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DEPARTMENT OF STATE
BUREAU FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20522

CAPITAL ASSISTANCE PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

PAKISTAN: EPADC - SEED POTATO MULTIPLICATION AND
STORAGE PROJECT

3910 327

AID-EG/R-7118

UNCLASSIFIED

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

UNCLASSIFIED

AID-DLC/P-748
June 21, 1968

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Pakistan: EPADC - Seed Potato Multiplication and
Storage Project.

Attached for your review are the recommendations for authorization of a loan in an amount not to exceed \$420,000 to the President of Pakistan to assist in financing the foreign exchange costs of goods, materials and services to the East Pakistan Agricultural Development Corporation, Government of East Pakistan, for a seed potato multiplication and storage project.

Please advise us as early as possible but in no event later than close of business on Wednesday, June 26, 1968, if you have a basic policy issue arising out of this proposal.

Rachel C. Rogers
Assistant Secretary
Development Loan Committee

Attachments:

Summary and Recommendations
Project Analysis
ANNEXES A-D

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EAST PAKISTAN
AGRICULTURAL DEVELOPMENT CORPORATION
SEED POTATO MULTIPLICATION AND STORAGE

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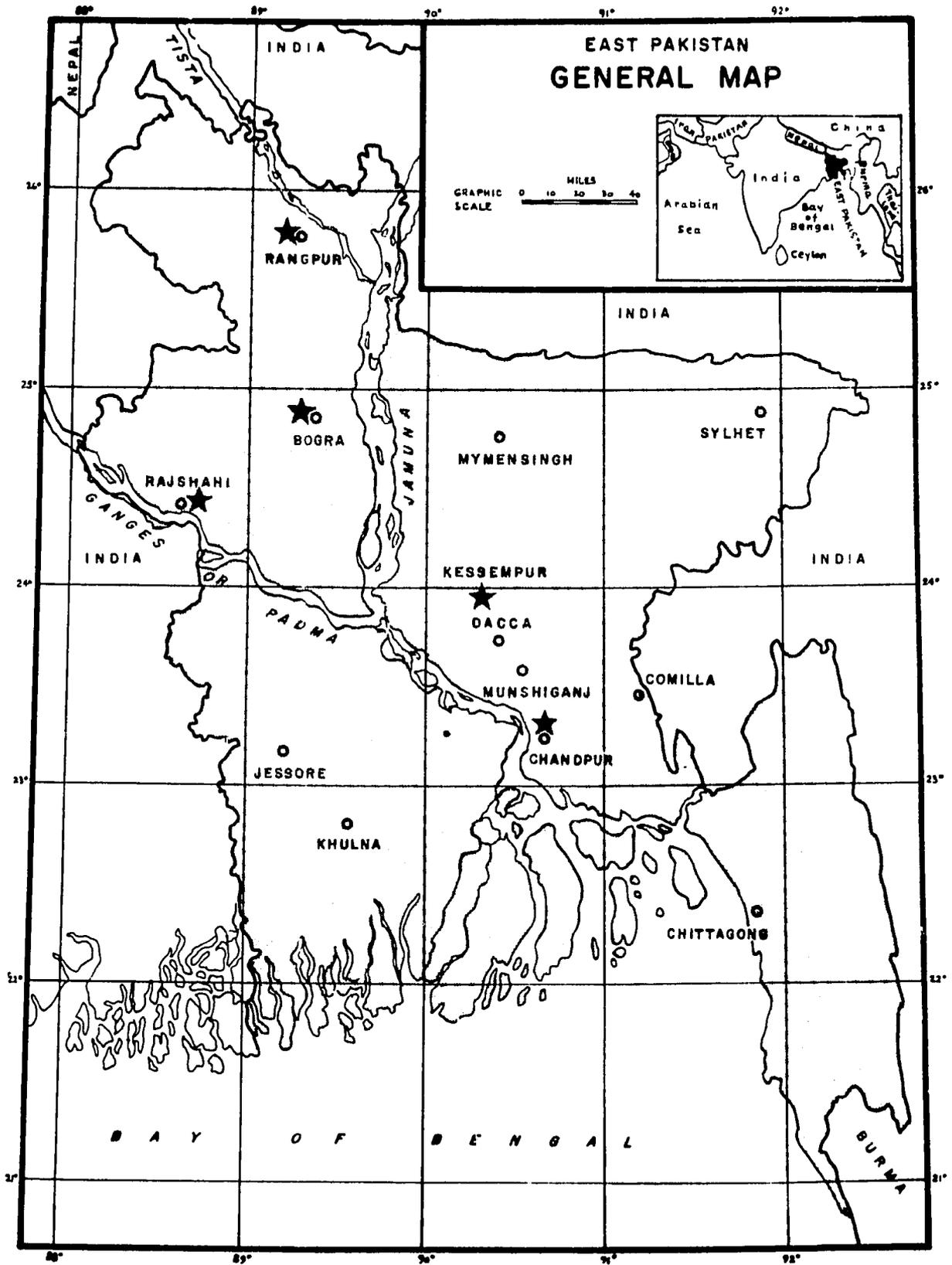
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Conversion Factors

- 1 maund (md.) = 82.29 pounds (lbs.)
- 1 long ton (L.T.) = 27.22 mds. = 2.240 lbs.
- 1 rupee (Rs.) = \$0.21; Rs. 4.762 = \$1.00



★ LOCATION OF PROPOSED COLD STORAGES

June 21, 1968

I. SUMMARY AND RECOMMENDATIONS

A. BORROWER

The Borrower will be the Government of Pakistan (GOP). The implementing agency will be the East Pakistan Agricultural Development Corporation (ADC), an agency of the Government of East Pakistan (GOEP).

B. AMOUNT OF LOAN

\$420,000

C. TOTAL COST OF PROJECT

The total estimated cost of the project, exclusive of working capital, is \$1,750,000, including \$420,000 in foreign exchange and \$1,330,000 in local currency. In addition seasonal working capital will be required up to a maximum level of about \$850,000 equivalent. The dollars will be provided by this loan; local currency costs will be funded by the GOP and its agencies.

D. PURPOSE

The purpose of this project is to increase the availability of improved varieties of high-yielding seed potatoes so that East Pakistan can increase its overall production of potatoes on the relatively limited acreage available for planting. The project will permit the GOP to reduce its present imports of seed potato thereby saving foreign exchange, and at the same time approximately double the quantity of improved high-yielding seed available for commercial production. Higher production of potatoes will provide an important nutritional supplement to food-deficient East Pakistan.

E. BACKGROUND

The GOEP has long recognized the desirability of increasing the production of potatoes as a supplement to rice and other food crops and has set a production target of 734,000 long tons (L.T.) of potatoes by 1969/70 as compared with actual production in 1964/65 of 395,400 L.T. In order to achieve higher production, it imports a limited amount of improved high-yielding seed potato stock (in 1967/68, 3,500 L.T. at a foreign exchange cost of about \$400,000). By selling the imported seed directly to farmers for commercial production, the benefits are marginal - i.e. only limited amounts of seed can be imported due to foreign exchange restrictions with the result that only about 5 to 6 percent of potato seed planted is first generation improved seed.

In March 1967, The ADC prepared a scheme for increasing the availability of improved varieties while at the same time importing lesser quantities, based on multiplication and storage of the imported seed under controlled conditions. A loan application for foreign exchange costs was made to AID but it was determined that too little information was available to make informed judgments or arrive at reasonable cost estimates. AID arranged for two teams to visit East Pakistan in February/March 1968 to study the proposal - an economist and a horticulturist from the U.S. Department of Agriculture ("USDA team") and a refrigeration engineer of Bovay Engineers, Inc. ("Bovay Engineers"). Their reports have been submitted, and along with the ADC proposal, provide the basic information for this paper.

F. DESCRIPTION OF PROJECT

The proposed project is for the import of improved varieties of high-yielding seed potatoes, multiplication of these potatoes through contract growers under supervised conditions, storage of the multiplied stock in five ADC cold storage units to be built and financed under this loan and sale to farmers at commencement of the next growing season. It is planned to import about 735 L.T. of seed a year which it is expected will yield about 5,500 L.T. of improved seed stock, or about 10 percent of East Pakistan's requirements for seed in 1969/70. The total time cycle will be one year from import of seed potatoes to commercial sale of the multiplied stock. The project proposal is for a fully integrated program, including horticultural supervision and assistance by ADC inspection staffs in each of the five districts where new cold storage units will be located, establishment of a certification program, testing and improvement of seed potato varieties, provision of farmer credit, and other elements necessary to develop a successful program.

AID loan financing will be limited to the foreign exchange costs of engineering and constructing the five cold storage units and funding the services of a horticultural advisor for two years.

G. JUSTIFICATION

The justification for this project rests on three counts:

1. Potatoes are important to East Pakistan - they provide a valuable nutritional supplement to diets in the Province, they represent a significant if limited element of food production, and they compete only marginally with other crops for cultivable land;

2. Native varieties of potatoes are heavily diseased and suitable acreage for planting is limited - thus the only practical way of increasing potato production is through increased availabilities of higher-yielding varieties of seed stock; and
3. It is less costly in foreign exchange and in terms of national economics to import limited amounts of seed and multiply them for distribution than solely to import seed.

Each of these findings is discussed more fully in the loan paper in Section VII. Suffice it to say here that the project is expected to double the quantity of East Pakistan's improved seed stock and result in a national economic rate of return of better than 25 percent.

H. PROBLEM AREAS

Despite the attractiveness of this project based on ADC plans and the analyses of the review teams, the potential problems in realizing fulfillment should be recognized. These center around the horticultural elements of the project and the ADC's capability to implement the scheme in a timely and satisfactory manner, rather than the construction and operation of the cold storage units. With respect to the latter, quite comprehensive preliminary designs and plans have been developed by Bovay Engineers, and with the help of a U.S. engineering consultant (as provided for in the project), we foresee no unusual difficulties in completing the units and putting them into operation.

A summary listing of the types of problems which will have to be faced is:

- ADC's own untested capability in staffing and administering an integrated program of this nature;
- the need to arrange for multiplication of the imported seed on approximately 2,000 acres of new acreage (present acreage is likely to be disease infested) by clusters of farmers so that growing can be supervised;
- need to educate and assist the farmers on good growing practices;
- uncertainties regarding yield from different generations of seed and cost-price relationships;

- need to arrange for and coordinate all inputs, such as seed, fertilizer, pesticides, water, credit and the like;
- competition from private cold storage operators who store third generation improved seed varieties; and
- need to develop varieties more resistant to disease, and to explore potential new sources of imports which would provide higher disease-resistance.

These problems have been recognized by the ADC, and, as discussed more fully in Section IX, Implementation of this paper, steps are being taken to make plans to resolve them. We conclude that with the reviews performed by the USDA team and Bovay Engineers, all the information and planning that could reasonably be developed at this stage have been completed and a satisfactory basis now exists for authorizing the loan. The problem areas identified above are not of undue proportions for a project which is basically of a technical assistance nature, and will be overcome partially through the vehicle of the technical assistance itself. To ensure orderly completion of the project, a detailed implementation plan will be required as a condition precedent to disbursement other than for advisory services under the loan agreement.

I. EXPORT-IMPORT BANK CLEARANCE

The Export-Import Bank decided on December 18, 1967 that it would not consider this project.

J. MISSION VIEWS

The Mission supports the project.

K. STATUTORY CRITERIA

All Statutory Criteria are met (see Annex B).

L. RECOMMENDATIONS

That a loan be authorized in an amount not to exceed four hundred twenty thousand dollars (\$420,000) to the Government of Pakistan for relending to GOEP and ADC, an agency of the Government of West Pakistan, on the following terms:

1. The Government of Pakistan to repay the loan to AID in U.S. 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 the date of the first disbursement. During the grace period the Government of Pakistan will pay interest to AID in U.S. dollars at the rate of two percent (2%) per annum on all amounts of outstanding principal. From and after the expiration of the grace period, the Government of Pakistan will pay interest to AID in U.S. dollars at the rate of two and one-half percent (2½%) per annum on all amounts of principal outstanding under the loan.

2. Relending terms between the Government of Pakistan, the Government of East Pakistan, and ADC, for the project to be satisfactory to and approved by AID.

3. The Government of Pakistan to produce evidence satisfactory to AID that all funds, in addition to the AID loan, needed to complete the project have been or will be made available.

4. All goods and services financed from the loan to be procured from and have their source and origin in the U.S.

5. The ADC through the GOP to submit to AID as a condition precedent to disbursement for other than advisory services a project implementation plan satisfactory to AID.

6. The loan to be subject to such other terms and conditions as AID may require.

CAPITAL ASSISTANCE COMMITTEE

AID/W

Loan Officers:
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Engineer:
Counsel:
Desk:

David Mandel/Emerson Gardner
Clyde Adams
James Erwin
William McCulloch
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Drafting Officers: David Mandel/Emerson Gardner

II. AGRICULTURE IN EAST PAKISTAN

A. Characteristics of Agriculture

East Pakistan like other underdeveloped countries suffers from a shortage of food. Despite an increase in rice production from about 8.5 million L.T. in 1960 to an average of 10.0 million L.T. over the past three years, the foodgrain deficit in 1967/68 will be equivalent to about 1.2 million L.T. of rice.

Rice is the major food crop with three crops produced annually. Jute is the major cash crop and chief foreign exchange earner. Approximately 22 million acres are available for agricultural production. All but 3 percent is actually used for at least one crop per year. This leaves little room for expanding output by increasing acreage. Production increases will, therefore, have to come from improved yields and more intensive cropping. Presently rice yields are among the lowest in the world -- about 984 pounds per acre. Cropping intensity is only about 120 percent.

The poor state of East Pakistan's agricultural sector is due in large part to the following factors:

1. Only one million acres are protected from flooding; only 300,000 acres are mechanically irrigated; and only 4 million acres are irrigated in some fashion.
2. Only 4.5 pounds of nutrient fertilizer on an average are used on each acre as compared to an optimum dosage in the order of 100 pounds.
3. Quality seed for all crops is in short supply.
4. Credit necessary to permit the farmer to obtain physical inputs is in short supply. Government and institutional sources are presently meeting only a fractional amount of estimated requirements.
5. Plant protection materials (e.g. insecticides and pesticides) are in short supply.
6. The growing extension program only reaches a small portion of the Province's farmers with information and training in modern cultural practices.

The shortcomings described above are recognized by the Government of Pakistan and the Provincial Government. The Third Five-Year Plan was revised to give agriculture top priority. In line with this

revision the Provincial Government issued in October 1967 a "Program for Attainment of Self-Sufficiency in Food by 1969/70" which outlines: (1) how much consumption of foodgrains should increase during the Third Plan period; (2) the increase in agricultural inputs necessary to raise production to the anticipated level of consumption; and (3) the institutional arrangements required to implement the program. The program also aims to reduce the gap between demand and actual production of oil seeds, fish vegetables and other supplementary foods.

The principal sources of rural credit are the Agriculture Department, the agricultural Development Bank (ADB), the Cooperatives, family, merchants and village money lenders, the latter charging exorbitantly high rates of interest. While the Government is taking steps to expand the availability of credit from institutional sources, particularly the ADB, there are a number of constraints. Among these are limitations in the regulations under which these organizations operate, inherent organizational weaknesses such as shortage of trained manpower to administer a large credit program, and most importantly a narrow capital base in the rural sector. To overcome these problems, the Government has taken a number of interim measures to ease the farmers credit problems which will have the effect ultimately of building up a broader credit as well as tax base in rural areas. Among these are the subsidy on fertilizer, the free availability of the plant protection materials, and subsidization of the cost of water for irrigation. A very important source of rural financing is the Rural Works Program which makes an important contribution to expanding the capital base through expenditures on rural infrastructure which at the same time places cash in the hands of the farmers.

To deal with the water problem a Thana Irrigation Program is being implemented. Through this program low lift pumps and tubewells are being installed and farmer pump groups organized. This program is in line with the decision of the Provincial Government to emphasize small irrigation projects.

B. AID Program

While supporting development and change in a number of key economic sectors, AID's priority program in East Pakistan is agriculture. AID's effort has centered on helping the farmer improve his productivity. It combines technical assistance, local currency, commodity and capital loan financing. The program is consistent with the IBRD and GOEP March 1966 Agreement on a broad strategy for agriculture.

Technical assistance has been directed toward several activities. Extension experts have been supplied to the Agricultural Directorate which is responsible for the Province's extension work. Program Building was adopted as the official extension program as a result of AID's success with this approach in Mymensingh. AID has also

provided specialists to the ADC - one in seed development and the other to help in the organization of the Power Pump Irrigation Program. Other technical assistance has been provided in the areas of credit, irrigation, forestry and fisheries. An important and successful program has been the establishment of East Pakistan Agriculture University at Mymensingh which is being supported by AID under a contract with Texas A&M University.

Local currency support in the agriculture sector has been directed primarily into the Rural Works Program. AID financing was instrumental in getting the program started, and continued strong support has been an important factor in the success of the Program. Local currency along with development loans has also been used in support of the Coastal Embankment Project.

Much of the financing of physical inputs needed by the farmers has been provided by AID through its commodity loans. Last year \$10.0 million of pesticides and fertilizer were procured by ADC using the proceeds of commodity loans. A \$25.0 million fertilizer loan for Pakistan is being provided by AID this year, of which a portion will be available for East Pakistan to meet a major part of its import requirements in 1968/69. Fractional (less than 1 cubic feet/second) pumps are also being provided under commodity aid.

The AID development loan program in East Pakistan is making an important contribution to the Government's agriculture effort. The Coastal Embankments Project has so far protected 1.0 million acres in the coastal regions of the Province from tidal flooding, allowing saline land to be reclaimed and giving the farmers in the area the assurance of at least one crop per year. AID loan financing of the State of California management team is designed to improve EPWAPDA's capability to carry out its responsibility for water development in the Province on which in the long term continued improvement in agriculture production will depend. AID is also financing feasibility studies of projects in the water sector (e.g. Dacca Southwest Irrigation; Small Electric Pump Irrigation and Karnafuli Irrigation) which may be carried out in the Fourth Five Year Plan.

The project reviewed here has an important bearing on AID's agricultural program in that it will establish a new and vital relationship with ADC. It will lay the groundwork for further capital and technical assistance which will strengthen ADC's capability to carry out its responsibilities.

III. THE AGRICULTURAL DEVELOPMENT CORPORATION

A. Organization and Activities

The proposed loan would be implemented by the Agricultural Development Corporation, the agency within the Government of East Pakistan primarily responsible for procuring and supplying to the farmers capital and physical inputs needed for increased agriculture production.

ADC was established in 1962 to consolidate many of the procurement and supply activities which had been scattered throughout the Department of Agriculture. Among the activities taken over were fertilizer procurement and distribution, power pump irrigation and seed multiplication. It is responsible for the present program of procuring and distributing seed potatoes. These programs under ADC's management have been reorganized and expanded in scope.

At this stage of East Pakistan's development ADC has an especially important role to play if food production is to be expanded. ADC is for the time being the main source of pumps, fertilizer and seeds for the farmers. It is, however, encouraging private sector participation in its activities. Private retailers are used for distribution of fertilizer to the farmers, and ADC is engaged in discussions with private oil companies to take over fertilizer distribution completely in one or two districts. The private sector is also showing interest in supplying small pumps to the farmers, which should eventually lead to the supplying of larger pumps of the type now provided the farmers by ADC. Through a commodity loan private firms are being financed to provide cold storage facilities, and there is a growing interest in food processing.

ADC is headed by a Chairman. The three main divisions are supply, finance and field operations which are headed by members or deputies to the Chairman. The seed potato project is the responsibility of the Manager of the Farms and Seeds Division, who in turn reports to the Director of Field Operations.

B. Assessment of ADC's Capability

ADC has had to expand its program rapidly in response to the demands of East Pakistan's more intensive effort in agriculture. This is brought out most clearly by the increase in its Annual Development Program from less than Rs. 25.0 million in 1962 to Rs. 99.0 million in fiscal year 1967/68. Because of this rapid growth, ADC has not been able to recruit and train an adequate number of qualified and experienced personnel. This has caused organizational and administrative problems. Despite these problems, its performance, especially, this past year, has been good. Through ADC's efforts,

the number of new low lift pumps set out increased from 3,000 in 1966/67 to 3,991 in 1967/68. Fertilizer sales increased 40 per cent during this same period.

ADC is aware of its problems and is taking steps to deal with them. The Manager, Farms and Seeds Division, was sent to Europe for three month training in 1966 with the GOP's own funds. Three key supervisors in this Division are in the United States now for participant training and will return to East Pakistan by the end of 1968*. Last year the ADC allocated Rs. 260,000 for in-service training and it has requested the services of consultants to assist in training its staff to implement and operate new projects.

With specific regard to the proposed seed potato project, ADC has some relevant experience. Under its seed multiplication and distribution programs it grows improved seed on its own farms. The improved seeds are multiplied again by registered growers. ADC has signed up 9,000 registered rice seed growers. The supervision of this program is carried out by ADC's seed development officers. Registered growers sign an agreement to buy improved seed from ADC, grow it under specified conditions and sell the reproduced seed to ADC for a premium price of Rs. 2.00 over the prevailing market price. The same general plan is envisaged for this project.

The Mission's assessment is that ADC is a reasonably well operated public sector institution which discharges its responsibilities with a satisfactory degree of competence. The Mission reports that the ADC seed farms have qualified, enthusiastic managers who know their jobs and are keenly interested in improving their farms. However, as its program expands and its undertakes new activities such as the proposed seed potato project, new skills and outside technical assistance will be required. This problem is discussed more fully in Section IX. Implementation.

- * M.S. Islam - 52 weeks training in farm marketing.
- M.A. Hakim - 39 weeks training in seed production.
- M. R. Bhuiyam - 52 weeks training in crop production.

IV. THE POTATO INDUSTRY-EXISTING SITUATION

A. Production

Potato production in East Pakistan has increased from 189,500 L.T. in 1955/56 to 590,570 L.T. in 1966/67, a gain of 375 percent (see Table 1 next page). This increase was due both to increased acreage (up 170 percent) and higher yields (up 75 percent). Potato production in East Pakistan is scattered throughout its 17 districts. The seven leading districts in 1966/67 in terms of output were: Rangpur, Dacca, Comilla, Bogra, Dinajpur, Mymensingh and Rahshahi (see Table 2, page 13). These seven districts account for about 53 percent of total production. Yields range from a low of 2.34 L.T./acre to 5.65 L/T/acre (in the 17 districts). Potato yields in East Pakistan are well below the average for the Far East and the world.

Among the problems of potato production found by the USDA team in East Pakistan were: (1) extensive virus infections, other potato plant diseases and insect damage; (2) improper preparation of the land; (3) insufficient space between seeds and rows; (4) insufficient and improper use of fertilizer and water; and (5) poor quality seeds.

Potatoes are usually planted from September to December and harvested from November to April.

B. Marketing

A sizeable portion of the potato crop never reaches the market. It is retained for use by the farmer either as table stock or seed stock or it is sold to neighbors and nearby villages. A Ministry of Agriculture study estimates that only one-third of the potato crop actually reaches the market.

The potatoes that do enter the market are sold either directly to a wholesaler or broker (Aratdar) or to a middle man (Bepari) who stands between the farmer and the wholesaler/broker. The potatoes are then sold either through established stores or itinerant retailers. With the construction of cold storage, this pattern is being modified with the cold storage operator replacing, to some extent, the wholesaler or broker.

C. Storage

Rough estimates indicate that about 30 percent of the potato crop is stored. Of this amount upward of nine-tenths is stored in individual homes and one-tenth in commercial cold storage. Home storage usually consists of placing layers of potatoes in sand on an outside elevated

Table 1

ACREAGE, YIELD, AND PRODUCTION OF POTATOES,
EAST PAKISTAN, 1955/56 - 1966/67

<u>Seasons</u>	<u>Area</u> (acres)	<u>Yield</u> (tons/acre)	<u>Production</u> (long tons)
1955/56	63,960	1.94	124,300
1956/57	71,735	2.64	189,500
1957/58	77,130	2.25	173,500
1958/59	87,735	2.55	223,900
1959/60	116,500	2.38	276,700
1960/61	137,800	2.46	338,300
1961/62	138,300	2.39	331,200
1962/63	142,700	2.50	356,600
1963/64	137,400	2.32	318,700
1964/65	137,400	2.88	395,400
1965/66	150,100	3.24	486,200
1966/67	173,840	3.40	590,570

Sources: 1955/56 to 1964/65. Agricultural Production Levels in East Pakistan, 1947-1965, Directorate of Agriculture, Bureau of Agricultural Statistics, 1966, pp. 234-237.

1965/66 to 1966/67. Unpublished data provided by the Bureau of Agricultural Statistics.

Table 2

ACREAGE, YIELD AND PRODUCTION OF POTATOES, BY
DISTRICT, EAST PAKISTAN, 1966/67

<u>District</u>	<u>Area</u> (acres)	<u>Yield</u> (long tons/acre)	<u>Production</u> (long tons)
Rangpur	18,720	4.30	80,460
Dacca	15,800	4.91	77,560
Comilla	18,020	3.12	56,265
Bogra	18,730	2.90	54,355
Dinajpur	19,590	2.72	53,250
Mymensingh	22,160	2.34	51,920
Rajshahi	19,280	2.39	46,035
Noakhali	7,020	5.65	39,655
Sylhet	9,940	3.53	35,055
Chittagong	6,270	5.18	32,475
Khulna	5,000	3.93	19,655
Barisal	3,320	3.60	11,950
Pabna	3,540	3.01	10,665
Jessore	1,840	3.74	6,895
Faridpur	2,400	3.74	6,875
Hill Tracts (Chitt.)	1,260	3.56	4,490
Kushtia	950	3.38	3,210
TOTAL	173,840	3.40	590,570

Source: unpublished data provided by the Bureau of Agricultural Statistics, Directorate of Agriculture.

rack. It is estimated that 20 percent are lost due to shrinkage, spoiling, rats, and similar causes.

Generally commercial refrigerated storage units hold 1,000 L.T. of potatoes. The potatoes are bagged and stacked on three tiers of ventilated wooden racks. In East Pakistan there are now 23 refrigerated cold storages with a total capacity of about 20,000 L.T.; construction of another 43,000 tons of storage capacity has been sanctioned by the East Pakistan Small Industries Corporation (EPSIC) and the Industrial Development Bank of Pakistan. About one-half of storage capacity, present and planned, is in the Dacca District.

Much of the space in existing cold storages appears to be taken up by the operators who buy potatoes for resale later in the season. More recently there has been an increase in growers renting storage space directly. Rental charges run from Rs. 12 to Rs. 13 per maund. This rate covers a whole season and no discounts are given for shorter periods. Generally the loading of storages begins in early March and continues through April. Table potatoes begin to move out of storage with the onset of monsoon in mid-summer at which time home-stored potatoes begin to deteriorate rapidly. This movement reaches a peak from mid-September to early November. Seed stock usually moves out of storage from mid-October through late November.

The existing storage facilities have no formal humidity control systems, but they often have a wet and dry bulb thermometer for measuring humidity. If the moisture level gets too low, water is applied to the floor or to the racks. No provision is made for ventilation with outside air, except as the door is opened. All handling of potatoes in commercial cold storage is by hand.

Although the existing storage facilities do a reasonably good job of holding potatoes for the table market, they have several weaknesses as far as seed storage goes. These include the lack of: (1) uniform temperature, (2) humidity control and (3) fresh air ventilation. Uniform temperature and humidity within the storage room reduces sprouting and rotting. Forced air ventilation with fresh air intake is necessary to maintain seed quality and to reduce internal blackheart.

D. Pricing

Based on very limited data, the average price of potatoes at the farm level is Rs. 14 to Rs. 15 per maund. Naturally improved varieties of potatoes (see next section, "Source of Seeds") command a higher price than native varieties. Also prices fluctuate seasonally with lower prices around harvest time. Finally prices vary from region to region.

Wholesale prices, for which there is more accurate and extensive data, clearly illustrate the fluctuations mentioned above. The wholesale price of potatoes appears to range from a seasonal low of about Rs. 14.4 per maund in February to Rs. 41.4 per maund in November. Regionally the wholesale prices of potatoes are about one-third higher in the northwestern districts of Bogra, Rangpur and Rajshahi than the central district of Dacca. At the retail level, prices are about Rs. 3 per maund higher than wholesale prices.

F. Source of Seeds

The traditional and predominant source of seed (perhaps 80 percent of total seed) is home produced and stored native varieties. The quantity of this type of seed available each year is determined by the previous season's production, the demands of the farm family for food and storage conditions.

A small but increasing quantity of seed (perhaps 10 to 15 percent of total) is made available through commercial refrigerated cold storage. These generally are improved varieties (i.e., second, third or later generations of imported seeds). This type of seed does not keep well in home storage. Cold storage seed is usually superior to home-stored seed but not as good as imported seed.

The third source of seed is imports (5 percent to 6 percent of the total) which have come from Holland since 1964/65. For many years prior to this, seed was obtained from India and Burma, but both these sources have been closed off by political difficulties. The imported seed from Holland is of high quality and certified to be 99 percent free from disease. At the same time, however, it has certain disadvantages--foreign exchange is required; seed reaches East Pakistan late because shipment cannot commence until early September and it then must be transported around Africa to East Pakistan; and the varieties are not as disease resistant as some varieties produced in other countries. Still, on balance, it has been advantageous to import the Holland seed rather than rely solely on local varieties.

V. THE PROJECT

The proposed seed potato multiplication and storage program is directed toward decreasing the need for imported seed while increasing the availability of certified improved seed. To accomplish this, ADC plans to import 20,000 maunds of seed annually. This seed will be multiplied by carefully selected farmers under the close supervision of ADC employees. ADC will certify and buy back the multiplied seed, store it in specially constructed cold storages and then sell the seed to commercial producers the following year.

A. Horticultural Aspects

Each year 20,000 maunds of seed will be imported to be used only as seed stock. Seed multiplication will take place in five major potato producing districts--Bogra, Rajshahi, Rangpur, Dacca and Comilla. Multiplication of the seed stock will be done by contracting with carefully selected blocks of farmers in isolated areas not used for potatoes in the past. This isolation is necessary to insure that the multiplied seeds are not infected with the viruses prevalent in East Pakistan's potato crop. The farmers will be given technical advice and instruction by a horticultural supervisor and two assistants attached to each of the five storages. Other inputs such as fertilizer, pesticides, and small irrigation pumps, which already are administered by the ADC, will be made available to the farmers. The farmers by previous agreement will sell all their certified grade potatoes to ADC for a premium of about Rs. 3.00 per maund above the market price. They will be free to sell the potatoes not accepted by ADC as they wish.

ADC expects to obtain about 150,000 maunds of certified improved seed for storage. This 7.5 fold increase is based on the assumption that the imported seeds will yield 100 maunds per acre and of this yield 75 percent will be acceptable. The USDA team believes that yields will be higher but the rate of acceptance lower, with the net amount available for storage remaining approximately as projected. After storage, the improved seed will be sold to farmers for commercial production.

B. Cold Storage Units

Five cold storage units, to be built with A.I.D. loan financing and owned and operated by ADC, will be used to store improved seed from its harvest to the next year's planting season. The storages will be located as follows:

<u>Area</u>	<u>District</u>	<u>City or Town</u>
North Western	Rangpur	Rangpur
	Bogra	Shuntaha
	Rajshahi	Rajshahi
Central Eastern	Dacca	Kesempur
	Comilla	Chandpur

These five districts produced 53 percent of East Pakistan's potato crop in 1966/67. They include the first four and seventh among all districts in terms of potato production. Many growers in the fifth ranking district Dinajpur will be able to utilize the storage at Rangpur. Parts of the sixth ranking district, Mymensingh, should be able to utilize neighboring storages; rather than locate one of the initial cold storage units here, it was felt more important to help stimulate potato growth in the more isolated and lesser developed northwestern districts. There is nothing sacrosanct about the number five for ADC's cold storage units and additional units may be built elsewhere later as needs dictate. Within the districts, each of the proposed locations is in the vicinity of a major town - Rangpur, Rajshahi, and Bogra are proposed on EPSIC industrial estates; Kesempur is adjacent to an ADC demonstration farm; Chandpur would require acquisition of a new site. The sites appear to be well located considering facilities available (e.g., power, water and sewerage), transportation (all are on inland water ways except Rangpur), and proximity to relatively isolated land suitable for potato production. Final review and decisions with respect to location will be required, however, by the ADC as an initial step in implementing the project.

Each storage will hold 1,000 L.T. of potatoes in bulk rather than bags. The storage area will be divided into four bins each cooled independently. To ensure that all the potatoes are kept at optimum temperature (40 to 45 degrees), cool air will be channeled through ducts in the floor of each bin and forced upward through the potatoes. To maintain optimum humidity (85 to 90 percent), the cooling units will be operated at temperatures above freezing to avoid condensation freezing on the cooling coils. The system will provide for a continuous intake of fresh air from outside. Storage sites will allow ample room for future expansion.

The major equipment and material to be imported for the five storages include condenser-compressor coils and ancillary equipment, insulation, insulated doors, electric equipment and plumbing materials. For each storage plant operation a potato stacker, potato grader and portable humidity recorder will be imported. A detailed description of

the design of each plant and equipment required is given in the Bovay Engineers' Report.*

C. Manpower Requirements

ADC will assign to each of the five storages a horticulturist and two assistants. They will be responsible for (1) teaching the farmers how to produce potatoes, (2) ensuring that the farmers utilize on a timely basis correct cultural methods, water, fertilizer, insecticides, etc. and remove diseased plants, and (3) establishment of certification standards and determining which seeds meet standards. This program will entail close relations with the farmer. They will also have to maintain records on the production of each seed multiplier and on the production of the successive generations of the multiplied seed. This is necessary to determine which farmers and which areas are best suited to the multiplication of seed.

During the storage period the horticulturist and his assistants will continue to educate the potato growers and will keep a careful watch on the condition of the stored seed.

According to the Bovay Report, each of the five storages will need a staff of 13 fulltime employees and 15 parttime employees. (Note: ADC's proposal calls for 16 people with no provision for parttime help.) The positions listed by the Bovay Report each each storage are: 1 Manager, 1 Assistant Manager, 1 Maintenance Foreman, 4 Equipment Operators, 4 Office Staff, and 2 Other. The recommendation for 15 part-time workers for four months, concurred in by the USDA team, appears sound. The part-time workers will be required for grading potatoes and loading and unloading the storage bins. Although a potato stacker and a potato grader are on the equipment list for each storage, much work will still have to be done by hand.

D. Technical Assistance Requirements

1. Horticultural Aspects. The key element in the effective operation of the proposed multiplication and storage program will be the close regulation of production and storage, particularly in the first few years.

* Bovay Engineers, Inc., Engineering Report on the East Pakistan Seed Potato Multiplication and Storage Project, March, 1968, Spokane, Washington.

According to the USDA Report* (page 53), "the farm production phase is apt to be the most difficult problem." For this reason, a qualified horticultural advisor will be required for at least two years and perhaps longer to help initiate the farm program, establish adequate standards of certification, ensure proper storage practices are followed, etc. Funding for two years services of such an advisor are included in the proposed loan.

In addition, the Dutch Information Centre for Potatoes has expressed an interest in providing assistance in research and might also be willing to provide training both in Pakistan and in Holland. This possibility should be explored. A joint approach whereby Dutch experts would work with U.S. advisors to be provided or already on board (e.g. the Agricultural Economic Advisor at the Provincial College of Agriculture who has some background in potatoes) may be feasible.

2. Storage Construction. The storage buildings and ancillary facilities will be designed by local engineers; final design of the mechanical and electrical systems will require a U.S. engineering firm. To ensure that each storage is properly constructed, it also will be necessary to provide an American engineer who will act as advisor to ADC's project engineers. He will advise his counterpart on such matters as:

- (a) selection of a Pakistan consulting engineering firm to design the buildings;
- (b) review of drawings and specifications and preparation of tender documents;
- (c) review of proposals;
- (d) acceptance tests and plant start-up; and
- (e) training of plant operating personnel.

E. Possibility of Private Sector Participation

The proposed project is a complex "total program" for the multiplication and storage of seed that will require careful planning and supervision. The multiplication and technical assistance aspects

* International Agricultural Development Services, U.S. Department of Agriculture, The Potato Industry in East Pakistan, May 1968, Washington, D. C.

would be of little interest to private interests; only a government agency such as the ADC would have the incentive and capability for undertaking such a program. Considering the cold storage units alone, it is unlikely that the private sector would wish to build and operate the units. Commercial storage operators are businessmen seeking high profits. They would not be attracted to activities which will require a large element of control and regulation by the Government. If they did enter the field, there is no guarantee that they would remain if seed potato prices dropped or more profitable opportunities arose in storing other crops. The alternative of ADC's leasing present storage space also does not appear feasible. First, there is little storage capacity available. Second, what storage there is, is not suitable for high quality seed potatoes. Third, storage is a profitable business, so ADC would have to pay very high prices for space.

We conclude that the project should be completely handled by ADC initially along the lines described above.

VI. PROJECT COSTS

Project costs, for which foreign exchange will be provided by the AID loan, are estimated as follows:

Non-Recurring Project Costs
(In thousands of dollar equivalent)

	<u>Rupees</u>	<u>FREX</u>	<u>Total</u>
I. 5-Cold Storage Units			
1. General Construction	595.3	31.2	626.5
2. Mechanical Construction	187.6	127.1	314.7
3. Electrical Construction	200.6	102.6	303.2
4. Plant Equipment	<u>84.0</u>	<u>35.0</u>	<u>119.0</u>
Sub-Total	1,067.5	295.9	1,363.4
5. Local Engineering	15.8	-----	15.8
6. U. S. Engineering	11.6	32.5	44.1
7. ADC Overhead (2½% items 1-6)	35.6	-----	35.6
8. Interest During Construction (7% items 1-6)	<u>77.4</u>	<u>-----</u>	<u>77.4</u>
Sub-Total	1,207.9	328.4	1,536.3
9. Contingency (10%)	<u>120.8</u>	<u>32.8</u>	<u>153.6</u>
Total Cold Storage Units	1,328.7	361.2	1,689.9
II. Horticultural Expert - 2			
Man Years Services	<u>-----*</u>	<u>60.0</u>	<u>60.0</u>
TOTAL PROJECT COSTS	1,328.7	421.2	1,749.9
USE	1,330.0	420	1,750

*Note: No estimate has been made of local currency cost for supporting a U. S. advisor, although some costs would be incurred.

The cost estimates for the cold storage units are based on the Bovay Engineers Report. Current Pakistani construction materials, labor and equipment prices were collected during a February field trip. Figures for equipment purchased in the U. S. are current trade prices. The local engineering fee is based on 15% of construction costs; the U. S. engineering fee includes \$5,000 for final design of the mechanical and electrical fee plus nine man months in the field. Spare parts, transportation, labor, duties and taxes are lumped with construction costs (detail is provided in the Bovay Report). An overall 10 percent contingency is provided for both Rupee and foreign exchange elements. These cost estimates for the cold storage units, which are current and based on detailed planning, are sound and form a reasonable basis for estimating project costs.

In addition to costs of the five cold storage units, funding is included for two years' services of a horticulturist to assist and advise on horticultural aspects of the seed multiplication program. If it is determined to finance this technician with grant funds, these funds may be deobligated at an appropriate time.

Total project costs are estimated to be \$1,625,000 equivalent, including \$420,000 to be funded under the proposed AID loan.

The above costs do not include funds necessary for working capital. The ADC, in its original project plans prepared in March 1967, estimated working capital needs would be about Rs. 3,750,000 (\$787,000 equivalent) for operation of the cold storage units, staff and procurement of certified seed. Our estimates approximate this figure - \$850,000 equivalent at the end of the storage season (September) when the ADC would be carrying inventory costs for 150,000 mds of multiplied seed plus the full year's cost for operation of the cold storage units and horticultural staff. The ADC expects to set up a revolving fund to meet working capital needs, through either Government financing or borrowings from commercial banks. Assurance that adequate funds will be made available for working capital purposes will be required as a condition under the loan.

VII. JUSTIFICATION FOR THE PROPOSED PROJECT

The justification for the proposed seed potato project is based on three major premises:

1. Potatoes are and should continue to be an important, albeit limited, element of agricultural production in East Pakistan;
2. Improved varieties of seed potatoes are necessary and will be required in increasing amounts; and
3. The optimal means of obtaining higher quantities of improved seed potatoes is through an import cum multiplication program rather than through higher levels of imports.

Each of these premises is examined below.

A. The Importance of Potatoes in East Pakistan

As described earlier, the achievement of self-sufficiency in food production has highest priority in terms of Pakistan's development program. Particularly in East Pakistan, whose population is estimated to be 66 million in 1968 and growing at an annual rate of 2.8 percent, there is need for substantial effort to overcome the food deficit, estimated to be 1.2 million tons in terms of rice this year.

1. Nutritional Value: Nutritionally, few, if any, commercially important crops equal the potential of the potato in terms of output of calories and other nutrients per acre. While potatoes generally rank lower than rice or wheat in calories and other nutrients on a weight basis, potato yields were five times those of Boro (or water) rice production and ten times those of wheat during the five-year period 1960/61 to 1964/65. If these ratios are applied to the nutritional values of rice and wheat, potatoes rank equal or higher in virtually every category (see Table 3 next page), particularly proteins and riboflavin, two of the most important nutrient needs in East Pakistan. In other elements, such as fats and Vitamin A, neither potatoes nor the foodgrain have significant value. Other vegetables (e.g. leafy green vegetables or tomatoes) would be preferable to potatoes in nutritional value; however such vegetables could not survive the

Table 3

NUTRITIONAL COMPOSITION OF POTATOES, RICE, AND WHEAT,
Retail Weight, in 100 grams, United States

<u>Nutrient</u>	<u>Unit</u>	<u>Potatoes</u>			<u>Cooked Rice</u>		<u>Soft Wheat</u>
		<u>Fresh</u>	<u>Boiled 2/</u>	<u>Flour</u>	<u>Brown</u>	<u>White 3/</u>	<u>Straight flour</u>
Calories	No.	76.0	65.0	351.0	119.0	109.0	364.0
Proteins	%	2.1	1.9	8.0	2.5	2.0	9.7
Fat	%	0.1	0.1	0.8	0.6	0.1	1.0
Calcium	mg.	7.0	6.0	33.0	12.0	10.0	20.0
Iron	mg.	0.6	0.5	17.2	0.5	0.2	1.1
Vit. A	I.U.	T	T	T	0	0	0
Vit. B ₁ (Thiamine)	mg.	0.10	0.09	0.42	0.09	0.02	0.08
Vit. B ₂ (Riboflavin)	mg.	0.04	0.03	0.14	0.02	0.01	0.05
Niacin	mg.	1.5	1.2	3.4	1.4	0.4	1.2
Vitamin C	mg.	20.0 <u>1/</u>	16.0	19.0	0	0	0

Notes:

1/ Yearly average. Recently dug potatoes have 26 mg. After three months storage they have 13 mg.

2/ Pared before cooking. T = Trace

3/ Unenriched

Source: Composition of Foods, Raw, Processed, Prepared, U.S. Department of Agriculture,
Agriculture Handbook No. 8, 1963, pp. 50-52, 66.

delays in transportation and marketing indigent to East Pakistan. The potato on the other hand is comparatively sturdy. It can be stored for up to eight months and can survive such slow modes of transportation as boats and bullock carts.

In sum, while potatoes may not be nutritionally ideal, they provide about as good an overall balance as any individual commercial crop can in East Pakistan at the present.

2. Importance as a Crop: In 1966/67, 173,840 acres were planted to potatoes in East Pakistan which resulted in production of 590,570 long tons of potatoes (average yield 3.40 L.T./acre). In terms of annual tonnage of production, potatoes rank fourth after rice, sugarcane and jute. At an average harvest-time price of Rs. 14.5/md, 1966/67 production represents farm income of about Rs. 233 million (or \$49 million equivalent). Studies in recent years indicate that costs per acre of producing potatoes assuming modern inputs such as fertilizer and improved seed are in the order of Rs. 1,000 per acre, while net profits may be in the order of Rs. 360 to Rs. 510 per acre. Thus returns to the farmer are high. These statistics indicate that potatoes, while of limited importance as compared to other food production in East Pakistan, are a significant crop and of financial importance / has been recognized by the Provincial Government, whose plans for increased food production call for an increase from the 590,570 long tons of potatoes in 1966/67 to 734,000 long tons in 1969/70 (up to 25 percent). /to the farmer. This/

3. Competition With Other Crops: Potatoes are sown and harvested from September through April, or what is called the winter (or "Boro") season. Boro is largely the off-season for rice because of insufficiency of moisture. However, with the continuing development of irrigation, new varieties of rice (e.g. IRRI-8) with higher yields, and recent high prices for rice which encourage production, Boro rice production reached 831,000 L.T. in 1966/67, or about 9% of total rice production in East Pakistan.

The soil and water requirements for potatoes and rice differ - potatoes are better suited to a lighter soil and less water than rice, which has a high water requirement. Boro rice production has been concentrated in Sylhet and Mymensingh (70-79 percent of Provincial production), which raise a relatively small

proportion of the potato crop (about 15-18 percent). On the other hand, the four northwestern districts of Rajshahi, Dinajpur, Rangpur and Bogra raise a very small proportion of the rice (about 4 percent) but a relatively large proportion of the potato crop (40-46 percent). Thus there is relatively little competition in these districts.

The main districts - where irrigation is available and soil not too heavy - in which both potatoes and Boro rice are important crops are Dacca and Comilla. In 1966/67 Boro rice and potatoes accounted for 15 percent and 23 percent respectively of Provincial totals. Some conversion of land cultivated to potatoes is likely to take place to rice this year due to the factors mentioned above. However, on balance there is not widespread or substantial competition between these two crops - for the most part planting to potatoes makes use of farm land that would otherwise lie fallow. The infusion of larger quantities of improved seed will be primarily to the northwestern districts which are unsuitable for Boro rice.

In summary, we conclude that potatoes are an important nutritional supplement to diets in East Pakistan, they represent a significant if limited element of food production in the Province, and they compete only marginally with other crops for cultivable land. The GOEP's goal to increase potato production is therefore sound.

B. Need For Increasing Amounts of Improved Seed Potato Varieties.

As discussed previously, only 5 to 6 percent of the total quantity of seed used for potatoes is represented by first generation improved seed. An additional 10 to 15 percent of seed potato, distributed primarily in the central districts, represents second or third generations of imported seed with reduced yields. It is estimated that 80 percent to 85 percent of total seed supply is from native varieties.

According to the USDA team observations, virtually all of the second and third generation seed stock and all local varieties are infected with one or more viruses, which result in rapid decreases in yields. A Dutch potato expert who has studied East Pakistan conditions estimates that yields are at least twice as high for first generation imported stock as for native seeds. Although reliable data is not available, the USDA team estimates that yields from imported seed decrease at a rate of 25 percent or more for each generation it is reproduced.

The Government of Pakistan has long recognized the importance of improved seed potatoes, having imported an average of more than 3,000 long tons a year since 1959/60 at an average annual cost of more than \$400,000. The USDA team concluded that "improvement of seed quality is of critical importance for the potato industry in East Pakistan".* New land available for cultivation is limited - especially if land which is suitable for other types of cultivation such as Boro rice is ruled out. If improved seed were eliminated, again in the words of the USDA team, "the quality of seed would run down even more, yields would drop, and total output would level out or drop".**

If the first premise is accepted -- that potato production should be increased -- then the second follows -- that there is need for increasing amounts of improved seed potato stock.

C. Import Cum Multiplication of Improved Seed Potato Versus an Import Program Only.

1. Foreign Exchange Saving: The quantities and foreign exchange costs of importing seed potatoes since 1959/60 are shown in the following Table: (Table 4, next page).

These imports represent a considerable outlay of Pakistan's scarce foreign exchange resources.

* USDA Report, page 82

** IBID, page 56

Table 4

QUANTITY AND COST OF IMPORTED SEED POTATOES
EAST PAKISTAN, 1959/60 - 1967/68

<u>Season</u>	<u>Quantity</u> (maunds)	<u>Cost</u>		<u>Cost per Unit</u> (rupees/maund)
		(rupees)	(\$ equiv)	
1959/60	80,000	NA	NA	NA
1960/61	120,000	NA	NA	NA
1961/62	72,000	NA	NA	NA
1962/63	178,631	4,047,000	850,000	22.6
1963/64	34,842	766,000	161,000	21.9
1964/65	92,343	2,066,450	434,000	22.4
1965/66	71,529	1,632,141	343,000	22.8
1966/67	54,500	1,255,878	264,000	23.0
1967/68	81,750	1,980,898	416,000	24.2

Source: East Pakistan Agricultural Development Corporation

Under the proposed project, 20,000 maunds of improved seed potato would be imported annually, which it is expected would produce about 150,000 of certified improved seed. A straight comparison of the foreign exchange costs (FREX) of the project versus importing the same amount of improved seed that would be produced under the project is as follows:

Foreign Exchange Savings

Year Ending Sept.	Quantity of Improved Seed Potato Available (mds)	Cost Import- ing Full Amount (\$)	Cost Import- ing Cum Multiplication (\$)	Savings Col. (4) over Col (3)	
				Annual (\$)	Cumulative (\$)
(1)	(2)	(3)	(4)	(5)	(6)
1968/69	-*	-*	66,500	(66,500)	(66,500)
1969/70	75,000	393,800	377,000	16,800	(49,700)
1970/71	150,000	787,500	135,000	652,500	602,800
1971/72	150,000	787,500	105,000	682,500	1,285,300
1972/73 & after	150,000	787,500	105,000	682,500	

* Note: No improved seed would be produced by the project the first year.

This projection assumes that only 10,000 maunds of imported seed would be imported for multiplication the first year the new storages would be ready (year ending September 1970), and that 20,000 maunds would be imported, multiplied and stored annually the next year and thereafter.

The foreign exchange savings under the import cum multiplication program are large. After the first two years when investment costs for the five cold storage units occur, annual foreign exchange savings climb to \$652,000 in 1971 and \$682,500 thereafter. If the cost of imported seed rises, as is likely, foreign exchange savings would increase proportionately. The project fully pays for itself in foreign exchange savings during the beginning of its first year of full scale operation (year ending September 1971). Even if a multiplication factor of 7.5:1 is not fully realized, or the quality of the multiplied seed is not as high as the imported seed, there would remain a large

element of saving in any foreign exchange comparison. Thus from a foreign exchange point of view, the proposed project is extremely attractive.

2. National Economic Benefits: It is difficult to analyze with any degree of accuracy the costs and returns of the proposed scheme because this would be a new activity and actual costs and productivity remain to be seen. Still, based on the detailed study of fixed investment costs prepared by Bovay Engineers, the overall study of the USDA team, and past estimates of the ADC itself, it is possible to make assumptions which may yield a reasonable magnitude of the national economic value of this project. The major assumptions are these:

- the life of the project is 21 years, including 2 years for construction of facilities with commercial operation commencing during the second year;
- imported seed can be multiplied 7.5 times into certified improved seed stock;
- during the first year of commercial operation only one-half capacity will be utilized (i.e. 10,000 mds seed imported; 75,000 mds stored); thereafter the scheme will operate at full scale;
- inflationary factors will equally affect both costs and revenues - no adjustments are made for these factors;
- the "shadow price" for foreign exchange in East Pakistan is in the order of Rs. 8.00 = \$1.00 (this is arbitrary, but lower than the Rs. 9.52 = \$1.00 shadow rate the IBRD recently has estimated to be appropriate for West Pakistan); and
- the costs and prices utilized in the USDA Report are valid.

Benefits are measured by calculating the costs of importing seed in an equivalent amount to the certified improved seed stock to be available from the cold storage units. The national economic benefit of the proposed project in these terms is above 25 percent. The most sensitive factor in these calculations is the yield to

be obtained in multiplying the imported seed. If seed is not distributed in time, if farmer planting practices do not meet expectations, if acreage planted with the improved seed is less than planned, if other inputs such as fertilizer and pesticides are not utilized, etc., then the improved seed available from the program, and hence benefits, will be reduced. In order to test the sensitivity of this factor, it has been assumed that yields are reduced by 25 percent (i.e. multiplication factor is 5.6 instead of 7.5); costs of ADC procurement of multiplied seed likewise are reduced by 25 percent (although ADC probably would have to pay a higher per unit cost to keep the multiplication program attractive to the farmers); and all other costs remain fixed (undoubtedly there would be some reduction in storage costs, e.g. power, since only three-fourths as much seed would be stored). Under this set of assumptions, the national economic benefit of the project would still be about 18 percent. The conclusion is that the quantifiable direct benefits of this project under likely conditions are very attractive from the viewpoint of the national economy.

In broader terms, the major benefit that will derive from the program is that there will be an increased quantity of potatoes grown and available for consumption. The current level of seed potato imports is only about half the quantity of improved seed that will be produced under this program. It is unlikely that the Government of Pakistan would substantially increase its allocations of scarce foreign exchange resources for seed potato imports to bring in the necessary seed potatoes to increase yields and production. The Northwestern districts, which historically have received little of the imported seed, are likely to benefit most from this program. Improved seed, which will come out of storage, should be available on a more timely basis than the imported seed, which as this year's experience indicates, may arrive late in the season. Growers of the improved varieties should receive higher prices than for native varieties. The benefits from these factors cannot be quantified, but nevertheless will be of real value.

VIII. FINANCIAL ANALYSIS

The seed potato project would become part of ADC's overall operation and hence separate financial statements have not been projected. However, the USDA team made some assumptions concerning costs and revenues of the project from which it is possible to develop a hypothetical profit and loss statement (see Annex A, Exhibit). The major assumptions underlying this statement are the same as set forth in the prior section ("National Economic Benefits"). More detailed explanation of the assumptions are included in the notes to the Exhibit. If these assumptions are valid, the project should earn a small profit (in the order of 10 percent when the project stabilizes). If the project has to borrow the full amount to cover the investment in the five cold storage units (\$1,654,300 not counting "ADC Overhead"), then cash generation should be sufficient to amortize the debt by 1977/78, or the eighth year of full commercial operation. This does not portray a highly profitable operation, but (1) high profits are not the purpose of this new venture for the ADC and (2) there is too little experience to have a good basis for projecting financial results. The USDA team has concluded that raising potatoes is a highly profitable business for growers in East Pakistan. In Comilla, for example, where a high proportion of improved seed is used, net returns after the costs of all inputs, are estimated to be between Rs. 360 and Rs. 510 (or \$76 to \$107 equivalent) per acre. A study on the comparative returns for Boro rice (native varieties) indicated a net return of Rs. 136/ acre. Admittedly the newer rice varieties would yield a higher profit. Nevertheless, this level of profit to the potato farmers indicates that some degree of change could occur in the assumptions without requiring significant changes in the financial viability of the project - e.g. yields could be lower, but it would still be profitable for farmers to buy and sell improved seed at the assumed prices; revisions in ADC costs could be reflected in revisions in prices for sale of the improved seed, etc.

In conclusion, it appears that this project should be self-supporting, but adjustments may be required in prices at which the ADC sells imported and improved seed to farmers and buys multiplied seed from farmers after experience is gained in the initial years of operation.

IX. IMPLEMENTATION

A. The Plan

Implementation of the project has two basic elements: (1) engineering, construction and operation of the five cold storage units and (2) development, staffing and carry through on the horticultural activities which are essential to the seed multiplication and storage program.

1. The Five Cold Storage Units. As a first step in proceeding with the five cold storage units, the ADC will have to finalize its plans for site locations. In addition to the engineering factors discussed in Bovay Engineers' Report, transportation facilities and potential farmer location will have to be evaluated and final selections made.

Bovay Engineers has outlined a quite detailed plan for building the five units. Final design and working drawings for buildings and ancillary facilities will be accomplished by a local consulting engineer. ADC's Engineering Branch will manage the selection of construction contractor(s), purchase of materials and general supervision of construction. An American engineer will be engaged for at least nine months to act as project consultant to the Engineering Branch and assist with tender document preparation through plant start-up and training of plant operating personnel. All building construction materials except for insulation and insulated doors are expected to be available locally. Virtually all mechanical and electrical equipment will be imported.

The schedule prepared by Bovay Engineers projects about eleven months between commencement of final design and start-up of facilities. Assuming commencement of design in the fall of 1968, there should be ample time to complete all units well before the time needed for storage, i.e. February 1970.

ADC anticipates no problem in recruiting adequate staff to operate and maintain the five storages - although it should be recognized that Bovay Engineers has estimated salary scales considerably higher than those projected by ADC. Key staff should be recruited prior to start-up of facilities so that full advantage can be taken of the American engineer's expertise. More than 20 cold storage units are now being operated by private owners, and no unusual problems in operating and maintaining the new facilities are expected which would be beyond the capability of ADC's staff.

2. The Horticultural Program. Horticultural activities need to be carefully scheduled to ensure that trained staff is available on time to select and work with farmers, supervise practices of growth and certification, and oversee storage conditions through to the marketing of the improved seed. Ideally, the ADC should use the 1968/69 planting and harvesting season (October to April) for setting up demonstration plots in the districts. This would have value in three ways:

- (a) The demonstration plots would be available for training ADC personnel;
- (b) The demonstration plots would be available for training farmers selected early enough in the recruiting period; and
- (c) The demonstration plots would serve to attract the interest of farmers during the recruiting period.

For this to be feasible the ADC would have to start recruiting and training its horticultural staff within the next few months, and the U.S. horticultural advisor should be on hand to assist with initiation of the program. Even if the ADC does not move this fast, horticultural personnel will have to be available and farmers selected by the planting season in October - December 1969 in order to have improved seed ready for storage in March/April 1970.

Intensive efforts will have to be made to find suitable locations of clusters of farms for the program, develop interest in the farmers, and then provide the necessary know-how, assistance and regulation to assure that satisfactory practices are followed to obtain maximum yields of disease-free stock. Inputs of fertilizer, pesticides, pumps and the like will have to be provided in a timely manner and standards for a certification program developed. Once the program is underway, these efforts will all have to be intensified as larger numbers of farmers are put under contract and quantities of improved seed stored approach maximum capacity. These aspects of the program point up a number of potential problem areas, most of which the ADC is aware of and working on, but need to be considered in analyzing this project. A tentative schedule for the storage and seed multiplication phases of the project is presented in the chart on the following page.

Tentative Schedule For Project Implementation

	1968												1969					1970					
	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
I. FIVE COLD STORAGE UNITS																							
Loan Authorization	X																						
Construction (all phases) ^{1/}					←																		
Recruiting & training storage personnel																							
II. SEED MULTIPLICATION																							
Horticultural Advisor					←																		
Recruiting & training horticultural personnel																							
Establishment of Demonstration Farms																							
Recruiting & preliminary training of farmers																							
Distribution of imported seed																							
Multiplication of imported seed																							
Harvesting of multiplied seed																							
Storage of multiplied seed																							

^{1/} See Bovay Report schedule for details.

B. Potential Implementation Problems

The following appear to be most critical elements of implementation, and the ADC's plans or arrangements for satisfying them should be set forth in an implementation plan to be submitted as a condition of this loan.

1. Recruiting and training horticultural personnel. The success of the seed multiplication program rests largely on the effectiveness of horticulturists and their assistants. They must ensure that the imported seeds are used in such a way as to produce a maximum yield of high quality seed potatoes. ADC must find the best people available for this work and provide them with training well in advance of the actual start of the seed multiplication phase. This problem can be alleviated somewhat by using personnel from ADC's rice multiplication program. Although they would require training in potato culture they would have experience in supervising seed multiplication by selected farmers. The Mission reports that another source of personnel is the East Pakistan College of Agriculture at Mymensingh, which is now providing suitable agricultural graduates to the ADC. According to Mission reports, ADC pays well enough to attract good people, and has already begun training its own staff members for the project.

2. Making arrangements with and providing assistance to farmers. To produce disease free potatoes, isolated areas not used for potatoes in the past should be found. This means that the farmers involved in the multiplication program should not have grown potatoes before. They will have to be convinced that participation in the multiplication program is to their advantage and then educated in the best practices of growing potatoes. The success of the extension effort with farmers will depend, in addition to the effectiveness of ADC's horticultural staff, on the number of farmers contracted with and their locations. If arrangements are made with blocks of larger farms, advice and assistance will be easier and more effective than if a large number of small scattered farms have to be dealt with.

3. Achieving desired yields. The whole cost-price relationship of the project proposal is based on achieving a net yield of 7.5:1 from the imported seed. Since farmers new at potato production will be recruited, some difficulty is inevitable and it is more than likely that this degree of multiplication may not be achieved the first year. As indicated in the "Financial Analysis" section of this paper, the viability of this project does not rest on realizing this multiplication factor. However, during the initial years of this project, the ADC will have to work closely with the contract farmers to ensure they are receiving adequate returns from the

program, and to make adjustments in buying and selling prices if necessary. One approach might be to guarantee a minimum return to the selected farmers for one or two years. This should attract farmers into the program and help retain those who may have had problems achieving desired yields. If they dropped out of the program the initial training effort would be wasted and ADC would have to begin again with a new farmer. A high rate of drop-outs in the first year could seriously impair ADC's ability to implement the project.

3. Timely arrival of imported seed. Since Holland has been the source of imported seed, shipment has not been possible before early September under the best of conditions, and with the Suez closing, arrival in time for the planting season has been a problem some years (especially during 1967/68). This is likely to continue unless other sources of seed are found. If seed arrives late, the planting would have to be concentrated in the central districts, and presumably some of the multiplied seed shipped north for storage. The ADC is exploring alternative sources of seed for this reason, as well as to find more disease resistant varieties (see below). Ordinarily, however, timely procurement and shipping from Holland would allow adequate time for distribution to the northwestern districts.

4. Providing other physical inputs. The selected farmers will require a variety of input other than imported seed, such as fertilizer, insecticides, pesticides, and water. Since ADC is the agency responsible for providing these inputs to farmers in the Province it should be able to ensure that the selected potato farmers are taken care of.

One possible action which can act as an incentive to farmers to join the program and insure the availability and use of physical inputs would be for ADC to make seed, fertilizer, etc. available to the farmer on a no or low interest credit basis. ADC could then deduct what the farmer owed from payments to the farmer for multiplied seed.

5. Relationships with potato growers and commercial cold storage operators. When seed multiplication gets underway farmers will no longer be able to obtain imported seed for potato production. For them this will initially mean lower yields and lower returns. This problem is partly dealt with in that ADC intends to import more than the required 20,000 maunds of seed in the first year. By the end of the first year, however, ADC will have had to face the farmers who can no longer get imported seed. ADC will have to meet this situation by making available high quality seed

from its multiplication program and convincing potato producers that this seed combined with better cultural practices will result in high enough yields to compensate for any losses.

Commercial cold storage operators who sell third generation seed will be in competition with ADC. ADC should have a competitive edge, however, since its seed will be of a better quality. Since the private operators markets will be affected, careful public relations will be required. One approach to this problem would appear to be an offer to help the operators improve their seed through more selective buying practices and better storage habits. Although this might lead to even stronger competition between ADC and commercial seed there should be a market for improved seed sufficient for both and the end result will be an even greater quantity of improved seed.

6. Developing better varieties of seed. This need has two facets: (1) to find more disease-resistant varieties of seed potato for import and (2) to undertake a much enlarged program of research and testing. The Mission reports that the ADC already is exploring alternative sources of seed which would eliminate the delayed arrival of seed as well as provide more suitable disease-resistant characteristics. The research program should cover a wide range of agronomic and horticultural matters such as variety testing, fertilization, irrigation and insect and disease control. The research work would probably be done in cooperation with the Directorate of Agriculture which is establishing a new research station at Dacca. The station, which is expected to be operational within one or two years, could perform the studies, with ADC testing the results throughout the Province.

As mentioned in the Summary and Recommendations section of this paper, these problems, while substantial and real, are not unusual for a technical assistance type project, and as indicated throughout, ADC is taking serious steps to resolve them. There is considerable lead time before the cold storage facilities will be on line which should allow an ample period for the ADC to firm up plans and arrangements, and submit a detailed implementation plan to AID. Development of project planning and concepts has progressed as far as could reasonably be expected at this time, considering the newness and nature of the project.

X. MISCELLANEOUS

A. Impact on the US. Economy

The loan funds will be used for the purchase of services and equipment in the United States. Continuing maintenance imports are expected to be minimal.

One of the long run objectives of this project is to reduce the dependence of the GOEP on imported grain foods. To the extent this project results in increased potato production it will serve the objective of reducing requirements for other types of food.

B. Export-Import Bank Clearance

The Export-Import Bank decided on December 18, 1967 that it would not consider a loan for this project.

C. Other Free World Sources of Financing

The consortium method of coordinating sources of financing for Pakistan's development requirements reasonably assures that no other Free World financing is available for this project.

D. Repayment Prospects

The Borrower will be the Government of Pakistan and the implementing agency the East Pakistan Agricultural Development Corporation of the Government of East Pakistan. It will be the obligation of the GOP to make interest and principal payments on this loan to AID.

An assessment of Pakistan's external debt position and prospects leads us to share the view of other observers, including the IBRD, that Pakistan can support additional debt as long as the blend of terms continues to be soft. Pakistan's debt service and that service as a percent of foreign exchange earnings since FY 1958 are shown in Table 5 on the following page. It is clear that debt service has grown very rapidly in the last ten years, both absolutely and as a percent of foreign exchange earned, although Pakistan has made successful efforts to increase its exports. However, if earnings of foreign exchange continue to rise by at least 7 - 10

percent a year the foreseeable debt service should remain within the range of 15 - 20 percent of earnings for the next decade. Even if every effort is made to sustain a good export performance, there are uncertainties concerning the future of Pakistan's raw material exports, such as jute and cotton, on which its foreign exchange earnings are heavily dependent. Therefore, Pakistan's ability to accept additional debt servicing obligations depends on the continuing availability of the bulk of its requirements on soft terms.

Table 5
Pakistan's Debt Service as a
Percentage of Foreign Exchange Earnings FY 58-67
 (in million rupees)

<u>Fiscal Year</u>	<u>Foreign Exchange Earnings</u> (1)	<u>Debt Service</u> (2)	<u>Column (2) as % of Column (1)</u>
1958	1,648	70	4
1959	1,752	991	5
1960	2,098	109	5
1961	2,256	130	6
1962	2,348	148	6
1963	2,711	224	8
1964	2,675	245	9
1965	3,025	380	13
1966	3,201	443	14
1967	3,283	429	13

Source: USAID Mission to Pakistan: Statistical Fact Book: 1968
 Table 8.1

XI. CONCLUSIONS AND RECOMMENDATIONS

The proposed project for multiplication and storage of improved varieties of seed potato will make an important, although limited, input to East Pakistan's agricultural development. It will save the GOP significant amounts of foreign exchange, make available approximately twice as much improved seed, and result in significant economic benefits --to the farmers and to the Provincial economy. The program, because it is new and involves working with a relatively young organization, requires that plans and arrangements for implementation be firmed up at an appropriate time--but the problems which will have to be faced are not substantial enough to effect the viability of the project. Based on the information developed from the ADC's own planning, and detailed studies performed by a USDA team and Bovay Engineers, we believe sufficient justification is available to approve this loan.

It is recommended that a loan of up to \$420,000 be authorized to the GOP subject to the following terms and conditions;

- 1) The Government of Pakistan to repay the loan to A.I.D. in U.S. 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 the date of the first disbursement. During the grace period the Government of Pakistan will pay interest to A.I.D. in U.S. dollars at the rate of two percent (2%) per annum on all amounts of outstanding principal. From and after the expiration of the grace period, the Government of Pakistan will pay interest to A.I.D. in U.S. dollars at the rate of two and one-half percent (2 $\frac{1}{2}$ %) per annum on all amounts of principal outstanding under the loan.
- 2) Relending terms between the Government of Pakistan, the Government of East Pakistan and East Pakistan Agricultural Development Corporation for the project to be approved by A.I.D.;
- 3) The Government of Pakistan to produce evidence satisfactory to A.I.D. that all funds, in addition to the A.I.D. loan, needed to complete the project have been or will be made available;
- 4) All goods and services financed from the loan to be procured from and have their source and origin in the U.S.;
- 5) The ADC through the GOP to submit to A.I.D. as a condition precedent to disbursement for other than advisory services a project implementation plan satisfactory to A.I.D.; and
- 6) The loan to be subject to such other terms and conditions as A.I.D. may require.

June 21, 1968

ANNEX A
ExhibitPROJECTED PROFIT AND LOSS STATEMENT
(thousands of dollars)

	<u>1969/70</u>	<u>1970/71</u>	<u>1971/72 & following years</u>
Income			
Sale of Imported Seed	79.8	159.6	159.6
Sale of Multiplied Seed	<u>598.5</u>	<u>1,197.0</u>	<u>1,1197.0</u>
Total Income	<u>672.3</u>	<u>1,356.6</u>	<u>1,356.6</u>
Direct Costs			
Imported Seed	69.3	138.6	138.6
Multiplied Seed	267.8	535.5	535.5
Premium for Multiplied Seed	47.3	94.5	94.5
Horticultural Staff	45.8	45.8	15.8
Storage	103.5	206.9	206.9
Other Costs			
ADC Overhead	13.3	25.5	24.8
Interest (7%)	57.9	115.8	115.8
Depreciation	<u>41.3</u>	<u>82.7</u>	<u>82.7</u>
Total Costs	646.2	1,245.3	1,214.6
Net Profit	32.1	113.3	142.0
Expected Cash Generation (Net Profit Plus Depreciation)	73.4	194.0	224.7

NOTES TO EXHIBIT

1. Seed potato imports: quantity assumed to be 10,000 maunds in 1969/70, 20,000 mds. in 1970/71 and annually thereafter. The ADC in its project report in March 1967 assumed this program would be functioning full scale in 1967/68; we believe our schedule for phase-in is more realistic. Costs for imported seed per maund are assumed to be Rs. 25/md. in FREX and Rs. 8/md. for unloading and handling, taxes, shrinkage, spoilage and transportation. Sales price from ADC to farmers assumed to be Rs. 38/md. (Source costs, sales price and ultimate quantities: USDA Report).
2. Multiplied seed: quantity assumed to be 75,000 mds. in 1969/70; 150,000 mds. in 1970/71 and annually thereafter. A multiplication factor of 7.5:1 is assumed. Costs to ADC for multiplied seed are estimated to be Rs. 17/md. (Rs. 15/md. to the farmer; Rs. 2/md. for bags and transportation). Sales price by ADC to farmers assumed to be Rs. 38/md. (Source costs, sales price and ultimate quantities: USDA Report).
3. Premium for multiplied seed: assumed to be Rs. 3/md. to be paid by ADC to the farmers (Source: ADC and USDA Reports).
4. Horticultural staff: assumes a team of one horticulturist and two assistants will be assigned in each of the five districts beginning in 1969/70. Our recommendation is that staff be recruited in 1968/69--to the extent this occurs, expenses will be incurred that year, but they are not significant. (Source staffing pattern based on ADC and USDA recommendations)
5. Storage: assumes one-half year costs 1969/70; full costs 1970/71 and annually thereafter. Annual costs are based on: a) electricity, \$62,100 (Bovay); b) maintenance and repairs, \$43,400 (ADC); c) insurance, \$7,100 (ADC), and d) staff, \$94,000 (Bovay). It is recognized that staff for the storage units should be recruited and trained several months before the units start operating (March/April 1970), thus more than one-half year's staff costs may occur in 1969/70 (but such increases would be slight).
6. ADC overhead: ~~2 1/2~~ 2 1/2% of direct (including seed) costs is provided for to cover ADC's overhead costs (based on ADC report).

7. Interest: for purposes of estimating "Project Costs" and interest during the initial years of operation, it is assumed a) the ADC would borrow funds to fully cover the costs of "Total Cold Storage Units" less "ADC Overhead," or \$1,654,300; and b) the interest would be 7%; and c) there would be a five-year grace period before principal repayment begins.
8. Depreciation: a straight 20-year depreciation rate of the "Total Cold Storage Units" costs is assumed.

CHECKLIST OF STATUTORY CRITERIA
Development Loan Fund

ATA 100/1-718
ANNEX B
June 21, 1968

PAKISTAN - SEED POTATO STORAGE

The following abbreviations are used:

FAA - Foreign Assistance Act of 1961, as amended by the Foreign Assistance Act of 1967

App. - Foreign Assistance and Related Agencies Appropriations Act, 1968

1. FAA §.102. Assistance wherever practicable consists of U.S. commodities and services furnished consistent with efforts to improve the U.S. balance of payments. All goods and services financed by this loan will have their source and origin in the United States.
2. FAA §.201(b). Manner in which loan will promote country's economic development, emphasizing help for long range plans and programs designed to develop economic resources and increase productive capacities. Considered throughout the Capital Assistance Paper, especially Section VII.
3. FAA §.201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within the United States. This loan is part of the U.S. share of consortium financing. Other financing for this project is not readily available.
4. FAA §.201(b)(2). Information and conclusion on activity's economic and technical soundness, including the capacity of the recipient country to repay the loan at a reasonable rate of interest. See Sections V, VII, and VIII. Pakistan is considered to have the capacity to repay this loan under recommended terms and conditions, see Section XD.
5. FAA §.201(b)(3). Information and conclusion on existence of reasonable promise activity will contribute to development of economic resources or increase of productive capacities. See Section VII.
6. FAA §.201(b)(4). Information and conclusion on activity's relationship to other development activities, and its contribution to realizable long-range objectives. The project will provide a valuable nutritional supplement in East Pakistan and assist Pakistan in realizing self-sufficiency in food production.
7. FAA §.201(b)(5). Country's self-help measures, including institution of FAA investment guaranty programs. Pakistan has been and is undertaking a wide range of significant self-help measures, particularly in agriculture. Pakistan has instituted the investment guaranty program.

8. FAA §.201(b)(6). *Information and conclusion on possible effects on U. S. economy, with special reference to areas of substantial labor surplus.* Commodities will be purchased from U.S. Suppliers. No particular benefit to areas of surplus labor is anticipated.
9. FAA §.201(b)(7). *Information and conclusion on the degree to which the country is making progress toward respect for the rule of law, freedom of expression and of the press, and recognition of the importance of individual freedom, initiative, and private enterprise.* Pakistan's adherence to the maintenance of the Rule of Law, individual freedom and relative freedom of expression and of the press is recognized. Private enterprise and initiative are regarded as having an important place in Pakistan's economic development drive. Measures have recently been taken which it is expected will permit even greater opportunity for the exercise of initiative and private enterprise.
10. FAA §.201(b)(8). *Information and conclusion on the degree to which the country is taking steps to improve its climate for private investment.* Pakistan's leaders have recognized that domestic and foreign private investment is essential to Pakistani economic development, and efforts supporting private investment continue.
11. FAA §.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 assist Pakistan in achieving self-sufficiency in food production.
12. FAA §.201(b). *Compliance with requirement that funds not be used to make loans to more than twenty countries in any fiscal year.* Pakistan has been included in the list of countries eligible for Development Loan assistance during the current fiscal year.
13. FAA §.201(b). *Information and conclusion on reasonable prospects of repayment.* It is concluded that repayment is reasonably assured.
14. FAA §.201(d). *Information and conclusion on legality (under laws of the country and the U. S.) and reasonableness of lending and relending terms.* The funds will be lent in compliance with the laws of the United States and of Pakistan. Lending terms are reasonable and relending terms must be approved by A.I.D.
15. FAA §.201(e). *Information and conclusion on availability of an application together with sufficient information and assurances to indicate reasonably that funds will be used in an economically and technically sound manner.* Considered in Section III. Sufficient information and assurances have been received - and adequate controls will be incorporated in the loan agreement - to indicate that the funds will be used in an economically and technically sound manner.

15. FAA §.201(f). If a project, information and conclusion whether it will promote the economic development of the requesting country, taking into account the country's human and material resource requirements and the relationship between the ultimate objectives of the project and the country's overall economic development.
17. FAA §.201(f). If a project, information and conclusion whether it specifically provides for appropriate participation by private enterprise.
18. FAA §.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.
19. FAA §.207. Information on the emphasis placed on
 - (a) encouraging development of economic, political and social institutions;
 - (b) improving availability in the country of educated trained manpower;
 - (c) self-help in meeting the country's food needs;
 - (d) programs aimed at malnutrition, disease eradication, slum clearance, water purification, sewage disposal, health education, maternal and child care (including family planning, and other public health assistance);
 - (e) other development activities including industrial development, free labor unions, cooperatives and voluntary agencies; transportation and communication systems; capabilities for economic planning and public administration; urban development; and modernization of laws to facilitate economic development.

The project will promote economic development. Considered throughout the Capital Assistance Paper, particularly Section VII.

Private farmers, merchants and consumers in East Pakistan will benefit from the project. Private U.S. Suppliers will provide the goods under the loan.

None of the loan funds will go directly to private enterprise in Pakistan or to intermediate credit institutions. All goods financed from the loan will be procured from private sources in the U.S.

Appropriate emphasis is being placed on all such development. See FY - 1969 Program Memorandum for a full statement and discussion of relevant background information.

20. FAA §.208. Information on the extent to which the country is (a) attempting to increase food production and food storage and distribution facilities; (b) creating a favorable climate for foreign and domestic private enterprise and investment; (c) increasing the role of the people in the developmental process; (d) allocating expenditures to development rather than to unnecessary military purposes or intervention in other free countries' affairs; (e) willing to contribute funds to the project or program; (f) making economic, social and political reforms such as tax collection improvements and changes in land tenure; (g) responding to the economic, political and social concerns of its people and showing a determination to take self-help measures.

(a) Pakistan has undertaken an extensive program to bring about agricultural self-sufficiency and improve means for storage and distribution of food. (b) Considered above with respect to Section FAA 201(b)(8). (c) Pakistan has applied great emphasis in its Basic Democracies and agricultural improvement program in bringing the people into its development process. (d) Pakistan's development programs embodied in its Third Five Year Plan stress key development areas, and governmental expenditures are used for development and not diverted to unnecessary military purposes or foreign intervention. (e) Pakistan is providing the local currency resources required for this Project. (f) Pakistan is engaged in programs for economic, social and political reforms of both a short and long-term nature, in order to achieve development objectives more efficiently and justly. (g) The emphasis Pakistan has placed on development is noteworthy and the country has demonstrated an unusual determination to carry through self-help measures.

21. FAA §.209. Information on multi-lateral assistance and regional programs, including the extent to which U.S. assistance will encourage regional development programs.

Pakistan is receiving assistance from the members of the Pakistan consortium from other free world donors, and from Communist bloc sources. It is not anticipated that the loan will affect regional development.

22. FAA §.281. Extent to which the loan will contribute to the objectives of assuring maximum participation in the task of economic development on the part of the people of the developing countries, through the encouragement of democratic private and local governmental institutions.

See Section III.

23. FAA §.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; (f) strengthen free labor unions.
- (a) All equipment and materials financed under the loan will be procured in the United States, with a consequent effect on US-Pakistan trade patterns; (b) No direct effect; (c) No direct effect; (d) No direct effect; (e) An integral part of this project is technical assistance to farmers in better growing practices for potatoes; (f) No direct effect
24. FAA §.601(b). Information and conclusion on how the loan will encourage U.S. private trade and investment abroad, and how it will encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).
- The loan will not have a direct effect on encouraging US investment abroad, but does encourage private US participation in foreign assistance programs by the use of US firms.
25. FAA §.601(d). Conclusion and supporting information on compliance with the Congressional policy that engineering and professional services of U.S. firms and their affiliates are to be used in connection with capital projects to the maximum extent consistent with the national interest.
- Construction will be supervised by a U.S. engineering consultant.

26. FAA §.602. *Information and conclusions whether loan will permit American small business to participate equitably in the furnishing of goods and services financed by it.* Goods procured under this loan will be supplied by US private enterprise; procurement procedures under this loan will permit equitable participation of US small business.
27. FAA §.604(a); App. §.108. *Compliance with restriction of commodity procurement to U. S. except as otherwise determined by the President and subject to statutory reporting requirements.* All procurement of goods financed by this loan will have their source and origin in the US.
28. FAA §.604(b). *Compliance with restriction that no funds be used to procure bulk commodities at prices higher than the market price prevailing in the U. S. at time of purchase.* No bulk commodities will be procured under this loan.
29. FAA §.604(d). *Compliance with requirement that marine insurance on commodities be purchased on competitive basis or, if the participating country discriminates against any marine insurance company authorized to do business in any State of the United States, that insurance be placed in the U. S.* The Loan Agreement will so provide.
30. FAA §.608(a). *Information as to the utilization of excess personal property in lieu of procurement of new items.* Excess property utilization will receive appropriate consideration, but it is unlikely that substantial amounts of such property can be utilized for this project.
31. FAA §.611(a)(1). *Information and conclusion on availability of engineering, financial, and other plans necessary to carry out the assistance and of a reasonably firm estimate of the cost of the assistance to the United States.* Engineering, financial and other plans have been prepared by the Borrower and are included in reports by U.S. advisory teams. See Section V & VI.
32. FAA §.611(a)(2). *Necessary legislative action required within recipient country and basis for reasonable anticipation such action will be completed in time to permit orderly accomplishment of purposes of loan.* No legislative action is required.

33. FAA §.611(b); App. §.101. *If water or water-related land resource construction project or program, information and conclusion on a benefit-cost computation.* Not applicable.
34. FAA §.611(c). *Compliance with requirement that contracts for construction be let on competitive basis to maximum extent practicable.* Construction is being financed by local currency.
35. FAA §.611(e). *Compliance with the requirement that for all projects estimated to cost in excess of \$1,000,000, the principal officer of AID in the country in which the project is located certify as to the capability of the country (both financial and human resources) to effectively maintain and utilize the project taking into account among other things the maintenance and utilization of projects in the country previously financed or assisted by the U. S. (Such certifications are to be approved by the Administrator or appropriate assistant administrator per Delegation of Authority #75 before assistance is authorized.)* Not applicable to a loan of \$420,000.
36. FAA §.612(b) and 636(h). *Appropriate steps that have been 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 U. S. are utilized to meet the cost of contractual and other services.* Such steps have been taken and will be required by the loan agreement.
37. FAA §.619. *Compliance with requirement that assistance to newly independent countries be furnished through multilateral organizations or in accordance with multilateral plans to the maximum extent appropriate.* Assistance to Pakistan is based on consortium meetings, which include international lending agencies.
38. FAA §.620(a); App. §.107(a) and (b). *Compliance with prohibitions against assistance to Cuba and any country (a) which furnishes assistance to Cuba or failed to take appropriate steps by February 14, 1964, to prevent ships or aircraft under its registry from carrying equipment, materials, or supplies from or to Cuba; or (b) which sells, furnishes, or permits any ships under its registry from carrying items of primary strategic significance, or items of economic assistance.* Pakistan is not in violation of these sections.

39. FAA §.620(b). *If assistance to the government of a country, existence of determination it is not controlled by the international Communist movement.* Pakistan is not controlled by the International Communist movement.
40. FAA §.620(c). *If assistance to the government of a country, existence of indebtedness to a U. S. citizen for goods or services furnished or ordered where such citizen has exhausted available legal remedies or where the debt is not denied or contested by such government or the indebtedness arises under an unconditional guaranty of payment given by such government.* Pakistan is not ineligible under this section.
41. FAA §.620(d). *If assistance for any productive enterprise which will compete with U. S. recipient country to prevent export to the U. S. of more than 20% of the enterprise's annual production during the life of the loan.* The project will not compete with US enterprise.
42. FAA §.620(e)(1). *If assistance to the government of a country, extent to which it (including government agencies or subdivisions) has, after January 1, 1962, taken steps to repudiate or nullify contracts or taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U. S. citizens or entities beneficially owned by them without taking appropriate steps to discharge its obligations.* Pakistan has not nationalized, expropriated or otherwise seized property of US citizens.
43. FAA §.620(f); App. §.109. *Compliance with prohibitions against assistance to any Communist country.* Pakistan is not a Communist country.
44. FAA §.620(g). *Compliance with prohibition against use of assistance to compensate owners for expropriated or nationalized property.* Loan funds would not be so used.
45. FAA §.620(h). *Compliance with regulations and procedures adopted to ensure against use of assistance in a manner which, contrary to the best interests of the U. S., promotes or assists the foreign aid projects or activities of the Communist-bloc countries.* The Loan Agreement will so provide.

46. FAA §.620(i). *Existence of determination that the country is engaging in or preparing for aggressive military efforts.* Pakistan is not ineligible under this section.
47. FAA §.620(i). *Information on representation of the country at any international conference when that representation includes the planning of activities involving insurrection of subversion against the U. S. or countries receiving U. S. assistance.* Pakistan has not participated in such conferences and is not ineligible under this section.
48. FAA §.620(j). *Existence of a determination that the country has permitted or failed to prevent destruction of U. S. property by mob action or has failed to take steps to prevent a recurrence and to pay compensation.* Pakistan is not ineligible under this section.
49. FAA §.620(k). *If construction of productive enterprise where aggregate value of assistance to be furnished by U. S. will exceed \$100 million, identification of statutory authority.* The loan will not exceed this amount.
50. FAA §.620(l). *Consideration which has been given to denying assistance to the government of a country which after December 31, 1966, has failed to institute the investment guaranty program for the specific risks of inconvertibility and expropriation or confiscation.* Pakistan has instituted the investment guaranty program.
51. FAA §.620(n); App. §.107(b); App. §.116. *Compliance with prohibitions against assistance to countries which traffic or permit trafficking with North Viet-Nam.* Pakistan does not traffic or permit trafficking with North Vietnam.
52. FAA §.620(o). *If country has seized, or imposed any penalty or sanction against, any U. S. fishing vessel on account of its fishing activities in international waters, information on the consideration which has been given to excluding the country from assistance.* Pakistan is not ineligible under this section.
53. FAA §.620(p); App. §.117. *U. A. R. restriction.* Not applicable.
54. FAA §.620(q). *Existence of default in payment under any Foreign Assistance Act loan to the country.* Pakistan is not in default under any FAA loan.

55. FAA §.620(s). *Consideration of whether the country is diverting U. S. assistance to military expenditures, or is devoting an unnecessary percentage of its budget for military purposes, or using foreign exchange for military equipment to a degree which materially interferes with its development so as to warrant termination of assistance until such diversion no longer takes place.* Pakistan is not ineligible under this section.
56. FAA §.620(t). *Compliance with prohibition on aid if country has severed diplomatic relations with U. S. unless agreements have been negotiated after resumption of relations.* Pakistan has not severed diplomatic relations with the United States.
57. FAA §.620(u). *Status of the country with respect to its dues, assessments, and other obligations to the United Nations.* Pakistan is not delinquent in any obligation to the United Nations.
58. FAA §.636(i). *Compliance with prohibition on financing non-U. S.-manufactured motor vehicles (except where special circumstances exist and a waiver is authorized).* All goods will have their source and origin in the United States.
59. App. §.102. *Compliance with requirement that payments in excess of \$25,000 for architectural and engineering services on any one project be reported to Congress.* Such contracts, if any, will be reported.
60. App. §.104. *Compliance with bar against funds to pay pensions, etc., for military personnel.* Funds from the loan would not be used for pensions.
61. App. §.106. *If country attempts to create distinctions because of their race or religion among Americans in granting personal or commercial access or other rights otherwise available to U. S. citizens generally, application which will be made in negotiations of contrary principles as expressed by Congress.* Pakistan does not attempt to create such distinctions.
62. App. §.111. *Compliance with existing requirements for security clearance of personnel.* If necessary, security clearances will be obtained.
63. App. §.112. *Compliance with requirement for approval of contractors and contract terms for capital projects.* The Loan Agreement will contain a provision covering this requirement.

64. App. §.114. *Compliance with bar against use of funds to pay assessments, etc., of U. N. member.* The loan funds will not be used to pay UN assessments.
65. App. §.115. *Compliance with regulations on employment of U. S. and local personnel for funds obligated after April 30, 1964 (AID Regulation 7).* This provision will be complied with, if applicable, under this loan.
66. App. §.118. *Viet-Nam iron and steel restrictions.* Not applicable.
67. App. §.119. *Compliance with reducing assistance by amounts spent for the purchase of sophisticated military equipment in countries other than Greece, Turkey, Iran, Israel, Republic of China, Philippines, or Korea.* No reduction in assistance to Pakistan is required under this section.
68. App. §.401. *Compliance with bar against use of funds for publicity or propaganda purposes within U. S. not heretofore authorized by Congress.* The loan proceeds will not be used for such purposes.

CAPITAL ASSISTANCE LOAN AUTHORIZATION

Provided from: Development Loan Funds

Pakistan: EPADC - Seed Potato Multiplication and Storage Project

Pursuant to the authority vested in the Administrator, Agency for International Development (hereafter called "A.I.D.") by the Foreign Assistance Act of 1961, as amended, and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter 2, Title I, the Development Loan Fund to the President of Pakistan of not to exceed Four Hundred Twenty Thousand U.S. dollars (\$420,000) to assist in financing the foreign exchange costs of goods, materials and services to the East Pakistan Agricultural Development Corporation, Government of East Pakistan, for a seed potato multiplication and storage project. The loan is subject to the following terms and conditions:

1. Interest and Terms of Repayment. The interest on the loan shall be two percent (2%) per annum on the disbursed balance of the loan during the grace period and thereafter two and one-half percent (2½%) per annum. The loan shall be repaid 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.
2. Currency of Repayment. Provision shall be made for repayment of the loan and payment of the interest in United States Dollars.
3. Other Terms and Conditions:
 - (a) Relending terms between the Government of Pakistan, the Government of East Pakistan and the East Pakistan Agricultural Development Corporation shall be subject to A.I.D. approval;

- (b) The Borrower shall produce evidence satisfactory to A.I.D. that all funds, in addition to the A.I.D. loan, needed to complete the project have been or will be made available;
- (c) All goods, materials and services financed under the loan shall be procured from the United States of America;
- (d) The East Pakistan Agricultural Development Corporation through the Borrower shall submit to A.I.D. as a condition precedent to disbursement for other than advisory services a project implementation plan satisfactory to A.I.D.; and
- (e) This loan will be subject to such other terms and conditions as the A.I.D. may deem advisable.

Assistant Administrator
Bureau for Near East and South Asia

Date

Non-Standard Provisions
of Draft Loan Agreement

June 21, 1968

To Be Negotiated With Borrower

Seed Potato Multiplication and Storage

Section 1.02 The Project. The Project shall consist of the multiplication and storage of improved varieties of seed potatoes in East Pakistan. The Project is more fully described in Annex 1, attached hereto, which Annex may be modified in writing. The goods and services to be financed under the Loan shall be described in the implementation letters referred to in Section 9.03 ("Implementation Letters").

Section 3.01. Conditions Precedent to Initial Disbursement. Prior to the first disbursement or to the issuance of the first Letter of Commitment under the Loan, the Borrower shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

- (a) An opinion of the Minister of Law of Pakistan or of other counsel acceptable to A.I.D. that this Agreement has been duly authorized or ratified by, and executed on behalf of the Borrower, and that it constitutes a valid and legally binding obligation of the Borrower in accordance with all of its terms;
- (b) A statement of the names of the persons holding or acting in the office of the Borrower specified in Section 8.02, and a specimen signature of each person specified in such statement;
- (c) Evidence of the relending or other financial arrangements with regard to the use of the funds provided hereunder;
- (d) Evidence that funds other than those provided hereunder which are necessary for the timely completion of the Project will be made available to ADC in a timely and effective manner;
- (e) An executed contract with a U.S. firm or firms satisfactory to A.I.D. for the provision of engineering services with respect to engineering and supervising construction of five cold storage units.

Section 3.02. Conditions Precedent to Disbursements Other Than For Engineering Services. Prior to any disbursement or to the issuance of any Letter of Commitment under the loan for any purpose other than to finance the services referred to in Section 3.01, the Borrower shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

- (a) An implementation plan for carrying out the Project, including but not limited to:
 - (1) final plans and justification for location of the five cold storage units,
 - (2) cost estimates,
 - (3) a time schedule,
 - (4) a detailed plan for the provision and training of qualified East Pakistan Agricultural Development Corporation employees, including storage facility and horticultural personnel,
 - (5) plans for selecting and contracting with farmers for the seed multiplication program,
 - (6) plans for exploring alternative sources of imported seed,
 - (7) plans for providing seed and other physical inputs such as fertilizer, pesticides and credit to the farmers, and
 - (8) plans for undertaking a seed potato research and testing program;
- (b) Evidence of satisfactory arrangements for obtaining the services of a U.S. horticultural advisor for at least a two year period;
- (c) An executed contract with a Pakistani firm satisfactory to A.I.D. for the provision of engineering services with respect to general construction of the five cold storage units;
- (d) An executed contract or contracts with a firm or firms satisfactory to A.I.D. for the provision of equipment and materials required for the five cold storage units; and

- (e) An executed contract or contracts with a firm or firms satisfactory to A.I.D. for construction of the five cold storage units.

Section 3.03. Terminal Dates for Meeting Conditions Precedent to Disbursement.

(a) If the conditions specified in Section 3.01 shall not have been met within ninety (90) days from the date of this Agreement, or such later date as A.I.D. may agree in writing, A.I.D. at its option may terminate this Agreement by giving written notice to the Borrower. Upon giving of such notice, this Agreement and all obligations of the parties thereunder shall terminate.

(b) If all of the conditions specified in Section 3.02 shall not have been met within one hundred eighty(180) days or such later date as A.I.D. may agree to in writing, A.I.D. at its option may cancel the then undisbursed balance of the amount of the Loan or may terminate this Agreement by giving written notice to the Borrower. In the event of a termination upon the giving of notice, the Borrower shall immediately repay the Principal then outstanding and shall pay any accrued interest and, upon receipt of such payments in full, this Agreement and all obligations of the parties hereunder shall terminate.

Non-Standard Provisions
of Draft Loan Agreement
To Be Negotiated With Borrower

Seed Potato Multiplication and Storage

Annex I

The Project is the establishment of a program under the East Pakistan Agricultural Development Corporation (ADC) to import, multiply, store and sell improved seed potato stock in East Pakistan. The Project consists of two primary aspects: (1) import, multiplication and maintenance of adequate standards with respect to the improved seed potato and (2) construction and operation of five cold storage units in five districts.

1. Import, Multiplication and Maintenance of Standards.

ADC will import about 20,000 maunds of seed potato annually, contract with farmers in areas within reasonable distances of the proposed new cold storage units to multiply the imported seed, provide horticultural assistance and advice to farmers in good growing practices, establish certification standards, procure the multiplied seed meeting standards from the contract farmers at harvest time, ensure the seed is stored under satisfactory conditions, and distribute and sell the stored seed to commercial growers. The time cycle for this process will be about one year. These functions will be performed by an inspection staff consisting of a qualified horticulturist and two assistants attached to each of the five cold storage units. This staff will be assisted by an expatriate horticultural advisor for at least two years.

2. Construction and Operation of Five Cold Storage Units.

Five cold storage units will be constructed and operated in the districts of Rangpur, Bogra, Rajshahi, Dacca and Comilla. These will be built with the assistance of a Pakistani engineering consultant to assist with general construction design and a U.S. engineering consultant to perform the engineering, construction supervision and training functions. Adequate staff for operating and maintaining the facilities will be provided by the ADC in sufficient time for training prior to start-up of the units, expected no later than January 1970.

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20522

ASSISTANT
ADMINISTRATOR

A.I.D. Loan No.
391-E-139

(Ref: ID-52/P-748)

CAPITAL ASSISTANCE LOAN AUTHORIZATION

Provided from: Development Loan Funds

Pakistan: EPADC - Seed Potato Multiplication
and Storage Project

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- (c) All goods, materials and services financed under the loan shall be procured from the United States of America;
- (d) The East Pakistan Agricultural Development Corporation through the Borrower shall submit to A.I.D. as a condition precedent to disbursement for other than advisory services a project implementation plan satisfactory to A.I.D.; and
- (e) This loan will be subject to such other terms and conditions as the A.I.D. may deem advisable.



Maurice J. Williams
Bureau for Near East and South Asia

26 JUN 1968

Date