

U N C L A S S I F I E D

AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington, D. C. 20523

PROJECT PAPER

Pakistan (391-0489)
Management of Agricultural Research and Technology (MART)

U N C L A S S I F I E D

P.D. Holt

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

PROJECT PAPER AMENDMENT

PAKISTAN-MANAGEMENT OF AGRICULTURAL
RESEARCH AND TECHNOLOGY (MART)
391-0489

JUNE 1990

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number
 One

DOCUMENT
 CODE
 3

2. COUNTRY/ENTITY

Pakistan

3. PROJECT NUMBER

391-0489

4. BUREAU/OFFICE

Asia and Near East

04

5. PROJECT TITLE (maximum 40 characters)

Management of Agricultural Research
 and Technology (MART)

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
 08 07 94

7. ESTIMATED DATE OF OBLIGATION

(Under 'B.' below, enter 1, 2, 3, or 4)

A. Initial FY 84

B. Quarter 4

C. Final FY 92

8. COSTS (\$000 OR EQUIVALENT \$1 = Rs. 21.00)

A. FUNDING SOURCE	FIRST FY 84			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	3,570	1,430	5,000	26,700	11,300	38,000
(Grant)	(3,570)	(1,430)	(5,000)	(26,700)	(11,300)	(38,000)
(Loan)	(-)	(-)	(-)	(-)	(-)	(-)
Other U.S.						
1.						
2.						
Host Country PARC/PROVINCES	-	-	-	-	10,500	10,500
Other Donor(s) CIMMYT/ICARDA	-	-	-	1,000	-	1,000
TOTALS	3,570	1,430	5,000	27,700	21,800	49,500

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ESF	184	080	-	11,500	-	-	-	11,500	-
(2) DA	184	080	-	18,500	-	8,000	-	26,500	-
(3)									
(4)									
TOTALS				30,000	-	8,000	-	38,000	-

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

958 967 968

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code R/AG TECH TNG
 B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

(a) To develop and disseminate improved technology and information through key institutions; and (b) To foster a collaborative relationship whereby research institutions serve private agribusiness and farmers and use the private sector to disseminate marketable, improved technologies.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY
 01 89 01 92 01 94

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 941 Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a page PP Amendment.)

This amendment adds \$3.0 million to the MART Project and extends the PACD to August 07, 1994.

Cleared by: Richard McClure, Controller *for Jim*

17. APPROVED BY

Signature: *J. Paul Guedet*
 J. Paul Guedet
 Title: Deputy Director
 USAID/Pakistan

Date Signed MM DD YY
 10/19/90

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

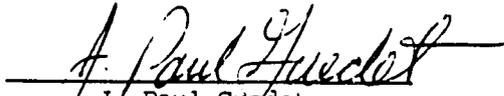
PROJECT AUTHORIZATION AMENDMENT

Name of Country/Entity: Pakistan
Name of Project: Management of Agricultural
Research and Technology
(MART)
Project No. 391-0489

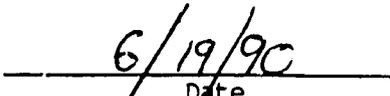
1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended, the Management of Agricultural Research and Technology (MART) Project for the Islamic Republic of Pakistan was authorized on August 8, 1984 by the Acting Director, USAID/Pakistan, involving planned obligations of not to exceed U.S. Dollars Thirty Million (U.S. \$30,000,000) in grant funds over a five (5) year period from the date of authorization. The Authorization was amended on April 20, 1986 to allow for Development Assistance funding.
2. Pursuant to Sections 103 and 531 of the Foreign Assistance Act, as amended, the original Project Authorization is hereby amended as follows:

I hereby authorize additional planned obligations of not to exceed Eight Million United States Dollars (U.S. \$8,000,000) in grant funds, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to assist in financing foreign exchange costs and local currency costs for this project. The total planned obligations for this Project shall not exceed Thirty-Eight Million United States Dollars (U.S. \$38,000,000) in grant funds.
3. I further authorize extension of the Project Assistance Completion Date (PACD) by an additional period of approximately two (2) years ten months, i.e. till August 7, 1994.
4. All other provisions of the original Project Authorization and its subsequent Amendments thereto shall remain in full force and effect **except as hereby amended.**

Approved Disapproved



J. Paul Guédet
Deputy Mission Director
USAID/Pakistan



Date

Clearance:

RLA: TBCarter: [Signature]
PDM: GHWest: [Signature]
ARD: HPPeterson: [Signature]
HDickherber: [Signature]
CNissly: [Signature]
PRO: JConly: [Signature]
FM: RMcClure: [Signature]
RLA: KTurner: [Signature]

RLA:KFMKassim mh:12/17/89
Revised: 03/13/90
04/08/90

2991R

**PROJECT PAPER AMENDMENT
MANAGEMENT OF AGRICULTURAL RESEARCH & TECHNOLOGY (MART)
391-0489**

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LIST OF ABBREVIATIONS

ACE	Agricultural Commodities and Equipment
AED	Academy for Educational Development
AERU	Agricultural Economics Research Unit
AGRIS	Agricultural Research Information System
ARD	Agricultural and Rural Development Office of USAID
ARP	Agricultural Research Project - World Bank
ASSP	Agriculture Sector Support Program
AV	Audio-Visual
AZRI	Arid Zone Research Institute
BALAD	Balochistan Area Development - USAID
BOSTID	Board of Science and Technology for International Development
CD-ROM	Compact Disk - Read Only Memory
CDSS	Country Development Strategy Statement
CIDA	Canadian International Development Agency
CIMMYT	International Wheat and Maize Improvement Centre, Mexico
DSTP	Development Support Training Project
DWRC	Denver Wildlife Research Center
EOPS	End of Project Status
FAA	Foreign Assistance Act
FAO	Food and Agriculture Organization
FPD	Forestry Planning and Development - USAID
FRLC	Federal Reserve Letter of Credit
FSM	Food Security Management
FSR	Farming Systems Research
FY	Financial Year (US Oct-Sept; GOP Jul-Jun)
GDP	Gross Domestic Product
GOP	Government of Pakistan
HC	Host Country
IBRD	International Bank for Reconstruction and Development (World Bank)
ICARDA	International Center for Agricultural Research in Dry Areas, Syria
IEE	Initial Environmental Examination
IQC	Indefinite Quantity Contract
IRRI	International Rice Research Institute - Phillipine
NARC	National Agricultural Research Center
NWFADP	Northwest Frontier Area Development Project
NWFP	Northwest Frontier Province
PACD	Project Assistance Completion Date
PACS	Provincial Agricultural Communication Support Cells
PARC	Pakistan Agricultural Research Council
PASA	Participating Agency Service Agreement - USG
PID	Project Identification Document
PP	Project Paper
Rs	Pakistan Monetary Unit (Rs. 21.00 = US\$1.00)
TA	Technical Assistance
TADP	Tribal Area Development Project
TIPAN	Transformation and Integration of the Provincial Agricultural Network (Project)
TITC	Technical Information Transfer Committee
USAID	United States Agency for International Development - Pakistan
USDA	United States Department of Agriculture
USDH	United States Direct Hire
USG	United States Government
VPM	Vertebrate Pest Management

I. SUMMARY AND RECOMMENDATIONS

A. Recommendations

USAID/Pakistan recommends that the MART Project be amended to increase life of project funding by \$8 million to a total of \$38 million. The new Project Assistance Completion Date (PACD) will be August 07, 1994. This amendment has been revised to redirect the Mission's emphasis in Agricultural Research toward a greater reliance on public/private sector linkages in order to ensure research relevance and better dissemination.

B. Summary Description of Amended Project

Agriculture continues to dominate Pakistan's economy, providing roughly 26 percent of its GDP and 70 percent of its export earnings and employing more than half its labor force. This has necessarily meant increasing demands from private commercial firms, farmers and government for improved technologies and a corresponding need for the research capability to develop them. Although the agriculture sector's research infrastructure has grown rapidly in response, the capacity to manage and evolve appropriately has not kept pace. Pakistan is not self sufficient in her major crops and food security remains an important objective for the country as a whole. Farmers' productivity remains below the potential that could be attained under Pakistan conditions and private agro-industry does not effectively meet the challenge posed by international competition. Research has not impacted upon productivity as significantly as it could because research management has not focused on the potential end use of research by agribusiness and the commercial farm community. Researchers have failed to focus their research on technologies addressing specific farming and business constraints, and they lack an effective system for transferring newly developed technology and information to private agribusiness firms and entrepreneurs, to extension service and to farmers.

The MART amendment will be the Mission's capstone activity with public sector agricultural research bringing to a close over 20 years of assistance in birthing, developing and maturing a responsive, dynamic and collaborative agricultural technology development and dissemination institution.

The MART project was designed to address the above-mentioned problems by strengthening the performance of the national agricultural research system. However, as determined by the project evaluation, the project purpose was too broad and accordingly, an inadequate response to the critical problems and constraints of Pakistan's research institutions. In addition, it was determined that the public sector needs encouragement and experience to foster linkages and collaboration with Pakistan's emerging private agribusiness sector. Therefore, the project has been modified to focus on ensuring the responsiveness of research to client demand; developing usable technologies to address recognized problems; and ensuring dissemination of research results to include important user groups such as agribusinesses and input manufacturers, which are, in their own right, potential effective disseminators.

Concomitant to this focus on research relevance is a narrower institutional focus under the amendment, in which nine participating research institutions (three national and six provincial bodies) become the targets for AID assistance, vs. the entire research system's universe of 250 institutions in the original project. Project amendment expected achievements, then, will be as follows:

1. A concrete system in operation by which the nine participating institutions approve research agenda based on farmer and agro-industry needs consistent with funding availability.
2. Marketable/farmer acceptable technologies developed for use by Pakistan's production system.
3. Operational linkages established and functioning for dissemination of appropriate research information between NARC, AZRI, and the four Provincial Agricultural Communication Cells on the one hand, and private agribusinesses, farmer associations and the extension service, on the other hand.

The project amendment approach to improving research planning, technology development and dissemination through strengthening public/private sector linkages will include putting in place mechanisms to afford agribusiness the opportunity to articulate needs for inclusion in research agenda, and to enable private firms to enter into collaborative agreements with PARC to address problems through joint, public/private research initiatives; involving private agricultural input manufacturers in farming systems research to address specific problems farmers face and test the solutions in farmers' fields for effectiveness and farmer acceptability; focusing research to address key, priority problems, such as production problems faced by farmers of the arid zone which comprises vast sections of Pakistan; including private sector representatives on bodies charged with dissemination of research results; and developing multi-media messages to disseminate improved technologies to a wide spectrum of targeted user groups.

To these ends, AID monies will finance technical assistance and training; competitively awarded grants to research institutions and private firms to address problems amenable to solutions through research; and some support costs of research operations conducted by the participating institutions.

The amendment will provide an additional \$8 million to the \$30 million of the original project. Detailed descriptions of the project's history, rationale, and modified purpose and activities are provided in the relevant sections.

C. Statutory Checklist and Mission Director's Certification

The program meets all applicable statutory criteria. Appropriate statutory checklists are included in Annex B. The Mission Director's Certification on compliance with Gray Amendment is contained in Annex C.

D. Project Amendment Issues

The Amended MART project concept paper, upon which this amendment is based, was approved in June 1989, and a copy of the project review committee's comments and the ANE/AA approval cable is included as Annex A. This section addresses the most critical issues in the approval cable which are relevant to the amended project and additional principal issues which were identified during preparation of the project paper amendment. Additional issues are addressed in Annex F.

1. GOP BUDGET SUPPORT FOR AGRICULTURAL RESEARCH - This issue raises 3 questions; Is the GOP providing adequate levels of funding for Agricultural Research? If not, how is this issue addressed by USAID Pakistan? Are the investments planned under MART sustainable?

The GOP budget allocations for research are below the recommended World Bank and other agencies' recommended levels and in fact are amongst the lowest in the world. Pakistan invests less than 0.5 percent of Agriculture Domestic Product in research. This can be compared to most developed countries which allocate around 2 percent and most developing countries which allocate closer to 1 percent. Investment per scientist is amongst the lowest in the world and the ratio of research activity costs relative to research personnel salaries is inadequate for efficient management. The government has recognized these problems in recent and current five year plans and is continually giving higher priority to research and extension. In the period 1983 to 1988, the PARC budget increased by nearly 25 percent per annum. In 1989, the originally approved budget was significantly below the level required to continue on-going research programs. This was pointed out to the GOP, and the importance USAID attaches to GOP support for agricultural research was highlighted in the ASSP benchmarks, which outlined expected levels of the total PARC budget and an appropriate personnel/operational funding ratio. The GOP, in response, provided additional resources to PARC, and important research programs are continuing with a greater ratio of funds for actual research operational costs. The GOP is also in the process of developing a project with the World Bank which will provide \$70 million over a 5 year period mainly to the provinces for research operating costs in high priority areas. The World Bank project complements the proposed extended MART Project. In conclusion, while not providing adequate resources by international standards, GOP support for agricultural research continues to increase year by year.

The USAID/ARD program has been designed to address funding for research from the perspective of both the level of funding and efficiency with which the available funds are used. The MART project addresses primarily the issues of how the funds are used. This is accomplished both through assistance in the management of research to see that high priority problem areas are addressed first with the funds that are available and through the development of revised accounting and financial management procedures that will enable PARC to better manage the funds available. The level of funding for research has been addressed primarily through the ASSP and the Benchmarks for that program which have been developed with the GOP as an important element of our policy dialogue. PARC has developed and submitted its most recent budget request in accordance with the ASSP benchmarks.

The MART project extension has been designed to assist PARC in increasing the contribution made by agricultural research, not through any increase or expansion in the existing institutions but through improved utilization of existing resources and increased cooperation with the private sector. (In fact, some of the planned expansion of facilities approved in the original project has been cancelled to concentrate resources on priority key research programs.) The revised project focuses on fewer institutions, fewer commodities, and only the highest priority research areas. The MART project will thereby help the GOP to sustain its highest priority research programs through a difficult budget period.

The amended MART Project will involve government research institutions in collaborative activities with the private sector. Research begun under the aegis of government will quickly be taken over for elaboration by the private sector to result in the further development and commercialization of technologies and self-sustaining changes in agricultural practices. The increased cooperation/collaboration with the private sector will enable PARC to carry out research which would be prohibitively expensive if either party tried to do it on its own and which will directly address issues for which the demand is demonstrated and lead to almost immediate adoption of findings in the production process. Examples of this include a program in poultry pathology research where PARC is providing the scientists, the private sector is providing the laboratory and operating cost and USAID is financing the imported analytical equipment. The laboratory will be operated by private industry with the research institution providing scientific expertise and the findings being made available to all firms in the industry. Other examples include cooperative research trials with the American Soybean Association for improved poultry feed, dairy farmers cooperating in selection of improved breeding stock etc. Interest among private livestock feed manufactures in the poultry trials already has led to quantum jumps in soybean meal imports from the USA.

2. AGRICULTURAL RESEARCH ROLE IN AGRIBUSINESS - Is continued support of Public Sector Research Institutions appropriate? Does the project recognize and support the development of private sector activities in agriculture?

The project, as originally designed, has been implemented by GOP public sector research institutes and departments. Improving the management of those institutions so that they can more effectively serve the agriculture sector has been the main focus. The direction of the project has been toward identifying solutions to problems that are constraining the development of agricultural production capacity and efficiency in Pakistan. Agricultural production is almost 100 percent in the private sector. The project has concentrated on the production component of agriculture and has had only minimal involvement with the input supply and marketing of agricultural products. Work with the research institutions started from their current focus and areas of relative strength and helped them expand and improve their performance. This focus on the problems and constraints to increased farmer production is valid but public sector research institutions must recognize the role of agribusiness as a legitimate end-user of technology; its role in the promotion of new markets,

processing and trade. Private agro-industry must be a partner in setting the research agenda as well as being the recipient of the information transfer. Recent changes in administration and outlook by PARC indicates that this understanding and commitment to private enterprise is a reality and that this key federal institute is ready to modify its activities and energies in this direction.

While this is the direction in which Pakistan needs to move, the structure of the industry is currently such that very few farms or commercial firms have either the financial or human resource capacity to engage in independent research. The strong positive economic returns to investments in research have been repeatedly demonstrated, but benefits are broadly diffused throughout the society, benefiting the farmers who use the knowledge or varieties in production as well as the consumers who purchase the product.

There are areas where the private sector cannot afford to invest in research even though it is needed because cost recovery and profitability horizons may be too distant. The new Pakistani "Basmati 385 rice" variety is a classic example of research necessarily conducted by the public sector supporting private sector production. The Pakistani government researchers who had been trained with USAID resources used germplasm provided by the International Rice Research Institute to produce a new variety with 30 to 40 percent higher returns. The private sector Pakistani farmers quickly adopted the variety, increasing their production and the supply of this important export crop. (Pakistani Basmati is a specialty rice commanding a premium price in the export market.) This research required participation of farmers and a recognition on the part of the public sector researchers of the importance of this crop in the export market. This research however, is not likely to have been conducted by the private sector because, unlike hybrid varieties which the private seed companies produce and market on an every season basis, the non-hybrid rice variety, once released, is available to anyone who buys the grain and quickly spreads from farmer to farmer. Private seed producing firms could therefore not expect any of the normal profitability resulting from a proprietary hold on a hybrid variety.

The private sector is involved in the export of Basmati rice. USAID is supporting the private sector exporters through its Agricultural Sector Support Program policy agreements by encouraging GOP to remove restrictions on export of Basmati rice by the private sector export firms. This is an example of the linkage in the USAID agricultural sector program between ASSP and MART.

Agribusiness did not make itself felt in the Basmati 385 production success in the genetic development of the new variety but, rather, in the expansion of the marketing and in the provision of inputs. However there are other examples where agribusiness plays a much different role. These aspects demand cooperation and aggressive collaboration with the private sector. The MART Project is prepared to assist GOP research institutions to continue expanding their linkages with the private sector and has already had some successes in this area. For example, the project developed and demonstrated the advantage of a new tillage and planting system that requires a new piece of machinery.

Arrangements with a Pakistani machinery manufacturer were made for the local licensing and local manufacture of the required "seed drill" and private farmers are now buying the drill, not only for their own farms, but are also contracting for services with other farmers. In another case, the farmers responded positively to a new hybrid forage plant which was tested and introduced in the MART supported Farming Systems Research. Early in the testing, a locally established multinational seed company became interested, has undertaken and is expanding its hybrid seed production and marketing of this crop. Seed sales of this crop is now their largest selling product.

The MART project, in the proposed extension, will expand on these types of activities to further promote and reinforce cooperation between the public research institutions and the private sector. This will include building on the Agribusiness Relations Cell that PARC already has in place to establishing a proactive office whose primary function is to support cooperation and joint ventures with the private agribusiness sector. Areas which are currently under active consideration and are expected to be initiated shortly include cooperative dairy trials with dairy farmers in Sindh, cooperative poultry pathology work between PARC, the Poultry Association and a major distributor of hybrid chicks, soybean processing and marketing, and others. Proposals will also be solicited ~~from the private sector in the competitive grants program~~ as another mechanism for supporting private sector research.

3. TECHNOLOGY DEVELOPMENT AND DISSEMINATION - What assurance is there that the technology developed with MART support will be appropriate for and disseminated among agribusiness and Pakistani farmers?

While MART is a research project and not an "extension" or development project, the appropriateness of the technology being researched and its dissemination to agribusiness, farmers and other end users continues to be a focus of the project. The project recognizes the responsibility researchers and research institutions have in seeing that they address relevant problems and generate technology useful to the agriculture sector in addressing those problems. The project continues to address this issue in a number of ways. The project helps the research institutions to improve their process of selecting priority problems to be addressed. This is done through the assistance in ~~research planning and project preparation~~ under the **Ensuring Research Responsiveness** component of the project, which will, *inter alia*, structure channels for businessmen to articulate their needs for inclusion in research agenda. Another vehicle, that both ensures the relevance of research and supports dissemination of research results, the farming systems research (FSR) program, has contributed to introducing and institutionalizing "on-farm" research from a system's perspective as an integral part of the research institutions. This program has led to the identification and solution of significant farmer problems. The demonstration and testing of technology packages on-farm is a critical aspect of both the FSR and AZRI research. These activities, which are carried out in cooperation with the extension services on a small scale, disseminate technology. More importantly, however, introducing and institutionalizing the on-farm research approach provides sustainable communication between private farmers, scientists and extension workers. In the case of AZRI, the institution has no fields on which to conduct trials and all

field research, by design, must be carried out on private farms in cooperation with the farmers. This forces the scientists to communicate with the private sector, responding to their employment and income concerns in carrying out research which is both environmentally and economically important to Balochistan and NWFP. While these activities will continue to mature under the MART amendment, the project will now encourage the research system to apply the same techniques and philosophy to agribusiness moving beyond production research into processing and marketing of agro-production.

The project includes a major initiative in information packaging and dissemination to a multiple audience in the Dissemination component. This component will help the research institutions develop their capability to maintain and use current library resources, modern audio-visual production and display techniques, and mass media communications to disseminate their message faster and more effectively to private sector farmers and agribusiness firms. Several marketable technologies identified and tested by the project have already been picked up by agribusiness firms. The MART project complements the extension programs which are heavily supported by the World Bank and, through its concentration on getting farmers and businessmen involved in the research and in developing information transfer systems, will make a major contribution to the dissemination of useful information and technology.

4. PURPOSE, STRATEGY AND FOCUS - In what way has the project been revised to modify its purpose, strategy and focus?

Responding to a major recommendation of the mid term evaluation, our in-house analysis of the project problem and rationale, and keeping in mind recent AID/Washington initiatives, the project has been revised by simplifying and focusing its purpose and activities. The original project addressed the entire agricultural research network, consisting of more than 250 federal and provincial institutions, universities, agencies, etc. In order for the project to be manageable and the purpose achievable, the project has been revised to concentrate activities on the following key participating institutions;

At the national level:

**Pakistan Agricultural Research Council (PARC);
National Agricultural Research Centre (NARC);
Arid Zone Research Institute (AZRI).**

At the provincial level:

**University of Agriculture Faisalabad (UAF);
Ayub Agriculture Research Institute, Faisalabad (AARI);
Agricultural Research Institute, Sariab (ARI, Sariab);
University of Agriculture, Peshawar (UAP);
Sind Agriculture University (SAU);
Agriculture Research Institute, Tandojam (ARI Tandojam).**

The provincial institutions will be involved mainly in the farming systems research and Provincial Agricultural Communication Support Cells activities. AZRI will concentrate on arid-lands research. PARC's Agribusiness Relations Cell will serve as the principal window through which private agribusinesses

will be able to avail themselves of inputs from the public research system for joint, public/private research undertakings. The three national institutions will reorient their research planning and management methodologies to ensure research responsiveness to user demand.

Beyond narrowing the institutional focus of the project, a further modification consists of a shift in focus to incorporate programs that have the potential for linkage with private sector agribusinesses that are likely to be involved in commercialization of technologies, processing and marketing.

This more focused approach has resulted in a project with achievable objectives as well as one which is more easily managed than the original, more open-ended, exclusively production focussed activity.

II. BACKGROUND

A. History

USAID/Pakistan has included agricultural research in many of its priority programs. In response to 1968 and 1973 reviews by Pakistani-American teams, projects were designed to focus on applied research and coordination of efforts at provincial and national research institutions. Support was provided to the institutional development of the Pakistan Agricultural Research Council (PARC) and the National Agricultural Research Center (NARC) to lay a sound foundation for an effective national program of agricultural research.

Based on recommendations from project evaluations, the MART project was initiated in 1984. As earlier projects emphasized collaboration with PARC and the development of NARC, the MART project has focused on strengthening the research capabilities of the principal provincial agricultural research institutes, including the agricultural universities.

(For more detailed background information and major accomplishments of the project, please see Annex-J.)

B. Progress to Date

The strategy in the original MART project paper was to increase agricultural production through strengthening the performance of agricultural research bodies. Activities were divided into five components: (1) Research Management and Administration; (2) Information Transfer; (3) Training for the Agricultural Research Network; (4) Arid Zone Research; and (5) Wheat and Maize Coordinated Programs.

The first three components were designed to strengthen and expand the human, physical, and technological resources available within the national agricultural research network and to improve the management of the system at the federal and provincial levels. The fourth component addressed the substantial gap that has existed in arid high altitude agricultural research for non-irrigated areas, which is especially important for the western regions of the country. Funds were provided to strengthen the capability of the Balochistan based Arid Zone

Research Institute (AZRI) to generate and disseminate quality and applicable technologies. The fifth component was designed to enable Pakistan to sustain and build on the impressive gains achieved in wheat and maize production by improving the research and outreach activities carried out through its nationally coordinated wheat and maize programs.

An external evaluation conducted during January and February 1989 found that the project provided necessary and desired support to the national agricultural research system to meet the national mandate for increased production of food and fibre. The evaluation concluded that the project was well managed, and was close to schedule. Most inputs had been provided on time and programmed outputs were produced. PARC, USAID and the contractors have managed the project effectively, using flexibility to achieve significant progress.

However, the evaluators determined that without substantial reduction in scope and modification, the purpose was not likely to be fully achieved. Accordingly, the evaluation team strongly recommended continuation and extension of the project to 1994 with modifications. The main findings regarding the implementation of the project are summarized below. The summary is keyed to the original project elements.

1. Research Management and Administration

- a. Management and Administration

The MART project provides support to the national agricultural research system, which is a loose alliance of independent provincial entities, coordinated by the Pakistan Agricultural Research Council (PARC). PARC's strategy for strengthening the cohesiveness of this alliance has three elements: (1) scientific excellence in the performance of its controlled elements; (2) the provision of useful services to other parts of the system; and (3) the ability to acquire resources for and represent the system.

PARC is performing well, the strategy is sound and should be continued. PARC has been very successful in attracting the support of donors to federal and provincial research programs. To meet the challenge of scientific performance under continuing financial austerity, PARC must strengthen its management in the following areas: (1) careful allocation of resources to well planned research programs directed at high priority problems and elimination of repetitive studies of less importance; (2) tight management of research operations, enforced by good program monitoring and evaluation; (3) personnel management practices that allocate and/or retain scientists to meet program needs, and assure through job descriptions and supervision that they understand what is expected of them; (4) effective financial management so that resources flow to experiments when needed under effective control; and (5) realignment of organizational structures for organizational development and change.

PARC now interprets good management to include sharing responsibility and aggressively pursuing cooperative agreements with agribusinesses to gain more involvement by the private sector in technology development and the marketing and dissemination of those technologies.

b. Farming Systems Research

Farming Systems Research (FSR) is a farmer-oriented research approach designed to improve the income and quality of life of private farmers by involving them in the diagnosis of their agricultural problems, the selection of research topics relevant to their needs and in the execution and evaluation of research trials with the aim of providing to the farmer the needed inputs (in many cases improved seed or machinery from the private sector) and management information.

Considerable progress has been made towards establishing the FSR program in all four provinces since 1987. Scientists have been introduced and enrolled to the FSR approach. Demonstrated improvements have increased productivity and raised net farm income. Examples include:

- (1) increased production and high rates of return from improved maize in the Mansehra district;
- (2) integration of sunflower as an alternative crop, as well as an improved health control program of sheep and goats at Fateh Jang;
- (3) introduction of new forages producing multi-cut high quality feed for dairy cattle in Shahkot in the Punjab;
- (4) introduction of low cost silage making at Proka;
- (5) intercropping of sugarcane with onion and radish at Tando Mohammad Khan and introduction of mungbean and soybean into a wheat-cotton cropping pattern at Hala in the Sind province;
- (6) poultry husbandry training for village women at Fateh Jhang.

c. Supply of Commodities

Commodities worth about five million dollars have been supplied to the federal and provincial research institutes as well as the three agricultural universities. These have included vehicles, computers and software, audio-visual equipment, laboratory equipment, and agricultural machinery. PARC has also arranged for equipment to be supplied for the private/public cooperative activities.

2. Information Transfer

Excellent progress has been made in this component as a result of well defined tasks, a superior advisor and strong PARC support. The Audio-Visual Communication Center and Training Institute building will be completed on schedule. Some equipment has already been acquired; Information transfer training courses have been given to 250 individuals at national and provincial levels, and a National Technical Transfer Coordination Committee is functioning. Considerable effort has also been given to improving a library information search capability, including bibliographic reference summaries. Recruitment of staff is somewhat behind schedule, but training is proceeding.

3. Training for the Agricultural Research Network

After an uncertain start in the first two years, the participant training program has moved ahead rapidly and is well ahead of schedule. The PARC Training Directorate has established a valuable computerized data base with information on participants overseas. Work on the in-country component has been slower but nevertheless, 70 short courses have been conducted in-country. The evaluation recommended that PARC assume leadership in the human resources development field for the agricultural research system considering both public and private sector needs. High priority should be given to a reentry program for returning scholars to ensure their inclusion in high priority research programs which respond to private sector needs.

4. Arid Zone Research

The objective of a fully functional, well-organized and well-managed Arid Zone Research Institute will not be reached in the five years originally provided. Current staff lack the capacity and experience to design and manage research independently. However, useful on-farm research has been developed and expanded from a very weak base. Personnel are cooperating with provincial FSR representatives to develop methods to transfer technology to the farmers. A stronger focus on range/livestock management and agronomy and water harvesting with a systems approach is needed. Linkage with the leather and livestock marketing/exporting industry is a key to increasing the vitality of the livestock program. A strong cooperative linkage with a more advanced center such as ICARDA is needed for four to six years more.

5. Wheat and Maize Coordinated Programs

Pakistani scientists have now assumed full responsibility for independent collection and maintenance of germ plasm, its manipulation to produce new varieties with desirable characteristics, and testing of their adaptability. Research into the reasons for the serious gap between the yields obtained on station and by better farmers, and those indicated by the national average is necessary. Limited supplies of good certified seed have been identified as one important factor; something which needs private agribusiness involvement. The CIMMYT Host Country Contract ends in September 1990. The economics activities associated with this component may be merged with other social science activities supported through an amendment.

C. Relationship to USAID Strategy

The Project Amendment supports and is consistent with AID policy as well as with the Mission's strategic thrust. As articulated in the Mission's FY 1988-93 Country Development Strategy Statement (CDSS), the Mission's agriculture sector strategic objective of maintaining agricultural growth in constant prices above 3-6 percent annually will depend on, *inter alia*, technology development/transfer to increase production and efficiency, increased private sector investment in agribusiness, and increased reliance on open market mechanisms. The MART project contributes to the attainment of these stepping stones toward the Mission's agriculture sector objective.

Public sector institutes and scientists are currently much more aware of the importance and the advantage of being responsive to and supportive of private sector needs and initiatives. The project supports and encourages this shift in orientation in that it supports collaborative research efforts involving the private as well as public sectors and makes research findings available to private sector firms. The rationale is that the system uses the initial, public sector research as the starting point for further private sector research and refinement to develop practical, profitable and marketable applications. Hence, the project seeks directly to open opportunities for private sector initiatives in research; and in extension, as private firms market their newly developed products (agricultural inputs) to the farmers. Moreover, wide dissemination of the technologies developed under the project presents private farmers and interested agribusinesses opportunities for growth based on greater productivity.

The MART amendment will be the Mission's capstone activity bringing to a close over 20 years of assistance to Pakistan's public sector agricultural research institutions. A main thrust during the amendment period up to the 1994 PACD will be collaboration and partnership between the private and public sectors in the maturing of a responsive, dynamic agricultural technology development and dissemination institution.

III. RATIONALE FOR PROJECT AMENDMENT

A. Introduction

USAID has contributed to the strengthening of research capabilities of federal and selected provincial research institutes in the agriculture sector over the past decade. A stage has been set: NARC has been upgraded to become the premier center for agricultural research in the country, and extensive laboratory and field equipment has been supplied to federal and provincial agricultural research institutes. A large number of agricultural scientists have been provided with advanced degree and non-degree training in the U.S. and other countries. Training for public and private sector scientists has been funded by MART, but further private sector training is now provided through the ASSP in the interest of better USAID portfolio management.

A deficit remains in that research leadership and management capability are not yet providing direction so that research significantly impacts upon the productivity of the sector. Commercial agro-industrial and marketing firms are not yet adequately considered in the setting of research agenda and agribusinesses are not actively sought out as collaborators in the development process. There are problems in the funding and management of research, the lack of applied research to determine solutions to specific farmer constraints and the lack of an effective system for transferring newly developed technology to the appropriate end-users. More specific problems in these areas, are described below.

B. Amendment Activities

The need for technological improvement in areas identified under the original project paper remains valid. However, as defined in the evaluation, the original

project was an insufficient response to many of the critical problems because of the broad scope of its original purpose. The amended project has modified this scope to focus on specific activities in key institutions, incorporating an integrated strategy of ensuring the responsiveness of research to client demand; developing relevant, marketable solutions to problems; and utilizing the full array of potential dissemination networks, including private agro-industrial concerns, which will disseminate research results in usable form to a wide user base by a variety of means, including, *inter-alia*, commercialization.

1. Ensuring Research Responsiveness

Two significant problems have been identified in the area of research planning. First, little is being done to obtain client input to research agenda to ensure the relevance of the research. No effective mechanisms exist (a) systematically to gauge farmers' problems that can be solved through improved, practical technologies; and (b) systematically to harness at least selected national research programs to address problems brought forward by private agribusinesses. Second, there is insufficient correlation between the actual funding needs of research activities and budget allocations, and between the process of prioritizing research activities and availability of funds. Budget allocations are not based on given research project requirements, and conversely, research agenda makers do not realistically take into account budgetary limitations, resulting in inadequate funds to carry out the research. Furthermore, full advantage has not been taken of potential savings that would accrue from implementing more joint public sector - private sector research activities, which, at the same time, would yield a high relevancy dividend.

2. Technology Development

The development of technology relevant to the needs of the agriculture sector (i.e. production, processing and marketing) requires attention to developing the necessary research skills as well as institutionalizing revised management methods, including a greater focus on seeking practical solutions to specific, client-selected problems and enlisting the private sector to share in research endeavors. The primary problem is to apply research to specific constraints and extract solutions relevant to agriculture. Several problem areas have been identified that especially require technological attention. Although related, the areas have been separated because of the existing structures, personnel and activities within each activity.

First, there is a need for problem-oriented research rather than research by individual discipline (breeding, pathology, soil science, etc.). Currently, the training and experience of most scientists has been discipline oriented. Academic training has seldom been sufficiently accompanied by practical on-farm experience. An interdisciplinary, problem-oriented farming systems research (FSR) perspective and approach is necessary to focus on the problems and interrelationships between the various enterprises with which each farmer is involved. Improvements in a specific commodity, wheat for example, may not be incorporated by the farmer because he may have a fodder or labor constraint that are not met by an improved variety of wheat.

Another area of concern is the lack of funds to support joint research activities between public sector programs and private commercial businesses. The latter can more efficiently develop the commercial and employment growth potential generated by synergistically designed technology packages in key research areas.

An additional area of concern that has not been adequately addressed pertains to social science factors, particularly economics. Since agricultural research has been dominated by the investigation of biological constraints, there has been limited attention on the broader issues concerning production, distribution and consumption. This may well have resulted in a smaller increase in production than expected from improved crop varieties and production methods.

Lastly, arid and semi-arid, non-irrigated land constitutes about two-thirds of the total land mass of Pakistan. The problems for development and judicious exploitation of this vast resource are different from those of irrigated lands. Research specific to dry areas and the livestock that are produced on those lands has been inadequately addressed in Pakistan because resources have been allocated elsewhere. There is a continuing need for personnel, facilities and equipment that can implement a long-term strategy for the development of arid zone research.

3. Dissemination

Research findings must reach politicians, agribusiness and planners as well as farmers and technicians. Accordingly, a good communications system is crucial to ensure that research needs, findings, and implications are spelled out in terms that all can understand. The research methods incorporated in the project extend technological developments to small groups of farmers through demonstrations and field trials. However, the larger audience of private farmers, extension services, educational institutions, agribusinesses and private agricultural input producers is not yet being reached to the extent required for newly developed technologies to impact optimally on the economy. There is a need for development and use of multi-media packages as a means of communicating between researchers and farmers, other researchers, agribusiness firms, educators, politicians and policy planners. Moreover, there is a need more fully to tap the considerable potential for dissemination of research through private "extension" networks. Better linkages need to be forged to channel improved technologies to farmers via agribusinesses engaged in, for example, contract farming. Finally, a smoother, more effective mechanism is needed to ensure the ready availability of research undertaken in relevant areas to private firms for commercialization, for the widest possible dissemination.

C. Summary

MART is a vital part of USAID's agricultural sector strategy and its objectives are high priorities of Pakistan's Seventh Five-year Plan. No other donor has plans to support the activities USAID will finance under the amendment.

Pakistan needs a strong system for developing relevant agricultural technology and disseminating it to respond to the increasing demands from private commercial firms, farmers and government for improved technologies. Although the agriculture sector's public research infrastructure has grown rapidly in response, the capacity to manage and evolve appropriately has not kept pace. Farmers' productivity remains below the potential that could be attained under Pakistan conditions and private agro-industry does not effectively meet the challenge of international competition in Pakistan or overseas. Research has not impacted upon productivity as significantly as it could because research management has not focused on the potential end use of research by agribusiness and the commercial farm community. Researchers have failed to develop technologies addressing specific farming and business constraints, and lack an effective system for transferring newly developed technology to private agribusiness firms and entrepreneurs, to the extension department and to farmers. The public sector institutions need encouragement and experience to foster linkages and collaboration with Pakistan's emerging private agribusiness sector.

IV. DESCRIPTION OF AMENDED PROJECT

A. Project Goal and Purpose

The goal of the amended project is to improve the income of small farmers, sustain an increase in food and fibre production and conserve the natural resource base.

The purpose is to:

1. develop and disseminate improved technology and information through key research institutions; and
2. foster a collaborative relationship whereby research institutes serve private agribusiness and farmers and use the private sector to disseminate marketable, improved technologies.

B. Strategy/Approach

The strategy of the amendment is reflected in the modified purpose statement. The Project will move from the original concept of dealing with the entire Pakistan national agricultural research network to a focus on selected institutions.

A further shifting of focus will support the Mission's disengagement from direct assistance to public sector research programs and movement towards a new approach of encouraging and assisting research to foster linkages and collaboration with Pakistan's emerging private agribusinesses. This focus will take MART a step further by the active promotion of a private sector strategy in agricultural research. Recognizing the rational progression in level of research effort and degree of involvement over time from public sector to private sector that has occurred in countries like the U.S., the Mission will implement this strategy by promoting both passive and active collaboration with the private sector in each of the three components of the amended project. The private

sector thrust will be a major focus of the project as indicated in purpose statement (b). The project will fund directly and through its contractors a series of activities that will foster this collaborative relationship, which will build a much stronger involvement in the agricultural sector by private enterprise. The amended project will assist the research system to respond to market forces and shift more resources into support for commercial crops and export - oriented crops. This new approach/strategy will develop the capability and experience of public sector agricultural research to use agribusiness more fully to motivate research and technological progress.

The amended project, therefore, will strengthen the national agricultural research system by developing model programs to serve as examples of the improvements in research performance and efficiency that are possible when public sector institutions are linked appropriately with the private sector.

The activities and interventions that will comprise the three project components are described below.

C. Project Components

The amendment will assist and work with nine research institutions, three at the national level and six at the provincial level. They are the Pakistan Agricultural Research Council (PARC); National Agricultural Research Center (NARC); and Arid Zone Research Institute (AZRI) (national); and University of Agriculture Faisalabad (UAF); Ayub Agricultural Research Institute (AARI), Faisalabad; Agricultural Research Institute (ARI), Sariaab; University of Agriculture Peshawar (UAP); Sind Agricultural University (SAU); and Agricultural Research Institute (ARI), Tandojam. These institutions were selected because they have the potential to collaborate and link with private sector agribusiness and have the personnel and infrastructure needed to address the critical problems and constraints of the production system.

The selected institutions will be involved in project amendment activities that have been designed to focus on agricultural research priorities as defined by businessmen and farmers. Given the nature of the amendment in working with a highly creative and evolving private sector, this project paper amendment purposely does not try to define all the specific research initiatives that will be undertaken. Rather the project will be responsive to windows of opportunity and demands placed upon the research system by agribusiness entrepreneurs and the creativity of the newly redirected agricultural scientists.

Nevertheless, it is possible to define herein key, broad areas in which research will be undertaken, because these areas have the recognized potential for significant expansion of production, employment and commercialization. Furthermore, outlined below are approaches, mechanisms, technologies to ensure the relevance of the research; and to incorporate private sector thinking and harness private sector resources in the planning of research agenda and development and dissemination of technologies.

The project amendment, then, will have three components, Ensuring the Responsiveness of Research, Technology Development, and Dissemination.

1. **Ensuring Research Responsiveness**

a. **Private Sector Contribution to Planning**

The project will assist PARC in aggressively looking for ways to increase the contribution of private sector agribusiness in research planning.

Implementation of the master plans that have been developed under the project for the National Agricultural Research Center (NARC) and the Arid Zone Research Institute (AZRI), and the development of similar plans for selected provincial institutions will improve research planning and priority setting, organizational structures and the fiscal responsibility of the institutions. Key to the relevancy of the master plans will be the input in priority and agenda setting of private agribusiness, commercial farmers, exporters and marketing firms. As one method to reorient research toward addressing the needs of these private research user groups, PARC will organize periodic seminars at which representatives of the country's major chambers of commerce/businessmen's associations will present PARC with problems faced by agro-industry for inclusion in PARC's research agenda.

In addition, PARC is formalizing its Agribusiness Committee into an Agribusiness Initiatives and Relations Cell with a Director to be better able to act positively on collaboration with agribusiness. This office is empowered to enter into agreements with private firms for joint research undertakings in which public sector research facilities address specific problems faced by private firms which also contribute to the joint research efforts.

Project-funded technical assistance will be on hand to provide advice and assistance in this process.

Farming Systems Research, another vehicle to encourage research responsiveness, is a methodology which addresses real production problems faced by farmers through research in the farmers' fields. FSR trial feedback constitutes a useful mechanism for refining agenda and approaches for the on-station research.

b. **Research Prioritization and Master Plan Implementation**

Project funded technical assistance will help NARC and AZRI prioritize their Master Plan agenda to accord not only with farmer and agribusiness needs but with budgetary realities to ensure that activities once initiated can be carried out to completion. Assistance will be provided in revising budget request and allocation procedures so that funding requirements of a given activity over the full life of the activity are taken into account (projectized budgets).

The principal MART contractor will assist NARC administrators to constitute interdisciplinary teams of scientists to tackle multifaceted problems more effectively, assist in the preparation of job descriptions as well as in the preparation of an administrative manual that describes, among other things, procedures for managing personnel, finances, and physical assets. In conjunction with the research activities, steps will be taken to ensure that the management and administrative aspects of NARC work smoothly and

efficiently. Funds and assistance will be provided to computerize NARC's accounting system. Computer training will be offered to research scientists on an on-going basis at the Training Institute.

The project will continue to provide technical assistance in the preparation of plans of other research institutions, using the experience gained preparing the NARC master plan. Both Punjab and Balochistan provinces have begun the planning process with MART assistance.

c. Enhancing Researchers's understanding of Private Sector Needs

An important effort will be the development of a special program coordinated by the PARC training office to facilitate the re-entry of recent overseas graduates into the national system as well as to link research scientists with private agribusinesses and formalizing their relationships with these firms. Since PARC has yet to formalize such a program, the amended project will review and select appropriate methods. These may include seminars, workshops and visits to view agro-industrial operations at different locations in Pakistan. An objective is to associate returning scientists with potential agro-industrial clients for cooperation in research activities. Agro-industry, on the other hand, will get to know who are the scientists, what are the resources and where are the facilities. An important target will be the 100 scientists who will arrive from their M.Sc. and Ph.D. degree programs in the U.S. during the amendment period.

d. Public Sector Incentives for Responsiveness to the Private Sector

Three types of incentives have been identified for further development under the project: a) credit for private sector linkages in employee evaluations, b) financial reward - grants and honoraria, c) contacts and opportunities. The first incentive to be developed is positive credit in employment evaluations for private sector linkages. This compliments and supports a continuing effort to improve personnel management in the research institutions and increase the merit factor in all promotion considerations. The second incentive category is financial reward. This takes two forms. One is the allocation of research grants that involve a direct private sector linkage. Such grants are supported by the project and PARC will be encouraged to consider the same factor in awarding grants under other programs which they manage, especially those funded by the GOP and the World Bank. Many of the best researchers have already shown in the previous phase of MART as well as in other projects and programs that they will respond if research operating funds are available. The grants however, in addition to making it possible to do research and enhancing the personal prestige of the researcher, also provide direct financial rewards to the scientist in the form of honoraria equivalent to 10% of their salary. The benefit of additional contacts with people interested in the same subject, i.e. agriculture technology, seems to be one of the least understood, but potentially one of the strongest incentives for the public sector to interact with the private sector. The unemployment situation being what it is, especially for young college graduates, researchers and university professors are continually looking for opportunities

for their children, nephew, nieces, etc. if not for themselves. Public sector employees who are currently isolated from what is happening in the private sector have little idea of the opportunities which could open up through contacts with and legitimate support of the agribusiness sector. The availability of these rewards and incentives will be communicated through workshops and seminars planned for the project and through administrative directives which will be issued by PARC.

2. Technology Development

In addition to enhancing selected research institutes' capabilities to respond to client demand in planning research activities, the project will promote and support applied research in specific areas to generate and disseminate improved technologies relevant to the needs of private sector. Specific areas for research emphasis include integrated farming systems, research on marketing, export and economic issues, a research grants program focusing on increased productivity of Pakistan's agricultural lands highlighting the stressed areas, and research on agricultural problems of production and marketing in the arid zone. These priority areas have been selected on the basis of the significance of potential production increases and potential for commercialization. **Technologies developed by the project will be linked to the appropriate agribusinesses who will be encouraged and assisted to refine and market them as products.**

Project support will include funds for technical advisors, workshops and seminars that bring the private and public sector actors together, training of research and extension staff and for research operations. A combined approach of such research support and competitive grants that will join private farmers and companies with public and private sector scientists to solve practical problems has been designed to strengthen existing capabilities and change the climate so that the public sector will more adequately support private commercial businesses. The latter can more efficiently develop the commercial and employment growth potential generated by the synergistically designed technology packages in key research areas. Qualified scientists are in place and are eager to participate, and there has already been progress in on-going research activities indicating a high probability of success and impact on the production system. **The private sector is already participating in some of these on-going activities and increased private sector participation will be encouraged under the project amendment.**

a. Farming Systems Research

Under the amendment, the FSR program will serve as a forum to promote the commercialization of proven technologies. Interested agro-industrial firms will participate in diagnosis of the technological problem, selection of research topic, execution and evaluation of the research trials with the aim of developing and market testing a product. A no-till wheat drill and hybrid forage seed are two examples of products already developed by FSR and commercialized by agribusiness. Examples of potential products are a virus-free seed potato to be produced jointly by the NARC tissue culture laboratory and a private company; use of a commercially packaged pheromone (insect) trap for crop protection or use of newly designed packaging of improved seed or a fertilizer mixture.

FSR programs will continue to operate in each province through the participating provincial institutions and will be expanded as more private sector firms and scientists come forward to cooperate. A special FSR women's program will continue to obtain women's input in the design of activities to ease women's everyday burdens and to develop improved income-generating products.

Project funds will be provided for initial development costs, and for costs associated with hosting, planning meetings and field days.

b. Arid Zone Research

Arid and semi-arid, non-irrigated lands produce a major portion of Pakistan's sheep and goats and constitute about two-thirds of the total land mass of Pakistan. Accordingly, development and judicious exploitation of this vast resource on a progressively sustained basis is a high priority area of research and development for Pakistan. Although this ecozone is found in all four provinces, it is especially prevalent in Balochistan and the North West Frontier Province. The Arid Zone Research Institute (AZRI) at Quetta was established in 1974 to generate and disseminate improved technologies for the development of arid and semi-arid areas.

During the amendment period, the institute will work on the problems relating to the following areas of research to increase productivity from dryland agriculture:

- Improvement of livestock management;
- Improvement of rangeland management and rehabilitation;
- Commercialization of introduced germplasm of annual, perennial grasses and legumes, as well as range forage shrubs and trees;
- Improvement of forage and dual purpose crop agronomic strategies by water harvesting techniques;
- Evaluation of socio-economic aspects of sheep and goat production and associated forage and dual purpose crop production;
- Increasing the quality of hides.

By design, AZRI's field work is carried out on private farms in cooperation with the farmers via the FSR methodology. This forces the researchers to respond to the farmers' concerns in carrying out the research important to Balochistan and North West Frontier Province. AZRI Research products to date, such as the drought tolerant four wing salt bush, have shown good potential in increasing fodder for the important livestock sector.

Project funds will provide technical assistance and some research support.

c. Economics/Social Science Program

Agricultural research in Pakistan has been dominated by investigation of the biological constraints to improved production. Limited attention has been paid to the broader social and economic issues concerning production, processing, marketing, distribution and consumption. The objective of this activity is to institutionalize the nascent social science program by assisting the PARC social

sciences division to broaden and strengthen activities in the five PARC supported Agricultural Economic Research Units (AERUs) at NARC and in each of the four provinces, and at relevant university departments. To do this, the amended project will support actual research activities that are designed to identify and address the broader aspects of commercial agriculture, particularly those that move beyond production to processing and marketing..

A MART-funded agribusiness specialist/economist will work with Pakistani colleagues to develop a research program linked with FSR. Additional linkages with the chamber of commerce in each province as well as industrial and farmer groups will be formulated. Study topics will be chosen that are of interest to private agribusiness, including market research and feasibility of product development. An explicit goal will be the joint financing of and collaboration in these studies with private sector groups.

d. Research Grants Program

The competitive research grants program focusing on increased productivity of Pakistan agricultural lands, highlighting the environmentally stressed areas, will offer support for public sector research scientists, private farmers, companies and private sector scientists with the objective of developing new technologies and the refinement of existing technologies into marketable products which are environmentally sound and promote the sustainability of Pakistan's agriculture system.

Funds from this program will be available for scientists to research the critical problems affecting agricultural lands under stress. Every year, productive, arable land is going out of production. It is estimated that 14 million acres in Pakistan are affected by high salinity levels, and many more are too arid, water-logged, sodic, or eroded for sustained agricultural production with current technology. There are alternative strategies for increasing productivity that can be exploited commercially, i.e.: use of salt tolerant crops and genetic manipulation to increase salt tolerance in existing crops; use of innovative farming systems; reclaiming land through forestry and salt tolerant fodder grasses; and, developing other productive uses of the land and associated wastelands, i.e. mariculture, silviculture, and high value cash crops. Specialized research programs are required in order to determine the most appropriate method for particular areas that will provide continuing employment opportunities and be commercially viable, and to develop the technologies needed to match the problems.

Grants will be awarded through the prestigious private sector U.S. National Academy of Science - Board of Science and Technology for International Development (NAS-BOSTID). Grant documentation prepared by NAS-BOSTID will constitute the contractual agreement between the National Academy of Sciences and the grantee institution, company or scientist. All projects will involve assistance from and collaboration with the very best U.S. scientists in their design, implementation and evaluation. Each project will be visited by BOSTID staff.

Grant proposals will be invited from both private and public sector scientists/institutions/firms. To encourage collaboration between public and private sector research, it is planned that a portion of the grant funds be reserved for proposals that include such collaboration. An example of this process is as follows: BOSTID would advertise widely and in response, private agribusinesses would present to BOSTID specific problems they are facing relative to agricultural production. BOSTID would judiciously select proposals appropriate to scientific investigation and would, through its network, find the suitable U.S. or Pakistani scientific institution to conduct the required research to solve the problems, utilizing project-funded grants. In a variant of this scenario, a private agro-industrial firm may receive a grant to enable it to fund research to solve its problems.

3. Dissemination

Component 3 will focus on the development, management and direct dissemination of research information. Model multimedia information modules will be developed to transfer technology to agribusinesses, policy planners, educators, extension services, target farmers and private and public researchers. Technical and human resources at NARC will be strengthened through training and similar information transfer cells will be developed in each of the provinces. The dissemination component will also provide agricultural scientists, agribusinesses and students with up-to-date information from international, agricultural, scientific organizations and successful, commercial, agricultural operations. Modern information storage and retrieval technologies will be employed, including microforms, CD-Rom, video-discs and computers. The project will assist in training library staff in the use of key agricultural journals and scientific publications on microform recently supplied to the main agricultural libraries. MART activities under this component will be carried out with the end-user of the improved technologies, i.e., the businessman and the farmer, very much in mind. The information is clearly of interest to various agribusinesses entities who are looking for improved products to market and a competitive technological edge on international competitors.

a. Private Sector Dissemination

The foregoing description of components 1 and 2 discussed the involvement of private agro-industrial concerns in planning and implementing research activities and how their involvement can lead to commercialization of a given agricultural input. Such commercialization constitutes perhaps the most effective means of dissemination. Similarly, agribusiness firms are frequently the most effective extensionists of improved seed varieties or cultural practices, which they disseminate through such arrangements as contract farming relationships with small farmers. The project will attempt to forge research/business linkages that would result in private sector dissemination of technologies through each of its three components.

As more private agribusinesses become involved in collaborative relationships, the dissemination to the private sector will become more proactive and demand driven. A special initiative of this component will be to produce a newsletter of research and technical information gathered and compiled with the private sector as target audience. The newsletter will feature information about proven and farm-tested technologies which, when further refined, packaged and marketed, will be profitable to private sector agribusiness.

b. Audio-Visual Production

MART will continue to develop and strengthen the capacity to produce high-quality information packages. The amendment will concentrate its efforts at NARC and the four Provincial Agricultural Communications Support Cells (PACS) and will aim at producing information packages (using research results) mainly from mature research programs, such as the National Coordinated Wheat and the National FSR Programs. To enhance audio-visual production capacity, the amendment will mobilize the national audio-visual production center at NARC and train the staff to operate and manage the facility. PACS Cells will be assisted in presenting AV packages such as television and radio programs, video cassettes, slides, charts, exhibits, overhead projections, etc. to the targeted audiences, i.e., agribusinesses, public planners, private and public researchers, extension workers and farmers.

c. National Network of Agricultural Communicators

A national Technical Information Transfer Committee (TITC), composed of leading agricultural communicators from private organizations as well as provincial and federal institutions, has been formed and meets at regular intervals. The function of this committee is to exchange information, recommend ways to improve agricultural communications among public and private sector end users, and to coordinate agricultural communications activities in Pakistan. Four corresponding Provincial Technical Information Transfer Committees will also be established, each including private sector representatives as members. These committees, the PACS Cells and NARC's AV unit will form the base for a national network of agricultural communicators. The amendment will provide funds for supporting TITC meetings, fund one national workshop each year and provide training to PACS Cells staff and cooperating extension personnel.

D. Project Achievements and Outputs

Component 1: Ensuring Research Responsiveness

Achievement: Concrete system in which the 9 key institutions, namely PARC, AZRI, NARC, UAF, AARI, SARIAB, UAP, SAU and ARI, Tandojam approve research agenda based on farmer and agro-industry needs consistent with funding availability.

Outputs:

· Periodic seminars organized by PARC at which representatives of the country's major chambers of commerce/businessmen's associations present PARC with problems faced by agro-industry for inclusion in PARC's research agenda. (TARGET: for NARC and AZRI in 1990; every institution involved by PACD).

· PARC, through its Agribusiness Relations Cell, enters into a minimum of 15 collaborative agreements with other Pakistani and international agribusinesses and agro-industrial firms for the purpose of finding solutions through research to problems brought forward by the private businesses. (TARGET: 3 in 1990; 3 per year for the next 3 years).

- NARC and AZRI are implementing efficient, output-oriented management systems characterized by projectized budgets, flexible personnel management systems and performance monitoring. (TARGET: beginning in 1990; incorporate entire institute by 1994).
- A strengthened national FSR program, including: an adequately funded and staffed FSR Coordination and Project Development Cell; model FSR projects established in target areas of each province; FSR course(s) introduced at the agricultural universities and a special women's FSR program. (TARGET: PARC cell in 1990; cells at all participating institutions by 1992; fully national network by 1994).
- NARC and AZRI master plan agenda prioritized in accordance with farmer/agribusiness needs and budget allocations. (TARGET: incorporated into annual research and budget plans beginning 1991).
- Re-entrant training participants are aware of technological needs of private agro-industry, as a result of a program of project funded visits to private businesses and seminars. (TARGET: each returnee participating in program within 4 months of arrival).

Component 2: Technology Development

Achievements: Marketable/farmer acceptable technologies developed for use by Pakistan's production system.

Outputs:

A minimum of 10 marketable products developed through long-term collaborative relationships in which PARC provides research related inputs and private agribusinesses and agricultural input manufacturers provide capital and other inputs. (TARGET: 2-3 per year from 1991-1994).

- Solutions to a minimum of 15 problems that are addressed by PARC in response to specific requests from private agribusiness firms, agricultural input manufacturers or private producers' associations. (TARGET: 3-5 per year from 1991-1994).
- Solutions to agriculture related problems identified by grantees (including a minimum of 5 agribusinesses), arrived at through research grants administered by BOSTID. (TARGET: solutions arrived at within 1-2 years after grant given; 1st grants in 1991).
- A minimum of 10 marketable, agriculture related products of private commercial enterprises developed through grants administered by BOSTID. (TARGET: 3-4 products developed per year in 1992-1994).
- Farming Systems Research (FSR) conducted by multidisciplinary teams from all 9 participating institutions with collaboration from private input manufacturers develops technologies resolving a minimum of 10 problems faced by farmers. (TARGET: 2-3 problems resolved each year 1991-1994).

- Demand for and suitability of a minimum of 10 agricultural inputs tested and proven through the FSR trials, resulting in commercial production of these inputs. (TARGET: 2 in 1990; additional 1-3 every year 1991-1994).

Component 3: Dissemination

Achievement: Operational linkages are established and functioning for dissemination of appropriate research information between NARC, AZRI and the 4 Provincial Agricultural Communication Support Cells on the one hand and private agribusiness, farmer associations, the extension service on the other hand.

Outputs:

- A minimum of 10 technologies developed through the national research system disseminated to farmers by agribusiness firms, through contract farming or similar mechanisms. (TARGET: 2 in 1990; 2-3 each year 1991-1992).
- A minimum of 10 products resulting from research undertaken through the national research system adopted by private agro-industry for commercialization. (TARGET: 2-in 1990; additional 2 every year 1991-1994).
- An effective system for documentation and transfer of field tested technology and information developed and operational, including institutionalized National and Provincial Technical Information Transfer Committees, each with private sector representatives as members, and four Provincial Agricultural Communication Support Cells. (TARGET: committees set up in 1990; support cells in 1991; system operational in 1991).
- A national microform and electronic media resources system established at NARC with database sharing and compatibility among cooperating libraries. (TARGET: established at NARC in 1990; national network in 1991).
- A special newsletter targeting private sector firms. (TARGET: PARC publication, begin in 1991).
- **Research-based technologies and practices adopted by farmers.** (TARGET: adoption rate increased by 10% per year beginning 1991).
- **Multimedia modules produced by the National & Provincial Agricultural Communication's Support Cells.** (TARGET: 2 in 1990; 2-5 more each year).

V. IMPLEMENTATION PLAN

A. Administrative and Monitoring Arrangements

The MART amendment will continue many of activities, initiatives and relationships established under the original MART project.

First, most of the long-term technical assistance contracts remain in place. Winrock, primary contractor for research management, FSR and technical information transfer activities, has been contracted through September 1991 funded by the original project. A follow-on technical assistance contractor funded by the amendment will be procured through a competitive process to provide the necessary additional long and short term technical expertise up to the PACD. The host country CIMMYT contract has a termination date of September 1990 and will be phased out at that time. ICARDA, whose direct AID contract terminated on 30 November 1989, is now funded through a grant from the original project to continue their collaboration with the Arid Zone Institute in Quetta to September 1991. The NAS-BOSTID competitive small grants program will be procured in July 1990 through a direct grant from the amendment. The small grants to scientists will be sub-grants administered by BOSTID.

Second, all of the federal and provincial institutions involved in the amended project activities are already participating in the project. In addition, commitments have been made to develop permanent FSR and information transfer cells within the key institutions.

GOP Responsibilities

The GOP agency responsible for the implementation of this project, the Pakistan Agricultural Research Council (PARC), is a semi-autonomous organization within the Ministry of Food, Agriculture and Cooperatives. PARC will be responsible for: (a) developing and coordinating collaborative agreements and partnerships with agribusiness and agro-industrial firms; (b) ensuring that all counterparts are in place for the technical assistance planned under the amendment; (c) procuring supplies and equipment when host country procurement is called for; (d) ensuring that duly qualified participants are selected for training; (e) managing the research grants program with NAS-BOSTID; and (f) participating in the implementation and evaluation of the amended project. The budgetary and staffing position of the Council are adequate to effectively undertake those responsibilities.

2. USAID Responsibilities

The Agricultural Production and Institutions Division of O/ARD continues to have overall responsibility for managing the project. This division is currently staffed with two USDH and four Pakistani professionals. USAID project management will concentrate on policy guidance with some technical input, providing clear guidelines to enable project objectives to be obtained in an orderly and timely fashion. They supervise TA operations to ensure that the project complies with USAID's mandates, and direct all evaluations of project activities. Lastly, they advise on commodity, technical assistance, construction and other goods/services procurement.

3. Contractor/Grantee Responsibilities

The TA contractors/Grantees are responsible for coordinating and managing day-to-day project activities. In coordination with the GOP and O/ARD, they will handle project activities within their respective offices. Although activities vary according to their respective disciplines, they coordinate efforts so that interventions successfully reach their intended audience.

Continued technical assistance is provided by two organizations: (1) Winrock to September 1991, followed by a contractor who will be selected competitively, responsible for promotion of project private sector activities, research management, FSR, social science and technology transfer; (2) ICARDA, through a grant, collaborating on arid zone research. A third organization, the Board of Science and Technology for International Development (BOSTID) of the US National Academy of Science, will be provided a grant under the amendment to coordinate and assist the research grant program.

B. Implementation Schedule

The amendment will extend the PACD from September 30, 1991 to August 7, 1994. The first tranche of new funding will be obligated in July, 1990 and additional funds will be obligated in subsequent FY's to fund the planned programs. Most resident long-term advisors are in place under existing contracts and grants. Additional long-term advisers and short term consultants will be provided under a new technical assistance contract funded by the amendment. A schedule of important implementation actions is shown in Table 1.

C. Acquisition Plan

1. Technical Assistance

The project amendment will finance the technical assistance, appropriate U.S. backstop personnel and short-term expatriate and local consultants. Total expatriate assistance under the amendment will consist of 67 person months long-term, 10 person months backstop and 36 person months short-term. The existing contract with Winrock and grant to ICARDA are funded almost entirely under the original project and will terminate in September 1991. A new contract for long- and short-term technical assistance to be funded under the amendment will be awarded in FY 1991 pursuant to competitive selection. It is expected that the T.A. contract will be an AID-direct contract.

Pakistani technical assistance managed by the principal technical assistance contractor will consist of 100 person months for short-term consultants and 396 person months for support staff.

No Gray Amendment set-aside is envisaged. The major technical assistance contracts were awarded on a fully competitive basis. Certification for consideration of Gray Amendment organizations is included in Annex C. The technical assistance plan is provided in Table 2.

2. Commodities

Commodities are procured either by USAID directly, by PARC under a host-country contract or through the contractor or grantee. PARC arranges for distribution to respective destinations, installation and commissioning of equipment and training of end-users in its maintenance and operation.

A commodity procurement plan is shown in Table 3.

Table 2 Technical Assistance Plan
(Current Project and Amendment)

Category of Personnel	PM*	FY 1990				FY 1991				FY 1992				FY 1993				FY 1994			
		10/89	-	9/90		10/90	-	9/91		10/91	-	9/92		10/92	-	9/93		10/93	-	9/94	
		OND	JFM	AMJ	JAS	OND	JFM	AMJ	JA												
U.S. PERSONNEL																					
A. Long-Term																					
a. Research Management/COP	12	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo							
b. FSR Advisor		xxx	xxx																		
c. Prov. Coordr. Punjab	24	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo				
d. Prov. Coordr. Sind	4	xx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	o											
e. Tech. Information Advisor		xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx												
f. Agricultural Spec. Econ.	27									ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
TOTAL PM	67																				
B. Short-Term																					
a. FSR Consultant	3				xxx		x		xx			oo			oo						
b. Training Consultant	2				xxx		x		xx			oo			oo						
c. Technical Consultants	14	x	x	xx	xx	x	xx	x	xx	oo	oo	oo			oo	oo			oo	oo	
d. Agribus. Mgmt. Consultants	5	xx	x	xx	xx	x	xx	x	xx	oo	oo	oo			oo	oo			oo	oo	
TOTAL PM	36																				
C. U.S. BACKSTOP STAFF																					
1. Project Coordinator	2				x				x	o					o						
2. Secretary	2				x		x		x						o						
TOTAL PM	10																				
HOST COUNTRY PERSONNEL																					
A. Consultants																					
1. FSR Technical (2)	54	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
2. Agribusiness Specialist	30				xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
3. Other Technical	16	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
TOTAL PM	100																				
B. Support Staff																					
1. Admin Officer (1)	33	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
2. Accountant (1)	33	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
3. Program Specialist (1)	33	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
4. Secretary (3)	99	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
5. Driver (3)	99	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
6. Officer Support (3)	99	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo	ooo
TOTAL PM	396*																				

x = Current Project Funding. o = Amendment Fundings *Under Amendment

3. Training

The training under the project is broadly categorized into three types: U.S. training, including long-term and short term; third country training; and in-country training. As previously mentioned, under the amendment, primary emphasis is given to in-country training activities, where increased attention is on quality of instruction and its relevance to the objectives of the revised MART project.

a. U.S. Training

Overseas training will continue to be implemented along lines established in the original project paper. Degree programs in relevant disciplines are offered to scientists identified by participating institutions and approved by PARC. Short technical courses at academic institutions or selected U.S. government agencies are offered to participating scientists, according to needs identified by the federal/provincial institutions and technical assistance. No additional long term training slots are offered through the amendment. Amendment funds will finance costs of continuation of long term training of participants sent to allow completion of the degree programs already allocated to federal/provincial scientists under the original project. However, an additional 20 short term training participants will be funded through the amendment.

b. Third Country Training

Funds for 4-6 scientists have been allocated for short technical training at international agricultural research centers. Such courses are offered to Pakistani scientists identified by project technical assistance as lacking in specific technical areas.

c. Incountry Training

The in-country courses are conducted by the technical assistance, private firms, public federal and provincial institutions, universities and combinations of these. It is anticipated that all such training funded by MART will be held, at facilities supplied by NARC, AZRI or provincial institutions. Based on an average training course cost of \$1500 per week at NARC for 20 participants; approximately 4400 person weeks of in-country training will be offered.

Table 3
Commodity Procurement Plan
(\$ 000)

Commodity	FX or LC	Nature of Commodity	Source	Method of Procurement	Estimated Cost
Furniture & Equip.					
a. Household & Office Equip.	LC	Replacement basis	PAK	AID Direct	100
b. Research Equip	FX	Assorted field and lab.	USA	R.F.P.	100
c. AV Equipment	FX	Studio camera and sound equip.	USA	I.F.B.	250
Total:					450

D. Evaluation Plan and Audit Considerations

Recommendations of the 1989 evaluation have been incorporated into the amended project. A second interim evaluation has been scheduled under amendment funding for fiscal year 1992. This evaluation will focus primarily on implementation of activities and will be concerned with how the amended project is progressing toward achievement of the amended purpose.

USAID/Pakistan will conduct a terminal project evaluation planned for 1994, approximately six months prior to the PACD, to examine the extent to which the project outputs, EOPS and purpose have been achieved. Particular attention will be given to the linkages and collaboration evident between PARC, the key provincial research institutions and private agribusiness and agro-industry.

Audit considerations are as follows:

Winrock is under USG audit cognizance. It is anticipated a successor direct contractor will have similar status. USAID recently funded a Non-Federal audit of ICARDA. Host country contracts for construction will be subject to USAID engineering inspection prior to reimbursement. U.S. National Academy of Science can be expected to be audited by the U.S.G. USDH commodities specialists monitor the host country procurement process and approve specific transactions.

VI. PROJECT ANALYSES

As discussed, the MART amendment has modified the project purpose to deal specifically with key research institutions rather than the entire Pakistan national agricultural research network within the framework of a new strategy to promote linkages and collaboration with the private sector. Accordingly, the components and activities of the amendment are changed to reflect this modified focus. In general the analyses made in the MART Project Paper are still valid. However, some modifications have been made to reflect the modified purpose. These changes are discussed below.

A. Technical Analysis

This analysis deals with the technical feasibility and relevance of the planned activities under the various components of this amendment. Building on the private sector initiatives already active, special efforts will be made to increase the total involvement of private sector agribusiness firms in the project.

1. Research Responsiveness

Substantial progress has been made in ensuring research responsiveness to client needs. However, it is necessary to further strengthen linkages with agro-industry. At least six mechanisms will be put in place under the three components of the project to ensure that these linkages are established and become operational:

- Representatives of businessmen's organizations will articulate their needs in formal seminars organized by PARC to obtain their input in the setting of research agenda.
- PARC's Agribusiness Relations Cell will enter into agreements with private firms to undertake research jointly to address the firms' problems.
- A portion of the BOSTID competitive grants will be set aside to address problems presented by private firms.
- The farming systems research activity will include in its agenda field-testing of products developed by private agricultural input manufacturers.
- A special newsletter targetting agribusiness will be published to disseminate research results to this group. This should, in turn, awaken business interest in contributing further in the setting of research agenda and in participating in joint research activities.
- A program for the re-entry of returning overseas participants will seek to integrate them into the public/private sector collaborative mode through specially organized site visits to selected agro-industries.

The concerned public sector institutions concur in the foregoing approaches. Furthermore, testing of private sector interest in participation during the pre-amendment phase of the project has yielded positive results. Hence, there is every expectation that these approaches to be developed under the amendment are fully feasible.

2. Technology Development

The development of technology relevant to the needs of the farmer requires attention to the specific research skills needed as well as the institutionalization of revised research methodologies. Based on the experience of the first five project years, the activities in this component have been narrowed in scope to address identified programs. These programs are designed to complement each other in their activities. A common approach has been identified; awarding research grants competitively in relevant areas, coordinating activities with management and information transfer programs, providing necessary training through technical courses, workshops and seminars, and disseminating technological developments through a trained cadre of agricultural communicators.

The amendment is providing funds for competitive research grants to encourage and support outstanding Pakistani scientists from both the public and private sector and agribusiness firms to undertake innovative research on agricultural related problems in collaboration with the very best U.S. scientists. As these grants will be administered by an experienced contractor within specific guidelines, no constraint is anticipated.

3. Dissemination

Good progress has been made in this component as a result of well defined tasks, a devoted advisor and strong institutional support. The Audio-Visual Communication Center and Training Institute will be completed in April, 1990. Some equipment has already been acquired with the remaining to be procured and installed on completion of construction. Additional staff needed will be recruited and trained. No particular constraint is anticipated.

A new activity has been added to this component. A special study of the agricultural libraries of Pakistan revealed that they are critically deficient in publications, equipment and trained staff. The amendment will address this deficiency by providing staff training to 17 selected agricultural libraries in the use of the newly acquired information systems. The libraries and methods to improve them have been identified. Again, no particular constraint is expected.

A newsletter featuring research results, targetting agribusiness, is expected to yield a high dissemination dividend, as private firms further develop research findings to result in commercialization of selected technologies.

4. Conclusion

The overall conclusion of technical analyses is that the activities proposed to be undertaken under the PP amendment are necessary and feasible and are achievable within the stipulated amendment period.

B. Administrative Analysis

The MART Project Paper administrative analysis describes in detail the structure and administrative capability of PARC and the provincial research

institutions with the conclusion that the necessary technical competence was present to effectively implement all the original components of the project. The description of these participatory organizations remains valid. However, it does not adequately address the issue of the inflexibility and immobility of the national agricultural research system, which in fact is a large, complex federated system of provincial and federal institutions meant to be coordinated by PARC.

The original purpose of the MART project was to "strengthen the performance of the national agricultural research system to generate and disseminate quality and relevant agricultural technologies to the farmers of Pakistan". The MART project was designed to promote, strengthen and bring about closer coordination between PARC and the provincial research institutes, so that the entire agricultural research network in the country operates as a well integrated and closely coordinated system of agricultural research to effectively address the problems of agricultural production.

Unfortunately, this did not fully materialize. Pakistan is a federation of four provinces with well defined constitutional responsibilities and authorities. The bulk of the research and educational infrastructure is in the provinces where there is no direct federal control. PARC's dominion is confined only to NARC, AZRI and a few other specialized national institutes. This led to problems in the implementation of the original MART project.

However, most of the management problems identified in the evaluation stem from two sources which are beyond the effective influence of MART. **First**, the provinces' independent responsibility for agriculture represents a federal system of research, like that of the United States. It is an alliance rather than a controlled organization, so changes must be brought about by consensus, which takes considerable time and effort to develop. This is partly accomplished through the MART Project Coordination Committee (PCC) which meets about every 6 months, on which all the key federal and provincial research institutions and universities are represented. The 9th meeting of the PPC met in December 1989 and unanimously endorsed the proposed amendment. **Second**, inflexible public sector management systems are not readily modified, even when an institution is autonomous. Staff are unwilling to risk their careers by **innovation in arcane areas**. Thus changes come slowly with the accrued benefits shown through modeling.

Therefore, the original purpose of trying to strengthen the performance of and effect change in the entire national agricultural research system is unachievable. The amendment modifies and reduces the scope of the purpose from dealing with the entire Pakistan national agricultural research network to a focus on nine selected key research institutions and programs and the introduction of a strategy of responsiveness and expansion of linkages and collaboration with agribusiness and agro-industry. Workable relationships and good-will have been built through project technical assistance and activities with the individual institutions and programs. The focus is thus reduced and the strategy modified to the point where the project is manageable and able to address priority problems where improvement is possible. By the termination of the project, the institutions should be able to continue on their own resources, **without AID support**.

The three federal and six provincial institutions selected for amended project interventions are chosen because they have the administrative capability to accomplish such activities, and because they are in the position to serve as an example for other institutions to follow.

The following are the key institutions participating in the project. Many of the activities will be primarily administrated through PARC and its two lead institutes, NARC and AZRI, with strong linkages with the network of agricultural research institutes and universities in each province, as described below:

Federal

Pakistan Agricultural Research Council (PARC) - Agricultural council of the federal Agricultural Ministry. Agricultural research division charged with overall coordination of research programs in the country. Significant progress was made during the original project to establish PARC as an effective coordinator of research programs. This will be strengthened under the amendment by implementing relevant project activities through PARC offices. PARC is developing an FSR coordination cell, for example, to take over responsibilities currently handled by project technical assistance. The research grants program and the social science work of the AERU's will be coordinated through PARC as well as the training re-entry program.

The existing committee at PARC dealing with agribusiness relations is being strengthened and expanded into a distinct office with an operational mandate to encourage and foster joint-ventures and collaboration with the private sector. This will facilitate many of the private sector activities already underway and others planned by the project.

- National Agricultural Research Centre (NARC) - Premier research center of PARC located in Islamabad, mandated to work on basic problems not addressed by provinces. Having worked through the development of its master research plan over the past 18 months, the research center is prepared to implement the plan to concentrate on several multidisciplinary research thrusts on priority problems. The master plan speaks to reorganization of research at the center and also to lower level problems of research project procurement, financial management and conduct of research on and off station. NARC, through the amendment, will take the lead in agenda setting in collaboration with the private sector. Significantly, links have been established between researchers at NARC and those at provincial institutions to coordinate project research activities in FSR, and the actual research thrusts of the grants programs.

In addition, the project has established central coordination units for training and development of an AV capability at NARC. These units will develop methods and modules to serve as models for linkage with similar provincial units.

- Arid Zone Research Institute (AZRI) - Located in Quetta, Balochistan, this institute has strong collaboration with the provincial system and has a mandate to work nationally on problems of the arid lands of Pakistan. Under the original project, AZRI developed its own long-term research plan. The MART project has also provided resources for the institute to develop an adequate infrastructure so that it will now be able to move ahead with the development of a strong research program, implementing its master plan in collaboration with ICARDA, aimed at developing technologies meeting the needs of the private farmers.

Provincial

University of Agriculture, Faisalabad (UAF) - Most developed agricultural university in Pakistan; located in Faisalabad in Punjab Province. Two of PARC's members are former professors of UAF, which has resulted in stronger linkages between the two. UAF is a recipient of original project technical assistance, commodities and training.

Ayub Agricultural Research Institute (AARI) - Large central research center of Punjab Agricultural Research Department located in Faisalabad is composed of a number of commodity and discipline based institutes. Has been an important site of technical assistance, commodity and training support from original project.

UAF and AARI are main collaborators working with the National FSR Cell in implementing the two main FSR Punjab target areas and the Provincial Agricultural Communications Cell and Information Transfer Committee.

Sind Agricultural University, Tandojam (SAU) - Located in Tandojam, Sind Province, this is the agricultural university serving the province and also reserves places for students from Balochistan.

Agricultural Research Institute, Tandojam (ARI, Tandojam) - Located on the same campus with SAU, this institute is the largest and most important research facility of the province.

SAU and ARI, Tandojam, together have received most of the MART project assistance given to Sind. Most important amendment activities will be FSR at two sites, the agricultural communication and dissemination activities and in-country training.

Agricultural Research Institute, Sariab (ARI, Sariab) - Located in Quetta, this is the main agricultural research station in Balochistan. Coordination of the provincial FSR work is at Sariab and the station is closely linked with the Ministry in development of the master research plan.

University of Agriculture, Peshawar (UAP) - Recently merged and integrated with the North West Frontier Provincial agricultural research system through assistance from the TIPAN project, the university now is set to play an important role as model to the other provinces in the coordination of agricultural education and research. UAP is a strong collaborator in the FSR and dissemination activities of the amendment.

Additional activities such as training courses and special short term technical assistance are administered with individual provincial institutes and universities.

In summary, Effective and appropriate administrative mechanisms are in place or will be established to meet the implementation requirements of this project. In addition, the organizations involved have the required manpower and experience, and are establishing the internal management systems and the necessary linkages with the agribusiness community to effectively implement the project. This competence will be enhanced under the project through the provision of training and technical assistance and research operational support. The project is therefore considered administratively feasible and sound.

C. Social Soundness Analysis:

In general, the analysis made in the original MART PP is still valid.

The MART Amendment will encourage and support development of a balanced system of agricultural research in which education, research, extension and agribusiness work in close cooperation. Such a system will effectively address serious constraints to agricultural production, thereby resulting in net benefits to farm employment and increased on-farm income.

Additional benefits will be generated from the inclusion of a women's program in the Technology Development component. Women play a major role in on-farm management but this role is not always appreciated. The MART project has hired a womens consultant to interact directly with rural women and develop programs to increase their production and income, while reducing their daily burdens.

The farming systems research approach will be widely employed under the amendment to test the acceptability of newly developed or improved technologies and products among the farmer beneficiaries.

Furthermore, social constraints to farmer acceptance of improved technologies will be examined under the social science sub-component of the project. Findings will be fed back to influence approaches being developed for technology dissemination, and will be made available to the extension services.

D. Economic Analysis

The economic benefits derived from research were discussed in detail in the MART PP. The analysis remains valid. In addition, references not mentioned in the original paper further illustrate potential economic benefits. For example, Griliches ^{1/} calculated that the return on funds invested in the

^{1/} Griliches, 1958. Zvi Griliches, "Research Costs and Social Returns: Hybrid Corn and Related Innovations," Journal of Political Economy, Vol. 66, No. 5 (October 1958).

development of hybrid corn and related innovations provided a return of 700% annually. Ardito-Barletta 2/ showed that from 1943 to 1963 Mexico received an annual benefit of 290% for every dollar spent on the cooperative corn and wheat improvement research program. Studies made in India by Saxena and Jha 3/ indicated rates of return of 40 to 60 percent for the economy as a whole.

Lastly, in a 1989 unpublished study on "Research and Productivity in Pakistan Agriculture", Evenson 4/ concluded that there is a strong link between investment in research and increase in agriculture productivity. These results are consistent with economic research results from other countries and further confirms the importance of research in agricultural development.

In other words, all studies consistently concluded that agricultural research is essential and enables increased production from a given resource. The economic value of that production is very high relative to the cost of research both in developed and developing countries. In addition to economic benefits, agricultural research has additional significance in that:

- it permits the substitution of knowledge for resources;
- it facilitates the substitution of less expensive and more abundant resources for more expensive or increasingly scarce resources;
- it releases the constraints on growth imposed by inelastic resource supplies;
- it diminishes hunger and ensures economic and political stability.

At present the level of research effort in Pakistan is 0.5% of GDP, which is well below the internationally recommended level of 1.0-2.0%. The funds allocated per scientist (8,900) are less than in India (21,800) and even Nepal (12,400), Bangladesh (16,200) and Sri Lanka (10,900). If Pakistan is to maintain its agricultural growth and continue to feed its fast growing population, it must provide adequate financial support to agricultural research, which is one of the cheapest and most effective ways of improving productivity. The MART project amendment will supplement GOP research efforts and encourage more active participation by the private sector to achieve the cherished goal of increased agricultural production and food/fibre sufficiency.

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- 2/ Ardito-Barletta, n.d. Nicolas Ardito-Barletta, "Costs and Social Returns of Agricultural Research in Mexico" (unpublished Ph.D. dissertation, Department of Economics, University of Chicago, n.d.).
- 3/ Saxena and Jha - quoted by Ruttan, V.W. :Paper presented at the AID Asia Bureau, Agriculture/Rural Development Conference, 1981.
- 4/ Evenson, R.E. "Research and Productivity in Pakistan Agriculture", 1989. (Unpublished).

E. Financial Analysis

1. General

The total life of project estimated cost is \$48.5 million. Financial resources for this project are: (a) a \$38.0 million A.I.D. grant (\$30.0 million for FY 84-89 and \$8.0 million for FY 90-94) under the Management of Agricultural Research and Technology (MART) project; and (b) a GOP contribution equivalent to about \$10.5 million. Additional resources for the period of the amendment are (a) \$1.8 million worth of commodities under the A.I.D. financed Agricultural Commodities and Equipment (ACE) program; and (b) an estimated \$250,000 in the form of technical advisory assistance from the core budget of one of the implementing agencies namely, the International Center for Agricultural Research in Dry areas (ICARDA).

Inflation was calculated for project costs at 5 percent per year compounded annually. During the past six years in Pakistan, inflation balanced with the decrease in value of the rupee in relation to the U.S. dollar. From 1983-89 the value of the rupee decreased at nearly a 10% compounded rate.

2. Detailed Cost Estimates

Six budget tables are provided on the following pages. Table 4 provides a summary of AID project costs as authorized in original project (\$30 million) as well as funds proposed in this amendment (\$8.0 million). The \$30 million authorized in the original project have been obligated and approximately \$17 million have been spent. Table 5 gives a summary of life of project costs with USAID and GOP contributions; Table 6 is a breakdown of GOP contributions for the amendment period; Table 7 shows a summary of AID funds by project component, project element and fiscal year; Table 8 shows a summary of AID funds by expense category and fiscal year; and Table 9 gives a summary of expenditures over the life of the project by expense category foreign exchange, local costs and fiscal year. The projected expenditure shown for 1990-1994 include \$13 million remaining from original project funds and the \$8.0 million proposed in this amendment, since there is no clear demarcation between ongoing activities and amendment activities. The budget tables do not include the \$1.8 million for commodities funded under the ACE program nor the estimated \$250,000 contribution from ICARDA.

Basis for Cost Estimates

Long-term technical assistance costs are estimated at approximately \$18,600 per person month based on official guidelines. This covers salary and benefits, and local support costs, but does not cover the salary costs of Pakistani staff. Short-term technical assistance is calculated on an average cost of \$14,700 per person month, based on official USAID guidelines and MART project experience. Training costs are based on the average of actual costs incurred by the project sponsored training participants and the anticipation of extensions by some long term trainees. Detailed cost estimates for long and short-term technical assistance, local consultants and staff, and training are included as Annex K.

TABLE 4
SUMMARY OF LIFE OF PROJECT AID COSTS
BY PROJECT ELEMENT
(\$ 000)

Expense Category (Project Element)	Original Project Per ProAg	Changes With Amendment	Revised Life of Project
1. TECHNICAL ASSISTANCE			
a. Long Term	9,550	1,408	10,958
b. Short Term	1,720	673	2,393
c. Local Consultants/Staff	880	489	1,369
Total T.A.	12,150	2,570	14,720
2. TRAINING			
a. U.S.			
(i) Long Term	7,400	140	7,540
(ii) Short Term	1,800	190	1,990
b. Third Country	500	50	550
c. In-Country	600	330	930
Total Training	10,300	710	11,010
3. COMMODITIES			
a. Vehicles	520	-	520
b. Furniture & Equipment	1,900	235	2,135
c. Computers	440	-	440
d. Other Commodities	610	190	800
Total Commodities	3,470	425	3,895
4. OTHER COSTS			
a. Research Support	1,430	950	2,380
b. AVCTI Construction	950	-	950
c. Grants			
(i) ICARDA	1,500	-	1,500
(ii) BOSTID-NAS	-	2,870	2,870
Total Other Costs	3,880	3,820	7,700
5. Evaluation	200	95	295
TOTAL	30,000	7,620	37,620
6. Contingency (5%)	0	380	380
GRAND TOTAL	30,000	8,000	38,000

Note: All costs include inflation.

TABLE 5

SUMMARY OF LIFE OF PROJECT AID COSTS BY PROJECT
COMPONENT AND PROJECT ELEMENTS
(\$ 000)

Project Component/ Expense Category	Original Project Per ProAg	Changes with Amendment	Revised Life of Project
1. Research Responsiveness			
a. Technical Assistance	6,150	1,280	7,430
b. Training	9,000	285	9,285
c. Commodities	470	50	520
d. Other Costs	300	240	540
TOTAL COMPONENT 1	15,920	1,855	17,775
2. Technology Development			
a. Technical Assistance	4,000	910	4,910
b. Training	1,000	330	1,330
c. Commodities	1,050	140	1,190
d. ICARDA Grant	1,500	-	1,500
e. BOSTID Grant	-	2,870	2,870
f. Other Costs	900	570	1,470
TOTAL COMPONENT 2	8,450	4,820	13,270
3. Dissemination			
a. Technical Assistance	2,000	380	2,380
b. Training	300	95	395
c. Commodities	1,950	235	2,185
d. Construction	950	-	950
e. Other Costs	230	140	370
TOTAL COMPONENT 3	5,430	850	6,280
4. Evaluation	200	95	295
TOTAL (1 - 4)	30,000	7,620	37,620
5. Contingency (5%)	0	380	380
TOTAL USAID	30,000	8,000	38,000
GOP Contribution	6,342	4,174	10,516
GRAND TOTAL	36,342	12,174	48,516

TABLE 6
GOP CONTRIBUTIONS FOR THE AMENDMENT
(Direct and In Kind)

Activity	\$ 000 *
1. AZRI Development & Recurrent Budget	1,410
2. 20% of NARC Budget	1,786
3. 10% of Provincial Research Budget	145
4. FARC Technical Assistance	198
5. Costs of Scientists Training Abroad	595
6. Project Vehicle Operating Costs	40
TOTAL:	4,174

* Calculated at an exchange rate of \$1.00 = Rs.21.00.

TABLE 7

SUMMARY OF LIFE OF PROJECT AID COSTS
BY PROJECT COMPONENT, PROJECT ELEMENT AND FISCAL YEAR
(\$ 000)

Project Component/ Expense Category	Original Project Per ProAg	Amendment					TOTAL LOP
		FY 90	FY 91	FY 92	FY 93	FY 94	
1. Research Responsiveness							
a. Technical Assistance	6,150	95	285	426	334	140	7,430
b. Training	9,000	50	65	75	55	40	9,285
c. Commodities	470	20	20	10	-	-	520
d. Other Costs	300	50	50	50	50	40	540
Sub-Total (1)	15,920	215	420	561	439	220	17,775
2. Technology Development							
a. Technical Assistance	4,000	20	90	426	334	40	4,910
b. Training	1,000	50	95	95	45	45	1,330
c. Commodities	1,050	20	35	35	30	20	1,190
d. ICARDA Grant	1,500	-	-	-	-	-	1,500
e. BOSTID Grant	-	1,450	950	470	-	-	2,870
f. Other Costs	900	50	145	140	140	95	1,470
Sub-Total (2)	8,450	1,590	1,315	1,166	549	200	13,270
3. Dissemination							
a. Technical Assistance	2,000	50	100	106	94	30	2,380
b. Training	300	10	20	30	25	10	395
c. Commodities	1,950	95	140	-	-	-	2,185
d. Construction	950	-	-	-	-	-	950
e. Other Costs	230	20	30	35	35	20	370
Sub-Total (3)	5,430	175	290	171	154	60	6,280
4. Evaluation	200	-	-	50	-	45	295
TOTAL (1 - 4)	30,000	1,980	2,025	1,948	1,142	525	37,620
5. Contingency (5%)	0	99	100	97	57	26	380
GRAND TOTAL	30,000	2,079	2,125	2,045	1,199	551	38,000

TABLE 8

SUMMARY OF LIFE OF PROJECT AID COSTS
BY EXPENSE CATEGORY AND FISCAL YEAR
(\$ 000)

Expense Category (Project Element)	Original Project	Amendment					TOTAL
		FY 90	FY 91	FY 92	FY 93	FY 94	
1. TECHNICAL ASSISTANCE							
a. Long Term	9,550	104	120	615	410	70	10,869
b. Short Term	1,720	31	235	136	150	68	2,340
c. Local Consultants/Staff	880	22	80	87	80	30	1,179
Sub-Total	12,150	157	435	838	640	168	14,388
d. Inflation 1/	-	8	40	120	122	42	332
Total T.A.	12,150	165	475	958	762	210	14,720
2. TRAINING							
a. U.S.							
i) Long Term	7,400	45	40	40	15	-	7,540
ii) Short Term	1,800	30	38	38	30	28	1,964
b. Third Country	500	10	10	10	10	2	542
c. In-Country	600	20	75	86	60	47	888
Sub-Total	10,300	105	163	174	115	77	10,934
d. Inflation 1/	-	5	17	26	10	18	76
Total Training	10,300	110	180	200	125	95	11,010
3. COMMODITIES							
a. Vehicles	520	-	-	-	-	-	520
b. Furniture & Equipment	1,900	95	130	-	-	-	2,125
c. Computers	440	-	-	-	-	-	440
d. Other Commodities	610	34	45	40	25	17	771
Sub-Total	3,470	129	175	40	25	17	3,856
e. Inflation 1/	-	6	20	5	5	3	39
Total Commodities	3,470	135	195	45	30	20	3,895

TABLE 8 (Continued)

Expense Category (Project Element)	Original Project	Amendment					TOTAL
		FY 90	FY 91	FY 92	FY 93	FY 94	
4. OTHER COSTS							
a. Research Support	1,430	110	205	200	195	125	2,265
b. AVCTI Construction	950	-	-	-	-	-	950
c. Grants							
(i) ICARDA	1,500	-	-	-	-	-	1,500
(ii) BOSTID-WAS	-	1,450	950	470	-	-	2,870
Sub-Total	3,880	1,560	1,155	670	195	125	7,585
d. Inflation 1/	-	10	20	25	30	30	115
Total Other Costs	3,880	1,570	1,175	695	225	155	7,700
5. Evaluation	200	-	-	45	-	40	285
Inflation 1/	-	-	-	5	-	5	10
Total Evaluation	200	0	0	50	0	45	295
6. Total (1-5) without inflation	30,000	1,951	1,928	1,767	975	427	37,048
7. Total Inflation	0	29	97	181	167	98	572
Total with Inflation	30,000	1,980	2,025	1,948	1,142	525	37,620
8. Contingency (5%)	0	99	100	97	57	26	380
GRAND TOTAL	30,000	2,079	2,125	2,045	1,199	551	38,000

1/ Inflation calculated for each fiscal year by 5% annually compounding over the relevant number of years. Grants are not inflated.

TABLE 9

A. I. D. FUNDING
LIFE OF PROJECT EXPENDITURES BY EXPENSE CATEGORY, FOREIGN EXCHANGE
AND LOCAL COSTS, AND FISCAL YEAR
(\$ 000)

Expense Category	FY 84-89		FY-90		FY-91		FY-92		FY-93		FY-94		TOTAL		TOTAL FX + LC
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
1. Technical Assistance															
a. Long-Term	4,470	1,200	1,450	830	1,450	500	500	310	310	150	80	10	8,260	2,800	11,060
b. Short-Term	600	450	250	120	210	115	150	90	155	95	55	35	1,420	905	2,325
c. Local Consultants/Staff:	-	830	-	100	-	100	-	95	-	75	-	35	0	1,335	1,335
Total T.A.	5,070	2,600	1,700	850	1,660	715	650	496	465	320	135	80	9,680	5,040	14,720
2. Training															
a. U.S.															
(i) Long-Term	2,670	200	1,440	60	1,440	60	1,100	50	450	20	50	-	7,150	390	7,540
(ii) Short-Term	1,300	300	100	30	95	30	30	20	30	15	25	15	1,580	410	1,990
b. Third Country	360	50	40	10	30	10	20	10	12	8	-	-	462	88	550
c. In-country	-	480	-	100	-	95	-	95	-	95	-	65	0	930	930
Total Training	4,330	1,030	1,580	200	1,565	195	1,150	175	492	138	75	80	9,192	1,818	11,010
3. Commodities															
a. Vehicles	390	10	115	5	-	-	-	-	-	-	-	-	505	15	520
b. Furniture & Equipment	1,400	320	300	115	-	-	-	-	-	-	-	-	1,700	435	2,135
c. Computers	440	-	-	-	-	-	-	-	-	-	-	-	440	0	440
d. Other	70	300	40	100	155	40	25	20	20	10	10	10	320	480	800
Total Commodities	2,300	630	455	220	155	40	25	20	20	10	10	10	2,965	930	3,895
4. Other Costs															
a. Research Support	150	730	50	300	50	290	40	290	45	290	45	100	300	2,000	2,300
b. AVCTI Construction	40	860	25	25	-	-	-	-	-	-	-	-	65	885	950
c. Grants															
(i) ICARDA	-	-	550	150	650	150	-	-	-	-	-	-	1,200	300	1,500
(ii) BOSTID-MAS	-	-	1,450	-	950	-	470	-	-	-	-	-	2,870	0	2,870
Total Other Costs	190	1,590	2,075	475	1,650	440	510	290	45	290	45	100	4,515	3,185	7,700
5. Evaluation	100	60	-	-	-	-	40	35	-	-	30	30	170	125	295
TOTAL (1 - 5)	11,990	5,890	5,810	1,745	5,030	1,390	2,375	1,116	1,022	758	295	300	26,522	11,098	37,620
6. Contingency	-	-	-	-	-	-	-	-	-	-	-	-	200	180	380
GRAND TOTAL	11,990	5,890	5,810	1,745	5,030	1,390	2,375	1,116	1,022	758	295	300	26,722	11,278	38,000

The commodity cost estimates: audio visual equipment are based on recent orders for the same or similar equipment by USAID/Pakistan. Other commodity costs cover the numerous small items expected to be needed. Specific details have not yet been developed. However, no large items are expected.

The cost for the construction of the Audio Visual Center and Training Institute at NARC is in accordance with the already executed fixed price contract funded under the original project. No further construction is anticipated.

A contingency factor of approximately 5% has also been added to cover possible research cost or training extensions.

3. Obligations

Beginning FY 90 nearly \$27.5 million of the \$30.0 million obligation was earmarked. The obligations schedule shown in Table 10 reflects the funding required by fiscal year for both ongoing and new activities. Anticipated obligations are FY 90 - 3,000; FY 91 - 2,000; and FY 92 - 3,000.

4. Methods of Implementation and Financing

Table 11 shows the methods of implementation and financing for the A.I.D. contribution for the project amendment. No departure from the three preferred methods of A.I.D. financing are contemplated, except for the use of direct L/Com's for host country contracts for procurements of primarily commodities and equipment and also technical services. The justification for using this method of payment is that the host country does not have sufficient resources to make payment and then seek reimbursement from A.I.D.

It is anticipated that both the major Technical Assistance contract as well as the international research institutions will all be within the scope of AID audit coverage. Host country commodity procurement is a part of the USAID arrival accounting system, and host country construction will be subject to AID engineering inspection approval. Local cost financing such as for local training is subject to Controller Office reviews on a sample basis.

F. Narcotics Impact Statement

The analysis made in MART PP remains valid.

G. Environmental Analysis

An initial Environmental Examination recommending negative determination was included in the original project PID and approved at the time of PID approval. In view of proposed modified project activities under the amendment, the Environmental Examination was reviewed at the time of the concept paper. A categorical exclusion for an environmental examination was recommended. The bureau environmental officer concurred by cable in a categorical exclusion for the amended project as shown in Annex I.

TABLE 10
OBLIGATION SCHEDULE
(\$ 000)

Year	Source of Funding		TOTAL
	ESF	DA	
Original Project:			
1984	5,000	-	5,000
1985	5,000	-	5,000
1986	1,500	8,500	10,000
1988	-	5,000	5,000
1989	-	5,000	5,000
Sub-Total:	11,500	18,500	30,000
Amendment:			
1990	-	3,000	3,000
1991	-	2,000	2,000
1992	-	3,000	3,000
Sub-Total:	-	8,000	8,000
TOTAL:	11,500	26,500	38,000

Table 11
Methods of Implementation and Financing
(US \$000)

<u>Method of Implementation</u>	<u>Method of Financing</u>	<u>Estimated Amount</u>
Participant (Overseas) Trg. through DSTP Contractor - A.E.D.	FRLC	300
AID Competitive Institutional Contract (1991-1994)	Direct Payment	2,800
Local Training	HC Reimbursement	400
Commodities (Household/ Office) - AID Procurement	Direct Payment	100
Commodities (Research Equipment) - HC Procurement	Direct L/Com or Direct Payment	350
Evaluation/Audit AID/W IQC	Direct Payment	100
Other Costs - Research Support HC Procurement	Direct Payment	950
Grant to BOSTID of U.S. National Academy of Science for predominant capability and exhibited competence.	Grant	3,000
	Total:	8,000

VII. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

A. Covenants

1. Funding for Amended Life of Project

The cooperating country agrees to budget, in its Annual Development Plans for Pakistan fiscal years 1989/90 through 1994/95 or the life of the amended project, whichever is longer, for sufficient funds to cover all estimated costs of the project, including all resources provided by both the cooperating country and donor agencies. The cooperating country further agrees to providing adequate funding for operation and maintenance of project facilities and vehicles.

2. PARC Agricultural Research Budget

The Grantee covenants that it will ensure that no hiring of new personnel will occur until such time the budget split between personnel costs and operating costs reaches a 60-40 ratio. Furthermore, the annual recurrent budgets will reflect levels in the operational line items sufficient for implementation of research projects.

B. Negotiating Status

The Amendment has been prepared with the full participation of the appropriate GOP officials. The MART project coordination committee, on which all of the major cooperating institutions and universities are represented, reviewed a draft PC-1 and recommended that the draft be submitted to the appropriate authorities for approval. It is anticipated that the amended Project Agreement will be signed by the GOP and USAID by July 1990.

VIII. ANNEXES

SUFFICIENT FORMAL OPPORTUNITIES TO EXPOSE PROVINCIAL INSTITUTIONS TO THESE MODELS, AND PERHAPS MORE IMPORTANTLY ADEQUATE RESOURCES TO FOLLOW-UP IN AREAS WHERE THEY DEMONSTRATE INTEREST.

4. ISSUE 2: ADDRESSING EDUCATIONAL CONSTRAINTS FOR AGRICULTURAL RESEARCH: IN THE RECENT EVALUATION, THE LOW EDUCATIONAL STANDARDS OF AGRICULTURAL GRADUATES HAS BEEN IDENTIFIED AS THE MAJOR INSTITUTIONAL CONSTRAINT IMPEDING AGRICULTURAL RESEARCH IN PAKISTAN. THE REFCABLE PROPOSES LIMITED TRAINING ACTIVITIES IN PARA 4.1 (II). WHILE MART IS NOT IN POSITION TO PROVIDE MAJOR REMEDIES FOR AG EDUCATION, THE ANALYSIS OF THE EDUCATION PROBLEM SHOULD BE DISCUSSED IN THE AMENDMENT AND PERHAPS ELEVATED TO A POLICY DIALOGUE ISSUE WITH THE GOP AND OTHER DONORS. FYI IN BANGLADESH, THE US AND JAPAN FINANCED THE INSTITUTE OF POSTGRADUATE STUDIES IN AGRICULTURE LARGELY TO DEAL WITH THE PROBLEM OF INADEQUATE QUALITY OF GRADUATES COMING TO RESEARCH ORGANIZATIONS. END FYI

5. ISSUE 3: WATER RESEARCH: IRRIGATED AGRICULTURE, WHICH PROVIDES NEARLY 90 PERCENT OF PAKISTAN'S AGRICULTURAL PRODUCTION, FACES MAJOR WATERLOGGING AND SALINITY PROBLEMS. THE EVALUATION CRITICIZED THE MART PROJECT FOR NOT PROVIDING ADEQUATE RESEARCH RELATED TO IRRIGATED AGRICULTURE. THE REF CABLE DOES NOT ADDRESS THIS ISSUE. WHAT SCOPE IS THERE WITHIN THE PP AMENDMENT FOR PROVIDING MORE FOCUS ON WATER LOGGING AND SALINITY ISSUES?

6. ISSUE 4: INTEGRATING RESEARCH AND PRODUCTION: THE REF CABLE PROPOSES TO INTEGRATE RESEARCH AND PRODUCTION PRIMARILY BY CONDUCTING RESEARCH IN THE FARMER'S FIELDS USING FARMING SYSTEMS RESEARCH AND DEVELOPMENT APPROACHES AND EQUIPPING A MULTIMEDIA PRODUCTION STUDIO. IT IS OUR VIEW THAT THESE INTERVENTIONS ENABLE RESEARCH TO BE MORE APPROPRIATE BUT ARE OFTEN LESS SUCCESSFUL IN MAKING RESEARCH AVAILABLE TO FARMERS AND LOCAL AGRICULTURAL FIELD ORGANIZATIONS. THE MISSION MAY WISH TO CONSIDER A SISTER COMPETITIVE GRANTS PROGRAM, TO COMPLEMENT THE PROPOSED RESEARCH GRANTS ACTIVITY, AIMED AT ENLISTING THE PARTICIPATION OF FIELD ORGANIZATIONS IN APPLIED RESEARCH AND FIELD TESTING. THIS APPROACH WOULD EXPAND THE OUTREACH OF MART/NARC AND FOCUS RESEARCH MORE DIRECTLY ON AGRICULTURAL PRODUCTIVITY APPLICATIONS AND ORGANIZATIONAL INNOVATION. THE MISSION SHOULD ALSO CONSIDER INCLUDING INTEGRATED PEST MANAGEMENT RESEARCH AND TRAINING COMPONENTS FOR THE MART PROJECT STAFFED BY A FULL TIME ADVISOR.

7. ISSUE 5: LINKAGES WITH OTHER AID-FINANCED

PROJECTS: AGRICULTURAL RESEARCH PLAYS AN IMPORTANT ROLE IN A NUMBER OF OTHER AID-FINANCED PROJECTS SUCH AS TIPAN, ISM, AND FSM. LIKEWISE, POLICY ISSUES IN THE AGRICULTURAL SECTOR RELATED TO AG RESEARCH, AND MART IN PARTICULAR, COULD USEFULLY BE INCLUDED IN THE ASSP NEGOTIATIONS WITH THE COP. THE AREAS WHERE PRODUCTIVE COLLABORATION BETWEEN MART AND OTHER AID-FINANCED PROJECTS SHOULD BE DESCRIBED IN THE AMENDMENT.

B. OTHER: A). REVISING BASIC PROJECT DESIGN - THE PROJECT EVALUATION CRITICIZED THE MART PROJECT DESIGN FOR INCLUDING ACTIVITIES WHICH WERE INAPPROPRIATE, FOPS WITHOUT BASELINE INFORMATION, AND INADEQUATE AMOUNTS OF MANAGEMENT RESOURCES. THE MISSION SHOULD USE THE DESIGN OF THE PP AMENDMENT TO MAKE THE NECESSARY MODIFICATIONS AND ENSURE CONSISTENCY IN ALL PROJECT DOCUMENTATION.

B). AGRO ECOSYSTEMS ANALYSIS - MISSION MAY WISH TO LOOK INTO AGRO ECOSYSTEMS ANALYSIS AND OTHER RAPID RURAL APPRAISAL APPROACHES TO DESIGNING FARMING SYSTEMS RESEARCH ACTIVITIES. BELIEVE GORDON CONWAY HAS ALREADY ASSISTED AGA KHAN FOUNDATION (AKRSP) TO ADOPT THIS APPROACH IN NORTHERN AREAS RURAL PROGRAMS IN PAKISTAN. EAGLEBURGER
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UNCLASSIFIED STATE 214215/02

SC(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A includes criteria applicable to all projects. Part B applies to projects funded from specific sources only: B(1) applies to all projects funded with Development Assistance; B(2) applies to projects funded with Development Assistance loans; and B(3) applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT? Yes
Yes

A. GENERAL CRITERIA FOR PROJECT

1. FY 1989 Appropriations Act Sec. 523; FAA Sec. 634A. If money is sought to obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified to Congress, has Congress been properly notified? Yes. A Congressional Notification (CN) has been submitted.
2. FAA Sec. 611(a)(1). Prior to an obligation in excess of \$500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? Yes.
3. FAA Sec. 611(a)(2). If legislative action is required within recipient country, what is the basis for a reasonable expectation that such action will be completed in time to permit orderly accomplishment of the purpose of the assistance? No further legislative action is required.

N/A

4. FAA Sec. 611(b); FY 1989 Appropriations Act Sec. 501. If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for guidelines.)
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and total U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively?
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

This project is highly Pakistan-specific and hence is not susceptible to execution as a part of a regional project, nor will it likely encourage regional development programs.
7. FAA Sec. 601(a). Information and conclusions on whether projects will encourage efforts of the country to:
(a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

(a) No This project has a
(b) Yes major impact on
(c) No improving the quality
(d) Yes of human resources
(e) Yes working in the
(f) No agriculture sector.
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

U.S. private enterprises will participate as suppliers of both goods and services under this project.

9. FAA Secs. 612(b), 616(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars. This is an ESF and DA funded project. The GOP will contribute the equivalent of 25% of the total project cost to help finance local costs.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? N/A
11. FY 1989 Appropriations Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?
12. FY 1989 Appropriations Act Sec. 549. Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807, which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel?
13. FAA Sec. 119(g)(4)-(6) & (10). Will the assistance (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other No.

wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas?

14. FAA Sec. 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt, and expenditure of project funds (either dollars or local currency generated therefrom)? N/A
15. FY 1989 Appropriations Act. If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government? N/A
16. FY 1989 Appropriations Act Sec. 538. If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.? N/A
17. FY 1989 Appropriations Act Sec. 514. If funds are being obligated under an appropriation account to which they were not appropriated, has prior approval of the Appropriations Committees of Congress been obtained? N/A
18. State Authorization Sec. 139 (as interpreted by conference report). Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/C and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision). This will be done.

D. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. **FY 1989 Appropriations Act Sec. 540**
(as interpreted by conference report for original enactment). If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities (a) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U.S. exporters of a similar agricultural commodity; or (b) in support of research that is intended primarily to benefit U.S. producers?

- (a) No
- (b) No

b. **FAA Secs. 102(b), 111, 113, 201(a)**. Describe extent to which activity will (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life, and otherwise encourage democratic private and local governmental

(a) The objective of the project is to strengthen research and management capabilities at selected key institutions; and to develop and disseminate information and improved technology relevant to farmers need.

(b) Funding is especially provided for technical information transfer which focuses on the management and dissemination of information. Model multi-media information modules will be developed to introduce project developed technology to varied audiences, from policy planners to farmers.

institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries.

(c) See a and b above.

(d) Training courses will be organized for rural women in relevant areas, e.g. farming systems research, at appropriate institutes.

(e) N/A

- c. FAA Secs. 103, 103A, 104, 105, 106 120-21; FY 1989 Appropriations Act (Development Fund for Africa). Does the project fit the criteria for the source of funds (functional account being used)?
Yes.

- d. FAA Sec. 107. Is emphasis placed on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?
Yes.

- e. FAA Secs. 110, 124(d). Will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?
Yes, the GO? will provide at least 25% of the total project costs.

- f. FAA Sec. 128(b). If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority?
Yes

- g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government. The project is designed to improve the income of small farmers, sustain an increase in food and fibre production and conserve the natural resource base. Training will be provided to the research personnel, social scientists, and agricultural communicators which will correspondingly improve their managerial, organizational and technical skills.
- h. FY 1989 Appropriations Act Sec. 536. Are any of the funds to be used for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions? No.
- Are any of the funds to be used to pay for the performance of involuntary sterilization as a method of family planning or to coerce or provide any financial incentive to any person to undergo sterilization? No.
- Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning? No.
- i. FY 1989 Appropriations Act. Is the assistance being made available to any organization or program which has been determined to support or participate in the management of a program of coercive abortion or involuntary sterilization? No.
- If assistance is from the population functional account, are any of the funds to be made available to voluntary family planning projects which do not offer, either directly or through referral to or information about access to, a broad range of family planning methods and services? N/A

- j. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? Yes.
- k. FY 1989 Appropriations Act. What portion of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, colleges and universities having a student body in which more than 40 percent of the students are Hispanic Americans, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)? Every reasonable attempt will be made to provide disadvantaged enterprises the maximum portion of project funding.
- l. FAA Sec. 118(c). Does the assistance comply with the environmental procedures set forth in A.I.D. Regulation 16? Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent feasible: (a) stress the importance of conserving and sustainably managing forest resources; (b) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (c) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (d) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices; (e) help conserve forests which have not yet been degraded by helping to increase N/A

production on lands already cleared or degraded; (f) conserve forested watersheds and rehabilitate those which have been deforested; (g) support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (h) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (i) conserve biological diversity in forest areas by supporting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation, and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas; (j) seek to increase the awareness of U.S. government agencies and other donors of the immediate and long-term value of tropical forests; and (k) utilize the resources and abilities of all relevant U.S. government agencies?

- m. FAA Sec. 118(c)(13). If the assistance will support a program or project significantly affecting tropical forests (including projects involving the planting of exotic plant species), will the program or project (a) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and (b) take full account of the environmental impacts of the proposed activities on biological diversity?

- n. FAA Sec. 110(c)(14). Will assistance be used for (a) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; or (b) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas?
- o. FAA Sec. 110(c)(15). Will assistance be used for (a) activities which would result in the conversion of forest lands to the rearing of livestock; (b) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands; (c) the colonization of forest lands; or (d) the construction of dams or other water control structures which flood relatively undegraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development?
- p. FY 1989 Appropriations Act. If assistance will come from the Sub-Saharan Africa DA account, is it (a) to be used to help the poor majority in Sub-Saharan Africa through a process of long-term development and economic growth that is equitable, participatory, environmentally sustainable, and self-reliant; (b) being provided in accordance with the policies contained in section 102 of the FAA;

N/A

N/A

(c) being provided, when consistent with the objectives of such assistance, through African, United States and other PVOs that have demonstrated effectiveness in the promotion of local grassroots activities on behalf of long-term development in Sub-Saharan Africa; (d) being used to help overcome shorter-term constraints to long-term development, to promote reform of sectoral economic policies, to support the critical sector priorities of agricultural production and natural resources, health, voluntary family planning services, education, and income generating opportunities, to bring about appropriate sectoral restructuring of the Sub-Saharan African economies, to support reform in public administration and finances and to establish a favorable environment for individual enterprise and self-sustaining development, and to take into account, in assisted policy reforms, the need to protect vulnerable groups; (e) being used to increase agricultural production in ways that protect and restore the natural resource base, especially food production, to maintain and improve basic transportation and communication networks, to maintain and restore the renewable natural resource base in ways that increase agricultural production, to improve health conditions with special emphasis on meeting the health needs of mothers and children, including the establishment of self-sustaining primary health care systems that give priority to preventive care, to provide increased access to voluntary family planning services, to improve basic literacy and mathematics especially to those outside the formal educational system and to improve primary education, and to develop income-generating opportunities for the unemployed and underemployed in urban and rural areas?

9. FY 1989 Appropriations Act Sec. 515.
If deob/keob authority is sought to be exercised in the provision of DA assistance, are the funds being obligated for the same general purpose, and for countries within the same general region as originally obligated, and have the Appropriations Committees of both Houses of Congress been properly notified?

N/A

2. Development Assistance Project Criteria (Loans Only)

This is an ESF and DA grant funded project.

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan at a reasonable rate of interest.

N/A

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20 percent of the enterprise's annual production during the life of the loan, or has the requirement to enter into such an agreement been waived by the President because of a national security interest?

N/A

c. FAA Sec. 122(b). Does the activity give reasonable promise of assisting long-range plans and programs designed to develop economic resources and increase productive capacities?

N/A

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA?

Yes, the ultimate beneficiaries of the project are the private sector small farmers whose income should rise as a result of increased agricultural production.

b. FAA Sec. 531(e). Will this assistance be used for military or paramilitary purposes?

No.

c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

N/A



UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

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Islamabad, Pakistan

MANAGEMENT OF AGRICULTURAL RESEARCH AND
TECHNOLOGY (MART) PROJECT (391-0489)

Certification for Compliance With Gray Amendment

I, J. Paul Guedet, acting on behalf of the principal officer of the Agency for International Development in the Islamic Republic of Pakistan, do hereby certify that the acquisition plan in the Project Paper was developed with full consideration of maximally involving Minority and Women-Owned Firms, or Gray Amendment Organizations, in the provision of required goods and services. Set-aside opportunities for such organizations to participate in **this project have been assessed and deemed inappropriate at this stage.** However, such organizations are encouraged to compete for contract awards, and prime contractors are expected to make an effort to sub-contract, as appropriate, with these entities. During the course of implementation, opportunities for such organizations to participate in the project will be further considered.



J. Paul Guedet
Deputy Director
USAID/Pakistan



Date



Telegram ECONOMIC
Telex ECON DIV No 05 614

No. 1(25)US-1/84
Government of Pakistan
MINISTRY OF FINANCE AND
ECONOMIC AFFAIRS
(ECONOMIC AFFAIRS DIVISION)

Islamabad, the 6th March, 1990.

FROM: JOINT SECRETARY,
TELE: 821682.

SUBJECT:- PROVISION OF ADDITIONAL GRANT ASSISTANCE OF \$ 13.5 MILLION
TO THE PHASE-II OF MART PROJECT.

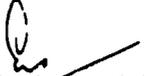
Dear Mr. Norris ,

Under the MART Project the USAID was to provide grant assistance of \$ 30 million which has since been obligated. The GOP feels that the US economic assistance under the above project has proved very useful in the development of the National Agricultural Research System and wishes to continue this project.

USAID are therefore, requested to kindly provide additional grant funds of \$ 13.5 million for the phase-II of the MART project with an extension of the Project Assistance Completion Date to September 30, 1994. The project would be revised in consultation with the provinces after which it will be considered for approval by the competent authority. A project agreement for additional funds would, however, be signed with USAID after its approval by the competent forum of the Government of Pakistan.

With best regards,

Yours sincerely,


(Saad Ashraf)

Mr. James A. Norris,
Director,
USAID Mission,
Islamabad.

AMENDED PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

Project Title and Number: Management of Agricultural Research and Technology
Project Number: 191-0489

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Program or Sector Goal:	Measure of Goal Achievement:		Assumption for Achieving Goal Targets
<p>The broader objective to which this project contributes:</p> <p>-To improve income of small farmers, sustain an increase in food and fibre production and conserve the natural resource base.</p>	<ul style="list-style-type: none"> - Increased production and availabilities of food and fibre - Decreased food imports - Improved foreign exchange situation - Increased per capita income 	<ul style="list-style-type: none"> - Published data on agricultural production, yields, and rural employment - GOP planning budget documents - Basic socio-economic data - AID project reports - Field observations 	<ul style="list-style-type: none"> - Continued GOP commitment to the agricultural sector in general and to agricultural research in particular as evidenced by adequate budgetary allocations and favorable policies - Required inputs for agricultural production are consistently available at affordable prices - Farmers adopt new technology - Weather conditions are favorable.
Project Purpose:	Conditions That Will Indicate Purpose Has Been Achieved: (EOPS)		Assumptions for Achieving Purpose and Outputs:
<p>The purpose is to:</p> <p>a) develop & disseminate improved technology and information through key research institutions, and</p> <p>b) foster a collaborative relationship whereby research institutes serve private agribusiness and farmers and use the private sector to disseminate marketable, improved technologies.</p>	<ul style="list-style-type: none"> - Concrete system in which the 9 key institutions, namely PARC, AZRI, NARC, DAF, AARI, SARIAB, GAP, IAS and ASI, Tandojam approve research agenda based on farmer and agro-industry needs consistent with funding availability 	<ul style="list-style-type: none"> - Allocation of adequate personnel & operating expenses to priority research programs - Implementation of master plans: NARP, AZRI, ANPB, NWP & Baluchistan - Checks in budget procedures to ensure earlier releases in the fiscal year of operating costs to priority programs 	<ul style="list-style-type: none"> - Despite acute financial stringency GOP continues to accord policy support and financial commitment to agricultural research at least at present levels - International lenders collaborate on collegial basis - Private agribusiness collaboration

AMENDED PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

Project Title and Number: Management of Agricultural Research and Technology
Project Number: 391-0489

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
	<ul style="list-style-type: none"> - Marketable/farmer acceptable technologies developed for use by Pakistan's production system. - Operational linkages are established and functioning for dissemination of appropriate research information between MARC, ADRI and the 4 Provincial Agricultural Communication Support Cells on the one hand and private agribusiness, farmer associations, the extension service on the other hand. 	<ul style="list-style-type: none"> - Monitoring expenditure of operating costs - Recommendations from meetings - Research Planning documents - Research reports by returned participants - Budgets allocated for programs staffed by returned trainees - Cooperative agreements - Generation of reports and research publications - Extension staff & researchers cooperating in on-farm research - Reports on activities and accomplishments of the PACS cells - Development of A/V modules for radio, t.v. & extension use - Publications written for and distributed to extension staff and private agri-business - Number of interventions adopted by target farmers - Number of target farmers adopting the new technology 	<ul style="list-style-type: none"> - Technologies developed are socially and economically appropriate to farmers - Research/extension/private agribusiness dialogue

AMENDED PROJECT DESIGN SUMMARY LOGICAL FRAMEWORK

Project Title and Number: Management of Agricultural Research and Technology
Project Number: 391-0489

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
	<ul style="list-style-type: none"> - Marketable/farmer acceptable technologies developed for use by Pakistan's production system. - Operational linkages are established and functioning for dissemination of appropriate research information between NAHC, AARI and the 4 Provincial Agricultural Communication Support Cells to the use and private agribusiness, farmer associations, the extension service on the other hand. 	<ul style="list-style-type: none"> - Monitoring expenditure of operating costs - Recommendations from meetings - Research Planning documents - Research reports by returned participants - Budgets allocated for programs staffed by returned trainees - Cooperative agreements - Generation of reports and research publications - Extension staff & researchers cooperating in on-farm research - Reports on activities and accomplishments of the FACS cells - Development of AV modules for radio, TV & extension use - Publications written for and distributed to extension staff and private agribusiness - Number of interventions adopted by target farmers - Number of target farmers adopting the new technology 	<ul style="list-style-type: none"> - Technologies developed are socially and economically appropriate to farmers - Research/extension/private agribusiness dialogue

AMENDED PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

Project Title and Number: Management of Agricultural Research and Technology
Project Number: 391-0489

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
OUTPUTS Magnitude of Outputs:			
Component 1: Ensuring Research Responsiveness			
<p>- Periodic seminars organized by PARC at which representatives of the country's major chambers of commerce, businessmen's associations present PARC with problems faced by agro-industry for inclusion in PARC's research agenda</p> <p>- PARC, through its Agribusiness Relations Cell, enters into a minimum of 15 collaborative agreements with other national and international agribusinesses and agro-industrial firms for the purpose of finding solutions through research to problems brought forward by the private businesses.</p> <p>- NARS and ADRI are implementing efficient, output-oriented management systems characterized by pre-settled targets, flexible personnel, management systems and performance monitoring.</p>	<p>- Project evaluations</p> <p>- Special surveys, studies and reports.</p> <p>- Published agricultural area and production data.</p> <p>- AID and project records.</p> <p>- Field observations.</p> <p>- PARC and Provincial research reports, records and scientific publications.</p>	<p>- Sufficient GOP staff and resources will be made available.</p> <p>- Project advisors are successful in transferring skills and technology to federal and provincial institutions.</p> <p>- GOP prepares and approves PC-Is as needed.</p> <p>- Qualified staff are selected for training.</p> <p>- Necessary skills and materials are available locally for construction programs</p> <p>- Adequate numbers of qualified personnel can be hired and retained to staff the production studio and expanded training facility.</p>	

AMENDED PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

Project Title and Number: Management of Agricultural Research and Technology
Project Number: 391-0489

Narrative Summary

Objectively
Verifiable Indicators

OUTPUTS (continued)

Magnitude of Outputs:

- A strengthened national FSR program, including: an adequately funded and staffed FSR Coordination and Project Development Cell, model FSR projects established in target areas of each province; FSR course(s) introduced at the agricultural universities and a special women's FSR program.

- MARC and AZRI master plan agenda prioritized in accordance with farmer/agribusiness needs and budget allocations.

- Re-entrant training participants are aware of technological needs of private agro-industry, as a result of a program of project funded visits to private businesses and seminars.

Component 2: Technology Development

- A minimum of 10 marketable products developed through long-term collaborative relationships in which PABC provides research related inputs and private agribusinesses and agricultural input manufacturers provide capital and other inputs.

- Solutions to a minimum of 15 problems that are addressed by FABC in response to specific requests from private agribusiness firms, agricultural input manufacturers or private producers' associations.

- Solutions to agriculture related problems identified by grantees (including a minimum of 5 agribusinesses), arrived at through research grants administered by BOSTID.

- A minimum of 10 marketable, agriculture related products of private commercial enterprises developed through grants administered BOSTID.

- Farming Systems Research (FSR) conducted by multidisciplinary teams from all 9 participating institutions with collaboration from private input manufacturers develops technologies resolving a minimum of 10 problems faced by farmers.

AMENDED PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

Project Title and Number: Management of Agricultural Research and Technology
Project Number: 391-0489

Narrative Summary	Objectively Verifiable Indicators
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OUTPUTS (continued)

Magnitude of Outputs:

- Demand for and suitability of a minimum of 10 agricultural tested and proven through the FSR trials, resulting in commercial production of these inputs.

Component 3: Dissemination

- A minimum of 10 technologies developed through the national research system disseminated to farmers by agribusiness firms, through contract farming or similar mechanisms.

- A minimum of 10 products resulting from research undertaken through the national research system adopted by private agro-industry for commercialization.

- An effective system for documentation and transfer of field tested technology and information developed and operational, including institutionalized National and Provincial Technical Information Transfer Committees, each with private sector representatives as members, and four Provincial Agricultural Communication Support Cells

AMENDED PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

Project Title and Number: Management of Agricultural Research and Technology
Project Number: 391-0489

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
INPUTS			
Implementation Targets: Type & Quantity			
<p>1. USAID -----</p> <ul style="list-style-type: none"> - Short and long-term technical assistance - Short & Long Term training incountry and overseas - computers, research equipment and other commodities - Studies & demonstrations - Start up research costs 	<ul style="list-style-type: none"> - See Technical Assistance in PP. - See financial analysis, implementation schedule and commodity plans in PP 	<ul style="list-style-type: none"> - AID & GOP funding levels proposed are approved and disbursed. - GOP meets the covenants - Appropriate consultants can be recruited to provide required technical assistance. - Private agribusiness is ready to collaborate with public sector agricultural research organisations 	
<p>2. GOP (Cost and in kind) ---</p> <ul style="list-style-type: none"> - Staff salaries and operating expenses - Operating and maintenance costs for newly constructed facilities. - Vehicle operating costs 			
<p>3. Private Agribusiness -----</p> <ul style="list-style-type: none"> - Inputs required for cooperative agreements and partnerships 			

ADDITIONAL ISSUES

The following secondary issues related to the MART amendment raised in the AID/W project review committee cable STATE 214215 dated 07 July 1989 and in the mission project committee meeting held on December 4, 1989 which reviewed the draft project paper have been considered in the design process and are discussed below:

1. Low educational standards of Pakistan agricultural graduates as impediment to high quality agricultural research.

In the January 1989 MART evaluation, the problem of inadequate quality of graduates from Pakistan Agricultural Universities as it impacts on the manpower quality for agricultural research was highlighted. While MART is not in a position to provide major remedies for improving agricultural education, the larger USAID agricultural program is addressing this problem. Special training programs funded by ASSP (albeit begun under MART funding) are providing special training for Balochistan and Sind agriculturists. ASSP is funding training slots for the Faisalabad and Tandojam faculties. Plans are underway for a general review of the Faisalabad University. The TIPAN project is working with Peshawar Agricultural University to upgrade that school.

The MART project does impact upon the University program, e.g., through the FSR activity. A number of professors are actively engaged in the on-farm FSR work and are modifying their respective course syllabii to reflect FSR philosophy. Some commodity and training support is given to strengthen their programs.

2. Research related to the problems of irrigated agriculture, especially water logging and salinity.

The MART Amendment is providing a grant for \$3.0 million to BOSTID to administer and coordinate research grants through PARC to the country's best scientists with an emphasis on the problems of stressed lands. Since much of Pakistan's productive agricultural land is irrigated, the problems of water logging and salinity will be of importance to the program. In addition the USAID Irrigation Systems Management Research project is promoting research on problems of salinity and waterlogging.

3. Integration of research and production.

This issue is related to a) the need for feedback on problems from the farmers (producers) to the research establishment, b) testing the validity of technology on farmer groups and c) the larger task of disseminating research results to the farmer community. FSR provides the basis for a good research/producer integration in providing for feedback and testing for validity as do the other on-farm activities planned in this project. The issue of dissemination is covered in the Issues Section D-3.

4. Project Emphasis and Federal/Provincial Linkages:

Continuing many of the on-going activities of the original project, the major emphasis and resources of the amended project go to the provinces. PARC and NARC will develop high quality programs and coordinate audio visual communication with provincial cells, in-service training programs for provincial staff, implementation of provincial master plans, and coordinate a research grants program with the provinces. The PARC Farming Systems Research (FSR) national coordinated research program implements the program in and through provincial institutions and is developing provincial FSR cells. The NARC audio-visual unit works with the 4 provincial cells, developing materials to be used by the provincial extension service. In addition PARC's agri-business relations cell has a national mandate which transcends the federal/provincial limits. Hence, linkages between the federal institutions and the provinces are built into the project's programs and activities.

PURPOSE-LEVEL INDICATORS
AND OUTPUT TARGETS

In response to Mission management and AID/W interest in focusing the Mission review process on project and development objectives, the Office of Project Development and Monitoring is currently developing a Purpose Level Monitoring (PLM) system for all projects in the Mission's portfolio. Below are statements that indicate the end of project status expected of critical project areas. These are the indicators to be monitored to determine whether the project purpose is being met. A short rationale for the selection of each indicator is included. The outputs to be monitored and target dates for completion under each indicator are listed in part C below.. The identification of the specific measures and data needed to monitor progress will be set up by the responsible officers in ARD and PDM in cooperation with the project contractors.

A. PURPOSE

The purpose is to:

- a) develop and disseminate improved technology and information through key research institutions; and
- b) foster a collaborative relationship whereby research institutes serve private agribusiness and farmers and use the private sector to disseminate marketable, improved technologies.

B. INDICATORS AND ANALYTIC INTERPRETATIONS

1. Concrete system in which the nine key institutions approve research agenda based on farmer and agro-industry needs consistent with funding availability.

The key to an aggressive, well managed research institution is its willingness and ability to respond to the needs of its clientele i.e. farmers and agribusiness. This indicator is broad based and to verify its achievement data will be collected relating to each of the project activities affecting the outputs at the participating institutions. These activities are:

- a) Research planning documents resulting from agenda setting seminars/meetings/workshops that interface researchers with farmer associations, chambers of commerce and agribusinesses.
- b) Cooperative agreements, facilitated by PARC's Agribusiness Relations Cell entered into by PARC, NARC and AZRI on the one hand and agribusinesses and agro-industry on the other.
- c) The National FSR coordination and project development cell and the provincial FSR projects.

2. Marketable/farmer acceptable technologies developed for use by Pakistan's production system.

This second indicator is related to the first. The verification of the purpose in relation to this indicator is in the actual conduct of the research that was planned. The purpose assumes positive answers to these questions: Is the research relevant? Are the technologies to farmer and market acceptable? Verification of achievement will be by monitoring the results of the research conducted through the PARC/BOSTID research grants; by AZRI and NARC scientists; by FSR projects and that conducted through the cooperative agreements of agribusinesses with PARC.

3. Operational linkages are established and functioning for dissemination of appropriate research information between NARC, AZRI and four Provincial Agricultural Communication Support (PACS) Cells on the one hand and private agribusiness, farmer associations, mass media, and the extension service on the other hand.

Productive development and dissemination of information and improved **technology relies upon communication between the various participants of the food and fibre production systems.** Technology must be relevant to the problems facing the end-users, which means researchers need feedback communication from agribusiness and farmers to determine agenda, priorities and problems. In reverse, farmers cannot adopt improved technology unless they learn of it from the researchers directly or via extension personnel or from the agricultural input dealers who serve them. Therefore, effective linkages between agribusiness, researchers and extension personnel is key to the achievement of the project purpose.

Verification of achievement of this purpose level indicator will be accomplished by monitoring a) the output and agenda of the NARC AV communication unit and the provincial PACS Cells; b) the flow of information including the multi media information modules being generated and broadcast and c) the acceptance and adoption of the information as evidenced by use of technologies by farmers and by agribusiness for commercialization.

C. TARGET DATES FOR REACHING OUTPUTS

Listed below are the dates targeted to reach the key outputs of the activities supported under the amendment. For an expanded description of the outputs see pages 23, 24 & 25 of the PP. Accomplishment of each of the outputs is indicative of project progress toward meeting its stated purpose. The procedures to be employed in monitoring progress are being developed by PDM, the ARD Project Officer and Project Contractors.

OUTPUTS	TARGETS					LOP
	1990	1991	1992	1993	1994	
1. CRITICAL EVENTS AGENDA						
a. Research Master Plan Developed						
1) NARC	X					X
2) AZRI	X					X
3) SARIAB		X				X
4) AARI Faisalabad			X			X
b. Agribusiness Relations Cell at PARC operational	X					X
c. PACS Cells Formed						
1) NARC	X					X
2) Balochistan		X				X
3) Sindh		X				X
4) Punjab	X					X
5) NWFP		X				X
d. BOSTID Grants Programs initiated by PARC	3	4	2			9
e. Re-entry Program initiated by PARC	X					X
f. AVCTI Building completion at NARC	X					X
g. TITC's						
1) National	X					X
2) Balochistan		X				X
3) Sindh		X				X
4) Punjab	X					X
5) NWFP	X					X
h. Agribusiness Newsletter published by PARC	2	4	6	6	6	24

OUTPUTS	TARGETS					LOP
	1990	1991	1992	1993	1994	
2. ENSURING RESEARCH RESPONSIVENESS						
a. Annual Research Agenda Seminars at Participating Institutions	2	4	7	5	9	all 9 institutions
b. Private Sector/PARC Collaborative Agreements Executed	3	6	9	12	15	15 Collaborative agreements
c. F.S.R. Cells at Participating Institutions	1	4	9	9	9	9 active cells
d. Projectized Budget for research projects at NARC and AZRI	20%	40%	50%	80%	80%	80 % projectized
e. Returning Participants to take part in Re-entry Program	15	30	60	70	90	all 90 returnees in program
3. TECHNOLOGY DEVELOPMENT						
a. Marketable Products developed by PARC Private Sector	1	3	5	8	10	10 products developed
b. Problems of Agribusiness solved	0	4	9	10	15	15 Agribusiness problems solved
c. Agricultural Problems identified/solved by BOSTID grantees	0	0	10	15	20	20 agricultural problems identified/solved
d. Marketable Products developed by BOSTID grantees	0	0	1	3	5	5 marketable products developed
e. Farmer Problems solved by FSP	0	4	6	8	10	10 farmer problems solved
f. Technologies tested and proven by FSP	2	4	6	8	10	10 technologies tested

OUTPUTS	TARGETS					LOP
	1990	1991	1992	1993	1994	
4 DISSEMINATION						
a. Technologies disseminated	2	4	6	8	10	10 technologies disseminated
b. Products Commercialized	1	2	3	4	5	5 products commercialized
c. National Library Information Resource System	0	5	12	17	17	17 libraries with system
d. Information Transfer Modules produced by the 5 Information Transfer Support Cells	2	6	10	15	20	20 Modules produced

42/100

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UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

Cable: USAIDPAK
Telex: 84270 PK
Telephone: 524071-19

18 Sixth Avenue, Ramna 5,
Post Office Box 1028
Islamabad, Pakistan

MANAGEMENT OF AGRICULTURAL RESEARCH AND
TECHNOLOGY (MART) PROJECT (391-0489)

USAID/PAKISTAN MISSION DIRECTOR'S WAIVER FOR A.I.D.
PAYMENT OF INTERNATIONAL PARTICIPANT TRAVEL COSTS

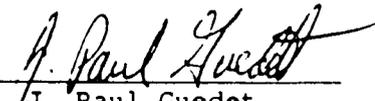
A.I.D. Handbook 10, Chapter 16C1, provides that the cost of international travel, including incidental costs en route as well as the cost of travel between the participant's city and the points of departure and return in the participant's home country, shall be paid by the host government or other sponsor unless, in the case of Mission-funded programs, the Mission Director has justified and authorized full or partial waivers and has so notified S&T/IT.

Training and institution-building are important components of the economic assistance programs negotiated between the Governments of the U.S. and Pakistan. USAID/Pakistan's experience, however, has been that the Government of Pakistan (GOP), due to serious foreign exchange and budgetary constraints, has been historically unable to fund international travel costs for short-term training programs. The consequences have been that Pakistani participants have, on numerous occasions, been denied worthwhile and much needed training, inhibiting the achievement of project targets.

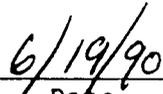
I have carefully reviewed the advisability of requiring full GOP funding for travel costs for participant training of one year or less and the alternative of funding such travel with grant and loan funds provided through USAID/Pakistan to the GOP. Recognizing the objectives of many of our projects and the fact that project success will be enhanced by encouraging opportunities for short-term training, I have determined that it would be prejudicial to U.S. interests to require that the GOP pay the entire international participant travel costs for training programs of one year or less.

Therefore, on all Mission-funded training programs up to and including one year, USAID/Pakistan shall be responsible for the entire cost of the round-trip economy class air ticket and other necessary incidental costs en route. Where a PIO/P has been originally written for a program of one year or less, but, after the participant has initiated his or her program, the program is extended so that it exceeds one year in total, USAID/Pakistan shall also fund the round-trip ticket. The justification for funding programs that are extended is to minimize administrative problems which are otherwise likely to occur.

On the basis of the above justification and pursuant to handbook 10, Chapter 16C2, I, J. Paul Guedet, acting on behalf of the principal officer of the Agency for International Development in Pakistan, do hereby waive the requirement that the host government fully fund international travel for training courses of one year or less and authorize payment with USAID/Pakistan loan and grant funds for travel costs as specified above.



J. Paul Guedet
Deputy Director
USAID/Pakistan



Date

PE

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ANNEX I

ACTION AID INFO AMB DCM ECON AREP/5

VZCZCIL0556

07-JUL-89

OO RUEHIL

TOR: 01:4

DE RUEHC #0899 2092344

CN: 56630

ZNR UUUUU ZZH

CHRG: AID

O 282342Z JUL 89

DIST: AID

FM SECSTATE WASHDC

ADD:

TO AMEMBASSY ISLAMABAD IMMEDIATE 3116

BT

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AIDAC

E.O. 12356: N/A

TAGS:

SUBJECT: IEE MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY PROJECT AMENDMENT

REF A) ISLAMABAD 14944, B) FAX OF IEE FOR MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY PROJECT, C) STATE 220292

THIS IS A REPEAT OF STATE 235525 WHICH WAS ACCIDENTLY MIXED UP WITH 235524.

1. SUMMARY: ANE/PD/ENV APPROVES A CATEGORICAL EXCLUSION FOR THE SUBJECT INITIAL ENVIRONMENTAL EXAMINATION, SUBJECT TO THE REVISIONS NOTED BELOW. WHILE A CATEGORICAL EXCLUSION IS TECHNICALLY CORRECT, IT WOULD BE SOUND ENVIRONMENTAL POLICY TO INCORPORATE ENVIRONMENTAL CONSIDERATIONS IN THE RESEARCH PROGRAM AND DEVELOPMENT OF TECHNOLOGIES WHICH ARE ENVIRONMENTALLY SUSTAINABLE IF ADAPTED. IN CONJUNCTION WITH REF C, SUGGESTED TOPICS FOR MISSION CONSIDERATION ARE PROVIDED. ANE/PD/ENV REGRETS THE DELAY IN REPLYING TO MISSION REQUEST FOR ACTION AND UNDERSTANDS THE URGENCY OF ASSISTING MISSION TO MEET OBLIGATION SCHEDULE. END

SUMMARY.

2. INITIAL ENVIRONMENTAL EXAMINATION (IEE). ANE/PD/ENV CAN CONCUR WITH A RECOMMENDATION FOR A CATEGORICAL EXCLUSION UNDER 22 CFR 216 AS NOTED IN THE TEXT OF THE IEE. THE IEE FACESHEET REQUESTED A NEGATIVE DETERMINATION WHICH IS NOT SUPPORTED IN THE TEXT. MISSION IS REQUESTED TO MAKE TECHNICAL CORRECTION TO FACE SHEET AND REFAX FOR ANE/PD/ENV SIGNATURE.

3. WHILE A CATEGORICAL EXCLUSION IS TECHNICALLY CORRECT AS THE ENVIRONMENTAL PROCEDURES ARE PRESENTLY WRITTEN, INDIRECT NEGATIVE ENVIRONMENTAL EFFECTS COULD OCCUR FROM THE DEVELOPMENT AND APPLICATION OF TECHNOLOGIES WHICH ARE NOT ENVIRONMENTALLY SUSTAINABLE. SUSTAINABILITY COULD BE IMPROVED BY THE EARLY INCORPORATION OF ENVIRONMENTAL CONSIDERATIONS IN THE DEVELOPMENT OF RESEARCH PROGRAMS, IDENTIFICATION OF TRAINING ACTIVITIES, THE USE OF AGROECOSYSTEMS ANALYSIS TO

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INTEGRATE RESEARCH AND PRODUCTION, PROVIDING TECHNICAL ASSISTANCE WHICH FOCUSED ON INTERDISCIPLINARY RESEARCH, STRENGTHENING PROGRAMS FOCUSED ON FARMERS, AND INCLUDING RESEARCH ON PESTICIDE USE AND INTEGRATED PEST MANAGEMENT. MISSION MAY WISH TO CONSIDER THESE TOPICS IN CONJUNCTION WITH REVIEW OF ENVIRONMENTAL SUSTAINABILITY OF AGRICULTURAL PROGRAMS IN PAKISTAN AS MENTIONED IN REF C.

4. NEXT STEPS. THIS CABLE SERVES AS ANE/PD/ENV'S CONCURRENCE WITH A CATEGORICAL EXCLUSION. IN ORDER TO PUT THE DOCUMENTATION IN PLACE, MISSION IS REQUESTED TO PROVIDE ANE/PD/ENV WITH A REVISED FAX REQUESTING CONCURRENCE WITH A CATEGORICAL EXCLUSION, NOT A NEGATIVE DETERMINATION AS ORIGINALLY REQUESTED. BECAUSE ACTING BUREAU ENVIRONMENTAL COORDINATOR IS LEAVING FOR TDY TO THE PHILIPPINES ON JULY 31, MISSION IS REQUESTED TO REFAK REVISED IEE AS SOON AS POSSIBLE.

5. MISSION REPLY TO REF C AND SUGGESTIONS RAISED IN PARA 3 ABOVE CAN BE CONSIDERED TOGETHER. IT IS EXPECTED THAT THE ISSUES RAISED WILL BE THE SUBJECT OF DISCUSSIONS FOR PROPOSED ANE/PD/ENV STAFF TDY IN OCTOBER.

6. PLEASE ADVISE. EAGLEBERGER

BT

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INITIAL ENVIRONMENTAL EXAMINATION (IEE)
FOR
MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY (MART)

- | | |
|----------------------------------|--|
| 1. Project Country | Islamic Republic of Pakistan |
| 2. Project Title and Number
A | Pakistan - Management of Agricultural Research and Technology (MART), 391-04 |
| 3. Project Funding | The LOP funding will be \$43.5 Million Grant and ESF funds |
| 4. Life of Project | FY 1984 - FY 1994 (10 Years) |
| 5. Reviewed and Concurred by | Waldemar Albertin
Mission Environmental Officer(A) |

Signature: W. Albertin
Date : 7-25-89

- | | |
|-------------------------------------|-----------------------|
| 6. Recommended Environmental Action | Categorical Exclusion |
|-------------------------------------|-----------------------|

7. Mission Director's Concurrence

Signature James A. Norris
Date 7/31/89

8. Decision of Environmental Coordinator, Bureau for Asia and the Near East

Approved W. Albertin
Disapproved _____
Date 7-25-89

**Major Accomplishments from USAID's Assistance to
Pakistan Agricultural Research**

AID assistance to Pakistan's Agricultural research institutions and programs has mirrored the ups and downs of US assistance to Pakistan over the past twenty years. In spite of the problems encountered, this assistance has been significant and the results of US and other donor support can be seen in the modern, well staffed and relatively well supported local research institutes. The impact can be seen in the high yielding varieties that continue to help Pakistani farmers to achieve record high output. It can be seen in the machinery used to replace the back breaking work of hand threshing doing the same work faster and with less field losses. The total impact can be seen in the approximately 3.5% growth rate in agriculture output that has enabled Pakistan to keep ahead of its burgeoning population. An attempt to quantify the economic returns to investment in research in Pakistan was recently carried out under the leadership of Robert Evanson of Yale University. He estimated, after separating out the returns to other factors of production including: improved roads, better markets, better educated farmers, etc; that the Internal Rate of Return to investment in Agricultural Research in Pakistan over the past 20 years has been approximately 70 percent per annum.

The contribution of AID to this can be best illustrated by looking at the two major projects that AID has funded over this period: Strengthening of Agriculture Research (391-0296) and Management of Agriculture Research and Technology (391-0489).

1973-1983 - Strengthen, no. of Agriculture Research: The status of agricultural research and development in Pakistan was reviewed by two Joint Pakistan-American Agricultural Research Teams in 1968 and 1973. That review found Agriculture Research to be ineffectively spread among provincial institutes, poorly supported and lacking both internal national coordination and effective links with the international agriculture research community. This led to a major USAID-funded agricultural research project entitled Strengthening of Agricultural Research Capabilities in Pakistan. This project was designed to support the development of coordinated national research programs under the Pakistan Agricultural Research Council (PARC). The project purpose was to establish a functioning centrally coordinated program of agricultural research for major agricultural commodities which effectively translates policy guidelines into specific research projects with achievable results to increase agricultural production and improve the income of low income farmers. The project provided support to PARC to develop and implement well coordinated national research programs for major agricultural commodities and important disciplines in cooperation with the provincial research institutes and agricultural universities. The project also provided support for the development of a National Agricultural Research Center (NARC), one of the few federal agricultural institutions in the country. The charter of the NARC is to

undertake research on problems not adequately addressed by the provincial agricultural research institutions or which, by their complex nature, require investigations in a well equipped/staffed centralized facility.

Despite initial difficulties, the project was highly successful in fully completing the various project elements and meeting stated objectives. Although the project was national in scope, greater support was provided to the institutional development of PARC and NARC. This was necessary to provide the leadership and technical support needed for the development of a viable and balanced nationally coordinated Federal/Provincial agricultural research system capable of effectively addressing the complex problems which constitute serious constraints to increased/ improved agricultural production. A sound base was laid for an effective national research program. NARC demonstrates tangible evidence of a constructive and vitally important partnership between USAID and GOP for agricultural research and development in Pakistan. GOP also took a number of important steps to improve one organizational structure of PARC coupled with competent technical staff complemented by appropriate support personnel. A new Ordinance was promulgated in 1981, which delegated increased authority to PARC to organize, plan, and execute their programs with **greater freedom and flexibility**. A new Division of Agricultural Research was created under the Ministry of Food, Agriculture and Cooperatives and the Chairman of PARC was appointed as Secretary to the GOP for the newly created Division. This significantly enhanced the effectiveness of PARC as an autonomous organization to plan, coordinate and evaluate agricultural research on a national basis.

The project was reviewed in 1982. It was concluded that in order to develop a balanced federal/provincial cooperative system of agricultural research, it was now necessary to strengthen the research capability of the provincial agricultural research institutes including the agricultural universities. To this effect a follow-on project entitled "Management of Agricultural Research and Technology (MART) was developed.

1983-90 - Management of Agricultural Research (MART): The original MART project, begun in 1983, consisted of five components: (1) Research Management and Administration; (2) Information Transfer; (3) Training for the Agricultural Research Network; (4) Arid Zone Research; and (5) Wheat and Maize Coordinated Programs.

The first three components were designed to strengthen and expand the human, physical, and technological resources available within the national agricultural research network and to improve the management of the system at the Federal and Provincial levels. Participating entities included, but were not limited to: the Pakistan Agricultural Research Council (PARC), the National Agricultural Research Center (NARC), the Arid Zone Research Institute (AZRI), the provincial agricultural research institutions and training institutes in all four provinces; and the agricultural universities in the Sind, Punjab, and the North West Frontier Province. The fourth component addressed the substantial gap

that had existed in arid high altitude agricultural research for non-irrigated areas, which is especially important for the western regions of the country. Under this component, funds were provided to strengthen the capability of AZRI, which is located in Quetta, Balochistan, to generate and disseminate quality and relevant technologies applicable to the non-irrigated areas of the country, which represent 47 percent of the total land area of Pakistan. The fifth component was intended to enable Pakistan to sustain and build on the impressive gains achieved in wheat and maize production by improving the research and outreach activities carried out through its nationally coordinated wheat and maize programs.

Under the project 80% of the resources were reserved for the provinces to be allocated on the basis of a population formula, viz, Punjab: 42% Sind: 17% NWFP: 13% Balochistan: 7%. A Project Coordination Committee (PCC) consisting of representatives of the four provinces and the federal Government headed by the Chairman, PARC, was appointed to ensure implementation of the project in accordance with the provisions of the approved PC-1. All decisions on matters relating to various components of the project were taken on the basis of consensus developed in the meetings of the PCC.

Accomplishments of MART to Date: The performance of the MART Project was critically evaluated in January-February, 1989. It was found that the project provided necessary and desired support to the National Agricultural Research System to meet the national mandate of increased food production. The evaluation concluded that the project was well managed, and was close to schedule. Most inputs had been provided on time and programmed outputs were produced.

To appreciate the accomplishments of the MART project and its contribution to Pakistan's development it is necessary to look at both the direct and indirect outputs of the project. To-date, the project has focused on the management of the research institutions themselves, and the accomplishment can best be seen in the improved or increased capacity of those institutions. These include such things as:

- a) better trained staff, computer systems to improve the speed and reliability of research analysis, better libraries to keep up with the rest of the world research activities, new field and laboratory equipment to actually do the trials.
- b) revised financial management systems and a computerized management information system to enable administrators to more effectively monitor and utilize scarce research resources.
- c) a planning process in place with master plans to focus research on priority areas.
- d) a farming systems research program that has put research in touch with farmers and their problems.

- e) the capacity to produce radio and video programs to communicate research products to the potential end users.
- f) a local training institute and trainers to plan and carry out the required in service training program.
- g) a functioning Arid Zone Research Institute which for the first time in Pakistan can now address the severe environmental and resource production problems that already impact on the people of Balochistan and other arid and semi-arid regions and could severely affect others if these regions are continually mismanaged.
- h) a strong cooperative interdisciplinary program involving socio-economic and biological and physical scientist in the national Wheat and Maize Coordinated Programs.

These direct, institutional development outputs of the MART project would be worthless however, if not translated into changes in the products and services of the economy at large. Those indirect outputs are there and in some cases can be **measured but in most cases must be estimated. As an example, we can measure the average yield of wheat in Pakistan and see that it has increased from 810 kilos per hectare in 1967 to 1,900 kilos per hectare in 1989 and the best farmers are getting over 4,000 kilos/hectare. The total output has gone from 3 million MT to almost 15 million over the past 22 years. Unfortunately the five fold increase made possible through research has provided only minimum food security and additional work will continue to be needed to further increase wheat yields. Another contribution of the project that can only be estimated at this time is the new planning system developed for those areas that are planted to wheat and rice. The new system requires a new grain drill which is being manufactured and distributed by private sector firms and only a few are currently in operation. This system can increase yields by 1 ton per hectare with no increase in production cost and is proving therefore to be very popular among farmers.**

When adopted this one change in technology will be worth over \$50 million per year to the Pakistan economy.

Another example of promising research is the development of a high yielding hybrid fodder crop for the milch buffalo. The new varieties are being tested and proven on farmers fields with a very strong positive response from the farmers. A 15 percent increased output in fodder should increase milk production by more than a million tons. This will add over a \$100 million per year to the agriculture sector output and provide the increased supply of high protein food required in the rural and urban areas.

To achieve the increases in output that are available with existing technology it is increasingly recognized in Pakistan that research done is not sufficient. To

bring the new technology into production, it is increasingly necessary to involve the agribusiness sector. The cooperation between private and public sector groups is functioning to bring the two examples cited above into production. Additional cooperation is required for much of the research that is now being carried out on the research stations. Thus, the MART project is being amended to concentrate now on building these linkages.

DETAILED COST ESTIMATES

A. LONG-TERM TECHNICAL ASSISTANCE

	U.S. \$

I. Monthly Salary	5,500
II. Salary Related Costs	
1. Fringe Benefits (35% of salary)	1,925
2. Post Differential (20% of salary)	1,100
3. Sunday Differential (5% of salary)	275
4. FICA (7.51% of salary)	413
5. DBA Insurance (4.25% of salary)	234
6. Overhead (60% of salary)	3,300
7. Storage of HHE	150
8. Home Office Backstop	1,500

Sub-Total (II):	8,897
III. Travel Related Costs	
1. In-country Per Diem (7 days x \$96)	672
2. In-country Transportation	175

Sub-Total (III):	847
IV. Monthly Housing Costs	
1. Rent	850
2. Utilities	500
3. Fumigation	10
4. Maintenance of Lease-Hold	250
5. Maintenance of Equipment	250
6. Guard	400

Sub-Total (IV):	2 260
V. Monthly Office Costs	
1. Rent	400
2. Utilities	295
3. Telephone	271
4. Office Supplies	140

Sub-total (V):	1,096
TOTAL (I - V):	18,600
\$18,600 x 67 Person Months	1,246,200

Note: These cost estimates are based on present Winrock contract.

Estimated One-Time Costs for
One new LT Advisor (Agribusiness Specialist)

	U.S. \$
I. International Travel	
a. Travel to Post	7,600
b. Travel from Post	7,600
c. Medical Travel	3,800
d. Emergency Travel	3,800
e. R&R/Home Leave Travel	15,200
f. Travel to/from Post, Home Office	3,973
Sub-Total (I):	41,973
II. International Per Diem	
a. Arrival	920
b. Departure	920
c. Arrival/Departure Home Office	1,135
d. Medical Travel	600
Sub-Total (II):	3,575
III. International Shipments	
a. UAB to Post	2,800
b. UAB from Post	2,800
c. POV to Post	3,000
d. POV from Post	3,000
e. POV inland transportation (to/from)	40
f. HHE to Post	14,400
g. HHE from Post	14,400
Sub-Total (III):	40,440
IV. Allowances	
a. Foreign Transfer	3,340
b. Education Allowance	2,000
Sub-Total (IV):	5,340
V. Other Direct Costs	
Visas, vaccines, taxis, etc.	600
TOTAL (I - V):	91,928
TOTAL LONG-TERM TECHNICAL ASSISTANCE:	1,338,128
INFLATION:	70,000
GRAND TOTAL:	1,408,128

B. SHORT-TERM TECHNICAL ASSISTANCE

	U.S. \$

I. Monthly Salary	5,500
II. Salary Related Costs	
1. Fringe Benefits (35% of salary)	1,925
2. Sunday Differential (5% of salary)	275
3. FICA (7.51% of salary)	413
4. DBA Insurance (4.25% of salary)	234
5. Overhead (60% of salary)	3,300
6. Home Office Backstop	1,500

Sub-Total (II):	7,647
III. In-Country Travel:	
1. In-country Per Diem (\$96 x 30 days)	2,880
2. In-country Transportation	175

Sub-Total (III):	3,055
Total (I+II+III):	16,202
\$14,700 x 36 Person Months	529,200

IV. International Travel Related Costs:	
1. International travel (US-Isl-US)	3,800
2. International Per diem	460
3. Other Direct Costs	400

Sub-Total:	4,660
\$4,660 x 24 Trips 1/	111,840
TOTAL SHORT-TERM TECHNICAL ASSISTANCE:	641,040
INFLATION:	32,000

GRAND TOTAL:	673,040

1/ 36 person months are required for short-term TA. It is assumed that each consultant will come for six weeks. Therefore, the total trips comes to 24 for 36 person months.

C. LOCAL CONSULTANTS AND STAFF

U.S. \$

I.	Consultants: (according to present Winrock contract, consultants' average rate comes to \$2,000 per person month)	
	100 Person Months are required during amendment period (100 x \$2,000)	200,000
II.	Staff (rates used are those which Winrock is paying to their present staff)	
	1. Admin Officer (Rs. 17,600 x 33 PM)	27,657
	2. Accountant (Rs. 7,850 x 33 PM)	12,336
	3. Program Spec. (Rs. 20,950 x 33 PM)	32,921
	4. Secretary (Rs. 7,500 x 99 PM)	35,357
	5. Driver (Rs. 5,600 x 99 PM)	26,400
	6. Office Support (Rs. 1,500 x 99)	7,071
	Sub-Total (II):	----- 141,743
	TOTAL SALARIES (I + II):	341,743
III.	Travel/per diem for local consultants (covers 4-year amendment period for entire 100 PM level of effort)	100,000
IV.	Other Direct Costs, e.g. overtime, uniform, cash awards, etc.	23,257
	TOTAL LOCAL CONSULTANTS/STAFF:	----- 465,000
	INFLATION:	24,000
	GRAND TOTAL:	===== 489,000

D. TRAINING

	U.S. \$

I. U.S. Long-Term: (finish up costs for the completion of degree programs already allocated to federal/provincial scientists under the original project) (28 persons x 3 months) or 28 x \$5,000/quarter	140,000
II. U.S. Short-Term: 20 participants @ \$9,000 - 10,000 each	190,000
III. Third Country: 4-6 Scientists at ICARDA (€ approx. 10,000 per participant)	50,000
IV. In-country: 44 courses of 5 week duration for 20 participants each. \$7,500 per course x 44 courses. The \$7,500 is derived as follows: \$75/per week X 20 persons X 5 weeks	330,000

TOTAL TRAINING:	710,000

-
- 1/ The breakdown for 44 courses is as follows:
- 10 at NARC (National)
 - 4 at Baluchistan
 - 14 at Punjab
 - 10 at Sind
 - 6 at NWFP

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 PP RUEHC
 DE RUEHIL #0422/01 134 **
 ZNR UUUUU ZZE
 P 141041Z MAY 90
 FM AMEMBASSY ISLAMABAD
 TO SECSTATE WASHDC PRIORITY 4190
 BT
 UNCLAS SECTION 01 OF 04 ISLAMABAD 10422

CLASS: UNCLASSIFIED
 CHRG: AID 05/14/90
 APPV: DIR(A):PG EDFT
 DRFTD: FDM:SPAUKAT/ARD:CN:
 SLY:AA
 CLFAP: 1. FDM 2. APD 3. P:
 4. RIA
 DISTR: AID AME DCM
 ECON 4
 ORG: OOR

AIDAC

FOR ANE/PD/PCS, SHEILA BLACKMAN

E.O. 12356: N/A
 SUBJECT: MANAGEMENT OF AGRICULTURAL RESEARCH AND
 TECHNOLOGY (MART) PROJECT (391-0489)

REF: 89 STATE 214215

1. THIS CABLE PROVIDES DRAFT LANGUAGE FOR A
 CONGRESSIONAL NOTIFICATION (CN) FOR THE SUBJECT
 PROJECT TO: (1) INCREASE THE LIFE OF PROJECT (LOP)
 FUNDING BY DOLS 8.0 MILLION FOR A TOTAL OF DOLS 38.0
 MILLION; AND (2) EXTEND THE PROJECT ASSISTANCE
 COMPLETION DATE (PACD) FROM SEPTEMBER 30, 1991 TO
 AUGUST 07, 1994. AN AD HOC REDELEGATION OF AUTHORITY
 TO APPROVE AND AUTHORIZE PP AMENDMENT IN THE FIELD
 HAS BEEN PROVIDED PER REFTEL.

2. ACTIVITY DATA SHEET:

- COUNTRY: PAKISTAN
- PROJECT TITLE: MANAGEMENT OF AGRICULTURAL
RESEARCH AND TECHNOLOGY (MART)
- PROJECT NO: 391-0489
- APPROPRIATION CATEGORY: ECONOMIC SUPPORT FUND
(ESF) AND DEVELOPMENT ASSISTANCE (DA)
- LIFE OF PROJECT FUNDING: ESP - DOLS 11.5 MILLION
DA - DOLS 26.5 MILLION
TOTAL - DOLS 38.0 MILLION
- PROPOSED OBLIGATION: FY-1990 - DOLS 3.0 MILLION
DA GRANT
- ESTIMATED FINAL OBLIGATION: FY-1992

3. PURPOSE: (A) TO DEVELOP AND DISSEMINATE IMPROVED
 TECHNOLOGY AND INFORMATION THROUGH KEY INSTITUTIONS;
 AND (B) TO FOSTER A COLLABORATIVE RELATIONSHIP
 WHEREBY RESEARCH INSTITUTIONS SERVE PRIVATE
 AGRIBUSINESS AND FARMERS AND USE THE PRIVATE SECTOR
 TO DISSEMINATE MARKETABLE, IMPROVED TECHNOLOGIES.

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4. BACKGROUND: A.I.D. ASSISTANCE TO AGRICULTURAL DEVELOPMENT IN PAKISTAN HAS INCLUDED VARIOUS TYPES OF SUPPORT FOR AGRICULTURAL RESEARCH. AID HAS SUPPORTED THE INSTITUTIONAL DEVELOPMENT OF THE PAKISTAN AGRICULTURAL RESEARCH COUNCIL (PARC) AND THE NATIONAL AGRICULTURAL RESEARCH CENTER (NARC) TO LAY A SOUND FOUNDATION FOR AN EFFECTIVE NATIONAL PROGRAM OF AGRICULTURAL RESEARCH. BASED ON RECOMMENDATIONS OF AN EVALUATION, THE MART PROJECT WAS DESIGNED AND INITIATED IN 1984 TO STRENGTHEN THE PERFORMANCE OF PAKISTAN'S NATIONAL AGRICULTURAL RESEARCH SYSTEM. AN EXTERNAL EVALUATION CONDUCTED DURING JANUARY/FEBRUARY 1989, FOUND THAT THE PROJECT PROVIDED NECESSARY AND DESIRED SUPPORT TO THE NATIONAL AGRICULTURAL RESEARCH SYSTEM FOR MEETING THE NATIONAL MANDATE OF INCREASED FOOD PRODUCTION. THE EVALUATION CONCLUDED THAT THE PROJECT WAS WELL MANAGED, AND STRONGLY RECOMMENDED CONTINUATION AND EXTENSION OF THE PROJECT WITH MODIFICATIONS. A FURTHER ASSESSMENT DETERMINED THAT PUBLIC SECTOR RESEARCH INSTITUTIONS SHOULD BE MORE RESPONSIVE TO THE END-USERS OF TECHNOLOGY AND SHOULD FOSTER COLLABORATIVE LINKAGES WITH PAKISTAN'S EMERGING PRIVATE AGRIBUSINESS SECTOR.

5. PROJECT DESCRIPTION: THE THRUST OF THE PROJECT HAS BEEN MODIFIED FROM THE ORIGINAL INTENT TO DEAL WITH THE ENTIRE PAKISTAN NATIONAL AGRICULTURAL RESEARCH NETWORK TO FOCUS, INSTEAD, ON SPECIFIC KEY INSTITUTIONS AND PROGRAMS THAT HAVE THE POTENTIAL TO COLLABORATE WITH PRIVATE SECTOR AGRIBUSINESS AND HAVE THE PERSONNEL AND INFRASTRUCTURE NEEDED TO ADDRESS CRITICAL PRODUCTION PROBLEMS. THESE KEY INSTITUTIONS AND PROGRAMS ARE DEFINED AS THOSE AREAS IN THE AGRICULTURAL RESEARCH SUBSECTOR THAT: (1) HAVE THE POTENTIAL TO SIGNIFICANTLY EXPAND PRODUCTION, EMPLOYMENT, AND COMMERCIALIZATION; AND (2) CAN SHOW SIGNIFICANT AND SUSTAINABLE PROGRESS BEFORE THE PACD. THE AIM WILL BE TO DEVELOP MODELS OF IMPROVED RESEARCH MANAGEMENT, APPLICABLE TECHNOLOGY AND EFFICIENT INFORMATION TRANSFER TO THE APPROPRIATE END USERS. THESE, LINKED WITH THE PAKISTAN AGRIBUSINESS INDUSTRY, WILL PROMOTE INCREASED LEVELS OF PRODUCTION, EMPLOYMENT AND INCOME

AMONG THE COUNTRY'S FARMERS.

THE PROJECT HAS BEEN REDefined INTO THREE COMPONENTS: (1) RESEARCH RESPONSIVENESS: PROBLEMS OF RIGIDITY OF APPROACH TO AND DEFINITION OF TARGET GROUPS AND INEFFICIENT MANAGEMENT OF RESEARCH PROGRAMS AND INSTITUTIONS ARE ADDRESSED IN THIS COMPONENT. FIRST, IMPLEMENTATION OF THE MASTER PLANS THAT HAVE BEEN DEVELOPED UNDER THE PROJECT FOR THE NATIONAL AGRICULTURAL RESEARCH CENTER (NARC) AND THE ARID ZONE RESEARCH INSTITUTE (AZRI), AND THE DEVELOPMENT OF THE SIMILAR PLANS FOR SELECTED PROVINCIAL INSTITUTIONS, WILL IMPROVE RESEARCH PLANNING AND PRIORITY SETTING, THE ORGANIZATIONAL STRUCTURES AND THE FISCAL RESPONSIBILITY OF THE SELECTED KEY RESEARCH INSTITUTIONS. KEY TO THE RELEVANCY OF THE MASTER PLANS WILL BE INPUT IN PRIORITY AND AGENDA SETTING BY PRIVATE AGRIBUSINESS, COMMERCIAL FARMERS, EXPORTERS AND MARKETING FIRMS. SECOND, IN-COUNTRY TRAINING BEGUN UNDER THE ORIGINAL PROJECT WILL BE CONTINUED WITH AN EMPHASIS ON PROVIDING NEEDED TRAINING TO THE RESEARCH PERSONNEL IN THESE SAME INSTITUTIONS AND PRIVATE SECTOR BUSINESSES. (2) TECHNOLOGY DEVELOPMENT: SPECIFIC AREAS FOR RESEARCH EMPHASIS INCLUDE INTEGRATED FARMING SYSTEMS RESEARCH, RESEARCH ON MARKETING, EXPORT AND ECONOMIC ISSUES, A RESEARCH GRANTS PROGRAM FOCUSING ON INCREASED PRODUCTIVITY OF PAKISTAN'S AGRICULTURAL LANDS HIGHLIGHTING THE STRESSED AREAS AND RESEARCH ON AGRICULTURAL PROBLEMS OF PRODUCTION AND MARKETING OF THE ARID ZONE. TECHNOLOGIES DEVELOPED BY THE PROJECT WILL BE LINKED TO THE APPROPRIATE AGRIBUSINESSES WHO ARE ENCOURAGED AND ASSISTED TO REFINE AND MARKET THEM AS PRODUCTS. (3) DISSEMINATION: THIS COMPONENT WILL FOCUS ON THE DEVELOPMENT, MANAGEMENT AND DIRECT DISSEMINATION OF RESEARCH INFORMATION. MODEL MULTIMEDIA INFORMATION MODULES WILL BE DEVELOPED TO INTRODUCE PROJECT DEVELOPED TECHNOLOGY TO VARIOUS AGRIBUSINESS, POLICY PLANNERS, TARGET FARMERS AND PRIVATE AND PUBLIC RESEARCHERS.

6. RELATIONSHIP OF THE PROJECT TO AID STRATEGY: THE PROJECT AMENDMENT SUPPORTS AND IS CONSISTENT WITH AID POLICY AS WELL AS WITH THE MISSION'S STRATEGIC THRUST. AS ARTICULATED IN THE CDSS, THE MISSION'S AGRICULTURE SECTOR STRATEGIC OBJECTIVE OF MAINTAINING AGRICULTURAL GROWTH IN CONSTANT PRICES ABOVE 3-6 PERCENT ANNUALLY WILL DEPEND ON, INTER ALIA, TECHNOLOGY DEVELOPMENT/TRANSFER TO INCREASE PRODUCTION AND EFFICIENCY, INCREASED PRIVATE SECTOR INVESTMENT IN AGRIBUSINESS, AND INCREASED RELIANCE ON

OPEN MARKET MECHANISMS.

7. HOST COUNTRY AND OTHER DONORS: THE GOP ACCORDS A HIGH PRIORITY TO AGRICULTURAL DEVELOPMENT. THE GOP'S SEVENTH FIVE-YEAR PLAN (1988-93) EMPHASIZES IMPROVED ORGANIZATION AND INTEGRATION OF AGRICULTURAL

RESEARCH, BOTH AT THE FEDERAL AND PROVINCIAL LEVELS. THE GOP IS EXPECTED TO PROVIDE AN ESTIMATED DOLS 10.5 MILLION, WHICH SATISFIES THE 25 PERCENT HOST COUNTRY CONTRIBUTION FOR THE DA PORTION OF THE PROJECT. THE AMENDED MART PROJECT WILL CONTINUE TO COMPLEMENT AND ENHANCE THE IMPACT OF PROJECTS FINANCED BY OTHER DONORS, THE MOST SIGNIFICANT OF WHICH ARE: (A) AGRICULTURAL RESEARCH PROJECT-II (ARP-II), FINANCED BY THE WORLD BANK, HAS BEEN APPRAISED AND IS EXPECTED TO BECOME EFFECTIVE IN 1991. (B) BARANI AGRICULTURAL RESEARCH AND DEVELOPMENT (BARAD): PARC AND THE CANADIAN INTERNATIONAL DEVELOPMENT AGENCY (CIDA) ARE PARTICIPATING IN AN EIGHT YEAR JOINT VENTURE, ENDING IN 1991, WITH A TOTAL COST OF DOLS 10.0 MILLION. (C) ITALY, HOLLAND, SWITZERLAND, JAPAN, AND FPO ARE PROVIDING ASSISTANCE FOR SPECIFIC CROPS OR REGIONAL PROGRAMS. THERE ARE 14 ONGOING PROJECTS WITH A TOTAL COST OF DOLS 8 MILLION.

6. BENEFICIARIES: THE PRIMARY BENEFICIARIES ARE PAKISTAN'S PRIVATE SECTOR SMALL FARMERS WHOSE INCOME SHOULD RISE AS A RESULT OF INCREASED AGRICULTURAL PRODUCTION; AGRIBUSINESS, WHICH IS EXPECTED TO BENEFIT THROUGH THE DEVELOPMENT OF MARKETABLE, COMMERCIALY VIABLE TECHNOLOGIES IDENTIFIED AND TESTED BY THE PROJECT; AND THE CONSUMERS WHO WILL BENEFIT FROM MORE PLENTIFUL AND AVAILABLE

AGRICULTURAL PRODUCTS.

9. MAJOR OUTPUTS

ALL YEARS

1. RESEARCH RESPONSIVENESS

- PERIODIC SEMINARS ORGANIZED BY PARC AT WHICH REPRESENTATIVES OF THE COUNTRY'S MAJOR CHAMBERS OF COMMERCE/BUSINESSMEN'S ASSOCIATIONS PRESENT PARC WITH PROBLEMS FACED BY AGRO-INDUSTRY FOR INCLUSION IN PARC'S RESEARCH AGENDA. Y

- PARC, THROUGH ITS AGRIBUSINESS RELATIONS CELL, ENTERS INTO COLLABORATIVE AGREEMENTS WITH PAKISTANI AND INTERNATIONAL AGRIBUSINESS AND AGRO-INDUSTRIAL FIRMS FOR THE PURPOSE OF FINDING SOLUTIONS THROUGH RESEARCH TO PROBLEMS BROUGHT FORWARD BY THE PRIVATE BUSINESSES. 15

- NARC AND AZRI ARE IMPLEMENTING EFFICIENT OUTPUT-ORIENTED MANAGEMENT SYSTEMS CHARACTERIZED BY PROJECTIZED RESEARCH ACTIVITIES AND BUDGETS, FLEXIBLE PERSONNEL MANAGEMENT SYSTEMS AND PERFORMANCE MONITORING. X

- A STRENGTHENED NATIONAL FSR PROGRAM, INCLUDING: AN ADEQUATELY FUNDED AND STAFFED FSR COORDINATION AND PROJECT DEVELOPMENT CELL; MODEL FSR PROJECTS ESTABLISHED IN TARGET AREAS OF EACH PROVINCE; FSR COURSE(S) INTRODUCED AT THE AGRICULTURAL UNIVERSITIES AND A SPECIAL WOMEN'S FSR PROGRAM. 9

- NARC AND AZRI MASTER PLAN AGENDA 2

PRIORITIZED IN ACCORDANCE WITH FARMER/AGRIBUSINESS NEEDS AND BUDGET ALLOCATIONS.

- RE-ENTRANT TRAINING PARTICIPANTS ARE AWARE OF TECHNOLOGICAL NEEDS OF PRIVATE AGRO-INDUSTRY, AS RESULT OF A PROGRAM OF PROJECT FUNDED VISITS TO PRIVATE BUSINESSES AND SEMINARS. X

2. TECHNOLOGY DEVELOPMENT

- MARKETABLE PRODUCTS DEVELOPED THROUGH LONG-TERM COLLABORATIVE RELATIONSHIPS IN WHICH PARC PROVIDES RESEARCH RELATED INPUTS AND PRIVATE AGRIBUSINESSES AND AGRICULTURAL INPUT MANUFACTURERS PROVIDE CAPITAL AND OTHER INPUTS. MINIMUM OF 10

- SOLUTIONS TO PROBLEMS THAT ARE ADDRESSED BY PARC IN RESPONSE TO SPECIFIC REQUESTS FROM PRIVATE AGRIBUSINESS FIRMS, AGRICULTURAL INPUT MANUFACTURERS OR PRIVATE PRODUCERS' ASSOCIATIONS. 12-20

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- SOLUTIONS TO AGRICULTURE RELATED PROBLEMS IDENTIFIED BY GRANTEEES (INCLUDING A MINIMUM OF 5 AGRIBUSINESSES), ARRIVED AT THROUGH RESEARCH GRANTS ADMINISTERED BY BOSTID. X
 - MARKETABLE, AGRICULTURE RELATED PRODUCTS OF PRIVATE COMMERCIAL ENTERPRISES DEVELOPED THROUGH GRANTS ADMINISTERED BY BOSTID. 9-12
 - FARMING SYSTEMS RESEARCH (FSR) CONDUCTED BY MULTIDISCIPLINARY TEAM FROM ALL 9 PARTICIPATING INSTITUTIONS WITH COLLABORATION FROM PRIVATE INPUT MANUFACTURERS DEVFLOPS TECHNOLOGIES RESOLVING A MINIMUM OF 10 PROBLEMS FACED BY FARMERS. 8-12
3. DISSEMINATION
- TECHNOLOGIES DEVELOPED THROUGH THE NATIONAL RESEARCH SYSTEM DISSEMINATED TO FARMERS BY AGRIBUSINESS FIRMS, THROUGH CONTRACT FARMING OR SIMILAR MECHANISMS. 8
 - PRODUCTS RESULTING FROM RESEARCH 10

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UNDERTAKEN THROUGH THE NATIONAL RESEARCH SYSTEM ADOPTED BY PRIVATE AGRO-INDUSTRY FOR COMMERCIALIZATION.

- AN EFFECTIVE SYSTEM FOR DOCUMENTATION AND TRANSFER OF FIELD TESTED TECHNOLOGY AND INFORMATION DEVELOPED AND OPERATIONAL; INCLUDING INSTITUTIONALIZED NATIONAL AND PROVINCIAL TECHNICAL INFORMATION TRANSFER COMMITTEES, EACH WITH PRIVATE SECTOR REPRESENTATIVES AS MEMBERS, AND FOUR PROVINCIAL AGRICULTURAL COMMUNICATION SUPPORT CELLS (PACSC'S). X
- A NATIONAL MICROFORM AND ELECTRONIC MEDIA RESOURCES SYSTEM ESTABLISHED AT NARC WITH DATABASE SHARING AND COMPATIBILITY AMONG COOPERATING LIBRARIES. X
- SPECIAL NEWSLETTERS TARGETTING PRIVATE SECTOR FIRMS. 1
- RESEARCH-BASED TECHNOLOGIES AND PRACTICES ADOPTED BY FARMERS. X

10. A.I.D. FINANCED INPUTS	LIFE OF PROJECT
-	(DOLS 000)
TECHNICAL ASSISTANCE	14,720
TRAINING	11,010
COMMODITIES	3,895
OTHER COSTS	7,700
EVALUATION	295
CONTINGENCY	380
TOTAL:	38,000

11. PRINCIPAL CONTRACTORS AND GRANTEEES: WINROCK INTERNATIONAL; INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN DRY AREAS (ICARDA); AND THE BOARD ON SCIENCE AND TECHNOLOGY FOR INTERNATIONAL DEVELOPMENT (BOSTID) OF THE U.S NATIONAL ACADEMY OF SCIENCE (NAS). JONES

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