints in the locality served. The effort

will consider and rationalize the farm economics, practicability and social implications of the innovations proposed. Laying the foundation for this effort will encompass multi-interdisciplinary investigations to identify baseline data on all aspects of the small farmer environment. Only then can we obtain a clear picture of the present situation and an understanding of the changes that can be made. From this, constraints will be identified upon which to focus the research effort.

The major role of the research component will be to develop a technical package which the farmer can implement. Initially, the package will be as simple as possible. It will become more complex as the farmer's competence and confidence in himself/herself and in the researchers and extension staff increase. In this respect the economics of the production package will be proven and demonstrated in the field--on farms in the locality, not on the research station--to assure its validity.

There have been and still are general research gap problems in Ghana: a shortage of new agricultural management and production inputs developed which were either actually rewarding to the farmer or which the farmer viewed as such; the research conducted has been inadequately designed and tailored to resolve real, immediate rural development needs, and has slighted the essential linkage between economics, technology and the social environment; and there has been an extreme shortage of adaptive/problem-oriented research conducted. Research, to be useful to and effective in improvements in rural/subsistence sector agriculture, must be based on knowledge of the existing farming systems and agricultural practices, of the constraints inhibiting agricultural/farming development, and be focused on identifying

or adapting innovations which are profitable, practical, applicable and responsive to the sector's or farmers' needs.

The initial thinking in the PRP for the small farm applied research consisted of three disciplines: agronomy, economics and socio/cultural, provided by the MOA. During further review with GOG, it was determined that research should focus on a broader range of problems and that all the necessary research expertise could not be provided from Ghanaian manpower resources. Therefore, three U.S. researchers will be provided for the seven-man multi-interdisciplinary research team. The findings of the research effort will be extended to the target population through the Extension Service component's field trials activity assisted by the Fields Trials Officer under the fertilizer component, by the applied research component, and by the marketing/extension and supervised credit staff of the ADB attached to the Farm Loan Offices. The Home Extension Unit will also focus on the women's role in agricultural production and the home, including field trial demonstrations, and extension/production, nutrition and home management training services.

In addressing the total scope of the small farm problem, the research component will focus on the following aspects:

Farming Systems/Farm Management. Most technicians are aware of the role and need for a profitable technological package in the farming system but have difficulty identifying or understanding the interactions and changes generated in the system through introduction of innovations. This is particularly true with respect to the division of labor between the sexes and the impact of new technology interventions on women who provide the bulk of the

agriculture labor force. Since this information is essential the research effort will be broader than crop variety or agronomic trials and will be an integral part of the program to adapt research results to specific farming systems and ecological zones. The research will also be closely coordinated with the Extension Service to assure the Extension Staff's training and awareness of the innovations and how they can be applied as a package to the farming system taking full account of the local constraints. This will help assure that the evolving and implemented adaptive research modifies and constantly improves the package with which extension is equipped for its role in the rural areas.

The constraints/research needs will be jointly identified with the farmers, both male and female, to maximize the probability that it will be viewed as applicable to their situation. It will also be conducted in line with the scarcity of resources on small farms rather than emphasizing optimal combinations of resources to maximize output. And it will be firmly based on subsistence or small crop farming, on the staple food crops of the subsistence farmer. Practical adoption of research results by subsistence farmers requires that research experimental conditions reproduce the conditions under which the technical innovations developed are to be applied on the farms. This includes the sex of the persons doing the work. It is conceivable that a male laborer on a research plot could cope with the new technique, but be difficult for a woman to implement on the farm due to the extra time, physical strength, etc., involved, particularly since most women already have a long, hard daily work schedule and may be less well-nourished than the men. All implications and ramifications of the division of labor require study and attention to the needs

for relevant research activities and focus. Therefore, the research effort will be designed to either remove or to adapt to critical constraints, and improve performance of the agriculture system, utilizing the baseline data/knowledge of the physical environment in designing farming systems and technology interventions to minimize effects of climate, rainfall, soils, etc., on the outcome of the program.

Over-specialization or simplification of research tends to focus efforts on one crop or practice with very little consideration given to its place in or relationship to the farming system or pattern. The optimum planting date, cultural practices, fertilizer requirements and applications, labor requirements, etc., are frequently determined by research on a single crop in isolation. But these optimums for a single pure stand crop may not be best when it must be produced with the other crops on the farm, often in a mixed or intercropping system, and compete with them for the labor and management available to and utilized for the farm as a whole. The recommendations for a given crop or practice must also be considered in conjunction with other crops or practices that precede or succeed them in the rotation or farming system as a whole. For these reasons the research will be conducted relative to the set of conditions and inter-relationships existing on the farms of the locality, not on the research station.

Soils Management. As in food crops, tropical soils management, particularly for small subsistence farming, has been generally ignored in past research efforts. Yet most of the area cultivated is under subsistence production. Therefore there is little hard, reliable research

data for guidance in this very important aspect of agricultural production. Soils management will be included in the farm management/farming systems research design, to determine the best methods for improving soil conservation and moisture absorption and retention for plant growth, retaining fertility and tilth, and how to manage the soils to permit sustained cultivation, reducing the need for shifting, slash and burn practices.

Applicability to Farming Systems. The agricultural research program must necessarily be designed around and be applicable to the factors of production and resource endowments and limitations of the rural area involved. Tractor-based management systems on the research station may show amazing results but have little applicability on the small holdings that by necessity are cultivated with a hoe or oxen. The theme of the day is applied research, but little research is actually conducted with the tools and resources available to or addressing the real constraints confronting the small farmer. Therefore, it seldom identifies results that are profitable and can be readily and reliably applied. Farm management, farming systems, production practices, fertilizer response, weed control, etc., regardless of the type or focus of research, must be conducted in terms of the farmers' resources, not the government's resources or the researchers' erroneous concept of the prestige attached to mechanization and modernization.

Duplicaton of Farm Conditions. The research component emphasis will, therefore, be on the crops and production systems, intensive or extensive,

best suited to the available land and the environment; the size of the individual holdings; the resources and constraints with which the small Ghanaian farmer must cope; and the population density the land must support. The farm management systems research will be conducted for and be applied to the specific rural economy in which it is located. Seed bed preparation, cultivation, fertilization, etc., will be conducted with the tools available to the rural economy or at most limited to improved tools or mechanization available and within the farmers' means of acquisition. The program will avoid the usual approach in which the research stations and programs conduct research with modern machinery, overhead irrigation, the full range of production inputs which the farmer neither owns nor has access to. To assure that the research is meaningful to the locality it will duplicate the farming systems and the physical, ecological, economic and other conditions of the locality since fertilizer trials, weed control or crop varietal output results, when conducted with modern machinery and irrigated farming, do not apply to hoe and hand labor cultivation.

Research will duplicate the conditions of the typical small farm in the locality which is four-five acres in size, plowed and cultivated with human muscles and hoes, intensively planted to multiple or mixed crops, confronted with labor constraints at peak seasons, on soils of medium fertility and low in organic matter, and depends on rainfall. The research plots and field trials will not be located on land previously plowed by tractors as this would invariably violate duplication of small farm

practices/conditions. If a new variety of food crop is being tested, it will be planted in an inter- or mixed-cropping system if this is the local system, rather than in a pure stand. Fertilizer and insecticides will be applied with the equipment the farmer has or can obtain, but this will usually be by hand. The new technology and innovations that are interjected into these management systems will be done in a manner that remains within the farmers' capability and accessibility whether physical, economic, or otherwise, and every attempt will be made to avoid disequilibrium of the farming system. Every effort will be made to demonstrate to the farmer through the research and field trial demonstrations that it is possible and profitable for him to implement and manage these innovations on his farm.

Input Availability. Problems arise because research is often designed and conducted with the goal of maximizing output per production unit, giving little if any attention to the necessary inputs and their availability and the farmers' ability to procure, provide or master them. If the farmers view labor as their major limiting factor of production, the research component will avoid developing a new practice or innovation requiring a substantially increased labor input, as little would be gained. The same will apply to inputs requiring capital or other resources the farmer does not have. However, with the production inputs, services, credit, etc., being developed and available through the other components of the project, the project is designed to the best of our ability to avoid serious bottlenecks, and research will be designed to maximize utilization of these factors in development.

Equilibrium of the System. Although past research has developed improved varieties of crops and techniques for increasing yields, it has generally given inadequate attention to the economics of the innovations in the farming system or to management problems which arise and require solutions that render the innovations feasible when implemented on the farm under actual farm conditions. The research will be designed and focused to avoid upsetting the equilibrium of the existing farming systems unless it can be replaced with a new, balanced and better system. This will be supported by farm studies identifying the practical obstacles to adopting recommendations emerging from research to which researchers will address appropriate attention. Then the interjection of the new crop, technology or innovation will be skillfully integrated into the local area's farming systems to avoid too abrupt shifts/changes in transforming the farming systems.

Multiple/Intercropping. Investigations will be conducted on the comparative merits of multiple or intercropping and monocropping. Indications are that total tropical production increases and the effects of weeds and insects decrease under intercropping systems, implying that monocropping may not be the best farming system for small subsistence farmers. This will be evaluated concomitantly with investigations to identify the best mix of crops and the crops most compatible with the intercropping and rotational system. Since intercropping is a widely used farming system in Ghana, the innovations will consist of improving

an ongoing and understood system rather than an interjection of a new system.

A year-round warm climate is a fundamental requirement of multiple or mixed cropping. Improving the system requires new technology, short and long season varieties of crops, systems and methods for overlapping planting and harvesting dates for maximum exploitation of land, sun, moisture, and optimum utilization of off-farm inputs such as fertilizers, insecticides, etc. An apparent initial requirement is starting with the major staple food crop and expanding to other appropriate crops in the system. Therefore initial efforts will start with the staple food as an inducement for the farmers to discuss other aspects of their program/problems.

Multicropping or interplanting requires attention to several factors; compatible crops, slow starters with fast starters, deep-rooted with shallow-rooted; non-use of excessively spreading varieties or other crops in succession susceptible to the same disease or attack by insects. Ratooning grain crops permit more than one harvest per planting. Heavily utilized soils require ample fertilizer. Insects flourish in constantly growing vegetation requiring control measures, usually frequent spraying and minimum cultivation.

Livestock is another potential interjection with multicropping since people do not eat the stalks, vines and leaves, and up to ten tons of forage plus the grain can be produced per acre. This normal waste could be converted into animal protein to improve the diets and incomes and provide manure for soil fertility.

Crop Storage. Ghana is having difficulty providing adequate food for its rapidly expanding population. In many cases total production is adequate but the quantity of food available for consumption is considerably reduced due to losses resulting from poor storage practices, insects, mold and rodents and while in transit for storage/distribution. Another serious resulting problem is that scarce foreign exchange must be expended to replace the food which is produced locally and lost due to improper storage and handling.

While a great deal of effort is expended in trying to increase production, little is expended on protecting this production, even though the latter would do much to avoid the existing estimated 30 percent loss and thereby actually add millions of tons of food to the national stocks. Despite efforts to encourage increased production, small subsistence farmers may well have limited incentive to do so, as experience has taught them that much of the fruits of their efforts will be wasted through such losses. Improved storage and handling may do as much to encourage farmers to increase production and increase the available stocks of food as direct productive services.

Improved on-farm storage will also have direct positive impact on farmer incomes. The need for cash for school fees and other demands and the threat of loss under traditional storage practices virtually force farmers to sell that portion they consider surplus to meet family needs at harvest time. And the prices received due to market glut, trader speculation and collusion, etc., are low compared to those paid later in

the year. Improved on-farm storage minimizing losses, combined with credit to carry them through this stress period, would enable the farmers to market produce when prices are more favorable. Improved on-farm storage structures would provide basic incentives for increasing production as more of the stored grains could be sold for a higher price a few months later and less of the food stored for family consumption would be damaged or destroyed. On-farm village level storage is extremely important since about 80 percent of all grains produced in the subsistence farming areas are stored there. This problem should be alleviated by the provision of credit and developing and extending improved storage facilities and practices.

Seed Multiplication Unit. The Seed Multiplication Unit will provide appropriate varieties of certified seed which have been proven adapted to Ghana's environmental conditions and are being grown. As new and better varieties are identified and proven by the research component of MIDAS, the Crops Research Institute, the proposed Semi-Arid Grain Crops Research and Development Program, or other sources, they will be incorporated in the program.

The initial proposal in the PRP did not include production/farm machinery for the foundation seed farms. Close investigation on the farms determined the existing farm production and harvesting machinery was totally inadequate both in amount and operational condition. Adequate commodities to accomplish the target outputs of genetically pure, disease and weed free, highly viable foundation seed are included.

Labor-intensive seed production was considered but was ruled out. The three foundation farms contain 80 acres, 150 acres and 200 acres. Labor requirements vary from very little during parts of the year to large crews during peak demand periods of seed bed preparation, planting, cultivation and harvesting. The labor supply is uncertain as home farms and others require the labor at the same time. Hand labor is much slower and the timing of each operation is critical relative to rainy season, soil moisture and weather permitting farm operations.

Harvesting, drying, processing is an example. Hand labor requires three-four months on the 80-acre farm to pick, husk, shell, dry and warehouse the maize. During this period, usually raining, the moisture content in the seed is 30 percent. High seed moisture content combined with hot weather result in fast deterioration and reduced viability of the seed. With mechanical pickers, huskers, shellers and fueled fire driers this operation is accomplished comparatively quickly and the properly dried seed is warehoused out of the weather, undeteriorated and with high viability.

Appropriate mechanization to permit timely and better seed bed preparation, subsequent cultivation and harvesting, combined with other production inputs, will result in increased yield and better quality seed per acre as compared to labor-intensive methods.

This does not suggest--in fact the entire project is focused away from--widespread tractor mechanization. But the foundation seed farms are such an essential input into increased production nationwide, they must

not be hampered or delayed by the lack of adequate serviceable tractors and equipment or the speed and quality with which tasks are accomplished by hand labor.

The mechanization and transport division of the MOA has an array of equipment in various locations throughout the country. But even a minimum of appropriate equipment for the seed farms is not available to the seed farms on any assured schedule because the primary purpose of the mechanization centers is to serve the custom work needs of farmers in the centers' service areas. Foundation seed is too crucial to project input and output targets to compete for equipment. The farms must have serviceable equipment available in adequate amounts to accomplish the variety of tasks properly and within critical time periods, or the supply of seed will be seriously decreased, both in quantity and quality.

The foundation seed will be distributed to contract growers who have demonstrated appropriate farm management/production practices to assure high quality seed production. They will multiply/bulk up seed for certification by the seed certification section of the Seeds Unit. This has been shown as a better approach than bulking up certified seed on Ministry/Government farms.

The Seeds Testing Laboratory will test seeds prior to issuance of certified seed certificates to assure the germination rate is of an acceptably high rate, that the seed is disease free and is not physically harmed or deteriorated.

Ghana Fertilizer Company. The fertilizer component will provide appropriate mixes of fertilizer which have been researched and recommended by the TVA technicians, the FAO fertilizer trials, and the Ghanaian/German program in the Northern Region.

Mixing/blending, bagging units and warehouses will be established at Tema port to handle the bulk imported fertilizer components. This method will result in a considerable savings to the GOG compared to importing mixed, bagged fertilizer.

The GOG has expressed considerable interest in a steam granulation plant. This is a more complicated operation and in order to be economic requires a much higher volume of through-put than the national fertilizer requirements during the project development period. Therefore this facility is not included in the project; however, it is possible that GFC will request other donors for assistance when granulation becomes feasible.

A fertilizer company has been established by the GOG with overall responsibilities for importing, mixing, bagging and distributing fertilizer to strategically and centrally located warehouses. As discussed previously, the MOA will distribute subsidized fertilizer until subsidies are eliminated. Following this, the company plans to wholesale fertilizer to several distributors (GNTC, UTC, Shell, Mobil, AGIP and BP) who jointly have about 1,000 existing retail outlets well distributed throughout the rural areas of Ghana. It is planned that the seeds and other production inputs will be marketed through and by the firms which establish the fertilizer distribution system.

ADB-Small Farmer Credit Expansion. The financial environment of the target population requires that credit be available and accessible if they are to obtain the production inputs and meet other needs such as storage necessary for increasing production and incomes.

ADB's target over the next six years is to establish and have in operation a total of 59 new FLOs. There are currently in existence 13 regional offices and 8 rural farmer credit offices. During Phases I and II of the project, 39 FLOs will be established and staffed. It is projected that during the subsequent two years an additional 20 FLOs will be established and staffed by the ADB.

Staff for the new FLOs will be transferred from trained personnel of the existing regional and rural loan offices, leaving some trained staff to carry on in the existing offices. These vacated positions will be filled with new recruited personnel to gain experience and training from the trained staff.

The ADB has a list of applicants on file, recently obtained, to be selected and trained also. The U.S.-provided training officer will conduct training programs for the new staff and for upgrading the on-board staff to assure the ADB has adequate manpower resources to expand its small farmer lending operations to the project target group and to carry on after project phase-out.

The location of new FLO's is being determined jointly by ADB and MOA to coincide initially with the MOA's focus on crop and small farmer concentration areas on a phased basis. This will also reflect on selection

of the area(s) for the Small Farmer Applied Research and Marketing components and the proposed District Planning and Rural Development Project.

The new FLOs as established by the ADB throughout the rural areas of Ghana will be authorized to make over-the-counter loans using simplified loan application procedures. They are designed to assure that the farmers will have quick access to funds for purchase of inputs and to meet other needs.

Most loans will be in-kind to minimize diverting credit funds to other than the intended purposes. Chits will be issued so that farmers can obtain inputs from distributors. Where credit for employing labor is required, cash will be provided in tranches, as required for each production cycle, such as land clearing, seed bed preparation, cultivation and harvesting.

A marketing/extension supervised credit activity has been added to the initially-proposed FLO program. This activity will provide close contact between farmers, extension agents and distributors. It will help identify input and credit requirements, advise farmers where inputs are available, assist in forming farmer groups/associations for obtaining group loans, assess total input requirements for the FLOs service area, and provide this data to the suppliers and distributors as guidelines for the types and quantity of inputs for which there will be a market when credit is disbursed.

The merits of FLOs versus rural unit banks were considered. It was determined that the FLOs were more appropriate to Ghana's needs at the

present, and would be easier to establish, manage and service. It is conceivable that at least some of the FLOs may subsequently evolve into rural unit banks.

Small Farmer Pilot Marketing Program. Marketing in Ghana is characterized by the small size of the production unit, poor communications and little product differentiation. These features as well as inadequate marketing and transport facilities, fragmented markets and unpredictable prices are common bottlenecks to rural development. Consequently, in assessing the essential minimum components of a rural development package, marketing deserves considerable attention. This component will consist of a pilot activity to identify approaches, inputs and incentives for increasing the effectiveness and efficiency of marketing small-scale farmer produce. Once these are tested and appear appropriate for replication and diffusion, the GOG can proceed with expansion.

The need for and most appropriate design of the marketing component will be assessed in three areas relative to their potential and needs for evolving a marketing program, i.e., land use capability, existing and potential productivity, infrastructure, potential produce market demand, status of existing marketing functions, etc. These are the Brong Ahafo Region, the Ashanti Region and the Western Region. One or two districts in one of these regions will be selected for the pilot program.

The objective of this component is to encourage private traders or farmers' associations in one pilot area to expand their product marketing

and input distribution functions in the more remote rural areas and nearer the farm gate. After baseline surveys of the pilot area, several private traders will be selected and offered the opportunity to obtain credit at prevailing commercial rates for working capital, to purchase trucks, tractors and trailers, and to construct simple rural assembly points. Recognizing the dominant role of women in the market trade, care will be taken to insure that women traders are among the traders considered/chosen to participate in the pilot program. The traders' operations will be monitored, but not controlled, in order to evaluate the effects of their activities on farmer incomes. Grant funds will be provided to GOG to finance baseline surveys and evaluation as well as the purchase of vehicles, tractors, trucks and equipment which will be lent to traders. Funds generated by repayment of these loans will be used to replicate the component in other locations.

Marketing in Ghana involves a complex and at times an obscure interaction of both traditional and modern institutions. Frequently these interactions are influenced by broader economic policies such as determination of parity prices. This influences and makes substantial resource demands on a very limited administrative capacity. Thus marketing provides an excellent opportunity for bringing traditional and private channels into the rural development process.

The performance of the marketing system within a region varies almost in direct proportion to the under-development of the region. Therefore market reform and improvement must proceed hand in hand with other development efforts and should be an integral part of the

agricultural and rural development program and policy. Only as the marketing system expands the market for and assures a reasonable price for produce will there be adequate economic incentives for farmers to increase production. Increased production can be encouraged by a marketing system that makes consumer goods and production inputs readily accessible at least cost. An efficient marketing system requires other supporting infrastructure--arterial and feeder roads, a market information and intelligence program, and a commodity grading system. The requirements for this infrastructure needs no elaboration, but refining the grading system will proceed only as demand dictates, rather than precede it. Locating the marketing component in the area in which the Small Farmer Applied Research component and the proposed FY 1977 District Planning and Rural Development program are implemented would help assure these essential supporting factors are provided.

The marketing requirements and institutions will change as production increases and diversifies and as the demand for specialization grows. In the initial stages the needs are simple--a market location that is easily and cheaply reached, feeder roads and transport, and a local buying agent. The main emphasis will be to assure that the first buyer and forward seller of the product represents the producers' interest and that the buyer has the facilities and transport equipment for proper handling, storage and onward movement of the produce. This the marketing component is designed to do.

The component recognizes that traditional trade channels provide services more efficiently, on a smaller margin, than could employed

cooperatives/government staff.

The GOG is aware of the value of the services the private traders provide for the marketing and distribution process and that these services must not be eliminated since it is extremely difficult to replace them or build a new system. And that when government marketing boards, cooperatives or similar agencies have been given a major marketing responsibility and they failed to provide the private traders' services, or provided them very inefficiently, problems have arisen.

There is little production incentive without fair and accessible marketing channels and little opportunity to increase production without prompt and regular supply of the means of production, much of which requires credit. Within the subsistence agriculture society where some product has been or is sold, there is a more definite tie-in between marketing, credit, supply and distribution, and to some extent savings, than is generally thought to be the case.

Traditional marketing channels by experience have developed a method or system which development experts and agencies took years to discover-- the integration of marketing, credit and supply. Purchasing farm produce both at the farm gate and at his shop is only one of these activities performed by the traditional channels. For example, as private traders buy farm produce, they sell consumer goods, building materials, fabrics, luxury items (transistor radios, bicycles, etc.). A great advantage or benefit is that the traders and farmers' associations operate through the year. Particular attention will be given to and effort made for maximizing both the receiving and delivery services of the marketing component.

INFRASTRUCTURE AND SPATIAL FACTORS:

Feeder road development and transportation availability will be expanded as appropriate to meet the needs of the level of development. The topographical, spatial and distance factors have a significant effect on the time, cost and risk involved in transporting produce and inputs, particularly to the small subsistence farmer, and weigh heavily in the net return the farmers realize from their produce. This and the cost, time and difficulty of obtaining data and production inputs from or about distant markets, and forwarding produce to these markets will be included in the marketing component of MIDAS and closely integrated with the proposed FY 77 District Planning and Rural Development Project in which marketing must plan an important part since these spatial and other relationships are critical for designing programs, planning allocation of resources and creating essential rural-urban linkages. Integration and coordination between the two activities will result in joint benefit and support since the investment in transportation systems in the District

Planning and Rural Development program will give appropriate attention to low-cost rural road networks to improve farm-to-market access, closer linkages between smaller urban areas and market towns, and between the rural area and main highways, railways and airports.

TECHNOLOGICAL IMPLICATIONS:

The project and its technological implications are appropriate for the specific time and place as shown by the progress resulting from initial, similar, past efforts in Ghana. Under the AID-supported Agricultural Extension and Production, and Focus and Concentration Projects, assistance was provided to develop and strengthen the Extension Service and the Seed Multiplication and Farm Mechanization Units. These activities were also assisted by USAID's loans for fertilizer, the FAO program for Increased Farm Production through Fertilizer Use and the ADB's Small Farmer Group Credit Scheme. These efforts largely focused on maize production. National maize production in 1963 was estimated at 296,000 long tons and was insufficient for national consumption demand. By 1974 national maize production increased to 433,000 long tons and even with the population increase in this same period from 8 million to 9.4 million, the production increase was about adequate to satisfy consumption demands, but was affected by storage, marketing and other constraints discussed above. It is estimated that 80 percent of the maize is produced by small farmers.

This very strongly indicates that if a profitable technological package and the requisite inputs and services are available and accessible, Ghana's

small farmers will respond. The project is designed to continue, strengthen and expand the past AID-supported activities in Extension, Seed Multiplication, Credit and Fertilizer and to add applied research, storage and marketing. And with the project's integrated design for and focus on small farm problems, delivery and receiving systems for inputs and marketing, and applied research to improve existing and develop new technology, the technological implications appear very favorable.

EXISTING TECHNICAL DEVELOPMENTS:

The project will utilize all available, appropriate existing technical developments. Ghana, relative to other African countries, has a long history of basic agronomic research on the technical parameters underlying input/output relations under controlled conditions. Its research institutions such as those within CSIR and the agricultural faculties of the University of Ghana and the University of Science and Technology have over the past 20 years published annual reports summarizing basic research results on a variety of trials and experiments for a variety of crops. These basic research results have been collated together in one volume in an attempt to evolve a standard set of recommendations for fertilizer application rates, seed varieties, cultural, rotation and storage practices for different crops and for different soil conditions. See, for example, the ready reference handbook on crop production in Ghana prepared by the CSIR for the Ministry of Agriculture first produced May 1971 and which has been updated annually since then.

These recommendations are now being tested in the field under actual conditions, taking into account the socio-economic and cultural constraints farmers face in adapting these recommendations as well as the organizational/

institutional constraints in having regular and timely access to inputs which are recommended. The most important ongoing programs applying the basic research recommendations are the FAO/Ghana 720 program entitled "Increased Farm Production through Fertilizer Use." (See technical report one entitled Agronomic Experimentation and Extension Work in the Volta, Central and Ashanti/Brong Ahafo Regions of Ghana, Rome, 1974); the USAID supported fertilizer/improved seed demonstration program, the Ghana German agricultural development program in the Northern Region; and, the work of the farm demonstration centers operated by the Christian Service Committee throughout Ghana. The results of these applied research efforts have been published in a variety of documents (see also the excellent "Guide for Field Crops in the Tropics and Sub-tropics," November, 1974, TAB/AID) and have been used extensively in developing the annexes for the economic analyses (see tables three through six of Annex C).

Although this basic research work has yielded the technical knowledge used by TVA and MSU in evolving their recommendations and is sufficient for the present, much more work needs to be done in applied research so that basic research results can be modified to more closely conform to small farmer needs, particularly of those who cultivate in complex multi-crop situations. The objective of the small farm systems research component is to complement MOA efforts in applied research by establishing a more effective link between basic research, extension agents and small farmers, so that basic research results can be applied and modified over time for a large number of crops, soil types and different multi-cropping systems. The applied research results are expected to resolve the more complex technical questions such as soil management techniques for small

farm continuous cultivation practices (as opposed to traditional shifting cultivation) and management systems on small multi-crop farms which ensure that crops complement each other in the mix reducing competition for sun, shade, nutrients, moisture and labor during the respective crops period or peak demand for each.

BASIS FOR CHOICE OF TECHNOLOGY:

The choice of technologies in this project is based on data provided in the Mission's surveys and studies: the Agriculture Assessment, Women's Role in Development, Seed Program Development in Ghana, Action Program for a Fertilizer Industry in Ghana, and Assessment of Small Farmer Credit in Ghana. These studies provided information for baseline data

and identified resource endowments, problems and constraints. This information combined with discussions with GOG officials, other donors and rural producers, formed the basis and guidelines for the choice of technology and for designing action programs to respond to and resolve the constraints. The project, therefore, represents the most suitable technology currently identifiable for the needs of the problem and area.

The Small Farmer Credit Study recommended the approach and techniques utilized in the design. However it was determined that the suggested annual rate of build-up in establishing FLOs and the number of farmers serviced by each center was beyond the staffing, management/supervisory competence of the existing ADB personnel, and this was scaled down to more manageable proportions. The number of officers to be assigned to each FLO was expanded also in line with ADB banking and security policies. And the Marketing Extension/Supervised Credit Officer activity was added to assist the borrowers to identify and locate input needs and information services and to improve the small farmers' credit utilization competence.

The study recommended short-term consultants to assist in establishing the FLOs and training the necessary staff. It was determined that the trained manpower constraints faced by the ADB for managing the expanding program required two full-time technicians to conduct training programs and to assist in organizing and establishing the FLOs for credit expansion, and these were added plus short-term consultants. These activities plus the proposed participant training will resolve the manpower constraints for the ADB Small Farmer Credit Program.

The Seed Development Study designed an appropriate program for drying, cleaning and processing foundation and certified seed. However, close review of the foundation seed farms revealed that the farms lacked adequate operational farm production equipment. The needs were assessed and the necessary farm machinery and equipment were included in the Seed Multiplication component to assure that certified seed production keeps pace with producer demands and the output capacity of the processing plants.

In light of the experienced manpower constraints it was determined that an experienced seeds technician was needed for two years to assist the Seed Multiplication Unit's administrative/management staff with the program improvement and expansion. This technician and the short-term consultancy plus the participant training will assure this component develops the appropriate competence for the task.

The Women's Role in Development study identified the constraints inhibiting development of this important segment of the rural/farm society and recommended the approach for designing this component. However, further assessment showed that support in addition to the recommendations contained in the study and training would be required to upgrade the field staff to appropriate levels. Therefore the University of Legon, Home Science Department input was expanded to conduct applied research on home and farm intermediate technology, to prepare instructional materials, and to conduct in-service training programs for the Home Extension Field Staff to assure the program develops and functions

properly in its role of improving the production/management competence and the income status and well-being of Ghana's women.

The initial thinking on the Small Farm Applied Research and the marketing components was to establish these activities in each of three districts, one in each environmental zone of the country. After careful consideration it was decided that these experimental pilot components should be reduced to one district, be sited and operable in the same district, or at least the same environmental zone, as the proposed District Planning and Rural Development program. This was done to maximize the benefits that each separate activity can provide to the others through the optimum integration possible from siting them in one locality, and the delivery of inputs and services such siting and integration should improve and make easier.

Note the Research and Marketing components' discussion in Section II, A (Background) and C (Detailed Description). On the basis of the needs for research and marketing, the technology/approaches described were selected and designed.

IMPLICATIONS FOR EMPLOYMENT EFFECTS:

The technology selected for the project is focused on small farm production and rural problems, is labor intensive, and therefore should increase rural employment opportunities. This plus the expected results of the Farmers Association and Agribusiness Development and the District Planning and Rural Development projects, both of which also focus on small farmers and the non-farm rural poor, should have considerable favorable impact on rural employment generation.

SUITABILITY FOR USE AND REPLICATION/DIFFUSION:

The best judgment resulting from intensive review by technical/professional expertise is that the proposed technology is highly suitable for utilization in Ghana and therefore is appropriate for replication and diffusion. And the Applied Research component, combined with continuing evaluation and modification for better

adaptation of existing and generated technology, will improve this factor.

HOST COUNTRY CAPABILITY FOR OPERATION AND MAINTENANCE:

The host country has had limited to several years' experience in administration, operation and maintenance of some of the activity competencies of the project and has developed varying levels of expertise and competence. This will be further upgraded through experience in the project component activities. In those areas where there are shortfalls in trained manpower and technical expertise, training and technical assistance will be provided under the project to strengthen and develop the requisite manpower resources and competence by end of project phase-out.

Further inputs are provided in this respect from USAID-supported ongoing Agriculture Management Development project which conducts seminars for two weeks each month, rotating from region to region, for agriculture personnel from the respective region and its districts and sub-districts. Senior agriculture management personnel are being trained at the Government Institution of Management and Public Administration (diploma course) and in the Masters of Agriculture Administration course at the University of Ghana, Legon.

The host country does a fair job of maintenance and operation on equipment and vehicles they have had experience with when spare parts are available. Therefore, spare parts will be imported with all equipment and vehicles. Relative to U.S. vehicles, the Ministries have used Chevrolets almost exclusively and express definite preference for them. This is in large part because repair and maintenance facilities and parts for them are more widely available and better than for other U.S. vehicles, and the experience that they have held up and performed better than other U.S. vehicles. Proprietary procurement is requested for Chevrolets for the above reasons, and to continue USAID's efforts to standardize vehicle imports into Ghana.

ENVIRONMENTAL IMPLICATIONS:

Due to the "institution developing" nature of the project, it does not constitute a major action directly affecting the physical environment. The indirect actions which the developing institutions will be undertaking, however, will have significant impact upon the environment. For example, the intensification of agricultural activity is often accompanied by increased soil erosion, siltation and pest problems, and, in turn, pesticide contamination problems and pollution of water courses, just to name a few. Adverse impacts such as these can be mitigated by sound planning and practices. This project will promote environmental concern by providing appropriate technical assistance and participant training to strengthen the indigenous capabilities in environmental analysis.

The project includes research on small farming systems and improved management and utilization of resource endowments which should result in minimum if any adverse effects on the environment. When clearing land for a new field, the traditional practice has been to burn the bush and trash, particularly in the forest zone. However, since most of the farming is done with hand tools, the farmers have little alternative to burning. The larger bush/trees cannot be removed from the field otherwise. Although burning under non-bush vegetation would add organic matter to and increase fertility in the soil, this borders on the impossible with hand tools. Opinions are divided relative to adverse effects of burning, with considerable opinion that managed/controlled burning, as part of a management program, is not harmful. Efforts will be made to minimize and manage burning.

The Fertilizer Company will establish a bulk unloading, mixing,

blending, bagging and storage complex at Tema port. The elevators and other components of the plant which could otherwise release dust into the air will be covered to contain the dust and minimize this problem. GFC, working with the National Fertilizer Committee and the MOA extension personnel, will, in their roles as educators and advisors, support environmentally sound methods of fertilizer application, as determined by U.S. technical assistance and by returning participants (environmental analysis would be part of their training). Monitoring impacts in selected areas, both beneficial and detrimental, would also be the function of the GFC. Similarly, the SMU staff and participants will also receive environmental training in order to promote environmentally sound decisions regarding seed types, farming techniques and storage practices.

Feeder roads/physical infrastructure will be planned and developed to minimize soil erosion from water run-off during the rainy season and avoid the gullying which could otherwise result.

TECHNICAL DESIGN AND REASONABLE COSTS:

The project is well designed to focus on and resolve the constraints faced by the small farmers. The technical design is reasonable and appropriate for the skills, knowledge and level of development of the target group, and for transforming them, step by step, from subsistence production to self-sufficiency and surplus production, and from poverty to economic respectability. With credit, the technology proposed is within their resources limitations. The combination of these factors adds up to high potential for achieving the projects' objectives. And the cost, relative to the expected end-of-project financial benefits which added to the social benefits of overall development in the rural areas, adds up to a very reasonably-priced project.

The cost estimates are firm, procuring only those technical services, training and commodities required to achieve project goals. The project is well designed technically, financially and socially. FAA Section 611 A and B are satisfied where applicable.

B. Social Soundness Analysis

1. Social-Cultural Feasibility

a. General: Approximately 82 percent of all farm holdings in Ghana are less than 10 acres in size. The farm families who work these holdings comprise the general target group for the proposed project. The project will initially focus on improving existing farm systems by expanding both the quantity and quality of inputs required by the systems rather than immediately introducing radically different practices which might prove to be highly disruptive to traditional socio-economic practices. The program will start from the existing and known system with

simple interjections and move to more complex systems and interjections as the progress and attitudinal environment transform to acceptance of greater changes. The division and utilization of labor, for example, is based on cultural as well as technical factors. Effecting change in this and other practices heavily influenced by sociological factors is apt to be slow. It will require that significant evidence of benefits be realized before farmers will be willing to commit themselves to new techniques particularly those requiring considerable cash outlays. The research component of the project has been specifically designed to take the existing social environment and the economics of the technology into account in determining the feasibility of innovations to be introduced. The Marketing, Research and Extension/Demonstration components of the project will first focus on staple food crops grown under mixed cropping conditions which are of major importance to the small farmer. Every effort will also be made in this project and in the Mission's overall agricultural program to insure that members of the target group are involved in identifying the needs which should be addressed and in planning/designing approaches so that interventions will not appear to be imposed from outside.

The Credit Expansion, Fertilizer, Seed Multiplication and Extension/Demonstration components will directly impact on small farm holders on a national basis. It is estimated that under the former, through the new Small Farm Credit Program of the ADB, 118,000 small farmers will be reached by the new farm loan offices by the end of nine years of program build-up. Demonstrations of fertilizer, seeds and agronomic practices will be held on small-scale farmers' fields to ensure that small farmers

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can immediately perceive the applicability of new cultural practices to their own situations, (i.e., farm size, labor and capital resources). Extension workers will organize group visits so that the effects of the improved practices being utilized on demonstration farms can be demonstrated to other farmers in the village community.

The Fertilizer and Seed Multiplication components, although not totally intended for or directed towards small farmers, contain several specific features designed to impact on them which should result in significant benefits accruing to small farmers. The increased number of extension demonstrations will generate an increased effective demand for these inputs. An effective and efficient distribution mechanism using traditional marketing channels will give small farmers improved access to seed, fertilizer and chemicals. And inputs will be packaged in the small quantities which are more appropriate for small farmers.

b. Organizational Structures: It is especially appropriate, in this instance, to utilize existing organizational structures for project implementation rather than to create new ones. Historically the pattern of institutional development in Ghana has been to create new organizations, particularly governmental, when existing ones fail or cease to function adequately. The GOG continues, however, to give increasing priority to developing the agricultural sector and to addressing the particular needs of the rural poor. The activities proposed under this project provide an opportunity to complement the government's effort to expand services and strengthen institutional capabilities, thereby increasing the probability

of program continuity and expansion after AID's assistance terminates.

In a complementary effort, the proposed USAID-supported Farmer Association and Agribusiness Development Project (FAAD) will be reinforcing local organizational structures through the formation and/or strengthening of farmer groups and associations at the farm level. As members of effective groups, small farmers will gain improved access to the services, inputs and information available from the national organizations.

c. Allocation of Time: An important assumption underlying the projected incremental benefits of this program relates to the availability of labor required by the farm holdings for applying improved inputs and new practices. The table below illustrates these requirements for "typical" ^{26/} holdings in southern and northern Ghana and compares them to total labor requirements under traditional practices.^{27/} A large part of the increase in labor will have to be allocated to additional weeding and tasks associated with harvesting, storing and selling the incremental output.

	<u>Incremental person days per holding</u>	<u>Total person days under traditional practices</u>	<u>Percent increase in labor required</u>
Southern	98	240	41 %
Northern	100	176	57 %

On small farms these activities are generally undertaken by women who are already considerably burdened with a variety of tasks and responsibilities

^{26/} See Annex C in which the typical holding is defined.

^{27/} Derived from Tables 3 through 6 in Annex C.

on the farm and within the household. ^{28/}

Without hired labor and without the introduction of labor-saving, intermediate technologies for women, (i.e., tricycle carts for water hauling, simple water catchment devices, small shellers, grinders and sun dryers, improved on-farm storage facilities, etc.), it is unlikely that the incremental output expected to be produced on these small holdings will be forthcoming. Consequently, the program envisages several components which may ameliorate these labor constraints. These are the provision of:

1. Foreign exchange to import intermediate technologies and equipment and/or raw materials required for their assembly and production by small rural enterprises;
2. Medium-term credit for small farmers to purchase these intermediate technologies;
3. Annual production credit to hire labor;
4. Assistance to the Home Extension Unit in extending knowledge and new technologies to women to improve resource management on the farm and in the household.

The agribusiness component of the FAAD Project will also encourage the development and manufacture of intermediate technologies appropriate to the technical requirements and to the cultural biases of the small farmer. It is anticipated that women farmers will be particularly receptive to labor-saving ideas/technologies introduced under either project.

d. Motivation: There is considerable motivation for small farmers to be responsive to programs offered through the project. Credit at

^{28/} "Women in Development in Ghana," pp. 34-64.

reasonable costs is rarely available to the small farmer as the limited funds are generally monopolized by large farmers with more "bankable" proposals. This fact is evidenced by the large number of small farmers who, needing funds for consumption and production purposes, seek out private money lenders who may charge as high as 200 percent interest per annum on relatively short-term loans. With the increased availability of credit, it is likely that many farmers will initially seek to increase production by clearing and putting more land under cultivation. The additional demand for labor may be a disincentive for credit utilization if an area faces a labor constraint during peak demand periods. It is expected that simple labor-saving intermediate technology will alleviate this situation.

The small farmers are also at a considerable disadvantage with the marketing system. They generally have little choice with respect to when or to whom they must sell their cash crops, which are head loaded to the village market mostly by women as surpluses are available from the holding and when funds are required by the household. It is anticipated that these constraints can be ameliorated through improved on-farm storage systems and increased farm production. Improving on-farm storage systems is of particular importance because of the multiple impact it could have. If the farmers could store their food crops throughout the year, the effects of the hungry season on the family would be lessened. Income would also increase because cash crops could be sold when it is to the farmers' advantage rather than immediately after harvest

when the prices are lowest. This may require limited consumption credit to bridge the stress periods of the hungry season and market/harvest glut. This increased independence from outside influences and its visible benefits should in turn provide an incentive for increasing production.

Under the Marketing component, alternative forms of assistance to private traders and farmers' associations will be developed and implemented on a pilot basis, and evaluated for their effects on farmer and trader incomes and marketed production. It is anticipated that through this pilot activity as well as assistance to private organizations proposed under the Farmer Association and Agribusiness Development Program, a marketing strategy can evolve and be replicated on a wider basis which minimizes the effects of friction and conflicting interests of all groups participating in the traditional marketing systems.

Another important assumption underlying projected benefits relates to the ability of the marketing mechanism to provide sufficient price incentives so that incremental production increases are sustained over and beyond the length of project. However, the most important improvements in food crop marketing in the short-run can and must be made on the farm by increasing production and the quality and quantity of food crops that can be brought to the market throughout the agricultural year. It follows, therefore, that the incentives expected from the marketing system in providing stable and fair product prices must, in the first instance, come from small farmers themselves. To assist farmers in

increasing their marketed production throughout the year and in reducing wastes and losses, the Marketing, Research and Extension components of this project will focus on developing and disseminating new techniques in bagging, chemical treatment, on-farm storage and food processing. The degree of incentives and motivation the farmers will have to adopt such new techniques will be primarily determined by the nature, cost and profitability of these techniques as they are made available by the project.

The incentives for utilizing cash inputs such as fertilizer and improved seeds will initially be less obvious to the small farmer, and such use will perhaps entail a greater risk in their eyes. For an individual farming at a marginal level, risking even a portion of his cash outlays on the package of improved inputs is not a step to be taken lightly. The visibility of the small farm demonstration activities and extension efforts, aimed specifically at the small farmer, should provide sufficient incentive for purchasing improved inputs on a credit basis. Therefore, it has been assumed in the Economic Analysis that it will take six years for the average small farmers reached by the project to bring 90 percent of their holdings under improved practices.

e. Communication Strategies: It is recognized that the cultural gap between the small farmers, the extension agents and private traders represents a potential problem in communications. By assigning a marketing/extension agent to each FLO, the ADB will attempt to facilitate communications and to improve relations between the farmers and the

agents which serve them. Local organizations/farmer associations can also play an important dual role as a conduit for information flowing from research/extension to the farmer, and as a voice for expressing the needs and interests of many farmers to government, etc. Specific information on language usage and perceptions are not currently available. The District Planning and Rural Development Project will focus on this problem, as will a part of the small farm applied research to be carried out under this project. Relevant information will be provided to the extension service for application as it becomes available.

2. Spread Effects and Secondary Social Benefits: Traditional agriculture on relatively small-scale, labor-intensive holdings, at present low levels of productivity, is considered to be a low status occupation. Those who have mobility through education or other means tend to leave the traditional farm sector and go to urban areas where they will invest a considerable amount of time in under- or unemployment in order to realize the expectation of wage employment. The annual increase in agricultural employment during 1960-70 was 1.25 percent, compared to annual increases in the total population of 2.8-3 percent. This implies that agriculture has not been absorbing much of the increase in the total labor force and may, in fact, have released labor at higher rates than urban areas could absorb in employment during that period.

This trend has serious implications for national efforts to meet the expanding demand for agricultural products. By helping the small-scale farmers to increase their real income on their present acreage, the

project may help to demonstrate that small-scale farming can provide a viable employment alternative. In addition, it is anticipated that the increased use of improved practices and intermediate technologies (such as bullock farming in Northern Ghana) will increase the productivity of land and labor and provide incentives to expand the average acreage cultivated so that farm incomes on small holdings may be comparable to those earned by semi-skilled urban dwellers. It is likely that such a shift in the structure size of small farming may contribute to improving the quality of life in the rural areas and help stem the present high rates of rural-urban migration.

C. Financial Plan

The total costs of the project over Phases I and II are \$51.8 million (including allowances for inflation). Phase I costs are approximately \$20.0 million and Phase II costs are \$32.0 million. Total GOG contribution over the life-of-project will be approximately \$16.8 million or 32.4 percent. This consists of \$6.6 million in Phase I and \$10.2 million in Phase II. Total AID assistance to the project is \$34.8 million which consists of \$30.0 million in development loan assistance and \$4.8 million in development grant assistance. AID loan funds will be provided in three equal amounts of \$10.0 million--the first loan in Phase I (FY 76-77) and the remaining two loans in FY 78 and FY 79. AID grant funds of \$1.854 million will be obligated for Phase I activities. Additional grant funds of \$2.95 million will be obligated in late FY 77 and subsequent

years for Phase II. Loan and grant assistance during Phase II will be contingent upon (a) an assessment of the progress of Phase I, (b) the availability of funds, and (c) a request for assistance from the GOG.

Table II presents a summary of project inputs by component. A more detailed financial plan for each component of the project is provided in Annex M as well as an obligation schedule for grant-funded activities during Phase I.

Fixed Amount Reimbursement (FAR)

The Mission proposes to use the FAR method to finance a limited number of the grant-financed items under this project (discussed below). The FAR method would not be appropriate for financing the majority of the specific outputs to be produced under this project. This method requires that the recipient(s) have (1) adequate budgetary resources-- both local currency and foreign exchange, and (2) the requisite trained manpower available to respectively plan and implement the activities underlying such outputs. In addition, it requires that the Mission have (or have access to) manpower required to approve/review the design specifications and to periodically monitor and inspect the production of the specific outputs.

The GOG is funding most of the local currency costs of the project. The bulk of AID financing is for foreign exchange which, as indicated above,^{29/} is scarce in Ghana. Given this situation, it would be

^{29/} See the Balance of Payments Section of the Background.

inappropriate to finance a program which has a heavy import content, using the FAR method. In addition, most (five) of the project components require technical assistance if they are to be successfully implemented. Ghana has neither sufficient foreign exchange nor adequately trained manpower to implement major portions of the project using the FAR method. The Mission may have access to personnel necessary to review/approve design specifications and to periodically inspect the work of the implementing agents. However, most of these will be contract personnel and their time will be needed and best spent providing direct assistance to the GOG implementing agencies in producing these outputs rather than "periodically inspecting" the production of the outputs.

As the Ghanaian staff gains more experience with the implementation of various components, as working relations between AID and Ghanaian project personnel are more firmly established, and as the foreign exchange situation eases, the GOG and the Mission will be in a better position to propose use of the FAR method of financing segments of the project.

In Phase I the FAR method may be appropriate for some of the local cost segments which will be grant funded. These include one of the two pilot components (research) and the extension/demonstration component. Given the experimental nature of the marketing component, the FAR method would not be appropriate.

The research component contains only one element of local cost: financing by AID. This is for Ghanaian supervisors and enumerators to conduct annual surveys of the research area during the first four years of the project.

The extension/demonstration component contains additional elements which might be suitable to finance with the FAR method. These include the provision of (1) seeds for 300 annual demonstrations, (2) hand/garden tools, (3) farm/home demonstration centers, (4) demonstration/instructional materials, (5) training workshops, (6) additions to the laboratory, (7) laboratory equipment, and (8) surveys.

These items are a small portion (\$270,000) of the project costs, but they represent an attempt to gain experience in using the FAR method, given the situation in Ghana. As indicated above, the Mission and the GOG will further explore the possibilities of using the FAR method to finance major portions of the project during Phase II.

Financial and Commitment Procedures:

The major instruments embodying commitment for transfer of USAID resources^{30/} to the program are:

1. Loan Agreements in respect of commodities, both cedi generating and non-generating, to be procured and funded under successive loans;
2. Project Agreements in respect of commodities, personnel and other technical assistance components funded by grants.

Successive Project Agreements will be entered into on a year-by-year

^{30/} See Tables 1 through 9 of Annex M for a detailed breakdown of GOG and USAID contributions to the program by component and cost categories.

MIDAS DISBURSEMENTS BY COMPONENTS AND SOURCES OF FUNDS (\$000)
(disbursements by Project Year)

Component and Source of Funds	Phase I		Phase II		Total Phase I	Total Phases I & II
	Year 1	Year 2	Year 3	Year 4		
<u>I. Credit Expansion</u>	904.3	1013.0	1207.0	1337.0	1917.3	4461.3
GOG	300.0	550.0	800.0	1050.0	850.0	2700.0
Grant	254.8	208.0	32.0	32.0	462.8	526.8
Loan	349.5	255.0	375.0	255.0	604.5	1234.5
<u>II. Fertilizer</u>	7983.7	2316.6	7137.6	7708.3	10300.3	25146.2
GOG	1206.3	1368.6	637.6	708.3	2574.9	3920.8
Grant	277.4	198.0	-	-	475.4	475.4
Loan	6500.0	750.0	6500.0	7000.0	7250.0	20750.0
<u>III. Seed Multiplication</u>	672.2	960.2	1560.6	986.0	1632.4	4179.0
GOG	219.2	546.3	1105.5	815.3	785.5	2686.3
Grant	375.3	285.5	249.0	75.5	660.8	985.3
Loan	77.7	128.4	206.1	95.2	206.1	507.4
<u>IV. Research</u>	428.7	346.5	305.5	305.5	775.2	1386.2
GOG	66.5	66.5	66.5	66.5	133.0	266.0
Grant	362.2	280.0	239.0	239.0	642.2	1120.2
<u>V. Extension</u>	419.5	366.4	392.2	411.0	785.9	1589.1
GOG	218.6	260.9	291.7	322.5	479.5	1093.7
Grant	200.9	105.5	100.5	88.5	306.4	495.4
<u>VI. Marketing</u>	266.5	68.0	68.0	68.0	334.5	470.5
Grant	266.5	68.0	68.0	68.0	334.5	470.5
<u>VII. Small Farm Equipment</u> (2 Raw Materials for Production of Intermediate Technology-- Loan)	0.0	1939.4	2918.9	2649.8	1939.4	7508.1
	0.0	1939.4	2918.9	2649.8	1939.4	7508.1
<u>VIII. Short-term Technical Assistance</u>						
Fund	175.0	75.0	75.0	75.0	250.0	400.0
Grant	175.0	75.0	75.0	75.0	250.0	400.0

(cont.)

MIDAS DISBURSEMENTS BY COMPONENTS AND SOURCE OF FUNDS (\$000)
(Disbursements by Project Year)

Component and Source of Funds	Phase I		Phase II		Total Phase I	Total Phases I & II
	Year 1	Year 2	Year 3	Year 4		
IX. SUB-TOTAL	<u>10849.9</u>	<u>7085.1</u>	<u>13664.8</u>	<u>13540.6</u>	<u>17935.0</u>	<u>45140.4</u>
A. Direct GOG Contributions	2010.6	2792.3	2901.3	2962.6	4802.9	16666.8
B. Grant	1912.1	1220.0	763.5	578.0	3132.1	4473.6
C. Loan	<u>6927.2</u>	<u>3072.8</u>	<u>10000.0</u>	<u>10000.0</u>	<u>10000.0</u>	<u>30000.0</u>
1. Non-Generating	427.2	1133.4	581.1	350.2	1560.6	2491.9
2. Generating	6500.0	1939.4	9418.9	9649.8	8439.4	27508.1
X. Indirect GOG Contributions	<u>649.3</u>	<u>631.0</u>	<u>638.4</u>	<u>646.0</u>	<u>1280.3</u>	<u>2564.7</u>
XI. GRAND TOTAL*	<u>11499.2</u>	<u>7716.1</u>	<u>14303.2</u>	<u>14186.6</u>	<u>19224.3</u>	<u>47705.1</u>
(Grand total including inflation)	(11499.2)	(8379.2)	(15629.9)	(16292.3)	(19878.4)	(51800.6)
A. Total GOG Contribution (GOG contribution including inflation)	2659.9	3423.3	3539.7	3608.6	6083.2	13231.5
	(2659.9)	(3926.0)	(4678.2)	(5513.8)	(6585.9)	(16777.9)
B. Grant (Grant including inflation)	1912.1	1220.0	763.5	578.0	3141.1	4473.6
	(1912.1)	(1301.0)	(867.5)	(699.7)	(3213.1)	(4780.3)
C. Loan (Loan including inflation)	6927.2	3072.8	10000.0	10000.0	10000.0	30000.0
	(6927.2)	(3152.2)	(10084.2)	(10078.8)	(10079.4)	(30242.4)

* Figures in parentheses are totals including inflation. Inflation here is calculated only on GOG direct costs because (a) land for various facilities is purchased in year 1 and (b) inflation allowances were included in calculation of other indirect costs. See Annex M, Tables 8 and 9. Inflation on loan costs is calculated here only on non-local currency generating items (i.e., excluding bulk fertilizer and small farm equipment) because (a) inflation allowances were included in projected price of fertilizer per ton and (b) imports of small farm equipment will be at a specific dollar value rather than specific items of equipment.

basis according to the implementation schedule outlined in Section IV. The first Loan Agreement committing funds for procurement of commodities during Phase I will be signed soon after AID/W approval and authorization is given in February 1976. The Loan Agreement will also embody the GOG commitment for disbursements of GOG contributions to the program by respective implementing agencies as well as to inter-agency resource transfers necessary to support respective program components. The specific GOG contributions to the program are the local cost items to be funded by respective implementing agencies (see Annex M).

A series of agreements among various GOG institutions will be required prior to signing the Loan Agreement. These agreements should explain the mechanisms by which requisite inter-agency resource transfers will be effected and specify the magnitude, time and conditions (where appropriate) of such transfers. Specifically, the agreements are between:

1. BOG and ADB in respect of BOG's advances to support ADB's annual incremental working capital requirements of its expanded small farmer credit operations. The requisite fund (Table C-25 in Annex C) will be advanced before ADB's annual operating cycle and before cedis are generated by the sale of commodities imported under the loan. The BOG advances before successive loan periods should not exceed the amount of cedis expected to be generated by the sale of commodities imported under successive loans. In the event that BOG advances will have exceeded cedi generations, direct cedi purchases with dollars

not to exceed twenty percent of successive loans will be allowed under this program;

2. MOF and SMU in respect of SMU's annual incremental working capital requirements;
3. MOF and GFC in respect of costs incurred by GFC resulting from continuing fertilizer price subsidies to farmers. These separate Letters of Agreements between GOG agencies will be appended to the Loan Agreement.

All loan-funded commodities will be procured by respective implementing agents from American or other eligible sources. The use of loan funds is summarized in Annex E, Part I. Part II of Annex E lists the specific items of equipment which will be grant and loan funded. Disbursements of loan funds for dollar costs of commodities will be effected through established USAID Letter of Commitments and Letter of Credit procedures. Grant-funded commodities and services will be procured either by USAID or the respective implementing agent according to the implementing schedule in Section IV.

Relation between MIDAS Loan (067) and Program Loan (017)

The present Program Loan (017) signed in November 1974 will be almost 95 percent committed in Letters of Credit by July 1976. Under the new MIDAS Loan (067) which is expected to be signed by June 1976, Letters of Credit will not be opened until September 1976. There will, therefore, not be any overlap between these loans. However, fertilizer and bulk handling equipment will be imported under the Program Loan (017) so that

there will not be any delays in the timely and orderly implementation of the initial activities, i.e., bulk import, handling and bagging of the fertilizer component.

D. Economic Analysis^{31/}

1. Introduction

A benefit-cost analysis was undertaken to come to some judgment about the impact of this program on the Ghanaian economy. The objective of the analysis was to:

- a. Explain the assumptions underlying the attainment of program benefits, i.e., increased production and incomes of small farmers;
- b. Explain the preconditions that need to be obtained to sustain a "desirable" stream of benefits over time; (the net present worth of benefits has been calculated over a 20-year period);
- c. Identify the factors whose variability are likely to have the greatest effect on the economic rate of return;
- d. Provide a rough benchmark and guidelines for program implementors and evaluators to assist them in identifying additional data and research needs as well as performance criteria against which program impact on the economy can be assessed over time.

In deriving the "estimated" economic benefits of the program, no pretense was made to associate them in any way with the "true" economic

^{31/} Tables referenced in this section are in Annex C.

benefits. Rather, the approach and scope of the analysis was merely to ask what events would have to occur on the benefit side to cover the economic costs of the program and to yield an acceptable economic rate of return. ^{32/}

2. Methods

Synthetic farm plans/budgets were prepared to represent the typical small-scale holding in southern and northern Ghana cultivating with traditional and improved practices. The typical holding in southern Ghana is assumed to cultivate 3.5 acres under food crops; for northern Ghana, 4.5 acres are assumed. The cropping pattern of the typical holding is given by the proportion of total area cultivated under major food crops in each of the two regions (see Tables C-1 and 2 in Annex A). The net value of production of the typical holding cultivated with traditional practices is estimated to be ₵390.60 in southern Ghana and ₵339.00 in northern Ghana. (See Tables C-3 and 4.)

In deriving the incremental returns of improved practices to the typical holding (see Tables C-5 and 6) the following assumptions were made:

- a. that the cropping pattern would remain unchanged;
- b. that farmers will adopt a set of technologies and improved practices which affect the productivity of the entire holding rather than the productivity of any one specific crop.

These assumptions are based on the following. The small farmer in

^{32/} The opportunity cost of capital in Ghana has been set at 15% per year.

Ghana inter-crops his fields in a variety of cropping systems/associations. This complex multi-cropping system protects the farmer against risks inherent in farming in the humid tropics, minimizes labor use and assures him of minimum harvests of a variety of crops throughout the calendar year. This implies that the small farmer bases his production decisions on obtaining a minimum quantity of foodstuffs from his entire holding rather than on obtaining optimum returns per area cultivated under any one specific crop. New technologies and practices consistent with these production decisions and intercropping systems are assumed to be:

1. improved land preparation, i.e., ridging and cultivating along contours;
2. improved soil management and water retention technologies;
3. additional weeding and chemical weed control;
4. protection against crop diseases and pests;
5. improved on-farm storage and bagging to reduce losses and wastes;
6. use of improved seeds;
7. use of fertilizer where the farmer may perceive the value of fertilizer equally for its effect on reducing length of fallows, as for its effect on increasing crop yield.

It is also assumed that:

- c. These technologies will be demonstrated for their effect on the entire small farm system rather than for their effect on any one crop alone; and

d. In adopting these technologies, small farmers will be induced to make production decisions that are more consistent with maximizing incomes of the holding, and less with safeguarding a minimum quantity of production per holding.

Given these assumptions (and assuming constant product prices) the net value of production of the typical holding cultivated with improved practices has been shown to increase to $\text{₹}787.30$ in southern Ghana and to $\text{₹} 774.90$ in northern Ghana when input prices are subsidized at present levels of subsidies (see Tables C-9 and 10). At unsubsidized input prices net value of production per holding is estimated at $\text{₹}678.40$ and $\text{₹}648.10$, respectively. Incremental yields and costs per acre for grains, cassava, yams and others (i.e., cotton, sugarcane and tomatoes) were taken from various publications of trial results on farmers' fields and experiment stations. Incremental yields for cocoyams and plantain have been assumed. This assumption and the importance of cocoyams and plantains in the cropping pattern of southern Ghana should point to the need for research into these crops which are also important components in the Ghanaian diet.

The incremental value-costs ratios per holding of adopting improved practices are 3.37 in southern Ghana and 3.14 in northern Ghana at subsidized input prices. At unsubsidized input prices, these value-cost ratios would be reduced to 2.18 and 1.97, respectively, assuming that holding sizes remain unchanged. These value-cost ratios do not include

the cost of credit to the typical holding. Requirements for annual production credit and medium-term ^{39/} credit are illustrated in Table C-12. These requirements have been estimated to cover the incremental cash costs (including hired labor) actually incurred by the typical holding in adopting improved practices. (See Table C-7 and 8.) For the holding in southern Ghana, these requirements are ₵293.35 (at unsubsidized input prices) for annual production credit and ₵105.00 for medium-term requirements not associated with land expansion. For northern Ghana, these estimates are ₵323.35 and ₵130.00 respectively. The figures below illustrate the effect of interest charges on the incremental value-cost ratios for the typical holding in southern and northern Ghana.

	<u>Southern</u>	<u>Northern</u>
Incremental costs ^{34/}	307.91	339.57
Interest (10%/year) ^{35/}	<u>39.84</u>	<u>45.35</u>
Total	347.75	384.91
Value of Incremental Production	670.55	667.48
Value-cost Ratio	1.93	1.73

These figures indicate that the small farmer will have sufficient incentive (from a financial point of view) to adopt the range of technologies and inputs that will be provided by the program. (Net value of production per holding has been estimated to increase by 91 percent in southern Ghana and by 74 percent in northern Ghana at unsubsidized

^{33/} Repaid over a two-year period.

^{34/} At unsubsidized input prices. Value-cost ratios at unsubsidized input prices are 2.94 for the typical holding in the south and 2.73 in the north.

^{35/} An annual production and medium-term credit.

input costs.) However, the modest value-cost ratios (relative to ratios normally expected in, say, East Africa) indicate that the small farmer in Ghana is likely to make additional adjustments in response to increased availability of credit (assuming he behaves as if he maximises income per holding.) It is assumed that, in the short run, the most likely adjustment will be an increase in farm size. For the purpose of this analysis it is assumed that some part of the total loan funds made available annually ^{36/} to the typical holding will be used to increase farm size by one acre in southern Ghana and 1.5 acres in northern Ghana over the five-year development period of this program. The investment cost of land expansion in southern Ghana is ₵60/acre (hired labor) for land clearing. The annual incremental benefit to the typical holding is equivalent to the net value of production on the increase in area cultivated (₵192.80/acre) less interest and amortization charges. The investment cost in northern Ghana is ₵444 for the purchase of a team of bullock and a bullock plow, and hired labor for land clearing.

The economic rate of return to bullock farming is 22 percent. (See Table C-13). The financial rate of return to farmer's own equity is over 50 percent when improved practices are applied to the incremental area cultivated. The value of incremental production (and value cost ratios) per holding, therefore, increases significantly when credit funds are applied to land expansion. In estimating total program benefits it is

^{36/} Average loan size per holding is ₵500 in the first year of the program and is projected to increase to ₵1,000 in year six as a result of inflation and acreage expansion

assumed that 67 percent of the small farmers reached by the credit program will increase their holding size in both southern and northern Ghana.

3. Projections:

Incremental Benefits

In calculating the annual incremental benefits of the program to the Ghanaian economy the net incremental benefits per typical holding were applied to the number of small farmers expected to be reached by ADB's expanded small farmer credit operations.

The ADB plans to open nine new Farm Loan Offices in the first year of project operations and 10 additional offices in each of five successive years. Further, ADB anticipates that through its group schemes each new FLO can extend credit services to 500 farmers during the first year of operation and to 500 additional farmers in each of three successive years. Therefore each FLO is expected to reach a total of 2,000 farmers after its fourth year and the total number of farmers reached by the entire program is projected to be 118,000 in the ninth year of program operation. (See Table C-14.)

While it may be possible to extend credit services at this projected rate of build-up, ^{37/} the productive use of credit by small farmers will depend inter alia on the provision of extension services, loan supervision, a profitable technological package, and availability of production

^{37/} ADB is now reaching about 35,000 farmers with 13 branches and 8 quasi FLOs.

inputs. Since the stream of economic benefits generated by the program is most sensitive to:

- a. the build-up of farmers utilizing credit productively, and
- b. the proportion of the total holding to which improved practices are applied,

it is mandatory that the provision of credit be effectively coordinated with extension and distribution of inputs, particularly in areas where the new FLOs will be located.

Total annual incremental benefits of the program are derived in Tables C-14 through 19 under alternative assumptions regarding the build-up of small farmers and of the proportion of the total holding cultivated with improved practices. A more modest build-up of participants than planned by ADB (i.e., reaching 118,000 farmers in year twelve) combined with the assumption that the typical small farmer learns to bring 90 percent of his holding under improved practices by year six generates a net present worth (NPW) at 20 percent of \$55.5 million over a 20-year period. The NPW increases by about 78 percent when ADB's projected build-up of farmers is applied to a quicker "learning" curve where the typical farmer brings 95 percent of his holding under improved practices in year four.

Since the monitoring of loan elements of the project by BOG requires initial local currency advances to ADB prior to the generation of local currency equivalent of foreign exchange through the sale of fertilizer, small farm equipment, etc., the projected build-up of farmers

also depends on:

- a. the ability of BOG to provide local currency advances to ADB;
- b. a realistic build-up of farmers that ADB could conveniently service as well as the proportion of holding that the small farmer learns to bring under improved practices.

Consequently, a compromising "medium projection" based on low projection proportion of total holding brought under improved practices, (i.e., 90 percent of the holding brought under improved practices by year six) and "high projection" build-up of farmers, (i.e., reaching 118,000 farmers in nine years) has also been used in estimating a NPW of annual incremental benefits. The NPW at 20 percent under the medium projection is 062.3 million over a 20-year period. This represents about 48 percent increase in NPW over the value under the "low projection." (See Table 18a.)

The program's effect on production of major food crops is illustrated in Table C-20 (summarized in Table III in the text). Tables C-21 through 24 present the total acreage of major crops which are expected to be brought under improved practices as well as the estimates of fertilizer and certified seed requirements in areas served by ADB's FLOs.

The figures below show the proportion of increased consumption requirements (relative to year 0) that will be contributed by the incremental production of the project.

TABLE III

	Year	5			10			15			20		
		<u>Low</u>	<u>Medium</u>	<u>High</u>									
I. <u>Incremental Production</u> ^{38/}													
Grains	0	74.1	180.0	245.7	292.0	411.7	482.8	353.2	457.5	516.9	444.3	494.3	521.2
Starches	0	90.3	216.1	270.8	351.5	458.4	563.7	416.8	512.3	579.6	444.5	557.3	584.0
II. <u>Consumption Requirements</u> ^{39/}													
Grains	1019.4	1206.2		1418.2			1673.2			1973.8			
Starches	5223.6	5932.6		6741.5			7649.7			8680.3			

^{38/} The increment is relative to "Without Project" production and should not be interpreted as annual increments to total production.

^{39/} See Agricultural Sector Assessment, Ghana, USAID Mission, December, 1974.

<u>Year</u>	<u>Grains</u>			<u>Starches</u>		
	<u>Low</u>	<u>Medium</u>	<u>High</u>	<u>Low</u>	<u>Medium</u>	<u>High</u>
5	40%	96%	132%	13%	30%	38%
10	73%	103%	121%	23%	30%	37%
15	54%	70%	78%	17%	21%	24%
20	47%	2%	55%	13%	16%	17%

4. Financial Analysis: Agricultural Development Bank

Introduction

The purpose of the analysis was to assess the financial viability of the small farmer credit program and to examine the conditions under which the program is able to generate sufficient funds for debt servicing over an assumed 20-year period. The analysis consists of two financial statements-- a cash flow (see Table C-25) and an income expenditure statement (see Table C-26). These statements were developed on the basis of the following conditions:

- a. That 59 new farm loan offices would be established over a six-year period, 9 in year one and 10 additional offices during each of the following five years. Although establishment costs in the cash flow are shown to be USAID loan-funded during years five and six, USAID cannot make any commitments to these funds at this time;
- b. That each loan office would reach 500 new farmers in the first year of its operation, 1,000 in the second year, 1,500 in the third, and a maximum of 2,000 farmers in the fourth year;

- c. That the average loan would be increased from ₦500 per farmer to ₦1,000 per farmer over six years to make allowance for increases in farm size and inflation;
- d. That the funds advanced to ADB by BOG before ADB's annual operating cycle cannot exceed the amount of local currency expected to be generated by the sale of imported loan-funded commodities within successive loan periods;
- e. That, therefore, ADB would use the year-end cash balances generated by the program as an additional source of funds to be applied (together with principal repayments in the previous years and annual BOG advances) to incremental working capital requirements in ensuing years.

Given these conditions, the cash flow was developed under the following assumptions:

- a. That the ADB can borrow AID loan funds (for the establishment costs of the new farm loan office) and AID/BOG advances (for working capital) at 2 percent per year for 10 years, and 3 percent thereafter, and that both loans carry an 8-year grace period on principal repayment;
- b. That loan funds are advanced prior to ADB annual operating cycles;
- c. That the lending rate to farmers is at least 10 percent per year;
- d. That bad debts do not exceed 8.25 percent of annual loan disbursements and that loans to farmers are, on average, repaid

- over a two-year period, 67 percent of annual disbursements falling due at the end of the same year and 33 percent less, bad debts, falling due at the end of the ensuing year;
- e. That ADB can obtain overdraft facilities from the commercial banking system to finance within-year working capital requirements. The interest costs of these overdraft facilities are 12 percent per year.
 - f. That the rate of build-up of participating farmers reaches 118,000 farmers in year nine and that the annual total loan disbursements reaches a level of £118 million in year fourteen and remains constant at that level thereafter;
 - g. That vehicles are replaced after five years and bullion trucks and office equipment after seven years. The salvage value is 20 percent of replacement cost;
 - h. A sensitivity test showed that with a 10 percent annual rate of inflation on recurrent investment and replacement costs, and without a compensating increase in the spread, ADB will have difficulty servicing the principal payments to BOG and AID during the 20-year projections period. The net effect would reduce the number of potential farmers reached by only 1.9 percent in year 5 and 2.3 percent in year 9.

Findings:

Financial

The cash flow shows that ADB will require BOG advances for seven successive years so that at the end of year seven a cumulative total of £32.1 million

will have been advanced by BOG. In no single year do BOG advances exceed credit generations anticipated during successive loan periods.

Assuming continued USAID support to the program through the six-year developing phase, a total of \$2 million in cumulative AID loan funds will be outstanding at the end of year six. The cash flow shows that ADB is able to begin to service these loans in year nine over an 11-year period while carrying over sufficient end-year cash balances to meet continued annual incremental working capital requirements as well as operating and replacement costs. Therefore, the spread of 8 percent during years one through ten and 7 percent during years eleven through twenty is more than sufficient to cover operating costs, bad debts, replacement and debt servicing of these expanded small farmer credit operations.

The income expenditure statement is given in Table C 26 of Annex C. It shows net losses in the first two years with a cumulative profit by year three and a steady build up in annual profits to \$5.3 million in year twenty. The ratio of annual expenditures to loan disbursements is 0.10 in year two and decreases to 0.045 in year 14. The ratio of profits to loan disbursements increases from 2 percent in year three to 4 percent in year fourteen.

Under the income side, the statement shows commitment fees as an additional source of revenues. These fees, \$20 per loan approved, are now being charged by ADB to compensate for the present low spread between lending and borrowing rates. However, with an 8 percent spread, the financial

viability of ADB and its debt servicing capacity will not be seriously impaired if these commitment fees are discontinued under this program.

5. Financial Analysis: Ghana Fertilizer Company ^{40/}

a. Raw Materials Requirements

In developing the cash flow for the GFC it was necessary to project the raw material requirements by years and estimate the cost of these materials delivered to the plant at Tema. Projections were made for three granular fertilizer raw materials: urea (45-0-0) conditioned, muriate of potash (0-0-60) and either diamonium phosphate (18-46-0) or mono-ammonium phosphate (11-52-0). Raw material requirements were projected to increase from 46,800 tons in 1976 to 117,000 tons in 1985 (see Table C-35). Prices were projected to show gradual increases over the period although present indications are that phosphatic fertilizers may decrease during the first two or three years. If indeed fertilizer prices continue to decline, the net cash flow of the GFC would be improved.

b. Capital Expenditures

Estimates of the cost of constructing the blending facility were provided by TVA in August 1975 and were used to determine the capital outlay necessary for buildings and equipment. Capital outlays for site preparation and building construction were projected at \$500,000. Conveying systems from the dock into the plant and plant handling and mixing equipment were projected at \$860,000. Vehicles necessary in the operation were kept

^{40/} The analysis is based on the assumption that a system will be implemented which will rebate the GFC any losses incurred as a result of continuing fertilizer subsidies to farmers.

at a minimum in the first year assuming that vehicles for deliveries from the plant to warehouses in Ghana could be handled by hiring private carriers. Total capital outlays were projected to be \$1,397,800 in the first year. In the second year additional capital outlays of \$108,000 are projected for four trucks and an office vehicle in order that the GFC can make deliveries prohibiting any inventory build up. Vehicles are assumed to have a life of five years, and capital outlays are shown for replacement during the remainder of the schedule.

c. Operating Expenses

A schedule of projected operating expenses was determined for the ten-year period based on TVA studies and local salary and wage schedules and local cost conditions. A contingency of 10 percent was assumed in these expenses for the first year, 5 percent for the second year, and two percent thereafter, to cover the uncertainties in the delivery of raw materials and operations in the start-up of the plant. (See C-36.)

d. Capitalization of GFC

The capital necessary to initiate the GFC operations was calculated in the cash flow statement. The first year requirements are \$6.4 million; \$5.1 million for working capital and \$1.3 million for fixed capital outlays. These requirements will be met by share equity contributions and a long-term loan. The equity loan ratio is 1:2. Additional equity and loans are called up as needed during the first four years. Equity totals \$2.4 million and loans total \$4.9. (See Table C-37.)

It was assumed that volumes could be turned over semi-annually during the first five years of operations. Annual working capital requirements, financed from the proceeds of the loan, were therefore one-half of annual operating costs. In years six and seven, volumes were assumed to turn over

three times per year; beginning in year eight quarterly turnovers were assumed so that the company could receive and handle the increasing tonnage of fertilizer and move it into the distribution network in an orderly fashion with minimum delay in storage. Working capital requirements were reduced correspondingly.

e. Cash Position

Cash inflows and outflows are determined annually and a year-end cash position is derived in Table C-37. Year-end cash balances plus additional equity and loan funds will cover working capital requirements and incremental cash outlays necessary for beginning each year's operation. Surplus cash balances are derived in year five. These surpluses are applied to principal repayment of the loan. This resulted in the total loan being paid off at the end of year nine. It has been assumed that annual incremental working capital requirements will be funded out of increased equity and long-term loans. If working capital can be entirely funded from overdraft facilities, the cash flow will be improved and the equity contribution and loans outstanding will be considerably reduced.

f. Operating Income-Expenditure Statement

Revenues from sales are shown in the operation statement (Table C-38). Revenues were based on an 18 percent mark-up on the CIF landed cost of the fertilizer each year. A tax moratorium of five years was assumed in accord with GOG policy.

In the first year of operation the company will realize a loss of

\$240,600. However, profits then increase each year until year six when taxes of 60 percent are paid on gross profit. Profits drop down in year six but continue to increase throughout the remainder of the project period.

g. Company Position and Financial Ratios

The GFC's balance sheet is projected in Table C-39. The balance sheet also illustrates GFC net worth which increases from \$1.9 million in year one to \$3.7 million in year ten. The return on net worth is 21 percent in year three and increases to 33 percent by year ten. The profit margin on sales is 4.9 percent in year three and 4.2 percent in year ten.

h. Depreciation

A depreciation schedule is calculated for plant equipment, buildings and vehicles (Table 6). The life of the plant equipment and building is assumed to be 15 years with no salvage value. Vehicles are assumed to have a life of five years under Ghanaian conditions. The accumulated depreciation is included as a reduction to assets in the balance sheet.

i. Summary

The annual rate of return to total capital over the ten-year period is estimated to be 10.8 percent. The annual rate of return to equity capital is 22.6 percent when profits are adjusted for taxes. With sound management practices and an appropriate rebate mechanism operating while

fertilizer prices are subsidized to farmers, the GFC should be able to operate on a financially profitable basis, repay its loans to the commercial banking system, and generate the economic benefits (in foreign exchange earnings) that have been projected by TVA consultants.

6. Financial Analysis: Seed Multiplication Unit

The annual incremental working capital requirements of SMU over the five-year program period are illustrated below:

<u>Ghanaian Fiscal</u>	<u>Seed Purchasing Costs</u> ^{41/}	<u>Seed Sales Revenues</u> ^{42/}	<u>Working Capital Requirements</u> ^{43/}
1976	1,065.0	945.0	1,065.0
1977	2,010.0	1,710.0	1,065.0
1978	3,150.0	2,655.0	1,440.0
1979	3,825.0	3,270.0	1,117.0
1980	4,200.0	3,510.0	930.0

^{41/} Incurred in beginning of fiscal year.

^{42/} Accrued by end of fiscal year.

^{43/} Required in beginning of fiscal year

The working capital requirements will be financed from the Consolidated Fund and advanced to SMU in the beginning of respective Ghanaian fiscal years. The data underlying these estimates are presented in Table C-41 of Annex C. It is anticipated that these requirements will be reduced

as the subsidy on maize seeds of ₦15.00/bag will be phased out. However, this reduction will be offset as new seed varieties for soybeans, sorghum, millet, etc., are introduced into the program.

IV. IMPLEMENTATION PLANNING

A. Administrative Arrangements

1. Recipient

The administrative units involved in the project on the recipient side are established agricultural and agricultural-related organizations of the GOG. The criteria for selecting these organizations give recognition to staff competence, experience in agricultural production input and resource supply, the existence of a close working relationship with the other organizations involved, a clear concept for working with the target population (the small farmer), and the capability to manage, implement and coordinate the project components. Training programs have been designed and incorporated in the project to improve the manpower competence in pace with project expansion, and to ensure continuity in the supply of needed inputs and services to small farmers after termination of the project.

The major project implementing agencies and organizations are:

- a. The Bank of Ghana (BOG)
- b. The Agricultural Development Bank (ADB)
- c. The Ministry of Agriculture (MOA)
 - (1) Seed Multiplication Unit (SMU)
 - (2) MOA Planning Division (renamed "Division of Economic Research and Planning Services (DERPS)
 - (3) The Extension Service and the Home Extension Unit working with the Department of Home Science, University of Ghana, and the Ghana Fertilizer Company (GFC)

Overall coordination of the project will be the responsibility of the Permanent Advisory Committee consisting of the Ministry of Economic Planning (MEP), MOA, BOG, GFC, ADB and USAID. The MEP will chair the committee, represent GOG interests under the project in line with government policy in the agricultural sector, and authorize GOG contributions to the project through the Ministry of Finance.

Bank of Ghana

The BOG is organized and operates on lines similar to central banks in other countries. It is the sole banker for the government and it is responsible for the execution of monetary policy. Although it is difficult to evaluate the performance of the bank in relation to its functions, particularly under the present worldwide inflation, some activities of the bank in the Agricultural Sector make it capable of managing the loan elements of the project. The formation of a Rural Credit Department within the bank in April 1967 to study the problems and procedures of agricultural credit culminated in the formation of an agricultural bank (now the ADB) which is capitalized in part by the BOG and by funds from savings and deposit accounts. In 1969 the Development and Finance Department of BOG established a guarantee scheme for loans made to the Agricultural Sector and is currently seeking to finance a variety of projects, particularly in the areas of international marketing of agricultural products.

The role of BOG under the project will be to (1) provide foreign exchange to project implementing agencies for purchase of fertilizer, small

farm equipment, etc., the sale of which will generate local currency to finance the annual incremental working capital requirements of the ADB's Small Farm Credit Program; (2) make loan advances to the ADB against the sale of imported commodities which will generate local currency; (3) perform the transaction of direct cedi purchases of some of the AID loan funds (up to 20 percent) in the event that ADB's working capital requirements, for any one year, exceed the amount of local currency generated by the sale of imported commodities; and (4) implement the marketing component of the project which involves the selection and financing of private traders and/or farmer associations to operate a regular marketing service in one limited geographic area.

The BOG is familiar with the process of converting foreign exchange to local currency resources for use by public and private institutions and has an excellent administrative capability. Its Development and Finance Department has five years' experience in implementation and monitoring of agricultural development projects such as storage, warehousing and trader credit facilities.

Agricultural Development Bank

The ADB is the principal source of credit for the agricultural sector. Established in 1965 as the Agricultural Credit and Co-operative Bank and renamed in 1967, its major functions include providing credit for the development of agriculture and agro-businesses, promoting agricultural

enterprises and operating savings accounts. Operating one central office, 13 branch offices and 8 farm loan offices in the nine regions of Ghana, ADB loan advances to the agricultural sector increased from ₵1.1 million in 1966 to ₵17 million in 1973. In 1974 the bank processed loans to 32,951 small farmers. Conscious of the important role the small farmers play in Ghanaian agriculture, the Bank initiated the commodity credit scheme for rice and maize in 1968 and 1969 respectively, based on group lending, to make loan facilities more accessible to larger numbers of small farmers and improve repayment rates resulting from social pressure of the group on potential defaulters.

Under this project the ADB will decentralize its loan approval authority and servicing activities and streamline its procedures and operations to facilitate loan processing for larger numbers of small farmers. As the main implementing organization of the credit component of the project, a Small Farm Credit Program will be established to separately manage the loan funds generated through the project to provide supplemental working capital for small farmer lending. The experience of ADB in small farmer credit administration, particularly under the commodity credit scheme, the staff training program designed under the project, the establishment of the additional 59 FLOs, and the already existing close working relationship between the ADB and BOG will enable the ADB to implement the small farmer credit program. The past working relationship between ADB, SMU and the MOA Extension Service will be strengthened through the interlinking requirements of the project components for which they are responsible and the coordinating committee's role and activities to improve coordination of the entire project.

1. Ministry of Agriculture:

The central organization of the MOA consists of the Directorate or functional arm and General Administration. The Directorate consists of six divisions, each headed by a director: Agriculture (including crops, seed multiplication, extension and operations); Veterinary; Irrigation and Reclamation; Fisheries; Transport and Mechanization; and Animal Husbandry. General Administration is under the Principal Secretary including Administrative and Supporting Services and Economic Research and Planning Services.

Seed Multiplication Unit

The SMU is responsible for activities related to production, certification and distribution of agricultural seeds. The comprehensive study conducted by Mississippi State University (MSU) under an AID contract for the development of a national seed program for Ghana commends the SMU operations since its establishment in 1961. Operating as a unit within the Agricultural Division, the SMU has expanded its seed production every year since its beginning, despite the inadequate facilities at its disposal and its skeleton staffing. The Unit will be strengthened through improvement in its facilities, staff training and expansion of its seed distribution system. In addition to the traditional distribution of seeds through the MOA Extension Service, improved seeds will also be distributed through the fertilizer marketing network previously discussed. Existing SMU arrangements with ADB in the form of in-kind sale of improved seeds to small farmers will ensure access to credit for seed and facilitate the extension of a package of improved technology to small farmers.

Small Farmer Applied Research

The Economic Research and Planning Service under the General Administration is responsible for identifying research needs, developing cooperative research projects and coordinating economic research projects. The service has two years' experience in the investigation of cost of production of major agricultural commodities, farm gate prices, crop production forecasts and acreage estimates for major crops. Under the project, the service will gather appropriate baseline data for designing a small farm applied research program. And it will conduct socio-economic and applied small farming and cropping agronomic and on-farm storage research to identify responsibility for acquisition and distribution of fertilizer previously handled by the MOA.

Ghana Fertilizer Company

The GFC will be the primary implementing organization for obtaining and supplying national fertilizer needs. The GFC will import basic granulated fertilizer elements, prepare mixtures, blend and bag them locally, thereby saving foreign exchange. This operation will reduce the foreign exchange required to import bagged fertilizer. Distribution agreements will be made between GFC and the various private commercial firms' distributing outlets to insure an efficient and effective distribution network.

Most of the personnel at GFC will be seconded initially from the MOA's current operations. Subsequently all GFC personnel will be direct GFC employees. With the training assistance provided in this component, GFC will develop the capability to successfully implement its program.

2. A.I.D.

This Mission's total agriculture/rural development program has been designed as an integrated overall effort focused on small farmers and rural development. The Small Farmers' Development (MIDAS) project components will both support and require support from the other ongoing projects or those coming into the pipeline. These are the District Planning and Rural Development, Farmers Associations and Agribusiness Development, Agricultural Management Development, and Upper Region Agriculture Rehabilitation and Health Promotion. The components of all of these programs are closely inter-related from a functional point of view, therefore the administrative arrangements presented herein will reflect the inter-linkages of the total program.

The paperwork/documentation is slowly becoming almost a full time job in project management. In addition, a considerable amount of field travel is required since a project officer cannot monitor/manage a project unless he is familiar, firsthand, with what is happening in the project. This in no way implies supervision or direction of contract personnel implementing the project. It is a matter of intimate firsthand knowledge of the project happenings, identifying potential problems, evaluating progress and providing the support from AID's end that is required. This cannot be done from the office. The project manager must spend the appropriate time at the project site and know firsthand what action to take. Otherwise it becomes a matter of guessing what actions are required, and often guessing wrong.

There are those who espouse the philosophy that with contractors to implement projects, AID's project officers do not have to spend time in

the field. Their job is monitoring/managing, which assumedly means documentation. However, experience has shown that in order to properly manage projects and avoid problems exploding on the scene, the project officer must spend enough time in the field with the projects/contractors to be aware of potential problems, and take appropriate actions to keep them from becoming actual problems. Since evaluation is a continuous process, field travel must be a continuous process, to make the evaluation more than an intellectual, second-guessing paper process. Giving appropriate attention to projects means that a project officer is fully employed when handling two projects.

Although MIDAS is written up as one project, it has several major components, any one of which will require considerable management/monitoring time. In addition to the MIDAS, the Mission has responsibilities for design and management of the other projects mentioned above. These are all essential inputs for development of the rural sector and can be implemented as a well-integrated overall program with appropriate staff on board to manage them. The breakdown into project groupings for purposes of monitoring/management are as follows:

- a. The Extension/Home Extension/Fertilizer Field Trials and the Seed Multiplication components of MIDAS;
- b. The proposed District Planning and Rural Development project and the Small Farm Marketing component of MIDAS. These will be located in the same geographic area and require particularly close integration and coordination. The main purpose of feeder roads in the rural development project will be to provide optimum access to delivery and receiving services for production inputs

and information and for marketing. Therefore, the design for the rural development project logically should include the infrastructure requirements for the marketing program.

- c. The Small Farms Applied Research component of MIDAS.
- d. The Small Farmer Credit and the Fertilizer Company components of MIDAS.
- e. The Farmer Association and Agribusiness Development Project (FAAD) and the technical/field agriculture portion of the Agricultural Rehabilitation and Health Promotion project.

In terms of staffing, the following appear the best arrangements for the present. It may be expedient to make some changes later as implementation proceeds:

- a. The Food and Agriculture Officer will have overall administrative and supervisory responsibility for the entire Agriculture/Rural Development program; he will also be the senior project officer for MIDAS, at least for the time being.
- b. The IDI will be the F&A officer's special assistant for various tasks as the need arises, and the F&A office program assistant which will provide her with as broad experience as possible. Currently she is assigned to the design of the FAAD project, working with the design contractor, and will be acting project

officer until the project officer arrives, at which time she will be Assistant Project Officer for FAAD.

- c. The DH Agricultural Economic Advisor, currently at post, will be project officer for the proposed District Planning and Rural Development Project, and the marketing component of the MIDAS. The local hire Agricultural Economist, currently on board, will be Assistant Project Officer. These two will also provide economic inputs for the office as required. They have a large chore ahead designing these projects and appropriately integrating the market component with the Rural Development Project.
- d. Three new project officers are required with ETAs of January 1976, March 1976 and July 1976, respectively.

One new project officer will be assigned the Extension/Home Extension/Fertilizer Trials and the Seed Multiplication components of MIDAS; one will be assigned the Farmer Association and Agribusiness project and the technical field agriculture portion of the Agricultural Rehabilitation and Health Promotion project. The training and experience background for the new project officers should be as follows, if at all possible, considering the forced placement regulation:

Extension/Home Extension/Fertilizer Field Trials and Seed Multiplication

This project officer should have experience in crops research/extension, emphasizing field trials/demonstrations, testing new varieties, fertilizer response and agronomic/cultural practices identified by research. He

should have worked closely with or for an extension service and in most cases with this background will have had a title similar to Extension/Research, result demonstration officer. He should also have had experience with seeds development and multiplication work. Very often these activities are closely coordinated and implemented together.

Farmer Association and Agribusiness, and Agricultural Rehabilitation and Health Promotion

This project officer should have experience establishing, promoting and developing local organizations, farmers'/rural associations, and hopefully in developing small agribusiness/rural industries. Preferably this individual would have at least a basic background and working knowledge of rural sociology/social anthropology, either through formal training or experience, or both.

Small Farmer Credit/Fertilizer Company

The officer assigned to these components should have an agriculture economics background, or at least have had a minor in Agricultural Economics. He must have a knowledge of and have worked in rural credit programs. Hopefully his experience will have included working with group credit activities.

As stated on the previous page, these project officers must fully accept the fact that they will be in the field, at the project sites, a considerable portion of time. If they are reluctant about or express doubtful attitude at all about the importance of field travel relative to project management, they just are not the individuals for the job.

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The Project Officers and Assistant Project Officers will be responsible for all appropriate activities of their projects: monitoring/evaluation, documentation, commodities, negotiations at appropriate levels with the host government as required, and assuring general AID support is provided on a timely basis to the project.

When problems arise requiring attention/negotiations at top levels of the host government, the Food and Agriculture Officer and/or the Director's Office will provide the necessary assistance.

B. Coordination, Integration and Implementation:

There are some extremely important functions which must be actively pursued throughout and beyond the life of the project upon which the success of the project and subsequent development is almost totally dependent. These are (1) thoroughly integrated and coordinated efforts of all implementing agencies of GOG and USAID; and (2) assuring that all the inputs and services are at the right place at the right time, in adequate quantities, and readily accessible to the small farmers.

Increasing production and incomes and realizing more equitable distribution of the benefits of development require that all small farmers, not just the more progressive, have access to improved production inputs, delivery and receiving services and systems, information, credit and rational marketing systems. However, it is possible that small farmers could have access to all or part of these

services but not to a technological package appropriate to their needs and environmental conditions. It is also possible that the technological package has been developed but that the requisite inputs are not available to the farmers, or that both the technological package and inputs were available but the farmers lacked the personal finances and/or credit was not available with which to procure the inputs. Assuming all these are available the farmers will also need extension/information services for guidance in implementing the package, supervised credit guidance for optimum credit utilization, and efficient markets for profitable sale of their produce.

The prime need is to develop and disseminate a proven, adapted and profitable technological package for small farmers based on social and economic feasibility, improved agronomic and resource management techniques, ready availability and accessibility to production inputs, the credit with which to purchase them, extension services for properly using them, and markets.

Therefore, research must develop and prove the technological package. Extension must demonstrate and encourage the farmers to apply it. The Seed Multiplication Unit, the Agriculture Development Bank, the Fertilizer Company and other institutions must provide and assure the inputs and services are available. The distribution system must assure the inputs are readily accessible to the farmers. And the marketing system must assure that the resulting produce can be efficiently disposed of at favorable prices.

Each implementing agency, therefore, must assure that their specific role in the project is fully implemented to provide the inputs or services for which they are responsible. At the same time, particular attention must be addressed to integrating and coordinating the various activities to assure that all the components are available and accessible in the right place at the right time. The joint, comprehensive integration of all agencies' activities may well be a more difficult task than the development and provision of the technological package, production inputs, credit and services by the agencies individually. This coordination and integration of activities must permeate the program from the national level through the local village level.

The Small Farmer Credit Program at the field level will function from the Farm Loan Offices whose staff include a Marketing/Extension Officer. This officer will function much as a supervised credit specialist. Close coordination will be required between the Marketing/Extension Officer and the Extension Service in assisting farmers with production and marketing problems, identifying input requirements, amount of credit required balanced with capacity to repay to avoid over financing, and in preparing the loan applications. He will also advise the farmers where inputs are available and coordinate with the Extension Service to assure the farmers receive guidance and training in proper utilization of the inputs at the proper time. While assisting the farmers to identify input needs, the volume required for the area

will be generally determined and the input suppliers/distributors can be advised of estimated stocks they can market as guidance for supplies to have on hand.

Through this effort other problems or future actions needed may be identified requiring attention from other institutions or service functions such as research, marketing or storage. Action may be required by agencies/institutions implementing components of the project or by others not directly involved in the project. The task will be to obtain assistance from the agency/institution having the appropriate expertise to address the problem.

Neither the marketing/extension officers nor the extension service are expected to have the expertise to address all the problems that arise, but they are expected to know where the expertise is available and arrange for the farmer and the appropriate agency/institution to get together to resolve the problem.

Close coordination will also be required between the Bank of Ghana, ADB and the GOG to assure that the working capital requirements of the ADB are made available on a timely basis to meet small farmer credit requirements and the expansion program envisioned under the project.

A U.S. institution or firm with competence and developing country experience in small farmer credit programs will be contracted with to provide a training specialist to assist the ADB to conduct continuous training programs in credit administration and supervision for staff of the farm loan offices; and an organization/management specialist to

assist the ADB with the organization and management of the credit program.

The Extension Demonstration component of the project must play a primary role in the total project, testing/demonstrating research findings on farmers' farms, farming systems, agronomic/cultural practices, mixed cropping, fertilizer response, etc.; training and encouraging farmers in implementing the practices; helping farmers determine input and credit requirements; communicating problems to research for investigation; identifying other problems and assisting farmers to obtain the necessary assistance and services from appropriate institutions and service organizations; and generally performing a liaison role between farmers and service organizations, institutions and government. This will require not only commitment on the part of the Extension Service to actively pursue this role, but also commitment on the part of the other institutions and service organizations to coordinate and perform their role individually and in response to requests from each other and the farmers.

The International Fertilizer Development Center has been established to implement development programs formerly handled by the Tennessee Valley Authority, and will be contracted with to provide an agronomist/field trials demonstration specialist to assist the Extension Service establish and conduct the field trial demonstrations.

The Home Demonstration Unit will likewise perform an essential liaison role relative to women's roles, participation in and contribution

to agricultural production and marketing, rural development and home management. The Unit will be responsible for the field trial demonstrations for women, and using the model home and gardens, the Unit will train women in improved production, nutrition and home management practices. The Unit will perform the same role with women that the Extension Service has performed for farmers in general relative to other institutions and service organizations. The Unit will be supported with applied research and staff training activities by the Home Science Department, University of Ghana, Legon.

The Fertilizer Company will determine the amount and types of fertilizers required nationally, import, blend, bag and assure that the distribution and marketing of the fertilizer is of appropriate scope to make fertilizer accessible to as many small farmers as possible. This will require coordination with research and extension relative to the best mixes for various crops; with extension, credit and marketing outlets relative to amounts and time needed at the outlet points; and with distributors/marketers to assure the right fertilizers are distributed to the right place at the right time.

The International Fertilizer Development Center will be contracted with to provide a marketing specialist to assist the Fertilizer Company and private distributors/marketers to design and implement an efficient fertilizer distribution system.

The Seed Multiplication Unit must coordinate closely with the Crops Research Institute relative to new varieties of crops developed

and adapted to different ecological environmental zones in Ghana, and for obtaining its annual supply of breeder seed from which to multiply foundation seed.

Close coordination will also be required between the SMU, the Extension Service and the credit component's Marketing/Extension staff to determine the amounts and varieties of seed required for farmers' demands upon which to base contracts with the contract growers multiplying the certified seed. Close coordination will also be required with the Ghanaian/German project in the Northern Region for cleaning and processing the certified seed, produced in the North, in the Ghanaian/German project's seed processing unit.

Marketing the certified seed through the distribution system organized for fertilizer will require close coordination between the Seed Multiplication Unit, the Fertilizer Company, and the fertilizer distributors/marketers to assure the proper varieties and amounts are distributed to where and when they are needed. Special care will be required to assure the bags of fertilizer and seeds are not piled on top of each other, or touching each other as deterioration of the seed could result. Mississippi State University will be contracted with to provide a seed production specialist to assist the Seed Multiplication Unit in this activity.

The Small Farmer Research component will in fact be conducting field experimentation and application of research results generated by the Crops Research Institute and Regional and International Research Programs rather than conducting a more basic agriculture research program.

This will generally involve utilizing other research institutes' proven findings in adaptive trials/testing on small farm systems, cropping patterns, etc., that duplicate small farm conditions. The information, technology and practices thus identified and tested will be fed into the extension network.

Basic research on new varieties of crops, soils, plant pathological and entomological problems, etc., will be conducted by the CSIR and other established research institutes. Utilization and performance of the new varieties in mixed cropping systems, improvement of small farming systems and on-farm storage, etc.; the application of research results to small farm conditions will be the role of the Small Farms Research component. This will require close coordination with CSIR and communication with regional and international institutions as well as with the Extension Service and credit and the marketing systems.

The Small Farmer Research component must provide extension with a technological package and information to extend to the farmer. And extension must communicate to research the small farmer's constraints requiring attention. Each component must coordinate their efforts to assure that solutions are identified, made available to, and impact favorably upon the small farmer.

USAID will provide three researchers either through contracting with a university or institute or by direct recruitment to assist in designing and implementing this activity.

The marketing component, an experimental pilot activity, will be designed by the BOG, assisted by USAID-provided short-term consultants.

Implementation will require close coordination between the BOG and the ADB for credit for on-farm storage and production inputs to increase the surplus produce for marketing; and between BOG and the Extension Service, the private traders, farmers' associations or cooperative marketing societies as appropriate to identify constraints in moving produce from the farm to the market station, to assure efficient movement of the produce.

USAID will provide the appropriate project officers from its Accra office to assure coordination and integration of USAID's assistance with project activities, and that the necessary and agreed-upon support from USAID are provided on schedule. It is very probable that all implementing agencies will be involved in all project component activities, at least to a limited extent, and will need to respond to requests from other project components for assistance. All implementing agencies must be fully and actively committed, implementing, evaluating and modifying actions as necessary. The services, actions and support must be in the right place at the right time and in adequate amounts and commitment, just the same and just as importantly as the production inputs and technological packages. These must all be entwined in the right mix if the project goals are to be achieved, thereby depicting the extreme importance of establishing the coordinating committee to review and evaluate project progress and suggest actions for improving integration and coordination to achieve maximum impact on the small farmers.

C. Implementation Plan:

The following is the implementation plan of major project events by sub-activity from the date of approval of the PP until the final series of project evaluations. Separate Planned Performance Tracking (PPT) charts and Critical Performance Indicators (CPIs) are attached as an annex.

MIDAS Implementation Schedule

ADB Credit Sub-activity

<u>Date</u>	<u>Event</u>	<u>Action Agent</u>
1. 1/76	Short term credit curriculum consultant arrives for 1 MM.	AID/W
2. 3/76	PP approved	AID/W
3. 4/76	- ProAg signed for credit activity including PIO/C for training materials and PIO/T for technical assistance. - First 3 of 9 new FIO's established from ADB's existing resources.	USAID/ADB
4. 6/76	- Loan signed. - PIO/P signed for two long-term participants.	USAID/GOG/AID/W
5. 7/76	Lots 1 and 2 of vehicles and equipment ordered utilizing loan funds for first 19 FIO's.	USAID/ADB
6. 7/76	Bank of Ghana makes working capital available to the ADB.	BOG/ADB
7. 8/76	Evaluation Design consultant (recruited in event #3) arrives for 2 MM.	AID/W
8. 8/76	- Training Advisor (recruited in event #3) arrives for two year tour. - Training materials arrive.	AID/W
9. 10/76	Training program starts.	USAID/ADE
10. 9/76	First two long-term participants depart for 18 MM each.	USAID/ADB
11. 9/76	Farm Loan specialist arrives for two-year tour.	AID/W

<u>Date</u>	<u>Event</u>	<u>Action Agent</u>
12. 9/76	Last three of first nine FLOs established	ADB
13. 1/77	Loan funded equipment and vehicles arrive.	ADB
14. 2/77	Marketing and Input Distribution consultant arrives for 2 MM.	AID/W
15. 2/77	First three of second group of 10 FLOs established.	ADB
16. 7/77	Evaluation Design consultant arrives for 2 MM. Evaluation of Phase I activities (Interim evaluation).	AID/W ADB/USAID
7/	ADB orders equipment funded under second loan.	
17. 9/77	Second group of FLOs established.	
18. 12/77	First four of 3rd group of FLOs established.	ADB
19. 2/78	Two long-term participants return (see event 11).	AID/W
20. 2/78	Input Distribution and Marketing consultant arrives for 2 MM.	AID/W
	Equipment ordered under second loan arrives.	
21. 7/78	- Evaluation consultant arrives for 2 MM. Evaluation of sub-activity progress. (Phase I Evaluation)	AID/W USAID/ADB
	- ADB orders equipment under loan	
22. 9/78	- Credit training team departs after two years.	USAID
	- Last of third group of FLOs established.	ADB
23. 10/78	- Fourth lot of vehicles and equipment arrives.	
	- First of fourth group of FLOs established.	ADB
24. 2/79	- Marketing Consultant arrives for 2 MM.	AID/W - USAID
	- Equipment ordered under loan arrives.	

<u>Date</u>	<u>Event</u>	<u>Action Agent</u>
25. 7/79	- Evaluation consultant arrives for 2 MM. - End of Project Evaluation.	AID/W-USAID-ADB
26. 9/79	Fourth group of FLOs established.	ADB

MIDAS Implementation Schedule

Fertilizer Sub-activity

<u>Date</u>	<u>Event</u>	<u>Action Agent</u>
1. 3/76	PP approved	AID/W
2. 4/76	ProAg signed including: - PIO/C for training aids/demonstration equipment. - PIO/T for (1) Chemical Engineer/Production Specialist; (2) Fertilizer Marketing/Distribution Specialist	USAID/GFC
3. 4/76	Contract let out for GFC plant building.	GFC
4. 4/76	- Chemical Engineer arrives for 6-week TDY. - Organization Consultant arrives for 2 MM.	AID/W AID/W
5. 5/76	- Agronomic/Marketing consultant arrives for 2 MM. - PIO/P for short term participants signed.	AID/W USAID/GFC
6. 6/76	Loan signed	USAID/GOG/AID/W
7. 7/76	Equipment for plant ordered with loan funds.	GFC/USAID
8. 7/76	5 short-term participants depart, 6 weeks each; 1 Marketing Manager and 1 Production Manager depart for 3 MM each.	USAID/GFC
9. 8/76	Chemical Engineer/Production Specialist and Marketing/Demonstration/Distribution Specialist arrive for two year tours.	AID/W
10. 12/76	GFC building complete.	GFC
11. 3/77	- Plant equipment arrives. - Engineer arrives for plant start-up for 3 MM.	AID/W
12. 4/77	Plant completed with equipment in place.	USAID/GFC
13. 5/77	Recurring events for life of project: - Fertilizer procured, bagged and sold to farmers	GFC/USAID

<u>Date</u>	<u>Event</u>	<u>Action Agent</u>
	- Interim Evaluation of fertilizer sub-activity.	GFC/USAID
14. 7/77	Five short-term participants depart for 6 weeks each.	USAID/GFC
15. 7/78	Recurrent events as per #13 above; expanded fertilizer distribution system institutionalized.	USAID/GFC
	End of Project Evaluation	

Seed Multiplication Unit:

The following is the schedule of activities for the seed component of the project. The GOG will make working capital available annually to the SMU beginning in January, 1976 for support of program activities.

MIDAS Implementation Schedule

Seed Component Sub-activity

<u>Date</u>	<u>Event</u>	<u>Action Agent</u>
1. 3/76	PP approved	AID/W
2. 3/76	MOA budget allocations for Seed Multiplication Division confirmed included in MOA Budget.	MOA
3. 4/76	Proag and PIO/T signed organizing project and recruitment of long term (2 years) Seed Specialist authorized.	USAID/MOA
4. 4/76	PIO/C for grant funded seed production equipment and two vehicles signed.	USAID/MOA
5. 5/76	PIO/P extending one long term participant one year signed.	USAID/MOA
6. 6/76	MIDAS loan signed.	USAID/GOG/AID/W
7. 6/76	PIO/P authorizing 3 short-term participants for 9 MM total training signed.	USAID/MOA
8. 6/76	Seed Processing Specialist arrives for 2-year tour.	AID/W
9. 7/76	- Certified and Foundation Seed processing equipment and vehicles order by MOA with loan funds.	MOA/USAID
	- PIO/T for installation engineer signed.	USAID/MOA
10. 1/77	Grant funded Production equipment (item 4) arrives.	AID/W - USAID
11. 3/77	- Foundation seed equipment arrives.	MOA/USAID
	- Equipment engineer arrives for 2 MM for installation of equipment	AID/W - USAID

<u>Date</u>	<u>Event</u>	<u>Action Agent</u>
12. 6/77	- Certified seed processing equipment arrives.	MOA
	- Installation engineer arrives for 3 MM.	AID/W - USAID
13. 6/77	- MOA orders second lot of Foundation and Certified seed equipment with loan funds.	MOA/USAID
14. 6/77	- PIO/P for 3 short term participants; 3 MM each.	USAID/MOA
	- PIO/P for 3 long term participants; 2 years each.	USAID/MOA
15. 9/77	- Long and short-term participants depart.	USAID/MOA
	- Mid project Evaluation	USAID/MOA
16. 1/78	- Lot 2 of Foundation and Certified seed equipment arrives.	MOA
	- Agricultural Engineer arrives for installation; 3 MM	AID/W
	- Organization and Management consultant arrives; 1 MM	
17. 3/78	MOA orders Foundation Seed equipment and Seed Testing Laboratory equipment, loan funds.	USAID/MOA
18. 6/78	Seed Processing specialist departs after two year tour.	USAID
19. 6/78	Three short term participants depart 3 MM each.	USAID/MOA
20. 1/79	Equipment (Item 17) arrives; Consultant arrives for installation for 2 MM.	AID/W - USAID
21. 8/79	Long term participant (Plant Breeder) departs for 1 year.	USAID/MOA
22. 8/79	Three long term participants (event 15) return.	AID/W
23. 10/79	End of project evaluation.	USAID/MOA/AID/W

MIDAS Implementation Schedule

Small Farm Applied Research Sub-activity

<u>Date</u>	<u>Event</u>	<u>Action Agent</u>
1. 3/76	PP approved	AID/W
2. 4/76	MOA makes budgets available. ProAg signed /T for Research System design for 3 MM each).	MOA USAID/MOA
	- Vehicles ordered	
3. 5/76	- Design team arrives - Research station site selected.	MOA/USAID
4. 7/76	ProAg signed including PIO/T for three full-time project specialists (Farm Storage; Farms Systems; and an Agronomist). - PIO/C signed for research and laboratory equipment.	USAID/MOA
5. 1/77	- Vehicles arrive. - 3 specialists arrive for two year tours.	AID/W
6. 1/77	- Research station established and staffed.	MOA
7. 3/77	- Two consultants arrive for 1 MM each. - Equipment arrives. - Order second-year equipment	AID/W USAID/MOA
8. 8/77	- Two long-term participants depart for 2 years each.	USAID/MOA
9. 12/77	- Year two equipment arrives.	AID/W
10. 2/78	- Two consultants arrive for 1 MM each for interim evaluation.	AID/W
11. 7/78	- Two consultants arrive for 1 MM each	AID/W

<u>Date</u>	<u>Events</u>	<u>Action Agent</u>
12. 7/79	- Two consultants arrive for 1 MM each.	AID/W
13. 7/80	- Two consultants arrive for 1 MM each.	AID/W
	- End of Project evaluation	USAID/MOA/AID/W
	- Four technicians depart at end of four year assignment.	USAID

MIDAS Implementation Schedule

Small Farm Applied Research Sub-activity

<u>Date</u>	<u>Event</u>	<u>Action Agent</u>
1. 3/76	PP approved	AID/W
2. 4/76	MOA makes budget allocations available. ProAg signed including PIO/T for Research System design team (2 people for 3 MM each).	MOA USAID/MOA
	- Vehicles ordered	
3. 5/76	- Design team arrives	MOA/USAID
	- Research station site selected.	
4. 7/76	ProAg signed including PIO/T for three full-time project specialists (Farm Storage; Farms Systems; and an Agrono- mist).	USAID/MOA
	- PIO/C signed for research and laboratory equipment.	
5. 1/77	- Vehicles arrive.	
	- 3 specialists arrive for two year tours.	AID/W
6. 1/77	- Research station established and staffed.	MOA
7. 3/77	- Two consultants arrive for 1 MM each.	AID/W
	- Equipment arrives.	
	- Order second-year equipment	USAID/MOA
8. 8/77	- Two long-term participants depart for 2 years each.	USAID/MOA
9. 12/77	- Year two equipment arrives.	AID/W
10. 2/78	- Two consultants arrive for 1 MM each for interim evaluation.	AID/W
11. 7/78	- Two consultants arrive for 1 MM each.	AID/W

<u>Date</u>	<u>Events</u>	<u>Action Agent</u>
12. 7/79	- Two consultants arrive for 1 MM each.	AID/W
13. 7/80	- Two consultants arrive for 1 MM each.	AID/W
	- End of Project evaluation	USAID/MOA/AID/W
	- Four technicians depart at end of four year assignment.	USAID

Bank of Ghana (BOG) and the Marketing Program:

The marketing component of the project is to be implemented by the Development Finance Department of the BOG. It seeks to reduce the marketing costs of private traders and farmer associations by increasing their mobility and accessibility to credit and to test the effects of these changes on trader marketing operations as well as farmer response. Private traders will be selected and offered credit at prevailing commercial rates for working capital under the BOG private trader financing scheme, to establish a regular marketing service in one geographic area. It is anticipated that this area will coincide with the area chosen for the proposed District Planning and Rural Development Program.

Prior March 1976

An area will have been chosen so that implementation can commence in FY 76. Also, the BOG will have designed the monitoring and evaluation mechanism for the project prior to initiation of project events.

Implementation Schedule-Marketing

	<u>Event</u>	<u>Action Agent</u>
1.	3/76 - PP approved by AID/W	AID/W
2.	4/76 - Pro Ag signed and Grant funded vehicle ordered - Recruit Base Line Survey Consultant	BOG/USAID USAID
3.	7/76 - Recruit Local Staff for Survey	BOG
4.	9/76 - Survey Consultant arrives for 4-MM	AID/W
5.	9/76 - Local Survey Staff on-board	USAID/BOG
6.	10/76 - PIO/T for Marketing Specialist Consultant signed	USAID/BOG
7.	1/77 - Base Line Survey completed	BOG/USAID
8.	3/77 - Consultant (Marketing Specialist) to develop equipment requirements/specifications arrives for 2-MM	AID/W
9.	4/77 - Grant Equipment ordered by Marketing Specialist with PIO/C and Pro Ag	USAID
10.	6/77 - Grant Agreement to fund local staff for marketing program signed	USAID/BOG
11.	12/77 - Grant Equipment arrives - Marketing Specialist arrives for 2-MM	USAID/AID/W AID/W
12.	1/78 - Local Hire Staff (4) on-board: Trader/Associations selected, equipment sold on credit and activity commences	BOG
13.	2/78 - Equipment sold on credit to traders and trader associations	BOG
14.	2/78 - Survey Consultant and Marketing Specialist arrive for 2-MM each to supervise initiation of marketing activities	AID/W/USAID
15.	3/78 - Traders commence marketing activities and local staff monitors and evaluates program	BOG/Trader Associations
16.	2/79 - Recurrent event: Survey Consultant and Marketing Specialist return for annual 2-MM each consultation on progress of project	USAID/AID/W
17.	2/80 - Recurrent event: As above - Major evaluation of project activity and progress, and assessment of performance and impact on farmer and trader incomes	USAID/AID/W/BOG

D. Evaluation Plan

A three stage evaluation system will be adopted to review project efficiency, effectiveness and progress toward the realization of project objectives as set out in the logical framework:

1. Routine Evaluation
2. Phase I Evaluation
3. Phase II Evaluation (end of project evaluation).

The Division of Economic Research and Planning Services (DERPS) of the MOA will be the primary GOG agency responsible for the data collection and analysis needed for the evaluation process. All three evaluations will require implementing agencies' inputs separately and overall assessment of the project by the Project Coordinating Committee. This committee will work with appropriate USAID/Ghana, AID/W staff and AID sponsored consultant staff in evaluating the project at the end of Phase I and Phase II.

Funding: To finance the services of evaluation consultants to verify baseline data, develop detailed targets and indicators and to assist the design of the quarterly reports, as well as the services required for both Phase I and Phase II evaluations, \$100,000 is included in the grant project budget to cover approximately 12 man months of short-term consultant services, travel, per diem and other related costs.

Baseline Data: Most of the necessary baseline data for this project have been collected. Some are contained herein.* Other data are contained in the technical reports upon which the design of this project is based. (See page 91-B, Basis for Choice of Technology). USAID/Ghana, assisted by eval-

* Data contained herein include average income and production per acre and per farm holding under traditional cultivating practices, number of farmers presently reached by ADB with credit, the rate of repayment, the number of agronomic/fertilizer demonstrations held on small farmers' fields, the level of subsidy on fertilizer and seeds, total domestic production of grains and starches by crop, producer prices and traditional labor requirements.

uation and statistical experts and the staff of the Project Coordinating Committee assisted by DERPS, will verify, revise and expand this data as necessary, and collect additional data as the project is implemented. For example, the economic analysis includes estimates of average per farmer income and production under traditional cultivating practices, based upon several surveys and research projects throughout Ghana. This information will be strengthened by income and production information which ADB will collect as part of its loan application and approval process, to verify the credit worthiness of an applicant. In addition, the research component and the baseline surveys in the marketing component will generate additional data to further strengthen existing information.

Indicators of Project Impact: Some of the key indicators of project success have been identified, targeted, and are included in Annex N (Evaluation Criteria) and in the economic and financial analysis and accompanying tables.* In addition, USAID/Ghana and the GOG will target certain other indicators prior to the signing of the loan agreement or prior to loan disbursements (e.g., the projected level of subsidy phase-down on fertilizer and seeds, and the projected rate at which fertilizer and seed distribution will be turned over to private commercial outlets), still other indicators will be formulated before or at the start of project implementation (e.g., the projected number of farmers which will be served by the pilot marketing component will be determined after baseline surveys of the pilot area are made).

** The PP includes indicators on projected number of farmers receiving credit from ADB, the size, uses and rate of repayments of these loans, average income and production per acre and per farm holding under improved cultivation practices, number of agronomic demonstrations to be held each year, output capacity of GFC and SMU, and incremental domestic production of grains and staves by crop.

Collection and Evaluation of Information on Impact: Data on all key indicators will be collected regularly during the course of project implementation. This collection process has been built into the activities of each of the six project components.

Routine Evaluation

The routine evaluation is designed to provide information on a continuing basis on the implementing agencies' activities and performance as they affect the target population (the small farmer). Each implementing agency will submit quarterly reports for review by USAID and subsequent discussion by the Permanent Advisory Committee in order to facilitate planning of actions on unresolved issues or problems affecting project success. The reports will include a description of activities carried out under each component and an analysis of the impact of these activities on the project outputs, purpose and goal. An evaluation consultant will assist the USAID and implementing agencies to design the format of these reports. On the basis of the quarterly reports, the Permanent Advisory Committee will suggest and adopt measures to overcome any problems.

Phase I Evaluation

The Phase I evaluation will be a joint GOG/AID effort made 20 months after the initial disbursements under the first AID loan. It will assess project progress against the interim targets included in Annex N (Evaluation Criteria) at the goal, purpose and output levels and identify needed changes in project design, if any. Based on this evaluation, AID will make a decision regarding the second \$10 million loan.

Content and Methodology: Immediately after authorization of the project, U.S. and Ghanaian specialists will develop a revised survey instrument to guide the accumulation of baseline and progress data which pertain particularly

to participating farmers. A detailed evaluation design will be drawn up, including the targetted indicators at the goal and purpose levels. This design will be based primarily upon the indicators included in Annex K (the Project Description for the Loan Agreement) and Annex N (Criteria for Follow-on Assistance), but also on indicators and baseline data provided elsewhere in the PP (e.g., financial and economic analyses) and supporting technical studies used as background for the PP. The evaluation team will spend three to four weeks on the project site and will consist of a USDA/PASA or contract agricultural economist, a USAID/Ghana agricultural expert, an AID/W program/evaluation officer, a Ghanaian representative (to be identified by the GOG) specializing in economics and/or the design and management of agricultural development programs.

Because of the relatively short duration of Phase I, progress toward achievement of outputs will be farther along and more visible than progress toward the project's production and income goals. Progress toward the project purpose will lie somewhere between.

At the output level:

--The team will review the quarterly reports to determine the extent to which projected output targets were met. As noted in the description of the routine evaluation, these reports will have been designed to include the type of information needed for the Phase I evaluation. USAID/Ghana will be responsible for establishing, in advance of the team's arrival, the completion of project outputs as scheduled. A series of field visits will enable the team to spot check these results, verifying their quantity and quality. Outputs under each component of the project will be subject to

this type of review.

At the purpose level:

--The evaluation will assess institutional performance, i.e., the delivery of goods/services to the client farmer, which are key to the achievement of the project's purpose. This aspect will probably require most of the team's time. Field visits to sites of FLO's, farm agents, farmers and headquarters offices of the various institutions will be the main sources of evidence of achievement. On the basis of this review of progress, the team will make an estimate of the prospects for achievement of project objectives beyond Phase I. For example, the team will review the progress of phase-over of fertilizer and seed distribution from the MOA and the SMU to the GFC and private commercial outlets and will provide a judgment as to whether this effort can be expected to continue effectively and reach its anticipated conclusion on time. Also, the team will seek to verify that small farmers have been in fact the principal recipients/beneficiaries of these outputs.

At the goal level:

--Initial signs of increased per farm production and income will be identified by comparing baseline income and production data from the economic analysis in the PP and from farm loan applications for the first cropping season and from other sources to be developed relating to participating farmers, as well as by reviewing appropriate data collected from the marketing, extension/demonstration, and research components of the project. This baseline data will be compared with progress data also to be collected.

This work will be integrated into an overview reflecting all the evidence of progress against each of the criteria included in the evaluation design. The overview will draw general conclusions regarding

the significance to the project objectives of the achievement and failure to achieve the specific targets included in the evaluation design. It will also include recommendations for revisions in the project design for Phase II and recommendations for a new Annex N which would provide criteria to measure progress under the second \$10 million loan upon which AID will make a decision regarding the third \$10 million loan.

The evaluation report will be reviewed by the Permanent Advisory Committee and USAID/Ghana which will forward it to AID/W with recommendations and comments.

Phase II Evaluation

This evaluation will be a comprehensive, technical, financial, social and economic analysis of the project, matched against project objectives to measure the extent to which project outputs, purpose and goal have been achieved. The content, methodology, and composition of the evaluation team will be much the same as that planned for the Phase I evaluation, although greater attention will be given to the evidence of achievement of project purpose and goal than could be given at the end of Phase I. The detailed design of this evaluation will be completed on the basis of experience to date early in Phase II.

E. Conditions Precedent and Covenants will be distributed separately but will be part of this paper.

Annex A

AID/W PRP Approval Message



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TELEGRAM

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G. IN DISCUSSING THE RESOURCES REQUIRED UNDER THIS PROGRAM, PP SHOULD EXPLAIN THE LINKAGE TO LOAN 217 AND RESOURCES BEING SUPPLIED UNDER IT. THIS DISCUSSION SHOULD COVER BOTH GERAL FOREIGN EXCHANGE/BALANCE OF PAYMENTS/IMPORTS REQUIREMENTS AS WELL AS THE SPECIFIC COMMODITIES NEEDED FOR THE MIDAS SUBACTIVITIES.

H. IN THE EVENT THAT CREDIT REQUIREMENTS EXCEED THE AMOUNT OF LOCAL CURRENCY WHICH CAN BE GENERATED FROM FERTILIZER SALES, AID/W AGREES TO DIRECT CEDI PURCHASES OF UP TO TWENTY PERCENT OF LOAN FUNDS. LIKELIHOOD OF SUCH AN EVENTUALITY SHOULD BE DISCUSSED IN RELATION TO PROJECTIONS OF CREDIT REQUIREMENTS PER PARA 3 B ABOVE.

4. PROPOSAL WAS VIEWED AS REMARKABLY INTERESTING IN THAT IT PROVIDES FOREIGN EXCHANGE FOR IMPORTS NEEDED TO INCREASE SMALL FARMER PRODUCTION AND AT THE SAME TIME DIRECTS LOCAL CURRENCY GENERATIONS TO SPECIFIC SUBACTIVITIES DESIGNED TO PROVIDE THE TECHNICAL ASSISTANCE THESE FARMERS NEED TO MAKE OPTIMAL USE OF THE NEW INPUTS. ECPR ALSO RECOGNIZED THAT SUCH A PROGRAM REQUIRES WORKING OUT A NUMBER OF DIFFICULT ISSUES WITH THE GOG AND NOTED AS WELL THAT USAID BELIEVES IT WILL BE ABLE TO RESOLVE THESE MATTERS SATISFACTORILY.

5. SINCE PROJECT REQUIREMENTS FOR THIS PROGRAM INCLUDE AT LEAST 33 MILLION DOLLARS IN LOAN FUNDS (ALTHOUGH ONLY 10 MILLION DOLLARS WILL BE AUTHORIZED THE FIRST YEAR) AND APPROXIMATELY 3 MILLION DOLLARS IN GRANTS, BOTH REQUIRING THE APPROVAL OF A/ID, PRP IS BEING TRANSMITTED TO DEPUTY ADMINISTRATOR FOR HIS INFORMATION.

6. AID/W HAS REVIEWED DESIGN REQUIREMENTS WITH USAID/HAG ECONOMIST AND MISSION DIRECTOR. ON THE BASIS OF THESE DISCUSSIONS, PROPOSE SIX WEEK TDY FOR JOHN WOOTEN, DESIGN OFFICER, AFR/DS, BEGINNING OCTOBER 1. (WOOTEN WOULD WORK PRIMARILY ON THIS PROJECT BUT WOULD ALSO SPEND 3-4 WEEKS ASSISTING PREPARATION OF DISTRICT PLANNING AND RURAL DEVELOPMENT PROJECT (373) PRP DUE IN AID/W NOVEMBER 15.) GIVEN THE WORK ALREADY COMPLETED BY DESIGN TEAM IN AID/W, BELIEVE USAID; WITH FUCHS-CARSCH AND WOOTEN, SHOULD BE ABLE TO COMPLETE PP, INCLUDING NEGOTIATIONS WITH THE GOG, BY END NOVEMBER. IF NECESSARY, SHERPER COULD ALSO BE MADE AVAILABLE DURING THE LATTER PART OF THE PROCESS SHOULD NEGOTI-

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ATIONS WITH THE GOG REQUIRE IT. USAID HAS ALREADY REQUESTED LEGAL ASSISTANCE FROM REDSO/WA TO DRAW UP PROJECT/LOAN AUTHORIZATION AND DRAFT AGREEMENT. REDSO/WA IS REQUESTED TO ADVISE POSSIBILITY OF PROVIDING THIS SERVICE TO USAID/ACCRA. IN ADDITION, AID/W RECOMMENDS USAID REQUEST REDSO PROVIDE EXPERIENCED CAPITAL PROJECTS OFFICER FOR 1-2 WEEKS TO REVIEW AND DEVELOP FINANCING AND IMPORT ARRANGEMENTS FOR THE LOAN PORTION OF PROGRAM. FINALLY, REQUEST USAID REVIEW SOCIAL ANALYSIS REQUIREMENTS AND ADVISE IF ANY ASSISTANCE REQUIRED TO COMPLETE THIS PORTION OF PP.

7. IF PP RECEIVED BY THANKSGIVING AND MEETS ALL ISSUES OUTLINED ABOVE AND IN ISSUES PAPER, BELIEVE IT IS REALISTIC TO EXPECT AUTHORIZATION BEFORE DECEMBER 31, 1975.

8. FOR REDSO/WA: PRP AND OTHER DOCUMENTS POUCHED. ADVISE YOUR ABILITY PROVIDE ASSISTANCE NOTED PARA 6 ABOVE. KISSINGER

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Annex B
Logical Framework

ANNEX B

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORKProject Title & Number MIDAS

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes (A-1)</p> <p>To increase agricultural production on small holdings, leading to higher levels of income and welfare for small farmers in Ghana.</p>	<p>Measures of Goal Achievement (A-2)</p> <p>In 5 years, approximately 68,000^{1/} additional small farmers will be reached by ADB's expanded small farmer credit operations. The typical small farmer reached by the program is expected to bring 75% of the holding under improved practices by year 5 which should result in a 70% increase in the net value of agricultural production (relative to 1975 average farm gate prices).</p>	<p>(A-3)</p> <ol style="list-style-type: none"> 1. Records from ADB's new management information and evaluation system; 2. MOA food situation reports and annual agricultural sample surveys; 3. Forthcoming results of the Household Expenditure Survey undertaken by the Central Bureau of Statistics 	<p>Assumptions for Achieving goal targets: (A-4)</p> <p>Factor-product price relations prevail which give small farmer adequate incentive to adopt new technologies and improved agricultural practices.</p>

PROJECT DESIGN SUMMARY
LOGISTIC FRAMEWORK

Project Title & Number MIDAS

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program Purpose: (B-1)</p> <p>To develop an institutionalized coordinated system to provide improved agricultural inputs and services to small farmers on a timely basis, particularly in areas served by ADB's new FLO's.</p>	<p>Conditions that will indicate purpose has been achieved. End-of-Project Status: (B-2)</p> <p>At the end of the 5th year of program build-up, 68,000 small farmers throughout Ghana are receiving credit from ADB's 49 new FLOs' expanded operations and also have access to a regular flow of improved farm inputs and services which are profitable to farmers and distributors.</p>	<p style="text-align: center;">(B-3)</p> <ol style="list-style-type: none"> 1. Records from ADB's new management information system regarding the number of farmers reached and the uses of credit provided; 2. MOA extension and demonstration records indicating the extent and regularity of services provided in these regions; 3. Surveys and interviews with farmers indicating the extent to which they have had regular access to improved farm inputs and services; 4. Records of GFC and its distribution outlets indicating the increase in fertilizer sales in these regions; 5. Records of SMU and its distribution outlets indicating the increase in sales of improved seeds in these regions. 	<p>Assumptions for achieving purpose: (B-4)</p> <p>That policies are pursued which encourage greater private sector participation in input distribution. That concerned GOG agencies will coordinate their annual work programs to assure that requisite service programs are designed and implemented to support ADB's expanded credit operations.</p>

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title & Number MIDAS

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs; (C-4)
<ol style="list-style-type: none"> 1. An efficient fertilizer procurement, handling, blending and distribution system operating nationwide; 2. An expanded and improved seed production, testing and distribution system operating nationwide; 3. An expanded and efficient small farmer credit program operating nationwide; 4. A small farm systems research capability instituted and functioning within the MOA; 5. An improved understanding of the structure and functioning of the food crop marketing system in Ghana, and experience with alternate approaches to traditional marketing channels. 6. An improved capability of the extension system to demonstrate to large numbers of small farms the profitability of adopting improved farm practices, seeds, fertilizer and on-farm storage; 7. A closer and more efficient coordination between private and public institutions serving the agricultural sector. 	<ol style="list-style-type: none"> 1. (a) One bulk handling and blending facility constructed and equipped at Tema; (b) Approximately 250 GFC outlets distributing fertilizer on a regular basis throughout Ghana; 2. (a) Three foundation seed facilities constructed and equipped at Winneba, Kumasi and Tamale; (b) Two certified seed facilities constructed and equipped at Winneba and Kumasi; (c) One seed testing facility constructed and equipped at Accra; (d) Approximately 350 private and public outlets distributing improved seeds throughout Ghana. 3. (a) 49 new FLOs established throughout Ghana, providing credit to 68,000 by year five; (b) An in-house staff training program instituted within ADB to train at least junior project officers and loan supervisors per year to staff the new FLOs. 4. One small farm systems research unit in the transition zone, staffed by two agronomists, veterinarian, a pathologist (part-time), an economist and a rural sociologist. 	<ol style="list-style-type: none"> 1. Site inspections. 2. Quarterly progress reports of implementation agencies. 3. Annual reports by Permanent Advisory Committee. 4. Annual project evaluations by the AID project management; 5. Reports of annual evaluations by the AID project management; 6. Interviews and surveys with private traders (particularly those participating in the pilot marketing activity) indicating the extent to which they have increased service to small farmers in the regions 	<ol style="list-style-type: none"> 1. Adequate working capital is available to GFC from commercial banks for advance purchases of bulk fertilizer 2. Adequate MOA budget funds are available to the SMU to finance seed purchases from private certified seed growers. 3. Adequate working capital is available to ADB from the BOG for initial outlays of credit and for annual incremental outlays of credit. 4. Adequate local manpower is available for training to fill key staff positions in the ADB, GFC, SMU and ERPS. 5. The GOG fiscal and pricing policies give adequate incentive for increased participation of the private sector in agricultural inputs distribution and product marketing. 6. Required budget and working capital resources are made available to implementing agencies in a timely manner.

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Project Title & Number MIDAS

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs (C-1) cont.	(C-2) cont. 5. Surveys and evaluations of pilot assistance activities to traders in one district (Transition Zone); 6. 300 fertilizer and seed demonstrations per year by extension personnel on farmers' fields for the first three years. 7. A permanent coordinating committee monitoring and evaluating the activities of institutions serving the agricultural sector.	(C-3) cont.	Assumptions for providing outputs (C-4) cont.

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Inputs: (D-1)</p> <p>See Detailed Financial Plan and Financial Projections (Annex M)</p>	<p>Magnitude of Inputs: (D-2)</p>	<p>(D-3)</p> <p>AID authorization and obligating documents. GOG budget expenditures.</p>	<p>Assumptions for providing inputs (D-4):</p> <p>AID follow-on assistance will be dependent upon project success, subsequent GOG requests for assistance and availability of funds.</p>

Annex C

Economic and Financial Analysis Tables

ANNEX C - Tables 1 - 41

**Table 1 - Derivation of the Cropping Pattern for the Typical Holding
Producing Primarily Food Crops Under Traditional Practices - Southern Ghana**

<u>Crop</u>	<u>Total Area Cultivated ^{1/} (000's Acres)</u>	<u>Percent- age</u>	<u>Median Acres per Holding</u>	<u>Net Value of Production per Acre ^{3/}</u>	<u>Net Value of Production per Holding</u>
Maize	557	39.1	1.37	30.50	41.79
Cassava	309	21.7	.76	162.00	123.12
Plantain	187	13.2	.46	130.00	59.80
Yams	146	10.3	.36	273.00	98.28
Cocoyams	97	6.8	.24	189.95	45.59
Rice	54	3.8	.13	23.60	3.07
Other crops ^{a/}	46.0	3.2	.11	147.60	16.24
Pulses	<u>27.5</u>	<u>1.9</u>	<u>.07</u>	39.50	<u>2.70</u>
Sub-total	1424.5	100.0	3.5 ^{2/}		390.59
Cocoa, etc. ^{b/}	3541				
Other Trees ^{c/}	<u>178</u>				
Total	<u>5143.5</u>				

^{a/} Includes Sorghum, Vegetables, Cotton, Bast Fibers, Tobacco, Rubber

^{b/} Includes Cocoa, coffee, kola, sugarcane

^{c/} Coconut, palm fruits, citrus, pineapple

^{1/} Source: Agricultural Sample Census 1970, Accra, Ghana

^{2/} Source: Ghana Agricultural Sector Assessment, 1974 USAID/Ghana

^{3/} Derived in Table 3, Row IX

Table 2 - Derivation of the Cropping Pattern for the Typical Holding Producing Primarily Food Crops under Traditional Practices - Northern Ghana 1/

<u>Crop</u>	<u>Acres (000's)</u>	<u>%</u>	<u>Median Acres per holding</u>	<u>Gross Margin per acre 2/</u>	<u>Net Value of Pro- duction per Holding</u>
Millet	375	30.7	1.38	36.10	49.82
Sorghum	268.5	22.1	.99	44.75	44.30
Maize	157	12.9	.58	33.50	34.08
Pulses	156.5	12.9	.58	57.30	33.23
Yams	146	12.0	.55	274.00	150.70
Rice	81.5	6.7	.30	36.90	11.07
Other ^{a/}	<u>33.0</u>	<u>2.7</u>	<u>.12</u>	131.60	<u>15.79</u>
<u>Total</u>	<u>1217.5</u>	<u>100.0</u>	<u>4.5</u>		<u>338.99</u>

a/ Includes vegetables, cotton, tobacco, bast fibers

1/ See Footnotes to Table 1

2/ Derived in Table 4, Row IX

Table 3 - Estimated^{1/} Per Acre Production Costs and Returns of Major Crops in Southern Ghana - Traditional Practices^{2/}

OPERATION	CROPS		MAIZE		CASSAVA		PLANTAIN		YAMS		COCOYAMS		RICE		PULSES		OTHERS		
	MD'S	¢'S	MD'S	¢'S	MD'S	¢'S	MD'S	¢'S	MD'S	¢'S	MD'S	¢'S	MD'S	¢'S	MD'S	¢'S	MD'S	¢'S	
I. ESTABLISHMENT																			
A. Clearing																			
B. Felling & Chopping																			
C. Windrowing & Burning																			
D. Removal of Stubs		15 ^{3/}		15.00		15.00		15.00		15.00		15.00		15.00		15.00		15.00	
E. Preparation	6	6.00	6	6.00	3	3.00	6	6.00	3	3.00	6	6.00	6	6.00	6	6.00	6	6.00	
F. Planting:																			
1. Materials		1.00	-	3.00	-	9.00	-	120.00	-	3.80	-	6.10	-	6.00	-	6.00	-	25.00	
2. Labor	3	3.00	8	8.00	10	10.00	15	15.00	9	9.00	3	3.00	3	3.00	-	3.00	-	10.00	
II. MAINTAINANCE																			
A. Weeding (2 times)	10	10.00	16	16.00	16	16.00	16	16.00	16	16.00	16	16.00	10	10.00	10	10.00	16	16.00	
III. HARVESTING																			
A. Cutting and Collecting	4	4.00	15	15.00	4	4.00	20	20.00	12	12.00	5	5.00	6	6.00	10	10.00	10	10.00	
B. Threshing/Bagging	-	-	-	-	-	-	-	-	-	-	-	-	6	6.00	-	-	-	-	
C. Shelling/Bagging (IMD/BAG)	4	4.00	-	-	-	-	-	-	-	-	-	-	-	-	5	5.00	-	-	
D. On-farm Processing/Storage	-	-	15	15.00	12	12.00	15	15.00	14	14.00	-	-	-	-	-	-	10	10.00	
IV. OTHER COSTS																			
A. Jute bags (¢0.40/bag/yr)	-	2.00	-	-	-	-	-	-	-	-	-	-	-	2.00	-	2.00	-	2.40	
B. Marketing	3	3.00	15	15.00	18	18.00	15	15.00	18	18.00	4	4.00	4	4.00	15	15.00	-	15.00	
C. Taxes (.30/bag)	-	1.50	-	5.00	-	3.00	-	5.00	-	5.00	-	1.80	-	.90	-	.90	-	3.00	
V. TOTAL COST		<u>49.50</u>		<u>98.00</u>		<u>90.00</u>		<u>227.00</u>		<u>95.80</u>		<u>58.90</u>		<u>57.90</u>		<u>112.40</u>			
VI. YIELD BAGS/ACRE^{4/}																			
		5(220 lbs/bag)	100Loads(60 lbs/load)	50Loads(75 lb/load)	125 Tubers (2.5lbs/tb)	45Loads(66 lbs/load)	5(180lbs/bag)	3(180lbs/bag)											
VII. PRICE ¢s/Bag^{5/}		16.00	2.60/load	4.40/load	.40/tuber	6.35/load	16.50/bag	32.40											
VIII. GROSS RETURN		80.00	260	220.00	500.00	285.75	82.50	97.20	260.00										
IX. NET VALUE OF PRODUCTION		<u>30.50</u>	<u>162.00</u>	<u>130.00</u>	<u>273.00</u>	<u>189.95</u>	<u>23.60</u>	<u>39.30</u>	<u>147.60</u>										

^{1/} These estimates are derived from a number of sources; Inter alia B. E. Fourke, "Wages and Incomes of Agricultural Workers in Ghana" Min. of Agriculture, "Current Agricultural Statistics", and "Records on Costs of Production of Selected Crops" 1972 (Contd. on page 8a)

Table 3 - (Contd.)

C. Okali "Dominase - A Mobile Cocoa Farming Community in Brong-Ahafo" 1975; S.Y. Ateu and P.H. Owusu "Food Production and Productivity of Resources in Traditional Food Farming"; A. Chinbuah, "Farm Budgets for Ghana, 1975."

2/ These estimates apply to a one year time frame. Yields of cassava and plantain, which mature over 15 and 14 months respectively, have been adjusted accordingly. This exercise ignores the value of production obtained from minor season cultivation.

3/ These costs are amortised over a four-year period after which land is returned to fallow. The cost of land clearing is $\text{¢}10/\text{acre}$, of felling and chopping; $\text{¢}4/\text{acre}$ of windrowing; $\text{¢}2/\text{acre}$ and of stub removal; $\text{¢}8/\text{acre}$. Family labor is valued at $\text{¢}1.00/\text{man-day}$ and hired labor at $\text{¢}2.00/\text{man-day}$.

4/ These yields are adjusted for on-farm wastes and losses estimated to be 10 - 15% for grains and 20-25% for roots and tubers.

5/ 1974 average annual rural market prices received by farmers. See: Min. of Agriculture, "Food Situation Reports" 1974, Accra, Ghana.

Table 4 - Estimated per Acre Production Costs and Returns of Major Crops in Northern Ghana - Traditional Practices

Operational	CROPS		Millet		Sorghum		Maize		Pulses		Yams		Rice		Other	
	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s
I. Establishment																
A. Land clearing)																
B. Windrowing & Burning)		6.00 ^{2/}		6.00		6.00		6.00		6.00		6.00		6.00		6.00
C. Preparation	5	5.00	5	5.00	5	5.00	5	5.00	5	5.00	5	5.00	5	5.00	5	5.00
D. Planting:																
1. Materials	-	.80	-	.80	-	1.00	-	6.00	-	120.00	-	6.10	-	25.00		
2. Labor	4	4.00	4	4.00	4	4.00	3	3.00	15	15.00	5	5.00	15	15.00		
II. Maintenance																
A. Weeding	6	6.00	6	6.00	6	6.00	4	4.00	10	10.00	5	5.00	15	15.00		
III. Harvesting																
A. Cutting & Collecting	5	5.00	5	5.00	4	4.00	6	6.00	20	20.00	5	5.00	10	10.00		
B. Threshing/Bagging	6	6.00	6	6.00	-	-	-	-	-	-	6	6.00	-	-		
C. Husking/Shelling/Bagging (IMD/Bag)	-	-	-	-	5	5.00	3	3.00	-	-	-	-	-	-		
D. On-Farm Processing	-	-	-	-	-	-	-	-	10	10.00	-	-	10	10.00		
IV. Other Costs																
A. Jute Bags (¢.40/bag/yr)	-	1.20	-	1.40	-	2.00	-	2.00	-	-	-	2.00	-	2.40		
B. Marketing	4	4.00	4	4.00	4	4.00	4	4.00	15	15.00	4	4.00	15	15.00		
C. Taxes (.30/Bag)	-	.90	-	1.05	-	1.50	-	.90	-	5.00	-	1.50	-	5.00		
V. Total Costs		<u>38.90</u>		<u>39.25</u>		<u>38.50</u>		<u>39.90</u>		<u>206.00</u>		<u>45.60</u>		<u>108.40</u>		
VI. Yield (Bag)		3(204 lbs/bag)		3.5(204lbs/bag)		4.5(220lbs/bg.)		3(180lbs/bg)		1200tubers (2.5lbs/tb.)		5(180lbs/bg)				
VII. Price (¢'s/bag)		25.00		24.00		16.00		32.40		.40 ^{1/} tuber		16.50		-		
VIII. Gross Return		75.00		84.00		72.00		97.20		480.00		82.50		240.00		
IX. Net Value of Production		<u>36.10</u>		<u>44.75</u>		<u>33.50</u>		<u>57.30</u>		<u>274.00</u>		<u>36.90</u>		<u>131.60</u>		

1/ See Footnotes to Table 3

2/ Total costs are amortised over 4 years. The cost of land clearing is ¢20/acre or 10 man-days of hired labor valued at ¢2/man-days. The cost of windrowing and burning is ¢4/acre.

1/
Table 5 - Estimated Per Acre Production Costs (at Subsidised Input Prices) and Returns of Major Crops in Southern Ghana - Improved Practices

OPERATION	Crop	MAIZE		CASSAVA		PLANTAIN		YAMS		COCOYAMS		RICE		PULSES		OTHERS	
		MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s
I. Establishment																	
A-D																	
Land Clearing ^{2/} etc.			7.50		7.50		7.50		7.50		7.50		7.50		7.50		7.50
E. Preparations: Ridging/contouring		8	8.00	8	8.00	4	4.00	8	8.00	4	4.00	8	8.00	8	8.00	8	8.00
F. Planting:																	
1. Materials																	
a. Seed's			1.00		6.00	-	9.00	-	120.00	-	3.80	-	6.10		6.00	-	20.00
b. Fertilizer			7.20		9.00	-	9.00	-	9.00	-	9.00	-	7.20		5.75	-	10.00
2. Labor		5	5.00	10	10.00	12	12.00	20	20.00	12	12.00	7	7.00	5	5.00	15	15.00
II. Maintenance																	
A. Weeding (3 times)																	
		15	15.00	24	24.00	24	24.00	24	24.00	24	24.00	15	15.00	15	15.00	24	24.00
B. Spraying																	
Materials ^{3/}			16.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labor		2	2.00	-	-	-	-	-	-	-	-	-	-	2	2.00	2	2.00
C. Fertilizer:																	
Materials			3.80		4.50	-	4.50	-	4.50	-	4.50	-	3.80	-	-	-	5.00
Labor		2	2.00	3	3.00	3	3.00	3	3.00	3	3.00	2	2.00	-	-	2	2.00
III. Harvesting																	
A. Cutting/Collecting																	
		6	6.00	20	20.00	8	8.00	35	35.00	20	20.00	8	8.00	8	8.00	15	15.00
B. Threshing/Bagging																	
		-	-	-	-	-	-	-	-	-	-	7	7.00	-	-	-	-
C. Shelling/Bagging																	
		14	14.00	-	-	-	-	-	-	-	-	-	-	10	10.00	-	-
D. Storage/Processing																	
		-	3.00	20	20.00	18	18.00	25	25.00	20	20.00	-	3.00	-	3.00	15	15.00
IV. Other Costs																	
A. Jute Bags (.40/bg/yr.)																	
			5.60	-	-	-	-	-	-	-	-	-	4.40	-	3.20	-	6.00
B. Chemicals (.15/bg)																	
		-	2.10	-	-	-	-	-	-	-	-	-	1.65	-	1.20	-	2.00
C. Plastic Lining (.25/bg.)																	
		-	3.50	-	-	-	-	-	-	-	-	-	3.75	-	2.00	-	3.00
D. Marketing:																	
1. Output		5	5.00	25	25.00	30	30.00	20	20.00	30	30.00	5	5.00	5	5.00	20	20.00
2. Input		2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	4	4.00	4	4.00

Table 5 - (Continued)

	Maize		Cassava		Plantain		Yams		Cocoyams		Rice		Pulses		Others	
	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s
<u>IV. Other Costs</u>																
E. Taxes (.30/bg)		3.60	-	10.00	-	10.00	-	10.00	-	10.00	-	3.30	-	2.40	-	10.00
<u>V. Total Cost</u>		<u>112.30</u>		<u>149.00</u>		<u>141.00</u>		<u>288.00</u>		<u>149.30</u>		<u>94.70</u>		<u>104.05</u>		<u>184.50</u>
<u>VI. Yield (bags/Acre)</u>		14	180 loads/60lbs/ ld)		75 loads		2000 tubers		70 loads		11		8		-	-
<u>VII. Price (¢'s/Bag)</u>		16.00		2.60/ld.		4.40/ld		.40/tuber		6.35/ld		16.50		32.40		-
<u>VIII. Gross Return</u>		224.00		458.00		330.00		800.00		444.50		181.50		259.20		440.00
<u>IX. Net Value of Production</u>		111.70		319.00		189.00		508.00		294.70		86.80		155.15		265.50

1/ Estimates of Incremental Yields and Costs Are Taken from the Following Sources: FAO Technical Report "Increased Farm Production through Fertilizer Use - Ghana" Rome 1974; FAO Report to the Government of Ghana "Applied Agronomic Research on Field Crops in Northern Ghana" Rome 1969; Various Publications of the Council for Scientific and Industrial Research, Accra, Ghana; TVA "Fertilizer Alternatives for Ghana" 1973 Muscle Shoals, Alabama; USAID "Guide for Field Crops in the Tropics and the Subtropics 1974, Washington, D.C.

2/ Total Costs of Land Clearing Operations are amortised over an eight-year period. It is assumed that the period of cultivation between fallow can be lengthened as a result of annual fertilizer use.

3/ Includes annual amortization of \$4.00 for a mechanical hand sprayer costing \$36.00.

Table 6 - Estimated ^{1/} Per Acre Production Costs (at Subsidised Input Prices) and Returns of Major Crops in Northern Ghana Improved Practices.

OPERATION	Millet		Sorghum		Maize		Pulses		Yams		Rice		Other	
	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD'S	¢'s	MD's	¢'s	MD's	¢'s	MD'S	¢'s
I. Establishment														
A-B														
Land clearing, etc.		3.00		3.00		3.00		3.00	-	3.00	-	3.00	-	3.00
C. Preparation/ridging	6	6.00	6	6.00	6	6.00	6	6.00	6	6.00	6	6.00	6	6.00
D. Planting														
1. Materials:														
a. Seeds														
b. Fertilizer	-	.80	-	.80	-	1.00	-	6.00	-	120.00	-	6.10	-	25.00
2. Labor														
	6	6.00	6	6.00	6	6.00	6	5.00	20	20.00	7	7.00	15	15.00
II. Maintenance														
A. Weeding (2 times)														
B. Spraying:	12	12.00	12	12.00	12	12.00	12	12.00	15	15.00	12	12.00	20	20.00
1. Materials														
2. Labor														
	-	-	-	-	2	16.00	-	-	-	-	-	-	2	16.00
	-	-	-	-	2	2.00	-	-	-	-	-	-	2	2.00
C. Fertilizer:														
1. Materials														
2. Labor														
	-	3.00	-	3.00	-	3.80	-	-	-	4.50	-	3.80	-	5.00
	2	2.00	2	2.00	2	2.00	-	-	3	3.00	2	2.00	2	2.00
III. Harvesting														
A. Cutting/Collecting														
B. Threshing/Baging														
C. Shelling/Bagging(IMF/Bag)														
D. Storage/Processing														
	7	7.00	7	7.00	6	6.00	8	8.00	35	35.00	8	8.00	15	15.00
	8	8.00	8	8.00	-	-	-	-	-	-	7	7.00	-	-
	-	-	-	-	14	14.00	8	8.00	-	-	-	-	-	-
	-	5.00	-	5.00	-	5.00	-	5.00	25	25.00	-	5.00	15	15.00
IV. Other Costs														
A. Jute Bags/ (.40/bag)														
B. Chemicals (.15/Bag)														
C. Plastic (.25/Bag) lining														
D. Marketing:														
1. Output														
. Input														
	6	6.00	6	6.00	6	6.00	6	6.00	20	20.00	6	6.00	20	20.00
	2	2.00	2	2.00	4	4.00	2	2.00	2	2.00	2	4.00	4	6.00

Table 6 (Contd.)

IV. <u>OTHER COSTS</u>	<u>Crop</u>		Millet		Sorghum		Maize		Pulses		Yams		Rice		Other	
	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s	MD's	¢'s
E. Taxes (.30/Bag)	-	2.40	-	2.10	-	4.20	-	2.40	-	10.00	-	3.30	-	10.00	-	10.00
V. Total Cost		<u>78.60</u>		<u>77.50</u>		<u>109.40</u>		<u>75.55</u>		<u>272.50</u>		<u>89.20</u>		<u>181.00</u>		<u>181.00</u>
VI. Yield (Bags/Acre)		8		7		14		8		2000 Tubers		11		-		-
VII. Prices (¢s/Bag)		25.00		24.00		16.00		32.40		.40/Tuber		16.50		-		-
VIII. Gross Return		200.00		168.00		224.00		259.20		800.00		181.50		440.00		440.00
IX <u>Net Value of Production</u>		121.40		90.50		114.60		181.65		527.50		92.30		234.00		234.00

1/ See Footnotes to Table 5

Table 7 - Incremental Annual Cash Costs and Man-day Requirements per Acre for Major Crops Under Improved Practices in Northern and Southern Ghana - Subsidised Input Prices

	<u>Incremental Cash Costs</u>					<u>Total</u>	<u>Incremental man-days</u>
	<u>Fertilizer</u>	<u>Spraying materials</u>	<u>Storage</u>	<u>Bagging</u>	<u>Taxes</u>		
	<u>(¢'s/Acre)</u>						
<u>Southern</u>							
Maize	11.00	16.00	3.00	9.20	2.10	41.30	21.5
Cassava	13.50	-	-	-	5.00	18.50	32.5
Plantain	12.50	-	-	-	7.00	19.50	31.5
Yams	12.50	-	-	-	5.00	17.50	43.5
Cocoyams	12.50	-	-	-	5.00	17.50	36.5
Rice	11.00	-	3.00	7.80	1.50	23.30	12.5
Pulses	5.75	16.00	3.00	4.40	1.50	30.65	15.5
Others	15.00	16.00	5.00	9.60	7.00	52.60	19.5
<u>Northern</u>							
Millet	12.00	-	5.00	5.20	1.50	23.70	16
Sorghum	12.00	-	5.00	4.20	1.05	22.25	16
Maize	11.00	16.00	5.00	9.20	2.70	43.90	27
Pulses	5.75	-	5.00	4.40	1.50	16.65	19
Yams	13.50	-	-	-	5.00	18.50	48
Rice	11.00	-	5.00	6.80	1.80	24.60	19
Other	15.00	16.00	5.00	8.60	5.00	49.60	23

1/ Derived from Tables 3 through 6

Table 7a - Estimated^{1/} per Acre Incremental Mandays and Ratio of Incremental Mandays to Total Mandays requirements under Traditional Practices for Major Crops in Southern and Northern Ghana

	<u>Incremental Mandays per Acre</u>	<u>Total Mandays/acre under traditional Practices</u>	<u>Ratio of Incremental Mandays to Total Mandays</u>
<u>South</u>			
Maize	21.5	45	0.48
Cassava	32.5	90	0.36
Plantain	31.5	78	0.40
Yams	43.5	102	0.43
Cocoyams	36.5	87	0.42
Rice	12.5	49	0.26
Pulses	15.5	49	0.32
Others	19.5	72	0.27
<u>North</u>			
Millet	16	33.5	0.48
Sorghum	16	33.5	0.48
Maize	27	31.5	0.86
Pulses	19	28.5	0.67
Yam	48	78.5	0.61
Rice	19	33.5	0.57
Other	23	73.5	0.31

1/ Derived from Tables 3 through 6.

Table 8 - Incremental Annual Cash Costs per Acre for Major Crops Under Improved Practices in Northern and Southern Ghana - Unsubsidised Input Prices.

	<u>Fertilizer</u>	<u>Seeds</u>	<u>Chemicals</u>		<u>Sub- Total</u>	<u>Other non- subsidised cash costs</u>	<u>Total Unsubsidised Cash Costs</u>
			<u>Spraying</u>	<u>Bagging</u>			
			<u>(¢'s/Acre)</u>				
<u>Southern</u>							
Maize	35.48	1.20	20.00	4.20	60.88	14.10	74.98
Cassava	43.55	-	-	-	43.55	5.00	48.55
Plantain	40.32	-	-	-	40.32	7.00	47.32
Yams	40.32	-	-	-	40.32	5.00	45.32
Cocoyams	40.32	-	-	-	40.32	5.00	45.32
Rice	35.48	3.90	-	3.30	42.68	9.00	51.68
Pulses	18.55	10.65	20.00	2.40	51.60	10.50	62.10
Others	48.39	-	20.00	4.00	72.39	21.60	93.99
<u>Northern</u>							
Millet	38.71	-	-	2.40	41.11	9.30	50.41
Sorghum	38.71	-	-	2.10	41.11	8.15	49.26
Maize	35.48	1.20	20.00	4.20	60.88	16.70	77.58
Pulses	18.55	10.65	-	2.40	31.60	8.50	40.10
Yams	43.55	-	-	-	43.55	5.00	48.55
Rice	35.48	3.90	-	3.30	42.68	10.30	52.98
Other	48.39	-	20.00	4.00	72.39	18.60	90.99

1/ Subsidised and unsubsidised prices (CIF Major Depots in Ghana) in ¢'s/Bag (112 lbs.) are: Sulphate of Amonia - 2.00 and 8.40, respectively; Single Superphosphate - 1.90 and 6.90. Muriate of Potash - 2.00 and 4.67; 15-15-15 - 2.80 and 12.80; 20-20-0 - 2.80 and 12.80.

Table 9 - Derivation of Net Value of Production, Incremental Costs and Value of Incremental Production for the typical holding in Southern Ghana Cultivating Under Improved Practices.

	Median Acreage (Acres)	Net Value of Production		Incremental Costs		Value of Incremental Production Taxes	
		Subsidised	Unsubsidised	Subsidised	Unsubsidised	(£'s)	(£'s)
<u>Drop</u>							
Maize	1.37	153.03	106.89	86.04	132.18	197.28	4.93
Cassava	.76	242.44	219.60	38.76	61.60	232.56	7.60
Plantain	.46	86.94	74.14	23.46	36.26	50.60	
Yams	.36	182.88	172.86	21.96	31.98	108.00	3.60
Cocoyams	.24	70.73	64.05	12.96	19.64	38.10	2.40
Rice	.13	11.28	7.59	4.65	8.34	12.87	.43
Other crops	.11	29.15	24.60	7.93	12.48	19.80	1.10
Pulses	.07	10.86	8.66	3.23	5.43	11.34	.17
Total	3.5	787.31	678.39	198.99	307.91	670.55	24.93

1/ Derived from Tables 3 through 8.

Table 10 - Derivation^{1/} of net value of production, incremental costs and value of production for the typical holding in Northern Ghana cultivating under improved practices (all figures are on a per holding basis)

Millet	1.38	167.53	130.67	54.79	91.65	172.50	3.31
Sorghum	.99	89.60	62.86	37.87	64.61	83.16	2.08
Maize	.58	66.47	46.93	41.12	60.66	88.16	2.44
Pulses	.58	105.36	91.76	20.68	34.28	93.96	1.39
Yams	.55	290.13	273.60	36.58	53.10	176.00	5.50
Rice	.30	27.69	19.18	13.08	21.59	29.70	.99
Other	.12	28.08	23.11	8.71	13.68	24.00	1.20
Total	4.5	774.86	648.11	212.83	339.57	667.48	16.71

1/ Derived from Tables 3 through 8

Table 11 - Estimated^{1/} incremental value cost ratios for major crops under improved practices in Northern and Southern Ghana

	Subsidised input prices	Unsubsidised input prices
<u>Southern Ghana</u>		
Maize	2.29	1.49
Cassava	4.08	2.57
Plantain	2.16	1.40
Yams	4.92	3.38
Cocoyams	2.94	1.94
Rice	2.77	1.54
Pulses	3.51	2.09
Others	2.50	1.59
<u>Northern Ghana</u>		
Millet	3.15	1.88
Sorghum	2.20	1.29
Maize	2.14	1.45
Pulses	4.42	2.74
Yams	4.81	3.31
Rice	2.27	1.38
Other	2.75	1.75

1/ Derived from Tables 7 through 10

Table 12 - Estimated^{1/} Credit Requirements for Productive Purposes of the Typical Holding in Ghana.^{2/}

	<u>Southern</u>		<u>Northern</u>	
	<u>Subsidised</u>	<u>Unsubsidised</u>	<u>Subsidised</u>	<u>Unsubsidised</u>
I. <u>Annual Production Credit</u>				
A. Seeds ^{1/}	4.80	8.80	4.31	15.83
B. Fertilizer	42.10	135.68	50.68	163.48
C. Pesticides/Herbicides	18.60	24.80	8.40	11.20
D. Chemicals	6.95	13.90	9.20	18.40
E. Plastic Lining	12.25	12.25	15.00	15.00
F. Labor (Man-days)	97.92	97.92	99.46	99.46
Total At Constant Size	182.62	293.35	187.05	323.37
At Increased Size ^{4/}	234.80	377.16	249.40	431.16
I. <u>Medium Term Credit</u>				
A. On-farm Storage	30.00	30.00	50.00	50.00
B. Jute Bags ^{2/}	1.20/Bag	1.20/Bag	1.20/Bag	1.20/Bag
C. Land Clearing ^{3/}	60/Acre	60/Acre	24/Acre	24/Acre
D. Bullock Team	-	-	300.00	300.00
F. Bullock Plow	-	-	120.00	120.00
F. Hand Sprayer	36.00	36.00	36.00	36.00
G. Hand Tools	15.00	15.00	20.00	20.00

/ Derived from Tables 5 through 8

/ Assume 20 Bags per Holding

/ Assume one Acre per holding in the south and 1.5 acres in the north.

/ Median holding size is expected to increase to 4.5 acres in the south and 6 acres in the north.

/ The estimates of credit requirements are based on the assumption that credit will finance only incremental cash costs. An average loan of \$500/holding is assumed so as not to rule out the possibility of financing total cash costs in some cases.

Table 13 - Economic and Financial Returns of Investments in Bullock Farming

	-----Year-----				
	0	1	2	3	4
I. <u>Outflow</u>	487.50	177.60	177.60	177.60	177.60
<u>Investment Costs</u>	---				
A. Bullock Team ^{1/}	300				
B. Bullock Plow	120				
C. Training ^{2/}	67.50				
II. <u>Recurrent Costs</u>		177.60	177.60	177.60	177.60
A. Maintenance ^{3/}		30.00	30.00	30.00	30.00
B. Debt Servicing					
1. Bullock & Plows		132.50	132.50	132.50	132.50
2. Incremental Annual Production ^{4/} Credit (Interest 10%)		15.10	15.10	15.10	15.10
III. <u>Inflow</u>	<u>420</u>	<u>216.00</u>	<u>216.00</u>	<u>216.00</u>	<u>516.00</u>
A. Sale of Bullocks ^{1/}		-	-	-	300
B. Net Value of Production on Incremental Acreage (144.02/Ac) ^{2/}		216.00	216.00	216.00	216.00
C. Loan Funds	420	-	-	-	-
IV. <u>Cash Flow</u>					
A. To Farmer	(67.50)	38.40	38.40	38.40	338.40
B. To Economy	(487.5)	186.00	186.00	186.00	186.00
V. <u>Internal Rate of Return</u>					
A. Financial to Farmers Equity					50%
B. To the Economy					= 22.2%

^{1/} Bullocks are purchased as 2 - 3 Year olds and sold after four years of service.
^{2/} New bullock farmers receive a six-week training course. The cost of training is 45 mandays valued at £1.50/MD including cost of travel and subsistence during the training period.

^{3/} Includes the value of hay and stubble and the cost of veterinary services
^{4/} The incremental annual credit requirements are £75.46/Acre for the typical holding in Northern Ghana.

^{5/} It is assumed that the bullock farmer can in the short run increase the size of his holding by 1.5 acres. The scarcity of family labor is likely to constrain larger increases in holding size.

Table 14 - Derivation of number of farmers reached by ADB's small farmer credit window - high projection^{1/}

Year	1	2	3	4	5	6	Number of Farmers Reached in Year ^{2/}	
							Total	Increment
1	4,500	-					4,500	4,500
2	2,000	5,000	-				14,000	9,500
3	13,500	10,000	5,000	-			28,500	14,500
4	18,000	15,000	10,000	5,000	-		48,000	19,500
5		20,000	15,000	10,000	5,000	-	68,000	20,000
6			20,000	15,000	10,000	5,000	88,000	20,000
7				20,000	15,000	10,000	103,000	15,000
8					20,000	15,000	113,000	10,000
9						20,000	118,000	5,000

^{1/} Assumes 9 new farm loan offices in year one and ten additional FLOs per year until year 6 and, that each new FLO will reach 500 farmers in year one, 1,000 in year two, 1500 in year three, and 2,000 in year four.

^{2/} Carried to Table 19.

Table 15 - Derivation of number of farmers reached by ADB's small farmer credit window - low projection

Year							Number of Farmers reached in year ^{2/}	
	1	2	3	4	5	6	Total	Incremental ²
1	900	-	-	-	-	-	900	900
2	2,700	1,000	-	-	-	-	3,700	2,800
3	5,400	3,000	100	-	-	-	9,400	5,700
4	8,100	6,000	3,000	100	-	-	18,100	8,700
5	10,800	9,000	6,000	3,000	1000	-	29,800	11,700
6	14,400	12,000	9,000	6,000	3,000	1,000	45,400	15,600
7	18,000	16,000	12,000	9,000	6,000	3,000	64,000	18,600
8		20,000	16,000	12,000	9,000	6,000	81,000	17,000
9			20,000	16,000	12,000	9,000	95,000	14,000
10				20,000	16,000	12,000	106,000	11,000
11					20,000	16,000	114,000	8,000
12						20,000	118,000	4,000

1/ Assumes 9 new Farm Loan Offices in Year one and ten additional FLOs per year until year 6; and that each new FLO will reach 100 farmers in year one, 300 in year two, 600 in year three, 900 in year four, 1,200 in year 5, 1,600 in year 6 and 2,000 in year 7.

2/ Carried to Table 18.; 3/ It is assumed that farmers reached in any one year will participate during the entire life of the program.

Table 16 - Derivation of weighted average incremental net economic benefits for the typical small holding reached by ADB's small farmer credit window.

	South		+	North		Weighed Average perholding
	£s	Weight		£s	Weight	
Net value of incremental production:						
1. Existing Acreage	387.47 ^{1/}	x .78 ^{2/}		344.82 ^{3/}	x .22 ^{2/}	378.09
2. New acreage	200.92 ^{3/}	x .78 ^{4/}		61.20 ^{5/}	x .22x.67 ^{4/}	<u>171.15</u>
Total	407.23			85.31		497.54 ^{6/}

1/ Derived from Tables 9 & 10, respectively; i.e., value of incremental production plus taxes less incremental costs at unsubsidised input prices.

2/ Of all farmers reached by ADB 78% will be in the South and 22% in the North. This is equal to the distribution of holdings between North and South.

3/ Derived from Table 9; i.e. net value of production per acre plus taxes.

4/ 67% of all farmers reached by ADB are expected to increase holding size.

5/ Derived from the Table 13 row IVB. The cash flow is totalled and averaged over four years.

6/ This figure, after adjustments of proportions of total holding cultivated with improved practices, is applied to total number of holdings reached by ADB to obtain total net economic incremental benefits of the program.

Table 17- Assumed proportions of total area cultivated brought under improved practices by the typical holding and corresponding weighed averaged net incremental benefits per holding reached by ADB.

Year	Low Projection		High Projection	
	Proportion	Value ^{1/}	Proportion	Value ^{1/}
	%	£s	%	£s
1	15	73.88	20	98.51
2	30	147.76	40	197.02
3	45	221.64	65	320.15
4	60	295.52	95	467.91
5	95	369.40		
6	90	443.29		

^{1/} Carried over from Table 16 i.e. 492.54 at 100%.

Table 18(a) - Derivation of Net Present Worth of Annual Incremental Benefits Assuming Medium Projections for Farmers Reached and Proportion Brought Under Improved Practices (₹s 000s) 2/

Year	1	2	3	4	5	6	7	8	9	Total
1	332.5	-								332.5
2	664.9	701.9	-							1366.8
3	997.4	1403.7	1071.3	-						3472.4
4	1329.8	2105.6	2142.5	1440.7	-					7018.6
5	1662.3	2807.4	3213.8	2881.3	1477.6	-				12042.4
6	1994.8	3509.3	4285.0	4321.2	2955.2	1477.6	-			18543.1
7		4211.2	5356.3	5762.6	4432.8	2955.2	1108.2	-		25821.1
8			6427.7	7203.3	5910.4	4432.8	2216.4	738.8	-	33135.4
9				8644.1	7388.0	5910.4	3324.6	1477.6	369.4	39747.8
10					8865.8	7388.0	4432.8	2216.4	738.8	44919.6
11						8865.8	5541.0	2955.2	1108.2	48613.4
12							6649.3	3694.0	1477.6	50830.3
13								4432.9	1847.0	51938.6
14									2216.4	52308.0
:										
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20										

N.P.W. 1/ at 15% = 128,332.5
N.P.W. at 20% = 82,260.7

1/ Estimated over a 20-year period
2/ Using a combination of low projection proportions of total area cultivated brought under improved practices and corresponding weighted average net incremental benefits per holding and high projection number of farmers reached by ADB.

Table 20 - Incremental Production of Major Crop on Holdings Reached by ADB

	Incre- mental Yields per Acre/1/ (LBS)	Incre- mental Yield per Holding2/ (LBS)	Annual Incremental Production in Year : (Tons 000's)												Price Per ton £s	
			5			10			15			20				
			Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High		
SOUTH																
Maize	1980	3914	26.2	63.3	75.4	118.8	153.4	172.2	148.0	169.9	191.7	163.0	182.8	193.5	162.90	
Cassava	4800	6024	47.6	113.9	130.0	217.7	242.7	300.3	246.7	271.2	306.8	205.2	294.9	309.2	97.10	
Plantain	1875	1593	12.6	30.2	34.2	38.9	62.9	77.9	49.5	70.4	79.6	70.1	76.7	80.2	131.40	
Yams	1875	1175	8.7	20.9	30.9	28.0	45.0	54.5	35.5	50.2	56.8	49.6	54.6	57.2	358.40	
Cocoyams	1650	719	4.8	11.7	17.2	11.2	27.0	32.6	21.6	30.0	33.9	29.1	32.4	34.2	215.50	
Rice	1080	219	2.1	5.2	7.6	8.1	12.6	15.1	10.1	14.0	15.8	13.4	15.0	15.9	205.70	
Pulses	900	92	0.6	1.4	2.1	2.3	3.6	4.3	2.9	4.0	4.5	3.8	4.3	4.5	403.20	
NORTH																
Millet	1020	2142	14.5	35.1	51.6	51.5	81.1	97.7	64.7	90.1	101.8	87.4	97.3	102.7	274.50	
Sorghum	714	1178	8.7	20.9	30.9	28.0	45.0	54.5	35.5	50.2	56.8	49.6	54.6	57.2	263.50	
Maize	2090	1777	13.6	32.6	48.2	45.2	72.0	87.1	57.1	80.2	90.7	78.7	87.0	91.4	162.90	
Pulses	900	796	4.8	11.7	17.2	17.2	27.0	32.6	21.6	30.0	33.9	29.1	32.4	34.2	403.20	
Yams	2000	2000	16.6	39.4	58.5	49.7	80.8	98.4	63.5	90.5	102.5	90.5	98.8	103.2	358.40	
Rice	1080	522	3.6	9.5	12.7	10.4	17.0	20.8	13.3	19.1	21.7	19.3	20.9	21.8	205.70	
			Grains	74.1	180.0	245.7	292.0	411.7	482.8	353.2	457.5	516.9	444.3	494.3	521.2	
			Starches	90.3	216.1	270.8	351.5	458.4	563.7	416.8	512.3	579.6	444.5	557.3	584.0	

1/ Derived from Tables 3 through 6

2/ Size of Holding Increases to 4.5 Acres in the South and 6.0 Acres in the North

Table 21 - Estimated Total Acreage of Major Crops Brought Under Improved Practices^{1/} (000's)

	5			10			15			20		
	<u>Low</u>	<u>Medium</u>	<u>High</u>									
<u>SOUTH</u>												
Maize	18.99	46.09	54.64	93.33	111.16	124.78	107.25	123.12	138.91	118.12	132.46	140.22
Cassava	9.88	23.63	26.97	45.17	50.35	62.30	51.18	56.27	63.65	42.57	61.18	64.15
Plantain	5.02	12.03	13.63	15.50	25.06	31.04	19.72	28.05	31.71	27.93	30.52	31.95
Yams	3.90	9.37	13.86	12.56	20.18	24.44	15.92	22.51	25.47	22.24	24.48	25.65
Cocoyams	2.33	5.68	8.35	8.35	13.11	15.83	10.49	14.55	16.46	14.13	15.73	16.60
Rice	2.39	5.91	8.64	9.20	14.32	17.16	11.48	15.91	17.95	15.23	17.05	18.07
Pulses	0.94	2.19	3.28	3.59	5.63	6.72	4.53	6.25	7.03	5.94	6.72	7.03
<u>NORTH</u>												
Millet	19.86	48.08	70.68	70.55	111.10	133.84	88.63	123.42	139.45	119.73	133.29	140.68
Sorghum	13.59	32.66	48.28	44.53	70.31	82.81	55.47	78.44	88.75	77.50	85.31	89.38
Maize	9.86	23.62	34.93	32.75	52.17	63.12	41.38	58.12	65.72	57.03	63.04	66.23
Pulses	7.50	18.28	26.88	26.88	42.19	50.94	33.75	46.88	52.97	45.75	50.63	53.44
Yams	7.44	17.67	26.23	22.29	36.23	44.13	28.48	40.58	45.96	40.58	44.30	46.28
Rice	4.09	10.80	14.43	11.82	19.32	23.64	15.11	21.70	24.66	21.93	23.75	24.77

^{1/} Derived from Table 3 through 6 and Table 20 as follows $\frac{\text{Annual Incremental Production}}{\text{Yield per acre under improved practices}}$

Table 22 - National Fertilizer Grades, Rates of Application and Nutrients Supplied per Acre ^{1/}

<u>Crop</u>	<u>Grade</u>	<u>Application Rate (Lbs/Acre)</u>	<u>Nutrients Supplied</u>		
			<u>N</u>	<u>- P₂O₅</u>	<u>- K₂O</u>
Maize	12-24-12	250	30	60	30
	46-0-0	100	46		
			<u>76</u>	<u>- 60</u>	<u>- 30</u>
Cassava	8-21-21	300	24	63	63
	46-0-0	100	46		
			<u>70</u>	<u>- 63</u>	<u>- 63</u>
Yams	10-20-15	300	30	60	45
	46-0-0	75	34.5		
			<u>65</u>	<u>- 60</u>	<u>- 45</u>
Rice	10-20-20	200	20	40	40
	46-0-0	150	69		
			<u>89</u>	<u>- 40</u>	<u>- 40</u>
Millet ^{2/}	37-40-50	200	74	80	100
	46-0-0	100	46		
			<u>120</u>	<u>- 80</u>	<u>- 100</u>
Sorghum ^{2/}	7-30-15	200	14	60	30
	46-0-0	100	46		
			<u>60</u>	<u>- 60</u>	<u>- 60</u>
Pulses	10-30-10	100	10	30	10
Plantain ^{3/}	NA	NA		NA	
Cocoyam ^{3/}	NA	NA		NA	

^{1/} Derived from TVA/USAID-MOA demonstration trial results. It is anticipated that farmers will apply these levels of N, P₂O₅ and K₂O during the 5-year project period. Grades will have to be modified during the 10, 15 and 20-year projection period.

^{2/} Derived from other Ghanaian research results

^{3/} Research results are particularly sketchy on rates of fertilizer application on plantain and cocoyam. It is, however, assumed that these two crops will also benefit from grades of fertilizer applied to other crops with which they are intercropped. No separate fertilizer grades are, therefore, assigned to these two crops. Fertilization of plantain and cocoyam on farmers' holdings is rare in Ghana.

Table 23 - Estimated Fertilizer Requirement in Year 5 for the Total Acreage of Major Crops Brought Under Improved Practices by Small Farmers Reached by ADB 1/ (TONS)

South	Low Projection			Medium Projection			High Projection		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
Maize	644.3	508.7	254.3	1563.8	1234.5	617.3	1853.8	1463.6	731.8
Cassava	397.0	277.9	277.9	949.4	664.6	664.6	1083.6	758.5	758.5
Plantain <u>2/</u>	-	-	-	-	-	-	-	-	-
Yams	113.2	104.5	78.3	271.9	251.0	188.2	402.2	371.2	278.4
Cocoyams <u>2/</u>	-	-	-	-	-	-	-	-	-
Rice	94.9	42.7	42.7	234.8	105.5	105.5	343.3	154.3	154.3
Pulses	4.2	12.6	4.2	9.8	29.4	9.8	14.6	43.8	14.6
North									
Millet	1063.9	709.3	886.6	2575.7	1717.1	2146.4	3786.4	2524.3	3155.3
Sorghum	364.0	364.0	364.0	874.8	874.8	874.8	1293.2	1293.2	1293.2
Maize	334.5	264.1	132.0	801.4	632.7	316.3	1185.1	935.6	467.8
Pulses	33.5	100.5	33.5	81.6	244.8	81.6	120.0	360.0	120.0
Yams	215.9	199.3	149.5	512.7	473.3	355.0	761.1	702.6	526.9
Rice	219.1	146.1	182.6	578.6	385.7	482.1	773.0	515.3	644.2
Sub-Total: South	1253.6	946.4	657.4	3029.7	2285.0	1585.4	3697.5	2791.4	1937.6
Sub-Total: North	2230.9	1783.3	1728.2	5424.8	4328.4	4256.2	7918.8	6331.0	6207.4
TOTAL	3484.5	2729.7	2385.6	8454.5	6613.4	5841.6	11616.3	9122.4	8145.0

1/ Derived from Tables 21 and 22

2/ See Table 22, footnote 3/

Table 24 - Estimated Certified Seed Requirement for the Total Acreage Brought Under Improved Practices by Small Farmers Reached by ADB 1/ (TONS)

	<u>Low</u>	<u>5 Medium</u>	<u>High</u>	<u>Low</u>	<u>10 Medium</u>	<u>High</u>	<u>Low</u>	<u>15 Medium</u>	<u>High</u>	<u>Low</u>	<u>20 Medium</u>	<u>High</u>
2/ South												
Maize	58.9	142.9	169.4	289.3	344.6	386.8	332.5	381.7	430.6	366.2	410.6	434.7
Rice	22.2	55.0	77.6	77.6	121.9	147.2	97.5	135.3	166.9	141.6	158.6	168.0
Fulses	4.4	10.3	15.4	16.9	26.5	31.6	21.3	29.4	33.0	27.9	31.6	33.0
2/ North												
Millet	31.8	76.9	113.1	112.9	177.8	214.1	141.8	197.5	223.1	191.6	213.3	225.1
Sorghum	21.7	52.2	77.2	71.2	112.5	137.5	88.7	125.5	142.0	124.0	136.5	143.0
Maize	30.6	73.2	108.3	101.5	161.7	195.7	128.3	180.2	203.7	176.8	195.4	205.3
Pulses	35.2	85.9	126.3	126.3	198.3	239.4	158.6	220.3	248.9	215.0	238.0	251.2
Rice	32.0	100.4	134.2	109.9	179.7	219.8	140.5	201.8	229.3	203.9	220.7	230.4
Sub-Total: South	85.5	208.2	262.4	383.8	493.0	565.6	451.3	546.4	630.5	535.7	600.8	635.7
Sub-Total: North	157.3	388.6	559.1	521.8	830.0	1001.5	657.9	925.3	1047.0	911.3	1004.1	1055.0
Total	242.8	596.8	821.5	905.6	1323.0	1567.1	1109.2	1471.7	1677.5	1447.0	1604.9	1690.7

1/
2/ Derived from Table 21 and the assumptions in footnote 2/
assumes the following planting rates: Maize 20lbs/acre; Rice 60 lbs/acre; Millet 10 lbs/acre; Sorghum 10 lbs/acre.
The planting rate of pulses is assumed to be 30 lbs/acre (the range is 20-30 lbs/acre).

A 100% replacement percentage or factor is necessary only for hybrid seeds. Since most recommended seed varieties are synthetics or composite, a replacement percentage of 35% is assumed in the estimation. This implies that farmers require 100% seed supply every 3 years. SMU does not produce planting materials of cassava, plantain, yams and cocoyams

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TABLE 25
CASH FLOW STATEMENT OF AID/BOB FARMER GROUP
IN THE PROJECTS OF SMALL HOOPER DISTRICT

	1975	1977	1978	1979	1980	1981	1982	1983	1984	1985
	1	2	3	4	5	6	7	8	9	10
I. INFLOWS										
A. Cash Balance Brought Forward	-	1333.0	4052.0	7347.5	11251.9	13970.1	16169.5	16207.4	15971.0	14130.0
B. AID/BOB Advances	2250.0	4334.5	5490.3	5927.1	5755.9	5192.0	1200.2	-	-	-
C. Loan repayments										
PRINCIPAL	1507.5	5547.4	12630.9	23213.7	35240.2	51157.2	55944.2	79100.6	9957.4	97357.5
INTEREST 10%	225.0	700.7	1794.4	3250.5	5050.3	7106.6	9107.4	10029.7	12320.7	13299.7
D. AID Loan	401.9	293.3	413.3	293.2	293.3	293.3				
E. Commitment Fees	90.0	290.0	570.0	950.0	1350.0	1750.0	2050.0	2350.0	2350.0	2350.0
F. Salvage Value						23.0	25.5	33.1	50.7	59.7
TOTAL	4474.4	12649.9	25177.5	42010.2	59979.6	79521.0	95167.3	100720.0	120676.7	127215.0
II. OUTFLOW										
A. Loans to Farmers	2250.0	7450.0	15100.0	23700.0	43500.0	60300.0	76150.0	90050.0	101000.0	100000.0
B. Investment Costs	401.9	293.3	431.3	293.3	293.3	293.3				
C. Recurrent Costs	345.0	532.5	920.0	1207.5	1495.0	1702.5	1702.5	1702.5	1702.5	1702.5
D. REPLACEMENTS										
Vehicles & Cycles						119.1	132.3	415.2	293.3	299.0
Office Equipment						119.1	132.3	132.3	132.3	-
Bullion Trucks								144.9	151.0	151.0
E. AID/BOB Advance Servicing										
PRINCIPAL	-	-	-	-	-	-	-	-	2571.2	2571.2
INTEREST	45.0	131.7	245.7	374.2	499.5	503.4	641.1	641.1	577.7	534.2
F. AID Loan Servicing										
PRINCIPAL	-	-	-	-	-	-	-	-	157.2	157.2
INTEREST	8.1	13.9	22.5	22.4	34.3	40.1	40.1	40.1	35.0	33.4
TOTAL	3052.0	7521.4	17719.5	30613.4	45722.1	63137.4	77745.0	92220.0	103530.7	113477.5
III. A. For Year Cash Balance										
Less Overdraft Charge (1%)	1426.4	4120.5	7450.0	11290.0	14157.5	16303.4	16421.3	15791.9		
Balance Carried Forward	1333.0	4052.0	7347.5	11251.9	13970.1	16169.5	16207.4	15971.9	14130.0	13727.5

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TABLE C 25 (Cont' .)

	1985 11	1987 12	1988 13	1989 14	1990 15	1991 16	1992 17	1993 18	1994 19	1995 20
I. INFLOWS										
A. Cash Balance Brought Forward	13777.5	13777.7	14690.9	15154.3	18126.0	20092.7	22242.1	24271.0	26590.7	27995.6
B. AID/BOG Advances	-	-	-	-	-	-	-	-	-	-
C. Loan Repayments										
PRINCIPAL	102440.0	105527.5	107435.0	102141.2	102265.0	102265.0	102265.0	102265.0	102265.0	102265.0
INTEREST 10%	13973.0	14395.7	14221.0	14702.1	14720.5	14720.5	14720.5	14720.5	14720.5	14720.5
D. AID Loan										
E. Commitment Fees	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0
F. Salvage Value	5.7	2.5	50.7	26.5	23.1	50.7	110.1	50.7	50.7	50.7
TOTAL	132559.2	135405.4	139155.6	141390.1	143545.6	145496.9	147697.7	149575.2	151994.9	154399.0
II. OUTFLOW										
A. Loans to Farmers	113000.0	115000.0	117500.0	118000.0	118000.0	118000.0	118000.0	118000.0	118000.0	118000.0
B. Investment Costs										
C. Recurrent Costs	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5
D. Replacements	293.3	412.4	293.3	132.3	415.2	293.3	550.4	293.3	293.3	293.3
Vehicles & Cycles	132.3	251.4	132.3	132.3	132.3	132.3	251.4	132.3	132.3	132.3
Office Equipment	161.0	161.0	161.0		144.9	161.0	161.0	161.0	161.0	161.0
Bullion Trucks					138.0		138.0			
E. AID/BOG Advance Servicing	3392.4	3312.3	3232.2	3152.0	3071.9	2991.7	2911.5	2831.5	2751.3	2671.2
PRINCIPAL	2671.2	2671.2	2671.2	2671.2	2671.2	2671.2	2671.2	2671.2	2671.2	2671.2
INTEREST	721.2	641.1	561.0	480.8	400.7	320.5	240.4	160.3	100.1	-
F. AID Loan Servicing	212.3	207.3	202.3	197.3	192.3	187.3	182.2	177.2	172.2	167.2
PRINCIPAL	157.2	157.2	157.2	157.2	157.2	157.2	157.2	157.2	157.2	157.2
INTEREST	45.1	40.1	35.1	30.1	25.1	20.1	15.0	10.0	5.0	-
TOTAL	11600.5	121714.5	123011.3	123274.1	123461.9	123254.7	123426.7	123026.5	122900.3	122914.2
III. A. Last Year Cash Balance										
B. Less Overdraft Charge (12%)	-	-	-	-	-	-	-	-	-	-
C. Balance Carried Forward	13777.7	14690.9	15154.3	18126.0	20092.7	22242.1	24271.0	26590.7	27995.6	31455.6

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TABLE 25 - INCOME AND EXPENSE STATEMENT OF THE FARMER CREDIT OPERATIONS

	1	2	3	4	5	6	7	8	9	10
I. <u>INCOME</u>	315.0	1099.7	2364.4	4223.5	5420.3	6890.4	11193.9	13332.8	14747.4	15719.5
A. INTEREST 10%	225.0	700.7	1794.4	3250.5	5060.3	7103.3	9107.4	10889.7	12320.7	13299.7
B. Commitment Fees	90.0	290.0	570.0	950.0	1360.0	1750.0	2050.0	2360.0	2360.0	2350.0
C. Salvage Value	-	-	-	-	-	23.0	25.5	33.1	50.7	59.0
II. <u>EXPENDITURE</u>	439.5	1039.6	1913.2	3093.2	4575.9	6220.6	7652.3	8746.1	9835.1	10672.6
A. INTEREST (2%/3%) ^{1/}	53.1	145.6	262.2	412.6	533.0	643.5	681.2	681.2	624.5	567.6
B. Overcraft Charges	41.4	75.9	110.4	144.9	179.4	213.9	213.9	-	-	-
C. Recurrent Expenditure	345.0	632.5	920.0	1207.5	1495.0	1782.5	1782.5	1782.5	1782.5	1782.5
D. Bad Debt (Loan Loss) ^{2/}	-	195.6	614.6	1320.2	2367.7	3502.7	4974.7	6282.4	7429.1	8332.5
Profit/Loss Before Depreciation	(124.5)	51.1	451.2	1135.3	1844.4	2601.8	3541.6	4586.7	4911.3	5036.9
F. Less Depreciation	64.2	113.6	182.7	232.1	281.5	330.9	330.9	330.9	330.9	304.5
<u>PROFIT/(LOSS)</u>	<u>(188.7)</u>	<u>(62.5)</u>	<u>268.5</u>	<u>903.2</u>	<u>1562.9</u>	<u>2270.9</u>	<u>3210.7</u>	<u>4255.8</u>	<u>4580.4</u>	<u>4732.4</u>

1/ 2% for first ten years and 3% thereafter.

2/ 33% of amount due for repayment in year 2 or 2.25% of total annual loan disbursements.

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TABLE 26 (Cont'd.)

	11	12	13	14	15	16	17	18	19	20
I. <u>INCOME</u>	16391.7	16329.2	17039.7	17094.2	17153.5	17139.2	17190.6	17139.2	17139.2	17139.2
A. INTEREST 10%	13973.0	14396.7	14621.0	14700.1	14720.5	14720.5	14720.5	14720.5	14720.5	14720.5
B. Commitment Fees	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0	2360.0
C. Salvage Value	50.7	72.5	50.7	72.5	73.1	50.7	110.1	50.7	50.7	50.7
II. <u>EXPENDITURE</u>	11450.2	11706.2	11940.6	11927.1	11943.3	11950.1	11772.9	11627.8	11602.6	11517.5
A. INTEREST (2.75%) ^{1/}	788.3	681.2	596.1	510.9	425.8	340.6	255.4	170.3	85.1	-
B. Overdraft Charges	-	-	-	-	-	-	-	-	-	-
C. Recurrent Expenditure	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5	1722.5
D. Bad Debt (Loan Loss) ^{2/}	7910.0	9322.5	9570.0	9593.7	9735.0	9735.0	9735.0	9735.0	9735.0	9735.0
<u>PROFIT/LOSS BEFORE DEPRECIATION</u>	<u>4932.9</u>	<u>5053.0</u>	<u>5091.1</u>	<u>5107.5</u>	<u>5220.3</u>	<u>5231.1</u>	<u>5417.7</u>	<u>5451.4</u>	<u>5536.6</u>	<u>5621.7</u>
E. Less Depreciation	220.7	304.5	304.5	304.5	330.9	330.9	330.9	330.9	330.9	330.9
<u>PROFIT/(LOSS)</u>	<u>4652.2</u>	<u>4748.5</u>	<u>4786.5</u>	<u>4803.0</u>	<u>4889.4</u>	<u>4950.2</u>	<u>5086.8</u>	<u>5120.5</u>	<u>5205.7</u>	<u>5290.8</u>

^{1/} 2% for first ten years and 3% thereafter.

^{2/} 33% of amount due for repayment in year 2 or 0.25% of total annual loan disbursements.



Department of State **TELEGRAM**

AMEMBASSY ACCRA

ACTION AID

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ANNEX A
P 312129Z OCT 75
M SECSTATE WASHDC
TO RUTAGN/AMEMBASSY ACCRA PRIORITY 5543
RUTAIJ/AMEMBASSY ABIDJAN 6499
BT
UNCLAS STATE 258624

AIDAC

E.O. 11652: N/A
SUBJECT: ECPR REVIEW AND APPROVAL OF PRP FOR MIDAS INTEGRATED GRANT/LOAN PROJECT 067

1. SUBJECT PRP REVIEWED AUGUST 11, 1975 BY AFRICA BUREAU EXECUTIVE COMMITTEE FOR PROJECT REVIEW IN MEETING CHAIRED BY DAA/AFR AND WITH PARTICPPATION PPC, TAB, AF/W AND USAID AG ECONOMIST. MINUTES OF REVIEW POUCHED, ALONG WITH COPIES OF ISSUES PAPER. USAID SHOULD NOTE THAT ECPR CONSIDERS 13 MILLION DOLLARS AS UPPER LIMIT FOR FY 76 LOAN.
2. ISSUES PAPER OUTLINED THOSE QUESTIONS WHICH MUST BE DEALT WITH IN THE PROJECT PAPER AND/OR NEGOTIATED WITH THE GOVERNMENT OF GHANA DURING THE FINAL PROJECT DESIGN, I.E., REPARATION OF THE PROJECT PAPER. MANY OF THESE ITEMS WERE ALREADY HIGHLIGHTED IN THE PRP ITSELF.
3. IN ADDITION TO ISSUES INCLUDED IN ISSUES PAPER, ECPR PROVIDED THE FOLLOWING GUIDANCE FOR THE PROJECT PAPER AND YOUR DISCUSSIONS WITH THE GOG:
 - A. IT IS VITAL THAT THE GOG AND AID HAVE CLEAR UNDERSTANDING OF THE OBJECTIVES OF EACH IN IMPLEMENTING THE MIDAS PROGRAM. WHILE THE ADDITIONAL FOREIGN EXCHANGE MADE AVAILABLE BY THE PROGRAM IS IMPORTANT TO THE GOG, THE TARGET IS THE GHANAIAN SMALL FARMER AND BOTH GOG AND AID'S ATTENTION SHOULD BE FOCUSED ON THE OBJECTIVE OF INCREASING HIS PRODUCTION AND LEVEL OF WELL BEING IN IMPLEMENTING THE SUBACTIVITIES OF THIS PROJECT. SIGNIFICANT PROGRESS TOWARD THIS OBJECTIVE (AS MEASURED BY CRITERIA SUCH AS THOSE LISTED IN THE ANNEX TO THE PRP) IS NECESSARY BEFORE ADDITIONAL LOAN RESOURCES WILL BE PROVIDED.

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B. PP SHOULD PROVIDE PROJECTIONS OF THE AMOUNT AND TYPE OF CREDIT REQUIRED FOR GHANA'S SMALL FARMERS AND THE PROPORTION OF THIS REQUIREMENT BEING MET FROM VARIOUS OTHER SOURCES, INCLUDING THE GOG.

C. DESIGN TEAM AND USAID SHOULD REVIEW WITH THE ADE THE TECHNICAL ASSISTANCE TO BE PROVIDED TO THE AGRICULTURE DEVELOPMENT BANK TO ASSURE THAT ADE STAFFING AND AID ASSISTANCE WILL BE SUFFICIENT TO SUPPORT THE ADE EXPANSION EFFECTIVELY.

D. PP SHOULD PROVIDE AN ANALYSIS OF THE CAPACITY OF THE GHANA FERTILIZER COMPANY. CONCERN IS WHETHER THIS NEW INSTITUTION WILL HAVE CAPACITY TO IMPLEMENT ESSENTIAL PART OF MIDAS PROGRAM. ANALYSIS SHOULD INCLUDE A DESCRIPTION OF ESTABLISHED GFC OPERATIONAL PROCEDURES, STAFF, AND THE FERTILIZER DISTRIBUTION SYSTEM, AS WELL AS PLANS FOR FUTURE DEVELOPMENT OF THE INSTITUTION, IF ANY (E.G., EXPANSION OF THE DISTRIBUTION SYSTEM).

E. AID/W UNDERSTANDS THAT THE GOG WILL MAKE AN ADVANCE IN Cedis TO THE ADE SMALL FARMER CREDIT DEPARTMENT SO THAT LENDING CAN BEGIN BEFORE LOCAL CURRENCY IS GENERATED FROM THE SALE OF FERTILIZER, AND THAT THE GHANA FERTILIZER COMPANY WILL SECURE INITIAL AND SUPPLEMENTARY WORKING CAPITAL BY BORROWING FROM COMMERCIAL BANKS. AID/W IS CONCERNED THAT THIS FUNDING BE AVAILABLE ON TIME. IN DISCUSSING THE FP WITH THE GOG, USAID IS REQUESTED TO EMPHASIZE THIS POINT. PP SHOULD INCLUDE A DESCRIPTION OF MEASURES TAKEN TO ASSURE TIMELY PROVISION OF THESE RESOURCES, INTER ALIA, SCHEDULE OF GOG ADVANCES. THE LOCAL CURRENCY GENERATED FROM THE SALE OF FERTILIZER SHOULD AT LEAST BE EQUIVALENT TO THE CIF VALUE OF THE IMPORTED FERTILIZER, THAT IS, ONCE FERTILIZER SALES BEGIN TO GENERATE LOCAL CURRENCY, THE Cedis RETURNED TO THE GFC SHOULD BE AT LEAST THE EQUIVALENT OF THE CIF VALUE OF THE FERTILIZER. PP SHOULD EXPLAIN MECHANISM BY WHICH GOG WILL REIMBURSE GFC FOR THE AMOUNT OF THE SUBSIDY. PP SHOULD ALSO DESCRIBE THE MECHANISM BY WHICH REFLOWS FROM AID FINANCED LOANS WILL BE USED FOR FURTHER LENDING TO SMALL FARMERS.

F. DESIGN TEAM AND USAID ARE REQUESTED TO REVIEW THE PERFORMANCE CRITERIA AND REVISE OR REINE THEM AS APPROPRIATE. IT MAY BE ADVISABLE TO REVIEW THEM WITH THE GOG WITH A VIEW TOWARD CLARIFYING OBJECTIVES (PER PARA 3 A ABOVE).

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1- 027 Main Project - ... requirements of ... credit ...
and ...

I Loan Disbursement (ie Working Capital)	II		III			IV		V		VI = 4/ ...
	PRINCIPAL Year 1	REPAYMENT Year 2 3/	TOTAL PRINCIPAL REPAYMENT	INTEREST (Year AT 1	RECEIVABLE 8.5% Year 2	TOTAL	INTEREST Year AT 1	RECEIVABLE 10% Year 2	TOTAL	
2250	-	-	-	-	-	-	-	-	2250.0	2250.0
7450	1507.5	-	1507.5	191.2	-	191.2	225.0	-	225.0	571.3
16100	4991.5	556.9	5548.4	633.2	47.3	680.5	745.0	55.7	800.7	975.9
28700	10787.0	1843.9	12630.9	1368.5	156.7	1525.2	1610.0	184.4	1794.4	1427.7
43500	19229.0	3984.7	23213.7	2439.5	338.7	2778.2	2870.0	398.5	3268.5	1701.8
50300	29145.0	7103.2	36248.2	3697.5	603.8	4301.3	4350.0	710.3	5060.3	18991.5
76150	40401.0	10766.2	51167.2	5125.5	915.1	6040.6	6030.0	1076.6	7106.6	17876.2
90550	51020.0	14924.2	65944.2	6472.7	1268.6	7741.3	7615.0	1492.4	9107.4	14998.4
101000	60333.5	18847.1	79180.6	7654.2	1602.0	9256.2	9005.0	1884.7	10889.7	10923.7
108000	67670.0	22287.4	89957.4	8585.0	1694.4	10479.4	10100.0	2228.7	12328.7	5713.9
113000	72360.0	24997.5	97357.5	9180.0	2124.8	11304.8	10800.0	2499.7	13299.7	2342.8
116000	75710.0	26730.0	102440.0	9605.0	2272.0	11877.0	11300.0	2673.0	13973.0	- 413.0
117500	77720.0	27967.5	105687.5	9860.0	2377.2	12237.2	11600.0	2796.7	14396.7	-2584.2
118000	78725.0	28710.0	107435.0	9985.0	2440.3	12485.3	11750.0	2871.0	14621.0	-4056.0
118000	79060.0	29081.2	108141.2	10030.0	2471.9	12501.9	11800.0	2908.1	14708.1	-4849.3
118000	79060.0	29205.0	108265.0	10030.0	2482.4	12512.4	11800.0	2920.5	14720.5	-4985.5

- 1/ Carried from the economic analysis section
- 2/ 67% of Total Repayment due at end of year 1 and 33% at end of year 2
- 3/ Adjusted for bad debt which is 25% of what should fall due for repayment at end of year 2
- 4/ Partly offset by end of year cash balance brought forward.

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<u>Year</u>	<u>Office Equipment</u>	<u>Vehicles (Excluding Bu for Trucks)</u>	<u>Bu for Trucks</u>	<u>Total</u>
1	20.7	23.7	19.7	64.1
2	43.7	50.2	19.7	113.6
3	66.7	76.6	39.4	182.7
4	89.7	103.0	39.4	232.1
5	112.7	129.4	39.4	281.5
6	135.7	155.7	39.4	330.8
7	135.7	155.8	39.4	330.9
8	135.7	155.8	39.4	330.9
9	135.7	155.8	39.4	330.9
10	135.7	129.4	39.4	304.5
11	135.7	129.4	39.4	304.5
12	135.7	129.4	39.4	304.5
13	135.7	129.4	39.4	304.5
14	135.7	129.4	39.4	304.5
15	135.7	155.8	39.4	330.9
16	135.7	155.8	39.4	330.9
17	135.7	155.8	39.4	330.9
18	135.7	155.8	39.4	330.9
19	135.7	155.8	39.4	330.9
20	135.7	155.8	39.4	330.9

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TABLE 29 - DEPRECIATION OF THE ASSETS OF B - OFFICE EQUIPMENT
(1990's)

Year											Total
1	20.7										20.7
2	20.7	23.0									43.7
3	20.7	23.0	23.0								66.7
4	20.7	23.0	23.0	23.0							89.7
5	20.7	23.0	23.0	23.0	23.0						112.7
6	20.7	23.0	23.0	23.0	23.0	23.0					135.7
7	20.7	23.0	23.0	23.0	23.0	23.0					135.7
8		23.0	23.0	23.0	23.0	23.0	20.7				135.7
9			23.0	23.0	23.0	23.0	20.7	23.0			135.7
10				23.0	23.0	23.0	20.7	23.0	23.0		135.7
11					23.0	23.0	20.7	23.0	23.0	23.0	135.7
12						23.0	20.7	23.0	23.0	23.0	135.7
13							20.7	23.0	23.0	23.0	135.7
14								20.7	23.0	23.0	135.7
15									23.0	23.0	135.7
16										23.0	135.7
17											135.7
18										23.0	135.7
19											135.7
20											135.7

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TABLE 30 - DEPRECIATION SCHEDULE FOR VEHICLES (INCLUDING BULLDOZERS AND TRUCKS) (2000%)

Year											Total										
1	23.8										23.8										
2	23.8	25.4									50.2										
3	23.8	26.4	26.4								76.6										
4	23.8	25.4	26.4	26.4							103.0										
5	23.8	26.4	26.4	26.4	26.4						129.4										
6		25.4	25.4	26.4	25.4	50.2					155.8										
7			26.4	26.4	25.4	50.2	26.4				155.8										
8				26.4	26.4	50.2	26.4	26.4			155.8										
9					26.4	50.2	26.4	25.4	26.4		155.8										
10						50.2	26.4	25.4	26.4	-	129.4										
11							26.4	26.4	26.4	26.4	105.6										
12								26.4	26.4	26.4	50.2	129.4									
13									26.4	26.4	50.2	26.4	-	129.4							
14										26.4	50.2	26.4	26.4	-	129.4						
15											26.4	50.2	26.4	26.4	26.4	-	155.8				
16												50.2	26.4	25.4	26.4	26.4	-	155.8			
17													26.4	26.4	26.4	26.4	50.2	-	155.8		
18														26.4	25.4	26.4	50.2	26.4	-	155.8	
19															26.4	26.4	50.2	26.4	26.4	-	155.8
20																26.4	50.2	26.4	26.4	26.4	155.8

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TABLE 31 - APPROPRIATION SCHEDULE FOR FISCAL YEAR 1970 - BULLDOG TRUCK
(1970's)

Year						Total
1	19.7					19.7
2	19.7					19.7
3	19.7	19.7				39.4
4	19.7	19.7				39.4
5	19.7	19.7				39.4
6	19.7	19.7				39.4
7	19.7	19.7				39.4
8		19.7	19.7			39.4
9		19.7	19.7			39.4
10			19.7	19.7		39.4
11			19.7	19.7		39.4
12			19.7	19.7		39.4
13			19.7	19.7		39.4
14			19.7	19.7		39.4
15				19.7	19.7	39.4
16				19.7	19.7	39.4
17					19.7	19.7
18					19.7	19.7
19					19.7	19.7
20					9.7	19.7

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APPENDIX

**Table C32 - ESTIMATED COST FOR OPENING A FARM LOAN OFFICE (FLO)
WITH ONE PROJECT OFFICER IN CHARGE**

<u>Personnel/Equipment/Furniture</u>	<u>No.</u>	<u>Fixed Costs (₱)</u>	<u>Amount Involved Current (₱)</u>
Project Officer	1	-	4,080.00
Marketing/Extension Officer	1	-	4,080.00
Senior Loans Asst. (Recoveries)	1	-	3,150.00
Loans Assistant	1	-	2,550.00
Clerk	1	-	1,800.00
Typist	1	-	1,800.00
Driver	1	-	1,350.00
Messenger/Cleaner	1	-	1,050.00
Watchman	1	-	900.00
Office Rent	-	-	1,200.00
Adding Machine	1	500.00	-
Typewriter 18"	1	680.00	-
Filing Cabinet (6 Drawers)	3	1,500.00	-
Safe Dual Lock	1	12,000.00	-
Junior Executive Desk	1	140.00	-
" " Chairs	3	120.00	-
" Writing Desk	2	160.00	-
Soft Back Padded Chairs	4	160.00	-
Typist/Clerk Desks	2	160.00	-
" " Chairs	2	40.00	-
Messengers Table	1	80.00	-
Writing Chair	1	20.00	-
Long Benches	2	160.00	-
Printing and Stationery	-	-	2,000.00
Miscellaneous Items	-	-	1,000.00
Camera (Polaroid)	1	150.00	-
Running cost of Camera	<u>1</u>	<u>-</u>	<u>1,000</u>
Sub-Total 1	-	15,870.00	26,050.00

Table C32 - Cont'd.

<u>Other Costs</u>	<u>No.</u>	<u>Fixed Costs (¢)</u>	<u>Amount Involved Current (¢)</u>
Vehicle (e.g. Land Rover @ US\$10,000)	1	11,500.00	-
Motor Cycle	1	1,725.00	-
Maintenance and running cost of Land Rover and Motor Cycle		<u>-</u>	<u>2,500</u>
Sub-Total 2		<u>13,225.00</u>	<u>2,500</u>
Total (= Subtotal 1 + Subtotal 2)		<u>29,095</u>	<u>28,550</u>
Contingency			<u>5764</u>
GRAND TOTAL (FOR AN FLO IN YEAR 1)			<u><u>63,409</u></u>

APPENDIX

The following are the replacement
Schedule for Vehicles & Office Equipment

Year	Group of FLOs/HDQ.	Replacements			
		Vehicles	Cycles	Office Equip.	Ballion Truck
6	Group 1 FLOs	9	9	-	-
7	Group 2 FLOs	10	10	-	-
8	Group 1 FLOs	-	-	See Table C32	-
	HDQ	-	-	-	1
9	Group 3 FLOs	10	10	-	-
	Group 2 FLOs	-	-	See Table C32	-
	Group 4 FLOs	10	10	-	-
10	Group 3 FLOs	-	-	See Table C32	-
	HDQ	-	-	-	1
11	Group 4 FLOs	-	-	See Table C32	-
	Group 5 FLOs	10	10	-	-
12	Group 5 FLOs	-	-	See Table C32	-
	Group 6 FLOs	10	10	-	-
	Group 1 FLOs	9	9	-	-
13	Group 6 FLOs	-	-	See Table C32	-
	Group 2 FLOs	10	10	-	-
14	Group 3 FLOs	10	10	-	-
15	Group 4 FLOs	10	10	-	-
	HDQ	-	-	-	1
	Group 1 FLOs	-	-	See Table C32	-
16	Group 5 FLOs	10	10	-	-
	Group 2 FLOs	-	-	See Table C32	-
17	Group 3 FLOs	-	-	See Table C32	-
	HDQ	-	-	-	1
	Group 1 FLOs	9	9	-	-
	Group 6 FLOs	10	10	-	-
18	Group 4 FLOs	-	-	See Table C32	-
	Group 2 FLOs	10	10	-	-
19	Group 5 FLOs	-	-	See Table C32	-
	Group 3 FLOs	10	10	-	-
20	Group 6 FLOs	-	-	See Table C32	-

TABLE C 35

GHANA FERTILIZER COMPANY - RAW MATERIALS AND COST
CIF Tema in U.S. Dollars

1. Project MIDAS

	1976			1977			1978			1979		
	Tons	Est. Cost	Total	Tons	Est. Cost	Total	Tons	Est. Cost	Total	Tons	Est. Cost	Total
Urea (45-0-0)	20,700	180	3,726	23,000	185	4,255	25,500	190	4,845	28,400	195	5,538
MAP (11-52-0)	-	-	-	-	-	-	20,400	210	4,284	22,400	215	4,816
NCL (0-0-60)	9,500	120	1,110	10,600	125	1,325	11,400	125	1,425	13,352	130	1,734
DAP (18-46-0) or Bulk Equivalent	16,600	210	3,486	18,400	215	3,956	-	-	-	-	-	-
Total Cost	<u>46,800</u>		<u>8,352</u>	<u>52,000</u>		<u>9,536</u>	<u>57,700</u>		<u>10,554</u>	<u>64,150</u>		<u>12,090</u>
	1980			1981			1982			1983		
	Tons	Est. Cost	Total	Tons	Est. Cost	Total	Tons	Est. Cost	Total	Tons	Est. Cost	Total
Urea	29,000	200	5,800	31,700	205	6,498.5	35,000	210	7,350	38,000	210	7,980
MAP	25,000	215	5,375	29,500	220	6,490	32,100	225	7,222.5	35,500	225	7,987.5
NCL	17,280	130	2,246	18,000	135	2,430	20,600	140	2,884	23,300	140	3,262
DAP	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost	<u>71,280</u>		<u>13,421</u>	<u>79,200</u>		<u>15,418.5</u>	<u>88,000</u>		<u>17,456.5</u>	<u>96,800</u>		<u>19,229.5</u>
	1984			1985								
	Tons	Est. Cost	Total	Tons	Est. Cost	Total						
Urea	41,800	210	8,778	45,980	210	9,656						
MAP	39,050	225	8,786	42,955	225	9,665						
NCL	25,630	140	3,588	28,193	140	3,947						
DAP	-	-	-	-	-	-						
Total Cost	<u>106,480</u>		<u>21,152</u>	<u>117,128</u>		<u>23,268</u>						

Table C 36

OPERATING EXPENSES GHANA FERTI ZER COMPANY

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
<u>Operating Expenditures</u>										
Raw Materials	8,352,000	9,536,000	10,554,000	12,090,000	13,421,000	15,418,500	17,456,500	19,229,500	21,152,500	23,267,700
Bags and Containers	514,800	572,000	634,700	705,650	784,080	871,200	968,000	1,064,800	1,271,280	1,288,406
Salaries and Wages	55,000	58,000	60,900	64,000	67,700	70,600	74,130	77,800	81,700	85,785
Utilities and Fuel	7,000	7,800	8,600	9,620	10,700	11,860	13,200	14,520	15,980	15,570
Maintenance Vehicles 10%	1,700	11,700	19,470	19,470	20,070	23,588	25,700	25,700	25,700	25,700
Insurance	25,000	26,250	27,562	28,940	30,390	31,900	33,500	35,175	36,930	38,775
Communications and Stationary	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000
Audit.	6,000	6,900	6,600	6,900	7,200	7,600	7,980	8,330	8,800	9,240
Staff Allowances	8,700	9,200	9,600	10,120	10,630	11,170	11,725	12,300	12,900	13,569
Social Security	6,600	6,960	7,300	7,680	8,060	8,470	8,900	9,330	9,804	10,290
Maintenance Bldg & Equipment	10,000	25,000	30,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Product Loss 1%	167,440	190,720	221,080	241,800	268,420	308,370	349,130	384,590	423,050	465,334
Contingency 1/	915,734	322,696	231,887	264,784	292,663	325,385	380,105	418,382	459,923	505,608
TOTAL	10,073,074	10,976,626	11,826,259	13,303,964	14,976,915	17,155,663	19,385,370	21,337,477	23,456,067	25,785,992

1/ 10% 1976, 5% 1977 and 1% thereafter

CASH FLOW STATEMENT GHANA FERTILIZER COMPANY

Table C 37

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
<u>CASH FLOW STATEMENT</u>										
<u>Inflows</u>										
Cash Brought Forward	---	4,890.1	5,845.0	6,683.3	7,735.1	8,798.4	8,395.2	8,200.9	8,237.5	8,405.0
Sales	10,462.8	11,927.4	13,202.7	15,098.9	16,762.0	19,221.8	21,740.9	23,947.3	26,342.2	28,976.2
Equity	2,144.8	235.7	44.3	22.9	--	--	--	--	--	--
Loans	4,289.6	471.5	88.6	45.8	--	--	--	--	--	--
Total	16,897.2	17,524.7	19,180.6	21,850.9	24,497.1	28,020.2	30,136.1	32,148.2	34,579.7	37,371.2
<u>Outflows</u>										
Operating Expenses	10,073.1	10,976.6	11,826.3	13,503.9	14,976.9	17,155.7	19,385.4	21,337.5	23,456.1	25,786.0
Capital Outlays	1,397.8	108.0	64.8	---	22.4	132.0	79.2	---	29.6	174.2
Interest	536.2	595.1	606.2	611.9	599.4	474.4	349.4	224.4	99.4	---
Principal Repayments	----	----	----	----	100.0	1,000.0	1,000.0	1,000.0	1,000.0	795.5
Total	12,007.1	11,679.7	12,497.3	14,115.8	15,698.7	18,762.1	20,814.0	22,561.9	24,585.1	26,755.7
End Year Cash Position	4,890.1	5,845.0	6,683.3	7,735.1	8,798.4	9,258.1	9,322.1	9,586.3	9,994.6	10,255
Less Taxes	---	---	---	---	---	862.9	1,121.2	1,348.8	1,589.6	1,834.4
Balance Carried Forward						8,395.2	6,200.9	8,237.5	8,405.0	8,791
Loan Amounts Outstanding		4,761.1	4,849.7	4,895.5	4,795.5	3,793.5	2,795.5	1,795.5	795.5	0

Table C 38

PROJECT LINES

	<u>OPERATING (INCOME-EXPENDITURE) STATEMENT GHANA FERTILIZER COMPANY</u>									
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Sales Revenues	10,462.8	11,927.4	13,202.7	15,098.9	16,762.0	19,221.8	21,740.9	23,947.3	26,342.2	28,976.1
Expenses										
Operating	10,073.1	10,976.6	11,826.3	13,503.9	14,976.9	17,155.7	19,385.4	21,337.5	23,465.1	25,786.0
Interest	536.2	595.1	606.2	611.9	599.4	474.4	349.4	224.4	99.4	---
Depreciation	94.1	114.1	126.1	126.1	130.6	153.5	137.4	137.4	137.4	132.5
Total	<u>10,703.4</u>	<u>11,685.7</u>	<u>12,558.6</u>	<u>14,241.9</u>	<u>15,706.9</u>	<u>17,783.6</u>	<u>19,872.2</u>	<u>21,699.3</u>	<u>23,692.9</u>	<u>25,918.5</u>
Profit Before Tax	(240.6)	241.7	644.1	857.0	1,055.1	1,438.2	1,868.7	2,248.0	2,649.3	3,057.1
less tax (60%)	---	---	---	---	---	862.9	1,121.2	1,348.8	1,589.6	1,834.4
Profit After Tax	(240.6)	241.7	644.1	857.0	1,055.1	575.3	747.5	899.2	1,059.7	1,222.7

TABLE C 39 - BALANCE SHEET SHARA FERTILIZER COMPANY

	0	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
A. ASSETS											
CASH IN HAND	5035.5	4290.1	5245.1	5623.4	7735.2	8798.5	8395.4	7201.1	7237.7	7405.4	791.3
BUILDINGS, EQUIPMENT & VEHICLES	1397.8	1397.8	1505.7	1570.6	1570.6	1593.0	1725.0	1804.2	1804.2	1833.5	2007.0
LESS CUMULATIVE DEPRECIATION	-	(94.1)	(202.2)	(334.3)	(460.4)	(591.0)	(744.5)	(882.0)	(1019.4)	(1156.2)	(1229.7)
TOTAL	6434.4	6193.8	7142.7	7919.7							
B. LIABILITIES											
EQUITY	2144.8	2144.8	2300.5	2424.8	2447.7	2447.7	2447.7	2447.7	2447.7	2447.7	2447.7
NOTES PAYABLE	429.6	4229.6	4751.1	4249.7	4295.5	4795.5	3795.5	2795.5	1795.5	795.5	-
CUMULATED EARNED SURPLUS (DEFICIT)	-	(240.6)	1.1	545.2	1502.2	2557.3	3132.6	3580.1	4779.3	5339.0	7061.9
TOTAL	6434.4	6193.8	7142.7	7919.7	8845.4	9800.5	9375.8	9123.3	9022.5	9082.2	9509.6
NET WORTH		1904.2	2321.6	3069.8	3949.9	5005.0	5580.3	6327.8	7227.0	8286.7	9509.6

TABLE C 40
FERTILIZER COMPANY - DEPRECIATION SCHEDULE

6. Project NUDAS

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
Equipment 1/	57,333	57,333	57,333	57,333	57,333	57,333	57,333	57,333	57,333	57,333
Building 1/	33,333	33,333	33,333	33,333	33,333	33,333	33,333	33,333	33,333	33,333
Vehicles 2/	3,400	3,400	3,400	3,400	3,400					
		20,000	20,000	20,000	20,000	20,				
			12,000	12,000	12,000	12,000				
					4,488	4,488	4,488	4,488	4,488	
						26,400	26,400	26,400	26,400	26,400
							15,840	15,840	15,840	15,840
Total	94,066	114,066	126,066	126,066	130,554	153,554	137,394	137,394	137,394	132,906

TABLE C-41

SEED MULTIPLICATION UNIT - WORKING CAPITAL REQUIREMENTS

Crop	Year 1			Year 2			Year 3			Year 4			Year 5		
	Quantity Bags	Cost ¢	Revenue ¢												
Maize	15,000	450,000	225,000	30,000	900,000	450,000	45,000	1,350,000	675,000	50,000	1,500,000	750,000	50,000	1,800,000	900,000
Rice	35,000	525,000	630,000	50,000	750,000	900,000	60,000	900,000	1,080,000	65,000	975,000	1,170,000	70,000	1,050,000	1,260,000
Groundnuts	1,000	9,000	90,000	4,000	360,000	360,000	10,000	900,000	900,000	15,000	1,350,000	1,350,000	15,000	1,350,000	1,350,000
Totals	-	1,065,000	945,000	-	2,010,000	1,710,000	-	3,150,000	2,655,000	-	3,825,000	3,270,000	-	4,200,000	3,510,000

Maize 200 lb/bag

Cost price ¢30 per bag

Selling price ¢15 per bag

Planting rate 20lb/acre

Rice 160lb/bag

Cost Price ¢15 per bag

Selling price ¢18 per bag

Planting rate 60lb/acre

Groundnuts 180lb/bag shelled

Cost price ¢90.00/bag

Selling price ¢90.00/bag

Planting rate 50 lbs/acre

Annex D
Marketing Plan:
Ghana Fertilizer Company, Ltd.

ANNEX D - MARKETING PLAN

GHANA FERTILIZER COMPANY LIMITED

I. Marketing and Distribution Objectives of Ghana Fertilizer Company

The long-run marketing and distribution objectives of the GFC are to procure, manufacture, and make available to all farmers throughout Ghana fertilizers as needed for the countries expanding agricultural program at the lowest possible prices commensurate with a viable operation. This objective encompasses timely procurement, distribution, warehousing and sale of fertilizers at numerous outlets throughout Ghana, where farmers can purchase their fertilizer needs without travelling long distances to do so.

II. Distribution and Marketing System

(a) The short-run marketing plan would be to commence business with a minimum cash outlay. Distribution and storage costs make up a substantial portion of the total cost of marketing fertilizers, therefore, for the first phase of the operation GFC will procure bulk fertilizers at the most advantageous prices possible and establish a bagging operation at the Port of Tema for packaging fertilizers. The fertilizers will then be distributed to the present warehouses operated by the Ministry of Agriculture and be paid for based on an agreed upon price at Tema Port.

(b) The long-run marketing plan would relieve the Ministry of Agriculture of the burden of handling fertilizers and release the Extension Officers to conduct educational programs for the agricultural sector. The GFC would serve as warehousing, transportation and logistics coordinator by acquiring and training a manager of marketing. Fertilizers would be distributed and sold by a group of commercial distributors now established in Ghana with marketing organizations, warehouses, and transport facilities. Fertilizers would be sold by GFC to those firms with established distribution agreements with GFC. The GFC would make sales of fertilizers at the Tema plant, at terminals located at Kumasi and Yapei, and at other locations as determined by GFC where terminal storages are needed to move the fertilizers for an orderly plant operation. The various crop development boards, due to their close ties with farmers and because they have facilities for transporting and distributing fertilizers, could also obtain fertilizers from GFC for distribution to their farmer members through agreements with GFC and the other distributors.

It is the goal of GFC to have as many as five or six commercial firms and the major crop development boards as distributors of fertilizers in Ghana with as many as 1000

retail outlets well distributed throughout the rural areas, through which it is expected improved seeds can also be marketed.

The GFC proposes sales prices at the company's terminals that reflect the cost of transport and storage cost to respective terminals. Large commercial farms could and should transport and store fertilizers used in their farming operations. Since farm produce generally moves south in Ghana and fertilizer moves north it is desirable to have all transport facilities loaded going both directions, therefore, large farm operations would be eligible to purchase directly from GFC at the plant, or at any of its terminals. Agreements will be worked out with each organization and incentives for purchasing in bulk will be encouraged.

III. Plan for Warehousing

In the initial operation, until distribution agreements are worked out, fertilizers will be sold by GFC to the Ministry of Agriculture who will be responsible for transport to the present depots operated by the Ministry. The Ministry of Agriculture will be responsible for all retail sales.

After distribution and marketing agreements have been worked out with the various distributors GFC will make sales at the plant, and at its terminals, and arrange for

transport of fertilizers if necessary. Prices at each sales point will be determined based on the cost of transportation to and storage at each location.

Once the commercial distributors begin warehousing and distributing fertilizers it is believed that fertilizers will be stored at most main depots, regional warehouses, and stores that the distributing companies operate.

Recent studies of the marketing operations of the major companies in Ghana revealed that more than adequate storage facilities currently exist to handle Ghana's projected fertilizers requirements for many years.

Warehouses previously operated by the Ministry of Agriculture could be used as terminals, or operated as buffer stock depots, as required. In some of the more remote areas and small villages, farmers' associations or Ministry of Agriculture Extension officers may still be required to handle fertilizers on a limited basis to assure that fertilizers are available to all farmers. Because of the high fertilizer requirements for the Northern and Upper Regions, and the economical barge transport to Yapei, a large warehouse will be built, or leased and operated by GFC at Yapei. This terminal will have facilities for handling palletized fertilizers. Later, if demand warrants, bulk fertilizer will be handled and sold at Yapei.

IV. Plans for Transportation

Current transportation facilities for distributing the increasing tonnages of fertilizers needed in Ghana are adequate for at least five years.

Transportation needed in the past to move shiploads of fertilizers have been available on short notice, therefore, the GFC will contract and maintain a schedule of movements of fertilizers with the Volta Lake Transport Company for moving the fertilizers to Yapei, and with private trucking companies and railroads for the other transport needed.

When the distribution agreements are completed, commercial companies and the crop development boards will be encouraged by the price differential to use their trucking facilities for handling fertilizers directly from the plant. It is believed that transportation facilities will be more efficiently utilized under the planned distribution agreements, and fertilizers will soon be demanded in bulk.

With several companies and organizations involved in distribution and sales, the logistic problems will be greatly simplified.

V. Plan for a Dealer Network

Fertilizer marketing is normally a total company system that directs the flow of goods from the production plant to the farmer in such a way that the farmers' needs are satisfied. It was not considered economical for GFC to

establish a marketing and distribution program with numerous retail dealers throughout Ghana, since developing such a system from the ground up is very expensive.

Utilizing existing facilities and saving the expense of creating a marketing system was considered sound, economical and efficient.

The principal initial constraint will be appropriate training for the new personnel marketing fertilizers throughout Ghana. Therefore, as the distribution agreements are developed, company training programs will be developed and carried out. Also product description leaflets and application recommendations for the various crops will be furnished the sales personnel. Training programs will be conducted for dealers and salesmen at national, regional and area meetings by GFC Marketing Manager.

The success of the marketing strategy and the rate at which new awareness and demand for fertilizer increase depends on the commitment and quality of effort of the retail dealers who contact the farmers and manages the retail outlets, therefore special efforts will be expended on this function.

VI. Plan for Agronomic Services

Initially GFC may operate with a marketing manager who is a trained agronomist since creating an awareness of the need for fertilizer will be part of the marketing strategy

of GFC. This awareness will be generated by face to face contact with farmers, the GFC, the MOA. The fertilizer distributors will jointly sponsor a "grass roots" educational program communicating profitability of fertilizer utilization to farmers. Agronomic practices combined with fertilizer application will form the basis for this educational program. Demonstrations, farm meetings, farm visits, and field days will jointly compose the agronomic service plans.

VII. Advertising and Sales Promotion

In the initial year of operation, it is anticipated that fertilizer demand will exceed supply, therefore very little promotion and advertising will be done. Notification of available sales locations for fertilizers will be conducted by posters at sales outlets, and by newspaper and radio advertisements.

During subsequent years advertising campaigns and promotional programs will be undertaken encompassing agronomical services findings and other research information. Advertising programs will be developed by the Marketing Manager.

VIII. Pricing, Subsidy and Method of Compensating GFC and Marketing and Distributing Organizations

At present retail prices of fertilizers have little or no relationship to the cost of the imported fertilizer, or

to the cost of distribution throughout the country. For GFC and commercial firms to enter the fertilizer business it will be necessary for these firms to operate at a reasonable profit.

It is assumed that the subsidy will be maintained for certain crops and locations for sometime to stimulate crop production and use of fertilizer. The GOG continue carrying responsibility for these costs.

New fertilizers introduced into the farming sector will be higher in analysis, (nitrogen, phosphorus, and potassium) than fertilizers presently being used therefore, the amounts required per acre will be lower and shipping costs within Ghana will be reduced relative to amounts of plant nutrients per pound of fertilizer.

It is proposed that a National Fertilizer Committee (discussed later), comprised of all factions of agriculture, and the fertilizer industry, make recommendations to the GOG on the pricing and subsidy of fertilizers.

) Pricing System for Ghana Fertilizer Company

It is proposed that GFC have an established ex-gate price at the plant in Tema, and any eligible distributor can purchase at the plant if they so desired. GFC will also sell fertilizers at the Kumasi and Yapeh terminals at established ex-gate prices for each location reflecting the cost of transportation and storage to each point.

Approved distributors can also purchase from these terminals.

Retail prices to farmers therefore will reflect the cost of transportation and handling to three zones in the country and be set by Government. All distributors selling fertilizers will sell at the same price in each zone.

Zone 1 Central, Eastern and Volta Regions

Zone 2 Northern and Upper Regions

Zone 3 Ashanti, Brong-Ahafo and Western Regions.

This pricing proposal is designed so that distributors and large farm corporations and trading firms, delivering farm produce to the south, can obtain fertilizer for the backhaul, or so that trucks going north partially loaded other commodities can complete their load with fertilizer and realize a full load rate.

(B) Pricing System for Distributors

Retail fertilizer prices will be established for each zone (1, 2, or 3) allowing a profit margin for the commercial distributors.

All marketing organizations will be required to sell fertilizers in each zone at the price set by the government. They will purchase at an established terminal price, reduced by the amount of the subsidy at any terminal location they desired. If their trucks were moving north, empty or partially loaded, it would be to their advantage and result in improved efficiency to haul fertilizers from the plant at Tema.

It is envisaged that several commercial companies presently engaged in marketing other products will engage in fertilizer marketing to make their marketing facilities and organization more efficient. It is desirable to have competition for sales even though all companies will be selling fertilizer at the same price as fixed by Government. To gain new customers, promotion and programs will be the basis upon which any firm obtains the bigger share of the market.

C) Rebate System

The GFC will be responsible for determining which of its products are for resale at the subsidized price, and which groups will not be eligible for a subsidy (large farms, etc.).

On a monthly basis GFC will bill the GOG Treasury for an amount equivalent to the subsidy allowance. Payments will be made promptly to GFC so that an orderly procurement program can be followed.

4. Use of Present Infrastructure

The fertilizer program proposed for Ghana will maximize utilization of all existing facilities presently available in the country. Marketing of fertilizers is principally a function of transportation for maximum distribution coverage. For the next five years adequate transportation facilities exist for moving the projected tonnages of

fertilizers to the end user. Three modes of transport will be used - truck, rail, and barge. As the demand increases, beyond the fifth year, attention will need to be given to: (1) barge facilities - on Volta Lake (2) transport facilities for fertilizers to be transported north (3) but most importantly for transport facilities to move the finished farm produce into the southern markets, or to the ports for exports. Each ton of plant nutrient used in agricultural production will produce an average of ten tons of grain or other food products, which will need to be transported to market.

The road and communications systems are two essential requirements for a viable marketing system for fertilizers, and for farm produce that will be forthcoming.

Dealers must be able to order fertilizers quickly and deliveries must be made promptly for a viable fertilizer industry to develop. Road and communications improvements are major commitments that GOG should make in its agricultural development program.

X. Co-ordination of Research and GFC

Considerable research has been done in Ghana relative to plant nutrient needs of the major crops. As the GFC begins operations new grades or ratios of fertilizers will be produced based on research carried on to identify

the appropriate mixes of fertilizers the GFC should be producing. Close coordination must exist between company agronomists and the several institutions in Ghana, to guarantee that research projects related to the marketing program are being carried out.

XI. Coordination of Ministry of Agriculture Extension Program and GFC Marketing Plan

The Extension service is the education arm of the MOA extending research information knowledge known technology in agriculture to as many farmers as possible. The GFC will be an asset to the Extension program providing a service that has not been available before in Ghana. The two organizations through coordinated efforts and activities will definitely compliment each other for the maximum benefit of the farmer. Therefore, the Extension and GFC agronomists are expected to plan and coordinate educational programs that compliment and extend new technology.

XII. National Fertilizer Committee

It is the goal and objectives of GFC to serve the fertilizer needs of all farmers in Ghana with the proper types of fertilizer for each crop, at the time needed, and in sufficient quantities to enable the GOG to meet its targets of Agricultural Production. In order to meet these goals it is proposed that the National

Fertilizer Committee be reactivated and new members added. This Committee should comprise all institutions of government (research and extension) the GFC commercial firms and boards distributing fertilizers, and farmers to serve as a coordinating group for all interests related to fertilizers. The objectives of this Committee would be to advise the GOG relative to import needs, research needs, pricing policies, and particularly to advise GFC as to the grades and ratios that should be produced and make policy recommendations related to handling fertilizers. The Committee should function as a working Committee and must meet at least once each quarter.

Annex E

Itemized Equipment List

Part I -- Summary of Loan Financed Commodities

**Part II -- Detailed Equipment List (to determine which items are
loan vs. grant funded, see Detailed Financial Plan,
ANNEX M, Part I)**

ANNEX E - Part I

Summary of Loan Financed Elements
((\$000))

<u>COMPONENT</u>	<u>YEAR</u>				<u>Total</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	
<u>Credit</u>					
Vehicles with spares	223.5	115.0	235.0	115.0	688.5
Equipment and supplies	<u>126.0</u>	<u>140.0</u>	<u>140.0</u>	<u>140.0</u>	<u>546.0</u>
Sub-total	349.5	255.0	375.0	255.0	1,234.5
<u>Fertilizer</u>					
Bulk fertilizer	6,500.0	-	6,500.0	7,000.0	20,000.0
Mixing equipment	<u>-</u>	<u>750.0</u>	<u>-</u>	<u>-</u>	<u>750.0</u>
Sub-total	6,500.0	750.0	6,500.0	7,000.0	20,750.0
<u>Seed Multiplication</u>					
Equipment	77.7	128.4	206.1	95.2	507.4
<u>Small Farm Equipment</u>	-	1,939.4	2,918.9	2,649.6	7,508.1
TOTAL	6,927.2	3,072.8	10,000.0	10,000.0	30,000.0
Phase I	10,000.0				
Phase II			20,000.0		

**ANNEX E - Part II: Itemized Technical/Equipment List
(funded from grant and loan; refer also to
Annex M, Part I)**

EXTENSION DEMONSTRATION

Home Science Department, University of Ghana, Legon

<u>Item</u>	<u>No.</u>	<u>Amount (000)</u>
Addition to laboratory for development and testing of production/home management intermediate technology/ labor saving devices.	1	8.7
Laboratory Equipment:		3.5
Folding Tables	6	
Folding Chairs	-40	
Kitchen Timers, Scales, Thermometers	4-4-8	
Refrigerators	1	
Pots, Pans, Equipment, Utensils		
Production Hand/garden tools/intermediate technology-picks, shovels, axes, hoes, machetes, water carts, hand operated cassava graters, maize shellers, groundnut shellers, other labor saving devices		.9
<u>HOME EXTENSION UNIT</u>		
Farm/home demonstration centers, constructed of local materials (mud and wood) with improvements relative to labor saving, sanitation, storage, etc.	40	80.0
Vehicles with spare parts - short wheel base and carryall panel type and pickup type	25	250.0
Demonstration materials such as portable chalk boards, flannel boards, nutrition/health charts, etc. with tripods, training aids - camp projectors, cameras, etc.	100	1.4
Production hand tools/intermediate technology - picks, shovels, axes, hoes, machetes, water carts, hand operated cassava graters, maize shellers, groundnut shellers, other labor saving devices.	100	11.0
<u>Extension Service</u>		
Training aids and demonstration materials - same as Home Extension Unit	200	2.82.8
Seed and fertilizer	70	7.0

<u>Item</u>	<u>No.</u>	<u>Amount (000)</u>
<u>Ghana Fertilizer Company</u>		
Fertilizer conveyor, mixing, weighing and bagging units, training aids,	3	750.0
Movie Projector	1	1.0
Slide Projector	1	.3
Cameras	5	.5
Training films and other visual aids		2.2

Seed Multiplication Unit

Foundation seed drying, processing storage, equipment for the processing plants ^{1/}	3	233.1
Certified seed drying, processing, storage equipment for the processing plants ^{1/}	2	256.8
Seeds testing laboratory equipment for testing/certifying seeds produced on the Foundation Seed Farms and by contract growers ^{1/} vehicles	1	17.5
Pick-up types with spare parts for certification unit to inspect foundation seed farms and contract growers production	6	69.0
Heavy duty trucks with spare parts for transporting certified seed to warehouses and distribution points	5	150.0
Farm/production machinery/equipment with spare parts	5	
tractors	5	8.0
disc plows	5	7.5
disc harrows	5	10.0
cultivators	3	5.4
maize seeders	1	1.8
groundnut seeder	1	3.0
small grains drill	1	
self propelled combing	3	27.0
maize pickers with husking attachment	3	1.8
tractor powered PTO crop sprayers		

Small Farms Applied Research

Laboratory/field plot equipment such as scales, bags, glass ware, insect dusters and sprayers, intermediate level hand/animal powered production and processing equipment, pocket calculators, air-conditioners		20.0
---	--	------

^{1/} See Mississippi State University report
Ghana National Seed Program Facilities, August 1975.

<u>Item</u>	<u>No.</u>	<u>Amount (000)</u>
Office equipment - typewriters, desk, adding machines/calculators, reproduction/duplicating equipment, filing cabinets, air-conditioners		10.0
Vehicles with spare parts;		
pick-up type	1	10.0
short wheel base and carryall type	3	30.0
surveying equipment;		
transit level, chains, rods, metal reel drag tapes, pitch grade level, compasses, distance measuring wheel		2.0

Marketing

This equipment list is tentative until detailed survey/baseline data are completed and the program is fully designed.

Trucks to transport produce to larger markets	3	45.0
Tractors/trailers for collecting produce at out-station collection points and farm gate	4	60.0
Assembly point construction	6	30.0
scales	15	7.5
crop dryers	3	15.0
materials, bags and tools	6	3.0

ADB Small Farmer Credit

Each loan office will require the following estimated at \$25,300 x 39 = \$986,700

adding machine	1	
typewriter (18")	1	
6 drawer filing cabinets	3	
dual lock safe	1	
desks/clerk/typist desks	5	
chairs	9	
table	1	
benches	2	
camera (Polaroid)	1	
vehicles	1	
motor cycle	1	
other miscellaneous items		
armoured trucks to service all branch banks & FLOs	2	

Item

Small Farm Equipment portion of Loan

- a. Animal powered farm equipment such as plows, cultivators, harrows ridgers, seeders, carts.
- b. Hand farm tools such as maddox type picks for seed bed preparation, axes for land clearing, dusters, sprayers, maize husking knives and shellers
- c. Intermediate level harvesting, processing, storage, equipment such as maize shellers, small grains thresher, groundnut shellers, cassava graters, grain grinders, on-farm storage

It is planned that most of the items under a-b-c-will be manufactured in the rural areas through assistance under the proposed Farmers Association and Agro-business project. Until this capability is developed, imports will be necessary.

- d. Shop equipment for small rural shops or blacksmiths to manufacture intermediate technology, are welders, gas cutting equipment, metal benders, hand and electric powered grinding wheels/equipment, drill presses, hacksaws, hammers, cold chisels, punches, anvils, forges, tongs, metal benders, wood saws planes and chisels.
- e. Steel, sheet metal, wheels and bearings for use in manufacturing intermediate technology.
- f. Small tractors and equipment for groups of small farmers to purchase cooperatively and use on their individual farms.
- g. Houses for staff on the Small Farms Applied Research component Station.
- h. Breeding and young/work age stock to upgrade increase work animal supply in Northern Ghana.
- i. Educational materials supplies and equipment for agriculture Education Institutions to be staffed and assisted by the peace corp for training middle level manpower resources for agriculture and rural development.
- j. Vegetable seeds unavailable and extremely difficult to produce in the tropics.

Annex F

Project Performance Training Network (PPT)

Country: GHANA	Project No: 641-0067	Project title: MIDAS-Small Farmer Development--Seed Production subactivity	Date: 1/76	/x / original / / revision #	apprvd:
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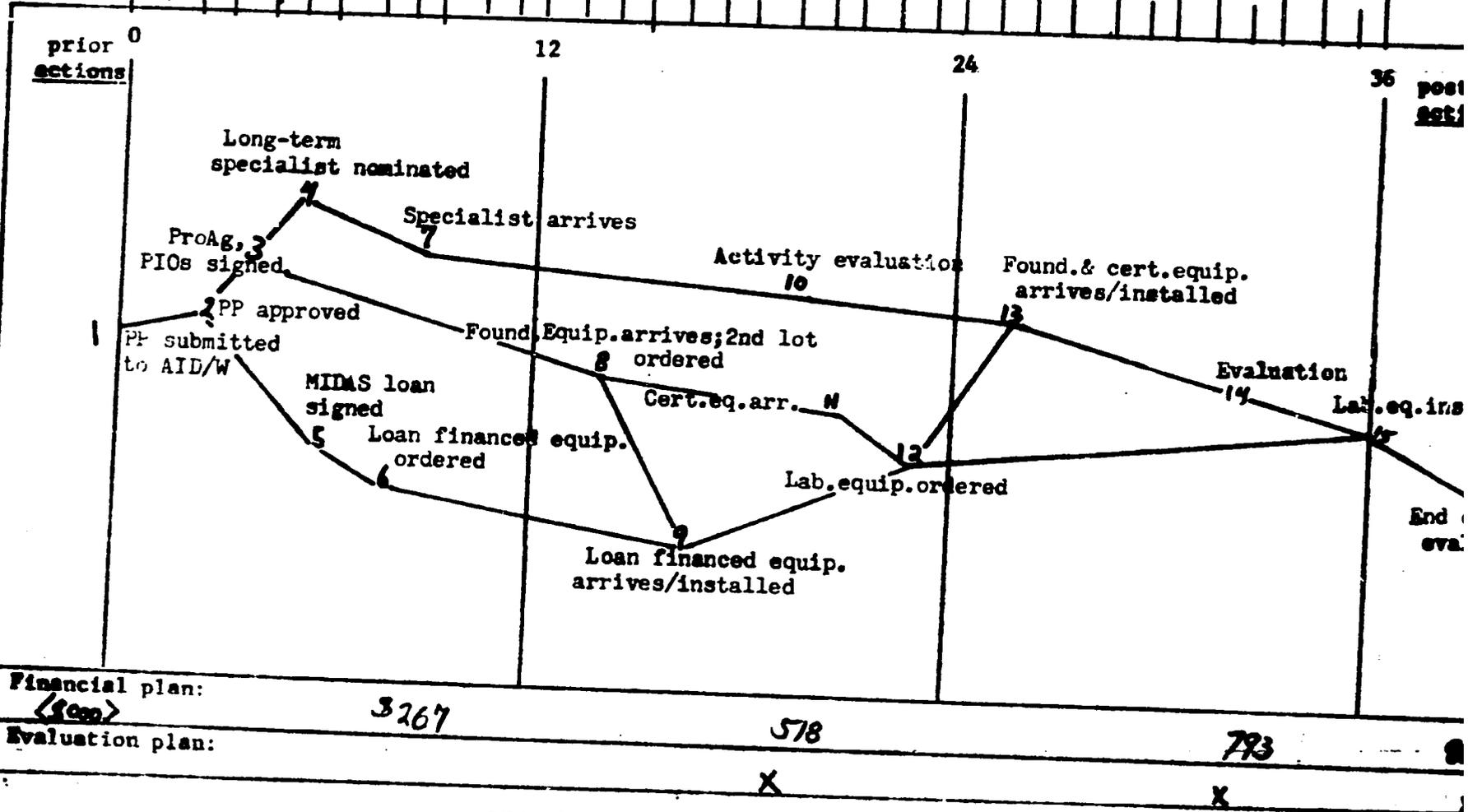
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79

79

month

F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J J A N



PROJECT PERFORMANCE NETWORK

CPI NARRATIVE	ACTION AGENT
1. 12/31/75 PP submitted to AID/W	USAID
2. 3/30 PP approved by AID/W	AID/W
3. 4/30 ProAg, PIO/T and PIO/Cs signed allowing recruiting of project technicians and procurement of grant funded commodities.	USAID/MOA
4. 6/15 Long term technician (probably from Mississippi State) nominated by AID/W.	AID/W
5. 6/30 MIDAS agriculture loan #1 signed by USAID and GOG.	USAID/GOG/AID/W
6. 8/31 Loan-financed Foundation and Certified seed equipment ordered.	MOA/USAID
7. 9/30 Long-term technician from MSU arrives in Ghana for 2-year tour.	AID/W
8. 3/30/77 Grant funded seed production equipment (ordered by #3) arrives. 2nd lots of Certified and Foundation equipment ordered.	AID/W-USAID/MOA
9. 5/30 Foundation seed equipment arrives and is installed with 2 MM TDY assistance.	AID/W-USAID/MOA
10. 8/30 Project evaluation	USAID/MOA/MSU
11. 9/30 Certified seed equipment arrives and is installed with 3 MM TDY assistance.	AID/W-USAID/MOA

	ACTION AGENT
12. 11/30/77 Lab equipment and pro Ag Foundation seed equipment ordered with loan funds.	USAID
13. 2/28/78 2nd lots Certified and Foundation equipment arrive with 3 MM TDY assistance for installation.	AID/W-USAID/MSU
14. 9/30 Evaluation of activity.	MOA/MSU
15. 1/31/79 Lab and other equipment arrives and is installed with 2 MM TDY assistance.	AID/W-USAID/MSU
16. 9/30/79 End of project evaluation.	AID/W-MSU/USAID

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Country: GHANA	Project No: 641-0067	Project title: MIDAS-Small Farmer Development: ADB Credit sub-activity	Date: 1/76	/x/ original / / revision #	APP#
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CPI NARRATIVE

ACTION AGENT

ACTION AGENT

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. 12/31/75 PP submitted to AID/W. USAID 2. 3/30/76 PP approved. AID/W 3. 4/30 Prokg signed including PIO/C for training materials; PIO/A for 2 long-term technicians. USAID/ADB 4. 6/30 Midas loan #1 signed. USAID/ADB/AID 5. 7/30 Bank of Ghana makes working capital available to the ADB. B/G/ADB 6. 8/30 Vehicles and equipment ordered with loan funds. ADB/USAID 7. 8/30 Training advisors nominated. AID/W 8. 8/30 First participants depart for long term training. USAID/ADB 9. 11/30 Two long-term technicians arrive. AID/W 10. 12/31 First 9 FLOs established. ADB 11. 2/28/77 Training starts. USAID/ADB 12. 5/30 Vehicles/equipment arrives. ADB 13. 7/30 Evaluation/Design consultant arrives for 2 MM; Evaluation. USAID/ADB/AID-W | <ol style="list-style-type: none"> 14. 12/31/77 19 FLOs established. ADB/AID 15. 2/28/78 Two long-term participants return. AID/W 16. 7/30 Evaluation consultant arrives for 2 MM; Phase I Evaluation. USAID/ADB/AID-W 17. 12/31 30 FLOs established. ADB 18. 7/30/79 End of Project Evaluation. USAID/ADB/AID <p>(Revised FPT charts will track in greater detail events of the last year.)</p> |
|--|---|

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Project No:	Project title: MIDAS-Small Farmer	Date:	/x/ original	apprvd:
77-147	Development: ADE Credit subactivity	2/76	/ / revision #	

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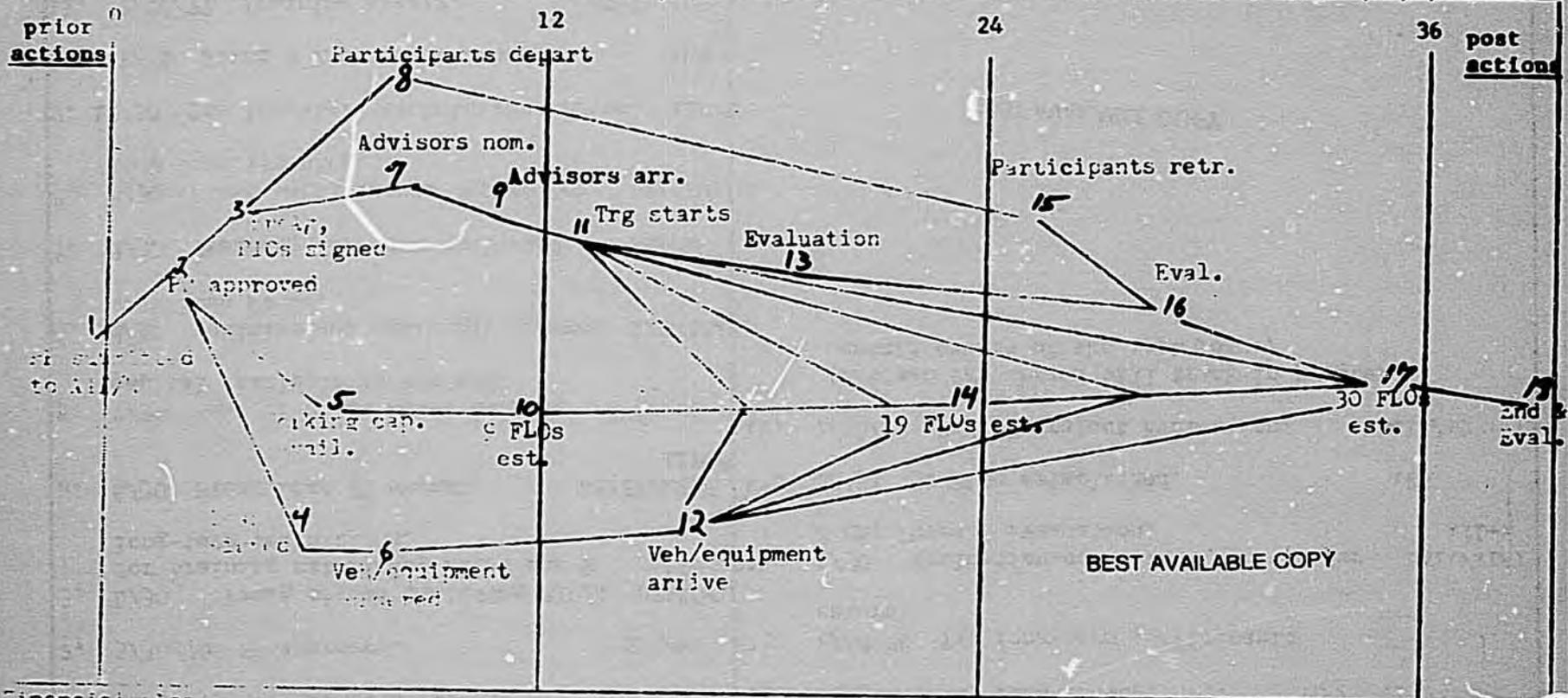
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months

prior actions

post actions



Financial

3000

Evaluation

372

267

429

506

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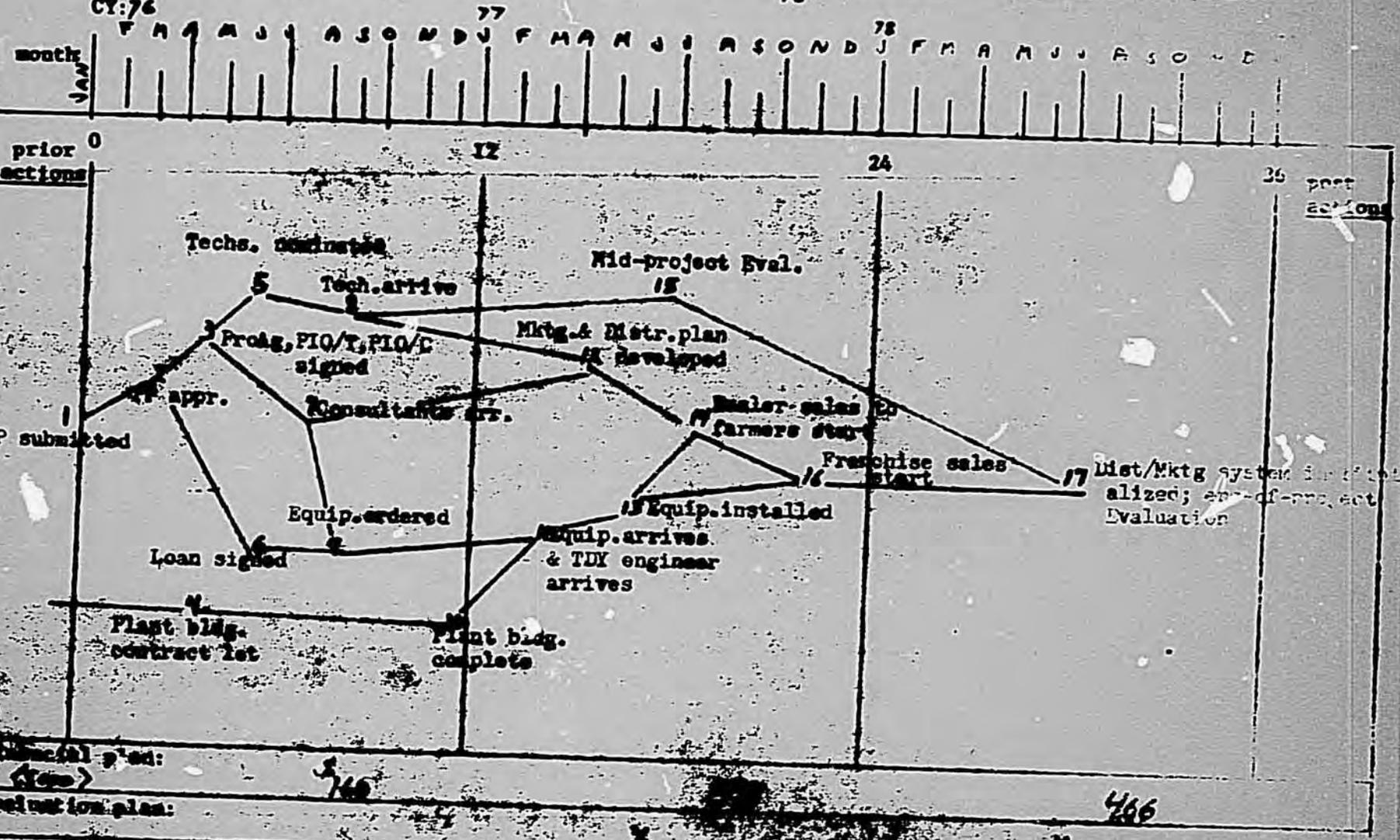
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PROJECT PERFORMANCE NETWORK

Country: GHANA	Project No: 641-0067	Project title: MIDAS-Small Farmer Development--Fertilizer sub-activity	Date: 1/76	/ / original / / revision
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Financial plan:
(see)

Equipment plan:

560

466

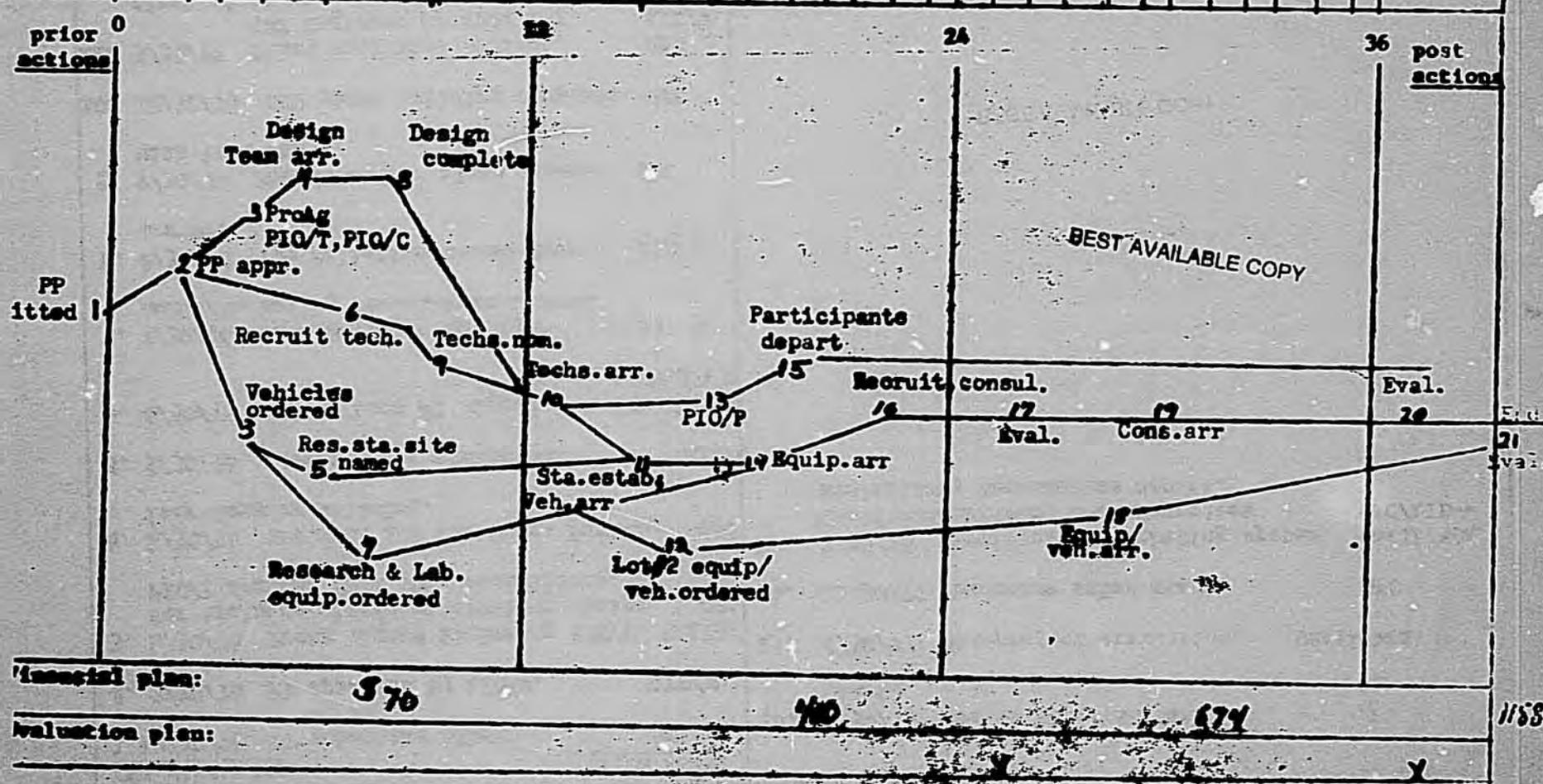
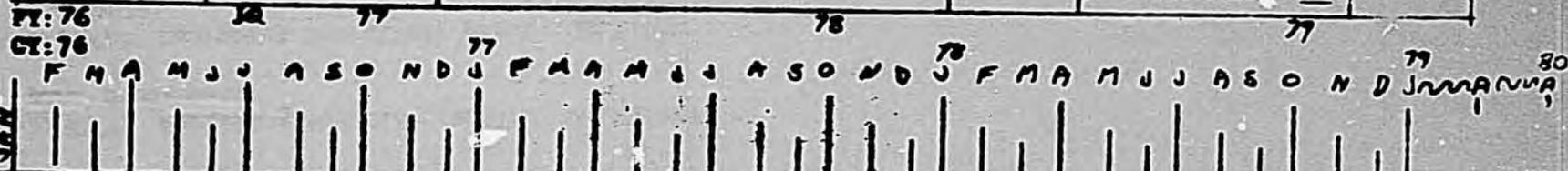
PROJECT PERFORMANCE NETWORK

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Country: Ghana	Project No: GAP-0067	Project title: MIDAS-Small Farmer Developments/Fertilizer sub-activity	Date: 1/76	/x / /																													
CPI NARRATIVE		ACTION AGENT																															
1. 12/30/76	FP submitted AID/W	2. 3/30/76	FP approved by AID/W.	3. 4/30/76	Prog signed including PIO/C for training aids/demonstration equip; PIO/T for two full time technicians.	4. 4/30/76	Contract let for Ghana Fertilizer Company building.	5. 5/30/76	Technicians nominated.	6. 6/30/76	MIDAS Loan #1 signed.	7. 7/30/76	Chem. Engineer and Agre-nomic/Marketing consultants arrive.	8. 8/30/76	Two full-time technicians arrive.	9. 9/30/76	Equipment for plant ordered with 1/2m funds.	10. 12/30/76	GFC plant building complete.	11. 3/30/77	Plant equipment arrives. THE Engineer arrives for plant start up.	12. 4/30/77	Marketing and Distribution plan developed.	13. 5/30/77	Equipment installed; plant completed.	14. 6/30/77	Dealer sales to farmers start.	15. 6/30/77	Mid-project evaluation.	16. 11/30/77	Franchise sales start.	17. 7/30/78	Distribution/Marketing system institutionalised; end-of-project evaluation; technicians depart.

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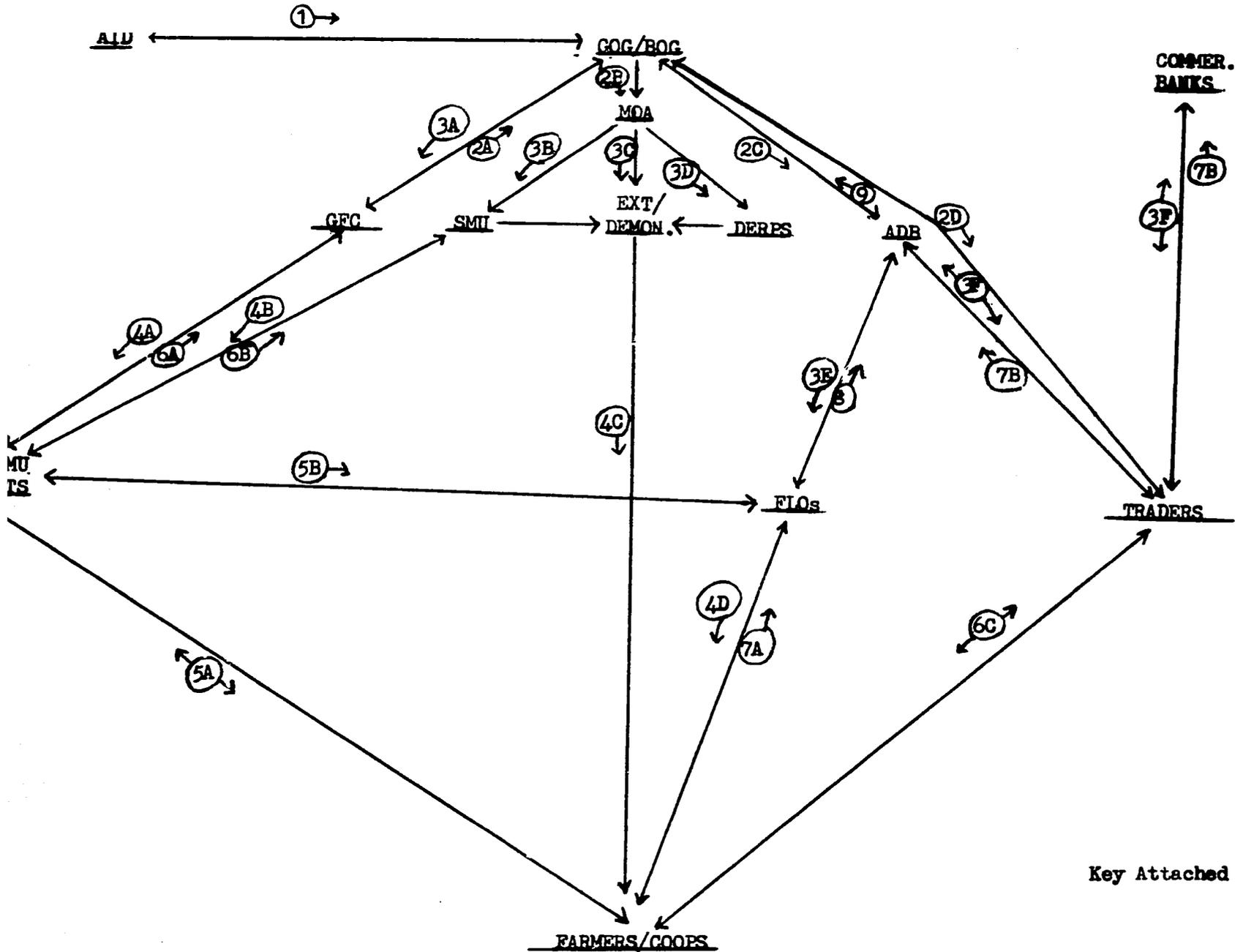
Country: Ghana	Project No: 641-0067	Project title: MIDAS-Small Farm Applied Research sub-activity	Date: 1/76	/x / original / / revisor #	app
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Country: Ghana	Project No: 641-0067	Project title: MIDAS-Small Farm Applied Research sub-activity	Date: 1/76	/x / original / / revision #	approved
CPI NARRATIVE		ACTION AGENT:		ACTION AGENT	
1. 12/31/75	Submit PP to AID/W	USAID	15. 8/30/77	Participants depart.	USAID
2. 3/31/76	PP approved.	AID/W	16. 10/30/77	Recruit evaluation consultant for two month TDY.	USAID
3. 5/30/76	ProAg signed recruiting design team, purchasing vehicle.	USAID/ MOA	17. 2/28/78	Evaluation arrives; mid-project evaluation.	AID/W-USAID MOA
4. 6/30/76	Design team arrives Ghana.	AID/W	18. 5/30/78	Equipment/vehicles arrive.	AID/W
5. 7/15/76	Research station site selected.	MOA/USAID	19. 7/30/78	Two consultants arrive for 1 MM.	AID/W
6. 8/30/76	PIO/T requests recruitment of 3 full time research technicians.	USAID/ MOA	20. 7/30/79	Evaluation	USAID/MOA
7. 8/30/76	PIO/C for research/lab equipment signed.	USAID/MOA	21. 7/30/80	Evaluation; end of project	USAID/MOA/AID-
8. 9/30/76	Research design plan completed.	USAID/MOA			
9. 10/30/76	3 technicians nominated.	AID/W			
10. 1/30/77	3 technicians arrive post.	AID/W			
11. 4/30/77	-Research station established. -Project vehicles arrive.	MOA AID/W			
12. 5/30/77	Balance of project vehicles and equipment ordered by PIO/C	USAID/ MOA			
13. 6/30/77	PIO/P signed for two long-term participants.	USAID/ MOA			
14. 7/30/78	First lot of lab equipment arrives.	AID/W			

Country: GHANA	Project No: 641-0067	Project title: MIDAS: BOG/Small Private Trader Development subactivity	Date: 1/76	<input checked="" type="checkbox"/> original <input type="checkbox"/> revision #	apprvd:
<u>CPI NARRATIVE</u>		<u>ACTION AGENT</u>	<u>ACTION AGENT</u>		
1. 12/75. PP submitted AID/W.	USAID	13. 9/30/78. Survey and Marketing consultants arrive for 2 MM; equipment sold to traders; project activity commences. Evaluation.	AID/W-USAID-BOG		
2. 3/30/76. PP approved by AID/W.	AID/W	14. 6/79. Recurrent event: Survey and Marketing consultants return for annual 2-MM consultation on progress of project.	USAID/BOG/AII		
3. 5/30. ProAg signed; grant funded vehicle ordered; consultant for base-line survey recruited.	USAID/BOG	15. 6/80. Recurrent event as above; major evaluation of project and assessment of impact on farmer and trader incomes.	USAID/BOG/AII		
4. 7/30. BOG recruits local staff for base line survey.	BOG				
5. 10/30. Local staff on board; survey consultant arrives for 4 MM.	BOG/ USAID/AID-W				
6. 11/30. PIQ/T for marketing consultant for 2 MM signed.	BOG/USAID				
7. 2/28/77. Base line survey complete.	USAID/ BOG				
8. 4/30. Marketing consultant arrives for 2 MM to develop equipment requirements.	AID/W				
9. 6/30. Grant equipment list complete; equipment ordered.	BOG/ USAID				
10. 8/30. Grant to fund local staff of market program organization signed. In-house Evaluation.	USAID/ BOG				
11. 4/30/78. Trader Associations identified/selected by local staff. Consultants requested.	USAID/ BOG				
12. 6/30. Equipment arrives.	AID-W/ USAID				

Annex G
Resource Flow Chart



ANNEX C - Resource Flow Chart

Key Attached

ANNEX G**Resource Flow Chart****KEY:**

GOG	Government of Ghana
BOG	Bank of Ghana
AID	U.S. Agency for International Development
Comm. Banks	Commercial Banks, Ghana
MOA	Ministry of Agriculture
GFC	Ghana Fertilizer Company
SMU	Seed Multiplication Unit
Ext/Dem	Department of Home Sciences, University of Ghana Extension Division, Home Extension Division of MOA
DERPS	Division of Economic Research and Planning Services
ADB	Agricultural Development Bank

TIME SEQUENCE OF RESOURCE FLOW: (Read chart top-down, left-right)

1. AID loan/grant assistance to GOG.
- 2A. GFC exchanges cedi working capital for foreign exchange (FX).
- 2B. GOG provides (cedi) working capital to MOA.
- 2C. BOG provides (cedi) working capital to ADB.
- 2D. BOG, through trader bill financing scheme, provides note to selected small traders.
- 3A. BOG provides FX to GFC for fertilizer imports.
- 3B. MOA provides working capital to SMU.
- 3C. MOA provides working capital to Extension Unit.
- 3D. MOA provides working capital to DERPS.
- 3E. ADB provides working capital to FLO's.
- 3F. Traders discount BOG notes either ADB or commercial banks.

ANNEX G (Continued)

Resource Flow Chart

- 4A. GFC distributes imported fertilizer to its outlets.
- 4B. SMU distributes seeds to its outlets.
- 4C. Ext. Unit holds demonstration on farmers' fields.
- 4D. FLO's extend credit to farmers/cooperatives.
- 5A. GFC outlets provide fertilizer, seed, intermediate technology to farmers; farmers pay cash for inputs.
- 5B. Alternatively, farmers pay for inputs with "chits" which GFC outlets exchange for cash from FLO's.
- 6A. GFC outlets pay for fertilizer received earlier from GFC.
- 6B. GFC outlets pay for seeds received earlier from SMU.
- 6C. Sale/purchase of product at farm gate.
- 7A. Farmers repay credit to FLO's.
- 7B. Traders repay credit to ADB or commercial banks.
- 8. FLO forward credit repayments to ADB's branch offices.
- 9. ADB make payments on credit from BOG.

Process starts again from 2A.

Annex H
Statutory Checklist

Annex H -- Statutory Checklist

The Statutory Checklist has been received in AID/W and is on file.

ANNEX I

Mission Director's Certification



ANNEX I

Department of State

TELEGRAM

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ACTION AID-31

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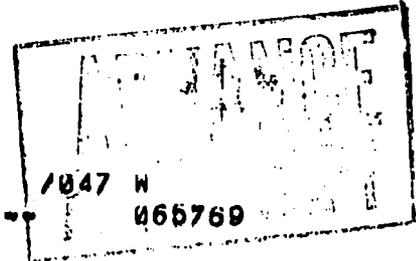
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EO 11652 NA
SUBJ: MIDAS SMALL FARMS DEVELOPMENT-DIRECTOR'S
CERTIFICATION, SECTION 611(E)

REF: STATE 071819

QUOTE I, W. HAVEN NORTH, THE DIRECTOR OF THE AGENCY FOR INTERNATIONAL DEVELOPMENT MISSION TO GHANA, DO HEREBY CERTIFY THAT IN MY JUDGMENT THE GOVERNMENT OF GHANA WILL HAVE THE FINANCIAL AND THE HUMAN RESOURCES CAPABILITY TO IMPLEMENT, MAINTAIN AND UTILIZE EFFECTIVELY SUBJECT CAPITAL ASSISTANCE PROJECT. THIS JUDGMENT, INTER ALIA, IS BASED ON THE FOLLOWING FACTORS:

1. THE GOVERNMENT OF GHANA IS ESTABLISHING UNDER THE LEADERSHIP OF THE MINISTRY OF ECONOMIC PLANNING A COORDINATING COMMITTEE TO FACILITATE AND ENSURE COORDINATED IMPLEMENTATION AND LIAISON WITH THE USAID MISSION IN EXECUTION OF THE PROGRAM FINANCED UNDER THE LOAN.
2. THE BANK OF GHANA WHICH PLAYS A KEY ROLE IN THIS PROJECT HAS DEMONSTRATED A KEEN INTEREST IN SMALL FARMS ORIENTED DEVELOPMENT AND CAPABILITY TO FACILITATE ACTION PROGRAMS IN THE FINANCIAL AND PRIVATE SECTORS.
3. MANAGEMENT DEVELOPMENT PROGRAMS ARE ALREADY WELL UNDER WAY TO STRENGTHEN AGRICULTURAL SECTOR PROGRAM IMPLEMENTATION.





Department of State

TELEGRAM

PAGE 02 ACCRA 02298 261442Z

4. THE AGRICULTURAL DEVELOPMENT BANK HAS OR WILL BE DEVELOPING WITH PROJECT HELP THE PROFESSIONAL STAFF AND COMPETENCY REQUIRED FOR THE PROJECT. IT IS ALREADY MEETING A SIGNIFICANT PART OF THE NATIONWIDE DEMAND FOR AGRICULTURAL CREDIT.

5. THE BANK OF GHANA WILL MAKE CEDIS AVAILABLE NEEDED FOR THE ADB EXPANSION PROGRAM AND HAS RESOURCES TO IMPLEMENT THE PILOT MARKETING ACTIVITY UNDER THE PROJECT.

6. THE SEED MULTIPLICATION UNIT HAS THE PROFESSIONAL STAFF OR IS DEVELOPING IT WITH PROJECT HELP AND COMPLEMENTARY FINANCIAL RESOURCES NEEDED FOR THE PROJECT. IT NOW OPERATES SEVERAL SEED FARMS, PRODUCES AND MULTIPLIES SEED AND MEETS IN PART THE NEED FOR SEED IN GHANA.

7. THE GHANA FERTILIZER COMPANY HAS BEEN ESTABLISHED AND IS BEING ORGANIZED TO HANDLE THE PROJECT AS RESPECTS FERTILIZER.

8. THE MINISTRY OF AGRICULTURE HAS AVAILABLE TO IT THE HUMAN AND FINANCIAL RESOURCES REQUIRED TO ESTABLISH THE SMALL FARMER APPLIED RESEARCH ACTIVITY, THE EXTENSION FIELD DEMONSTRATION, AND THE HOME DEMONSTRATION ACTIVITIES INCLUDED IN THE PROJECT. SIGNED W. HAVEN NORTH, DIRECTOR, USAID/GHANA, MARCH 26, 1976. UNQUOTE.
BLACK

Annex J

Borrower/Grantee's Application for Assistance

ANNEX J - BORROWER/Grantee's Application for Assistance

Requests were received from GOG for assistance to conduct studies and design development programs for the various project components. The studies, discussed in Section II, Background, of the PP, were completed and formed the basis for the projects.

The Commissioners, Ministry of Economic Planning and Ministry of Agriculture, requested Section I, Summary and Recommendations, B, Project Issues, page 7, that USAID obtain AID/W approval for the project.

The formal Application for Assistance will be distributed separately but will be made part of this paper.

Annex K

**Project Description for the Loan
Authorization and Grant Agreement**

ANNEX K

Project Description for the Loan Authorization and Grant Agreement

The project is designed to strengthen the capability of existing institutions in Ghana serving the agriculture sector to extend their services to more small-scale farmers, thereby increasing their production and incomes. The project consists of six components which are described below. A permanent Advisory Committee will be established to coordinate the project components, monitor progress and make recommendations for ongoing program adjustments. The committee will consist of representatives of each of the OG implementing agencies and will have a project coordinator responsibility for administrative matters relating to project coordination.

The components of the Project are:

I. Small Farmer Credit Expansion

The objective of this component is to expand and streamline the Agriculture Development Bank's (ADB) small farmer credit operations so that a larger number of farmers will have regular access to small loans and annual production credits.

Thirty-nine new Farm Loan Offices (FLOs) will be established in outlying rural areas; U.S. technical assistance and participant training will be provided for FLO personnel. Market service/extension programs will be established. Part of the additional working capital required for the project will be recovered from the spread between ADB's lending and borrowing rates on funds for the expanded small farmer credit program.

It is expected that these inputs will assist ADB in streamlining its credit operations so that it will reach about 68,000 new small farmers after five years with annual and medium-term credit averaging about ₵500 per year per participating farmer. GOG will establish the ADB spread and will contribute to the amount of any deficits incurred by ADB.

One of the most important elements of the project is that the ADB receive a regular and timely flow of cedis to finance the annual incremental working capital requirements of its small farmer credit program. The Bank of Ghana will advance these funds annually to ADB.

Fertilizer and intermediate technology equipment (see components described below) imported under the project will be sold and the cedis generated thereby will go to the MOF. At the end of the year the MOF will reimburse the BOG for the ADB advance, assisted by the cedis generated by these sales. The import and use of small farm equipment and fertilizer, together with the implementation of the components discussed below, will help to assure that small farmers reached by ADB's expanded credit operations will have ready access to improved agricultural inputs and services and that those farmers will use credit productively.

II. Fertilizer

The objective of this component is to assist the Ghana Fertilizer Company (GFC) to procure, mix, blend and bag, and make available a regular and timely supply of improved fertilizer mixtures required by Ghana's varied soils and crops.

The project includes the import of fertilizer mixing equipment to be installed at Tema Port and provision of technical assistance and

participant training to strengthen GFC's management and organizational structure and to assist the GFC and other firms such as the GNTC, UAC, Mobil, etc., to implement a nationwide distribution system that makes fertilizer easily accessible to small farmers.

It is expected that the increased demand and use of fertilizer from these coordinated activities and services will both require and enable the GFC to import, process and distribute to farmers about 71,300 tons of appropriate fertilizers by the end of year five. The foreign exchange savings of bulk handling and mixing in Ghana are estimated to be about 20 percent of prevailing CIF prices of bagged imports.

III. Seed Multiplication

The objective of this component is to assist the Seed Multiplication Unit (SMU) to expand and improve its seed production and processing activities and to enable the SMU to distribute, on a wider scale, larger volumes and varieties of high quality seeds to farmers.

The project includes the purchase of seed cleaning and processing equipment and construction of processing plants at the three foundation seed farms and the two certified seed farms as well as a testing facility in Accra, vehicles and seed production/farming equipment at three foundation seed farms, U.S. technical assistance, and participant training.

It is anticipated that annual production of certified maize seeds will increase from 15,000 bags in year one to 60,000 bags in year five, rice seeds from 35,000 to 70,000 bags, and groundnut seeds from 1,000 to 15,000 bags. Also, SMU envisages expanded production of improved sorghum and millet seeds as well as soybean seeds in Phase II of the program.

The MOF will provide the SMU with its annual requirements for additional working capital requirements resulting from the project.

IV. Intermediate Technology for Small Farmers

Small-farm equipment such as small tractors and implements, bullock-drawn farm implements, stationary threshers for group farming schemes, food processing equipment, stock for bullock breeding programs, etc., can be imported under the loan and sold to small farmers individually, to groups and/or associations.

V. Research

The objective of this component is to assist the Division of Economic Research and Planning Services, Ministry of Agriculture, to establish a multi-disciplinary applied research capability on small farm systems in Ghana. The applied research effort will encompass:

- a. agronomy - crops and farming systems, mixed/inter cropping and production practices;
- b. agriculture economics - the economics of research results and of proposed innovations on farms, incomes, farm management and marketing;
- c. rural sociology - identifying the sociological/cultural factors affecting adoption of new practices and technology, and formulation of means for coping with inhibiting factors;
- d. extension - developing methods and materials for extending results to farmers and establishing two-way communication between research and production to assure research focuses on small farm problems

and to assure appropriate farmer feedback for future research activities;

- e. on-farm storage - identify, test and develop new structures and systems which can be easily and cheaply constructed by farmers and which will reduce on-farm waste and losses;
- f. animal husbandry, fisheries, entomology and pathology - an out-station is planned, possibly in an area of the transitional zone where trial results are expected to have maximum replicability and transferability to both the forest and savannah zones.

The project will include full-time researchers in agronomy, on-farm storage and farming systems; short-term consultant expertise as and when required in entomology and plant pathology; and procurement of vehicles, office and laboratory equipment and materials.

VI. Extension Demonstration

The objective of this component is to assist the Extension Service and Home Extension Division of the Ministry of Agriculture, and the Home Science Division of the University of Ghana to expand the number of demonstration plots on small farmers' fields utilizing improved agricultural inputs and production techniques and to encourage a more effective use of resources on the holding as well as in the household. This component also recognizes that many women are not only farm workers but also farmers in their own right and, therefore, should have equal access to technical assistance, production inputs and services. The project will provide vehicles, construction of 40 demonstration homes throughout Ghana, materials for demonstration plots and support to the Home Science Division of the University of Ghana to supply training materials and to organize workshops for the extension staff.

It is anticipated that this activity will strengthen the Extension Service and Home Extension Units capacity to demonstrate to farmers improved production practices and input utilization, and to more closely coordinate their activities with those of the Agricultural Development Bank in demonstrating the profitability of these practices to farmers participating in the small farm credit program.

Annex L
Draft Loan Authorization

Annex L -- Draft Loan Authorization

The Draft Loan Authorization will be distributed separately but will be made part of this paper.

Annex M

Part I -- Detailed Financial Plan (disbursements by project year)

Part II -- Project Financial Projections (obligations and expenditures by fiscal year)

PROJECT: MIDAS
 COMPONENT: CREDIT EXPANSION
 INSTITUTION: AGRICULTURAL DEVELOPMENT BANK (Disbursements by Project Year)

ANNEX M - TABLE 1

(Unit: \$1,000)

Input Category & Item	Loan Grant or GOG	Local Currency or FX	Total No. Units	Unit Cost	PHASE I				PHASE II				Total Cost
					Year 1		Year 2		Year 3		Year 4		
					No. Units	Cost							
I. VEHICLES													
Vehicles (incl. Spares)	L	FX	39	10.0	9	90.0	10	100.0	10	100.0	10	100.0	390.0
Low Cost Transport w/spare	L	FX		1.5	9	13.5	10	15.0	10	15.0	10	15.0	58.5
Bullion Truck	L	FX	2	120.0		120.0			1	120.0			240.0
II. ESTABLISHMENT COSTS													
Office Equipment ^{1/} (Typewriters, chairs, etc)	L	FX	39 FLO	14.0	9	126.0	10	140.0	10	140.0	10	140.0	546.0
TOTAL CARRIED FROM TABLE													
III. TECHNICAL ASST.													
Farm Loan Specialist	G	FX	2 MY	Yr 70.0	12 MY	70.0	12 MY	70.0					140.0
Training Specialist	G	FX	2 MY	Yr 70.0	12 MY	70.0	12 MY	70.0					140.0
Evaluation Consultant	G	FX	8 MM	8.0	2 MM	16.0	64.0						
Marketing Consultant	G	FX	8 MM	8.0	2 MM	16.0	64.0						
IV. PARTICIPANT TRAINING	G	FX	4 MY	18.0	2 MY	36.0	2 MY	36.0					72.0
V. RECURRENT OPER. EXP.													
A. Farm Loan Offices	GOG	LC	39	25.0	9	225.0	19	475.0	29	725.0	39	975.0	2400.0
B. Headquarter Costs													
1. Evaluation	GOG	LC	1	30.0	1	30.0		30.0		30.0		30.0	120.0
2. Training	GOG	LC	1	20.0		20.0		20.0		20.0		20.0	80.0
3. Marketing/Extension	GOG	LC	1	25.0		25.0		25.0		25.0		25.0	100.0
VI. INFLATION													
7% Inflation FX (YR 2-4)	G&L	FX						32.4		59.0	64.6	64.6	156.0
18% Inflation LC (YR 2-4)	GOG	LC						99.0		313.9		675.2	1088.1
VII. TOTAL*													
A. GRANT						208.0		208.0		32.0		32.0	480.0
B. LOAN						349.5		255.0		375.0		255.0	1234.5
C. GOG						300.0		550.0		300.0		1050.0	2700.0

^{1/} About 75% is Local Cost

* The totals shown in Tables 1-9 are deflated (1976) costs of the components. The inflation allowances above are not added to these totals, but are added in the Summary Table 10. See supplementary data in Table 10 of this Annex.

PROJECT:
COMPONENT:
INSTITUTION:

MIDAS
FERTILIZER
GHANA FERTILIZER COMPANY

ANNEX M - TABLE 2

(Disbursements by Project Year)

(Unit: \$1,000)

Input Category and Item	Loan Grant or GOG	Local Currency or FX	Total No. Units	Unit Cost	PHASE I				PHASE II				Total Cost
					Year 1		Year 2		Year 3		Year 4		
					No. Units	Cost	No. Units	Cost	No. Units	Cost	No. Units	Cost	
I. FACILITIES AND EQUIPMENT													
Ph. I Mixer, Weigher, Conveyor	L	FX											
Ph. I Warehouse Const.	GOG	LC	14,000 sq. ft	\$ 17 sq.ft				750.0					750.0
Training Aids and Materials	G	FX				2.0		500.0					250.0
II. FERTILIZER (BULK)													
Year 1 (FY 76)	L	FX	36,000 MT	\$236 MT	27500 MT	6500.0							
Year 3 (FY 78)	L	FX	48,000 MT	\$183 MT					35500 MT	6500.0			20,000.0
Year 4 (FY 79)	L	FX	54,000 MT	\$293 MT							23900 MT	7000.0	
III. TECHNICAL LIST													
Fert. Mktg./Dist Specialist (1)	G	FX	2 MY	70.0	12 MM	70.0	12 MM	70.0					140.0
Chem. Eng. Consultant(1)	G	FX	6 MM	8.0	4 MM	32.0	2 MM	16.0					48.0
Eng. Consultant (CVA)(1)	G	FX	6 MM	8.0	3 MM	24.0	3 MM	24.0					48.0
Agron./Mktg Consultant (Training) (1)	G	FX	5 MM	8.0	3 MM	24.0	2 MM	16.0					40.0
Demonstration/Trials Specialist	G	FX	2 MY	70.0	12 MM	70.0	12 MM	70.0					140.0
IV. PARTICIPANT STAFF													
Production Manager (1)	G	FX	3 MM	2.0	3 MM	6.0							6.0
Sales Manager (1)	G	FX	3 MM	2.0	3 MM	6.0							6.0
Mgt./Tech. Training (5)	G	FX	10 MM	2.0	10 MM	20.0							20.0

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Fertilizer (Cont'd.)

(Unit: \$1,000)

Category and Item	Loan Grant or GOG	Local Currency or FX	Total No. Units	Unit Cost	PHASE I				PHASE II				Total Cost
					Year 1		Year 2		Year 3		Year 4		
					No. Units	Cost							
RECURRENT OPERATING EXPENDITURE													
Balance Carried from Table C36	GOG	LC				1206.3		858.6		637.6		708.3	
Inflation on LC (2-5)	GOG	LC						246.4		250.2		455.5	952.1
Inflation on FX (YR 2)	G & L	FX						66.4					66.4
TOTAL GRANT *						254.0		198.0					
TOTAL LOAN						6500.0		750.0		6500.0		7000.0	
TOTAL GOG						1206.3		1368.6		637.6		708.3	

* Totals do not include inflation. See Footnote, Table I. See supplementary data in Table 10 of this Annex.

Seed Multiplication (Cont'd.)

1

(Unit: \$1,000)

Input Category & Item	Loan Grant or LOG	Local Currency or FX	Total No. Units	Unit Cost	PHASE I				PHASE II				Total	
					Year 1		Year 2		Year 3		Year 4		No. Units	Cost
					No. Units	Cost	No. Units	Cost	No. Units	Cost	No. Units	Cost		
V. VEHICLES														
A. Pick-up, w/Spares	G	FX	6	11.5	1	11.5	1	11.5	2	23.0	1	11.5	6	57.5
B. 14-Ton Truck	G	FX	5	30.0	1	30.0	1	30.0	2	60.0	1	30.0	5	150.0
VI. TECH. ASSISTANCE														
A. Ag. Eng. Consultant	G	FX	10 MM	9.0	2 MM	16.0	3 MM	24.0	3 MM	24.0	2 MM	16.0	10 MM	80.0
B. Org. & Mgt.	G	FX	2 MY	70.0			1 MY	70.0	1 MY	70.0			2 MY	140.0
C. Seed Processing Specialist	G	FX	24 MM	70.0	24 MM	70.0	24 MM	70.0					24 MM	140.0
VII. PARTICIPANT TRNG.														
A. Seed Technology	C	FX	48 MM	1.5			24 MM	36.0	24 MM	36.0			48 MM	72.0
B. Plant Breeding	C	FX	24 MM	1.5							12 MM	18.0	12 MM	18.0
C. Ag. Engineering	C	FX	24 MM	1.5			12 MM	18.0	12 MM	18.0			24 MM	36.0
D. Seed Technician Short Course	C	FX	27 MM	2.0	9 MM	18.0	9 MM	18.0	9 MM	18.0			27 MM	54.0
VIII. PARTICIPANT TRAVEL														
<u>Recurrent Operating Exp.</u>														
A. Found. Seed Facility Operation	COG	LC		46.0				46.0		46.0		92.0		184.0
B. Cert. Seed Facility Operation	GOB	LC		145.8						290.4		290.4		580.8
C. Seed Lab. Facility Operation	GOB	LC		12.0										-
D. Administrative (Labor)	GOB	LC					65.4		110.5		130.2			306.7
E. Contingency (10% (of Administrative))	GOB	LC					6.5		11.0		13.1			30.6
IX. INFLATION														
7% Infl. FX (YR 2-4)	G & L	FX					29.0		66.0		38.4			133.4
16% Infl. LC (YR 2-4)	GOB	LC					98.3		433.8		524.3			1055.4
X. TOTAL * A. TRAIT														
							327.5		285.5		249.0		75.5	938.5
							77.7		128.4		205.1		95.2	507.0
							219.2		545.3		105.5		215.3	

* Totals do not include inflation. See footnote, Table 1. See supplementary data in Table 10 of this Annex.

ANNEX M - TABLE 4

PROJECT:
COMPONENT:
INSTITUTION:

MIDAS
AGRICULTURAL RESEARCH (SMALL FARMER APPLIED RESEARCH PROGRAM)
MINISTRY OF AGRICULTURE PLANNING DIVISION

(Disbursements by Project Year) (Unit = \$1,000)

Input Category and Item	Loan Grant or GOG	Local Currency or FX	Total No. Units	Unit Cost	PHASE I				PHASE II			
					Year 1		Year 2		Year 3		Year 4	
					No. Units	Cost						
I. INVESTMENT COSTS												
1. Vehicles & Spares	G	FX	4	10.0	4	40.0						
2. Laboratory Equipment	G	FX		5.0	1	5.0	1	5.0	1	5.0	1	5.0
3. Office Equipment	G	FX	2	5.0	1	5.0	1	5.0				
4. Survey Equipment	G	FX	1	2.0	1	2.0						
II. TECHNICAL ASSISTANCE												
1. Farm Systems Specialist	G	FX	4 MY	70.0/YR	1	70.0	1	70.0	1	70.0	1	70.0
2. Agronomist	G	FX	4 "	70.0/YR	1	70.0	1	70.0	1	70.0	1	70.0
3. Consultancy												
a) Entomology	G	FX	5 MM	8.0/MM	1	8.0	1	8.0	1	8.0	1	8.0
b) Plant Pathology	G	FX	5 "	8.0/MM	1	8.0	1	8.0	1	3.0	1	3.0
4. Farm Storage Specialist	G	FX	4 MY	70.0/YR	1	70.0	1	70.0	1	70.0	1	70.0
III. PARTICIPANT TRAINING												
1. Farm Systems Specialist	G	FX	2 MY	18.0/YR	1	18.0	1	18.0				
2. Agronomist	G	FX	2 "	18.0/YR	1	18.0	1	18.0				
SURVEYS												
SUPERVISORS/ENUMERATORS	G	LC	4	8.0/YR	1	8.0	1	8.0	1	8.0	1	8.0
IV. GHANAIAN PERSONNEL												
A. FIELD STAFF												
1. Rural Sociologist	GOG	LC	4 MY	6.0/YR	1	6.0	1	6.0	1	6.0	1	6.0
2. Farm Management	GOG	LC	4 "	6.0/YR	1	6.0	1	6.0	1	6.0	1	6.0
3. Marketing Specialist	GOG	LC	4 "	6.0/YR	1	6.0	1	6.0	1	6.0	1	6.0

Agricultural Research (Cont'd.)

Input Category and Item	Loan Grant or GOG	Local Currency or FX	Total No. Units	Unit Cost	PHASE I				PHASE II			
					Year 1		Year 2		Year 3		Year 4	
					No. Units	Cost						
B. SUPPORT STAFF												
1. Livestock Specialist	GOG	LC	4 MY	6.0/YR	1	6.0	1	6.0	1	6.0	1	6.0
2. Fishery Specialist	GOG	LC	4 "	6.0/YR	1	6.0	1	6.0	1	6.0	1	6.0
3. Veterinary	GOG	LC	4 "	6.0/YR	1	6.0	1	6.0	1	6.0	1	6.0
4. Extension	GOG	LC	4 "	6.0/YR	1	6.0	1	6.0	1	6.0	1	6.0
C. CLERICAL STAFF (Clerk, Driver, Office Assistant)	GOG	LC	4 "	7.1/YR	1	7.1	1	7.1	1	7.1	1	7.1
V. OPERATING COSTS												
A. Rent (Including Electricity and Water)	GOG	LC	4 Years	5.0/YR		5.0		5.0		5.0		5.0
B. Materials and Supplies	GOG	LC	4 "	3.0/YR		3.0		3.0		3.0		3.0
C. Vehicle Maintenance	GOG	LC	4 "	2.0/YR	4	8.0	4	8.0	4	8.0	4	8.0
D. Contingency	GOG	LC		@ 10%		1.4		1.4		1.4		1.4
7% Inflation FX (YR.2-4)	G	FX						19.6		34.6		53.8
18% Inflation LC (YR.2-4)	GOG	LC						12.0		26.1		42.8
TOTAL GRANT*						322.0		280.0		239.0		239.0
TOTAL GOG						66.5		66.5		66.5		66.5

* Totals do not include inflation. See Footnote, Table 1. See supplementary data in Table 10 of this Annex.

PROJECT: ML 13
 COMPONENT: DEMONSTRATION/EXTENSION
 INSTITUTION: MINISTRY OF AGRICULTURE

ANNEX - TABLE 5

(Disbursements by Project Year)

(Unit: \$1,000)

Input Category & Item	Loan Grant or GOG	Local Currency or FX	Total No. Units	Unit Cost	PHASE I		PHASE II		Total Cost				
					Year 1		Year 2			Year 3		Year 4	
					No. Units	Cost	No. Units	Cost		No. Units	Cost	No. Units	Cost
I. HOME EXTENSION PROGRAM													
A. Farm/Home Demonstration Centers (Establishment of Centers)	G	LC	40	2.0			10	20.0	10	20.0	10	20.0	60.0
B. Vehicles - Pick-Up W/Spare	G	FX	25	1.0	10	100.0	4	40.0	4	40.0	4	40.0	220.0
C. PARTICIPANT TRAINING	G	FX	30 WM	1.5/WM	10	15.0	10	15.0	10	15.0	10	15.0	60.0
D. EQUIPMENT													
Training Aids	G	FX				6.0		5.0					11.0
Hand Tools	G	LC				12.0		12.0		12.0			36.0
Demonstration Materials	G	LC	100 Sets	.014	100	1.4							1.4
Seed (100 Demo)	G	LC				0.5							0.5
Seed (100 Demo)	GOG	LC						0.5				0.5	1.5
Fertilizer (100 Demo)	G	FX				3.0							3.0
Fertilizer (100 Demo)	GOG	LC						2.8		2.8		2.8	5.4
E. RECURRENT O&M EXP.													
Vehicle Maint. & Oper.	GOG	LC	20	2.0	10	20.0	14	28.0	17	34.0	20	40.0	122.0
Demo. Center Operations	GOG	LC	40	1.2			10	12.0	20	24.0	30	36.0	72.0
Ext. Agent Salary (Part)	GOG	LC	Per Agent/Year	1.0	70	70.0	80	80.0	90	90.0	100	100.0	340.0
Recurrent Exp. Contin.	GOG	LC		10%		90.0		12.0		14.8		17.6	53.4
18% Inflation (YR 2-4)	GOG/G	LC						24.4		65.2		139.5	464.3
7% Inflation (YR 2-4)	G	FX						5.4		12.6		16.9	35.9
TOTAL PHASE I *						137.9		92.0		97.0		75.0	391.9
TOTAL GOG						99.0		35.3		165.1		195.9	597.3

* Totals do not include inflation. See Footnote, Table 1. See supplementary data in Table 10 of this Annex.

...ation/Extension (Cont'd.)

(Unit: \$1,000)

Input Category & Item	Loan Credit or GOG	Local Currency or FX	Total No. Units	Unit Cost	PH/SE I		PH/SE II				Total Cost			
					Year 1		Year 2		Year 3			Year 4		
					No. Units	Cost	No. Units	Cost	No. Units	Cost		No. Units	Cost	
II. EXTENSION SERVICE														
A. Equipment														
Training Aids	G	FX	200 Sets	3.0									3.0	
Demonstration Materials	G	LC		2.3										2.3
Seed (200 Demo.)	G	LC												1.0
Seed (200 Demo.)	GOG	LC												1.0
Fertilizer (200 Demo.)	G	FX						1.0		1.0			1.0	3.0
Fertilizer (200 Demo.)	GOG	LC					5.0		5.0			5.0	15.0	
B. Recurrent Oper. Exp.														
C. Ext. Agent Salary (Part)														
	GOG	LC	Per Agent/Year	1.0		100.0		100.0		100.0		100.0	400.0	
D. Recurrent Exp. Contingency														
	GOG	LC		10%		10.0		10.0		10.0		10.0	40.0	
18% Inflation(YR 2-4)	GOG/G	LC					20.9		45.5			74.6	141.0	
TOTAL GRANT *						12.3							12.3	
TOTAL GOG						10.0		116.0		116.0			45.0	

* Totals do not include inflation. See Footnote, Table 1. See supplementary data in Table 10 of this Annex.

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PROJECT: MEAC
 COMPONENT: DEMONSTRATION/UNIVERSITY SUPPORT
 INSTITUTION: UNIVERSITY OF CHINA

(Disbursements by Project Year)

(Unit: \$1,000)

Input Category and Item University Support	Loan Grant or GOG	Local Currency or FX	Total No. Units	Unit Cost	PHASE I				PHASE II				Total Cost
					Year 1		Year 2		Year 3		Year 4		
					No.	Cost	No.	Cost	No.	Cost	No.	Cost	
III.													
A. Training Workshops		LC	10	2.0	2	4.0	2	4.0	2	4.0	2	4.0	16.0
Additions to Laboratory		LC				2.7							2.7
B. Equipment													
Laboratory Equipment		LC				3.5							3.5
Garden Tools		LC				0.9							0.9
Instructional Materials		LC				1.7		1.7		1.7		1.7	6.7
Development & Testing of Labor Saving Devices		LC				2.7		2.7		2.7		2.7	10.8
Backyard Garden Experiments		LC				1.4		0.9		0.9		0.9	4.1
Staff Field Visits		LC				0.9		0.9		0.9		0.9	3.6
C. Surveys													
Collection of Data		LC				0.9		0.9		0.9		0.9	3.6
Evaluation		LC				0.9		1.7		1.7		1.7	5.0
Overhead		LC		@ 5%		1.2		0.7		0.7		0.7	3.3
D. Recurrent Costs	GOG	LC				2.7		8.7		2.7		2.7	34.7
Recurrent Costs Contingency	GOG	LC		@ 10%		0.9		0.9		0.9		0.9	3.6
13% Inflation on LC (YR 2-4)	GOG/G	LC						4.2		9.1		14.9	22.2
TOTAL GRANT *						26.8		13.5		13.5		13.5	57.3
TOTAL GOG						9.6		9.6		9.6		9.6	30.4
IV. GRANT TOTALS *													
A. TOTAL GRANT						177.5		105.5		100.5		28.5	472.0
B. TOTAL GOG						218.6		260.9		291.7		322.5	1093.7

* Totals do not include inflation. See Footnote, Table 1. See supplementary data in Table 10 of this Annex.

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PROJECT: MEAS
 COMPONENT: MARKETING (SMALL FARMER PILOT MARKETING PROGRAM)
 INSTITUTION: BANK OF GHANA DEVELOPMENT FINANCE DIVISION/PRIVATE TRADERS

ANNEX M - TABLE 7

(Disbursements by Project Year) (Unit \$1,000)

Input Category & Item	Loan Grant or GCG	Local Currency or FX	Total No. Units	Unit Cost	PHASE I				PHASE II				Total		
					Year 1		Year 2		Year 3		Year 4		No. Units	Cost	
					No. Units	Cost	No. Units	Cost	No. Units	Cost	No. Units	Cost			
I. PILOT PROJ. DEV.															
Field Baseline Survey ^{1/}	G	FX	1 Sur.		1	54.0									
Follow-Up Survey ^{1/}	G	FX	6 MM				3 MM	27.0		3 MM	27.0			1 Sur.	54.0
Impact. Eval. Survey ^{1/}	G	FX	1 Sur.									3 MM	27.0	6 MM	54.0
II. MGT./OPER. SUPPORT															
Area Mktg. Specialist	G	LC	144 MM	12 MM 5.0			3 MY	15.0		3 MY	15.0	3 MY	15.0	144 MM	45.0
Mktg. Coordinator	G	LC	60 MM	12 MM 5.0	1 MY	5.0	1 MY	5.0	3 MY	15.0	3 MY	15.0	60 MM	20.0	
Mktg. Spec. Consultant	G	FX	10 MM	1 MM 8.0	4 MM	32.0	2 MY	16.0	1 MY	5.0	1 MY	5.0	10 MM	20.0	
Misc. Operational Exp.	G	LC		5.0		5.0		5.0	2 MM	16.0	2 MM	16.0	10 MM	20.0	
III. EQUIP. & FACILITIES															
Area #1 (High Humidity)															
Transport Trucks	G	FX	3	15.0	3	45.0								3	45.0
Assembly Point Const.	G	LC	6	5.0	6	30.0								15	30.0
Scales	G	FX	15	0.5	15	7.5								15	7.5
Crop Dryers	G	FX	3	5.0	15	15.0								15	15.0
Materials Bags & Tools	G	LC	6 Sets	.5	6 Sets	3.0								15 Sets	3.0
Tractor/Trailers	G	FX	3	20.0	33	60.0								3	60.0
TOTAL GRANT*(FX)						213.5		43.0		43.0		43.0			342.5
TOTAL GRANT (LC)						43.0		25.0		25.0		25.0			118.0
7% Inflation (YR 2-4)	G	FX						3.0		6.2		9.7			18.9
18% Inflation (YR 2-4)	G	LC						4.5		9.8		16.1			30.4

^{1/} About 33% is Local Cost (i.e., Field Enumerators, Clerical Services, Local Consultants)

* Totals do not include inflation. See Footnote, Table 1. See supplementary data in Table 10 of this Annex.

ANNEX M TABLE 3 - INDIRECT GOB CONTRIBUTIONS (\$000's)
(Disbursements by Project Year)

<u>Description/Year</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>Total</u>
1. <u>COST OF LAND</u>					
STU Foundation Seed Farm	84.2				84.2
warehouse for Fertilizer	83.2				83.2
Research Laboratory	0.5				0.5
	0.5				0.5
2. ADB Headquarter (Small Farmer Loans department) ^{2/}	4.2	4.9	5.2	6.9	21.2
3. Interest Payments on Commercial Loans to GFC ^{3/}	560.9	626.1	632.6	639.1	2458.7
<u>Total Indirect GOB Contribution</u>	<u>649.3</u>	<u>631.0</u>	<u>638.4</u>	<u>646.0</u>	<u>2564.7</u>

^{1/} Derived from Table 29

^{2/} 1% Inflation rate assumed per year.

^{3/} This considers the interest rate (13%) which GFC pays on commercial loans it receives.

ANNEX B TABLE 9 - DETAILED LIST OF CONTRIBUTIONS OF DONORS

ITEM	UNITS	AMOUNT (000's)	\$ EQUIVALENT IN 000's
1. Land ^{1/}			
(a) JMU Foundation See' Farms ^{2/}	319 Acres	95.7	23.2
Fumasi	80	24.0	20.9
Tamale	89	26.7	23.2
Winneba	150	45.0	39.1
(b) Warehouse for Fertilizer	2 Acres	0.5	0.5
(c) Research Station (Laboratory)	2 "	0.5	0.5
2. ADB Headquarter (Small Farmer Loan Department) ^{3/}	-	4.8	4.2

^{1/} Assumes the purchase price of land to be £300 per acre.

^{2/} Estimates are based on existing acreage. The land committed to foundation see' production may increase over time in pace with increased demand requirements

^{3/} Assumes a rent charge of £400 per month.

ANNEX M - Table 10
Summary Data to Detailed Financial Plan*
(\$000 disbursements by Project Year)

COMPONENT AND ITEM	Loan, Grant, or GOG	Local Currency or FX	Total No. Units	Unit Cost	YEAR 1		Total
					No. Units	Cost	
<u>Credit Expansion</u>							
Vehicles	G	FX	2	10.0	2	20.0	20.0
Furniture and appliances	G	FX	2 sets	13.4	2 sets	26.8	26.8
<u>Fertilizer</u>							
Vehicle	G	FX	1	10.0	1	10.0	10.0
Furniture and appliances	G	FX	1 set	13.4	1 set	13.4	13.4
<u>Seed Multiplication</u>							
Vehicles	G	FX	2	10.0	2	20.0	20.0
Furniture and appliances	G	FX	2 sets	13.4	2 sets	26.8	26.8
<u>Research</u>							
Furniture and appliances	G	FX	3 sets	13.4	3 sets	40.2	40.2
<u>Extension</u>							
Vehicles	G	FX	1	10.0	1	10.0	10.0
Furniture and appliances	G	FX	1 set	13.4	1 set	13.4	13.4
<u>Marketing</u>							
Vehicle	G	FX	1	10.0	1	10.0	10.0
TOTAL						190.6	190.6

* This provides for vehicles, furniture and appliances for long-term U.S. consultants. These amounts were not included in Tables 1-9 detailing each component. The amounts are included in the Summary Table which follows (Table 11).

MIDAS DISBURSEMENTS BY COMPONENTS AND SOURCES OF FUNDS (\$000)
(disbursements by Project Year)

Component and Source of Funds	Phase I		Phase II		Total Phase I	Total Phases I & II
	Year 1	Year 2	Year 3	Year 4		
<u>I. Credit Expansion</u>	904.3	1013.0	1207.0	1337.0	1917.3	4461.3
GOG	300.0	550.0	800.0	1050.0	850.0	2700.0
Grant	254.8	208.0	32.0	32.0	462.8	526.8
Loan	349.5	255.0	375.0	255.0	604.5	1234.5
<u>II. Fertilizer</u>	7983.7	2316.6	7137.6	7708.3	10300.3	25146.2
GOG	1206.3	1368.6	637.6	708.3	2574.9	3920.8
Grant	277.4	198.0	-	-	475.4	475.4
Loan	6500.0	750.0	6500.0	7000.0	7250.0	20750.0
<u>III. Seed Multiplication</u>	672.2	960.2	1560.6	986.0	1632.4	4179.0
GOG	219.2	546.3	1105.5	815.3	785.5	2686.3
Grant	375.3	285.5	249.0	75.5	660.8	985.3
Loan	77.7	128.4	206.1	95.2	206.1	507.4
<u>IV. Research</u>	428.7	346.5	305.5	305.5	775.2	1386.2
GOG	66.5	66.5	66.5	66.5	133.0	266.0
Grant	362.2	280.0	239.0	239.0	642.2	1120.2
<u>V. Extension</u>	419.5	366.4	392.2	411.0	785.9	1589.1
GOG	218.6	260.9	291.7	322.5	479.5	1093.7
Grant	200.9	105.5	100.5	88.5	306.4	495.4
<u>VI. Marketing</u>	266.5	68.0	68.0	68.0	334.5	470.5
Grant	266.5	68.0	68.0	68.0	334.5	470.5
<u>VII. Small Farm Equipment</u> (2 Raw Materials for Production of Intermediate Technology-- Loan)	0.0	1939.4	2918.9	2649.8	1939.4	7508.1
	0.0	1939.4	2918.9	2649.8	1939.4	7508.1
<u>VIII. Short-term Technical Assistance</u>						
Fund	175.0	75.0	75.0	75.0	250.0	400.0
Grant	175.0	75.0	75.0	75.0	250.0	400.0

(cont.)

MIDAS DISBURSEMENTS BY COMPONENTS AND SOURCE OF FUNDS (\$000)
(Disbursements by Project Year)

Component and Source of Funds	Phase I		Phase II		Total	Total
	Year 1	Year 2	Year 3	Year 4	Phase I	Phases I & II
IX. SUB-TOTAL	<u>10849.9</u>	<u>7085.1</u>	<u>13664.8</u>	<u>13540.6</u>	<u>17935.0</u>	<u>45140.4</u>
A. Direct GOG Contributions	2010.6	2792.3	2901.3	2962.6	4802.9	10666.8
B. Grant	1912.1	1220.0	763.5	578.0	3132.1	4473.6
C. Loan	<u>6927.2</u>	<u>3072.8</u>	<u>10000.0</u>	<u>10000.0</u>	<u>10000.0</u>	<u>30000.0</u>
1. Non-Generating	<u>427.2</u>	<u>1133.4</u>	<u>581.1</u>	<u>350.2</u>	<u>1560.6</u>	<u>2491.9</u>
2. Generating	6500.0	1939.4	9418.9	9649.8	8439.4	27508.1
X. Indirect GOG Contributions	<u>649.3</u>	<u>631.0</u>	<u>638.4</u>	<u>646.0</u>	<u>1280.3</u>	<u>2564.7</u>
XI. GRAND TOTAL*	<u>11499.2</u>	<u>7716.1</u>	<u>14303.2</u>	<u>14186.6</u>	<u>19224.3</u>	<u>47705.1</u>
(Grand total including inflation)	(11499.2)	(8379.2)	(15629.9)	(16292.3)	(19878.4)	(51800.6)
A. Total GOG Contribution (GOG contribution including inflation)	2659.9 (2659.9)	3423.3 (3926.0)	3539.7 (4678.2)	3608.6 (5513.8)	6083.2 (6585.9)	13231.5 (16777.9)
B. Grant (Grant including inflation)	1912.1 (1912.1)	1220.0 (1301.0)	763.5 (867.5)	578.0 (699.7)	3141.1 (3213.1)	4473.6 (4780.3)
C. Loan (Loan including inflation)	6927.2 (6927.2)	3072.8 (3152.2)	10000.0 (10084.2)	10000.0 (10078.8)	10000.0 (10079.4)	30000.0 (30242.4)

* Figures in parentheses are totals including inflation. Inflation here is calculated only on GOG direct costs because (a) land for various facilities is purchased in year 1 and (b) inflation allowances were included in calculation of other indirect costs. See Annex M, Tables 8 and 9. Inflation on loan costs is calculated here only on non-local currency generating items (i.e., excluding bulk fertilizer and small farm equipment) because (a) inflation allowances were included in projected price of fertilizer per ton and (b) imports of small farm equipment will be at a specific dollar value rather than specific items of equipment.

ANNEX M - Part II
Table 12

PROJECT FINANCIAL PROJECTIONS

USAID/GHANA
Project #0067, MIDAS
GRANT ACTIVITY

	U.S. Dollar Costs (\$000)			U.S. Financed Outputs (Obligations in \$000)		
	OBLIGATIONS	EXPENDITURES	UNLIQUIDATED	MAJOR OUTPUTS	ESTIMATED	
					Through 9/30/76	FY 77
Estimated Through 9/30/76	1854.2	1196.5	657.7	1. An efficient fertilizer procurement, handling, blending and distribution system operating nationwide	329.5	159.8
Estimated FY 77	1363.0	1429.0				
Estimated Through 9/30/77	3217.2	2625.5	591.7	2. An expanded and improved seed production, testing and distribution system operating nationwide	504.6	308.5
Estimated FY 78	819.3	1188.4				
Estimated FY 79	743.7	966.3		3. An expanded and efficient small farmer credit program operating nationwide	298.0	157.5
Estimated Through 9/30/79	4780.2	4780.2	- 0 -	4. A small farm systems research capability instituted and functioning within the EMA	120.2	344.3
				5. An improved understanding of the structure and functioning of the food crop marketing system in Ghana and experience with alternative assistance approaches to traditional market channels	241.0	101.0
				6. An improved capability of the extension system to demonstrate to large numbers of small farmers the profitability of adopting improved farm practices, seeds, fertilizer and on-farm storage	185.9	126.9
				Sub-total	1579.2	1288.0
				7. General short-term technical assistance fund	175.0	75.0
				TOTAL	1854.2	1363.0

Table 13

PROJECT FINANCIAL PROJECTIONS

USAID/GHANA
PROJECT #0067, MIDAS
GRANT ACTIVITY

	U.S. Dollar Costs (\$000)			U.S. Financed Inputs (Obligations in \$000)		
	<u>OBIGATIONS</u>	<u>EXPENDITURES</u>	<u>UNLIQUIDATED</u>		<u>ESTIMATED</u>	
					<u>Through</u>	<u>FY 77</u>
					<u>9/30/76</u>	
ESTIMATED THROUGH 9/30/76	1854.2	1196.5	657.7	1. Technicians, Advisors and Consultants	939.6	762.0
ESTIMATED FY 77	1363.0	1429.0		2. Construction and Surveys	25.0	20.0
ESTIMATED THROUGH 9/30/77	3217.2	2625.5	591.7	3. Vehicles	233.0	40.0
ESTIMATED FY 76	819.3	1188.4		4. Equipment, Materials and Supplies	468.6	355.0
ESTIMATED FY 79	743.7	966.3		5. Participant Training	105.0	110.0
ESTIMATED THROUGH 9/30/79	4780.2	4780.2	-0-	6. Local Salaries and Miscellaneous	83.0	76.0
					<u>1854.2</u>	<u>1363.0</u>

Table 14

PROJECT FINANCIAL PROJECTIONS					
PROJECT: 0067 NIGAS		UNRAID/GHANA			
SUBBANT - ACCRUED EXPENDITURES (\$000)					
COMPONENT	Subent No.	Grant Incl. Inflation	Loan	Inflation On Loans	TOTAL
Fertilizer	1	489.3	20,750.0	52.5*	21,291.8
Seed Multiplication	2	1,058.4	507.4	60.3	1,626.1
Credit Expansion	3	553.2	1,234.5	129.6	1,917.3
Ag. Research	4	1,228.2			1,228.2
Marketing	5	519.8			519.8
Demonstration/Extension	6	531.3			531.3
Exports of Small Farm Equipment	-	-	7,508.1	0**	7,508.1
General Short Term Technical Assistance Fund	-	400.0	-	-	400.0
TOTAL		<u>4,780.2</u> =====	<u>30,000.0</u> =====	<u>242.4</u> =====	<u>35,022.6</u> =====

* This figure represent inflation on imports of mixing equipment. Inflation on fertilizer is estimated and included in per ton prices. See Annex C, Table C-35.

** Imports of small farm equipment are based on a dollar value rather than specific piece of equipment.

PROJECT FINANCIAL PROJECTIONS

OUTPUT NO.	USAID/GHANA									
	SUMMARY - OBLIGATIONS AND ACCRUED EXPENDITURES BY OUTPUTS									
	OBLIGATIONS					EXPENDITURES				
	Year 1	Year 2	Year 3	Year 4	TOTAL	Year 1	Year 2	Year 3	Year 4	TOTAL
	Thru 9/30/76	FY 1977	FY 1978	FY 1979		Thru 9/30/76	FY 1977	FY 1978	FY 1979	
1 - Grant, Incl. Inflation Loans	329.5	159.8			489.3	123.3	184.2	121.8		489.3
Inflation on Loans	7,250.0		6,500.0	7,000.0	20,750.0	6,500.0	750.0	6,500.0	7,000.0	20,750.0
Sub-Total	7,579.5	212.3	6,500.0	7,000.0	21,291.8	6,683.3	986.7	6,621.8	7,000.0	21,291.8
2 - Grant, Incl. Inflation Loans	504.8	398.5	133.2	22.1	1,058.4	313.3	325.9	346.3	72.9	1,058.4
Inflation on Loans	206.1		206.1	95.2	507.4	77.7	128.4	206.1	95.2	507.4
Sub-Total	710.7	407.5	369.2	138.7	1,626.1	391.0	463.3	582.3	189.5	1,626.1
3 - Grant, Incl. Inflation Loans	298.0	157.5	75.2	22.5	553.2	119.8	194.2	161.5	77.7	553.2
Inflation on Loans	604.5		375.0	255.0	1,234.5	349.5	255.0	375.0	255.0	1,234.5
Sub-Total	902.5	175.4	504.5	334.9	1,917.3	469.3	467.1	590.8	390.1	1,917.3
4. Grant, Incl. Inflation	120.2	344.3	268.0	495.7	1,228.2	110.2	330.5	273.7	513.8	1,228.2
5. Grant, Incl. Inflation	241.0	101.0	136.4	41.4	519.8	109.0	192.3	78.6	139.9	519.8
6 - Grant, Incl. Inflation	185.9	126.9	131.5	87.0	531.3	185.9	126.9	131.5	87.0	531.3
Unallocated Loan, Imports of Small Farm Equipment: Loans	1,939.4		2,918.9	2,649.8	7,508.1		1,939.4	2,918.9	2,649.8	7,508.1
Short Term Technical Assistance Fund--Grant	175.0	75.0	75.0	75.0	400.0	175.0	75.0	75.0	75.0	400.0
GRAND TOTAL	11,854.2	1,442.4	10,903.5	10,822.5	3,5022.6	8,123.7	4,581.2	11,272.6	11,045.1	35,022.6

Table 16

	<u>OBIGATIONS</u>					<u>EXPENDITURES</u>				
	<u>Year 1</u> <u>Thru 9/30/76</u>	<u>Year 2</u> <u>FY 1977</u>	<u>Year 3</u> <u>FY 1978</u>	<u>Year 4</u> <u>FY 1979</u>	<u>TOTAL</u>	<u>Year 1</u> <u>Thru 9/30/76</u>	<u>Year 2</u> <u>FY 1977</u>	<u>Year 3</u> <u>FY 1978</u>	<u>Year 4</u> <u>FY 1979</u>	<u>TOTAL</u>
FUND										
Grant, Incl. Inflation	1,854.2	1,363.0	819.3	743.7	4,780.2	1,196.5	1,129.0	1,188.4	966.3	4,780.2
Loans	10,000.0		10,000.0	10,000.0	30,000.0	6,927.2	3,072.8	10,000.0	10,000.0	30,000.0
Inflation on Loans		79.4	- 84.2	- 78.8	242.4		79.4	84.2	78.8	242.4
GRAND TOTAL	11,563.6	1,442.4	10,903.5	10,822.5	35,022.6	8,123.7	4,581.2	11,272.6	11,045.1	35,022.6

Table 17

PROJECT : 0067 NIDAS COMPONENT : FERTILIZER INTERVENTION: GHANA FERTILIZER COMPANY	USAID/GHANA ACCUMULATED EXPENDITURES (\$000)				
	Year 1	Year 2	Year 3	Year 4	TOTAL
EXPANDED COST COMPONENTS					
GRANT FUNDED:					
FASA - Fertilizer Marketing/Dist. Specialist	12.0	72.0	60.9		144.9
FASA - Demonstration/Trials Specialist	12.0	72.0	60.9		144.9
FASA - Fertilizer Specialist	79.0	-	-		79.0
FASA - Consultants	38.9	22.0			60.9
Vehicles	10.0				10.0
Participant Training	16.0	16.0			32.0
Training Aids, Materials and Supplies	15.4	2.2			15.4
TOTAL GRANT FUNDED	<u>183.3</u>	<u>184.2</u>	<u>121.8</u>		<u>489.3</u>
LOAN FUNDED:					
Fertilizer Mixing Equipment		750.0			750.0
Fertilizer	<u>6,500.0</u>		<u>6,500.0</u>	<u>7,000.0</u>	<u>20,000.0</u>
TOTAL LOAN FUNDED	<u>6,500.0</u>	<u>750.0</u>	<u>6,500.0</u>	<u>7,000.0</u>	<u>20,750.0</u>
7% Inflation on Loan Foreign Exchange		<u>52.5</u>			<u>52.5</u>
GRAND TOTAL	<u>6,683.3</u>	<u>986.7</u>	<u>6,621.8</u>	<u>7,000.0</u>	<u>21,291.8</u>

Table 18

EXPANDED COST COMPONENTS	USAID/GHANA				TOTAL
	ACCUMULATED EXPENDITURES (\$000)				
	Year 1	Year 2	Year 3	Year 4	
GRANT FUNDED:					
TS Contracts	24.0	195.9	168.9		388.8
Materials and Supplies	26.8				26.8
Vehicles W/spares	61.5	44.4	95.0	50.8	251.9
Farm Machinery	175.0				175.0
Participant Training	26.0	85.6	82.4	22.1	216.1
TOTAL GRANT FUNDED	313.3	325.9	346.3	72.9	1,058.4
LOAN FUNDED:					
Equipment	77.7	128.4	206.1	95.2	507.4
7% Inflation on Loan Foreign Exchange		9.0	29.9	21.4	60.3
GRAND TOTAL	391.0	463.3	582.3	159.5	1,626.1

Table 19

PROJECT : 0067 MIDAS COMPONENT : CREDIT EXPANSION INSTITUTION: AGRICULTURAL DEVELOPMENT BANK		USAID/GRAMA ACCUMULATED EXPENDITURES (\$000)				
EXPANDED COST COMPONENTS	Year 1	Year 2	Year 3	Year 4	TOTAL	
GRANT FUNDED:						
IS Contract - Farm Loan Specialist	6.0	72.0	66.9		144.9	
IS Contract - Training Specialist	35.0	72.0	37.9		144.9	
IS Contract - Short Term Consultants	16.0	34.2	36.7	55.2	142.1	
Vehicles	20.0				20.0	
Participant Training	16.0	16.0	20.0	22.5	74.5	
Materials and Supplies	26.8				26.8	
TOTAL GRANT FUNDED	119.8	194.2	161.5	77.7	553.2	
LOAN FUNDED:						
Vehicles w/Spares	223.5	115.0	235.0	115.0	688.5	
Equipment And Supplies	126.0	140.0	140.0	140.0	546.0	
TOTAL LOAN FUNDED	349.5	255.0	375.0	255.0	1,234.5	
7% Inflation on Loan Foreign Exchange		17.9	54.3	57.4	129.6	
GRAND TOTAL	469.3	467.1	590.8	390.1	1,917.3	

Table 20

PROJECT : 0057 MIDAG		USAID/GHANA			
COMPONENT : AGRICULTURAL RESEARCH		ACCRUED EXPENDITURES (\$000)			
INSTITUTION : MINISTRY OF AGRICULTURE, PLANNING DIVISION					
<u>EXPANDED COST COMPONENTS</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>TOTAL</u>
GRANT FUNDED:					
TECHNICAL ASSISTANCE					
TS Contract - Farm Systems Specialist		74.9	80.1	155.8	310.8
TS Contract - Agronomist		74.9	80.1	155.8	310.8
TS Contract - Farm Storage Specialist		74.9	80.1	155.7	310.7
Consultants	40.0	31.1			71.1
Vehicles W/Spares	30.0	10.0			40.0
Equipment And Supplies	40.2	10.7	5.7	18.1	74.7
Participant Training		48.0	18.5	8.0	74.5
Surveys (Supervisors/Enumerators)		6.0	9.2	20.4	35.6
	110.2	337.5	273.7	513.8	1228.2

Table 21

PROJECT : 0067 MIDAS		USAID/GHANA				
COMPONENT : MARKETING		ACCRUED EXPENDITURES (\$000)				
INSTITUTION : BANK OF GHANA DEVEL. FINANCE DIVISION/PRIVATE TRADERS						
		<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>TOTAL</u>
<u>EXPANDED COST COMPONENTS</u>						
GRANT FUNDED:						
Surveys - Local Contracts		54.0	28.9	30.9	33.1	146.9
Assembly Point Construction (FAR)		30.0				30.0
Consultants			37.0	40.7	98.5	176.2
Vehicles		20.0	95.0			115.0
Equipment and Supplies			25.5			25.5
Misc. Operating Expenses		5.0	5.9	7.0	8.3	26.2
TOTAL		109.0	192.3	78.6	139.9	519.8

Table 22

PROJECT : 0067 MIDAS		USAID/GHANA				
COMPONENT : DEMONSTRATION/EXTENSION		ACCRUED EXPENDITURES (\$000)				
INSTITUTION : UNIVERSITY OF GHANA/MINISTRY OF AGRICULTURE						
		<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>TOTAL</u>
EXPANDED COST COMPONENTS						
GRANT FUNDED:						
Establishment of Home Demo. Centres (FAR)			21.4	22.9	24.5	68.8
Participant Training			31.1	35.6		66.7
Lab. Construction	8.7	-	-	-		8.7
Vehicles W/Spares	110.0	42.8	45.8	49.0		247.6
Equipment, Supplies, Seeds and Fertilizer	55.2	19.8	15.4	1.7		92.1
Conduct Training Workshops (FAR)	4.0	4.0	4.0	4.0		16.0
Support for Univ. Staff (Field Visits, Surveys, etc.)	8.0	7.8	7.8	7.8		31.4
TOTAL		185.9	126.9	131.5	87.0	531.3

Annex N
Evaluation Criteria

ANNEX N -- Evaluation Criteria for Follow-on Assistance

The following criteria for measuring project progress are taken from the project paper. Phase II assistance including the second \$10 million loan will depend on the progress made against these criteria during Phase I. (The evaluation of Phase I progress will include development of similar criteria for assessing progress under the second \$10 million loan.)

Credit

1. Establishment and functioning of the ADB small farm credit department and 15-19 new Farm Loan Offices (FLO's).
2. A total of 10,000-14,000 additional small farmers (cultivating 10 acres or less) using agricultural production credit.
3. An operational staff training program. A total of at least 15-19 senior project officers and 30-38 junior loan officers trained and staffing the new FLO's.
4. Bad debts and debt delinquency each not exceeding 10-12 percent of scheduled repayments.
5. Effective loan supervision by the ADB of individual and group farmers. Each new FLO should be staffed by a junior project officer responsible for input/product marketing. He will liaise with and be supported by MOA extension staff.

Fertilizer

1. Establishment and operation of a bulk handling and bagging facility by the GFC, bagging fertilizers in quantities appropriate for both small and large scale farmers. Projected capacity of GFC is included in Annex C, Tables C-35 and C-36.
2. Establishment and operation of an advance fertilizer procurement system.
3. Establishment and operation of a nationwide fertilizer distribution system involving participation of private and/or commercial firms. Projections of the number and locations of these firms are provided in the agreement between the GOG and GFC which will become a condition precedent in the loan agreement.
4. Phase-down of price subsidies on fertilizers purchased by small farmers. Projected rate and level of subsidy phase-down will be included in a schedule submitted as a condition precedent to the loan agreement.
5. Evidence that GFC is a commercially viable institution, including, for example, the use of a fertilizer wholesale and retail price structure reflecting regional distribution cost differentials.

6. Establishment and functioning of a system to effect the timely rebate of fertilizer price subsidies from GOG to the GFC.

7. Improved coordination between the GFC and the MOA's research and extension divisions, relative to the production of and extension of information on appropriate fertilizers for small farm conditions.

Seed Multiplication

1. Installation and operation of seed processing facilities at one foundation seed farm and at one certified seed farm. The seed facility should be bagging seeds in quantities appropriate for both small and large scale farmers. Projections of the quantities of seeds to be produced are provided in Annex C, Table C-41.

2. Establishment and operation of an expanded seed distribution system involving the participation of private and/or commercial firms, e.g., GNTC, BP, AGIP, Shell, UAC, UTC and/or other private marketing outlets. The agreement between the GOG and the MOA/SMU which will become a condition precedent in the loan agreement will provide projections of the total SMU seed supplies to be distributed by private and/or commercial firms.

3. Phase-down of price subsidies on seeds purchased by small farmers. Projected rate and level of subsidy phase-down are included in schedule submitted as a condition precedent to loan agreement.

4. Improved coordination within the MOA among SMU, research and extension divisions relative to the production and extension of information on appropriate seeds for small farm conditions.

Extension/Demonstration

1. A minimum of 300 additional agronomic/fertilizer demonstrations per year on small farmer plots.

2. An improved data collection and evaluation system for agronomic/fertilizer demonstrations.

3. More effective outreach of extension agents through closer coordination at working levels with CIDA-Guelph-assisted extension officer training programs, FAO-assisted field trial and planning programs, USAID-assisted field trials programs, ADB loan and marketing officers, GFC's sales promotion programs, and the MOA's research division.

4. Establishment and operation of approximately 8-10 new farm/home demonstration centers.

5. A total of about four training workshops conducted by the Department of Home Science, University of Ghana, for the MOA's home extension agents.

6. Installation and operation of equipment at laboratory/workshop at Department of Home Science.

Research

1. Establishment and operation of one research station in the MOA.
2. Implementation of work schedules, studies and surveys in support of MOA's small farm system research program.
3. Effective coordination between MOA's research unit and ADB, GFC, SMU, UG/Department of Home Science and the MOA's extension division and home extension unit.

Marketing

1. Completion of baseline survey of the small farmer marketing situation in the pilot area.
2. Marketing agents selected and provided credit. Number of agents and projected number of farmers to be served will be determined in baseline survey of pilot area.

Other

1. Continued and effective functioning of Permanent Coordinating Committee.
2. Continued GOG commitment to small farmer development.
3. Request from GOG for continued AID support.
4. Evidence that average production and incomes of farmers served by FLO's are increasing at rates regarded to be commensurate with those projected in the economic analysis of the PP and with the more refined projections or targets to be developed by USAID/Ghana, the MOA/DERPS and the ADB's research departments for Phase I, from additional baseline data which will be collected early in project implementation.

Annex 0
Projected Supply and Demand
for Food

Annex 0

Table 1 -- Estimates of Supply, Demand and Import of Food in Ghana
(000 tons)

	Year	0	5	10	15	20
1. Total production without project (see Table 3)						
A. Grains		871.0	893.0	976.6	1067.7	1167.3
B. Starches		5906.0	7359.9	9171.8	11429.8	14243.6
2. Total production with project (1 plus 3)						
A. Grains		871.0	1138.7	1459.4	1584.6	1688.5
B. Starches		5906.0	7630.7	9735.5	12009.4	14827.6
3. Incremental production due to project (p.121, PP)						
A. Grains		0	245.7	482.8	516.9	521.2
B. Starches		0	270.8	563.7	579.6	584.0
4. Incremental production as a <u>1/</u> percentage of total production						
A. Grains		-	21.6	33.1	32.6	30.9
B. Starches		-	(27.5)	(49.4)	(48.4)	(44.6)
			3.5	5.8	4.8	3.9
			(3.7)	(6.1)	(5.1)	(4.1)
5. Projected consumption requirement (p.121, PP)						
A. Grains		1019.4	1206.2	1418.2	1673.2	1973.8
B. Starches		5223.6	5932.6	6741.5	7649.7	8680.3
6. Projected demand for food <u>2/</u>						
A. Grains		1070.4	1266.5	1489.1	1756.9	2072.5
B. Starches		5223.6	5932.6	6741.5	7649.7	8680.3
7. Import requirement <u>3/</u>						
A. Grains		199.4	127.8	29.7	172.3	384.0
B. Starches		(199.4)	(373.5)	(512.5)	(689.2)	(905.2)
		-682.4	-1698.1	-2994.0	-4359.7	-6147.3
		(-682.4)	(-1427.3)	(-2430.3)	(-3780.1)	(-5563.3)
8. Imports as percent of demand for food <u>4/</u>						
A. Grains		18.6	10.1	2.0	9.8	18.5
B. Starches		(-)	(29.5)	(34.4)	(39.2)	(43.7)
		-13.1	-28.6	-44.4	-57.0	-70.1
		(-)	(-24.0)	(-36.0)	(-49.4)	(-64.1)

1/ Figures in parentheses refer to without project (i.e., #3 as % of #1)
2/ Includes an additional 5% for livestock consumption of grains (starches are rarely fed to livestock in Ghana). The figures have not been deflated to account for previous years' stocks because the food distribution corporation which is required to carry stocks handle only 1% of total production and consequently their stocks are negligible. There is also only a minimal inter year stock holding by

private traders who handle the bulk of total marketable surplus of food.

- 3/ Figures in brackets refer to demand that is met by imports without project. The negative figures for starches means amount above consumption that can be exported.
- 4/ The negative figures for starches means percentages above consumption that can be exported.

REMARKS

Table 1 shows that there will be an excess demand for grains in Ghana over the 20 year period 1976-1995 whereas over the same period there will be an excess supply of starches. Based on the demand and supply estimates (Table 1) there will be the need to, on the average, import about 37% of the grain demand of Ghana. This figure, however, reduces significantly to an average of 12% with the implementation of the MIDAS project.

Conversely the country will be capable of exporting an average of about 43% of the starch demand of the country and this will increase to about 50% with the implementation of the MIDAS project. This picture of the food demand and supply situation implies the need for GOG to direct more attention to grain production in order to accelerate the rate of exclusion of grain importation.

Table 2 -- Estimates of Domestic Production Growth Rates ^{1/}

<u>YEAR</u>	<u>GRAINS</u>		<u>STARCHES</u>	
	Production in 000's tons	Percent Change	Production in 000's tons	Percent change
1971/72	701		5235	
1972/73	723	3	4672	-11
1973/74	799	10	5468	17
1974/75	817	2	5906	8
Modal Domestic Production Growth Rate			2.5%	6%
Effective Rate ^{2/}			1.875%	4.5%

^{1/} Derived from Table 1

^{2/} Assuming 75% achievement of growth rate due to weather and disease hazards as well as price shifts.

Table 3 --Projection of Total Domestic Production (in 000's tons) ^{1/}

<u>YEAR</u>	<u>GRAINS</u>	<u>STARCHES</u>
Base Year=1975	817.0	5906.0
1976	831.7	6171.8
1977	846.7	6449.5
1978	861.9	6739.7
1979	877.4	7043.0
1980	893.2	7359.0
1981	909.3	7691.1
1982	925.7	8037.2
1983	942.3	8398.9
1984	959.3	8776.9
1985	976.6	9171.8
1986	994.1	9584.6
1987	1012.0	10,015.9
1988	1038.2	10,466.6
1989	1048.8	10,937.6
1990	1067.7	11,429.8
1991	1086.9	11,964.1
1992	1106.5	12,481.6
1993	1126.4	13,043.3
1994	1146.6	13,630.2
1995	1167.3	14,243.6

^{1/} Derived from Table 2

TABLE 4 -- National Production Parameters (1971-75)
(000 tons)

	<u>Total Domestic Production</u> ^{1/}					<u>Two Year Averages of Production</u>			
	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1971/72</u>	<u>1972/73</u>	<u>1973/74</u>	<u>1974/75</u>
<u>GRAINS</u>									
Maize	378	383	410	468	430	380	396	439	449
Millet	120	97	106	127	135	108	101	116	131
Sorghum	174	149	164	148	146	161	156	156	147
Rice	49	51	63	71	68	50	57	67	69
Pulses	<u>100</u>	<u>97</u>	<u>127</u>	<u>133</u>	<u>131</u>	<u>98</u>	<u>112</u>	<u>130</u>	<u>132</u>
TOTAL GRAINS	821	777	870	947	910 ^{2/}	797	822	908	928
				LESS SEEDS AND WASTE		<u>701</u>	<u>723</u>	<u>799</u>	<u>817</u>
<u>STARCHES</u>									
Cassava	2350	2769	2776	3483	3550	2559	2772	3129	3516
Plaintain	3230	1632	2026	2121	2140	2431	1825	2073	2130
Yams	895	649	671	849	880	772	660	760	864
Cocoyams	<u>1800</u>	<u>636</u>	<u>1302</u>	<u>1356</u>	<u>1375</u>	<u>1218</u>	<u>969</u>	<u>1329</u>	<u>1365</u>
TOTAL STARCHES	8275	5686	6775	7809	7945 ^{3/}	6980	6230	7291	7875
				LESS WASTE AND SEEDS		<u>5235</u>	<u>4672</u>	<u>5468</u>	<u>5906</u>

^{1/} Source: DAP page 85 and Agricultural Attache's (Lagos) Report, January 1976

^{2/} Assumes 12% for waste and seeds for grains

^{3/} Assumes 25% for waste and seeds for starches

Annex P

Projected Supply and Demand for Credit

SMALL FARMER DEMAND FOR CREDIT IN GHANA

The demand of the traditional small farmer (cultivating 10 acres or less) for credit in Ghana largely depends on the quantity of hired labor he will have to secure for production. In effect, his credit demand is a function of the size of family labor available to him and the additional labor he will have to hire, especially during peak production season. The reason for this high correlation between labor and credit is that under existing traditional technologies, labor is the most important variable input of production in the same way as land is the most important fixed asset of the farmer.

By making improved inputs (seeds, fertilizer, small farm equipment) available to the small farmer under the MIDAS project, we are increasing the farmer's demand for credit beyond that needed/ to cover labor costs. Of course, the extent to which these improved technologies will be adopted depends, among other things, on the extent to which credit is available to the small farmer participating in the program. Though it is difficult to establish a benchmark for small farmers' credit demand, estimates of the increased demand resulting from the MIDAS project can be made on the basis of the assumption that the increased demand for credit is a function of the improved inputs made available under the project, mathematically expressed as

$$D_c = f(F, S, T), \text{ where } \begin{array}{l} D_c \text{ is increased demand for credit} \\ F \text{ is fertilizer required per holding} \\ S \text{ is seeds required per holding} \\ T \text{ is technology to be used on each holding} \end{array}$$

From Table I below it can be seen that small farmer demand for credit will increase by ₵ 83.81 and ₵ 71.86 an acre in Southern and Northern Ghana, respectively. Table II shows the impact of the MIDAS project to increasing credit availability to small farmers.

Table I--Incremental Credit Requirement Under MIDAS (in €)^{1/}

	<u>Southern Ghana</u>	<u>Northern Ghana</u>
At constant farm size ^{2/} _{3/}	293.35	323.37
At increased farm size	377.16	431.16
Per acre	€ 83.81	€ 71.86

1/ Derived from Table 12, Economic Analysis of MIDAS PP

2/ Farmers bring 95% of their existing holding (3.5 acres in the South, and 4.5 acres in the North) under improved practices

3/ Farmers bring 95% of existing holdings under improved practices and expand holdings by 1.0 acres and 1.5 acres in the Southern and Northern Ghana, respectively

NOTE: That the MIDAS project is aimed at achieving footnote 3/.

Total number of holders in Ghana = 857,000
 Total number of small farmers (cultivating less than 10 acres) = 82% of total holders
 = 0.82 x 857,000
 = 702,740

Projected number of farmers to be reached under MIDAS

Year 1	4,500
2	14,500
3	28,500
4	48,000
5	68,000
6	88,000
7	103,000
8	113,000
9	118,000

Total number of small farmers presently served under ADB's "Group Scheme"
 = 35,000

Hence, number of small farmers not receiving ADB credit
 = 702,740 - 35,000
 = 667,740

Percent of total small farmers receiving ADB credit under the "Group Scheme"
 = $\frac{35,000}{702,740} \times 100$
 = 5%

Table II--Incremental Projection of Impact of MIDAS on Small Farmers Not Receiving ADB Credit

<u>Year</u>	<u>Projection of Farmers</u>	<u>%</u>	<u>Plus 5% of 'Group Scheme' farmers</u>
1	4,500	0.7	5.7
2	14,500	2.2	7.2
3	28,500	4.3	9.3
4	48,000	7.2	12.2
5	68,000	10.2	15.2
6	88,000	13.2	18.2
7	103,000	15.4	20.4
8	113,000	16.9	21.9
9	118,000	17.8	22.8

In effect, the MIDAS project will enable ADB to expand the number of small farmers serviced by the bank to increase from 5% to about 23% in nine years. The remaining 77% of small farmers will have to continue to receive credit from other sources existing presently (e.g., the Ghana Co-operative Bank, money lenders, relatives and friends).

drafted: AChinbuah, 3/10/76