PROJECT PAPER AMENDMENT

BARI REGIONAL STATION DEVELOPMENT
ISHURDI
Agricultural Research Project (388-0003)

Proposal and Recommendations
For AID/W Review

BANGLADESH

June 1979

BARI Ishurdi Regional Station Development Component:
Agricultural Research Project

TABLE OF CONTENTS

Page Numbers

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: C (A = ADD, C = CHANGE, D = DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY ENTITY: BANGLADESH

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5. PROJECT NUMBER (7 digits): 388-0003

6. BUREAU/OFFICE: A. SYMBOL: ASIA; B. CODE: 04

7. PROJECT TITLE (Maximum 40 characters): Agricultural Research

8. ESTIMATED FY OF PROJECT COMPLETION: FY 82

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 76; B. QUARTER 1 (Enter 1, 2, 3, or 4); C. FINAL FY 82

10. ESTIMATED COSTS $000 OR EQUIVALENT $1 - ( )

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	2,311	2,533	4,844	5,161	3,231	8,392
(GRANT)	(691)	(153)	(844)	(3,541)	(851)	(4,392)
(LOAN)	(1,620)	(2,380)	(4,000)	(1,620)	(2,380)	(4,000)
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY	-	3,480	3,480	-	8,469	8,469
OTHER DONOR(S)						
TOTALS	2,311	6,013	8,324	5,161	11,700	16,861

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 76 F. GRANT	E. 1ST FY 76 G. LOAN	H. 2ND FY 77 I. GRANT	H. 2ND FY 77 J. LOAN	K. 3RD FY 78 L. GRANT	K. 3RD FY 78 M. LOAN
(1) FN	141	080	080	844	4,000	360	-	920.1	-
(2)									
(3)									
(4)									
TOTALS				844	4,000	360		920.1	

A. APPROPRIATION	N. 4TH FY 79 O. GRANT	N. 4TH FY 79 P. LOAN	Q. 5TH FY 80 R. GRANT	Q. 5TH FY 80 S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1)	400	-	1,646.7	-	4,391.8	4,000
(2)						
(3)						
(4)						
TOTALS	400		1,646.7		4,391.8	,000

12. IN-DEPTH EVALUATION SCHEDULED: MM 06 YY 82

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 (1 = NO, 2 = YES)

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Richard L. Podol

TITLE: Director (Acting)
USAID/Bangladesh

DATE SIGNED: MM 06 DD 14 YY 79

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 06 DD 20 YY 79

AID 1330-4 (3-78)

Part I. Project Summary and Recommendations

A. Recommendations

1. That the existing Agricultural Research Project (388-0003) be amended to include additional funds for the expansion and development of the Bangladesh Agricultural Research Institute's Regional Station at Ishurdi.

2. Grantee: The Bangladesh Government (BDG) implementing agency will be the Bangladesh Agricultural Research Institute (BARI) of the Ministry of Agriculture and Forests.

3. That grant funds for this amendment be provided as outlined below:

	($000)
a. Total Project Amendment Cost (AID plus BDG contribution)	1,325
b. A.I.D. Assistance	
Grant -	1,000

for the development and expansion of the BARI Regional Station at Ishurdi. The project will finance overall farm and station development including farm buildings, administrative laboratory complex and residential staff quarters; land leveling for research plot development; electrification and water distribution systems; roads, drainage and irrigation; and for farm machinery, laboratory equipment and furniture.

($000)

	FY 80	FY 81
c. Host Country Contribution:		
(i) Recurring/operating Budget	75	75
(ii) Development Budget	100	75
Total : $325 =	175	150

B. Description of the Project

1. The ongoing Agricultural Research Project will be amended to develop and strengthen the Regional Agricultural Station, Ishurdi to enable the station to better undertake applied and adaptive research on non-rice food crops relevant to the local conditions.

The agricultural sector goal of the Bangladesh Government is to achieve sustained equitable growth in agricultural production. One of the key subsectors within agriculture is the development of a national agricultural research system capable of identifying priority research problems and producing cost effective solutions utilizable by policymakers and farmers alike. This national research system should contribute significantly to the sector goal when interlocked with an effective outreach extension system disseminating research results to farmers and gathering feedback from them. Therefore, there is a need to develop the four regional stations of BARI in order to strengthen the linkage for a national system of meaningful applied research which will reach all farmers.

AID is already involved with the development of the Ishurdi Regional Station. The existing Project provided an initial amount for construction of residential quarters. The time has now come to fully develop the station. The World Bank is providing funds for the development of the other three Regional Stations at Hathazari, Jamalpur and Jessore.

This amendment will provide funds for:

a. Irrigation facilities ($100,000); godown ($30,000); chemical, fuel and fertilizer store house ($30,000); workshop implement shed ($30,000); field laboratory-administrative complex ($90,000); training facility and hostel ($50,000); services, including provision of water and electricity ($85,000); threshing floor ($20,000); roads and drainage ($50,000); fencing ($80,000); land development including leveling and shaping ($25,000); and additional residential buildings ($80,000).

b. Essential farm machinery and equipment ($110,000); pump engines and tubewells ($30,000); laboratory equipment and furniture ($100,000).

c. Professional fees ($20,000).

d. Inflation (10%) - Construction ($70,000).

2. Facility Construction

The ongoing project is financing 57 residential units for research staff at the station. Strengthening of the research station will require additional staff totalling approximately 84 personnel by FY 82. To provide all staff with residences, and should there be any demand for any more quarters in the future, an additional one unit of "A" type and six units of "C" type residential quarters will be constructed. See Table 1 for explanation of housing type and justification for additional units.

Some institutional construction is needed. Accordingly, a field laboratory/administration complex will be constructed. In order to be able to provide training for extension workers and farmers, a training facility and hostel will be constructed. BARI will provide short term training and in-service refresher training for personnel of the Directorate of Agriculture (Extension and Management) on improved methods of cultivation and use of research findings for non-rice food crops similar to what BRRI provides for rice. This facility will also enable BARI to hold short (3 to 5 day) training sessions for farmers.

3. Commodities

The project will provide farm machinery and equipment for cropping and harvesting. To ensure adequate maintenance, basic workshop facilities and tools will be included.

The machinery and equipment are necessary to insure timely installation and maintenance of research trials. Mechanized farm machinery on research stations in developing countries is used solely for this purpose. In order to insure that farmers have access to information on the use of indigenous and improved hand and bullock equipment, BARI will conduct trials related to so-called appropriate technologies.

Basic laboratory equipment appropriate for field research and office furniture will be provided under this project amendment. Laboratory equipment needed for the Ishurdi Station includes microscopes, glassware, seed testing equipment, moisture meters, seed incubators, chemicals, soil testing equipment, laboratory balances, PH meters, etc. No sophisticated equipment will be purchased.

C. Summary Findings

The design, as proposed, is well suited to achieve the purpose of this project amendment. It has been carefully planned to make full and efficient use of available resources. The nature of the research approach is particularly well suited to the crop research needs of Bangladesh with a minimum ratio of research costs to actual gains for small farmers. Potential adverse environmental impacts of the project are judged to be none or minimal; and, the indirect effects are judged to have little or no adverse environmental impact. The financial plan is carefully designed and firm, and suited to the needs of the project. The plan appears adequate to achieve the required outputs and project purpose.

D. Project Issues

1. Will research findings be adequately disseminated to all farmers in the area ?

Several donor activities are concentrating on improving the extension mechanisms within Bangladesh. In the areas adjacent to the Ishurdi Station, the relationships between research and extension have greatly improved in the past five years. We can reasonably assume that the research findings will be disseminated with the assistance of the research staff through the Directorate of Agriculture (Extension and Management). The Ministry of Agriculture has developed task forces for different crops such as wheat, pulses, oil seeds, vegetables, etc., to bring together all of the support services, such as research, extension and inputs in order to increase production.

2. Why should AID develop this station and not the World Bank ?

The World Bank chose not to get involved with support for the Ishurdi Regional Station because AID was already providing funds for residential quarters. When the question arose, IDA funds were already committed for other areas of agricultural research. Therefore, it was agreed with the Bank and BARI that AID should support the development of the station.

Part II. Project Background and Detailed Description

A. Background

Bangladesh is confronted with a food-population imbalance. The imbalance between food production and food consumption requirements has been accented by low production yields and the rapidly increasing food requirements of an exceedingly rapid growth in population. The major goal of the Bangladesh Government is foodgrain self-sufficiency by 1985/86. One of the major objectives USAID has chosen to support in assisting the BDG to meet its goal, is increasing foodgrain production. One of the main subsectors within agriculture which needs development, is a national agricultural research system capable of identifying priority problems and producing cost effective solutions utilizable by all farmers.

The 1981 Country Development Strategy Statement (CDSS) emphasizes the need for continued adaptive research related to improved technology. The USAID program will continue to support research for small farmer cropping systems, low cost nutritious crops and appropriate agricultural technology. Furthermore, the CDSS states that "...agriculture is the leading productive sector in Bangladesh. No other sector holds promise for achieving growth with an improvement in the living standards of the poor majority. Since virtually no new land will become available for cultivation, increased production means higher yields per acre. The adoption of high yielding variety foodgrain technology, while for purposes of maximizing employment and avoiding large-scale mechanization, is the only possible way to achieve an increase in yields per acre at a rate rapid enough to achieve foodgrain self-sufficiency."

At the request of the Planning Commission, AID fielded a team in early 1974 to assess the needs of agricultural research in Bangladesh. In summary, the team found that, except for rice, agricultural research was essentially inactive, fragmented among various ministries, uncoordinated and out of contact with relevant international research activities. The team also concluded that agricultural research for crops other than rice (other cereals, pulses, vegetables, oil seed crops etc.) should receive much more attention and should be the object of AID support.

The northwestern area of Bangladesh, in which the Ishurdi Regional Station is located, has soils and a climate well suited for crop diversity. With emphasis on adaptive research in this area, the BDG can begin to reach its goal of foodgrain self-sufficiency. One such example, is the increase in wheat acreage and per acre yields in the northwest compared to the rest of the country in the past two to three years. The popularization of wheat occured with little help from the extension service. This demonstrates the ease with which Bangladesh farmers will accept agricultural innovation.

During 1974 and 1975, twelve man months of TDY assistance was financed by AID to develop the Agricultural Research Project and to develop a plan for reorganizing and strengthening the Agricultural Research Institute at Joydevpur and Ishurdi.

The Agricultural Research Project (388-0003) forms the base for developing a crop research system for Bangladesh. AID loan funds are being used to develop the 430 acre central research complex at Joydevpur, and for residential quarters at the Ishurdi Regional Agricultural Research Station.

The Project is providing 57 residential units for research staff at the Ishurdi Station. By the end of 1979, all of these units will be completed and staff operations for research will be expanded. In order to fully utilize the potential of this station for a more effective, regionally-based, adaptive research program, facilities have to be improved and expanded. Thus, the existing Agricultural Research Project is being amended to provide the necessary funds.

B. Detailed Description

1. Introduction

The development of research stations and their subsequent management is taking on a new dimension in Bangladesh. The BDG's strategy is to reduce foodgrain imports and to attain foodgrain self-sufficiency by 1985. The Government's priorities lie in strengthening its institutional capabilities for developing appropriate technologies for boosting agricultural production.

The Regional Agricultural Research Station at Ishurdi was established in the early fifties. The purpose of this research station is to undertake production-oriented adaptive research on non-rice food crops, and to give specialized attention to agricultural problems of the Northern Region.

Ishurdi station is an old station and needs a tremendous amount of work to get it into first class condition. Development of the station necessitates some rethinking on staffing, housing and equipment for the station. Since all agricultural research activities must be based on a well-equipped farm, it was essential that emphasis be given to the development of the physical facilities of the station's farm and to establish priorities in their development. The project is being amended to develop the Ishurdi Station which will give the necessary support to the research functions of BARI.

Ishurdi Station Development of the Agricultural Research Project will include facilities construction and equipment for the station. A description of major activities is presented below.

2. Facility Construction

The grant will provide funds to construct the buildings and facilities necessary for the complete development of the Ishurdi Station. Similar buildings have already been designed for the central station at Joydevpur. Building designs and plans will be replicated from the architectural designs used for the original project at Joydevpur and Ishurdi. Funds will be provided for architectural and engineering services. There will be a cost involved with replication of plans from the original designs. These designs will have to be modified to construct buildings which are specific to size and shape for conditions which are applicable for the regional station.

In order to insure that buildings are properly located and the station is properly layed-out for short and long range development, a master plan and a site development plan are being prepared.

A detailed list of buildings and facilities to be constructed is presented at Table 2.

3. Commodities

A summary of estimated commodity costs is shown at Table 3 and Table 4. Major commodity items include land leveling equipment, tractors, cultivating and harvesting machinery, irrigation equipment, workshop equipment, laboratory equipment and supplies, chemicals, furniture and project vehicles.

4. Technical Assistance

There will be no expatriate direct technical assistance connected with the development of the Ishurdi Station. That is to say, no full time technicians will be living at the Station. The Ishurdi Station is part of the BARI system and the ongoing components of the project provide for technical assistance. The contract with the International Agricultural Development Service (IADS) and the PASA with the Denver Wildlife Research Center (DWRC) will provide the necessary technical competencies. For example, the Farm Development Specialist under the IADS contract will be used to assist the BARI Project Director and engineers with the Master Plan, land leveling activities and with the installation of roads, the irrigation system and the drainage system. If necessary, the Station Development Specialist can be extended to provide additional assistance for completing the station development activities at the Ishurdi Station. This will be determined at a later date.

5. Project Inputs

a. U.S. Government

Based on the above project description, the following resources are required to achieve project purposes:

Schedule of Funds	FY 80	FY 81	Total
		($ 000)	
Machinery, equipment & vehicles	110	-	110
Farm buildings	110	-	110
Residential quarters	80	-	80
Research/admin. complex	140	-	140
Farm site development	370	-	370
Laboratory equip. & furniture	100	-	100
Professional fees	20	-	20
Inflation (10%)	70	-	70
	1,000	-	1,000
BDG contribution (construction and site development)	75	75	150
BDG other costs	100	75	175
Total :	1,175	150	1,325

The adequacy of present construction cost estimates is a subject which has been thoroughly scrutinized. Inflation during the past year was about 15 percent. The estimates presented are as current as we can obtain and are based on BDG calculations tempered by USAID engineering input. However, based on present construction activities of an identical nature under the existing project components, the cost estimates should be fairly reliable. Our intention is to reconfirm these estimates at the time contracts are awarded. After contracts are awarded, cost overruns will be the responsibility of BARI. This has been the standard procedure under the Loan Agreement and BARI has fulfilled their commitments.

b. Bangladesh Government

The BDG's contribution consists of the Ishurdi site, renovation of existing buildings, and additional construction. The BDG will also meet the operating and maintenance costs of the regional station. The total BDG contribution is estimated to be $325,000 over two fiscal years.

c. Other Donors

(i) World Bank - The World Bank is providing U.S. $3,000,000 for the development of three BARI Regional Stations (Hathazari, Jamalpur and Jessore) and one sub-station (Ramgarh).

(ii) Swedish International Development Agency

Winter Oil Seeds	- BARI	$250,000.

6. Outputs

The BARI Ishurdi Regional Station will be completely constructed and equipped by December, 1982. This includes the farm site development (drainage, roads, irrigation, land shaping, etc.); construction of farm buildings, residential quarters, and laboratory/ administration complex; fencing and electrification and water distributions systems.

When the facilities are complete, the BARI Regional Station staff will be able to fully implement the overall objectives of crop research.

7. End of Project Status

It is anticipated that the following conditions will indicate that the project purpose has been achieved:

a) The Regional Station at Ishurdi will be a full functioning unit of the BARI research system;

b) Needs of small farmers being used as criteria for regionally-based research priorities;

c) Research results being disseminated through the agricultural extension service to farmers; and

d) Farmer problems being worked on and solved.

Table 1

Residential Quarters

"A" Type	-	1500 Sq. Ft. per family unit	= One unit
"C" Type	-	750 Sq. Ft. per family unit	= Six units

Present housing unit available by the end of 1979.

"A" Type	= 1 unit
"B" Type	= 18 units
"C" Type	= 24 units
"D" Type	= 18 units
Old Quarters to be renovated	= 6 units

BARI Staff stationed at the Ishurdi Regional Agricultural Research Station (Breakdown of each type of quarters required).

			In FY 79	By FY 82
A Type	=	Principal Scientific Officer (PSO)	1	2
B Type	=	Senior Scientific Officer	5	9
		Scientific Officer	5	10
		Fieldman	7	13
C Type	=	Agr. Overseer	7	12
		Clerks	5	9
D Type	=	Peons /Darwans	12	14
		Drivers	5	7

Table 2

Ishurdi Station Development

Machinery, equipment and vehicles	$	110,000
Irrigation system (includes a Sprinkler system)		100,000
Pump engines and tubewells		30,000
Fencing		80,000
Buildings		
Residential units		80,000
Chemical, fuel store and fertilizer building		30,000
Godown		30,000
Threshing floor (Enclosed)		20,000
Workshop-implement shed		30,000
Field laboratory-administration complex		90,000
Water distribution system and tank		60,000
Training facility and hostel		50,000
Farm site electrification		25,000
Roads and drainage		50,000
Land leveling and shaping		25,000
Laboratory equipment and furniture		100,000
Professional fees - (A & E Services)		20,000
Inflation (10%) - construction		70,000
Total =	$	1,000,000

Table 3

Farm Machinery and Equipment	Units
A. Land Leveling Equipment	
1. Scraper	1
2. Rear Blade	1
3. Leveler	1
B. Tractors	
1. 75 HP - 4 wheel	1
2. 42 HP - 4 wheel	1
3. Power tiller - 10 HP	2

Table 3 (contd.)

		Units
C.	Cultivating Equipment	
	1. Plow	1
	2. Harrow	2
	3. Fertilizer/seed drill	1
	4. Cultipacker	1
D.	Harvesting Equipment	
	1. Multicrop thresher	1
	2. Head thresher	1
	3. Seed dryer	1
	4. Seed grader	1
	5. Seed cleaner	1
E.	Other Equipment	
	1. Power sprayer	2
	2. 4-wheel trailer	1
	3. 2-wheel trailer	1
	4. Spare parts	-
F.	Irrigation Equipment	
	1. Turbine pump and electric motor	1
	2. Sprinkler system (portable)	1
G.	Workshop Equipment	
	1. Small table lathe	1
	2. Drill press	1
	3. Grinder	1
	4. Small electric welder	1
	5. Hard drill (electric)	1
	6. Wrenches	-
	7. Hand tools	-
H.	Vehicles	
	1. Pickup truck	1
	2. 4-wheel drive jeeptype vehicle	1

Table 4

Laboratory Equipment	Unit
1. Microscopes	7
2. Grinding mill	1
3. Calculators	5
4. Balances and scales	4
5. Refrigerator	2
6. Moisture meter	2
7. Seed incubator	2
8. Small electronic oven	1
9. Dehumidifier	4
10. PH meter	1
11. Seed cleaner	1
12. Autoclave	1
13. Seed cabinets	4
14. Glass ware	-
15. Chemicals	-

Part III. Project Analyses

A. Technical Analysis Including Environmental Assessment

This analysis has already been completed under the original Project Paper. This section remains essentially unaffected by the addition of the Ishurdi Regional Station Development component.

1. Alternative Design

An alternative to the project design as proposed might be direct transfer to farmers of research results from the central station at Joydevpur. USAID and the World Bank have thoroughly analyzed the benefits of developing the national agricultural research system for Bangladesh. The development of this regional station, the three other regional stations and the crop/subject specific substations is essential to determining the specific problems of farmers in different geographic areas of the country.

2. Technical Analysis of the Ishurdi Regional Agricultural Station Development Component as Proposed

The nature and timing for the completion of the entire development of the Ishurdi Station appear suited to the achievement of project goals. AID is already committed to assisting the BDG with the reorganization, strengthening and development of the national agricultural research system. Because of the initiative taken by AID in identifying priority needs for developing the system, the World Bank has decided to fully develop the other three BARI regional stations. USAID is already committed to the development of the Ishurdi Station through financial assistance for construction of 57 residential units. It is now essential that the station be fully developed in order that the Bangladeshi research scientists and technicians can fully utilize the results which are beginning to be generated by the improvement of the national system.

The project will strengthen the agricultural research system in Bangladesh by enabling BARI to better undertake applied, adaptive and adoptive research relevant to local conditions. By fully developing the regional station, a closer relationship with extension will be possible. The research results and support which will come from the regional station will provide the necessary linkage to the farmers in the area.

The facility design appears to be modest, functional and adequate for the anticipated needs of this particular regional station for the life of the project and well into the future. Commodities requested are based on those required for the efficient use of anticipated research activities.

In summary, the project design, as proposed appears well suited to achieve the purpose of this project amendment.

3. Environmental Assessment

The station has been in existence for twenty years in the same location. The amount of land connected with the station has decreased. Forty acres were given four years ago to the Agricultural Extension Training Institute. Old buildings and other facilities already exist. New and appropriate buildings and modern facilities, site development, landscaping, roads and walks in this area will improve rather than adversely affect the environmental quality of the area. The construction of the new residential units with improved water supply, sanitation and electrical service will offer positive advantages to BARI personnel.

No forest land will be destroyed since the site has been in existence for 20 years. Land leveling and improvement in water supply for irrigation and drainage will have positive impact at the site. The site is on flat gradient land and there will be no detrimental erosion caused by water. Improved drainage will minimize the chances of flooding areas adjacent to the station during the monsoon season. There is no requirement for removal and resettlement of farmers, since the site is on land already owned by the BDG.

The impact on the environment stimulated by the applied and adaptive research will be positive. Results of all research conducted are meant to increase production and intensify land usage. New crop varieties and improved cultural practices must be determined for local conditions whether the technique is locally developed or adaptive research on introduced methods.

Research results are beginning to identify new and improved varieties which are fertilizer responsive, therefore, the technology being extended will provide optimal application rates of fertilizer. Efficient use of fertilizer will in fact contribute to the optimal use of chemicals in soil and water. Adaptive research combined with appropriate technologies will increase the effective use of available organic compounds for plant nutrition. Genetic improvement through breeding will develop insect and disease resistant varieties, thus limiting the use of chemical pesticides.

B. Financial Analysis and Plan

1. Financial Rate of Return/Viability and Recurrent Budget Analysis of Implementing Agencies

Both of these analyses have been completed for the original Agricultural Research Project Paper (388-0003). They remain essentially unaffected by the addition of the development of the Ishurdi Regional Station.

2. Financial Plan/Budget Tables

The Financial Plan (see Table 5 for details) indicates that a total of $1,325,000 is required, of which $225,000 will be foreign exchange and $1,100,000 in local currency. The total AID grant of U.S. $1,000,000 is shown as a one-time obligation in fiscal year 1980. The BDG's contribution to the Project is U.S. $325,000 equivalent in local currency for fiscal years 1980 and 1981.

The BDG Five and Two Year Plans list general allocations for each ministry but do not provide detail to the extent that the BARI budget can be specifically identified. Therefore, the evaluation of the level of budgetary commitment of the BDG is based on the approved budget level for FY 1980 shown in the Plans which is adequate for the agencies implementing this project amendment.

The estimated costs for the Ishurdi Regional Station component of the Agricultural Research Project is $1,325,000 for the life of the project. This amount includes 10% inflation on construction costs. The portion of the costs borne by the BDG for this amendment is approximately 25%. The BDG is contributing almost 60% of the $14 million involved with the entire Project.

Estimates for FY 80 are based on current costs. In general, shipping charges are estimated at about 40 percent of the item cost, although more specific estimates are made for larger items.

Table 5 : Financial Plan

Agricultural Research Project - Amendment II

BARI Regional Agricultural Station, Ishurdi

	FY 80		FY 81		TOTAL
	L. C. $ Equivl.	FX US $	LC $ Equiv.	FX US $	
Ishurdi Regional Agr. Station					
A. AID Project Costs					
Machinery, equipment & vehicles	-	110			110
Farm buildings	110	-			110
Residential Quarters	80	-			80
Research/Admin. complex	90	-			90
Training Facility & Hostel	50	-			50
Irrigation System	70	30			100
Tubewell/Pump Engine	15	15			30
Fencing	80	-			80
Station electrification	25	-			25
Water distribution/Tower	60	-			60
Roads & Drainage	50	-			50
Land Shaping & Leveling	25	-			25
Laboratory Equipment	-	70			70
Furniture	30	-			30
Professional Fees	20	-			20
Inflation (10%)	70	-			70
Sub-Total :	775	225			1,000
B. BDG Project Costs					
Capital Budget	100	-	75	-	175
Operating & Other Costs	75	-	75	-	150
Sub- Total :	175	-	150	-	325
TOTAL :	950	225	150	-	1,325

C. Social Analysis

The proposed changes in the scope of the project will not significantly alter the pattern of popular participation in the project. Nor will the benefit incidence be essentially different.

At the research station, the proposed construction should enhance the performance of the institution and directly benefit its research and problem-solving capabilities. The effect of the research facility itself upon farmers will remain the same as stated in the original Project Paper.

D. Economic Analysis

1. Payoffs to Agriculture Research

The importance of new technology cannot be overemphasized. This is particularly true in agriculture where expanded production and broad participation depend upon the availability of new seeds which can be profitably utilized by farmers. The experience with new rice seeds now needs to be replicated with wheat, other grains, oils, and vegetable varieties. Modern inputs such as irrigation and fertilizers, although vital, are not in themselves sufficient to ensure yield increases. The economic payoff of improved seed technology has been shown to be significant in terms of augmented crop production and expanded employment and can provide the basis for a growing agricultural sector. Agricultural research makes this possible. The old seeds do not ensure yield and employment increases.

The inherent time lags in the development of a domestic research capability should not deter this critical investment. Dr. Evenson of Yale University estimated in 1968 that the average lag time between the investment in a research institution and realization of delivered seed benefits is $6\frac{1}{2}$ years. It requires a lead time of this magnitude to breed better seed, whether imported or domestic, and to ensure its multiplication and distribution to all farmers. Too often credit and other agricultural supplies are expanded ahead of adequate supplies of a profitable new technology, i.e. the seed itself.

This project is predicated upon an underlying realization that a relatively small investment in agricultural research in Bangladesh is needed now to capitalize upon the relatively larger investments in cooperatives, agricultural credit, and extension activities that are taking place. The AID sponsored Small Farmer Credit seminar held in Manila in 1973 made it clear that the availability of an acceptable seed technology must accompany the supply of other inputs.

2. Internal Rate of Return

An internal rate of return analysis for research would compare the present discounted costs of an agriculture research institute, and its extension system, with the present value of projected production benefits attributed to the new seed. The rate of return would also reflect the social benefits derived from employment creation on farms.

Future benefits and, therefore, the internal rate of return, are impossible to project with any degree of accuracy. Certainly a 15 percent rate of return should be attainable given basic assumptions with regard to output prices and the availability of other agricultural inputs. While such assumptions cannot be taken for granted, recent developments have been encouraging. The BDG has followed its highly successful rice procurement program of 1977/78 with an equally successful wheat procurement program in 1979, and by now appears committed to a policy of ensuring incentive prices to agricultural producers. On the input side, USAID's Fertilizer Distribution Improvement Project has contributed to a rapid increase in the (admittedly still low) level of fertilizer use by Bangladeshi farmers; and the Experimental Rural Finance Project is helping to bring low-priced institutional credit to sharecroppers and small farmers.

Despite present conditions in Bangladesh there is reason to be optimistic. It is worth noting some estimates from Kislev and Evenson regarding investment in agricultural research in LDCs. They have found that payoffs to investments in agricultural research are extremely high. They conclude that perhaps as much as three times as much growth is purchased per research dollar as compared to an equal investment in extension. They also point out that the amount and quality of seed technology transferred into a country is directly dependent on the quality of that country's research capability. A domestic seed research capacity is critical for technological adaptation, for direct adoption in the past has been shown to fail.

3. Research on Other Food Crops

Within the agricultural sector of Bangladesh we recognize that certain areas of research have higher relative internal rates of return than others, with rice and jute leading the list. However, these areas are sufficiently covered by the Government and outside assistance. Non-rice food crop research offers an attractive supplementary area for investment. Fuller utilization of Bangladesh's land

and labor resource base requires a wide diversification of the country's high yielding seed base. The country's yield and cropping intensity remain far below levels achieved in neighboring countries. New seeds, particularly for dry land crops, will make better use of the country's projected growth of fertilizer and irrigation coverage. The cropping intensity for the nation as a whole is estimated to be 149%. If the cropping intensity were increased to 200%, there would be an additional 10 million acres annually of productively utilized land requiring over four million man years of labor. The utilization of this land potential depends in large measure upon appropriate seed.

Research is now needed on wheat, edible oils, pulses, and vegetables so that the production and employment benefits of increased rice yields can be carried forward by a wide range of new seeds. Such a broader base insures better land use during the dry months, better use of scarce irrigation water, better nutrition, and a greater and more diversified flow of cash earnings than is presently provided by a dual crop culture of rice and jute.

Part IV. Implementation Arrangements

A. Analysis of the Recipient's and AID's Administrative Arrangements

1. Recipient and A.I.D.

A description of the BDG's policy toward agricultural research, the administrative status of the Bangladesh Agricultural Research Institute (BARI) and the administrative arrangements of BARI and AID for the Project have already been given in detail in the original Project Paper. As a component of the original Project, the development of the Ishurdi Regional Station will fall under the same administrative structure and arrangements.

BARI will handle the execution of civil works through its existing construction cell. The BARI construction cell was originally established for the supervision of the Project, and has been expanded to handle the World Bank construction activities at the other three regional stations and the Ramgarh sub-station. This cell will be further strengthened for this component of the project by the appointment of an assistant engineer and two sub-assistant engineers who will be supervised by the existing BARI superintending engineer (Project Director). The additional staff will be obtained from BDG's Public Works Department (PWD) on deputation or hired on a temporary contract basis. The Project Director will handle contract administration work and final work certification, while the assistant engineer will be responsible for materials, field supervision and final work. The assistant engineer and the two sub-assistant engineers will be located at the Regional Station to supervise civil works through local contractors. The land development work, the installation of an irrigation system, roads and drainage will be supervised by a BARI agricultural engineer, who will be posted at the station for the period of the development work.

B. Implementation Plan

1. A timetable for implementation of this component of the Project is given below:

Activity	Target Date
Authorization	
Transmittal of Project Paper Amendment	
Send to AID/W	June, 1979
AID/W Approval	August, 1979
Project Agreement Amendment signed	October, 1979
Infrastructure	
Building sites identified	Underway
Tendering for construction	August, 1979
Contract awarded for architectual services	October, 1979
Master Plan completed	November, 1979
Construction contracts awarded	November, 1979
Land development begins	December, 1979
Facility construction begins	January, 1980
Facility construction completed	December, 1981
Commodities	
Major equipment & farm machinery ordered	January, 1980
Equipment and supplies received and installed	December, 1981
Project Monitoring	
USAID Project Manager	Life of Project
USAID Engineers	Life of Project
Project evaluation	Yearly
In-depth evaluation	Mid-1982

2. Disbursement and Procurement

Construction costs and commodity procurement will be financed by AID from project funds as specified in an amendment to the Project Agreement. These procedures will be consistent with the ones being used for disbursement and procurement under the terms of the original Project Paper. Procedures for utilizing project funds are established under the terms of AID Agricultural Research Loan Agreement (388-T-006) and the Project Agreement.

Disbursements under this grant are expected to be accomplished by three methods: Letter-of-Commitment; Direct Reimbursement and modified Fixed Amount Reimbursement. Those methods are described in Implementation Letter No. 2 of AID Agricultural Research Loan (388-T-006). However, these procedures will be modified as necessary through project implementation letters.

3. Monitoring and Reporting Agreements

The Ishurdi Station amendment will be monitored directly by the USAID direct-hire project officer. As with the other project components, BARI will be required to submit quarterly progress reports to AID. All local construction activities will be reported regularly through monthly reports prepared by BARI through their project Director. It will also be monitored directly by the USAID engineers.

Procurement will be the responsibility of the BARI Assistant Director for Administration with assistance from the USAID project officer. All procurement undertaken will be of items approved by AID and purchased under AID procurement procedures. Commodities will be monitored directly by the USAID Commodity Logistics Branch, Office of the Controller.

C. Evaluation Plan

Routine PES evaluations will be conducted during the life of the project, i.e., February 1980 to December 1982. These evaluations will be based on monitoring reports and actual inspections of the physical facility. The evaluations will determine if project inputs are being provided as planned, and if project outputs are being accomplished as planned. The routine evaluations will be used to recommend alterations of project inputs, if required, to achieve the project purpose. A special in-depth evaluation will be conducted upon completion of the project to determine achievement of the project purposes.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 80 to FY 82
Total U.S. Funding 1,000,000
Date Prepared June, 1979

Project Title & Number: Agricultural Research 388-0003

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes (A-1): Year round cropping of non-rice crops through full utilization of land when rice farming is not possible or economically feasible.	Measures of Goal Achievement (A-2): By 1982: 1. One hundred thousand acres currently fallow in the northwest are brought under cultivation.	(A-3): 1. Statistical reports of Ministries of Planning and Agriculture. 2. BADC records of sales of improved seed varieties. 3. Crop cutting surveys.	Assumptions for achieving goal targets (A-4): 1. Sufficient availability of fertilizer, seeds and pesticides to farmers. 2. Natural conditions provide sufficient moisture for growing crops.
Project Purpose (B-1): To fully develop the BARI Regional Agricultural Research Station at Ishurdi in order strengthen the agricultural research system specifically for the northwestern region of Bangladesh.	Conditions that will indicate purpose has been achieved: End of Project status (B-2): By 1982: 1. Research results suitable to Bangladesh released to Agriculture Extension Service.	(B-3): 1. BARI publications. 2. BARI written communications to Extension Service 3. Visual inspection of research activities.	Assumptions for achieving purpose (B-4): 1. BARI staff have motivation to carry on relevant research. 2. Farmers willing to participate in field trials.
Project Outputs (C-1): 1. BARI Regional Agricultural Station at Ishurdi completely constructed and equipped by December, 1982. a. Land shapping and leveling completed. b. All buildings constructed.	Magnitude of Outputs (C-2): 1. Approximately 130 acres completely leveled and layed out in experimental plots or for breeder seed multiplication.	1. Modified fixed amount reimbursable system for building construction. 2. USAID engineers monitoring reports.	Assumptions for achieving outputs (C-3): 1. Scientific officers willing to coordinate on interdisciplinary efforts within BARI. 2. Farmers willing to accept research results and improved technologies to increase production.
Inputs (D-1): 1. See Tables 2, 3 and 4 for for details. 2. BARI budgetary allocation.	Implementation Target (Type and Quantity) (D-2): 1. U.S. $1,000,000 (AID Grant for overall Station development). 2. Taka equivalent $325,000 BDG contribution. 3. See implementation target pages.	(D-3): 1. USAID monthly and periodic reports 2. USAID engineering reports on construction activities. 3. Evaluation reports. 4. BDG budget.	Assumptions for providing inputs (D-4): 1. Continued BDG commitment to project. 2. No undue difficulties in local procurement of construction services, materials or equipment.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

(INSTRUCTION: THIS IS AN OPTIONAL FORM WHICH CAN BE USED AS AN AID TO ORGANIZING DATA FOR THE PAR REPORT. IT NEED NOT BE RETAINED OR SUBMITTED.)

Life of Project:
From FY 80 to FY 82
Total U.S. Funding 1,000,000
Date Prepared: June, 1979

PAGE

Project Title & Number: Agricultural Research 388-0003

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal. The broader objective to which this project contributes: (A-1)	Measures of Goal Achievement: (A-2)	(A-3)	Assumptions for achieving goal targets: (A-4)
	2. Six hundred thousand acres of HYV wheat under cultivation in the northwest.		
	3. One hundred thousand acres in pulses, legumes, maize and other nutritious crops under cultivation in the northwest.		
	4. Twenty-five thousand acres of improved oilseed crops under cultivation.		
	5. One hundred and fifty thousand acres under vegetable cultivation.		

25

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project
From FY 80 to 82
Total U.S. Funding 1,000,000
Date Prepared June, 1979

Project Title & Number Agricultural Research 388-0003

PAGE 2

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Purpose (B 1)	Conditions that will indicate purpose has been achieved: End of Project status (B 2)	(B 3)	Assumptions for achieving purpose (B 4)
	2. Research underway being fully conducted by BARI staff at the Station. 3. Five farmer field trials conducted for each major crop. 4. Linkages established by Ishurdi Station within overall BARI system. 5. Linkage established with regional station and district extension system in northwest. 6. BDG allocation of necessary resources for Ishurdi Station beyond termination of project.	4. Field trial reports. 5. BDG Budget. 6. BARC evaluation of research findings.	

24

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project
From FY 80 to FY 82
Total U.S. Funding 1,000,000
Date Prepared: June, 1979

Project Title & Number: Agricultural Research 388-0003

PAGE 3

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal:	Magnitude of Outputs:		Assumptions for achieving outputs:
c. Electrification and water distribution systems completed and operational. d. All equipment purchased and received. 2. Cross-disciplinary research programs solving problems facing Bangladeshi farmers by 1982. 3. Ishurdi Station becomes a full functioning unit of the BARI system. 4. Research results being disseminated through the extension service to farmers.	2. Facilities completed a. 7 Residential units b. 1 Chemical, fuel store fertilizer building. c. 1 godown d. 1 threshing floor e. 1 workshop-implement shed. f. 1 field-laboratory administrative building g. 1 training facility and hostel h. fencing i. irrigation system j. water distribution system k. farm site electrification l. roads & drainage. 3. Commodities and equipment purchased a. farm machinery b. laboratory equipment c. vehicles d. pump & engine e. furniture.	3. Project Manager monitoring of Project. 4. BARI engineering staff reports on construction and station development. 5. Research reports of BARI 6. IADS progress reports on agricultural research.	3. Natural or man-made disasters do not hamper construction. 4. Construction materials remain in adequate quantities and quality at reasonable price.

12

BARI Ishurdi Regional Agricultural Station Development

Initial Environment Examination:

Threshold Decision by Assistant Administrator/Mission Director

Approval : [illegible] Acting Director

Disapproval : _____

Date : 14 JUN 79

A. Nature, Scope and Magnitude of Environmental Impacts

1. Description of Project

The project calls for a grant to the BDG Ministry of Agriculture and Forests for the physical development of the BARI Regional Agricultural Station at Ishurdi in Pabna District. The purpose of this component of the project is to fully develop and equip this regional station in order to develop an effective applied crop research unit in a regional setup.

The emphasis on the research activities from the regional station will be aimed at small farmers and problems relating to the specific geographic, climatic and topographical area. Emphasis will be placed on low-cost effective technologies which will result in better health due to improved diets and higher income for farm families within the target group.

2. Identification and Evaluation of Environmental Impacts

a. Direct Impacts

The direct impact of the research activities on the environment will be non-existent or minimal. The impact of the physical facility at Ishurdi, however, will be positive. Site development, landscaping, roads and drainage and irrigation in this area will improve rather than adversely affect the environmental quality of the area.

The BARI Regional Station at Ishurdi has been in existence for 20 years. The physical boundaries have been established and all of the land shaped and identified for plot development. No forest land will be destroyed since the site is already layed out for research activities. Land leveling and improvement in water supply for irrigation and improved drainage facilities will create a positive impact at the site. The site is on flat gradient land and there will be no erosion effects.

Improved drainage will minimize the danger of flooding during the monsoon season. There is no requirement for removal and resettlement of farmers, since the land is already owned by the BDG.

b. Indirect Impacts

The impact on the environment from the adaptive and applied research will be positive. Results of all research are meant to increase production and intensify land usage. New crop varieties and improved cultural practices will be determined for varied local conditions from techniques developed locally.

With agronomic research identifying different crop varieties which are fertilizer responsive, this will provide the necessary information for optimal application rates of fertilizer. Efficient use of fertilizer will, in fact, contribute to minimized use of chemicals in soil and water. Adaptive research combined with appropriate technologies will increase the effective use of available organic compounds for plant nutrition. Genetic improvement through plant breeding will develop insect and disease resistant varieties, thus limiting the use of chemical pesticides.

B. Recommendation for Environmental Action

A negative determination is recommended on the bases that:

(i) There is judged to be a minimal adverse environmental impact from the project activities;

(ii) the activities are parallel and in conformity with the objectives and plans of Directorate IX of the United States, "Man and the Biosphere"; and

(iii) that the approach of the project is consistent with the recommendations and philosophy of the Programmatic Environmental Impact Statement for AID activities in the area of pesticide use and crop protection.

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Areas and Suh-areas [1]	Import Identification and Evaluation [2]
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population	N
b. Extracting natural resources	N
c. Land clearing	N
d. Changing soil character	N
2. Altering natural defenses	N
3. Foreclosing important uses	N
4. Jeopardizing man or his works	N
5. Other factors	
_____	N
_____	
B. WATER QUALITY	
1. Physical state of water	N
2. Chemical and biological status	L
3. Ecological balance	N
4. Other factors	
_____	N
_____	

1/ See Explanatory Notes for this form.

2/ Use the following symbols:

N - No environmental impact
L - Little environmental impact
M - Moderate environmental impact
H - High environmental impact
U - Unknown environmental impact

IMPACT IDENTIFICATION AND EVALUATION FORM

C. ATMOSPHERIC

1. Air additives---------- N
2. Air pollution---------- N
3. Noise pollution---------- N
4. Other factors

_____ N

_____ _____

D. NATURAL RESOURCES

1. Diversion, altered use of water---------- N
2. Irreversible, inefficient commitments--------- N
3. Other factors

_____ N

_____ _____

E. CULTURAL

1. Altering physical symbols---------- N
2. Dilution of cultural traditions---------- N
3. Other factors

_____ _____ N

_____ _____

F. SOCIOECONOMIC

1.	Changes in economic/employment patterns-----	M
2.	Changes in population----------	N
3.	Changes in cultural patterns----------	M
4.	Other factors	
	_____	N
	_____	

G. HEALTH

1.	Changing a natural environment----------	N
2.	Eliminating an ecosystem element----------	N
3.	Other factors	
	_____	N
	_____	

H. GENERAL

1.	International impacts----------	N
2.	Controversial impacts----------	N
3.	Larger program impacts----------	N
4.	Other factors	
	_____	N
	_____	

I. OTHER POSSIBLE IMPACTS (Not listed above)

_____	N
_____	
_____	

Total Project
Grant Funds Detail

AID Project Cost	FY 76	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	Total
1. BARI-BARC Agr. Research Component								
a. Technical Assistance	465	170	426	-	470	-	-	1,531
b. Local Support	15	40	51	47	-	-	-	153
c. Commodities	168	-	-	-	-	-	-	168
d. BARC Contract Research	70	30	122	-	-	-	-	222
e. Training	126	120	117	94	30	-	-	487
Sub-Total	844	360	716	141	500	-	-	2,561
2. Vertebrate Pest Component								
a. Technical Assistance (PASA)	-	-	76.3	113	100	100	81.1	470.4
b. Participant Training	-	-	6.1	38	27	27.6	5.3	104
c. Commodities	-	-	29	16	16	-	-	61
d. Other Costs	-	-	92.7	92	3.7	4	3	195.4
Sub-Total	-	-	204.1	259	146.7	131.6	89.4	830.8
3. BARI Regional Agr. Station, Ishurdi								
a. Machinery, equipment & Vehicles	-	-	-	-	110	-	-	110
b. Farm Buildings	-	-	-	-	110	-	-	110
c. Residential Quarters	-	-	-	-	80	-	-	80
d. Research/Admin. Complex	-	-	-	-	140	-	-	140
e. Farm Site Development	-	-	-	-	370	-	-	370
f. Laboratory Equip. & Furniture	-	-	-	-	100	-	-	100
g. Professional Fees	-	-	-	-	20	-	-	20
h. Inflation (10%) Contingency	-	-	-	-	70	-	-	70
Sub-Total	-	-	-	-	1,000	-	-	1,000
TOTAL	844	360	920.1	400	1,646.7	131.6	89.4	4,391.8