

UNCLASSIFIED

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

43,

PROJECT PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

BANGLADESH: Fertilizer Storage Project

AID-DLC/P-2193

UNCLASSIFIED

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

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AID-DLC/P-2193
August 23, 1976

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: BANGLADESH - Fertilizer Storage Project

Attached for your review is the recommendation for authorization of a loan to the People's Republic of Bangladesh of not to exceed five million, two hundred and fifty thousand United States dollars (\$5,250,000) to assist in financing the foreign exchange and local currency costs of providing materials and services for a fertilizer storage project.

This loan is scheduled for consideration by the Development Loan Staff Committee on Thursday, August 26, 1976, at 2:00 p.m. in Room 3886 New State. If you are a voting member a poll sheet has been enclosed for your response.

Development Loan Committee
Office of Development Program Review
and Evaluation

Attachment:
Summary and Recommendations
Project Analysis

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

TO BE COMPLETED BY ORIGINATING OFFICE

1. TRANSACTION CODE (X) APPROPRIATE BOX)
 ORIGINAL CHANGE
 ADD DELETE

PP
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2. COUNTRY/REGIONAL ENTITY/GRANTEE
BANGLADESH

4. PROJECT NUMBER
388-0030

5. BUREAU
A. SYMBOL **ASIA** B. CODE **04**

3. DOCUMENT REVISION NUMBER

6. ESTIMATED FY OF PROJECT COMPLETION
FY **78**

7. PROJECT TITLE - SHORT (STAY WITHIN BRACKETS)
 FERTILIZER STORAGE

8. ESTIMATED FY OF AUTHORIZATION/ORLIGATION
 A. INITIAL **8 TO** B. FINAL FY **TO**

9. SECONDARY TECHNICAL CODES (MAXIMUM SIX CODES OF THREE POSITIONS EACH)
011 063

10. ESTIMATED TOTAL COST (\$000 OR EQUIVALENT, \$1 = **Tk 15**)

A. PROGRAM FINANCING	FIRST YEAR			ALL YEARS		
	B. FY	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL (GRANT)	651	4599	5250	651	4599	5250
(LOAN)	()	()	()	()	()	()
OTHER 1. 388-11-190-002	-	-	-	(82)	-	(82)
U.S. 2.						
HOST GOVERNMENT	-	1750	1750	-	1750	1750
OTHER DONOR ()						
TOTALS	651	6349	7000	651	6349	7000

11. ESTIMATED COSTS/AID APPROPRIATED FUNDS (\$000)

A. APPRO- PRIORITIZATION CODE	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE	FY 77		FY 78		ALL YEARS					
			D. GRANT	E. LOAN	F. GRANT	G. LOAN	H. GRANT	I. LOAN	J. GRANT	K. LOAN		
FN	133	013		5250								5250
TOTALS				5250								5250
ESTIMATED EXPENDITURES					2630		2620					

12. PROJECT PURPOSE(S) (STAY WITHIN BRACKETS) CHECK IF DIFFERENT FROM PID/PP

To increase small farmer agricultural production.

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

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: *Joseph S. Toner*

TITLE: **Joseph S. Toner, Director, USAID/Bangladesh**

DATE SIGNED: **MO. 06 DAY 18 YR. 76**

15. DATE RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MO. 06 DAY 30 YR. 76

AID 1330-4 (5-75)

BANGLADESH
FERTILIZER STORAGE PROJECT
PROJECT PAPER

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** Annex B can be obtained from ASIA/PU/SA, telephone 235-8910.

BANGLADESH
FERTILIZER STORAGE PROJECT

Definitions of Rates, Weights and Terms

Currency

U. S. Dollar \$1.00 = Taka 15.00

Weights

One Maund = 82.2 pounds

Metric Ton (MT) = 2,204.6 pounds (26.82 Maunds)

Fertilizers

Ammonium Sulphate = AS

Triple Super Phosphate (0-46-0) = TSP

Muriate of Potash = MP

Urea = 46% N

Nitrogen = N

Complex fertilizers containing, in any combination, Nitrogen,
Phosphorous and Potassium = N-P-K

Rice Seasons - Approximate

Aus season (about one-third of the total paddy acreage).

Aus seeding is done between mid-March and beginning May;
the crop is harvested between beginning July and mid-August.

Aman season (nearly 60 percent of the total paddy acreage).

Seedlings are raised in June-July; the crop is harvested
between mid-November and end-December.

The Boro (winter) crop. Seeds are planted from November on;
the crop is harvested between the end of April and May.

Government Administrative Data

Districts	= 19
Thanas	= 422; size about 10-15 square miles
Unions	= 4,000 (plus); about 10 per Thana
Villages	= Several per Union

Organizations

Bangladesh Agricultural Development Corporation (BADC) - Government Corporation responsible for supplying all agricultural inputs.

Bangladesh Chemical Industries Corporation (BCIC) - Government Corporation including domestic fertilizer manufacturing among other responsibilities.

Bangladesh Inland Water Transport Corporation (BIWTC) Government common carrier for water transport.

Integrated Rural Development Program (IRDP) - Government agency charged with rural development, principally directed through multipurpose cooperatives.

Thana Central Cooperative Associations (TCCAs) - Thana level cooperative groups sponsored by IRDP.

Terms

Godown - warehouse.

Small Farmer - Bangladeshi farming not more than two acres, including all land owned, rented and sharecropped by him and by members of his immediate family.

BANGLADESH
FERTILIZER STORAGE PROJECT

Part I. Project Summary and Recommendation

A. Recommendation

Loan in Transitional Quarter \$5,250,000

(Terms: 40 year repayment including 10 year grace.
Two percent interest during grace period, three percent
thereafter.)

NOTE: Eximbank has indicated no interest in the proposed loan.

B. Description of the Project

The project provides for construction of up to 50,000 metric tons (MT) of warehouse space for storage of fertilizer, including basic housing and office space, and related engineering and construction supervision services. The warehouses will be constructed at 62 sites in 13 Districts (see Annex B.1). Of the total number, 42 will be Thana level 500 MT capacity with three of 1000 MT also at Thana level where demand or logistics constraints require larger capacity than the basic 500 MT. The remainder will be at District or Intermediate level, eight at 1000 MT and nine at 2000 MT. The Bangladesh Government has recently approved a program to add 69,600 MT of fertilizer storage capacity within three years. In addition, another 282,800 MT is planned to be proposed for construction under the Second Five Year Plan. This project is an immediate response to the present need and will finance up to 50,000 MT of warehouses, and ancillary buildings, and related consultant engineering services.

Total project costs are estimated at \$7.0 million, including the \$5.25 million AID loan. The balance represents the contribution of the Government of Bangladesh (Government). Except for the costs of the expatriate consultant services, almost all costs will

be local in character. Construction will be financed under fixed-amount-reimbursement (FAR) terms, and the AID loan will finance 75 percent of the previously agreed costs for each warehouse facility. The Government in turn will agree to expend an equivalent amount of its own foreign exchange for procurement in the United States.

The principal implementing agency will be the Bangladesh Agricultural Development Corporation (BADC) with responsibility specifically assigned to the BADC Construction Division (see organization charts at Annex B.2). Actual construction will be undertaken for each warehouse compound (including ancillary buildings for office and housing) or number of compounds by local contractors selected under Government competitive procedures. AID will approve both terms of a standard contract and procedures for selection of the contractors. AID will also finance a contract between BADC and an expatriate-local joint venture consultant firm to provide engineering and construction supervision. Overall monitoring will be carried out by AID through the USAID Mission to Bangladesh (Mission).

The broader purpose of the project is to increase rural incomes, specifically for small farmers, through providing these farmers with improved access to fertilizer, an essential component to increase of crop production, employment and incomes. Construction of the additional warehouse space at the sites selected for the project will serve not only to clear existing blockages in fertilizer distribution, but also provide required storage space at the point in the system closest to the farmer, the Thana level. The combined result will be to increase availability of fertilizer to farmers generally, thereby reducing the chance of higher costs from short supply, and specifically benefitting the small farmer who tends to be particularly penalized at scarcity. In this connection, AID is currently working with BADC in a pilot program for improved fertilizer distribution with the particular purpose of meeting small farmer needs. As this pilot program evolves into a national fertilizer distribution system, the additional warehouse space built under this project will assist that purpose.

The completion of project will see up to 50,000 MT of new fertilizer warehouse space constructed at 62 sites throughout the country.

Achievement of the broader purpose of the project will be indicated through increased fertilizer flows through the system representing an increase from 1976-77 levels of 100 percent in fertilizer sales to small farmers, and a national increase in crop production totalling at least 12 percent over the life of the project.

C. Summary Findings

The requirement for increased fertilizer storage space on an emergency basis is clearly evident. In terms of the immediate need the timing for proceeding with construction this year is critical. Designs and estimates are prepared in draft, initial site and size selections have been made, the potential environmental impact is minimal, and the project is ready for implementation. (See Technical Analysis at Part III. A.)

The Financial Analysis and Plan at Part III. B. demonstrates a favorable financial return for the project and sets forth a detailed financial plan. The Social Analysis at Part III. C. concludes that the storage space constructed under the project will help to ensure that adequate fertilizer stocks are available in areas of shortage, thus acting to provide the small farmer with equal access to an essential agricultural input. The result will be to place him in a better relative position to the larger farmer who now has greater access in the scarcity areas. The Economic Analysis (Part III. D.) demonstrates both the return from fertilizer use for the small farmer and states the positive character of benefits to the small farmer from the project.

The project meets all applicable statutory criteria; the Statutory Checklist is attached at Annex F. The Mission Director has certified that Bangladesh has the capability to maintain and utilize the project effectively. See Annex G.

D. Project Issues

The principal project issue concerns AID involvement in local construction in Bangladesh. This issue derives from previous

difficulties in implementing such programs during the post-Independence relief period. Local construction projects encountered considerable monitoring and control problems in working to ensure adequate quality of local construction. The issue will be met in context of this project, however, through contribution of a larger Mission engineering staff, direct involvement of consultant engineering and construction supervision services, as well as through application of FAR as a vehicle for construction payments by AID. In addition, all conditions with respect to project procedures and responsibilities on the part of the Government will be specifically detailed in the loan agreement and implementation letters at the outset of the project.

E. Project Committees

USAID Project Committee

Robert W. Nachtrieb, CDD, Chairman
Emory M. Howard, AGR
Allan W. Strom, ENG
Joseph F. Stepanek, PRO
William T. Oliver, PRO
Lauryn C. Drengler, CONT

AID/W Project Committee

SER/ENGR; Wendell Anderson
ASIA/TR/ARD, Russell W. Bierman
ASIA/SA/BIS, Steve F. Wallace
ASIA/PD/SA, Rufus A. Long
GC/ASIA, Peter Bloom

Part II. Project Background and Detailed Justification

A. Background

The AID commitment to this project is a reflection of broader concern with the need for growth in Bangladesh rural incomes and related increases in food production. It also, however, directly derives from the continuing AID contribution since Independence to meeting Bangladesh requirements for fertilizer inputs 1/, a contribution which is likely to continue into the foreseeable future. See projections at Annex B.3. There is no question of the importance of fertilizer as an essential input to basic rural development in Bangladesh. A detailed discussion of this requirement is set forth at Annex B.4, but in summary it concludes that given constraints on expansion of cultivatable area, crop and rural income increase have to be achieved through higher yields. In immediate terms, this translates as a continuing requirement for fertilizer. The availability of HYV seed is a corollary input, but one which depends upon fertilizer, which itself can be applied to both HYV and local varieties.

The immediate background to this project dates from May 1976, when the Bangladesh Government determined that it could not proceed with the proposed FY 1976 \$30.0 million Agricultural Inputs Project III. This decision was taken notwithstanding an initial BADC request, which was confirmed by a formal Government loan request as late as April 1976, and basic agreement on the project deriving from continual discussions going back to the preceding August. In making its decision, the Government cited storage constraints, that it simply did not have sufficient storage for the projected 1976-77 demand.

The project analysis for the Agricultural Inputs Project III 2/ had specifically recognized the contingent requirement for

1/ A total of 178,321 MT of urea; 231,590 MT of TSP; 40,000 MT of rock phosphate; and 10,000 MT of MP. Financing was provided under the AID Relief and Rehabilitation Grant and Agricultural Inputs Loans I and II (388-T-001 in FY 1974 and -002 in FY 1975).

2/ See draft Project Paper for FY 1976 Agricultural Inputs Project III, March 1976.

increased fertilizer storage space, and reflected this in both the draft conditions precedent and covenants for the loan agreement. Under these terms, the Government was obligated to acquire and construct necessary additional warehouse capacity to meet the requirements of the project. This statement in fact reflected a strengthening of the condition as a result of AID/ Washington project review and the revised condition was accepted by BADC. The late decision not to proceed with the project reflected a strong underlying concern and apprehension on the part of the Government with respect to its ability to meet these obligations, and the conclusion that it could not.

This project is in direct response to that decision and the evidence of concern which that represents. Given the extreme scarcity of Bangladesh resources and particularly of foreign exchange, a decision not to proceed with a \$30.0 million loan on the point of authorization is compelling evidence of concern and need.

With respect to the development of the storage requirement, the determinations as to site and size are based on two factors. First of these is to provide additional space at the Thana level, the terminal point of the BADC distribution system, the point at which fertilizer is put into the hands of the private sector (the dealers) for sale to the farmers 3/. Second, is to put additional required space at points within the BADC system above Thana level which are chronic points of delay in the system. In most cases, the Thana level warehouses are of the 500 MT type, although in three instances 1000 MT capacity buildings are to be constructed at the Thana level. This is necessary where, for example, either projected demand exceeds the reasonable capacity of the smaller warehouse or where logistic conditions are such that during the monsoon the Thana becomes inaccessible. Since the rains also coincide with the principal peak of fertilizer demand, the aman crop 4/, such additional Thana capacity is essential to adequate supply in certain parts of the country.

3/ See description of fertilizer distribution system at Annex B. 5.

4/ See Annual Cropping Calendar at Annex B. 6.

There have been several studies in recent years in Bangladesh which have treated with or touched upon fertilizer, the fertilizer distribution system and the requirement for storage. First of these was the Bangladesh Transport Survey (BTS) 5/ which among its other analyses dealt with the flow of fertilizer through the country. The BTS made the point that fertilizer movement in the present pattern is "broadly rational" from the large warehouses to the District level, but "relies heavily on congested routes and transshipment points". The siting of the larger warehouses under this project is designed to meet the need for clearing the bottlenecks at precisely those points, at least 17 of the most critical.

At the same time, a study conducted by the Tennessee Valley Authority (TVA) 6/ also dealt with the question of fertilizer flows and the effect of storage on the requirements of this movement. The TVA Report conclusions are discussed in more detail in Part III. A. below, but in general the findings on this point were too broad to be of immediate practical use in arriving at firm recommendations with respect to site and size of storage. In consequence of this, the lenders under the Ashuganj Fertilizer Project (Ashuganj) 7/ agreed to have a study carried out to determine an optimum distribution system for fertilizer, including storage requirements, for a 10 year period. 8/ After a number of delays, this study has just (May 28, 1976) been contracted with the Economist Intelligence Unit and associated firms, and is expected to be available in draft by November 1976 (Phase I) and February 1977 (Phases I and II). Once the study has been completed, under the terms of the Ashuganj Loan Agreement 9/, the Government is required to

5/ Bangladesh Transport Survey, 1974 (in draft). By the Economist Intelligence Unit under IDA financing.

6/ Bangladesh Fertilizer Situation, prepared for AID by TVA, October 1974.

7/ Ashuganj Fertilizer Project for construction of a urea and ammonia manufacturing complex. Total current cost estimated at approximately \$305.0 million, including \$190.0 million foreign exchange. Present AID Loan 388-T-003 for \$30.0 million based on original estimate.

8/ See Terms of Reference for Bangladesh Fertilizer Marketing and Distribution Project at Annex B. 7.

9/ Section 5.05 (b) of AID loan agreement 388-T-003 for the Ashuganj Fertilizer Project.

furnish to AID as well as to the other lenders (under terms of their agreements) the Government's program for improvement of fertilizer marketing and distribution, including additional storage. The agreements also provide that the Government, after consultation with the lenders, will implement a program for improvement of the fertilizer distribution and marketing system. Similarly, a study has also recently been completed for BADC by FAO/UNDP 10/in which blockages of fertilizer movement and limitation on turn-over at lower levels of the system are identified as main contributing constraints to the Government carrying out an expanded program for fertilizer distribution and use.

The Ashuganj Study is expected to be the definitive report with regard to the storage requirement, site and sizes. Given the immediate character, however, of at least a significant portion of this requirement and the eventual much greater order of the overall need 11/, there is a perceived necessity to proceed at this point with construction of the most essential of the storage requirement.

The Ashuganj Study addresses both site and size for required additional warehouse space, and the preliminary results (Phase I draft) in November 1976 will be in advance of final determinations for commencement of construction under the first phase (1976-77) of this project. 12/ The Phase II draft final report for the study in February 1977 will be well ahead of the final decisions required under this project for the second construction phase (1977-78). 13/ Notwithstanding the fortuitous coincidence of these dates, it is expected that the study results will confirm the priorities recorded under this immediate project, particularly with respect to Thana level warehouse space which

10/ A Survey on Constraints and Bottlenecks in the Distribution of Fertilizers from Thana Store to the Farmer by H. H. Scharling, FAO Fertilizer Programme Bangladesh, April 1976.

11/ See discussion under Part III. A. below and projections at Annexes B. 3. and B. 9.

12/ See Implementation Plan under Part IV. B. below.

13/ Ibid.

is to comprise the greater part of the first phase of construction. This basic storage, in view particularly of the limited character addressed by this project of the overall requirement, is expected to be reflected as an essential part of the broader pattern identified by the Ashuganj Study. 14/

The project essentially represents a portion of the overall 69,600 MT program approved for priority funding on June 10, 1976 by the Executive Committee of the Bangladesh Government National Economic Council, adjusted for change from 200 and 400 MT Thana level warehouses to 500 MT on the basis of demand and cost. The project is identical with and corresponds to the requirements set forth in the Government's request for the loan. 15/

B. Detailed Description

1. The broader sector goal to which the project is directed is an increase in Bangladesh small farmer income through increased crop production on land cultivated by small farmers during the 1977-79 crop years. Measurement will be through Government statistics coupled with joint AID-Government evaluations, AID field surveys and comparison of data from other agencies and donors. The goal will be achieved through a five percent increase in crop production in 1977-78 and seven percent in 1978-79. The achieving of the goal assumes that weather and flood conditions are temperate throughout both years, disease or pest infestation is within normal bounds, and that HYV seed is available and small farmer demand for such seed increases.

2.a. The purpose of the project is to provide small farmers with improved access to fertilizer, an essential component to increase of crop production and income. This will be measured by an increase of 100 percent over the base 1976-77 crop year in fertilizer sales to these small farmers. This purpose will be accomplished through construction of fertilizer warehouses at immediately critical points in the fertilizer distribution system,

14/ A follow-on Agricultural Inputs Support Project for \$14.3 million AID financing which includes an additional increment of the fertilizer warehouse continuing requirement, is currently being addressed in a Project Identification Document (PID) in context of the FY 1978 Annual Budget Submission (ABS).

15/ See Loan Request at Annex H.

clearing principal bottlenecks and providing adequate storage at Thana level where existing demand or logistics constraints have already indicated the need. In this connection, AID is already working with BADC to test and develop a program for more equitable distribution of fertilizer particularly aimed at the needs of the small farmer 16/. Both the pilot, the results of which are expected in the 1976-77 crop year to be applied nationwide, and this storage project, will give emphasis to and support the achievement of the same purpose - improvement in the income of the small farmer.

Principal assumptions to achieving the purpose are: continuing adequate supply of fertilizer through sustained or increased domestic production, together with continued fertilizer import financing by donors as needed; reduction of subsidies on the market price of fertilizer; an increase in the number of dealers entering the distribution system or expansion of their coverage; and no sharp increase in cross-border fertilizer demand that would divert fertilizer out of the Bangladesh market through smuggling.

b. The end of project status will see an increase of up to 100 percent over the base 1976-77 crop year in sales of fertilizer to small farmers, sales accomplished through private dealers at the same prices as paid by larger farmers. The project results will also reflect private dealers with inventories on hand to meet full demand at peak seasons, and substantial elimination of the black market.

3. Project outputs include construction of up to 50,000 MT of warehouse capacity, including office and housing space, at 62 separate sites. Of this number, 42 are at 500 MT capacity, 11 at 1000 MT and nine at 2000 MT. All of the 42 smallest size together with three of the 1000 MT warehouses are sited at the Thana level, the remainder at the District or intermediate levels. Local contractor construction services, as well as construction supervision by BADC are also included in the project. In addition

16/ See description of current fertilizer pilot distribution program at Annex B. 8.

the project finances engineering and construction supervision services of an expatriate-local joint venture consultant to review construction as well as designs, specifications and contracts. Finally, the project includes improvements in fertilizer ordering within the system, with transportation scheduled on a more timely basis in terms of movement requirements, and a reduction of losses and delays in the system.

4. a. The Bangladesh Government inputs include a local currency budget of \$1.75 million equivalent, representing 25 percent of total project costs and including: 25 percent of the direct costs of construction; land preparation; civil works related to main construction; locally available equipment and furniture; electrification and sanitary requirement costs; and an estimated 240 man-months of services of the BADC Construction Division assigned to the project for design, engineering, tendering and awarding of contracts, and supervision of construction.

b. The AID inputs include a loan of \$5.250 million of which up to \$4.450 million will be expended on a 75 percent FAR basis for costs of construction. The \$0.80 million balance of the loan will finance the costs of an expatriate-local joint venture consultant for monitoring of design, engineering, contracts and construction, as well as provide limited financing (approximately \$28,000) for vehicles to be imported specifically for support of the consultant (A limited program of six man-months training and 12 man-months technical assistance in improving central office-field system management and control of fertilizer movement and storage will be financed from separate AID funding. ^{17/} Except for the costs of the expatriate consultant and the limited import of equipment and materials, all costs are expected to be local in character.

^{17/} Funded under the AID Development Services and Training Grant to Bangladesh.

c. In event vehicles on a temporary basis cannot be supplied from local sources to meet the transportation needs of two field engineers, a waiver will be required to import two jeep vehicles from India. The expatriate engineers will be required at the outset of the project to review and approve all design and specifications and to supervise and inspect construction progress. The engineers will require transportation to perform these functions, such transportation is not expected to be available locally.

Procurement from the U.S. is estimated to require at least six months while Indian Jeeps can be delivered to Dacca within 60-90 days. It is essential to obtain the jeeps from India in order to avoid delaying the project.

5. The relationship between the inputs and outputs in direct. It proceeds from a basic storage requiremtn which affects the flow or availability of fertilizer at critical points to the farmer. The placing of these facilities should ensure both that principal blockages down the distribution line can be cleared, but also that there is storage available at the terminal point at the Thana level, once the flow is cleared further up the system. The connection between these inputs and the production income output is conclusive (see discussion of fertilizer role in Bangladesh at Annex B.4), with the principal assumption that fertilizer supply will be adequate to meet demand. This requirement is expected to be met through a related AID loan for agricultural inputs 18/, as well as through domestic production and other scheduled or expected imports.

18/ A Project Review Paper (PRP) has already been submitted to AID/Washington and approved for preparation of an FY 1977 Agricultural Inputs Project for \$26.0 million; a follow-on requirement is also being addressed in the FY 1978 ABS.

Part III. Project Analysis

A. Technical Analysis Including Environmental Assessment

1. Introduction

A total of up to 24,000 MT of required additional warehouse capacity has been identified at the Thana level; including 42 of 500 MT and three at 1000 MT. In terms of the discussion under Part II. B. above, this capacity is directed to meeting storage requirements at the terminal point in the distribution system identified through demand or logistics constraints. In addition, in addressing the need for clearing of critical flow points within the system, a further 17 sites have been recorded for an estimated capacity of up to 26,000 MT, including eight at 1000 MT and nine at 2000 MT. The total capacity therefore to be provided under the project is 50,000 MT at 62 sites. A table and map recording all sites and sizes is at Annex B. 1.

2. Relationship of the Project to Projected Overall Requirements

Several principal factors affect the overall requirement for storage space. The total utilization of fertilizer in the course of a year bears directly on storage requirements; however only a fraction of that amount normally will have to be stored at any given time. Fertilizer usage fluctuates seasonally. Stocks dwindle during peak buying periods, and accumulate during slack periods. Where in-country transport is not consistently available, greater stockpiling is required in proximity to the end-user to avoid shortages during peak periods. Similarly, to the extent supply from foreign and domestic sources cannot be timed to coincide with periods of demand, the shortage requirement must be increased to provide a buffer or reserve stock capacity.

In Bangladesh all such factors are **variable** and difficult to predict, and require a response in terms of a greater margin of storage if the system is to function at all. The following describes the process by which alternative fertilizer use and storage requirement projections were developed.

a. Fertilizer Demand Projections

The Bangladesh Government Five Year Plan (FYP) prepared in early 1974 contained a set of projections by BADC through 1977-78. In January 1976 BADC revised its FYP figures downward, the first two years revised to reflect actuals. The IBRD in the Ashuganj Appraisal Report 19/ contained an estimate through 1983 which was slightly more conservative than the original FYP figures. AID developed a third set for the Agricultural Inputs Project III 20/ based on projections of total acreage under cultivation and of sales adjusted to reflect adequate supply. All projections are summarized for comparison at Annex B. 9 with tables included for the three major types of fertilizer, urea, TSP and MP.

The projections which are reflected in the determinations for this project are based on the sum of the lowest of each of the alternative estimates for each fertilizer; thus the revised FYP figures for urea, the AID figures for TSP, and the revised FYP figures for MP were combined. See Annex B. 9., page 4.

b. Storage Requirement Projections

As in the case of the demand projections above, several alternative analyses were applied:

(1) One was to apply to the demand projections the ratio of current demand to current storage availability. The most recent estimate for fertilizer sales for 1976-77 totals 550,000 MT 21/; existing storage available, excluding port transit capacity, is approximately 286,000 MT 22/. The ratio of these figures is 1:0.52. Multiplying the combined fertilizer demand projections derived above by 0.52 results in the storage requirement figures in column c of Annex B. 10.

19/ Appraisal of Ashuganj Fertilizer Project - Bangladesh (Report No. 598-BD), dated December 18, 1974.

20/ See draft Project Paper, March 1976.

21/ BADC revised Five Year Plan projections, January 1976.

22/ Scheme for Construction of Fertilizer Godowns in Bangladesh prepared by BADC, as revised February 1976. Approved by the Executive Committee of the Bangladesh Government National Economic Council, June 10, 1976.

(2) The TVA Report (see Part II. A. above) followed a similar method in developing two sets of storage requirement figures, one "conservative" and the other "liberal". TVA first developed "conservative" and "liberal" projections of fertilizer usage for 1978-79 and 1983-84. The existing ratio of fertilizer use to storage capacity was then applied, less 10 percent for 1978-79 to account for improved logistical facilities, and 20 percent for 1983-84 for the same reason.

Figures for the intervening years were developed by AID through interpolation of the TVA figures. Both "conservative" and "liberal" sets began with 1973-74 actuals at 258,100 MT, and were developed from that point. Accordingly, both sets were adjusted downward to begin at 1976-77 with 286,000 MT, excluding port transit space. This is approximately the storage capacity available for fertilizer now.

(3) BADC in another recent project 23/ cites a storage factor of 35 to 45 percent of total fertilizer consumption. (The figures developed in paragraph (1) above use a factor of 52 percent.) To facilitate comparison, a mean figure of 40 percent was applied to arrive at the totals in column f of Annex B. 10.

(4) An additional alternative applied was to estimate the probable duration of the slack consumption periods, i. e., when seasonal demand is low. The amount of stockpiling likely or necessary during the slack period was estimated assuming that imports and domestic production both continued at a reasonably even pace.

The most extended slack period is that between the final top dressing of the boro crop and the initial applications for the aman 24/ Fertilizer demand during the intervening aus crop is relatively insignificant. This slack period is approximately four months, or 33 percent of the year. When the supply pipeline is steady (taking into account an average down-time factor for maintenance of domestic production facilities), approximately 33 percent of the total annual fertilizer supply will stockpile during that time. Adding ten percent to accommodate bunching of import arrivals, 43 percent of the total annual supply could reasonably accumulate during the slack period. See column g of Annex B. 10.

23/ Draft Interim Fertilizer Storage Project dated March 22, 1976.

24/ See Annual Cropping Calendar at Annex B. 6.

(5) A final analysis was then done predicated on a requirement for storage capacity sufficient to accommodate the peak seasonal demand for fertilizer. The major crop is the monsoon or aman crop. BADC attempts each year to stockpile sufficient fertilizer to satisfy the entire aman demand in order that success of the aman crop not depend on the chances of fertilizer arrivals or production during the crop period. Since the aman reserve is the largest stockpile required to meet demand, the storage system at a minimum must be able to accommodate it. The figures in column h of Annex B. 10 reflect an analysis based on this alternative. Aman reserve projections were developed by starting with the BADC aman reserve figures of 200,000 MT for 1976-77 and 222,000 MT for 77-78 and projecting an increase of 13.7 percent per year. Then, assuming that individual warehouses could at the maximum be filled to 90 percent of capacity, storage requirements as shown at column h of Annex B. 10 were developed for the projected aman reserve.

Annex B.10 summarizes the six sets of projections described above. Variations among the figures for each year are within reasonable limits, and the averages overall state a reasonable basis for the final projection. Starting with existing storage capacity of 286,000 MT in 1976-77, additional storage requirements are therefore estimated as follows:

TABLE - 1
ADDITIONAL STORAGE REQUIREMENTS

<u>Year</u>	<u>Projected Total Capacity Requirement</u>	<u>New Capacity Required Each Year</u>	<u>Total New Capacity Required</u>
1976-77	286,000(actual)	-	-
1977-78	293,500	7,500	7,500
1978-79	334,300	40,800	48,300
1979-80	373,300	39,000	87,300
1980-81	417,800	44,500	131,800
1981-82	463,500	45,700	177,500

In addition, a minimum of 20,000 MT of rented warehouse capacity should be replaced annually with BADC-owned warehouses designed and constructed for fertilizer storage. Thus the cumulative requirement for new construction would be 20,000 MT by the end of 1976-77; 47,500 at the end of 1977-78; 108,300 by 1978-79; 167,300 by 1979-80; 231,800 by 1980-81 and 297,500 by 1981-82. See Annex B.14.

c. Conclusion

A total of 50,000 MT of capacity is projected for construction during the two year life of this project. The project clearly addresses a critical and immediate need, and is consistent with a reasonable and conservative projection of construction requirements.

3. Construction Plans, Designs and Procedures

BADC has its own construction capability. The responsible unit is the BADC Construction Division which has 11 fulltime direct hire engineers on its staff for design and construction supervision. The Construction Division has also been authorized by the Government to recruit an additional 13 engineers, from whom an estimated 240 man-months is expected to be contributed to this project. BADC has the authority to let contracts to private local firms for construction services. Preliminary designs for all size warehouses to be constructed under the project have been completed by BADC. See Annex B.11. As discussed below under Part IV.A. Administrative Arrangements, the consultant will assist BADC in preparation of all designs, standard contract terms, bid procedures, selection of contractors and award of contracts, and will supervise construction to assure compliance with standards. On completion of a building the consultant will certify that it was constructed to specification and will certify the final cost.

The construction method to be used for the warehouses and ancillary buildings to be built under the project is the standard applied to construction of permanent buildings in Bangladesh: i. e. , brick and mortar walls, concrete reinforced columns and reinforced concrete roof. The alternative methods, corrugated iron sheeting, either total structure or roofing, wood, or jute fiber, are not considered suitable either on grounds of reduced durability (corrugated iron sheeting and wood) or delays and cost of required imported raw materials (jute fiber). Also, in connection with jute fiber construction, the existing technology is still limited and there are no private firms in the field. The traditional permanent construction standards, on the other hand, are widely understood and accepted and there is a large body of local contractors who could perform the work required. On balance, proceeding on the basis of these standards appears the most effective course. It reflects the stated preference of the Government, it offers the prospect of least delay, and it ensures a durable response to what is a long-term and continuing need.

Based on review of the preliminary site and size selections, designs and cost estimates, and considering the implementation procedures and approval requirements both for AID and the consultant to be financed under the project (see Parts II. B above and IV. A. following), the project is reasonable in terms of cost, technical requirements and planning. On this basis, the project meets the requirements of the Foreign Assistance Act, Sections 611(a) and (b).

4. Environmental Analysis

Given the limited area and non-manufacturing character of the buildings to be constructed under the project, and the wide dispersion of sites, it is not expected that the project will have any significant impact, adverse or beneficial, on the environment. See Environmental Assessment at Annex C. In addition, in context of the review and final approval of sites and designs for project implementation, the consultant will review each such site, and the effect of the design as it impacts on the site in terms of environmental requirements and will recommend to AID accordingly. In case of an environmental impact question, the AID Mission will raise the issue with BADC and in the case of significant impact will withhold approval for inclusion of the site in the project until the issue has been resolved to AID satisfaction.

B. Financial Analysis and Plan

1. Financial Viability

The cost of adequate storage is a cost associated with expanding fertilizer usage. Assuming a usable life of 20 years, an initial construction cost averaging Tk 1500 (\$100) per ton, an annual operating cost of \$10 per ton of capacity and an annual stock turnover of two times the cost of storage can be prorated against the fertilizer stored as follows:

An annual stock turnover factor of two times means two tons of fertilizer accommodated for each ton of storage capacity. With a usable life of 20 years, 40 tons of fertilizer will thus be stored

for each ton of capacity 25/. Distributing initial construction costs results in a cost per stored ton of Tk 37.50 (\$2.50). Recurring costs account for an additional Tk 75 (\$5.00) per stored ton, for a total of Tk 112.50 (\$7.50) per ton.

Adding this cost to the farm gate price of fertilizer increases the latter from \$291 to approximately \$299 per ton. This is the equivalent of \$648 per plant nutrient ton of fertilizer. Based on the results of 2719 field experiments conducted before Independence 26/, a ton of plant nutrient will yield a minimum of 5.9 tons of foodgrain. Therefore, an investment of \$648 for a ton of plant nutrient, including the costs of additional storage, will produce an additional 5.9 MT of rice. At current international prices, it would cost \$1003 to import 5.9 MT of wheat. Put another way, \$648 spent on fertilizer will yield 5.9 MT of rice; the same \$648 would buy only 3.8 MT of imported wheat.

Fertilizer to be applied, however, must be available; and to be available must be moved through points within the system and placed to reach the farmer in timely and adequate amount. This is the requirement for storage.

2. Recurring Budget Analysis

BADC estimates the cost of operation and maintenance of warehouses to be Tk 75 (\$5.00) per ton the first year increasing ten percent per year due to price escalation. It is estimated that storage facilities will be completed and turned over to BADC roughly as follows:

25/ USAID field reports on fertilizer sales in distribution pilot program Thanas indicate some godowns are experiencing stock turnover of up to twelve times annually. However, the most efficient use of the distribution system, particularly in view of the tenuous communications links to most outlying areas, calls for an annual turnover factor on the order of two times.

26/ See Table 13 for details.

TABLE 2

RECURRING COSTS OF WAREHOUSES

<u>Year of Project</u>	<u>Capacity Installed (MT)</u>	<u>Recurring Costs</u>	<u>FX Equivalent</u>
1976-77	25,000	Tk 1,875,000	\$ 125,000
1977-78	50,000	4,125,000	275,000
1978-79	50,000	4,537,500	302,500

BADC will include sufficient funds in its budget to cover the recurring costs of these as well as all other BADC warehouses. BADC's costs, both foreign exchange and local, are principally covered by revenue from fertilizer sales by direct Government allocation. Sales revenue depends on volume of sales and price; the Government allocation covers the remaining need for revenue.

3. Financial Plan and Budget Tables

TABLE 3

SUMMARY COST ESTIMATE AND FINANCIAL PLAN

Use	AID			BDG			TOTAL		
	FX	LC	Total	FX	LC	Total	FX	LC	Total
Const. Reimb.	-	4450	4450	-	-	-	-	4450	4450
Land, BADC Costs	-	-	-	-	1483	1483	-	1483	1483
Consultants ^{a/}	623	149	772	-	-	-	623	149	772
Vehicles	28	-	28	-	-	-	28	-	28
Project Equip.	-	-	-	-	50	50	-	50	50
Contingency	-	-	-	-	217	217	-	217	217
Training ^{b/}	(12)	-	(12)	(2)	-	(2)	(14)	-	(14)
Tech. Assist. ^{b/}	(70)	-	(70)	-	(20)	(20)	(70)	(20)	(90)
TOTAL	651	4599	5250	-	1750	1750	651	6349	7000

^{a/} Dollar cost estimate for consultants based on \$7400 per man month including salary, differential, overhead, fee, and other expenses.

^{b/} These components funded separately under the AID Development Services and Training Grant, and thus not included in project totals.

C. Social Analysis

1. Social-Cultural Feasibility

The present estimated population of Bangladesh is 78 million, of whom some 90 percent live in rural areas and are substantially dependent on agriculture or agro-related industries for their livelihood. Agriculture accounts for 61 percent of Bangladesh's gross domestic product, one of the highest ratios in the world. Despite this, yields per acre and per capita food production are among the lowest in Asia.

In terms of increasing agricultural production, the most important socio-cultural determinant is the land tenure system. By international standards all Bangladeshi farmers may be said to be small farmers, but within Bangladesh itself there are substantial economic differences between farmers with only marginal differences in land-holdings. Given the same quality of land, a three-acre farmer is much better off than one-and-a-half acre farmer and similarly a three-acre farmer in Comilla is better off than a three-acre farmer in Rangpur or the coastal polders.

Further, due to Moslem inheritance law, i. e. a ban on primogeniture, few farmers have contiguous holdings. All sons share equitably in the inheritance; daughters also share, but to a lesser extent. The process of inheritance and land acquisition through marriage has led to intensive fragmentation of holdings. Individual plot size averages one-third of an acre (a bigha). Thus a farmer with three acres is apt to have nine widely scattered plots. This leads to great inefficiency because inputs must be moved by the farmer over a wide area, costing him both time and transport charges.

Many farmers work land on a leased basis (borgha farming) in order to overcome some of these problems. Borgha can be done in a variety of ways. First, land may be leased from a better-off, sometimes absentee, landholder or a landholder who for family or other reasons is prevented from farming his own holding. Second, land may be leased from an owner whose plot is so small that it is uneconomical to be farmed separately. Or, farmers may temporarily trade among themselves without giving up title in order to achieve compact units to work.

There are large gaps in the information available about land tenure in Bangladesh. Two known factors, however, have important bearing on this project. First, the ownership of land, in terms of size and productivity, determines the social hierarchy of rural Bangladesh. Second, because of fragmentation, it is impossible to segregate small farmers as a separate group from large farmers on a geographic basis. Therefore, equal access by both small and large farmers is the most that can be achieved by this project.

The rural elites benefit greatly from the present system of fertilizer distribution. In times or conditions of fertilizer shortages, and in the absence of a free market mechanism, allocations are often based on political and social influence. The rural elites who are influential with Thana officials are ensured adequate supplies of fertilizer at subsidy prices whereas small farmers under these conditions may be faced with limited supplies or none at all. In such circumstances, the small farmer must buy at full cost or better on the black market, which operates because dealers are unable to make a sufficient profit under the existing Government system.

This project will serve to ensure that full stocks of fertilizer can be moved to and stored in the areas where fertilizer shortages occur regularly, thus ensuring availability and that small cultivators have equal access to this key element in the spread of HYV technology. Equal access will place the small cultivator in a better relative position to the larger farmer, who now has greater access in scarcity areas.

2. Spread Effects

As noted above under Part II. B. , AID is working currently with BADC on a system for improved fertilizer distribution through a pilot program with particular reference to the needs of small farmers ^{27/}, both small land holders and share croppers. The successful development and replication of this model hinges on two factors:

^{27/} See description of pilot program at Annex B. 8.

- a. sufficient fertilizer stocks, including reserves, to meet total aggregate demand, and;
- b. adequate stocks available to individual private dealers to meet total potential demand in their respective areas.

The Ashuganj Project 28/and prospective continuing AID assistance for agricultural inputs 29/address the first factor. Also, these future inputs loans will be tied to the application nationwide of the results of the BADC pilot program for improvement in the distribution system to small farmers. This project is closely related to the pilot and its replication depends upon the successful development of an overall distribution system.

A key factor, among others, in the choice of the pilot distribution areas was their comparative advantage in storage space at the Thana level, i. e. , successful implementation of the pilot is dependent on locally available supplies to meet potential demand. Replication of the pilot and thereby the spread of benefits is keyed to additional installed capacity in other Thanas. Our analysis shows that only 88 Thanas have adequate storage capacity, i.e. , 400 MT or better, to meet projected demand. This project will provide an additional 42 Thanas with 500 MT installed capacity, plus 1000 MT in three Thanas. The follow-on project, proposed for FY 1978 funding, will provide an estimate additional 110,000 MT of installed capacity 30/, which together with this project will meet the main Thana requirement for the term of the present projections through 1980-81. The Mission assumes that once the Ashuganj Study (see Part II.A. above) has been completed, the Bangladesh Government or other donors (the U.K. has already evidenced an interest) will install the remaining requirements. In the case of donors, this interest should be reinforced by the successful conclusion of the pilot distribution program and application of the system nationwide. Both this project and the follow-on will also install additional storage capacity at the District or Intermediate level to service the Thana warehouses.

28/ See footnote 7 above.

29/ See footnote 18 above.

30/ See footnote 14 above.

In summary, both this project and the pilot fertilizer distribution system are keyed to improve small farmer access to fertilizer; successful replication of the distribution model, and hence the spread of benefits, is dependent in large measure on the increased storage capacity at the local level provided under this project.

3. Social Consequences and Benefit Incidence

a. Access to resources and opportunities

Direct beneficiaries of the project are the BADC and private fertilizer dealers. The BADC will have additional, improved storage capacity for its main commodity, fertilizer, thus easing somewhat its distribution management problems. Fertilizer dealers are usually small merchants serving a limited area. Their ability to meet farmer demand for fertilizer on a continuous basis should provide them with direct economic benefits because they will be able to increase sales; their source of supply, the Thana warehouses, will be capable of larger total stock, thus reducing chances of shortages which in the final analysis can only hinder long-term growth of an economic dealer system. The need for additional personnel in the management of BADC's increased storage capacity, plus a faster turnover of stocks on both the part of BADC and the fertilizer dealers, may generate some small incremental employment in the rural areas.

The main purpose of the project, however, is to provide small farmers with improved access to modern inputs. Since the system is designed to increase availability, the small farmer will be paying slightly less in not having to purchase from the black market. For the time being, it is assumed that farmers will continue to rely on traditional and present institutional credit means. The AID Mission, however, is proposing to finance a small farmer credit program beginning in FY 1978, which will facilitate further small farmer access to modern inputs.

b. Employment

The general absence of farm machinery in Bangladesh almost guarantees an increase in on-farm labor proportional to the increase in fertilizer use. This does not mean that large

numbers of unemployed will have jobs. Rather, it means that the underemployment in farm families will be reduced. If in addition large farmers should increase their use of fertilizer significantly, more on-farm labor opportunities will be created.

c. Rural displacement, migration and urbanization

As noted above, a great deal remains unknown about the land tenure situation and trends in Bangladesh. Research into this field will be financed by AID under a separate activity. 31/

4. Statement on the Role of Women

It is highly unlikely that women will be involved in either the construction of fertilizer warehouses or administration of the fertilizer distribution system. This project will do very little directly towards integrating women into the national economy. The traditional attitudes toward women in rural Bangladesh are among the most, if not the most, conservative in the world. Aside from that of homemaker, low level jobs in the Family Planning Program, and occasionally teaching, there are few socially acceptable roles for rural women. Women will probably benefit principally or only as part of rural farm families, which together benefit from increased returns to farm labor as a result of the project. In this connection, some increase in women working in the fields has been noted by several observers, who attribute this to the higher employment effect of the modern inputs, HYVs and fertilizer. This project will reinforce that trend to the extent it is in fact taking place. In addition, the AID Mission is now working on addressing the possibility of AID assistance on a broader front to women in Bangladesh 32/, and this may also impact on or reinforce the potentially overall positive, if indirect, effect of this project to the same purpose.

31/ The AID Mission plans to finance a land occupancy study beginning in FY 1978. In the interim, TDY consultants will be financed under regional Project Development and Support funds to continue research in this area.

32/ See FY 1978 ABS PID for National Women's Academy for Integrated Programs.

D. Economic Analysis

1. Introduction

This includes a review of the benefits of the new seed technology in general as well as those attributable to fertilizer and to fertilizer storage. The economic returns to local and HYV varieties are documented by case studies conducted in 1975. Increases in yield per acre with varying fertilizer application rates and accompanying cost benefit ratios based on BADC figures are also presented. The benefits of fertilizer storage in general, and of improvements in the BADC storage and distribution system, are discussed in light of the on-going fertilizer pilot program 33/. Although adequate data are not available to provide a basis for a cost benefit analysis of incremental improvements in fertilizer storage, benefits are discussed in light of the improved timeliness and quantities of supplies, reduced losses, and the fertilizer pilot. The concluding sections of this economic analysis include the Balance of Payments Position and the Debt Service Requirements.

2. The Seed and Fertilizer Revolution

Following on the theoretical and strategy discussions in the Bangladesh Development Assistance Program, the high yielding varieties represent the principal vehicle for increasing agricultural production and for increasing the participation of the rural poor in the production process. The supply of chemical fertilizers is a basic ingredient for this revolution. The single most important characteristic of new seed is their high degree of responsiveness to increased applications of fertilizer; traditional seed varieties are relatively less responsive to modern chemicals. As important as the supply of credit, water, and institutional support are to success of the HYV seed, these other inputs remain secondary to that of the continuous and adequate supply of fertilizer.

The topography, weather and flooding patterns of Bangladesh, and the limitations they impose on transport and cropping,

33/ See Annex B. 8.

necessitate a fertilizer system that is more complex than would be the case in an equivalent geographic area in another country. The fertilizer system, particularly the scale and location of its warehouses, must maximize the availability of fertilizer at the terminals, i. e. nearest the farmers. The following case studies and cost benefit analyses of fertilizer response rates illustrate the private and social value of a modern fertilizer system.

3. Return to the Farmer

The farmer's decision to invest in fertilizer depends upon many considerations, the foremost among which is his expected return. In reviewing this question of return to farmers due to fertilizer use, a series of nine case studies are presented below. The cases examine small farmer holdings of one-half to two acres and growing local and HYV rice; these cases include three from the aman crop, two during the aus, and six from the boro crop. The cases are primarily from 1975, but also include 1974 and 1973 data. Eight of the studies were done by the AID Mission, and the ninth, which represents an averaging of 35 case studies, was done by CORR (Christian Organization for Relief and Rehabilitation). For each of the tables given below, the following measures have been followed:

1 acre	=	3 bigha
1 maund	=	40 seers = 82.29 pounds
1 seer	=	2.06 pounds
paddy	=	0.67 rice (approximate)

Furthermore, each revenue section has an upper and lower price range (i. e. Tk 100-150 and Tk 40 per maund, respectively); this variation has been borne out by experience in Bangladesh over the past two years. Comments, which follow tables, are based on the upper range revenue and net return figures presented.

TABLE 4

Returns from local variety aus (.6 acre), 1975

Modhupur Thana, Tangail District

Actual Costs:	Seed (local	Tk	128	
	Manure		25	
	Ploughing		20	
	Weeding		100	
	Harvesting		40	
	Total		<u>313</u>	
Revenue:	Yield 8 mds. @ Tk 100 per maund of paddy	Tk	800	
	@ Tk 40		320	
Net Return:	(Upper Range)	Tk	487	
	(Lower Range)		7	
Percentage Return on Cash Investment	(Upper Range)		155.6%	
	(Lower Range)		2.2%	

TABLE 5

Returns from HYV aus (.7 acre), 1975

Tangail Thana, Tangail District

Actual Costs:	Seed (HYV) - 10 sr. @ Tk 6/sr.	Tk	60	
	Urea - 36 sr. @ Tk 1.25/sr.		45	
	TSP - 20 sr. @ Tk 1.00/sr		20	
	Irrigation		45	
	Pesticide - none		-	
	Transplanting (family)		-	
	Ploughing (family)		-	
	Harvesting (family)		-	
	Total		<u>170</u>	
Revenue:	Yield 28 mds. @ Tk 100	Tk	2800	
	@ Tk 40		1120	
Net Return:	(Upper Range)	Tk	2630	
	(Lower Range)		950	
Percentage Return on Cash Investment:	(Upper Range)		1547.1%	
	(Lower Range)		558.8%	

TABLE 6

Returns from HYV aman (1.5 acres), 1974-75

Modhupur Thana, Tangail District

Actual Costs:	Seed (IR-8) (family)	Tk	-
	Urea - 15 sr. @ Tk 200/md.		75.00
	TSP - 10 sr. @ Tk 100/md.		25.00
	MP - 5 sr. @ Tk 60/md.		7.50
	Pesticide - 1/4 sr. @ Tk 16/sr.		4.00
	Transplanting		3.00
	Ploughing		3.00
	Seedling		40.00
	Irrigation - none		-
	Seeding		9.00
	Harvesting (family)		-
	Total		<u>166.50</u>
Revenue:	Yield 45 mds. @ Tk 100	Tk	4500.00
	@ Tk 40		1800.00
Net Return:	(Upper Range)	Tk	4333.50
	(Lower Range)		1633.50
Percentage Return on Cash Investment	(Upper Range)		2602.7%
	(Lower Range)		981.1%

TABLE 7

Returns from local aman (1.2 acres), 1974-75

Tangail Thana, Tangail District

Actual Costs:	Ploughing	Tk	42
	Seed (local)		280
	Weeding		10
	Harvesting		200
	Total		<u>532</u>
Revenue:	Yield 25 mds. @ Tk 100	Tk	2500
	@ Tk 40		1000
Net Return:	(Upper Range)	Tk	1968
	(Lower Range)		468
Percentage Return on Cash Investment	(Upper Range)		369.9%
	(Lower Range)		88.0%

TABLE 10

Returns from HYV boro (.6 acre), 1975

Actual Costs: Ploughing		Tk 120
Seedling		150
Urea - 50 sr. @ Tk 1.30/sr.		65
TSP - 24 sr. @ Tk 1/sr.		24
MP - 24 sr. @ Tk .75/sr.		18
Irrigation - Tk 6/.01 acre (= 6 x 66)		396
Weeding - 8 laborers x 3 times (= 24 @ Tk 5)		120
Pesticide (1 time sprayed)		15
Harvesting - 14 laborers @ Tk 5 + food (= 14 x 10)		140
	Total	1048
Revenue: Yield 15 mds. @ Tk 125		Tk 1875
@ Tk 40		600
Net Return:	(Upper Range)	Tk 827
	(Lower Range)	- 448
Percentage Return on Cash Investment:	(Upper Range)	178.9%
	(Lower Range)	- 42%

TABLE 11

Returns from IRRI Boro, 1974

Chauddogram Thana, Comilla District

Actual Costs: Irrigation (highly subsidized)		Tk 111
Fertilizer Urea - 2 mds. @ Tk 50/md		100
TSP - 2 mds @ Tk 40/md		80
MP - 1 md. @ Tk 30/md		30
Seed - 10 sr. @ Tk 100/md		25
Pesticide		51
Seed bed preparation		46
Ploughing		300
Transplanting		150
Weeding		150
Harvesting		120
Threshing		50
	Total	Tk 1213

Note: Average cost for deep tubewell scheme.

Revenue: Yield 50 mds. @ Tk 100		Tk	5000
	@ Tk 40		2000
Net Return:	(Upper Range)	Tk	3787
	(Lower Range)		787
Percentage Return on Cash Investment:	(Upper Range)		312.2%
	(Lower Range)		64.9%

TABLE 12

Returns from HYV Boro, 1973

Podrishipur Thana, Tangail District

(Average of 35 Farm Cases (costs per acre))

Actual Costs: Ploughing		Tk	45
Irrigation			69
Fertilizer			48
Seed HYV			37
Labor			95
	Total		<hr/> 294
Revenue: Yield 45.5 md. @ Tk 30		Tk	1365
	@ Tk 40		1820
Net Return:	(Lower Range)	Tk	1071
	(Upper Range)		1526
Percentage Return on Cash Investment:	(Lower Range)		364.3%
	(Upper Range)		519.0%

COMMENT

a. A review of these case data above suggests that the incentive to adopt HYV and use chemical fertilizer is high. For HYV, the net return is many times the cash expenditure. Although this sample is small, it does indicate that a return of three or four hundred percent is common, and that it can be considerably higher. Cash needs per acre ranged from a low of Tk 111 to a high of Tk 1746 for the fully costed case, with the average cash expenditure requirement per acre at approximately Tk 600. It is not known what proportion of these cash expenditures had to be borrowed. The cash burden of fertilizer purchases varied between 34 and 64 percent of total cash expenditure for the two cases of fertilizer purchased on the open market and between 7 and 17 percent for fertilizer purchased at Government prices.

b. These data reflect cash payments, and not an accounting of all implicit costs, or payments in kind. For this reason the term "Net Return" necessarily excludes returns to family labor, land, equipment and its own cash resources. As can be seen from this data, farm operations can be either completed by family labor and materials, or be hired or purchased, or (as is most typical) a combination of both. Because the data are not adjusted for this factor, the given rate of return on cash expenditure can only be suggestive of the fully-costed net profit level.

c. Because the "Net Return" covers all types of family cash expenses, it is very hard to tell how sensitive fertilizer use is to a continued decline of both fertilizer subsidies and paddy prices. Little work has been done in Bangladesh to estimate the minimum rate of return (with all cash and kind costs taken into consideration) at which farmers find it profitable to use HYV and chemical fertilizers. Very high paddy prices in the past three years have placed a premium on fertilizer, but these extreme levels are certainly over, at least for the present. The 1975-76 aman paddy prices were approximately in the range of Tk 40-70 per maund, the lowest in years. This paddy price decline followed the changes of Government from August 1975, and it is not possible to predict how long these prices will prevail. A return to Tk 100 level, however, is considered reasonably possible in this current year.

d. The average yields are 14 maunds per acre for the three local varieties, and 35 for HYV. The crude aggregate fertilizer yield response ratio (compared in maunds) averages out to be 1:22; if the high yield indicated in Table 6 is excluded, the ratio is about 1:15, still high. This rate probably reflects the importance of irrigation and the fact that the relatively small dosages generate increasing return at the margin.

e. The cases above are obviously crude estimates, given the extremely small sample and the fact that no control is included for the significance of irrigation, which is expected to be high. For example, there are indications that one in five crops is severely damaged by lack of water and one in three results in a poor crop due to limited water conditions. At the same time, however, the cases do reflect actual crop conditions and are illustrative of the potential benefits to farmers of fertilizer and HYV use.

f. Fertilizer Response Ratios - Results indicated in Table 13 below are based on some 2719 field experiments conducted before Independence. Fertilizer applications of nitrogen, phosphorous and potassium were applied, singly and in combination, on local rice varieties.

TABLE 13
INCREMENTAL INCREASE YIELD PER ACRE
BY CROP FROM THE APPLICATION OF N-P-K SINGLY AND

N-P-K (Nutrient lbs/Acre)	<u>IN COMBINATION</u> a/ (Pounds Per Acre)					
	Local Varieties					
	Aus	Response Ratio	Aman	Response Ratio	Boro	Response Ratio
0-0-0	1150	-	1150	-	1150	-
40-0-0	1576	10.6	1610	11.5	1679	13.2
0-40-0	1449	7.5	1472	8.1	1541	9.8
40-40-0	1886	9.2	1805	8.1	1725	7.2
40-40-40	2208	8.8	2047	7.5	1863	5.9

NOTE: As nitrogen application rates are increased beyond 40 lbs/acre, phosphate must be added to fully utilize the added increments of nitrogen.

a/ Dr. A. Alim, An Introduction to Bangladesh Agriculture, p. 184.

The response ratios are much higher with the HYVs, but since much of the small farmer production continues to be local variety, the more conservative ratios are accepted for purposes of this analysis.

The following tables compare the phosphate plant nutrient cost to the farmer, with both current estimates of low and high sales prices of paddy. This comparison is made for a range of response ratios from 1:3 to 1:8; that is, the input of one metric ton (MT) of plant nutrient will yield from 3 to 8 additional MT of rice. The response ratios would be higher for nitrogen (urea).

TABLE 14

COST/BENEFIT ANALYSIS COMPARING INCREMENTAL
SUBSIDIZED COST OF ADDITIONAL PHOSPHATE FERTILIZER
USE TO INCREMENTAL VALUE OF INCREASED RICE YIELDS
(In Metric Tons)

Product to Yield Ratio	Subsidized Phosphate Plant Nutrient Cost a/	Value of Paddy		Cost Value Ratio	
		High (\$300)	Low (\$150)	High	Low
1:3	163	900	450	5.5	2.8
1:4	163	1200	600	7.4	3.7
1:5	163	1500	750	9.2	4.6
1:6	163	1800	900	11.0	5.5
1:7	163	2100	1050	12.9	6.4
1:8	163	2400	1200	14.7	7.4

a/ BADC figure (1975).

TABLE 15

COST/BENEFIT ANALYSIS COMPARING INCREMENTAL
NONSUBSIDIZED COST OF ADDITIONAL PHOSPHATE FERTILIZER
USE TO INCREMENTAL VALUE OF INCREASED RICE YIELDS
(In Metric Tons)

Product to Yield Ratio	Nonsubsidized Phosphate Plant Nutrient Cost a/	Value of Paddy		Cost Value Ratio	
		High (\$300)	Low (\$150)	High	Low
1:3	631	900	450	1.4	0.7
1:4	631	1200	600	1.9	0.9
1:5	631	1500	750	2.4	1.2
1:6	631	1800	900	2.9	1.4
1:7	631	2100	1050	3.3	1.7
1:8	631	2400	1200	3.8	1.9

a/ Based on BADC figure (1975).

From the two tables, above, it is clear that it is financially beneficial under almost all the conditions indicated for farmers to use fertilizer. The exception is at the very low 1:3 and 1:4 product to yield ratios, coupled with the current lowest estimate value of paddy, and at full cost fertilizer. At the same time, however, to encourage fertilizer use, particularly among small farmers who have the least resources and greatest risk exposure, a return of at least 3:1 or better should be considered a base. With the current subsidized rates (Table 14, above) the benefits are obvious and that base level of return presents no issue except at the 1:3 product to yield ratio and low paddy value. As the subsidy is reduced, however, the threshold for a 3:1 return becomes much higher. At the current time, for example, on the basis of the low estimate value of paddy (\$150), the return to the farmer at full cost fertilizer does not reach even 2:1 at the highest of the yield to product ratios. (Table 15, above))

4. Fertilizer Storage - Introduction

The fertilizer storage system in Bangladesh is designed to serve the multiple needs of three rice crops each year, and jute, tea, oil, pulses, sugar, and minor crops. The annual floods during the summer make transportation difficult and require the positioning of stocks well ahead of demand in some areas. The inability of most farmers to transport fertilizer more than a few miles also requires a system that stores fertilizer in small warehouses in each of the country's 390 rural Thanas. As most farmers operate holdings of less than two acres, the ability to buy small amounts of fertilizer locally is of utmost importance.

Increasing fertilizer storage capacity with parallel improvements in fertilizer logistics are important if this system is to lead the process of agricultural modernization. The present storage system needs improvements in the following areas: storage space in quality warehouses, located in Thanas, supplied by adequate transit warehouses, and of sufficient size to supply expected demand, with reserves remaining on hand.

Much of the present storage capacity is rented. In fact some 180,000 MT out of a total capacity of 286,000 MT is rented from private owners. Because of the corrosiveness of chemical fertilizers private owners are reluctant to offer storage space to BADC. As a

consequence poor quality warehouses are the only types available and these in turn cause fertilizer to be damaged when dampened by leaky roofs and floods. Construction under the project will displace some of this inadequate rented capacity, and thereby improving the quality of the warehouse space and reducing the risk of both fertilizer and warehouse damage. Construction under the project will also expand storage capacity in those areas where the offtake storage space ratio is high and demand is projected to increase and where logistics constraints require dry season prepositioning or movement of adequate stocks.

Parallel with the project is the fertilizer pilot program noted above and described in Annex B. 8. Under this pilot, the public storage system is being complemented by a larger role for retail fertilizer dealers. These dealers are being permitted a more flexible relationship with respect to their Thana level sources of supply, and in turn will be more responsive to farmers. During 1976 these pilot Thanas will be used to test a flexible price mark-up for dealers, direct farmer access to Thana warehouses, the establishment of reserve stocks at the Thana level, and competition among dealers. All of these factors taken together will contribute to increased dealer responsiveness to the fertilizer needs of farmers. More competitive price regulations will direct dealers toward competing for customers and thereby should curtail artificial shortages and prices. Adequate locally available supplies, however, are essential to this purpose.

Given the fact that small farmers of Bangladesh farm 50 percent of the land but use only 4 percent of the fertilizer (based upon surveys conducted in 1975), there is dramatic potential for increased fertilizer use. The replication of the pilot program, coupled with improved storage, will create a fertilizer system responsive to more end-users applying larger amounts of fertilizer.

5. Fertilizer Storage

As shown in Section 3 above, the profitability of the new seed is clear. It is also clear that the identification of benefits attributable to one input by itself is not possible short of field trials that vary one input and hold the others constant. This has been done for

fertilizer applications but not for fertilizer storage. In theory, the introduction of fertilizer where not in use before contributes dramatically to yield increases and therefore to the benefit stream accruing to fertilizer storage. For this project, storage is already in place, although inadequate in quality or capacity; the project proposes incremental improvements in the existing system.

As discussed in Part II. A. above, the final sites and sizes of warehouses to be constructed during the two construction seasons (1976-77 and 1977-78) will be determined on the basis of the Ashuganj study. This determination will depend upon several factors including the quality of present warehouses; projected demand for fertilizer; areas where fertilizer offtakes as a ratio of fertilizer space are high and warrant additional capacity; areas where communications during the floods are difficult; and requirements for adequate movement within the system, particularly for servicing the Thana level.

Some of this new storage space will overlap with the fertilizer pilot project presently underway. This will enable the Mission to evaluate the integration of an improved public supply system with a larger role for private dealers.

The benefits attributable to this project are many, although by themselves they would be hard to quantify:

- Bottlenecks which occur in the supply of fertilizer have in the past contributed to scarce supplies, reduced yields, and black market prices. Ensuring supplies will prevent the social loss inherent in a black market climate.
- Increased fertilizer supplies will improve crop yields as will the ability to supply fertilizer types in their proper ratios.
- The timing of fertilizer is also critical in an economy where few farmers are able to purchase in advance for the lack of credit and private storage space.
- Space for reserve stocks of fertilizer is needed in each Thana to ensure that fertilizer is available on demand.

Each facet of this system can hypothetically be evaluated for its potential benefit.

The benefits of improved storage, for example, can be approached from the point of view of the farmer. The storage system contributes to improved timeliness, to the ratio of fertilizer supplies, to reduced risks by virtue of reserve stocks, and contributes to stable prices. Two of these benefits could be evaluated if data existed on the frequency with which yields suffered for the lack of adequate fertilizer supplies and from the lack of timely deliveries. The severe fertilizer market situation that occurred during 1974-75 created these kinds of private and social losses. By estimating the yield losses that occurred during this period it would be possible to estimate the value of improved Thana and supporting transit point storage units. These derived benefits would vary directly with the magnitude of the losses. Such data are not available, but the positive character of the benefits can reasonably be assumed for purposes of this project.

6. Bangladesh Balance of Payments Position

Bangladesh's balance of payments position, weak to begin with, has deteriorated steadily over the past three years. Foreign exchange reserves, which had grown to \$227 million in December, 1972, due principally to the fact that the import trade had been disrupted even more than exports, fell to \$86 million in February of 1973. Reserves were reported exhausted by mid-1974 and, accordingly, the July-December, 1974 import licensing program was drastically curtailed. Non-donor-financed imports, other than food, were cut from \$431 million in the first half of 1974 to \$293 million in the second. On August 1, 1975, reserves had recovered to the level of \$232 million sufficiently enough to allow the Government to lift some of its restrictive import processes.

Exports, which have never attained more than 80 percent of their pre-war level, fell back in FY 1974. While the Government had forecasted a 32 percent rise in FY 1975, the IMF after careful examination of the export picture, concluded that the actual increase was insignificant. FY 1974 non-food imports were less than 70 percent of prewar imports. To import even this reduced market basket, plus the increased volume of food imports needed, would mean at least a 30 percent import increase for FY 1975. The FY 75 and FY 76 balance of payments reflects essentially the same basket of imports, but at increased prices to the aid donors.

TABLE 16

BANGLADESH BALANCE OF PAYMENTS

(\$ Millions)

	<u>1975/76</u> <u>Est.</u>	<u>1976/77</u> <u>Projection</u>
Imports	- 1,420	1,350
Exports	330	405
Other	- 20	- 28
	<hr/>	<hr/>
Current Account Balance	- 1,110	- 973
Other Receipts and Payments	35	40
IMF	106	0
Debt Service	- 34	- 20
Change in Reserves	98	0
	<hr/>	<hr/>
Total External Capital Requirements	905	953
Disbursements from Aid Pipeline	501	473
Disbursements from New Commitments	404	480

a/ Source: IBRD March, 1976.

Unless there is a very marked increases in aid, Bangladesh will not be able to support so large a current account deficit. Only OPEC country aid could possibly be forthcoming in amounts large enough; thus far, however, aid from this source has been disappointing with only \$70 million estimated to have flowed in during FY 1975 from commitments already in place.

7. Debt Service Requirements

Bangladesh's debt service burden was only \$18 million in FY 1974, rising to only \$28 million in FY 1975, an indication of success thus far in getting aid on either grant or very soft loan terms with long grace periods, appropriate to its situation. Although we do not have an accurate estimate to the amount of former Pakistan debts that Bangladesh will finally assume under the current plan for debt division, the service burden will be very light, with creditors expected to reschedule at 84 percent grant element or better. On March 3, 1976, Bangladesh and the United States signed a rescheduling agreement, by which the Government assumed liability for almost \$88 million; the terms for repayment of Visible Project Loans called for a fifteen year grace period, 1.6 percent interest rate, and forty-year repayment schedule.

We expect that all donors will continue to provide assistance either on grant or concessional loan terms, as required by Bangladesh's status as one of the least developed countries in the world. Overall, we feel that the prospects for repayment of this \$5.25 million loan appear reasonable.

Part IV. Implementation Planning

A. Administrative Arrangements

1. Recipient

The Bangladesh Warehouse Corporation (BWC), a public (Government-owned) corporation under the Ministry of Jute, is by statute the designated agency for construction and coordination of all Government-financed warehouse space. The BWC, however, is at present exclusively concerned with warehousing for jute and general item public warehouses and does not become involved in specialty warehouse construction, e. g. for foodgrains, fertilizer, pesticides, railways, roads and highways, etc. The Government expects that eventually as warehouse construction requirements are broadly met and the BWC develops greater management skill, that all warehouse activity will be put under the BWC as the statute now contemplates. The Government does not see a role in this project, however, for the BWC. 34

BADC therefore will be the implementing agency for the Government and within BADC the Construction Division will have primary responsibility for the project. The Construction Division has an experienced staff of 11 qualified engineers and has been the responsible unit in BADC for all construction activity related to BADC work. See organization chart at Annex B. 2. In addition, as noted under Part III. A. above, the Division has been authorized by the Government to recruit 13 new hire engineers with an expected contribution of 240 new man-months to this project. Specifically on point of the requirements of this project, the Construction Division has been responsible for design, awarding of contracts and supervision of construction for over 100,000 MT of storage capacity throughout the country. Bangladesh construction standards are based on original British requirements and are fully adequate for purposes of this project.

Past difficulties experienced with local construction under the AID Relief and Rehabilitation Grant reflected in part a chronic lack of materials in the immediate post-Independence period, a shortage

34/ Source: Government of Bangladesh Planning Commission, June 1976.

which combined with sharp price escalation, gave rise to black marketing of materials and falsifying of construction reports to indicate construction had been carried out at certain standards when in fact it had not been. The first of these constraints, shortage of materials, is not now the case and nor is it expected to be over the term of this project. This will reduce the incentive to compromise construction quality. However, the requirement that work be done according to specification will be further reinforced through use of FAR as the vehicle for AID payment for construction.

The BADC Construction Division has the technical capability to do the job, including basic design, site selection and preparation, letting of contracts, and supervision of construction. The additional staff capabilities already authorized per above will be reinforced through AID-financed assistance as discussed below.

Local Bangladesh construction contractor capability is well established and widely available. In general, work is highly labor-intensive and contractors are often little more than labor managers, but experienced in construction and building. The keys to competent and acceptable work by these contractors are clear and agreed upon specifications, close supervision and monitoring, and payment conditions tied to performance. Each of these factors is addressed in the arrangements for implementation of the project.

Since all materials are available locally, contractors are expected to bid the work including supply of materials. To the extent such materials or specialized items are not available locally, AID will finance imports through procurement by BADC from AID Geographic Code 941 sources. This is expected to be a very small component of the project, if a component at all.

B. AID

The project will finance a joint venture expatriate-local engineering consultant firm to supervise construction and assist the BADC Construction Division meet its responsibilities under the project. The contract will provide for three expatriate engineers, two for full-time field work and one primarily at Dacca to work with BADC and AID, as well as local technical staff including engineers, three draftsmen and three surveyors. The contract for these services will

be between BADC and the firm, but will be financed under the loan. It is expected that these services will include approximately 84 man-months of expatriate engineering, 162 man-months for local engineers, a similar 162 man-months of local technical time (draftsmen and surveyors), plus 210 man-months of local staff support.

The role of this engineering consultant will be to work with the BADC Construction Division on a day-to-day basis, review and approve all designs and specifications, inspect and approve site selections, review the standard contract terms and conditions for the project, develop and review construction unit estimates, review contract awards, supervise and inspect construction progress, and advise the BADC Construction Division of shortfalls or problems. The consultant approvals of the standard contract terms and conditions, of designs and specifications, cost estimates, and issuance of certification of completed construction will be the principal source of data for AID monitoring of the project and for reimbursement. The consultant, by copies of reports to BADC, will keep AID advised of all progress and problems in carrying out the work.

The AID Mission will monitor progress of the project, including review and approval of the standard contract, of bid and award procedures, of designs and specifications and of cost estimates; and will reimburse the Government for completed construction: (a) in accordance with previously approved specifications and at the 75 percent share of the originally agreed costs; (b) upon issuance of completion certificate by the consultant confirmed by a minimum of 30 percent sample inspection by AID of completed construction. The Mission Engineering Office will be the principal staff responsible for project monitoring and the Project Officer will be an assigned direct-hire AID engineer. This monitoring requirement should be met without additional hire.

Payment of all costs, local and U.S. dollar, for the consultant will be from the proceeds of the loan (see discussion below, Part IV. B.). U.S. dollars disbursed for all local costs, both for the consultant and for reimbursement for completed construction, will be by direct U.S. dollar payment to the Bangladesh Government, which will in turn undertake to spend an equivalent amount of its own foreign exchange in the United States.

B. Implementation Plan

1. The basic implementation outline is as follows:

<u>Date</u>	<u>Project Action</u>
August 1976	Loan authorized.
September 1976	Loan Agreement signed.
November 1976	Initial conditions precedent satisfied.
June 1977	Conditions precedent to first phase construction satisfied.
June 1977	Completion of first phase construction.
June 1977	Confirmation of first phase completion and reimbursement by AID.
September 1977	Joint AID-Government evaluation of first phase, agreement on and implementation of findings.
June 1978	Conditions precedent to second phase construction satisfied.
June 1978	Completion of second phase of construction.
June 1978	Confirmation of second phase completion and reimbursement by AID.
September 1978	Joint AID-Government evaluation of second phase.
December 1978	Final disbursement.
September 1979	Final joint AID-Government evaluation of project.

2. Implementation Details

The principal implementing agency for the project is the Bangladesh Government through BADC. In BADC itself (see organization chart at Annex B. 2.), the Directorate of Supply is responsible for area or location selection and for recommendation with respect to the size of the warehouse to be constructed in each case. The BADC Construction Division then takes responsibility for implementation.

The Construction Division reviews and selects the exact building sites, which upon BADC management approval, are then acquired from the owners by the Finance Directorate of BADC which carries out the purchase negotiations and makes payment. The Construction Division then prepares the designs and specifications for site preparation and contracts and supervises the carrying out of this work.

Once site preparation has been completed, or while it is still underway, the Construction Division confirms the designs and specifications for building construction, lets tenders for competitive bidding for the construction work, and awards the contract. Construction work until completion is then carried out by the contractor under Construction Division supervision. Progress payments per agreed unit or stage of construction are reviewed and approved for payment by the Construction Division. Actual payment is made by the Directorate of Finance either directly or through a commercial (Government-owned) bank.

Under usual Government construction contracting practices, progress payments are made at certain points during construction, e. g. , completion of the foundations, plinth level completion, lintel, roof, etc. This is expected also to be the practice in this project; however no AID reimbursement is to be made for construction until final completion by the contractor, certification by the consultant and selective confirmation by AID inspection.

On the AID side, Mission responsibility for the project is to be placed principally with the Engineering Office of the Capital Development Division, with one US direct-hire engineer assigned primary responsibility and one local direct-hire engineer to assist. The Mission engineers are to carry out periodic monitoring and inspection of construction, as well as inspect on a minimum 30 percent sample basis

for final approval for payment. The Mission engineers are also to review and approve all designs, specifications, cost estimates, and agree upon the precise terms of construction to be reflected in the AID reimbursement under the FAR terms for the project. The engineers are also responsible for liaison with the project consultant (below) and for keeping in touch with the progress of the project through the consultant as well as separately on their own initiative.

The expatriate-local joint venture consultant engineering firm is a key factor in effective implementation of the project. The consultant is to be selected through AID procedures for contract with BADC, the contract to be subject to AID approval. All costs of the contract are to be financed under the AID loan, including all costs of local staff and local logistics support. This is considered essential to ensure rapid mobilization of the consultant and prompt approvals and payment. It will act to minimize the almost inevitable housekeeping and local expense issues between the consultant and the Government (BADC), which once they materialize, could result in significant delay in project implementation. The Government's 25 percent share of total project costs is to be met otherwise through the construction component.

The consultant is to work with and at the direction of the BADC Construction Division on a day-to-day basis, reviewing all designs, specifications and cost estimates, reviewing site selection, site preparation, contract procedures and awards, as well as standard terms of the contracts, assisting the preparation of these documents and performing construction supervision. The consultant is expected to carry out construction supervision at site and provide the BADC Construction Division with its findings and recommendations, with a copy to AID. Consultant approvals of each of these steps or actions, and particularly the issuance of construction completion certificates, will be the principal guide for AID exercise of its monitoring responsibilities and for AID reimbursement under the loan for completed construction. 35/

Construction is to be carried out in two phases, 1976-77 and 1977-78, approximately one-half of the total 50,000 MT being carried out in each year. The first phase will concentrate to the greatest practicable extent on construction of warehouses at Thana level; except as sites of Thana size and larger are in proximity to each other, where inclusion of both in the same phase minimizes demand on travel, inspection and monitoring time.

35/ See Scope of Work Outline at Annex B. 13.

The project schedule calls for loan agreement signing by September 1976. The initial conditions precedent include both the routine legal and designation of Government representative requirements, but also execution of a contract with the consultant. The conditions precedent to each phase of construction reflect AID approval requirements with respect to costs and standard contract terms, as well as final site selections, warehouse size determinations and land acquisition. They also include consultant certification of completion of construction in accordance with the agreed specifications and certification of costs.

Upon completion of the first phase of construction in June 1977, the consultant will issue completion certifications with respect to construction completed in accordance with the agreed initial specifications and record the final costs. Reimbursement by AID against the initial agreed cost estimate will follow AID review and inspection on a sample basis of a minimum 30 percent of all sites. If discrepancies are found, no reimbursement is to be made for that site until required corrections have been carried out. If they are not carried out within an agreed time, the site will be deleted from the project. This is to be an articulated and clearly understood condition agreed upon at the outset of the project, and reflected in the loan agreement and basic implementation letter.

The cycle for the second phase of construction corresponds to the first year, except that a joint AID-Government evaluation of the first phase must have been completed and the agreed findings implemented as a condition to disbursement for the second phase. Joint evaluation is also to follow the second phase, with a final evaluation to be conducted a year later, after the full crop year (1978-79) has been completed, in order to assess the results in terms of the overall fertilizer use, crop production and income goals of the project.

Final project disbursement takes place in December 1978 prior to the final evaluation and is based on completion of all construction per project conditions.

C. Evaluation Arrangements for the Project

The main output of the project will be the warehouses constructed. Since construction of the warehouses will be done on a FAR basis, evaluation of the outputs will be done first by the consultant, whose certification of completion in accordance with agreed specifications is a precondition to AID reimbursement, and by AID itself through sampling of a minimum 30 percent of completed work. The point in each case is to ensure that the warehouses have met agreed specifications. (Cost reimbursement by AID is on the basis of the AID share (expected to be 75 percent) of the initial agreed cost estimate.)

Secondly, in September 1978, following completion of the first phase of construction, a joint AID-Government evaluation will be carried out. This is not only to address the results of the construction program in terms of procedures, efficiency and costs, but also to review and evaluate the record of BADC in providing management for the new warehouses. Any discrepancies or problems identified which become agreed findings of the evaluation will be incorporated in changes to be implemented in a condition to reimbursement for the second phase. The same type of evaluation will be carried out in September 1978, following completion of the second phase, and changes required would be expected to be a condition to proceeding with the proposed follow-on FY 1978 project. 36/

On the scale of the broader project purpose, the joint evaluations above, and a final evaluation in September 1979, will assess the effectiveness of the project in improving access of small farmers to fertilizer, and the production and income results. The same requirement for agreed findings to apply as conditions to follow-on projects will also apply.

For these broader evaluations, the AID Mission will use BADC reports for both baseline data and confirmation of end-of-project status. Comparisons will be made of fertilizer sales for the pre-construction and post-construction periods. Emphasis will be given to fertilizer offtakes for peak periods, such as the beginning of the aman crop planting. In addition, the AID staff will survey all project constructed

warehouses prior to the aman planting to ensure that stocks are adequate. Price surveys and a random sample of small farmers will be conducted in the construction areas. This will determine whether reasonable prices have been maintained and that small farmers had access to and did use the available fertilizer.

The evaluation in September 1977 will indicate whether project redesign is necessary. All three evaluations (1977, 78 and -79) will probably be part of larger evaluations of the entire fertilizer distribution system, covering not only this project but the pilot distribution system (1977) and the application of that system under the follow-on proposed agricultural inputs loans. TDY or consultant assistance may be needed for each of these evaluations.

D. Conditions Precedent, Covenants and Negotiating Status

1. Conditions Precedent to Initial Disbursement

- a. Legal opinion as to binding character of loan agreement.
- b. Designation of authorized representatives of the Government.
- c. A contract between BADC and a firm satisfactory to AID to perform engineering and other consultant services for the project.

2. Conditions Precedent to Disbursement for Each Phase of Construction

- a. Listing of final site selections and determinations of warehouse size for each site.
- b. Evidence of acquisition by BADC of land and other rights required for use of each site in accordance with the purpose of the project.
- c. Copies of designs, specifications, cost estimates and standard construction contract approved by the consultant.
- d. Certifications by the consultant of completion of construction for each site in accordance with the initial designs and specifications, and of completion costs.

3. Condition Precedent for Second Phase Construction in Addition to Conditions Above

Completion of joint AID-Government evaluation of first phase construction and implementation of agreed findings.

4. Special Covenant

The Government will join, or cause BADC to join, in evaluation by AID of the second phase of construction under the project and of the overall results of the project upon crop production, fertilizer use and small farmer incomes; and agrees that the results of these evaluations as appropriate and as agreed by AID and the Government, or BADC for the Government, will be accepted by the Government as conditions to disbursement respectively under any immediately following AID loans to the Government for construction and for import of fertilizer or fertilizer raw materials.

5. General Covenants

- a. The Government will cause BADC to carry out the project with diligence and efficiency, and in accordance with sound administrative, financial, engineering and construction practices, and will not take nor permit any action which would interfere with the effective implementation of the project.
- b. The Government will make available to BADC promptly as needed, the land, funds, facilities, services, personnel and other resources which are required, in addition to the proceeds of the loan, for timely carrying out of the project. The Government agrees that its contribution to the project will not be less than twenty-five percent (25%) of the total project cost.
- c. The Government will cause BADC to operate the project in such manner as to ensure the continuing and successful achievement of the project purpose.
- d. The Government will implement those obligations of the Government under the loan agreement between the Government and AID for the Ashuganj Fertilizer Project which affect or have relation to the implementation of this project.

e. The Government will consult with AID from time to time at the request of either with respect to basic inland transport capability and will take action as appropriate to increase the efficiency of such transport as it affects the implementation of the project.

f. The Government will consult with AID from time to time at the request of either, with respect to the obligations accepted by the Government under the project and any question related thereto.

5. Terminal Dates for Conditions Precedent and Disbursement

a. Conditions precedent to initial disbursement will be met within two months from the date of signing of the loan agreement.

b. Conditions precedent to first phase construction will be met within nine months and for second phase construction within 21 months from signing of the loan agreement.

c. The terminal date for disbursement under the loan will be 27 months from the date of signing of the loan agreement.

6. Status of Negotiations

Project preparation has been carried out in close coordination with BADC, the principal implementing agency for the performance of the project. Preliminary agreement has been recorded on specific sites and sizes for the warehouses to be constructed. Subject to confirmation or modification as the Ashuganj Study 37/ may indicate, and BADC and the Government have accepted the FAR terms for AID financing of construction. Agreement has also been reached in principle on the retention of a consultant engineer and on the general scope of services. The Government has agreed to provide the required advance funding for the construction on a timely basis. Signing of the loan agreement, satisfaction of initial conditions precedent, and the beginning of construction should not be delayed following authorization of the loan.

37/ See Part II. A. above.

AID/W APPROVAL

No PRP was prepared for this project. The following are excerpts from cables and descriptions of conversations which indicate AID/W approval in principle for a fertilizer storage project.

1. AID/W message STATE 177305 dated July 28, 1975 for the prospective FY 1976 agricultural inputs loan stated in part as follows:

"Constraints. We believe the following constraints require study:

... storage. Need analysis of present storage facilities (central, regional and local) and assessment of adequacy for consistent availability of fertilizer to farmers, with special emphasis on needs of small farmers."

2. AID/W cable STATE 095887 dated April 20, 1976, reporting on Asia Project Advisory Committee review of Agricultural Inputs III Loan (excerpt).

"Storage: CP i. e. assures funds for additional storage will be made available if needed. Committee believes this not sufficient and recommends following CP be inserted in addition ... (Quote) Evidence that there is or will be sufficient capacity available to store all fertilizer expected to be produced domestically or imported during the following crop season (unquote)..."

3. During the Bangladesh AID Group meeting in Paris in May 1976, senior officials of AID/W and the Bangladesh Government discussed the recent decision of the Bangladesh Government not to proceed with the AID FY 1976 \$30.0 million loan for the Agricultural Inputs Project III. The Government had previously cited storage space as the basis for its decision. As a result of this discussion, AID/W agreed to hold approximately \$5.0 million for emergency storage requirements for fertilizer. It was understood that this fund would be held only for a short period of time, a matter of ~~weeks~~, and use would depend upon the Bangladesh Government presenting an acceptable project for financing.

4. Pursuant to this undertaking, the AID Mission in cooperation with the Bangladesh Government has prepared the Project Paper to which this appears as an Annex, and on June 15, 1976 sent a cable, DACCA 3067, in pertinent part as follows:

"Per discussion in Paris we are pouching this Friday, June 18, a project paper for construction of up to 50,000 MT of fertilizer storage capacity and related housing and office space. Total project costs are approximately \$7.0 million of which \$1.75 million represents the contribution of the BDG with the \$5.25 to be met by AID financing...."

Accordingly, on the basis of the above, the AID Mission forwards this Project Paper for AID/W review and authorization of \$5.25 million loan for fertilizer warehouse construction.

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BANGLADESH: FERTILIZER STORAGE
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ANNEX B

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PRELIMINARY LIST OF WAREHOUSE LOCATIONS

A. 500 Tons

- | | |
|-----------------------------|-----------------------------|
| 1. Barisal, Charfession | 22. Kishoreganj, Dergapur |
| 2. Barisal, Tajamuddin | 23. Kishoreganj, Barbatta |
| 3. Barisal, Nazirpur | 24. Kishoreganj, Abdullapur |
| 4. Barisal, Rajapur | 25. Pabna, Shahjadpur |
| 5. Barisal, Kathalia | 26. Pabna, Kastpur |
| 6. Bogra, Nandigram | 27. Rajshahi, Niamatpur |
| 7. Dacca, Sreenagar | 28. Rajshahi, Porsha |
| 8. Dacca, Shibpur | 29. Rajshahi, Tamore |
| 9. Dacca, Narsindi | 30. Rajshahi, Muhadevpur |
| 10. Dacca, Dahar | 31. Rangpur, Saghata |
| 11. Dacca, Nowabganj | 32. Rangpur, Bharungamari |
| 12. Dinajpur, Ghoraghat | 33. Rangpur, Kethargonj |
| 13. Faridpur, Balakandi | 34. Sylhet, Dharampasha |
| 14. Faridpur, Kotwali para | 35. Sylhet, Jamalganj |
| 15. Faridpur, Kalkini | 36. Sylhet, Sulla |
| 16. Faridpur, Boalmari | 37. Sylhet, Benalachang |
| 17. Faridpur, Madaripur | 38. Sylhet, Dherai |
| 18. Kishoreganj, Mitamoin | 39. Sylhet, Beambasar |
| 19. Kishoreganj, Kaltuadi | 40. Sylhet, Gowinghat |
| 20. Kishoreganj, Hossainpur | 41. Sylhet, Sherpur |
| 21. Kishoreganj, Atpara | 42. Tangail, Basail |

B. 1000 Tons

- | | |
|-----------------------------|------------------------|
| 1. Barisal, Mathbaria | 7. Mymensingh, Sherpur |
| 2. Dacca, Manikganj | 8. Rajshahi, Rohanpur |
| 3. Kishoreganj, Mitamoin | 9. Rangpur, Gaibanda |
| 4. Kishoreganj, Thakurakona | 10. Sylhet, Srimangal |
| 5. Noakhali, Feni | 11. Sylhet, Maidanagar |
| 6. Mymensingh, Jamalpur | |

C. 2000 Tons

- | | |
|----------------------------|---------------------------|
| 1. Barisal, Hularhat | 5. Noakhali, Chournuhami |
| 2. Bogra, Joypurhat | 6. Mymensingh, Shambaganj |
| 3. Bogra, Bogra | 7. Pabna, Ullapara |
| 4. Kishoreganj, Kuliarchar | 8. Rajshahi, Noagaon |
| | 9. Rangpur, Kurigram |

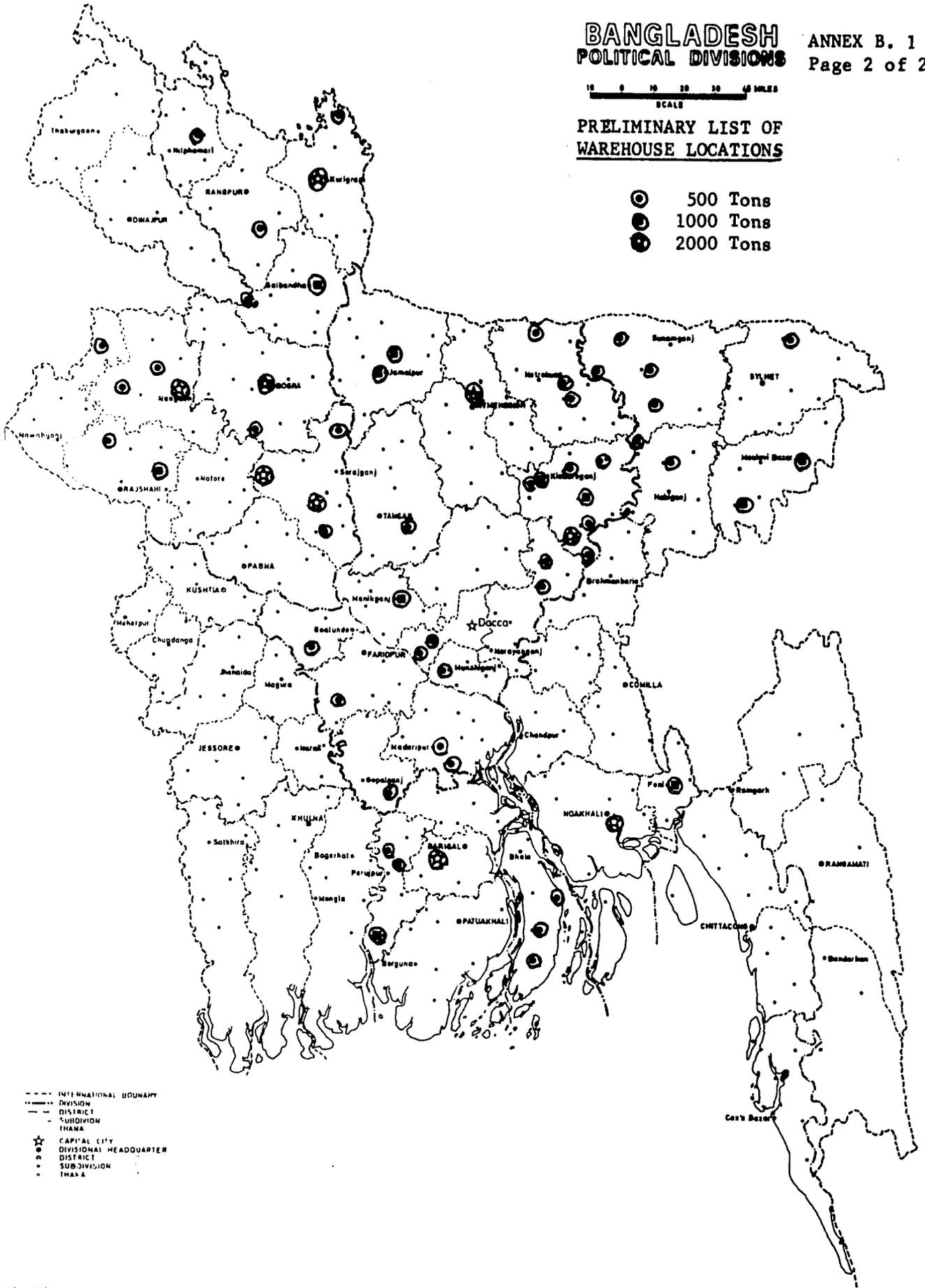
BANGLADESH POLITICAL DIVISIONS

ANNEX B. 1
Page 2 of 2



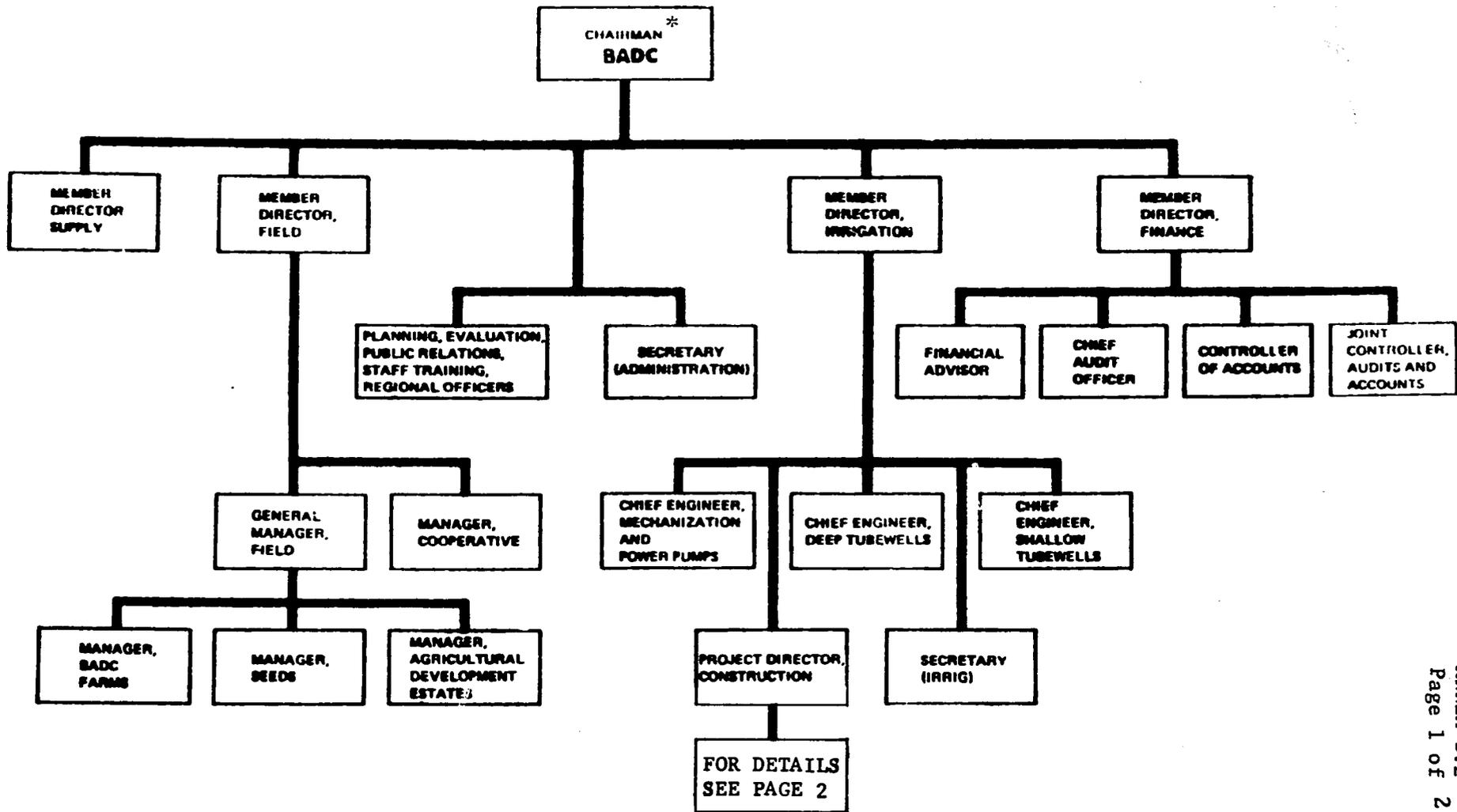
PRELIMINARY LIST OF WAREHOUSE LOCATIONS

- 500 Tons
- 1000 Tons
- ⊙ 2000 Tons



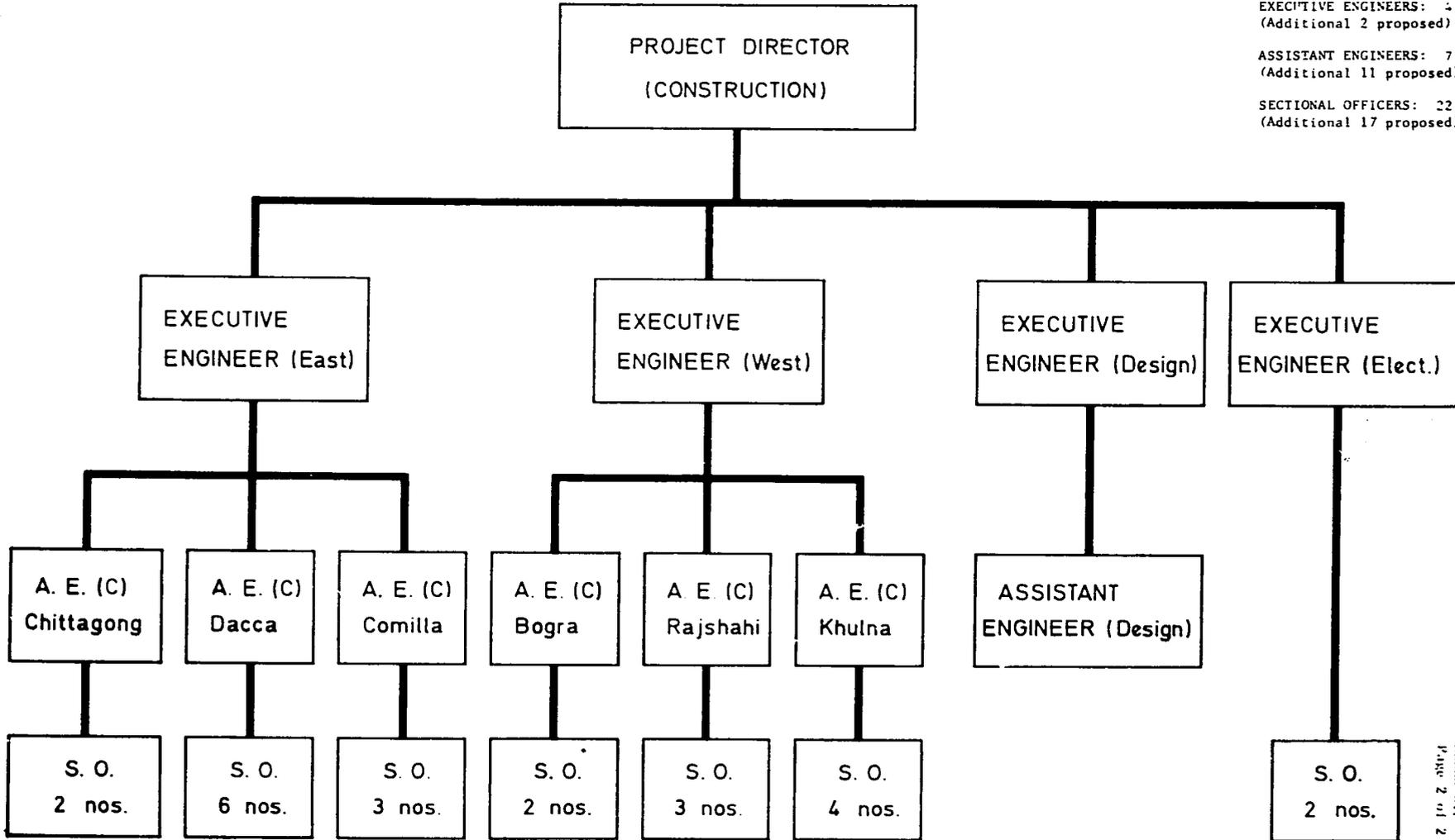
- - - INTERNATIONAL BOUNDARY
- - - DIVISION
- - - DISTRICT
- - - SUBDIVISION
- - - THANA
- ★ CAPITAL CITY
- ★ DIVISIONAL HEADQUARTER
- DISTRICT
- SUBDIVISION
- THANA

**GENERAL ORGANIZATION CHART OF THE
BANGLADESH AGRICULTURAL DEVELOPMENT CORPORATION**



* Chairman, BADC reports directly to the Secretary, Ministry of Agriculture.

ORGANIZATION AND PERSONNEL CHART OF THE BADC CONSTRUCTION DIVISION



REMARKS

PROJECT DIRECTOR: 1
(Construction)

EXECUTIVE ENGINEERS: 4
(Additional 2 proposed)

ASSISTANT ENGINEERS: 7
(Additional 11 proposed)

SECTIONAL OFFICERS: 22
(Additional 17 proposed)

PROJECTION OF FERTILIZER REQUIREMENTS

Bangladesh has three principal separate fertilizer requirements,^{1/} each of which holds different implications for continuing AID support.

Urea

As shown in Attachment A, Bangladesh will be self-sufficient in domestic production of urea fertilizer from 1978-79 through 1982-83. This assumes both that the Ashuganj plant comes into production in 1978-79, that demand does not exceed production, and that excess production is exported. Given the wide margins, the likelihood is that demand will not overtake production until 1983-84, and by that time a second urea plant may be on stream. In addition, some portion of excess of production over demand in the preceding years could be carried forward to extend further the years of full coverage from domestic production. That leaves only an import requirement for the year 1977-78 of approximately 115,000 MT. On the basis of previous averages, non-US imports should account for no more than 50,000 MT of this requirement.

TSP

The Government's own figures assume annual domestic production of 80,000 MT from the existing two plants, with a total rated capacity of 152,000 MT. This is optimistic, but even at that level (per Attachment B), production would supply less than one third of domestic requirements over the period 1977-78 through 1983-84. These requirements are substantial even on the basis of the most conservative projections.

The alternatives to straight TSP import are increased domestic manufacturing capacity, or direct application of ground reactive rock, or a combination of both. Both TSP plants, however, operate on supply of imported phosphate rock and sulphur, and ground reactive rock is also imported. Costs of production or direct application are accordingly

^{1/} Excluding ammonium sulphate which is used exclusively for tea production, and which is produced domestically at the required 12,000 MT per year.

subject to price factors beyond Bangladesh Government control. TVA did a study (Bangladesh Fertilizer Situation) in 1974 in which at current prices the alternative of combining increased local manufacture and use of reactive rock was economically preferred. Reactive rock was the least cost alternative, but due to soil characteristics it apparently can only be applied to 60 to 70 per-cent of the country.

The calculations developed by TVA would have to be brought up to date at present prices, but taking the alternative of least change - i. e. increase in domestic TSP capacity combined with imports of reactive rock - which appears to be the optimum short-term course - such a 2/ facility could probably not be in production before 1982-83 at the earliest.

Even assuming such a plant, in combination with production from the existing facilities, was able to meet the 1982-83 requirement of 394,000 MT of TSP, this would still leave a requirement from 1977-78 through 1981-82 totalling 1.2 million MT, of which at the most 400,000 MT would be met from existing domestic production. The remaining 800,000 MT would have to be imported. Even calculating non-US financed imports at 75,000 MT annually, or 375,000 MT over the five year term, this would still leave a deficit of some 425,000 MT. On an annual basis, this would amount to a requirement of approximately 85,000 MT to be financed by AID.

MP

MP in the small quantities in which it has been applied in Bangladesh has been imported largely from Canada and Norway. The projection at Attachment C, however, indicates a growth in need which these two countries may not be able to meet. The US is also a supplier. Without attempting to determine at what point the present sources will not be able to meet the requirement, it may be enough to note that sometime after 1981-82 US supply may become a factor.

2/ In view of the absence of any present plans for such a plant, the projection at Attachment B assumes that no such additional plant will be in production before 1984-85. The application of the 1982-83 date above is in terms of the five-year frame of reference for this present discussion of projected needs.

Conclusion

On basis of the above, it would appear that the US could be called upon to supply urea in only the single year 1977-78; but as a source of TSP, the role of the US may continue at least until 1981-82.

At that point, depending on decisions made and implemented previously with respect to increased domestic TSP manufacture, the long-range contribution of the US for fertilizer imports may resolve in a continuing lower level support for both TSP and MP imports. This would then appear to be a requirement extending into the foreseeable future.

However, the construction of additional TSP manufacturing capability does not obviate the need for imports. Rock phosphate and phosphoric acid or sulphur, the raw materials for TSP production, must still be imported.

Attachments: A - Urea Production and Demand Projections
B - TSP " " " "
C - MP Demand Projections

ATTACHMENT A

Urea

Production and Demand Projections

Metric Tons Per Year

<u>Year</u>	<u>Production</u>	<u>Demand</u> ^{a/}	<u>Difference</u> ^{b/}
1977-78	300,000	415,000	(115,000)
1978-79	564,000	464,000	100,000
1979-80	775,000	518,000	257,000
1980-81	775,000	578,000	197,000
1981-82	775,000	646,000	129,000
1982-83	775,000	722,000	53,000
1983-84	775,000	806,000	(31,000)

a/ Demand projections are based on extrapolation from Government revised (January 1976) Five Year Plan figures at average annual increase of 11.7 percent. The resulting projections are the most conservative of several separate estimates which on extrapolation show the following for 1983-84: Original Five Year Plan - 1,802,000 MT; 2. IDA (Ashuganj Loan Paper) - 937,000 MT; 3. AID (Agricultural Inputs III Project Paper) - 927,000 MT; and 4. AID (projection combining Ashuganj and revised Five Year Plan rates) - 831,000 MT. See Annex B. 9 below in which these projections are summarized.

b/ Difference cited for the years 1978-79 through 1982-83 could either be exported or stored and carried forward for subsequent year requirements, or a combination of both. Carry-forward of any significant portion would act to extend self-sufficiency beyond 1983-84, the point to which it would do so depending on the amount reserved. Decisions with respect to the portion to be exported or reserved would have to take account of storage costs as well as export prospects.

TSP
Production and Demand Projections

<u>Year</u>	Metric Tons Per Year		<u>Difference</u>
	<u>Production</u> ^{a/}	<u>Demand</u> ^{b/}	
1977-78	80,000	176,000	(96,000)
1978-79	80,000	207,000	(127,000)
1979-80	80,000	243,000	(163,000)
1980-81	80,000	286,000	(206,000)
1981-82	80,000	335,000	(255,000)
1982-83	80,000	394,000	(314,000)
1983-84	80,000	463,000	(383,000)

a/ Assumes that current production projection from existing capacity (152,000 MT rated) can be maintained and that no additional plant will be in production before 1984-85. Since current production is only 60,000 MT per year and there are no present plans for an additional plant, the production projection is conservative in terms of the possible requirements under 'Difference'.

b/ Demand projections are extrapolated from estimates developed for AID Agricultural Inputs III Project at an average annual increase of 17.5 percent. With the exception of the IDA (Ashuganj Loan Paper) projection which shows 1983-84 at 401,000 MT (but which includes 1977-81 figures which are higher than the above table), the projection above is the most conservative of several separate estimates which on extrapolation show the following for 1983-84: 1. Original Five Year Plan - 1,021,000 MT; 2. Five Year Plan (revised January 1976) - 1,147,000 MT; and 3. AID (projection extending revised Five Year Plan at lower rate) - 520,000 MT. See Annex B. 9 below in which these projections are summarised.

ATTACHMENT C

MP
Demand Projections
(No Domestic Production)
Metric Tons Per Year

<u>Year</u>	<u>Demand^{a/}</u>
1977-78	35,000
1978-79	41,000
1979-80	49,000
1980-81	58,000
1981-82	68,000
1982-83	80,000
1983-84	94,000

a/ Demand projection is based upon extrapolation at an annual rate of 18 percent from the Government Five Year Plan figures revised (January 1976). It is the most conservative of several separate estimates which on extrapolation show 1983-84 figures as follows: 1. Original Five Year Plan - 1,012,000 MT; 2. IDA (Ashuganj Loan Paper) - 102,000 MT; and 3. AID (projection based on relation to TSP use) - 99,000. See Annex B. 9 below in which these projections are summarized.

BANGLADESH
FERTILIZER AND FOODGRAIN PRODUCTION

Although AID has not yet undertaken an agriculture sector assessment for Bangladesh,^{1/} certain rural development priorities are already clearly manifested. Bangladesh's most critical need is simply to grow more food. In the face of a population growth rate that in twenty-three years will double the country's 80 million people and will sizeably increase the current annual foodgrain import requirement of over two million tons, there is no alternative but to increase dramatically food production in the immediate future. Foodgrain self-sufficiency, accordingly, is a declared goal of the Bangladesh current Five Year Plan (FYP) which ends in June, 1978. To accomplish this objective, annual production increases in excess of six percent must be achieved over the remaining years of the Plan. See Table 1, below.

TABLE I
ANNUAL REQUIREMENT AND PROJECTED PRODUCTION
OF FOODGRAIN DURING FYP

<u>Year</u>	<u>Population</u> (millions)	<u>Foodgrain</u> <u>Consumption</u> <u>Requirement</u> (millions of tons)	<u>Gross</u> <u>Production of</u> <u>Foodgrains</u> (millions of tons)	<u>Foodgrain</u> <u>Available for</u> <u>Consumption</u> (millions of tons) ^{a/}	<u>Deficit</u> <u>(Surplus)</u> (millions of tons)
1973-74	76.2	12.0	12.1	10.9	1.1
1974-75	78.5	12.4	13.2	11.9	.5
1975-76	80.9	12.8	13.8	12.4	.4
1976-77	83.1	13.1	14.4	13.0	.1
1977-78	85.4	13.5	15.4	13.9	(.4)

^{a/} After deducting 10 percent from the gross product for seed, feed and wastage.

SOURCE: USAID, based on Bangladesh Five Year Plan, 1973-78.

^{1/} The International Bank for Reconstruction and Development (IBRD), International Development Association (IDA), has, conducted, however, such a study. See Bangladesh Development in a Rural Economy, Report No. 455a-BD (in three volumes), dated July 31, 1974.

Achievement of this goal must deal with the basic fact that the possibility of expanding the cultivable area of Bangladesh is very limited. Of the country's total 33 million acre land area, approximately 25 million are cultivated; and of this about 10 million acres are double-cropped. Of the remaining 14 million, deep flooding permits only a single floating rice crop for 5.5 million acres, and a further 2.5 million can only be cultivated at all after the floods recede in November of each year. All rice grown during the dry season from November to March must be irrigated. Shortage of available land for expansion of cultivation and the impact of annual deep flooding are the principal constraints to expanding agricultural production. Over the past 20 years, some increases in cultivated area have come about through decreases in the amount of land which had normally remained fallow. Further decreases however, are only likely to take place slowly and in declining amounts, as land continues to be required for cattle grazing, shifts in cropping patterns and other uses.

Even more significant than increases in cultivated area, however, has been the growth brought about in cropping intensity. Over the past 20 years, there has been a dramatic increase in multiple cropping, raising intensity from 120 percent to 146 percent. In effect, this means that almost one-half (10 million acres) of the country's cultivated area is double cropped. With the already concentrated use of land, in terms of cultivated acreage, as a proportion of total acreage, and cropping intensity, further intensification will be difficult without fertilizer, seeds and irrigation. 2/

The response of the Bangladesh Government to these constraints, the lack of additional land and the impact of deep flooding, is

2/ Unfortunately, increases in cultivation have in no way kept pace with population growth. The result has been that total cropped area per person declined from .575 acres in 1949-50 to .468 acres in 1969-70. It is expected by the end of the current FYP to decline further to .420 cropped acres per person.

BANGLADESH
FERTILIZER DISTRIBUTION SYSTEM

a. The Bangladesh Agricultural Development Corporation (BADC, a public corporation) imports and procures locally all fertilizer distributed in Bangladesh. 1/ BADC was established in 1961 in East Pakistan to handle a wide-range of agricultural inputs, not only fertilizer; these other inputs include seeds, agricultural machinery and equipment, low-lift pumps, shallow and deep tubewells, and seed multiplication farms. The corporation has semi-autonomous status within the Ministry of Agriculture and the Chairman of the corporation reports directly to the Secretary. 2/ BADC is responsible for movement of fertilizer to the Thana level, and at that point, as discussed below, it is purchased either by one of the private licensed retail dealers, or in the case of 69 of the 422 Thanas, by the Thana Central Cooperative Association (TOCA), 3/ acting as a wholesale agent and reselling the fertilizer to its member village cooperatives or to one of the dealers.

b. The present fertilizer distribution system functions as follows:

(1) At District.

There is a coordination committee at the District level which acts as the District approving authority for fertilizer allocations. This committee is chaired by the Deputy Commissioner, has the Assistant Director of Rural Development as secretary, and has other relevant District level officers from various Ministries as members. This committee determines the District's fertilizer requirements and approves each Thana's allotment. Since Independence these committees have not met; the District Agricultural Officer (Ministry of Agriculture) and the District Manager of BADC are substituting de facto for the committee. They procure and distribute fertilizer to the Thanas, according to available District stock and targets set by BADC Dacca. The District-to-Thana allocation is determined by the acreage of each crop under cultivation, the previous year's targets, and the sales achievements of the Thana.

1/ An exception is the approximately 12,000 MT of AS, which is produced directly from the Panchganj Plant by the Bangladesh Tea Association.

2/ BADC organization charts at Annex B.2

3/ Cooperative groups sponsored by the Bangladesh Government through the Integrated Rural Development Program (IRDP).

(2) At Thana.

An Agricultural development committee, called the Thana Krishi Unnayan Committee (TKUC), is responsible for fertilizer at this level; the Circle Officer (Development) acts as chairman, with the Thana Agricultural Officer, as secretary, and the following as members of the TKUC: Project Officer (TCCA), Thana Inspector (BADC), Thana Fishery Officer, plus four members from the local Union Krishi Unnayan Committee (who are the chairman of their UKUCs). The TKUC makes the allotments of fertilizer directly to the dealers at Union Level. See (3) and (4) below.

(3) At Union.

Previously, the Union Krishi Unnayan Committee (UKUC), or Union agricultural development committee, had directed the flow of fertilizer at Union level. The monthly Union allotments by each Thana had been made by the TKUC, in the past, upon submission of the requirements by the UKUC, with the Union's past fertilizer consumption level serving as the prime determinant for the allocation. Allotments to the UKUCs however, were abolished by BADC in August, 1975; the TKUC now directly supplies the dealers. The UKUCs still function for other, more general agricultural activities.

(4) Ordering and Supply

The TKUCs inform the District committee (in reality, at present, the District Manager of BADC) of their fertilizer requirements. The District Manager of BADC, in turn, informs BADC Dacca of the requirements. All the Thanas order and are supplied fertilizer in the following sequence:

<u>Ordering</u>	<u>Supply</u>
Farmers	BADC (Dacca)
to	to
KSS ^{h/} or Dealer (Union)	BADC (District)
to	to
TKUC (Thana)	TCCA or BADC (Thana)
to	to
BADC (District)	KSS or Dealer (Union)
to	to
BADC (Dacca)	Farmers

BADC operates fertilizer godowns at all levels down to the Thana.

^{h/} KSS - Krishi Samabaya Samity (Village or Primary Cooperative Society), the lowest level of the IRDP-TCCA system.

(5) TCCAs.

The Thana Central Cooperative Associations act as Thana wholesale agents in certain Districts of Bangladesh. BADC's Thana warehouses are handed over to the TCCAs for a monthly rent of Tk 700 for warehouses for those with 200-ton capacity. In the last two years, approximately 69 TCCAs have become fertilizer wholesalers out of a total of some 162 TCCA Thanas.

(6) Village KSS and Retail Dealers.

Retail dealers are appointed by the Sub-Divisional Managers of MDC and village KSSs are appointed by TCCAs as retail dealers. (Between the District and the Thana is the Sub-Divisional administrative level which is staffed by most Ministries.) KSSs and appointed retail dealers sell fertilizer to end-users, i.e., to farmers individually or as members of crop production schemes. Upon allotment of fertilizer from the District to Thana level, the dealer obtains the approval order from the Thana Agricultural Officer, detailing the exact amount of fertilizers to be received. The dealer then proceeds to the office of the Thana Inspector of BADC, or to the TCCA, to pick up the fertilizer. The fertilizer supplied to the dealers is taken from the Thana warehouse by the dealer and sold by him to the end-user.

BANGLADESH
FERTILIZER MARKETING AND DISTRIBUTION PROJECT
TERMS OF REFERENCE

Objective

1. To develop phased proposals for improving the fertilizer marketing and distribution system (complete with all its personnel and material components) so that, taking into account costs and benefits, foreign exchange scarcity and administrative constraints, the resulting system should be the best achievable for the period 1976 through 1986. Investment proposals and, to the extent applicable, proposals for reorganization should be so phased as to be able to distribute and market the country's fertilizer requirements by the end of 1978, when the Ashuganj Fertilizer Plant is expected to commence commercial operations. 1/

2. The study must:

Phase I.

(a) Carry out economic and financial analysis of alternative distribution systems and provide sufficient information on the optimal distribution system, including in particular transport modes, bulk vs bag shipment, size and material of bags, etc so as to enable the Ashuganj Fertilizer and Chemical Company to take decisions on the design of the storage, bagging and dispatch facilities of the Ashuganj Fertilizer Plant; and

(b) On the basis of projections of demand for fertilizer estimate the seasonal storage requirements for the major trans-shipment and Thana wholesale locations up to 1985/86.

Phase II.

(c) Complete the feasibility study of proposed investments to improve the fertilizer marketing and distribution system, including where deemed more efficient, multipurpose facilities for storage

1/ USAID note: Plant commercial operation date now probably mid-1979.

or transport of grain, pesticides, seeds, etc. as well as for fertilizer. The feasibility study would include cost estimates and economic and financial analysis in sufficient detail to enable a proposed project to be appraised for financing by a bilateral or international agency.

3. The draft final report for Phase I is to be completed within four months of inception and the final report within one month of receipt of written comments from the Government. The draft final report for Phase II is to be completed within three months of inception and the final report within one month of receipt of comments from the Government.

II. Specific Tasks Under Phase I

1. Making use of existing fertilizer consumption projections updated to take account of more recent experience and specific development plans that are likely to have an impact on fertilizer use, such as irrigation projects and the rainfed rice improvement project, establish Thana-wise seasonal and annual consumption projections for 1976/77 to 1985/86 and an indicative forecast for a further approximately 10-year period.

2. Factors affecting procurement of all imported fertilizers and fertilizer raw materials (rock phosphate, sulphuric acid) must be assessed. These include, but are not confined to, the likely world market situation of the materials concerned, Bangladesh's foreign exchange situation and priorities thereof, domestic production forecasts, and information, inter alia, from all branches of the Government of Bangladesh, the Bangladesh Aid Group, bilateral aid-giving agencies and the IBRD.

3. Based on the foregoing, a judgment must be made on the quantity of maximum pipeline storage requirements year by year, for the ten-year period under review.

4. Arising out of domestic production projections and the likely demand for the domestically procured fertilizer, exportable surpluses and import requirements must be determined year by year, and methods for their movement developed, in conjunction with other fertilizer transport and storage needs.

5. Assuming that farmers' points of purchase (the retailers' outlet) will be supplied from Thana stores and that these points will be required to carry adequate, pre-determined inventories, a model for developing seasonal and monthly fertilizer movements must be constructed. It is to commence at the point at which the fertilizers become the property of the marketing and distribution organization and end in the Thana stores.
6. Taking into account information to be provided under Paragraph 4.9 of this Agreement and listed in Appendix-D, the location, capacity and design of the required components of the storage pipeline must be determined. These will include:
 - a. storage at plant site;
 - b. storage of finished products at port of entry;
 - c. the intermediate warehouses;
 - d. the Thana warehouses;
 - e. a year-by-year phasing of their construction for the ten-year period under review;
 - f. the feasibility of integrating grain and fertilizer storage and criteria thereof.
7. Taking into consideration conditions prevailing in Bangladesh, specific recommendations must be made on:
 - a. what proportion, if any, of indigenous production should be delivered in bulk to satellite bagging plants located in intermediate stores;
 - b. equipment for bulk handling and satellite bagging plants;
 - c. methods of containerization to be employed for bulk transport;
 - d. the likely cost, including foreign exchange component, of the equipment and construction of bulk handling and satellite bagging facilities and the phasing of their installation.
8. Taking into consideration the conclusions of 5, 6 and 7 above, transport capabilities must be surveyed and recommendations for their strengthening made, with the prime objective of developing least-cost systems. These must include, but not be confined to specifying:

- a. expected quantities handled by road, rail and water transport, in ton-miles;
- b. suitable covered rail wagons on both rail systems;
- c. specific locomotive needs;
- d. meter-gauge train ferries across the Brahmaputra;
- e. whether to employ unit trains and the kind to be used;
- f. coaster, tugboat, and barge requirements and specifications;
- g. port facilities, inland and salt water;
- h. trucks;
- i. local short-distance haulage needs from railhead or river port to warehouse;
- j. the handling facilities required at each point of transfer;
- k. the phasing-in of additional facilities;
- l. costs, including foreign exchange component, of each of the groups.

In the foregoing, extensive use shall be made of recent Economist Intelligence Unit (EIU) studies and findings.

9. Examine the present pricing structure and on-costs and recommend a fair and equitable price buildup based on costs and reasonable profit margins commensurate with services rendered.
10. Taking due notice of existing private and public transport organizations, make specific recommendations as to what part, if any, of the additional transport equipment should be owned by the fertilizer marketing and distribution organization.
11. Determine the most suitable package size, balancing end-user convenience against costs.
12. Arising out of 11, packaging methods and materials must be evaluated, approximate specifications as to dimensions and strengths given, bag testing methods established and stacking patterns developed to ensure proper inventory and movement control on a "first-in-first-out" basis. The costs and economic benefits of changing existing bagging materials must be analyzed and specific recommendations made to enable, inter alia, the drawing up of specifications of the bagging lines of the Ashuganj plant and the desirability, under the conditions of Bangladesh, to have a completely weatherproof package.

13. Determine whether BADC will be capable of carrying the fertilizer marketing and distribution business along with its other growing activities and make specific recommendations as to whether, and when (in terms of time or volume of business) a separate fertilizer marketing and distribution corporation might have to be set up. Determine at what point along the distribution pipeline it should hand over to other organizations such as private, cooperative, or public sector wholesalers; and/or retailers.
14. In view of the geographic spread of the fertilizer (and, possibly, pesticides, seeds, etc.) business, prepare an organization chart for the marketing and distribution organization. This should include, but not be confined to:
- a. the sales organization, comprising of personnel in contact with the dealers;
 - b. the distribution organization, comprising movement, bagging, warehouse management, and contact with the railways, water transport, truckers, and local hauliers;
 - c. product line personnel for items that may be distributed along with fertilizer (see Phase II);
 - d. a market research and market intelligence organization that will develop annual and five-yearly consumption forecasts on a Thana, product, and seasonal basis every year. This forecast must be available to enable ordering the next year's import need in good time and to give a positive basis for longer-range supply contracts;
 - e. as part of d. above, specify the time of the year when such forecasts are to be submitted in a country-wide consolidated form;
 - f. a market development organization which must include dealer training and may include market development, advertising and sales promotion activities directly operated by the fertilizer marketing and distribution organization;
 - g. develop the necessary supervisory superstructure including the criteria and location of regional subdivisions and the headquarters organization. Establish a realistic salary formula for all cadres, with due regard to equivalent Government and private enterprise compensation structures that will enable the build-up of motivated, high quality staff.

15. Calculate the costs of such an organization under the overall management system that will evolve from 12 above and make specific recommendations as to the necessary dealer, wholesaler, distributor and importing organization's mark-ups. In this context, evaluate and make specific recommendations on whether any part of the distribution chain should work on a commission agency basis (pay after sale) or whether ownership of fertilizer and final responsibility of disposal should devolve on the extraneous wholesaler and/or retailer. Similar recommendations are required for other products marketed with fertilizers.

16. Estimate extent and duration of credit needs of the distribution chain, on the assumption that the end-user pays cash for this purchase (whether from his own resources or borrowed is not part of this study).

17. Determine whether there are any specific technical assistance and/or domestic and external training needs for developing the fertilizer marketing and distribution program; and quantify and cost them.

III. Specific Tasks Under Phase II

1. Examine whether and how the distribution of seeds, pesticides, sprayers and other purchased inputs should be integrated with that of fertilizer distribution and in what way such integration affects distribution management and the multiple use of storage and handling facilities. Also, examine, in coordination with consultants involved in the foodgrain storage study, any possible saving through joint use of storage, transportation or distribution facilities.

2. For all assets to be acquired or rehabilitated for the fertilizer marketing and distribution system, including to the extent found justified transportation investments and satellite bagging facilities, and to the extent found desirable facilities for the combined storage and/or distribution of grain, pesticides, seeds etc. as well as fertilizer, determine:

- a. Capacity, location (including a map) and suggested five-year phased program for rehabilitation of existing storage facilities and/or construction and acquisition of new facilities;
- b. Investment cost, broken down into local and foreign exchange components;
- c. Proposed organizational arrangements for project implementation and for management of facilities once acquired;
- d. Estimated seasonal patterns of utilization of facilities;
- e. Estimated annual operating costs and recommended charges for the use of facilities and resulting projected cash flows;
- f. Benefit analysis, including both the financial and economic rates of return.

In examining possible multipurpose storage facilities for foodgrains and pesticides as well as fertilizer, use should be made of results of the foodgrain study 2 and pesticides study 3 to be undertaken by USAID-financed consultants. The feasibility study for the proposed investments should be in sufficient detail to enable a proposed project to be appraised for financing by a bilateral or multilateral aid agency.

EXPECTED REPORT OUTLINE

Summary and Conclusions - Phase I

A. Past Performance

1. fertilizer marketing and distribution since 1963/64; evaluation of achievements; shortcomings;
2. analyse and evaluate the present cost structure methods of payment and margins;
3. prepare fertilizer production and consumption projections for the next 10 years, by nutrients; review available data, evaluate and develop the product-wise figures on which the marketing and distribution plan is to be based (a desk study);

B. Project Planning Parameters

1. Review of fertilizer supply situation from:

2/ USAID note: Reference unclear. Possibly refers to Kansas State University team scheduled for July 1976.

3/ USAID note: Pesticides study completed March 1976.

- i indigenous sources;
- ii imports;
- iii expected control over import pricing of raw materials and finished products.

2. Time perspective of proposed project, reasons.

C. The Project

1. Need for the project.
2. Project components.

a. Sales to end-users

- i. location and numbers (within each Thana) of final sellers;
- ii. minimum deliveries to dealers, their method of payment, handling charges;
- iii. permitted dealer margins; enforcement.

b. Supplying dealers

- i. by wholesalers/distributors;
- ii. by BADC direct;
- iii. TCCA and/or other wholesaler involvement;
- iv. proposed flow chart from factory/port to the sales point;
- v. seasonal storage facilities required, their location and size.
- vi. costs of operation.

c. Product preparation

- i. bag sizes, bagging materials, reasons for recommendations (economic and operational), specifications, control thereof;
- ii. points of bagging, facilities required, cost (local & FX);
- iii. costs of operation.

d. Market development and market intelligence

- i. details of market intelligence required, methods of consumption forecasts for one year; and for each of the following five years;
- ii. marketing services, sales promotion, and market development required; identify scope and extent devolving on the marketing organization, with special reference to dealer training.

- e. Integrating other input services marketing with fertilizers.
 - i. Identify and discuss product lines;
 - ii. additional physical facility requirements in distribution chain;
 - iii. procurement, packaging;
 - vi. incremental costs to organization; total marketing costs.

- f. Related services and facilities
 - i. indigenous production phasing (routine plant shutdown timings, new plant construction schedules);
 - ii. import phasing and management;
 - iii. transportation needs:
 - (a) rail
 - (b) road
 - (c) water
 - (d) local
 - (e) delivery methods of dealers
 - (f) terminal handling facilities
 - iv. satellite bagging facilities (if found justified).

- g. Organization and Management
 - i. evaluate BADDC's capability to carry fertilizers;
 - ii. BADDC and/or alternative organizations, their formations, timing of change over, if any;
 - iii. staffing patterns, organization charts, locations, office and transport equipment needs, job descriptions at each stage;
 - iv. recommendation for technical assistance and training.

Summary and Conclusions - Phase II

A. Past Performance and Current Situation

- 1. marketing and distribution of other production inputs;
- 2. pesticides and seeds: review of available data, consumption forecasts (a desk study);
- 3. same for any other product arising out of a. above;

4. existing unitary and multipurpose storage facilities owned and rented by public agencies for fertilizer and for any other commodity for which multipurpose storage facilities are recommended;
5. performance of the system, its volume of commodities handled and stored, seasonal movement, location;
6. major problems experienced with the existing system.

B. Project Planning Parameters

1. projections on a seasonal and Thana basis of the volume of fertilizer to be handled and stored and the volume of any other commodity recommended to be stored in multipurpose facilities with fertilizers;
2. comparison of the above projections with the quantity and quality for existing facilities;
3. criteria for determining the location, capacity and design for transportation, storage or satellite bagging facilities or equipment proposed to be built, procured or rehabilitated;
4. justify the need for the project.

C. The Project

Describe the overall project and its major components, its total investment cost, and the criteria used in determining project design as against possible alternatives including;

1. capacity, location (including a map) and a suggested five-year phased program for construction or rehabilitation and/or acquiring of storage facilities;
2. investment cost, broken down into local and foreign exchange components;
3. proposed organizational arrangements for project implementation and for management of facilities once acquired;
4. estimated seasonal patterns of utilization of facilities;
5. estimated annual operating costs and recommended charges for the use of facilities and resulting projected cash flows;
6. benefit analysis, including both the financial and economic rates of return.

Appendix

To contain all cost and facilities tables, ⁱⁿ phasing-in table or diagram

ANNEX B. 7
Page 11 of 11

form and summary cost tables showing local and foreign exchange costs and phasing. Recurrent costs, year by year are to be shown.

BANGLADESH
PILOT FERTILIZER DISTRIBUTION PROGRAM

1. Description

The program includes a pilot test of a revised system for distribution and sale of fertilizer with the objective of increasing such sales generally but particularly through providing improved access to fertilizer for small farmers. The pilot is being carried out in 40 Thanas and includes testing of the following: a) fertilizer dealers able to charge a flexible mark-up; b) farmers able to buy fertilizer from any dealer in the farmer's Thana; c) farmers able to buy an agreed minimum amount from the Thana fertilizer warehouse; and e) establishing of reserve fertilizer stocks generally at Thana and District/Intermediate level. The pilot is being jointly monitored by AID and the Government of Bangladesh and the agreed results following evaluation after the 1975-76 crop season will be incorporated in a country-wide improved system for distribution and sale of fertilizer.

The program began in two phases: Phase I was put underway on February 1, 1976 and includes 10 Thanas testing the dealer flexible mark-up, another ten experimenting with Thana warehouse sales to farmers, and one Thana testing both simultaneously. Phase II began on May 25, 1976 and provides for testing of both the flexible mark-up and Thana warehouse sales in an additional 19 Thanas. In all 40 Thanas of the pilot farmers are able to buy from any dealer in the Thana, and are not restricted to a single dealer.

2. Data Being Assembled for the Pilot Thanas

The following baseline data is being assembled for each pilot Thana:

- a. Land utilization statistics;
- b. Number of Unions, villages and farm families;
- c. Acres per farm and percent of land cropped;
- d. Central storage capacity;
- e. Number of dealers, farms per dealer and acres per dealer;
- f. Names and locations of dealers;
- g. Fertilizer sales 1972-73 through 1974-75;
- h. Records of monthly fertilizer transactions, including beginning and ending inventories, arrivals and sales from July 1, 1975 to present;
- i. Location of reserve stocks; and
- j. Acreage under local and HYV rice and wheat cultivation for 1972-73 and 1973-74.

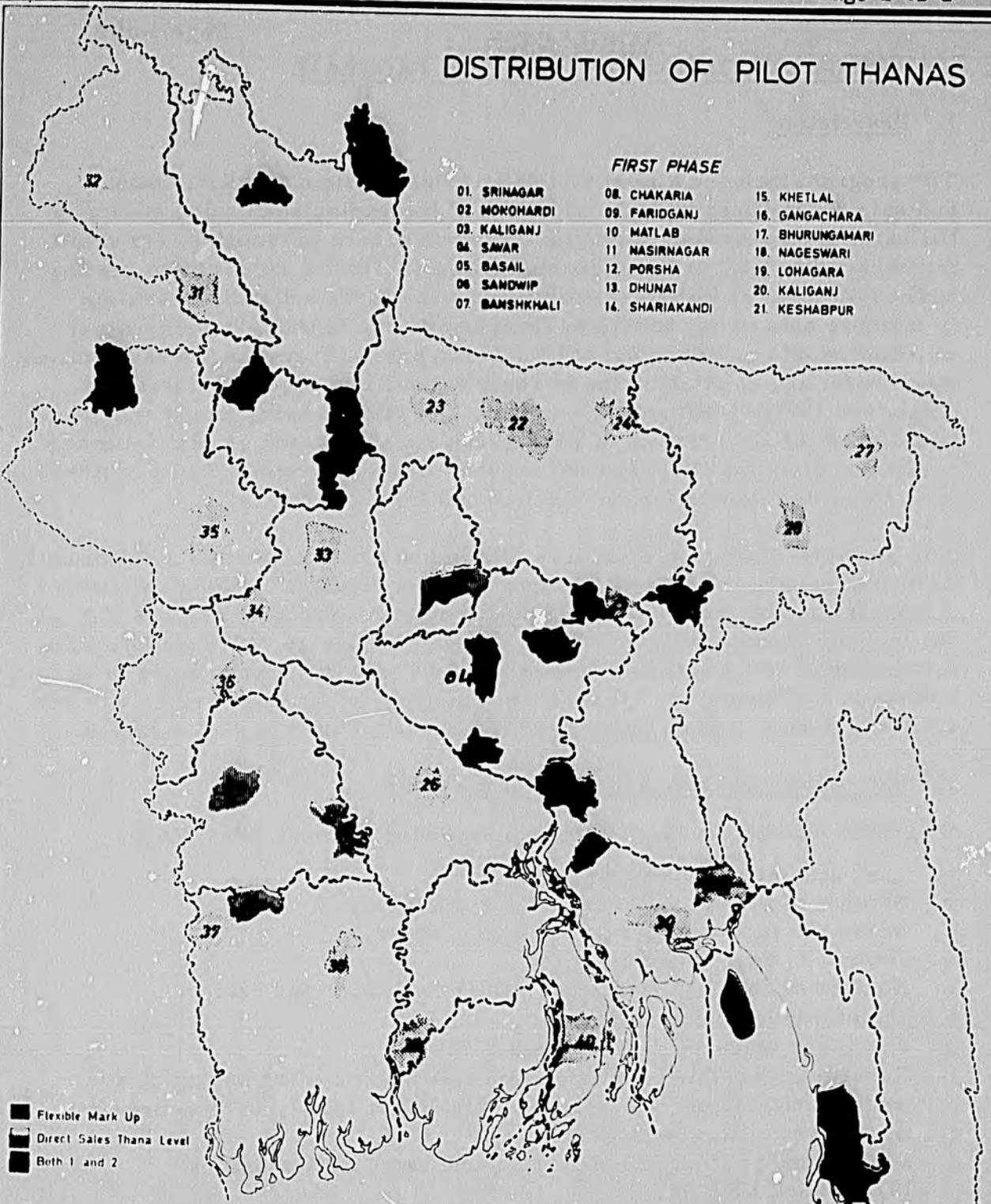
3. Location of Pilot Thanas

A map showing the location and phasing of the pilot Thanas follows on the next page.

DISTRIBUTION OF PILOT THANAS

FIRST PHASE

- | | | |
|----------------|-----------------|------------------|
| 01. SRINAGAR | 08. CHAKARIA | 15. KHETLAL |
| 02. MOROHARDI | 09. FARIDGANJ | 16. GANGACHARA |
| 03. KALIGANJ | 10. MATLAB | 17. BHURUNGAMARI |
| 04. SAWAR | 11. NASIRNAGAR | 18. NAGESWARI |
| 05. BASAIL | 12. PORSHA | 19. LOHAGARA |
| 06. SANDWIP | 13. DHUNAT | 20. KALIGANJ |
| 07. BANSHKHALI | 14. SHARIAKANDI | 21. KESHABPUR |



- Flexible Mark Up
- Direct Sales Thana Level
- Both 1 and 2

11, 12, 1 and 2

SECOND PHASE

- | | | |
|-------------------|------------------------|---------------|
| 22. FULPUR | 29. FENI | 36. KUSHTIA |
| 23. SHERPUR | 30. SUDHARAM (Najkhal) | 37. SHATKHIRA |
| 24. BARHATTA | 31. FULBARI | 38. FAKIRHAT |
| 25. KULIAR CHAR | 32. PIRGANJ | 39. MATHBARIA |
| 26. BHANGA | 33. ULLAPARA | 40. LALMOHAN |
| 27. GOPALGANJ | 34. ATGHARIA | |
| 28. MOULAVI BAZAR | 35. NATOPE | |

COMPARISON OF FERTILIZER DEMAND PROJECTIONS

TABLE 1
000 Metric Tons
UREA

	<u>a/</u> FYP	<u>b/</u> IDA	<u>c/</u> AID PP	<u>d/</u> FYP Revised	Figures used for storage <u>e/</u> projections
73-74	301	315	268*	268*	
74-75	342 (13.6%)	367 (16.5%)	176*	176*	
75-76	423 (23.6)	428 (16.6)	322	300	
76-77	518 (22.4)	499 (16.5)	374 (16.1)	345 (15.0%)	
77-78	616 (18.9)	583 (16.8)	438 (17.1)	415 (20.2)	415
78-79	737 (19.6)**	630 (8.0)	496 (13.3)**	464 (11.7)**	464
79-80	881 (19.6)**	682 (8.8)	562 (13.3)**	518 (11.7)**	518
80-81	1054 (19.6)**	738 (8.2)	637 (13.3)**	578 (11.7)**	578
81-82	1260 (19.6)**	799 (8.2)	722 (13.3)**	646 (11.7)**	646
82-83	1507 (19.6)**	866 (8.3)	818 (13.3)**	722 (11.7)**	722
83-84	1803 (19.6)**	937 (8.2)	927 (13.3)**	806 (11.7)**	806

* Actuals.

** These figures are extrapolated from the projections made by an average of percentage increases for the years covered in the projection.

a/ Bangladesh original Five Year Plan, 1973-78.

b/ Appraisal of Ashuganj Fertilizer Project - Bangladesh (Report No. 598-BD), dated December 18, 1974.

c/ Draft Project Paper for AID Agricultural Inputs Project III, March 1976.

d/ Projections revised by BADC, January 1976.

e/ See projections at Annex B. 3. above.

Prepared: USAID/Bangladesh
May, 1976

COMPARISON OF FERTILIZER SALES PROJECTIONS

TABLE 2

000 Metric Tons

	<u>a/</u> FYP	<u>b/</u> IDA	<u>TSP</u>	<u>c/</u> AID PP	<u>d/</u> FYP Revised	Figures used for storage projections ^{e/}
73-74	158	105		94*	94*	
74-75	173 (9.4%)	128 (21.9)		76*(15.4% P.A.)	76*(16.4% P.A.)	
75-76	207 (19.6)	156(21.8)		123	125	
76-77	254 (22.7)	189 (21.1)		147 (19.5)	175 (40.0)	
77-78	332 (30.7)	222 (17.4)		176 (19.7)	250 (42.8)	176
78-79	400 (20.6)**	245 (10.3)		207 (17.5)**	322 (28.9)**	207
79-80	483 (20.6)**	271 (10.6)		243 (17.5)**	415 (28.9)**	243
80-81	582 (20.6)**	299 (10.3)		286 (17.5)**	535 (28.9)**	286
81-82	702 (20.6)**	330 (10.3)		335 (17.5)**	690 (28.9)**	335
82-83	847 (20.6)**	364 (10.3)		394 (17.5)**	890 (28.9)**	394
83-84	1021 (20.6)**	401 (10.3)**		463 (17.5)**	1147(28.9)**	463

* Actuals.

** These figures are extrapolated from the projections made by an average of the percentage increases for the years covered in the projection.

a/, b/, c/, d/, e/ - See page 1 of this Annex.

COMPARISON OF FERTILIZER DEMAND PROJECTIONS

TABLE 3

000 Metric Tons

	<u>a/</u> FYP	<u>b/</u> IDA	<u>c/</u> AID PP	<u>d/</u> FYP Revised	Figures used for storage projections <u>e/</u>
73-74	61	22	N/A		
74-75	74 (21.3%)	27 (22.7)	"		
75-76	104 (40.5)	34 (25.9)	"	25	
76-77	134 (28.8)	42 (23.5)	"	30 (20.0%)	
77-78	187 (39.5)	52 (23.8)	"	35 (16.6)	35
78-79	248 (32.5)**	58 (11.5)	"	41 (18.0)**	41
79-80	328 (32.5)**	65 (12.0)	"	49 (18.0)**	49
80-81	435 (32.5)**	73 (12.3)	"	58 (18.0)**	58
81-82	576 (32.5)**	81 (10.9)	"	68 (18.0)**	68
82-83	764 (32.5)**	91 (12.3)	"	80 (18.0)**	80
83-84	1012 (32.5)**	102 (11.8)**	"	94 (18.0)**	94

** These figures are extrapolated from the projections made by an average of the percentage increases for the years covered in the projection.

a/, b/, c/, d/, e/ - See page 1 of this Annex.

COMBINED PROJECTIONS USING MOST
CONSERVATIVE FIGURES FOR UREA,
TSP AND MP a/

TABLE 4

	<u>UREA</u>	<u>TSP</u>	<u>MP</u>	<u>TOTAL</u>
76-77				550 <u>b/</u>
77-78	415	176	35	626
78-79	464	207	41	712
79-80	518	243	49	810
80-81	578	286	58	922
81-82	646	335	68	1049

a/ See projections at Annex B. 3 above.

b/ Current estimate of total sales for 1976-77.

COMPARISON OF FERTILIZER STORAGE REQUIREMENT PROJECTIONS

TABLE I

<u>a</u> Year	<u>b</u> Fertilizer Projections	<u>c</u> Storage Current Proportions (. 52)	<u>d</u> TVA "Conservative"	<u>e</u> TVA "Liberal"	<u>f</u> BDG Propor- tions (. 40)	<u>g</u> Supply Stockpile During Slack Offtake Periods(. 43)	<u>h</u> Demand Stockpile for Aman Reserve	Average c - h
76-77	550,000	286,000	286,000	286,000	220,000	236,500	222,000	256,100
77-78	626,000	326,000	332,300	336,200	250,400	269,180	247,000	293,500
78-79	712,000	370,000	378,500	386,400	284,800	306,160	280,000	334,300
79-80	810,000	421,000	394,600	433,000	324,000	348,300	319,000	373,300
80-81	922,000	479,000	410,600	489,800	368,800	396,500	362,000	417,800
81-82	1,049,000	545,000	426,600	526,400	419,600	451,100	412,000	463,500

NOTES:

Column b projections are sums of annual figures for Urea, TSP and MP on pages 4-6 of Annex B. 3.

Column d and e figures are derived from figures in Bangladesh Fertilizer Situation, TVA, October 1974, adjusted downward so as to begin in 76-77 at 286,000 tons. See work sheets following.

Column f figures are 40 percent of fertilizer projections in column b. A BADC draft paper dated 22 March 76 states storage capacity is normally 35-45 percent of total consumption; the middle figure of 40 percent was used.

Column g figures are based on stockpiling pipeline supply during slack off/take periods. A slack period of four months is assumed during which sales are insignificant. If supply pipelines were steady, 33 percent of annual supply would stockpile during this time. An additional 10 percent is included for bunching of import arrivals.

Column h figures are based on stockpiling projected peak demand for the aman(monsoon) crop.

**SOURCE : USAID/Bangladesh
June 1976**

TVA PROJECTIONS
GODOWN REQUIREMENTS
(Excluding Port Transit)

TABLE 2

	<u>CONSERVATIVE</u>	<u>LIBERAL</u>
73-74 (Actual)	258.1	258.1
74-75	339.3	353.8
75-76	420.5	449.6
76-77	501.7	545.3
77-78	582.9	641.1
78-79	664.1	736.8
79-80	692.2	825.8
80-81	720.3	914.9
81-82	748.5	1003.9
82-83	776.6	1093.0
83-84	804.7	1182.0

SOURCE: Figures for 73-74, 78-79 and 83-84 taken from Bangladesh Fertilizer Situation, TVA, October 1974. Intervening figures interpolated.

WORK SHEET:

MOVING TVA PROJECTIONS BACK TO
76-77 STARTING POINT OF 286,000 MT

TABLE 3

<u>YEAR</u>	<u>TVA FIGURE</u>	<u>ADJ. FACTOR</u>	<u>ADJ. FIGURE</u>
"Conservative"			
76-77	501.7	0.57	286.0
77-78	582.9	"	332.3
78-79	664.1	"	378.5
79-80	692.2	"	394.6
80-81	720.3	"	410.6
81-82	748.5	"	426.6
"Liberal"			
76-77	545.3	0.52	286.0
77-78	641.1	"	336.2
78-79	736.8	"	386.4
79-80	825.8	"	433.0
80-81	914.9	"	489.8
81-82	1003.9	"	526.4

SOURCE: TVA figures from Table 2 of this Annex.

PROJECTED GODOWN REQUIREMENTS

ON BASIS OF

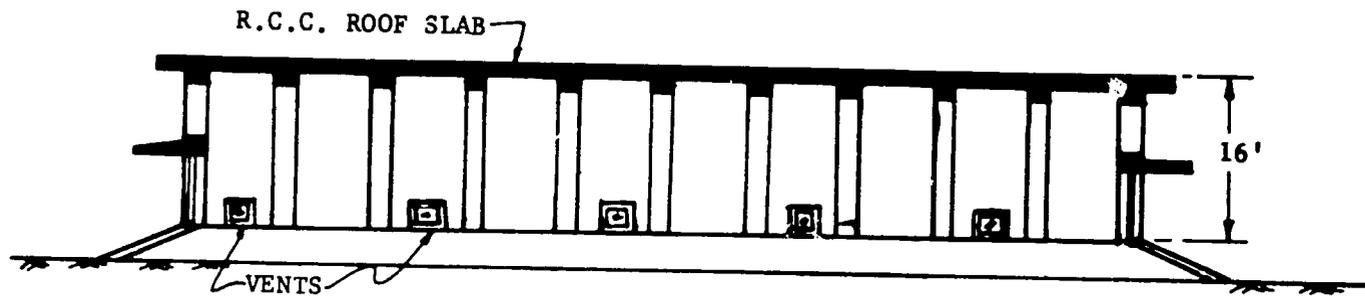
AMAN RESERVE

Assumptions :

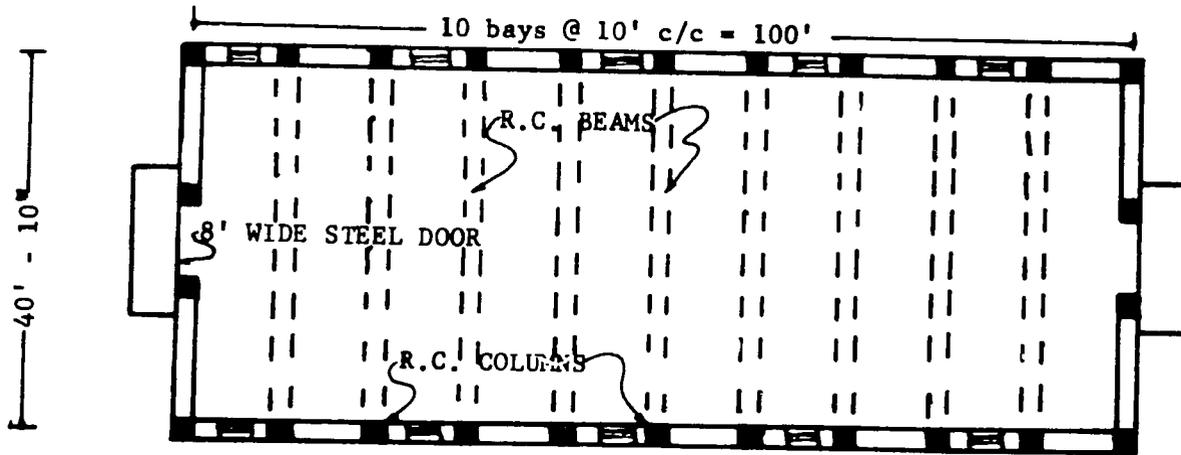
1. 100 percent of aman reserve to be stored.
2. At peak conditions, godowns will average 90 percent full.

<u>YEAR</u>	<u>AMAN RESERVE</u>		<u>STORAGE REQ.</u>
1976-77	200	÷ .90 =	222
1977-78	222	"	247
1978-79	252	"	280
1979-80	287	"	319
1980-81	326	"	362
1981-82	371	"	412

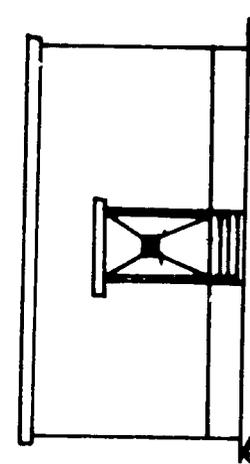
Aman reserve requirement is assumed to expand at the same rate as overall fertilizer usage. The rate of expansion is assumed to be 13.7 percent annually, i. e., the same rate in the combined projections in Table 4, Annex B. 9.



LONGITUDINAL SECTION

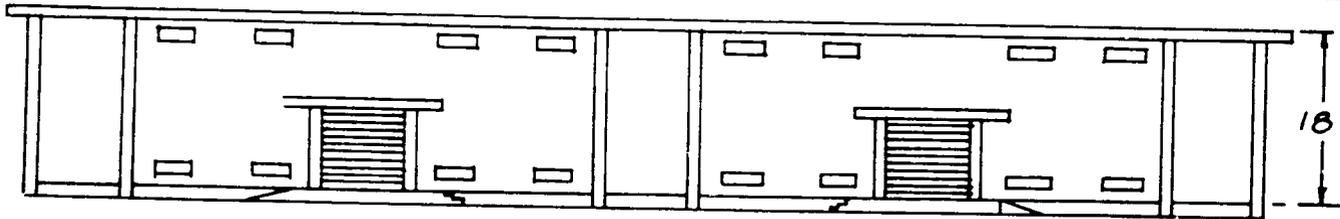


FRAMING PLAN

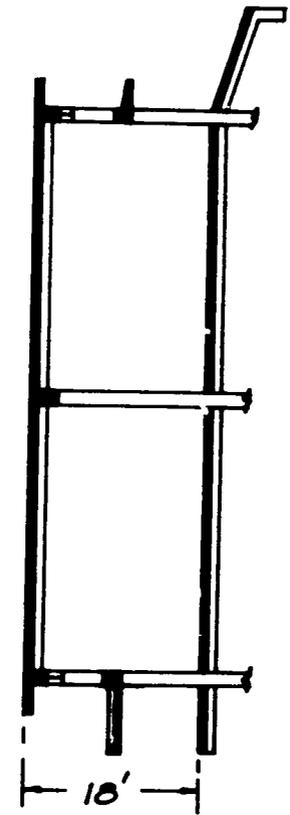
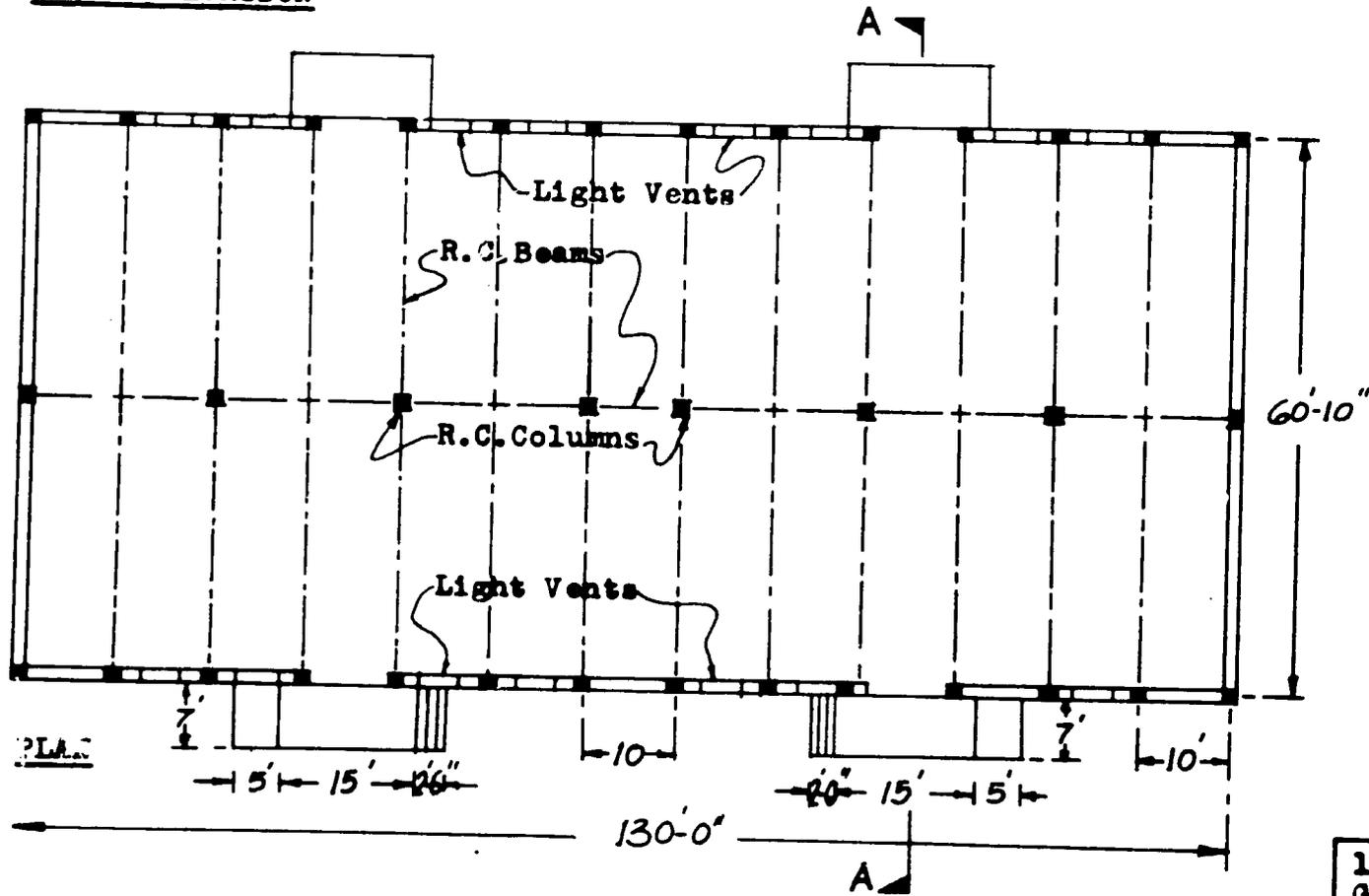


END ELEVATION

FERTILIZER GODOWN
 500 TON CAPACITY
 SOURCE: BADC JUNE 1976



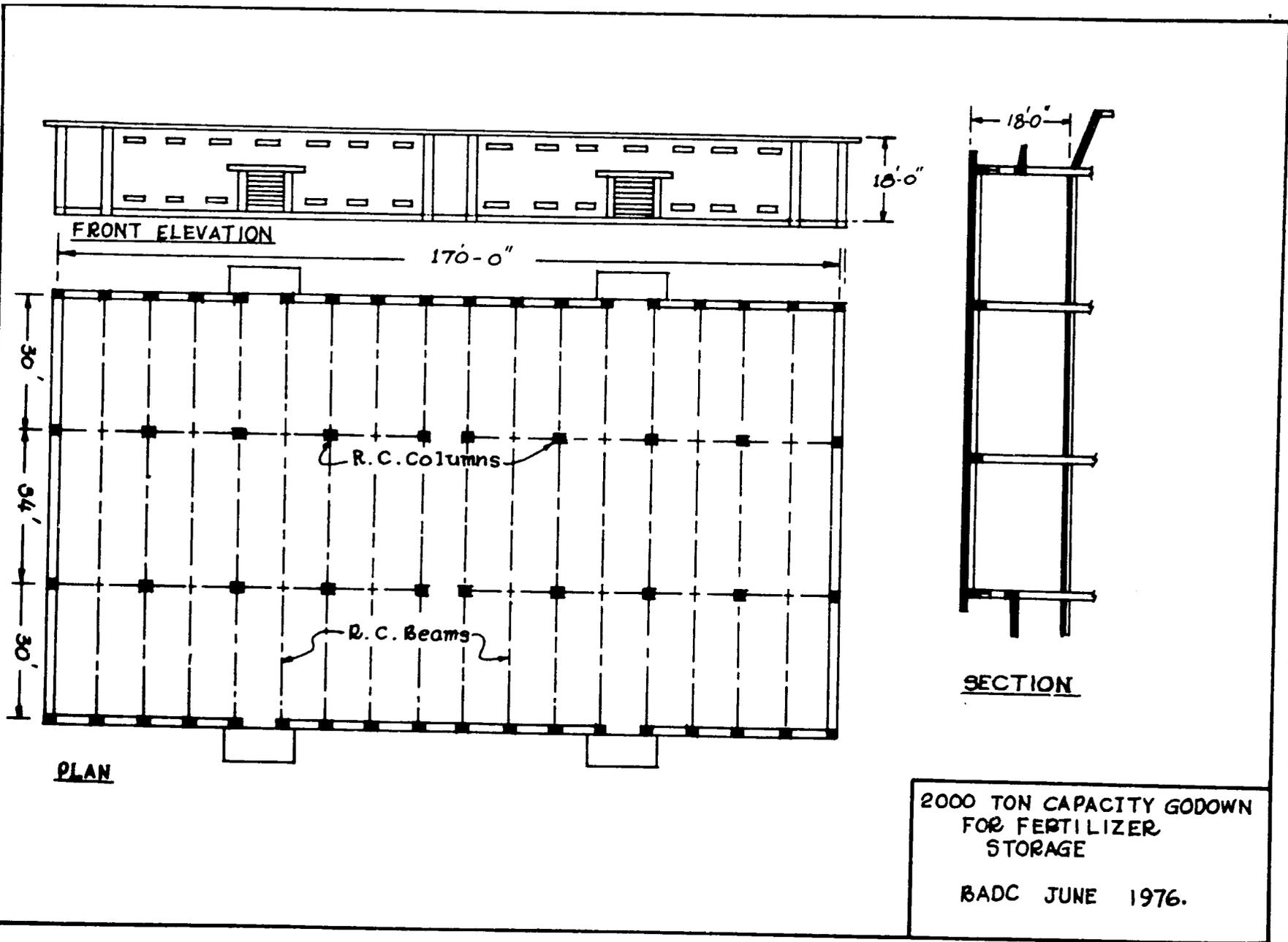
FRONT ELEVATION



SECTION A-A.

**1000 TON CAPACITY
GODOWN FOR FERTILIZER
STORAGE**

BADC JUNE, 1976.



2000 TON CAPACITY GODOWN
 FOR FERTILIZER
 STORAGE
 BADC JUNE 1976.

ESTIMATED UNIT COSTS OF PROPOSED WAREHOUSES
INCLUDING ANCILLARY BUILDING

I. 500 Ton Capacity Warehouse	Tk	Dol. Equiv.
A. Land: 1.5 Bigha @ Tk. 50,000;	75,000	5,000
B. Warehouse:		
1. Site Development	100,000	
2. Approach Road	38,500	
3. Fencing: 600 Rft. @ Tk. 40	24,000	
4. Construction: 4000 Sft. @ Tk. 140	560,000	
5. Electrification	10,000	
	<hr/>	
TOTAL	732,500	48,833
C. Ancillary Buildings:		
1. Office-cum-Residence, Storekeeper 725 Sft @ Tk. 135	97,875	
2. Darwan/Weighman's Quarters 230 Sft. @ Tk. 135	31,050	
3. Sanitation and Electrification 30% of Construction Cost	38,677	
	<hr/>	
TOTAL	167,602	11,173
D. Total A + B + C	975,102	65,006
E. BDG Contribution (25 percent)	243,775	16,251
F. Amount to be financed by AID	731,327	48,755

SOURCE: USAID/Bangladesh

Based on estimates by BADC. June 1976.

II. 1000 Ton Capacity Warehouse:		
	Tk.	Del. Equiv.
A. Land: 3 bigha @ Tk. 50,000 per bigha	150,000	10,000
B. Warehouse:		
1. Site Development	120,000	
2. Approach Road	60,000	
3. Fencing Cost 830 Rft. @ Tk 40	33,200	
4. Construction Cost of Godowns 8000 Sft. @ Tk. 140 per Sft.	1,120,000	
5. Electrification	10,000	
TOTAL	1,343,200	89,547
C. Ancillary Buildings:		
1. Office-cum-Inspection Room 1 no.	81,000	
2. Store-Keeper Residence 2 nos. (Flat system) 475 Sft. @ Tk. 135 per Sft.	64,125	
3. Darwans quarter 2 nos. (Flat system) 230 Sft. @ Tk. 135 per Sft = 31050 x 2 =	62,100	
4. Sanitation and Electrification @ 30 percent of Construction Cost	63,000	
TOTAL	270,225	18,015
D. Total A + B + C	1,763,425	117,562
E. BDG Contribution	440,856	29,391
F. Amount to be financed by AID	1,322,569	88,171

III. 2000 Ton Capacity Warehouse:

	Tk	Dol. Equiv.
A. Land: 4 bigha @ Tk. 50,000	200,000	13,333
B. Warehouse:		
1. Site Development	135,000	
2. Approach Road	75,000	
3. Fencing cost 1000 Rft @ Tk. 40 per Rft.	40,000	
4. Construction cost 16000 Sft. @ Tk. 140 per Sft.	2,240,000	
5. Electrification	10,000	
	<hr/>	
TOTAL	2,500,000	166,667
C. Ancillary Buildings:		
1. Office-cum-Inspection Room 600 Sft. @ Tk. 135 per Sft.	81,000	
2. Store-Keeper's Residence 2 nos. (Flat system) 475 Sft. @ Tk. 135 per Sft.	128,000	
3. Darwans Quarters 2 nos. (Flat system) 230 Sft. @ Tk 135 per Sft. = 31,050 x 2 =	62,000	
4. Sanitation and Electrification @ 30 percent of construction cost	81,000	
	<hr/>	
TOTAL	352,000	23,467
D. Total A + B + C	3,052,000	203,467
E. BDG Contribution (25 percent)	763,000	50,867
F. Amount to be financed by AID	2,289,000	152,600

**Outline Scope of Work
For Project Consultant
(Expatriate-Local Joint Venture)**

Under direction of the BADC Construction Division carry out the following:

- 1. Assist in selection of sites on basis of need, availability of land and utilities, site accessibility, and site preparation requirements. Assist in preparing scopes of work for site preparation work at each site.**
- 2. Assist in preparation of all final construction drawings, specifications, materials lists, and cost estimates.**
- 3. Review terms and conditions and assist in preparation of tender (bid) documents.**
- 4. Assist in selection of local contractors in accordance with generally accepted professional standards.**
- 5. Review terms and conditions and assist in preparation of a standard contract.**
- 6. Supervise all construction to assure compliance with designs and specifications and costs agreed at the outset of such construction by BADC and AID.**
- 7. Prepare progress reports on regular basis for BADC and for AID. Reports should cover progress made during reporting period as well as problems encountered.**
- 8. Issue certificate of completion for each building as construction is completed in accordance with specifications previously agreed by BADC and AID, and also certify completion costs. This will enable AID to arrange for selective monitoring to assure construction is satisfactory for AID financing.**

**SOURCE: USAID/Bangladesh
June 1976**

STORAGE CONSTRUCTION REQUIREMENTS
ADDITIONAL CAPACITY PLUS REPLACEMENT OF RENTED UNITS

<u>Year</u>	<u>Additional capacity required (Table 1, p. 16)</u>	<u>Replacement of rented warehouses (Est.)</u>	<u>Total new capacity required each year</u>	<u>Cumulative Total</u>
1976-77	-	20,000	20,000	20,000
1977-78	7,500	20,000	27,500	47,500
1978-79	40,800	20,000	60,800	108,300
1979-80	39,000	20,000	59,000	167,300
1980-81	44,500	20,000	64,500	231,800
1981-82	45,700	20,000	65,700	297,500

At present BADC rents a total of approximately 180,000 MT of warehouse space for fertilizer storage. This includes 49,000 tons of capacity rented within the last year, including 11,000 tons at Chittagong port. The rented units are of widely varying quality. Most of the units up-country are wood frame with C. I. sheet roofing and siding, and thus highly susceptible to weather and corrosion due to exposure to TSP. This warehousing is to be replaced with properly designed and constructed units as quickly as possible. These level units to be constructed replacing rented units will add as well to total capacity: 200 MT or 400 MT units will be replaced by 500 MT reinforced concrete units. Firm figures for amount of rented capacity to be replaced will be developed in accordance with the final determination of sites, when the Ashuganj Fertilizer Marketing and Distribution Project Study Findings are available.

BANGLADESH
FERTILIZER STORAGE PROJECT
ENVIRONMENTAL ASSESSMENT

The proceeds of this loan will be used to construct and equip fertilizer warehouses totalling up to 50,000 MT of capacity throughout Bangladesh.

The direct impact of the project upon the environment will be minimal. The structures to be built are non-manufacturing in function and so release no waste products into the environment. Sites are widely dispersed over the country. Construction techniques to be used are standard throughout Bangladesh, using brick, mortar, concrete and steel reinforcing bar. A possible immediate effect would be erosion due to site preparation and removal of vegetation. However, erosion resulting from such causes is minimal in flat terrain. Also, given the limited area occupied by each site and the dispersion of sites, such erosion effects overall will be of virtually no significance. In context of the review and final approval of sites and designs for project implementation, the consultant will review each such site, and the effect of the design as it impacts on the site, in terms of environmental requirements and will recommend to AID accordingly. In case of an environmental impact question, the AID Mission will raise the issue with BADC and in the case of significant impact will withhold approval for inclusion of the site in the project until the issue has been resolved to AID satisfaction.

The quality of fertilizer storage has been a chronic problem in Bangladesh. TSP tends to corrode CI sheet roofing and siding, damaging the warehouse, the fertilizer, as well as contaminating the immediate ground area where no flooring is used. The warehouses to be constructed will be of brick, mortar and reinforced concrete, and thus far more durable. Damage to warehouses themselves as well as to stored fertilizer and the immediate area will be virtually non-existent at project sites.

The more significant impact on the environment will be that of the fertilizer made available as a result of the new storage space. The availability and the use of fertilizer will be increased; and this will increase yields, which in Bangladesh are among the lowest in the world. The fertilizer will have a significant beneficial effect in helping Bangladeshis increase their food production, thereby increasing the nutritional level of the farmers, as well as providing them extra money for items which will improve the quality of their lives.

Detrimental environmental effects of fertilizer are principally due to run-off of the irrigation water which will contain nitrates and phosphates from the fertilizers. At some point these waters are again utilized as domestic water supply. In excess concentration, these are harmful to health. The nitrates and phosphates in the drainage waters will also cause an increase in growth of aquatic nuisance plants such as water hyacinths which will, in turn, obstruct local water transportation.

While the fertilizers in the drainage waters cause increased growth of aquatic nuisance plants, they also increase the growth of algae which in turn helps to increase fish production.

There is a continuing effort to keep inland rivers and waterways clear of water hyacinth; this is done by hand labor to clear the way for navigational purposes. The additional fertilizer in use as a result of this project would not appear of significant amount to enlarge the problem beyond the capability of the Government and local people to deal with it -- within the normal level of effort required each year for canal and river clearing.

In a few parts of the world, ground water containing high concentrations of nitrates has caused hemoglobinemia in infants. However, data are not available on the nitrate content of drinking water in Bangladesh and there is no evidence of the incidence of hemoglobinemia. This condition, if it exists, is unlikely to be aggravated by the amounts of fertilizer normally applied in Bangladesh and by the even smaller amounts that would enter the domestic water supply if the fertilizer is properly applied.

No environmental protection measures with respect to fertilizer have been recommended in this report. The most important detrimental effect is the potential for domestic water pollution; this has not been a problem in those areas of Bangladesh where increased use of fertilizers has occurred. Any pollution is diminished to a miniscule amount by the enormous volume of water and the flushing action generated by the rivers which flow through Bangladesh.

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Project Title & Number: BANGLADESH - FERTILIZER STORAGE - 382-0030

Life of Project:
From FY TQ to FY 1979
Total U. S. Funding \$5,250
Date Prepared: June 16, 1976

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>Increase small farmer income through increased production on land cultivated by small farmers (including share-croppers).</p>	<p>Measures of Goal Achievement:</p> <ol style="list-style-type: none"> Five percent increase in production by farmers cultivating two acres or less in 1977-78. Seven percent increase by same farmers in 1978-79. 	<p>MEANS OF VERIFICATION</p> <ol style="list-style-type: none"> Ministry of Agriculture data on crop production for 1977-78 and 1978-79. Sample surveys of small farmers by USAID staff or consultants. Joint AID-BDG evaluations. 	<p>IMPORTANT ASSUMPTIONS</p> <p>Assumptions for achieving goal targets:</p> <ol style="list-style-type: none"> Farm gate prices for domestic food-grains remain relatively stable. Temperate weather and flood conditions through life of project. Disease and pest infestation within normal bounds. HYV seed available and small farmer demand for it increases.
<p>Project Purpose:</p> <p>To increase small farmer agricultural production.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <ol style="list-style-type: none"> Increased and appropriate use of fertilizer by small farmers. Increased production of major crops by small farmers. Private dealers have inventories on hand to meet full demand at peak seasons. Black market in fertilizer substantially eliminated. 	<p>BADC data on fertilizer offtakes.</p> <p>Dealer sales records.</p> <p>Sample surveys of small farmers by USAID staff or consultants.</p> <p>Monitoring on a random basis of dealer sales at peak demand periods by USAID staff.</p> <p>Joint AID-BDG evaluations.</p>	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> Domestic production of fertilizer increases as currently planned. Donors continue to be willing to finance fertilizer imports as needed. Subsidies reduced on market price of fertilizer. More dealers are allowed to enter distribution system. Demand for fertilizer in crossborder areas does not increase to the extent that smuggling becomes attractive.
<p>Outputs:</p> <ol style="list-style-type: none"> Increased storage in BADC system closest to farmer. Increased storage in BADC system at District/Intermediate levels, which alleviate bottlenecks in present system. Effective inventory control and management at all levels on the part of BADC personnel. 	<p>Magnitude of Outputs:</p> <ol style="list-style-type: none"> At Thana level: <ol style="list-style-type: none"> 42 500 MT warehouses 3 1,000 MT warehouses At District/Intermediate level: <ol style="list-style-type: none"> 8 1,000 MT warehouses 9 2,000 MT warehouses <ol style="list-style-type: none"> Orders placed on time Transportation scheduled as needed. Losses in system minimized. 	<p>Fixed-amount-reimbursable system monitored by expatriate consultant.</p> <p>BADC data on fertilizer offtakes.</p> <p>Field surveys and monitoring by USAID staff, and joint AID-BDG evaluations.</p>	<p>Assumptions for achieving outputs:</p> <p>Construction materials remain available locally in adequate quantities and quality and at reasonable price.</p> <p>Budgetary resources available as necessary on timely basis. Land available at suitable locations.</p>
<p>Inputs:</p> <p>JDG: Local currency; land; BADC services.</p> <p>AID: Financing for local construction costs, expatriate consultant services, equipment, vehicles.</p>	<p>Implementation Target (Type and Quantity)</p> <p>BDG: Tk 26,250,000(\$1,750,000) for land, construction, equipment, 240 man-months of BADC services for design, engineering, tendering, contract awards and construction supervision.</p> <p>AID: \$4,450,000 for FAR financing of 75% of cost of completed construction; \$772,000 for expatriate consultants; \$28,000 for vehicles.</p>	<p>Ministry of Finance and BADC budgets and financial reports; BADC engineering reports; procurement documentation.</p> <p>AID financial reports.</p>	<p>Assumptions for providing inputs:</p> <p>Continued BDG commitment to project.</p> <p>No undue difficulties in local procurement of construction services, materials or equipment.</p> <p>Expatriate consultants, vehicles and equipment will be available on timely basis.</p>

Project Performance Tracking Network

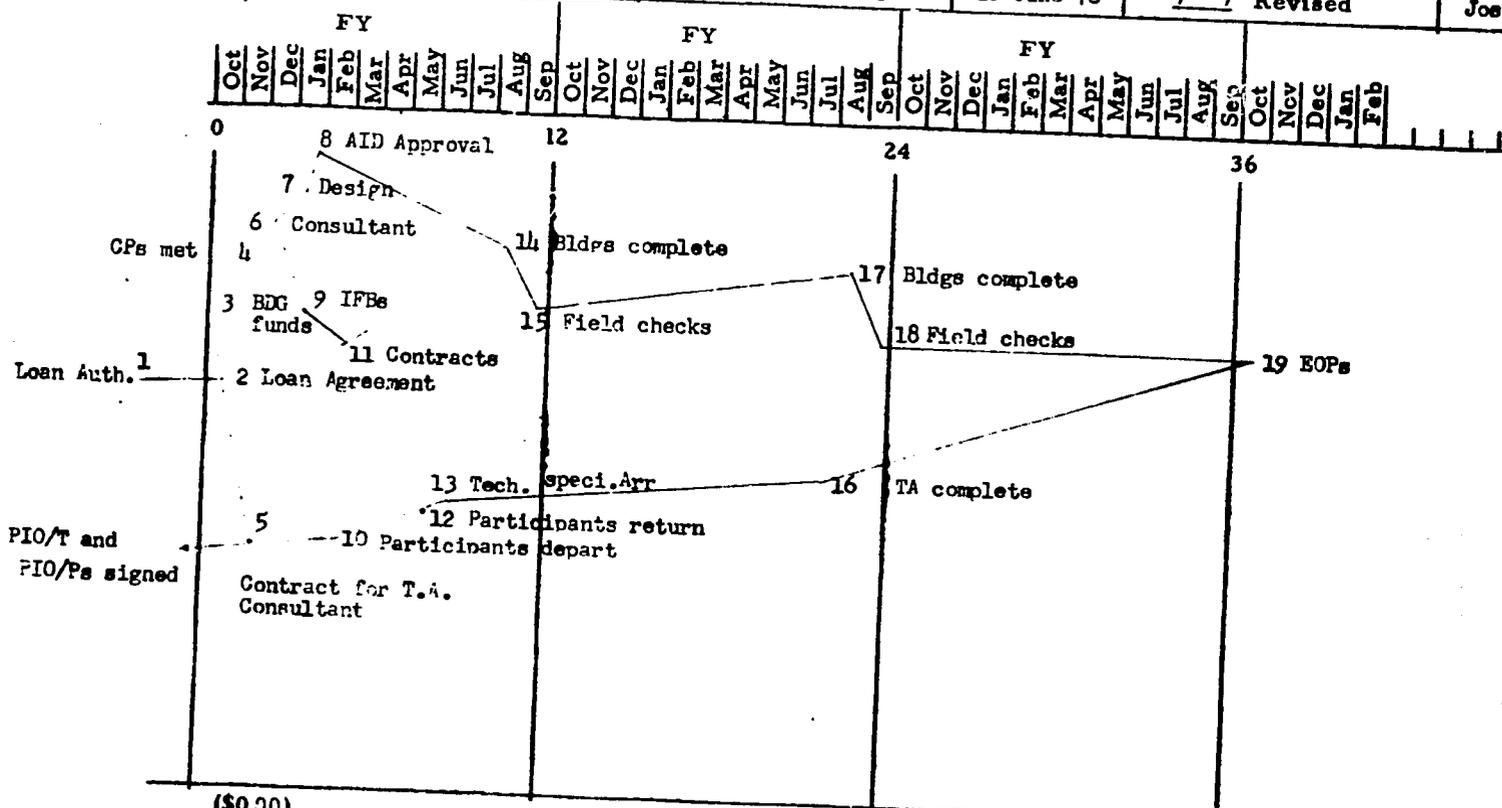
Country: Bangladesh	Project No: 388-0030	Project Title: Fertilizer Storage	Date: 18 June 76	<input checked="" type="checkbox"/> Original <input type="checkbox"/> Revised	PPT Approval: Joseph S. Toner, Director
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CPI Narrative:

- (*) (PIO/T and PIO/PS signed under project no. 388-11-190-002)
1. August 76 Loan authorized
 2. October 76 Loan Agreement signed
 3. November 76 Allocation of funds by BDG
 4. November 76 Initial CPs met
 5. November 76 Contract for T.A. consultant
 6. December 76 Acquisition of expatriate-local joint venture consultant
 7. January 77 Completion of designs and specifications
 8. January 77 AID approval
 9. January 77 Issuance of IFBs for construction
 10. February 77 Participants depart for training
 11. February 77 Contracts awarded
 12. May 77 Participants return from training
 13. June 77 Technical specialist arrives
 14. August 77 First phase buildings complete
 15. September 77 Field checks complete, reimbursement made
 16. June 78 TA complete; specialist departs.
 17. August 78 Second phase buildings complete
 18. September 78 Field checks complete, reimbursement made
 19. October 79 End of project status achieved;

PROJECT PERFORMANCE TRACKING NETWORK

Country: Bangladesh	Project No. 388-0030	Project Title: Fertilizer Storage	Date 18 June 76	<input checked="" type="checkbox"/> Original <input type="checkbox"/> Revised	PPT Approval Joseph S. Toner, Director
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(\$ 00)			
FINANCIAL PLAN	X	2.63 Million	X 5.25 Million
EVALUATION PLAN:	X		X (Either ex post facto evaluation or evaluation under proposed FY 78 Agricultural Inputs Support Loan)

CHECKLIST OF STATUTORY CRITERIA

ANNEX F
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BASIC AUTHORITY

i. FAA Sections 103, 104, 105
106 and 107. Is Loan being
made :

(a) for agriculture, rural
development or nutrition:

The loan is being made to help
Bangladesh improve agriculture,
rural development and nutrition by
financing a primary agricultural input,
required storage space for fertilizer.
It will contribute directly to increasing
foodgrain yields and thereby assist the
overall development of the rural sector.

(b) for population planning
or health;

No.

(c) for education, public
administration; or human
resources development;

No.

(d) to solve economic and
social development problems
in fields such as transportation,
power, industry urban develop-
ment, and export development;

No.

(e) in support of the general
economy of the recipient
country or for development
programs conducted by private
or international organizations.

No.

COUNTRY PERFORMANCE

Progress Towards Country Goals

2. FAA Sections 201(b)(5), (7) and
(8); 208.

(a) Describe extent to which
country is:

(1) Making appropriate efforts to increase food production and improve means for food storage and distribution.

Increasing foodgrain production is a major objective of the Bangladesh Five Year Plan (FYP). Included also in the FYP are programs for storage and distribution of food.

(2) Creating a favorable climate for foreign and domestic private enterprise and investment.

BDG policy encourages both foreign and domestic private enterprise and investment, and in January 1975 an OPIC bilateral agreement was concluded. In addition, the new Martial Law Administration (since November 7, 1975) has particularly emphasized the role of private enterprise and has announced a new investment policy encouraging both foreign and domestic private investment.

(3) Increasing the public's role in the developmental process.

Implementation of Bangladesh's development plans requires a large public role in development. The use of the agricultural inputs is essentially by the people themselves. Cooperatives are encouraged by the Government, directly involving the public in a participation role. In addition, the national rural works program also requires a high degree of local decision-making and participation.

(4) (a) Allocating available budgetary resources to development.

Bangladesh's budgetary resources are overwhelmingly allocated to relief and development expenditures.

(b) Diverting such resources for unnecessary military expenditure (See also Item No. 19) and intervention in affairs of other free and independent nations. (See also Item No. 10)

Bangladesh's military expenditures are very low in absolute and relative terms. The level of defense spending is not a diversion of development funds.

(5) Making economic social and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

Bangladesh is a nation of small landowners with a landholding system which is more equitable than most LDCs. Accordingly, land tenure changes, while necessary perhaps in the long-term equity question, are not as critical an element for the development of Bangladesh as for other LDCs. The average acreage per family is $2\frac{1}{2}$ to 3 acres. On the other questions, the new Martial Law Administration has evidenced a concern for each of these; this has been manifested through tighter public administration, return of some newspapers to private control, and encouragement of private enterprise. Recognition of the importance of individual freedom and initiative also appear to be marks of the new Government. Martial Law has been extended to the country in what appears principally to be an effort to clear up carry-over problems of corruption and abuse of power. Respect for the rule of law is stated as underlying the current measures.

(6) Willing to contribute funds to the project or program.

The Bangladesh Government will contribute at least 25 percent towards the local costs of this project. See PP Part III. A.

(7) Otherwise responding to the vital economic political and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

The new Government evidences a real concern for these questions and has been taking action to improve the public service, to release economic activity from constraints formerly imposed by governmental intervention, and to alleviate conditions of the people through rural works programs, food for work and other self-help programs.

(b) Are above factors taken into account in the furnishing of the subject assistance?

Yes.

Treatment of US Citizens and Firms

3. FAA Section 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a US citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?

No.

4. FAA Section 620 (e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, appropriating, or otherwise seizing ownership or control of property of US citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

At the present time, the BDG is not in violation of the requirement of this section. However, the BDG in 1972 did nationalize five firms which were fully or partially-owned by US entities. It has announced a compensation policy and is therefore taking steps to discharge its obligations toward US citizens and entities.

5. FAA Section 620(o):
Fisherman's Protective Act.
Section 5. If country has seized, or imposed any penalty or sanction against, any US fishing activities in international waters,

Bangladesh has not taken such action.

(a) has any deduction required by Fisherman's Protective Act been made? Not applicable.

(b) has complete denial of assistance been considered by AID Administrator? Not applicable.

Relations with US Government and Other Nations

6. FAA Section 620(a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba? The US Mission is not aware of any BDG non-compliance with this section.
7. FAA Section 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? The Secretary of State has so determined.
8. FAA Section 620 (d). If assistance is for any productive enterprise which will compete in the United States with United States enterprise, is there an agreement by the recipient country to prevent export to the United States of more than 20 percent of the enterprise's annual production during the life of the loan? Not applicable.

9. FAA Section 620(f). Is recipient country a Communist country? No.
10. FAA Section 620 (i). Is recipient country in any way involved in (a) subversion of, or military oppression against, the United States or on any country receiving US assistance, or (b) the planning of such subversion or aggression? (a) No.
(b) No.
11. FAA Section 620 (j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action, of US property? No.
12. FAA Section 620 (l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID administration within the past year considered denying assistance to such Government for this reason? An OPIC bilateral agreement was signed on January 15, 1975.
13. FAA Section 620(n). Does recipient country furnish goods to North Viet-Nam or permit ships or aircraft under its flag to carry cargoes to or from North Viet-Nam? The Mission is not aware of any BDG non-compliance with this section.
14. FAA Section 620(q). Is the government of the recipient country in default on interest or principal on any AID Loan to the country? No.

ANNEX F

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15. FAA Section 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? **Bangladesh has not severed diplomatic relations with the US. Remainder of the question therefore is not applicable.**
16. FAA Section 620 (u). What is the payment status of the country's US obligation? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? **Bangladesh is not in arrears. Remainder of the question is therefore not applicable.**
17. FAA Section 481. Has the government of recipient country failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to US Government personnel or their dependents, or from entering the US unlawfully? **No.**
18. FAA Section 659 If (a) a military base is located in recipient country, and was constructed or is being maintained or operated within funds furnished by US and (b) US personnel carry out military operations from such base, has the President determined that the government of recipient country has authorized regular access to US correspondents to such base? **There is no such military base in Bangladesh.**

Military Expenditures

19. FAA Section 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).)

The military expenditures in the Bangladesh budget are approximately nine percent, and are probably among the lowest LDCs expenditures. The Soviet Union has provided a limited number of aircraft for the Bangladesh Air Force. This non-sophisticated equipment was purchased on credit at reduced prices. The country is not diverting development assistance funds for military expenditures.

CONDITIONS OF THE LOAN

General Soundness

20. FAA Section 201(d). Information and conclusion on reasonableness and legality (under laws of country and the United States) of lending and relending terms of the loan.

Bangladesh is a developing country. The loan terms are two percent during a ten year grace period and three percent for the balance of the 40 year repayment period. This is the minimum rate permitted by United States law and is much below the legal interest rate in Bangladesh.

21. FAA Sections 201(b)(2);201(e). Information and conclusion on activity's economic and technical soundness. If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to AID application for such funds together with assurance to indicate that funds will be used in an economically and technically sound manner?

Yes, See Loan Request at Annex H.

22. FAA Section 201(b)(2). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.

Section III (D) of Project Paper sets forth the information in question, and concludes that there is a reasonable prospect for repayment of the loan.

23. FAA Section 201(b)(1). Information and conclusion on availability of financing from other free world sources, including private sources within the United States. No other US private or public source of finance is available for this loan. Other donors assisting Bangladesh meet its agricultural inputs needs may provide financing for projects complementary to this project.
24. FAA Section 611(a)(1). Prior to signing of loan will there be
(a) engineering, financial, and other plans necessary to carry out the assistance and
(b) a reasonably firm estimate of the cost to the United States of the assistance?
(a) Yes.
(b) The cost of assistance to the United States is limited to the \$5.25 million amount of the loan.
25. FAA Section 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of loan? No such legislative action is required.
26. FAA Section 611(e). If loan is for Capital Assistance, and all US assistance to project now exceeds \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project? Yes. See Annex G of the Project Paper.
- Loan's Relationship to Achievement of Country and Regional Goals
27. FAA Sections 207; 113
Extent to which assistance reflects appropriate emphasis on: (a) encouraging development
The project directly contributes to the country's self-help efforts to increase foodgrain production and meet its own

of democratic, economic, political, and social institutions; (b) self-help in meeting the country's food needs; (c) improving availability of trained manpower in the country; (d) programs designed to meet the country's health needs; (e) other important areas of economic, political and social development, including industry; free labor unions, cooperatives, and voluntary agencies; transportation and communication; planning and public administration; urban development; and modernization of existing laws; or (f) integrating women into the recipient country's national economy.

food needs. Although it is not specifically directed to training of manpower or development of the institutions under (a), whatever rural income increase results from the project should assist in development or support of a rural standard of living; in augmented incomes lies the greater potential for encouraging such institutions. Similarly, health and increased roles for women, although not specifically addressed by the project, should benefit from any increase in rural income and living standards. For the items under (e), development of rural cooperatives can be expected to result from the success of this project; the other items under (d) are not sufficiently related to the project objectives to include comment.

28. FAA Section 209. Is project susceptible of execution as part of regional project? If so, why is project not so executed?

No. The project is not so susceptible.

29. FAA Section 201(b)(4). Information and conclusion on activity's relationship to, and consistency with, other development activities, and its contribution to realizable long-range objectives.

The project is fully consistent with major objectives of the Bangladesh Five Year Plan in increasing foodgrain production, including provision of necessary storage for this purpose. It is also consistent with US objectives for rural development targeted to the rural poor. See Project Paper for discussion.

30. FAA Section 201(b)(9). Information and conclusion on whether or not the activity to be financed will contribute to the achievement of self-sustaining growth.

The project will contribute towards wider use of modern agricultural inputs, without which increased food production and self-sustaining growth in Bangladesh are impossible.

31. FAA Section 209. Information and conclusion whether assistance will encourage regional development programs. Applicable only to the extent that use of modern agricultural inputs involves results of research carried out elsewhere in the region; the project may tend to encourage such exchanges.
32. FAA Section 111. Discuss the extent to which the loan will strengthen the participation of the urban and rural poor in their country's development, and will assist in the development of cooperatives which will enable and encourage greater numbers of poor people to help themselves toward a better life. Use of modern agricultural inputs and increased productivity should result in chance for improvement in incomes of the rural poor, thereby helping to give them a basis for greater participation in development, including participation in the development of and through cooperatives. The urban poor are not really addressed by the project, except to the extent rural development takes place, migration of the rural poor to the cities may be reduced.
33. FAA Section 201(f). If this is a project loan, describe how such project will promote the country's economic development taking into account the country's human and material resource requirements and the relationship between ultimate objectives of the project and overall economic development. Increased agricultural production is essential to Bangladesh's economic development. Fertilizer is a prime requirement for increase of production, and adequate fertilizer storage is an essential corollary.
34. FAA Section 281(a). Describe extent to which the loan will contribute to the objective of assuring maximum participation in the task of economic development on the part of the people of the country, through the encouragement of democratic private, and local governmental institutions. Modern agricultural inputs are required for implementation of Bangladesh's goal to increase food production; similarly, adequate storage is essential to permit these inputs to reach the farmer. Without such increased production and resulting adequate food levels, participation of the people of the country in institutions indicated would be adversely affected.

35. FAA Section 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.
- The project is specifically targeted to the basic rural development and foodgrain production needs of the country. The accomplishment of the objectives of the project may result in increased cooperatives activity and greater participation by the poorer rural population, thus involving greater participation in basic self-government type activities and development of such institutions.
36. FAA Section 201(b)(3). In what ways does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities?
- The project contributes directly to increasing agricultural production and indirectly to other aspects of rural development. Availability of modern agricultural inputs is critical to both; storage is essential to such availability.
37. FAA Section 601(a). Information and conclusions whether loan will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions.
- The project is not directly applicable to foreign trade. It will facilitate private initiatives of farmers and reinforce a more competitive marketing for fertilizer distribution. It does help cooperatives development, since cooperatives are involved in distribution of inputs. Increased availability of agricultural inputs will improve the technical efficiency of the agriculture sector. The project is not directed toward labor unions.
38. FAA Section 619. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans to the maximum extent appropriate?
- This project is in addition to assistance already being channeled through multi-lateral organizations.

39. FAA Section 201(b)(6). Information and conclusion on possible effects of loan on US economy, with special reference to areas of substantial labor surplus, and extent to which US commodities and assistance are furnished in a manner consistent with improving the US balance of payments position.
40. FAA Section 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources.
41. FAA Section 601(b). Information and conclusion on how the loan will encourage US private trade and investment abroad and how it will encourage private US participation in foreign assistance programs (including use of private trade channels and the services of US private enterprise).
42. FAA Section 601(d). If a capital project, are engineering and professional services of US firms and their affiliates used to the maximum extent consistent with the national interest?
- Consulting services will be procured under US source and origin, thereby contributing to US labor usage. The project is principally directed to financing commodities and services on a local basis. Bangladesh will expend in the US an amount equivalent to disbursements under the loan for local costs, therefore redressing any significant balance of payments impact.
- Loan proceeds are only intended for procurement of goods and services from private sources.
- The project will finance fertilizer storage space. Since much imported fertilizer is from private US suppliers this should tend to encourage US-Bangladesh trade and the role of US private enterprise in participation in foreign assistance.
- Yes.

43. FAA Section 602. Information and conclusion whether US small business will participate equitably in the furnishing of goods and services financed by the loan. Normal Small Business notification will be required in the implementation of the project.
44. FAA Section 620 (b). Will the loan promote or assist the foreign aid projects or activities of the Communist-Bloc countries? No.
45. FAA Section 621. If Technical Assistance is financed by the loan, information and conclusion whether such assistance will be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis. If the facilities of other Federal Agencies will be utilized, information and conclusion on whether they are particularly suitable, are not competitive with private enterprise, and can be made available without undue interference with domestic programs. Any Technical Assistance provided will be from private enterprise on a contract basis to the extent not provided directly by AID.

Loan's Compliance with Specific Requirements

46. FAA Section 110(a); 208(e). In what manner has or will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to which the loan is to be made? 25 percent of the costs of the project will be met by Bangladesh. See PP Part III. B.

47. FAA Section 660. Will the loan be used to finance police training or related programs in recipient country? No.
48. FAA Section 114. Will the loan be used to pay for performance of abortion or to motivate or coerce persons to practice abortion? No.
49. FAA Section 201(b). Is the country among the 20 countries in which development loan funds may be used to make loans in this fiscal year? Yes.
50. FAA Section 201(d). Is interest rate of loan at least 2 percent per annum during grace period and at least 3 percent per annum thereafter? Yes.
51. FAA Section 201(f). If this is a project loan, what provisions have been made for appropriate participation by recipient country's private enterprise? Construction will be done by private local contractors.
52. FAA Section 604(a). Will all commodity procurement financed under the loan be from the United States except as otherwise determined by the President? Yes, procurement will be limited to Bangladesh plus AID Geographic Code 941 sources.
53. FAA Section 604(b). What provision is made to prevent financing commodity procurement in bulk at prices higher than adjusted US market price? The loan does not contemplate financing of bulk commodity procurement.

54. FAA Section 604(d). If the cooperating country discriminates against US marine insurance companies, will loan agreement require that marine insurance be placed in the United States on commodities financed by the loan?
- Yes, the Loan Agreement will so provide.
55. FAA Section 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement, when the domestic price of such commodity is less than parity?
- Project does not contemplate financing of agricultural commodities.
56. FAA Section 604(f). If loan finances a commodity import program, will arrangements be made for supplier certification by AID and AID approval of commodity as eligible and suitable?
- Such arrangements will be applied to extent commodities are financed for import.
57. FAA Section 608(a). Information on measures to be taken to utilize US Government excess personal property in lieu of the procurement of new items.
- Excess personal property is not appropriate for this project.
58. FAA Section 611(b); App. Sect 101. If loan finances water or water-related land resources construction project or program, is there a benefit-cost computation made, insofar as practicable, in accordance with the procedures set forth in the Memorandum of
- The project does not entail such construction.

59. FAA Section 611(c). If contracts for construction are to be financed, what provision will be made that they be let on a competition basis to maximum extent practicable? Project implementation arrangements will provide for competitive selection of local contractors to maximum extent practicable.
60. FAA Section 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the United States are utilized to meet the cost of contractual and other services. The US does not own a significant amount of Bangladesh taka which could be used in this project. The Bangladesh Government will contribute 25 percent of the total costs of the project and this contribution will be in local currency.
61. App. Section 113. Will any of loan funds be used to acquire currency of recipient country from non-US Treasury sources when excess currency of that country is on deposit in the US Treasury? Bangladesh is not an excess currency country.
62. Section 30 and 31 of PL 93-189 (FAA of 1973). Will any part of the loan be used to finance directly or indirectly military or paramilitary operations by the US or by foreign forces in or over Laos, Cambodia, North Vietnam, South Vietnam, or Thailand? No.
63. Section 37 of PL 93 - 189 (FAA of 1973); App. Section 111. Will any part of this loan be used to aid or assist generally or in the reconstruction of North Vietnam? No.

64. FAA Section 622. Will arrangements preclude use of funds for CIA activities? Yes.
65. FAA Section 612(d). Does the United States own excess foreign currency and, if so, what arrangements have been made for its release? See Paragraphs 60 and 61, above.
66. FAA Section 620(g). What provision is there against use of subject assistance to compensate owners for expropriated or nationalized property? The loan will not be used for this purpose.
67. FAA Section 620(k). If construction of productive enterprise is involved, will aggregate value of assistance to be furnished by the United States exceed \$100 million? The project will not fund such enterprise; also US assistance is limited to the \$5.25 million loan.
68. FAA Section 636(i). Will any loan funds be used to finance purchase, long-term lease, or exchange of motor vehicles manufactured outside the United States, or any guaranty of such a transaction? Yes. A waiver is being sought to permit procurement of two jeep vehicles from India.
69. App. Section 103. Will any loan funds be used to pay pensions, etc. for military personnel? No.
70. App. Section 105. If loan is for a capital project, is there provision for AID approval of all contractors and contract terms? There will be provision in the loan agreement that contract terms and conditions will be subject to AID approval.
71. App. Section 107. Will any loan funds be used to pay UN assessments? No.

72. App. Section 108. Compliance with regulations on employment of US and local personnel (AID Regulation 7). The project will comply with these regulations.
73. App. Section 110. Will any of the loan funds be used to carry out provisions of FAA Section 209(d)? No.
74. App. Section 112. Will any of the funds appropriated or local currencies generated as a result of AID assistance be used for support of police or prison construction and administration in South Vietnam or for support of police training of South Vietnamese? No.
75. App. Section 113. Describe how the Committee on Appropriations of the Senate and House have been or will be notified concerning the activity, program, project, country, or other operation to be financed by the loan. Formal notification will be given to Congress with respect to this loan.
76. App. Section 501. Will any loan funds be used for publicity or propaganda purposes within the United States not authorized by Congress? No.
77. App. Section 504. Will any of the funds appropriated for this project be used to furnish petroleum fuels produced in the continental United States in Southeast Asia for use by non-US nationals? No.

78. APP Section 901. b; FAA Section 640 C.

(a) Compliance with requirement that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed with funds made available under this loan shall be transported on privately owned US flag commercial vessels to the extent that such vessels are available at fair and reasonable rates.

Yes, the loan agreement shall contain such a requirement.

(b) Will grant be made to loan recipient to pay all or any portion of such differential as may exist between US and foreign flag vessel rates?

No

79. FAA Section 116. Does the assistance directly benefit the needy people? If not, does the country engage in a consistent pattern of gross violations of internationally recognized Human Rights?

The assistance will directly benefit the needy people of Bangladesh.

BANGLADESH

FERTILIZER STORAGE PROJECT

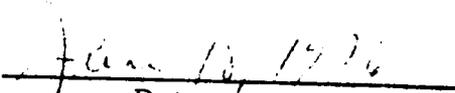
CERTIFICATION PURSUANT TO SECTION 611(e) OF THE
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Joseph S, Toner, Mission Director, the principal officer of the Agency for International Development in Bangladesh, having taken into account, among other things, the maintenance and utilization by the Bangladesh Government and its agencies of projects previously financed by the United States, do hereby certify that in my judgment Bangladesh has the financial and human resources capability effectively to utilize the project to be financed by this loan.

This judgment is based upon considerations discussed in the Project Paper to which this certification is attached.



Joseph S. Toner
Director



Date

(Government Seal)

ANNEX H
Page 1 of 2

Mr. Kafiluddin Mahmood
Secretary

Ministry of Planning
Sher-e-Bangla Nagar
Dacca-15

D.O. No. ERD/USA(P)-9/76

Dated: June 18, 1976

Subject: Request for AID Assistance to Bangladesh -
Fertilizer Storage Project

Dear Mr. Toner:

The Government of Bangladesh, under its First Five Year Plan, has adopted a primary objective of self-sufficiency in the production of foodgrains. An essential element in this effort involves adequate and timely supply of fertilizer to farmers. On June 10, 1976 the Government of Bangladesh approved a project prepared by the Bangladesh Agricultural Development Corporation to construct additional storage capacity required to accommodate projected increases in fertilizer usage. Construction is required at all levels throughout the fertilizer distribution system, but initially and principally at the Thana level, nearest the sale point to farmers. The highest priority areas of need are those where Government fertilizer storage facilities are presently inadequate or do not exist, where demand is expected to expand significantly in the near future, and where communications are cut seasonally due to monsoon flooding. The total costs of meeting these needs, including ancillary buildings and engineering consultant services, is estimated to be \$7,000,000. Accordingly the Government of Bangladesh would appreciate and herewith requests the assistance of the U.S. Government through AID in carrying out this program. Specifically assistance through a loan of \$5,250,000 is requested to assist in financing construction of warehouses, related buildings for housing and office space, and consultant services related to the construction.

The Government of Bangladesh agrees that costs of the consultant services including all local currency (Bangladesh Taka) costs, will be financed directly and in entirety from the AID loan. The Government of Bangladesh also agrees that the financing provided under the AID loan for construction will be reimbursed for construction completed in accordance with specifications agreed between the Government of

Bangladesh and AID before commencement of such construction and at an amount of 75 percent of the costs for construction as agreed between the Government and AID before commencement of such construction. Advance funding of local currency sufficient to implement the construction in agreed stages on a timely basis will therefore be provided by the Government of Bangladesh, of which 75 percent will be reimbursed by the AID loan in accordance with the procedure above. The remaining balance of such construction costs, as well as other local currency costs for a total of not less than 25 percent of overall project costs, will be met by the Government of Bangladesh.

In connection with this project, the Government of Bangladesh undertakes to expend in the United States, from its own foreign exchange resources, an amount equivalent to the United States dollars reimbursed to the Government of Bangladesh or expended by AID from this loan for the local currency costs of the project. Such expenditures will not include purchases from the United States which are financed with AID funds under this or any other AID project.

The project will be jointly evaluated by the Government of Bangladesh and AID at scheduled intervals and the agreed results of such evaluations incorporated in the succeeding procedures for implementation of the project. In addition, the Government agrees that for the evaluation conducted following completion of all construction and the final project evaluation, the agreed results of such evaluations as appropriate will be accepted by the Government as conditions to disbursement under any succeeding AID loans for construction and for import of fertilizer or fertilizer raw materials.

The Government of Bangladesh also agrees that in order to ensure optimum final determinations with respect to sites and sizes of the warehouses to be constructed under this project, the preliminary listings of such sites and sizes included at present in the project formulation will be revised as necessary in accordance with the forthcoming recommendations of the Bangladesh Fertilizer Marketing and Distribution Project Study currently being implemented under the Ashuganj Fertilizer Project.

Please let me know if we can provide you with any further information.

Mr. Joseph S. Toner
Director
USAID, C/o American Embassy
Purbani Hotel, Dacca-2

Sincerely yours,
/sd/
(Kafiluddin Mahmood)

BANGLADESH
FERTILIZER STORAGE PROJECT

Project Description

The Bangladesh Government has recently approved a program to add 69,600 MT of fertilizer storage capacity within three years. In addition, another 282,800 MT is planned to be proposed for construction under the Second Five Year Plan. This project is an immediate response to the present need and will finance up to 50,000 MT of warehouses, and ancillary buildings for housing and office space, and related consultant engineering services. The broader purpose of the project is an increase in rural incomes, specifically for small farmers, through providing improved access to fertilizer, an essential component to increase of crop production and income.

The project, therefore, provides for construction of fertilizer warehouses and ancillary buildings at immediately critical points in the fertilizer distribution system, clearing principal points where movement of fertilizer is obstructed, and at Thana level where existing or projected demand or logistics constraints have identified the need.

The project loan funds will finance on a fixed-amount-reimbursable (FAR) basis 75 percent of the previously agreed costs of construction upon completion of construction according to specification. The Government of Bangladesh will advance all local currency required for such construction and will absorb the non-reimbursed 25 percent, which in addition to other local costs accepted by the Government of Bangladesh, will constitute 25 percent of total project costs met by the Government of Bangladesh. Consultant engineering services will also be provided under the project, all costs of which will be financed under the AID loan.

The Government of Bangladesh will expend in the United States from its own foreign exchange resources an amount equivalent to the United States dollars reimbursed to the Government of Bangladesh or expended by AID from this loan for local currency (Bangladesh Taka) costs of the project. Such expenditures will not include purchases from the United States which are financed with AID funds under this or any other AID project.

LOAN AUTHORIZATION

Provided from: Food and Nutrition
(Bangladesh: Fertilizer Storage)

Pursuant to the authority vested in me as Assistant Administrator, Bureau for Asia, Agency for International Development ("A.I.D.") by the Foreign Assistance Act of 1961, as amended, ("the Act") and the delegations of authority issued thereunder, I hereby authorize the establishment of a loan ("the Loan") pursuant to Part I, Chapter 1, Section 103, and Chapter 2, Title I, the Development Loan Fund, to the People's Republic of Bangladesh ("the Government") of not to exceed Five Million Two Hundred and Fifty Thousand United States Dollars (\$5,250,000) to assist in financing the foreign exchange and local currency costs of providing materials and services for a fertilizer storage project. This loan will be subject to the following terms and conditions:

1. Terms of Repayment and Interest Rate

The Government shall repay the Loan to A.I.D. in United States Dollars within forty (40) years from the date of the first disbursement under the Loan, including a grace period of not to exceed ten (10) years from said date. The Government shall pay to A.I.D.

in United States Dollars interest at the rate of two percent (2%) per annum during the grace period and three percent (3%) per annum thereafter on the outstanding disbursed balance of the Loan and any due and unpaid interest.

2. Other Terms and Conditions

A. Unless A.I.D. otherwise agrees in writing,

(a) Goods and services financed under the loan shall have their source and origin in Bangladesh and in countries included in A.I.D.' Geographic Code 941, except that non-Bangladesh source and origin consultant services shall have their source and origin in the United States.

(b) The loan agreement shall provide that, prior to the first disbursement of the loan proceeds, the Government shall submit, or cause to be submitted, the following in form and substance satisfactory to A.I.D.:

(1) An executed contract between the Bangladesh Agricultural Development Corporation (BADC) and a firm satisfactory to A.I.D. to perform engineering and other consultant services for the project;

(2) Evidence of adequate plans, budget and staff for the operation and maintenance of facilities constructed under the project.

(c) The loan agreement shall provide that prior to disbursement of loan proceeds as reimbursement for each phase of construction, the Government shall submit, or cause to be submitted, the following in form and substance satisfactory to A.I.D.:

(1) Documentation submitted to A.I.D. prior to construction consisting of (a) a listing of final site selections and determination of warehouse size for each site, (b) evidence of acquisition of land and other rights required for the use of each site in accordance with the purpose of the project, and (c) copies of designs, specifications, cost estimates and standard construction contract approved by the consultant;

(2) A certification by the consultant of completion of construction at each site in accordance with the specifications agreed upon by A.I.D. and BADC, and certification of completion costs.

(d) The loan agreement shall provide that prior to disbursement of loan proceeds for the second phase of construction the Government shall join, or cause BADC to join, an evaluation of the first phase by A.I.D., and that

the findings of such evaluation as agreed by the Government, or by BADC for the Government, and A.I.D. will be implemented in the conduct of the second phase of construction.

(e) The loan agreement shall contain the following special covenant by the Government:

The Government will join, or cause BADC to join, an evaluation by A.I.D. of the second phase of construction under the project and of the overall results of the project upon crop production, fertilizer use and small farmer incomes; and agrees that the results of these evaluations as appropriate and as agreed to by A.I.D. and the Government, or BADC for the Government, will be accepted by the Government as conditions to disbursement of any immediately following A.I.D. loan to the Government for construction of storage facilities and for import of fertilizer or fertilizer raw materials.

B. The loan agreement shall include such other terms and conditions as A.I.D. may deem advisable.

Assistant Administrator
Bureau for Asia

Date

Clearance:

GC/Asia:HMorris _____
Asia/PD:ARLove _____
Asia/TR:TCClark _____
ENGR/OPNS:JSloan _____
Asia/DP:DCohen _____
PPC/DPRE:AMHandly _____
SER/FM:TBlacka _____
DAA/Asia:MHBadler _____

GC/Asia:PBloom:hp:8/9/76