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AGENCY FOR INTERNATIONAL DEVELOPMENT

DEPARTMENT OF STATE

WASHINGTON, D.C. 20523

PROJECT PAPER

PAKISTAN - MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY

391-0489

AUGUST 1984

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number

DOCUMENT CODE: 3

2. COUNTRY/ENTITY: Pakistan

3. PROJECT NUMBER: 391-0489

4. BUREAU/OFFICE: ASIA — 04

5. PROJECT TITLE (maximum 40 characters): Management of Agricultural Research and Technology

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 09 DD 30 YY 89

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)
A. Initial FY 84 B. Quarter 4 C. Final FY 87

8. COSTS ($000 OR EQUIVALENT $1 = Rs 13.00)

A. FUNDING SOURCE	FIRST FY 1984 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	3,570	1,430	5,000	18,803	11,197	30,000
(Grant)	(3,570)	(1,430)	(5,000)	(18,803)	(11,197)	(30,000
(Loan)	(-)	(-)	(-)	(-)	(-)	(-
Other U.S. 1. ACE (391-0468)	2,500	-	2,500	2,500	-	2,500
Other U.S. 2.						
Host Country	-	-	-	-	1,135	1,135
Other Donor(s) CIMMYT + ICARDA	-	-	-	750	-	750
TOTALS	6,070	1,430	7,500	22,053	12,332	34,385

9. SCHEDULE OF AID FUNDING ($000)

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

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 958 | 967 | 968

11. SECONDARY PURPOSE CO: -

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

A. Code	R/AG	TECH	TNC
B. Amount			

13. PROJECT PURPOSE (maximum 480 characters)

To strengthen the performance of the national agricultural research system to generate and disseminate quality and relevant agricultural technologies to the farmers of Pakistan.

14. SCHEDULED EVALUATIONS
Interim MM 07 YY 87 | MM YY | Final MM 07 YY 89

15. SOURCE/ORIGIN OF GOODS AND SERVICES
[X] 000 [ ] 941 [X] Local [ ] Other (Specify)

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

Cleared by: FM - D. Pratt

17. APPROVED BY
Signature: Jimmie M. Stone
Title: Acting Director, USAID/Pakistan
Date Signed: MM DD YY

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

AID 1330-4 (8-79)

PROJECT AUTHORIZATION

NAME OF COUNTRY: Pakistan
TITLE OF PROJECT: Management of Agricultural Research and Technology
NUMBER OF PROJECT: 391-0489

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Management of Agricultural Research and Technology Project for the Islamic Repbulic of 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, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project.

2. The project is designed to strengthen the performance of the national agricultural research system to generate and disseminate quality and relevant agricultural technologies to the farmers of Pakistan. Funds provided by A.I.D. for this project will be used, among other things, to procure technical advisory assistance, training, commodities and construction services and to support field studies and demonstrations required to: (a) increase the capacity at the national and provincial levels to plan, manage, and evaluate Pakistan's agricultural research needs and priorities; (b) strengthen the capability within the national agricultural research network to manage, account for, and utilize financial resources; (c) strengthen the operational linkages between Federal and Provincial research organizations and among the agricultural universities and research and extension personnel; (d) establish long-term institutional linkages between the Pakistani national agricultural research network and selected regional and international research centers; (e) establish a critical mass of research skills and managerial talent within the national agricultural research network; (f) institutionalize a multi-disciplinary farming systems research program; (g) institutionalize the capacity within the national agricultural research network to produce and disseminate new technologies responsive to the needs of client groups (farmers, agro-industry, extension, agricultural educators, research scientists, planners, and policy-makers); (h) expand the in-service training capacity at the Federal and Provincial levels; (i) improve the capacity of the Arid Zone Research Institute (AZRI) to plan and carry out effective research on agricultural problems applicable to the arid and high altitude areas of Baluchistan and similar areas of Pakistan; (j) improve the research capability for wheat and maize with an expanded outreach activity; (k) strengthen selected commodity research programs to enable them to generate relevant technological packages; and, (l) develop and implement mechanisms to increase the participation of the Pakistani private agribusiness sector in the identification, conduct, and dissemination of research.

3. The agreement(s) which may be negotiated and executed by the officer(s) to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms, covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a. Source and Origin of Goods and Services

Goods and services financed by A.I.D. under this Project shall have their source and origin in Pakistan or in the United States except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States and Pakistan.

b. Covenant as to Post-Training Employment

Except as the Parties may otherwise agree in writing, the Grantee, acting through its Ministry of Food, Agriculture and Cooperatives, shall make every reasonable effort to require that each person trained under this Project works in activities related to agricultural research in Pakistan for not less than three times the length of time of his or her training program provided, however, that in no event shall such an individual be allowed to work in agricultural research activities for less than one year nor be required to work in agricultural research activities for more than five years from the date of that individual's completion of training. The Grantee shall, further, not approve extensions in the trainee's permitted time abroad if such extension shall allow the trainee to remain abroad beyond that time required for his or her training program.

c. Covenant as to Private Sector Participation in Agricultural Research

A.I.D. and the GOP recognize the desirability of effectively incorporating the expressed research needs and requirements of the domestic private agribusiness sector into the research agenda of national and provincial research agencies, and the desirability of private agribusiness organizations contracting for a progressively greater share of research financed by this project. Accordingly, except as the parties may otherwise agree in writing, the Grantee covenants to prepare and provide a report, in form and substance satisfactory to A.I.D., establishing a two-year plan for increasing opportunities for the Pakistani private sector in the above cited areas. This plan shall include consideration of such issues as A.I.D. may, from time to time, establish in PILs but, at a minimum, shall establish benchmarks for increased Pakistani private sector opportunities in the selection of

priority agricultural research topics, in the conduct of such research, in the planning of and participation in mutually beneficial and appropriate training programs, and in the dissemination of relevant technologies to farmers.

Jimmie M. Stone
Acting Director
USAID/Pakistan

8/8/89
Date

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LIST OF ABBREVIATIONS

AID	Agency for International Development
ARD	Agriculture and Rural Development Office of USAID
ARP	Agricultural Research Project
ATI	Agricultural Training Institutes
AZR	Arid Zone Research (Project Component)
AZRI	Arid Zone Research Institute, Baluchistan
CIDA	Canadian International Development Agency
CIMMYT	International Wheat and Maize Improvement Center, Mexico
DSTP	Development Support Training Project
ESF	Economic Support Funds
FY	Fiscal Year (U.S.: October-September; GOP: July-June)
FAA	Foreign Assistance Act
FSR	Farming Systems Research
GOP	Government of Pakistan
IBRD	International Bank for Reconstruction and Development (World Bank)
ICARDA	International Center for Agricultural Research in Dry Areas, Syria
IT	Information Transfer (Project Component)
LOP	Life of Project
LT	Long Term
MART	Management of Agricultural Research and Technology (Project)
MOFA	Ministry of Food, Agriculture and Cooperatives

NARC	National Agricultural Research Center
NCRP	Nationally Coordinated Research Program
NWFP	Northwest Frontier Province
PACD	Project Assistance Completion Date
PARC	Pakistan Agricultural Research Council
PIL	Project Implementation Letter
RFP	Request for Proposals
RMA	Research Management and Administration (Project Component)
Rs	Pakistan Monetary Unit (Rs 13.00 = U.S. $1.00)
ST	Short Term
TA	Technical Assistance
TARN	Training for the Agricultural Research Network
TIPAN	Transformation and Integration of the Provincial Agricultural Network (Project)
TOEFL	Test of English as a Foreign Language
USAID	AID Mission in Pakistan
USDA	United States Department of Agriculture
USG	United States Government
WMCP	Wheat and Maize Coordinated Programs (Project Component)

I. SUMMARY AND RECOMMENDATIONS

A. Recommendations

1. Funding

It is recommended that an Economic Support Fund (ESF) grant of $30 million be authorized, of which $5 million is proposed for obligation in FY 1984, for the Management of Agricultural Research and Technology (MART) Project, which has a Project Assistance Completion Date (PACD) of September 30, 1989. The estimated Government of Pakistan (GOP) contribution to the project is the rupee equivalent of approximately $1.1 million at the exchange rate of U.S. $1.00 = Rs 13.00.

2. Geographic Code

Except as A.I.D. may otherwise agree in writing, the Project Authorization should specify that:

a. goods and services financed by A.I.D. under this Project shall have their source and origin in countries included in A.I.D. Geographic Code 000 or Pakistan; and,

b. ocean shipping financed by A.I.D. under this Project shall be only on flag vessels of the United States or Pakistan.

A recent SER/COM, AID/Washington policy clarification concerning the eligibility of Cooperating Country flag bottoms in projects specifying A.I.D. Geographic Code 000 plus Cooperating Country source indicates host country bottoms may be authorized if a programmatic reason exists for doing so. A key concern in the negotiation of the Pakistan economic assistance program was the threat to Pakistan's economic stability posed by a deteriorating balance of payments. The use of Pakistani flag bottoms supports the intent of the overall assistance program by augmenting Pakistan's balance of payments receipts. Moreover, a precedent wasestablished by the use of Pakistani bottoms for A.I.D.-financed projects authorized in FY 1982; excluding them from this Project would unnecessarily strain the understanding and cooperation that has been established between our two Governments.

B. Summary Project Description

The purpose of the MART Project is 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 project builds on the considerable accomplishments which have characterized Pakistani agricultural research over the last 37 years and, in particular, the significant progress achieved under the A.I.D.-financed Agricultural Research Project (391-0296), which began in 1969 and will terminate in 1985. The basic problem which the MART Project is designed to address is that the rapid growth in the agriculture sector's research infrastructure has outpaced the country's capacity to manage it.

A comprehensive evaluation of the on-going Agricultural Research Project conducted in October 1983 concluded that a sound basis had been laid for an effective national research program. The evaluation, however, identified several key areas where improvements were required before the agricultural research system could achieve its potential in contributing to Pakistan's agricultural production goals. The major problem areas are as follows:

1. a diffusion of research organizations whose activities are often compartmentalized and duplicative;

2. uneven distribution of resources throughout the agricultural research network;

3. research activities that are frequently carried out without adequate concern for priorities, planning or proper methodology;

4. less than rational allocation of and inadequate accounting for research resources;

5. inadequate linkages among research entities, between research and extension agencies, between research and agricultural education institutes, and between public sector research agencies and the private sector;

6. lack of facilities and appropriate technology for the packaging and transfer of research-generated information;

7. shortages of adequately trained personnel in key management and scientific research categories; and,

8. major gaps in selected commodity and disciplinary research programs.

The MART Project will address these problems through 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 are 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 will include but are 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 Northwest Frontier. The fourth component addresses 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. Such research is critical to achieve significantly increased agricultural yields in Pakistan. Under this component, funds will be provided to

strengthen the capability of AZRI, which is located in Quetta, Baluchistan, to generate and disseminate quality and relevant technologies applicable to the non-irrigated areas of the country, which represent 47 percent of the country's total land area. The fifth component will 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.

1. Research Management and Administration

Under this project component, a series of systems analyses will be undertaken by teams of expatriate and Pakistani specialists to identify the problems and their causes and propose alternative solutions in the areas of research planning, research methods, organization and administration, information flow, and financial management. Recommendations emerging from these analyses will be translated into specific management improvement interventions which will be implemented throughout the national agricultural research network under the direction of PARC, with the assistance of long-term and short-term consultants. A number of special studies and interventions are also planned in the areas of farming systems research, funding of agricultural research, private sector participation in agricultural research, bookkeeping and accounts, and research/outreach integration.

2. Information Transfer

The purposes of this component are to: (a) make research results more readily available to the general public and potential end-users; and, (b) disseminate the information in ways which respond to the needs of client groups and which ensure that the information will be properly and effectively utilized. Activities contemplated under this component include technical assistance and training in the production and dissemination of media and target-oriented technical information packages and the construction and equipping of a multi-media production studio on the campus of the NARC.

3. Training for the Agricultural Research Network

This component is designed to improve the capacity of the agricultural research community in Pakistan to: (a) identify personnel needs; (b) define appropriate education and skill development programs to meet those needs; and, (c) develop and institutionalize in-service, in-country career development courses to train existing and new personnel. To achieve this objective, the following activities are contemplated: (a) implementation of a personnel needs assessment and preparation of a long-term training plan; (b) training of NARC and Provincial training facility staff; (c) physical expansion of the NARC training facility; (d) development and initial implementation of tailored in-country training courses; and, (e) development of guidelines for participant selection, pre-departure preparation, and academic supervision of overseas degree and non-degree training programs.

4. Arid Zone Research

This component is designed to strengthen the capacity and capability of AZRI in Baluchistan to generate and disseminate quality and relevant technologies aimed at increasing agricultural production in Pakistan's non-irrigated areas. It is expected that A.I.D. will enter into a Collaborative Agreement with the International Center for Agricultural Research in Dry Areas (ICARDA), to finance the services of expatriate research scientists to work with Pakistani scientists at AZRI, at the Provincial Agricultural Research Institute in Baluchistan, and Provincial extension staff to plan and conduct research programs and to organize and conduct training programs at AZRI and the Provincial training facility in research methodologies, mixed farming, and on-farm research. Specific research activities to be undertaken include: (a) adaptation trials of imported and local varieties of cereal grains, legumes, forage, and pasture grasses; (b) demonstrations and verification studies on farmers' fields of technologies that have proven superior on research stations; and, (c) special studies on such topics as range and livestock management, mixed farming, animal nutrition, and livestock marketing.

5. Wheat and Maize Coordinated Programs

Despite impressive increases in maize and wheat production in Pakistan in recent years, there continues to be a large gap between production potential, as demonstrated on farmers' fields, and the actual production of the average farmer. This project component is designed to help close that gap by supporting the following research and outreach activities carried out through Pakistan's Nationally Coordinated Wheat and Maize Programs: (a) the continuation of efforts to produce high-yielding varieties of wheat and maize that are adapted to Pakistani conditions; (b) the development of a detailed agro-ecological analysis that will permit the identification of wheat and maize zones in Pakistan; (c) the establishment of larger and more accessible on-farm research and verification areas in representative locations that will permit the generation, testing and revision of production techniques appropriate to Pakistani conditions; and, (d) the increased use of farming systems research methods to ensure that the generation of researchable ideas and the development and extension of new technologies are done in ways that maximize their chances of adoption by farmers.

A summary of the A.I.D. contribution to the MART Project by expense category and project component is presented in Table 1.

C. Summary Findings

This project is ready for implementation and is judged to be socially, financially and economically sound, and technically and administratively feasible.

TABLE 1

Summary of AID Contribution to the Project by Expense Category and Project Component

(In US $ 000)

Expense Category a/	PROJECT COMPONENT RMA	IT	TARN	AZR	WMCP	Total b/
Technical Assistance	4,133	1,105	1,010	3,419	2,098	11,765
Training	5,183	963	985	1,215	971	9,317
Commodities	642	920	435	380	556	2,933
Construction	-	432	1,228	-	-	1,660
Studies	600	-	-	401	299	1,300
Evaluation	150	37	38	37	38	300
Sub-Total	10,708	3,457	3,696	5,452	3,962	27,275
Contingency(10%)	1,070	345	369	545	396	2,725
TOTAL	11,778	3,802	4,065	5,997	4,358	30,000

KEY:

RMA = Research Management and Administration
IT = Information Transfer
TARN = Training for the Agricultural Research Network
AZR = Arid Zone Research
WMCP = Wheat and Maize Coordinated Programs

a/ Inflation = 5 percent for all FX costs; 12 percent for local construction costs; and, 10 percent for all other local costs, all compounded annually.

b/ Does not include: (i) approximately $2.5 million under the Agricultural Commodities and Equipment Program (391-0468) for the importation of agricultural research commodities and equipment in support of RMA ($1.5 million), TARN ($250,000), AZR ($600,000) and WMCP($150,000) components; and, (ii) approximately $750,000 worth of technical advisory assistance from ICARDA (about $550,000 for the AZR component) and CIMMYT (about $200,000 for the WMCP component) from their core budgets.

D. Statutory Criteria and Mission Director's Certifications

1. The project meets all applicable statutory criteria. Appropriate checklists are included in Annex B.

2. Two certifications signed by the USAID/Pakistan Mission Director are included in Annex C:

a. an FAA 611 (e) certification, which certifies that the GOP has the capability to implement and maintain the project; and,

b. an FAA 612 (b) certification to permit the disbursement of dollars in lieu of U.S.-owned rupees to finance local costs.

E. APAC Concerns and Project Issues

The Project Identification Document (PID), upon which this project is based, described four possible project components: (1) Strengthening the NWFP Agricultural University at Peshawar; (2) Management Program for Technology Development; (3) Institutional Reform: Restructuring the Agricultural Research, Education, and Extension Network; and, (4) Strengthening the Arid Zone Research Institute (AZRI). The PID was approved in November 1982, and a copy of the APAC PID approval cable is included in Annex A. Subsequently, however, the Mission and the GOP decided to make the first component a separate project, to eliminate elements of the third component, and to include several additional activities. This section addresses those issues in the APAC PID approval cable which are relevant to the redesigned project and additional issues which were identified during preparation of the Project Paper.

1. Level of Technical Assistance

Approximately 36 percent of the total A.I.D. contribution to the project has been provisionally allocated for technical assistance. This includes 480 person-months of long-term and 188 1/ person-months of short-term expatriate technical assistance. The 480 person-months of long-term assistance consists of 8 consultants for three years each and 4 consultants for 4 years each; A.I.D. grant funds have been budgeted for the total costs of these 12 consultants and also the local support costs only of one ICARDA and one CIMMYT consultant, both of whom will be financed from the core budgets of their parent organizations. The allocation of 36 percent of A.I.D. resources for technical assistance (and 28 percent for local and overseas training) is indicative of the

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1/ An additional 18 person-months of specialist assistance has been budgeted under the Evaluation component.

major institution-building nature of this project. It also takes into account the facts that: (a) the project is national in focus and will involve thousands of Pakistanis who work within the national agricultural research network at PARC, NARC, AZRI, the four provincial training facilities, the 65 research institutes and 162 substations, centers, and laboratories engaged in agricultural research throughout Pakistan, the three existing agricultural universities, and extension staff in all four provinces; (b) transfer of appropriate technology to Pakistan in both the management area as well as the sciences is a major objective of the project; and, (c) on-the-job training by resident experts is not only highly desirable but essential to ensure that management skills and new or revised methodologies are effectively implemented and that individuals trained overseas apply their newly acquired skills in meaningful and productive ways. The proposed levels and nature of technical assistance for this project have been discussed with World Bank staff to ensure complementarity and to avoid duplication of effort with Bank-financed technical assistance inputs to PARC and the agricultural research network. The technical assistance plan has also been fully discussed with the GOP, and A.I.D. and the GOP have concluded that the level and type of assistance are both necessary and appropriate to achieve the major institutional and technology transfer objectives of this project. (See Section III, Project Description and Section V.E., Financial Analysis.)

2. Recurrent Cost Implications

The GOP is expected to contribute the equivalent of about $1.1 million or 3 percent of the total cost of the project. This estimate does not include the recurrent budgets of participating local research andtraining facilities without the project but reflects only the additional costs to the GOP as a result of the project. These costs fall into four categories: local staff salaries and related costs; facility operations; vehicle operation; and, facility maintenance. These four categories of inputs also constitute the only recurrent costs which will result from this project and will have to be borne by the GOP once the A.I.D. input terminates. In project year five, the total amounts to about Rs 3,497,000 or the equivalent of about $269,000 (at the exchange rate of U.S. $1.00 = Rs 13.00). (See Section V.E., Financial Analysis.) This amount of funds is small when compared with the savings that will accrue to the GOP as a result of the improved management of the entire agricultural research network and the resultant more prudent and efficient use of financial resources within the system, both GOP as well as externally provided resources. As indicated in Annex D, the GOP has provided its assurances to A.I.D. that the necessary financial and human resources required for the project will be forthcoming.

3. Administrative Feasibility

The administrative structure within which MART is to be implemented is already in place. Although improving, especially during the last year with the completion of the NARC, it needs to be strengthened in precisely the ways MART is designed to accomplish. MART builds on positive trends within an already viable, if not efficient administrative structure. The project design takes into account the absorptive capacity of PARC and the Federal and Provincial Governments.

As follow-on to the A.I.D.-financed Agricultural Research Project (391-0296) and the IBRD-financed Agricultural Research Project, MART's primary purpose is to strengthen the management and utilization of resources and infrastructure that were developed under these previous projects and that developed in Pakistan over the past 37 years.

4. Farming Systems Research Approach

Two problems are consistently raised with respect to the effectiveness of agricultural research in Pakistan. One problem is the relevance of the research carried out on many stations. There is concern that the selection of research topics may be based on institutional or personal interests rather than on what will benefit Pakistani farmers. The second problem is the relationship between research and extension. The concern is that research results are not transmitted through extension agencies to farmers in ways that maximize the chances of adoption or optimum use of improved technologies by large numbers of farmers.

Farming systems research (FSR) is a farmer-oriented research approach designed to address these problems. FSR stresses that farmers must be involved in the diagnosis of agricultural problems. The selection of research topics must be based on farmers' priorities, and farmers must be involved in both the conduct and evaluation of research trials. Farmer participation in agricultural research at this level can only be brought about by the involvement of the extension services because extension provides the essential link between research and the farmer. Thus, the FSR approach addresses the problems of research relevance and research/extension relationships simultaneously.

The problem of building linkages between researchers and farmers through extension usually is not technical. Rather, it is a problem of organization and management. Some progress has been made in recent years through on-farm trials involving the extension services. However, critical organizational and incentive problems that reinforce compartmentalization of research and extension institutions have not been resolved. For this reason, a significant portion of MART resources will be allocated to improve research management. This and other MART-induced improvements will accelerate and strengthen what, until now, has been an unsystematic application of FSR in Pakistan.

5. ICARDA

A project committee composed of representatives from AID/Washington and USAID/Pakistan determined that the AZR project component should be classified as collaborative assistance. This decision, made on July 22, 1983, was based on an evaluation of two international agricultural research centers and one American university consortium qualifying under the dryland agriculture research capacity evaluation criteria. ICARDA received the highest numerical score from all panel members and was selected as having predominant capability and the advantage of economy in cost because of its location in Syria. ICARDA responded to the Request for Expressions of Interest. The ICARDA proposal was drawn upon heavily in the development of the AZR component of this project.

ICARDA's service will be procured through a direct USAID/Pakistan-ICARDA contract. As suggested in the APAC cable, ICARDA will sub-contract for the range management and livestock inputs from a U.S. educational institution distinguished for its work and experience in range management/livestock research and the application thereof to foreign environments such as Pakistan.

6. Involvement of Pakistan's Agricultural Universities

The role of Pakistan's three major agricultural universities (University of Faisalabad, Faisalabad; NWFP Agricultural University, Peshawar; and Sind University of Agriculture, Tandojam) as active participants in Pakistan's research efforts has fluctuated greatly over the past three decades. Historical, political and administrative factors have influenced several GOP administrative decisions that have frequently changed the role and power structure of the universities in their relationship to GOP ministries. The universities' relationship to the GOP Ministries has ranged from complete independence to one of support institutions. These changes have led, to a degree, to irrelevance and inaffectiveness from which the universities have not fully recovered. Full recognition of past policy errors and administrative mistakes has informed the design of this project.

University participation builds upon the fact that, in spite of past history, the universities have sustained the desire and ability (although an ability not fully developed) to assume a more active role in agricultural research. In recognition of this potential role, the three agricultural universities are represented on the Board of Governors of PARC. In addition, the universities are active members in a number of the Nationally Coordinated Research Programs, notably the wheat and maize programs. Both PARC and the universities want to expand on this relationship. MART assures this enhanced role.

Several interventions have been included in the project to facilitate interaction between universities and research organizations. Expanded participation by universities in farming systems research will be facilitated through the provision of project funds for sociological and economic studies. Sabbatical opportunities for research at NARC or at other sites by university staff (six per year) is an important activity of the project. University personnel will be trained under the participant training program and will serve as instructors or as participants in seminars and in-country training programs. Universities will also receive commodity support to strengthen their research capabilities.

F. Recommended Waivers

Three waivers are required to implement the project as designed:

1. a source/origin/nationality waiver from A.I.D. Geographic Code 000 to Code 935 and a waiver of FAA Section 636(i) to permit USAID/Pakistan to procure sixty-three (63) right-hand drive, four-wheel drive vehicles and spare parts (14 station wagons, 12 land cruisers, 32 pickup trucks, and 5 15-passenger vans) valued at an estimated $536,500;

2. a source/origin/nationality waiver from A.I.D. Geographic Code 000 to Code 935 to permit the Pakistan Agricultural Research Council (PARC) to procure approximately $450,000 worth of multi-media production equipment from Japan and approximately $150,000 worth of agriculturalequipment, including Hege plot combines, Claas plot combines, and Wintersteiger plot planters from West Germany and Austria; and,

3. a justification for non-competitive procurement to permit PARC to negotiate and execute a four-year contract valued at approximately $3,000,000 with the International Wheat and Maize Improvement Center (CIMMYT) to provide technical services and training to implement the Wheat and Maize Coordinated Programs component of this project.

USAID/Pakistan plans to seek approval of the justification for non-competitive procurement of CIMMYT and of the vehicle waiver from the A.I.D. Administrator and the Assistant Administrator for Asia (AA/ASIA), respectively, and will request that the USAID/Pakistan Mission Director approve the commodity waiver. The justifications for these waivers are provided in Annex F.

G. Contributors to the Project Paper (See Annex N.)

II. BACKGROUND

A. USG-GOP Negotiations

The United States Government and the Government of Pakistan are into the third year of a renewed and strengthened effort to increase their economic and development cooperation. High level USG-GOP consultations in 1981 culminated in the negotiation of a $3.2 billion package of military and economic assistance, which the U.S. agreed to provide to Pakistan between U.S. FY 1982 and U.S. FY 1987. This assistance package is an indispensable contribution to the shaping and implementation of a new U.S.-Pakistan relationship and to the critical role that Pakistan plays in the region.

The economic component of the assistance package, which amounts to $1.625 billion over six years, is designed to achieve maximum development impact while providing as much support as possible to Pakistan's balance of payments. The economic assistance program, which continues a tradition of cooperation between the two countries, seeks to help Pakistan to fulfill the basic human needs of its people. At the same time, it is designed to address the country's foreign exchange needs through quick-disbursing activities that lay the foundation for economic growth and stability in the future.

The agreed upon economic assistance program wil:

1. reactivate a long-term development assistance relationship, which is important because of Pakistan's size, levels of poverty, strategic location, and other multi-faceted U.S. interests;

2. provide balance of payments support to help address short and medium-term foreign exchange shortfalls, thereby reducing development constraints and strengthening the economy;

3. address key economic problems, which will help Pakistan to achieve self-sustaining growth and manage its debt burden;

4. complement and support IMF, IBRD, and other donor initiatives and program assistance and accentuate their overall impact; and,

5. expand resource availability for local cost financing.

The Management of Agricultural Research and Technology (MART) Project has been developed in the context of the ESF program in Pakistan. It supports the objectives outlined above, particularly with respect to the need to address key problems affecting the GOP's efforts to achieve self-sustaining growth and to complement multilateral initiatives in the agricultural sector. It also supports the GOP's efforts to ensure that its development resources are effectively managed and provide a strong production base by which farmers and other primary beneficiaries, including the private sector, research organizations and agricultural universities, can directly contribute to and benefit from economic growth.

B. The Agriculture Sector

1. Overview

Agriculture is the largest sector in the Pakistan economy. It accounts for 29 percent of the Gross Domestic Product (GDP), employs 55 percent of the labor force, and provides 70 percent of export earnings, including primary and processed agricultural products. The relative share of agriculture in GDP has declined in recent years, primarily because of a faster growth rate in other sectors. However, the agriculture sector, in absolute terms, has maintained a steady rate of annual growth, showing over 4 percent during the period of the GOP's Fifth Five-Year Plan (1978-1982). An even higher rate of growth is projected in the GOP's Sixth Five-Year Plan. This places Pakistan in a select group of developing countries that have succeeded in establishing and maintaining a high rate of growth in the agricultural sector. Performance in the agriculture sector will continue to be a dominant factor in determining Pakistan's overall economic growth rate. For this reason, the Government of Pakistan assigns high priority to the further development of this sector.

Despite the high growth rate and an abundance of resources (adequate soils, generally favorable climate, adequate water), agriculture in Pakistan is characterized by low productivity. The Indus Basin, for example, has the potential to produce 100 million tons of food grain annually but produces barely 20 million tons. In addition, there is a wide gap (50-80 percent) in yields obtained by progressive farmers applying a complete package of proven, improved technology for major crops and the yields of average farmers using traditional methods. Table 2 illustrates the disparity between potential yields and recorded national average yields in Pakistan.

2. Agricultural Research

When Pakistan became independent in 1947, little of the substantial agricultural research network and infrastructure of undivided India remained with Pakistan. For example, not one of the national institutes of the Government of India, established in undivided India, was located in the territories which now constitute Pakistan. By contrast, 65 research institutes and 162 stations, sub-stations, centers and laboratories engaged in agricultural research (crops, livestock, fisheries, forestry and social science) exist in Pakistan today. In addition, there are: three agricultural universities located at Faisalabad, Tandojam and Peshawar; a Barani Agricultural College (Rawalpindi); a Faculty of Agriculture, Gomal University (D.I. Khan); a College of Veterinary Sciences (Lahore); and, five agricultural training facilities for field assistants at Peshawar, Rawalpindi, Rahim Yar Khan, Sakrand and Sargodha. Figure 1 shows the location of the agricultural research and educational/training institutions in Pakistan.

TABLE 2

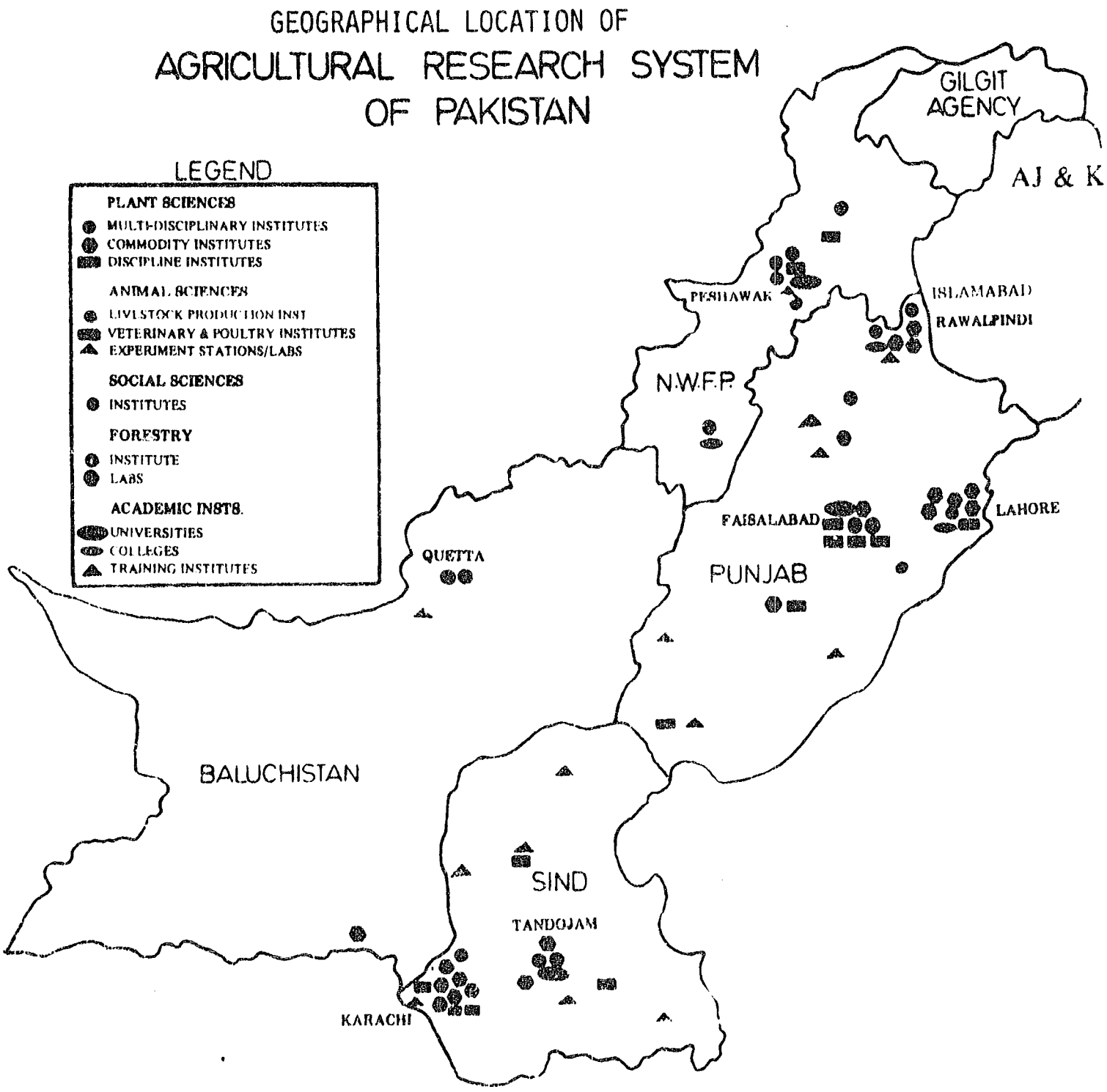
YIELD GAP OF VARIOUS AGRICULTURAL COMMODITIES a/

	Potential Yield Under Experimental Conditions (Kg/Hectare)	Average Yield of Progressive Farmers (Kg/Hectare)	National Average Yield (Kg/Hectare)	Yield Gap Between Potential and National Average Yield (Kg/Hectare)	Yield Gap Between Progressive Farmer and National Average Yield (Kg/Hectare)	Unachieved Potential (Percent)	Difference Between Progressive and Average Farmer (Percent)
1. Crops							
Wheat	6,425	2,800 b/	1,643	4,782	1,157	74	41
Paddy Rice	9489		1,611	7,878		83	
Maize	6,944	2,000 b/	1,273	5,671	727	81	57
Sugarcane	182,780	52,175 c/	39,215	143,565	12,960	79	33
Cotton (Lint)	1,400		339	1,061		76	
Rape/Mustard	2,743		605	2,138		78	
Potato	38,128		10,403	27,725		73	
2 Fruits							
Mango	25,812		5,866	19,946		77	
Citrus	27,602		10,004	17,598		64	
Apple	21,551		9,201	12,350		57	
3. Milk Production							
Nili Buffalo	6,600		2,400	4,200		63	
Sahiwal Cow	4,600		2,000	2,600		56	
Red Sindhi Cow	3,500		1,500	2,000		57	

Source: Report of the Evaluation Team, Pakistan Agricultural Research Project (391-0296), October 1983; and Steven R. Tabor and Larry C. Morgan, "Agricultural Production Contracting in Pakistan: A Case Study in Agribusiness Innovation, "Pakistan's Edible Oilseed Industry, Pakistan Oilseed Development Board, Islamabad, March 1984.

a/ For PFY 1980/81.
b/ Average yield for CIMMYT on-farm trials carried out by farmers under supervision.
c/ Yields reported by supervised cane growers under contract to a sugar mill.

FIGURE 1


GEOGRAPHICAL LOCATION OF
AGRICULTURAL RESEARCH SYSTEM
OF PAKISTAN
LEGEND
PLANT SCIENCES
MULTI-DISCIPLINARY INSTITUTES
COMMODITY INSTITUTES
DISCIPLINE INSTITUTES
ANIMAL SCIENCES
LIVESTOCK PRODUCTION INST
VETERINARY & POULTRY INSTITUTES
EXPERIMENT STATIONS/LABS
SOCIAL SCIENCES
INSTITUTES
FORESTRY
INSTITUTE
LABS
ACADEMIC INSTS.
UNIVERSITIES
COLLEGES
TRAINING INSTITUTES
GILGIT AGENCY
AJ & K
PESHAWAR
ISLAMABAD
RAWALPINDI
N.W.F.P.
FAISALABAD
LAHORE
QUETTA
PUNJAB
BALUCHISTAN
SIND
TANDOJAM
KARACHI

Several research organizations have been successful in developing yield-improving technologies. The agricultural universities and training facilities, moreover, have graduated more than 3,000 research scientists and technicians. The success the country has enjoyed in developing these human and organizational resources, however, has created a number of problems. The basic problem is that the rapid growth in the institutional infrastructure has outpaced the country's capacity to manage it.

C. Institutional Setting for Agricultural Research

The organization of Pakistan's agricultural sector closely parallels the organizational setup in other countries with Federal/Provincial form of government. Agricultural production and extension are largely the responsibility of Local and Provincial Governments, while research is carried out at both the Federal and Provincial levels. At the present time in Pakistan, agricultural education institutions play almost no role in the research/development process. The latter is confined to a large number of specialized research organizations operating under the auspices of several Ministries, Commissions, Boards and Authorities.

Historically, there has been a trend toward greater coordination of, if not central control over, agricultural research in Pakistan. Under the British, most of the responsibility for agricultural research, education and extension was assigned to the Provincial Governments. In 1929, the Government created the Indian Council of Agricultural Research (ICAR) as a central body to facilitate communication and coordination of provincial scientific research. After independence, Pakistan established a similar body, the Food and Agriculture Council, but this Council had little power and almost no money.

In the mid-1970's, the Government created the Pakistan Agricultural Research Council (PARC). In 1978, it was reconstituted as an autonomous body at the Federal level. PARC has been granted the authority to conduct its own research and to promote and coordinate agricultural research throughout Pakistan. Its functions are to:

1. undertake, aid, promote and coordinate agricultural research;

2. arrange for the expeditious utilization of research results;

3. establish research entities as necessary to fill in the gaps in the existing program of agricultural research;

4. arrange for the training of high-level scientific manpower in agricultural sciences;

5. generate, acquire and disseminate information relating to agriculture;

6. establish and maintain a reference library; and,

7. perform any other functions related to the above.

PARC's technical staff (Grade 16 and above) has grown from 168 in PFY 1977/78 to more than 1,000 in PFY 1983/84. Administratively, PARC is divided into: four technical divisions (crop sciences, natural resources, animal sciences, and social sciences); two special projects departments; and, finance, administration, legal and support services divisions. An organization chart of PARC is provided in Figure 2. PARC also has direct operational control over the following Federal research institutions: Cereal Diseases Research Institute (CDRI); Vertebrate Pest Control Center (VPCC); Insect Pest Control Laboratory (IPCL); National Agricultural Research Center (NARC); and, Arid Zone Research Institute (AZRI).

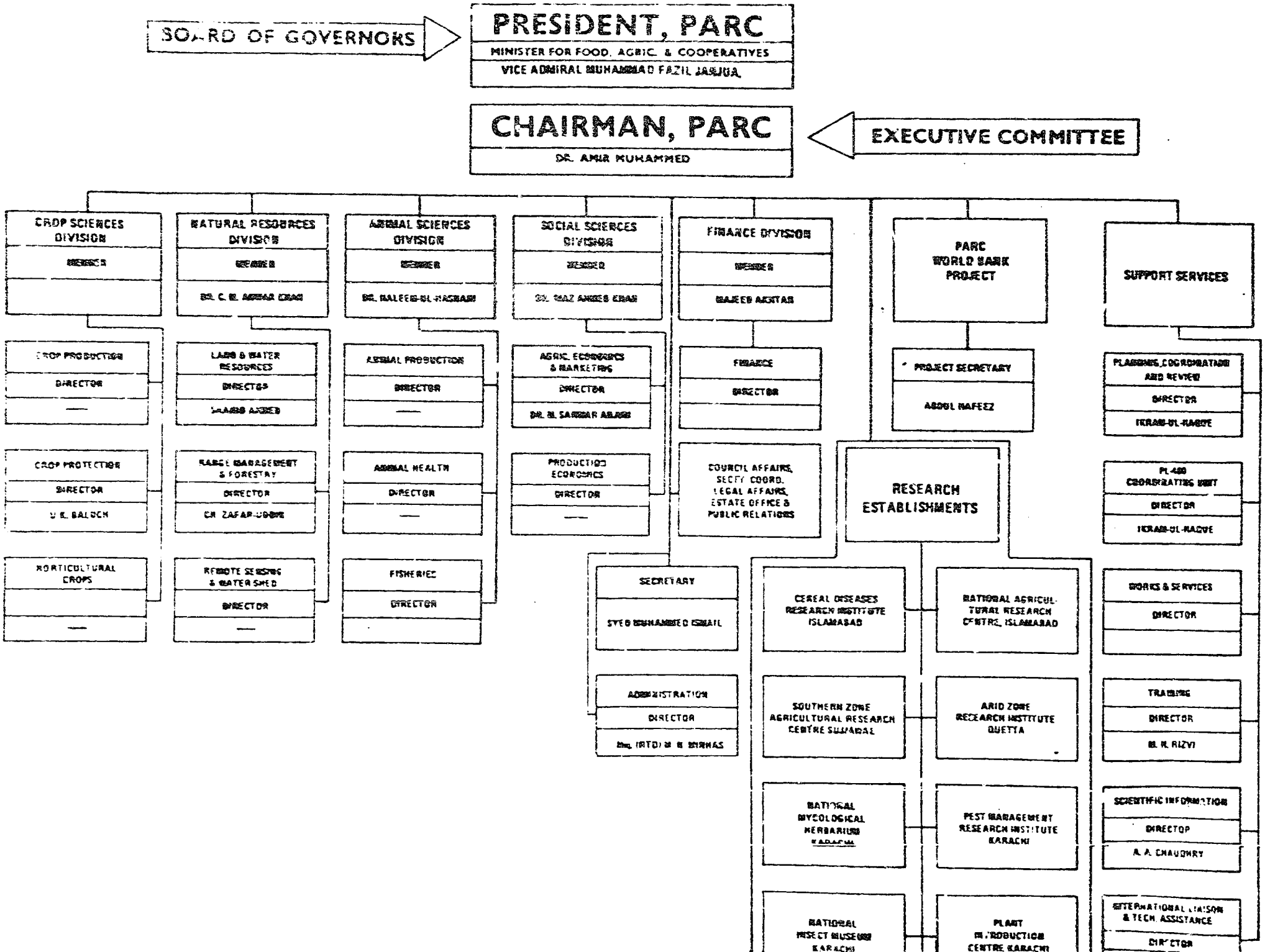
In addition to the PARC organizations, there are a number of other Federal agricultural research institutions in Pakistan operating under the authority of six different organizations. These include: three operated directly by the Pakistan Central Cotton Committee; three by the Ministry of Food, Agriculture, and Cooperatives; one by the Irrigation, Drainage and Flood Control Research Council; three by the Pakistan Atomic Energy Commission; three by the Pakistan Tobacco Board; and, one by the Water and Power Development Authority. In total, there are 21 research establishments operating at the Federal level.

Despite the trend toward centralization, the Provincial research institutions retain a great deal of operating authority and independence, and they continue to conduct most of the agricultural research in Pakistan. At present, a total of 16 Provincial government agencies operate 141 research establishments in the four provinces. The bulk of the research in the provinces is discipline and commodity oriented; very little focuses on small-holder production problems. The provinces have been reasonably successful as channels through which new varieties and technologies have been introduced from abroad. However, Provincial research organizations could play an even more important role as channels through which farmers articulate their needs and through which farmers are better served.

Some progress has been made in establishing mechanisms for coordination of research and information among the diverse research organizations. Under the auspices of PARC, Nationally Coordinated Research Programs (NCRP), linking Federal and Provincial research operations, have been established in the following areas: Wheat, Barley and Triticale; Maize, Millet and Sorghum; Rice; Potatoes; Forage and Fodder; and, Improving Water Management and Control System Development. Proposals for a dozen more Coordinated Programs are under consideration.

All Provincial governments have established Agricultural Research Coordination Boards to coordinate research within the province. These boards, however, have been largely ineffective. The Research Coordination Boards in th Sind, NWFP and Baluchistan rarely meet and have little operational funding. The Punjab Board meets but is much too large. One consequence of the ineffectiveness of these Boards is long delays in the approval of proposed research topics.

FIGURE 2: ORGANIZATION STRUCTURE OF PARC



D. Sector/Program Constraints

The premise upon which the MART Project and the current A.I.D.-financed Agricultural Research Project is based is that breakthroughs in yields can only be brought about through the pursuit of science-based agriculture. As a major participant in and beneficiary of the "Green Revolution," Pakistan is well aware of the potential benefits of science-based agriculture. However, Pakistani scientists are far from realizing their full potential to help improve agriculture in their country. While there is room for improvement in a number of areas, the single most important constraint to improved agricultural research and development is the inefficient utilization of existing resources and the lack of sufficient emphasis on research management and administration.

The institutional infrastructure needed for effective agricultural research in Pakistan is largely in place. This is a result of achievements not only under the existing A.I.D.-financed Agricultural Research Project, but also due to the efforts of other donors and those of the Pakistani agricultural research community itself. In many ways, Pakistan suffers from too many rather than too few research organizations. The plethora of organizations has contributed to compartmentalization, overlap and duplication of research activities.

The 1983 evaluation of the on-going A.I.D.-financed Agricultural Research Project concluded that the Project had been "highly successful" and that "a sound base has been laid for an effective national research program." The evaluation singled out the Project's achievements in: (1) the construction of facilities at the NARC; (2) the development of Nationally Coordinated Research Programs for major commodities; (3) the strengthening of the management and administrative capabilities at PARC and, (4) the training of 105 Pakistani scientists in overseas universities. It also noted that progress, albeit limited, was being made in developing linkages with extension, including selective research on farmers' fields.

Notwithstanding these achievements, the evaluation identified several critical areas requiring improvement. In research management and administration, the evaluation underscored the need for: improvements in the organization and staffing of the NARC, financial management, and, channels of communication between PARC and project/program managers; increased use of university and provincial resources in designing, implementing, and evaluating research projects; improved maintenance of equipment; and, the institutionalization of research operations procedures that had been developed under the Project. In the area of personnel, the evaluation recommended: implementation of a personnel needs assessment; expansion of in-country training facilities for research scientists: development of a sabbatical research program; strengthening of Pakistan's agricultural universities; improved selection, pre-departure preparation, and supervision of overseas degree candidates; and, expansion of exchange programs with international agricultural research centers. And, in the area of outreach, the evaluation recommended reinforcement of farming systems research; continuation of the "travelling seminar" system; and, a more systematic effort to disseminate research information to the full range of target audiences from GOP policy-makers to farmers.

In light of these recommendations and based on an assessment of constraints in the sector, the following categories of problems have been identified as those most appropriately addressed under the MART Project:

1. Uneven Distribution of Research Resources

The ongoing A.I.D.-financed Agricultural Research Project concentrated mainly on PARC and NARC. Yet, most agricultural research and nearly all production and extension activities are carried out in the provinces. In terms of resource allocation, what is critically needed is a shift of priorities and resources from the center to the periphery, from the Federal level to the Provincial level and from the research station to the farmers' field. Most of MART Project resources have therefore been programmed to support research and outreach activities in the provinces.

A principal management problem within the agricultural research network involves the coordination of activities among Provincial research organizations as well as between Federal and Provincial entities. The institutional framework for improved coordination already exists. Representatives of the provinces are members of PARC, and Provincial Coordinating Boards have been established. However, major problems exist with respect to coordinated planning, rational allocation of resources, timely disbursement of funds, and procurement and delivery of commodities. What appears to be lacking is an integrated set of management incentives and procedures to enable PARC and the Boards to be more effective.

2. A Need for Farmer-Oriented Research

Agricultural research in Pakistan tends to be oriented toward production maximization. Inadequate attention is given to the combination of biological and socio-economic constraints that affect the acceptance by farmers of improved technologies arising from research. Acceptance of technologies is further constrained by inadequate methods of extending and transferring information to farmers. In the past, the natural sciences and social sciences were seen as incompatible. More recently, there has been some attempt at interdisciplinary collaboration. However, there remains a great deal of misunderstanding about the role social scientists can play in agricultural research. One objective of the MART Project is to develop and foster interdisciplinary methods of agricultural research. This will be pursued, in particular, through increased support for farming systems research.

3. A Need for Private Sector Participation in Research

Virtually all of agriculture, from production through processing and marketing, is handled by the private sector in Pakistan. Private industry in Pakistan produces many production inputs (fertilizers, pesticides, machinery, and the like). Private business is now expanding into specialty production. The poultry industry, for example, is growing at a rate of 20 percent per year. A Poultry Growers' Association has been formed by eighteen hundred large producers. Twenty feed mills (largely serving the poultry industry) exist in Pakistan.

However, private industry does not carry out extensive research on its own behalf. Rather, it relies on in-country and externally generated research for the solution of problems. The GOP recognizes the potential role of the Pakistani private agribusiness sector in agricultural research, and the desirability of increasing this role. The MART Project will therefore assist the GOP to identify areas of opportunity for increased private sector collaboration and participation in agricultural research.

4. A Need for Better Trained Personnel

There are many well-trained and qualified scientists associated with agricultural research in Pakistan. However, there are major gaps at all levels, scientist, technician, and support staff, particularly in the provinces. In addition, certain areas of specialization lack adequate numbers of personnel. A related problem is that personnel who have been well trained at the beginning of their careers need continual re-training to keep up with the rapid changes in agricultural technologies and research methods. The MART Project will address these needs by providing overseas training for Pakistani agricultural scientists and educators and by developing in-country career development training courses designed to update technical skills.

5. Inadequate Packaging and Dissemination of Research Findings

To date, most of the information transfer activities carried out by agricultural research institutes have concentrated on the publication and distribution of printed materials. Because of financial constraints and the lack of adequate numbers of trained personnel and necessary equipment, the use of audio-visual communication techniques by agriculture information and outreach services has been limited. Radio is probably the most effective media for reaching the rural population in Pakistan. There are 15 radio stations in the country broadcasting to more than 95 percent of the country. Nine of these stations now broadcast agriculture programs in local languages. The Pakistan Television Corporation has the potential to reach 80 percent of the population from its six production studios. Under the GOP's Sixth Five-Year Plan, seven more production studios are to be operating by 1988, such that the potential will exist for television broadcasting to reach 90 percent of the population.

Agriculture broadcasting services suffer from the lack of technical information prepared in a format relevant to the farm community and consistent with the information generated from agricultural research. The MART Project will respond to this problem by: (a) financing the construction of a studio for the preparation of audio and visual agricultural information packages; and, (b) training individuals in the provinces and at NARC in the use of audio-visual and other mass communication techniques.

6. Deficiencies in Research Management, Organization and Administration

The decentralization of research operations that characterizes Pakistan has the virtue of getting research closer to the real conditions under which farmers work. The diffuse organization of research, however, has resulted in compartmentalization, overlap and duplication of research activities. Communications and cooperation among the research organizations, following upon the successes of the Nationally Coordinated Research Programs, need to be strengthened. There is a further need for improved management information and financial management systems throughout the research network.

The constraints to more efficient use of existing research resources are both technical and managerial. Technical problems primarily involve research methods. Improvements are needed in the following areas: the process by which research problems are identified, conceptualized, and prioritized; the methods by which field trials and laboratory research are undertaken; the extent to which social science considerations are adequately incorporated in the agricultural research agenda; and, the use of media for the production and dissemination of research findings.

Managerial problems exist in such areas as research organization and administration, financial planning, and coordination of research among units within the same organization, among organizations within the same province, and between Federal and Provincial research entities. There is a critical need for more effective linkages among Federal and Provincial research institutes, provincial training facilities, the international research centers, the agricultural universities in Pakistan, provincial extension agencies, farmers, and the domestic agribusiness private sector. Coordination between and among the provinces and national research establishiments exists to a limited degree but requires strengthening. Localized coordination among research, extension and education entities exists within some provincial research institutions. Yet, there is little province-wide or nationwide coordination in the planning and execution of the same activities. In addition, the agricultural universities have become largely isolated from the agricultural research system. Their research and extension functions are not well integrated either provincially or nationally.

E. Lessons Learned

The following lessons learned from agricultural research projects around the world and in Pakistan were incorporated into the design of the MART Project.

1. Lessons Learned from Agricultural Research Projects Around the World

In the last two years, A.I.D.'s Office of Evaluation, Bureau for Program and Policy Coordination, has sponsored two major reviews of

agricultural research projects around the world.2/ The lessons derived from these studies may be summarized as follows:

a. Host country commitment and support to research is essential. Government commitment determines "the sustainability of a research project as well as (indirectly) the utilization of research findings." (Murphy) There is a difference between "obtaining government's acceptance of a project and obtaining . . . government commitment." (DAI)

b. Technological solutions alone cannot solve problems which have political, economic, and social dimensions. The selection and design of agricultural research projects should consider socio-economic and politico-bureaucratic factors; technological changes can sometimes have negative effects such as increasing income disparities among rural households.

c. Research should be farmer-oriented. Project designers and implementors should be aware of the potential "trade-offs . . . . between helping small farmers and increasing aggregate food production to meet growing urban and export demand." (DAI) Farmer-orientation means more on-farm research and the development of "official linkages and feedback mechanisms among institutions and government entities with responsibilities in research, extension, and the provision of services to farmers . . . ." (Murphy)

d. Inadequate management of limited resources can undermine the effectiveness and sustainability of an otherwise satisfactory program. Management problems that are frequently encountered in agricultural research projects include insufficient numbers of adequately trained staff; delays in financial disbursements and in procurement resulting in late delivery of essential commodities and an inability to complete experiments on time; and, weaknesses in information systems, particularly involving two-way communications between research, extension and farmers. (Murphy and DAI)

2/ See Development Alternatives, Inc. (DAI), A.I.D. Experience in Agricultural Research: A Review of Project Evaluations, by Paul Crawford with the assistance of Albert H. Barclay, Jr., A.I.D. Program Evaluation Discussion Paper No. 13, May, 1982; and Josette Murphy, Strengthening the Agricultural Research Capacity of the Less Developed Countries: Lessons from A.I.D. Experience, A.I.D. Program Evaluation Report No. 10, September, 1983.

e. Coordination among researchers and other development actors, from farmers to politicians, is the key to success. It is particularly important to develop linkages among research institutions, between research and extension and between research and farmers. "Research institutions should not function in isolation, but should maintain an active network of information exchange with other national institutions in comparable ecological zones, as well as with international research institutions." (Murphy) Bureaucratic incentives often run counter to the establishment of linkages. It is not sufficient, therefore, to rely on the goodwill of institutional actors to "cooperate"; formal procedures designed to ensure cooperation must be established, and resources must be made available to make cooperation operational. (DAI)

2. Lessons Learned From Agricultural Research Projects in Pakistan

A.I.D. assistance to agricultural research in Pakistan has been channeled primarily through the Agricultural Research Project (391-0296). An October 1983 evaluation of this Project made the following observation:

> "The history of the project illustrates the importance of undertaking institution-building projects of this kind with patience and flexibility. A decade is not a long time in such a development process, and A.I.D. should be prepared to allow at least that much time for satisfactory progress . . . ".

The evaluation underscored several major lessons from the Project:

a. In the development of institutions, time, patience, perseverance and flexibility are of utmost importance. The decision to stay with it, but to modify and redesign to adjust to a very dynamic situation has been the key to the success of this project.

b. An improved system of national coordination in Pakistan for organizing, managing research and establishing research priorities is absolutely necessary to effectively mobilize scientific resources to solve agricultural production problems.

c. A large though insufficient number of well-trained, committed individuals of all categories--scientific, technical and administrative--exists in Pakistan. However, provision must be made to ensure that they are paid sufficient salaries, are provided with opportunities for advancement, and are given enough responsibility and authority to carry out their jobs, if they are to be attracted to and retained within the system.

d. Adequate facilities and support services must be constructed to create an environment in which well-trained Pakistani scientists can conduct professionally satisfying research. This is an important incentive for attracting competent staff and encouraging productive research.

F. Other Donor Assistance

The MART Project will build on the achievements of the existing A.I.D.-financed Agricultural Research Project which ends in June 1985. It will also complement and enhance the impact of three projects financed by the World Bank (IBRD) and one project financed by the Canadian International Development Agency (CIDA), which are described below.

1. The IBRD-financed Agricultural Research Project will provide $24 million to extend the facilities of the National Agricultural Research Center (NARC) to include an expanded capability for livestock and oilseeds research.

2. The IBRD's Training and Visitation Project is directed to improve agricultural extension services. Ten districts, five in the Sind and five in the Punjab, have been selected as pilot areas for introducing this new approach to extension. The approach is also being tested in the Mardan SCARP Project in the NWFP.

3. The $15 million IBRD Third Education Project, in addition to increasing the supply of qualified teachers in primary and middle schools, is designed to improve the quality and output of trained personnel for agriculture and rural development. The agricultural training facilities in the provinces, which are the source of most field assistants, will receive support under this project.

4. Under the $15 million Barani (Dryland) Research Project financed by CIDA, assistance will be provided to the NARC to conduct on-station and on-farm research to improve rainfed crop yields under typical farmers' conditions. This project will also improve the laboratory facilities at the NARC for the analysis of oil crops.

G. Relationship to A.I.D. Policy, A.I.D. Strategy and Other A.I.D. Projects

The MART project has been designed to carry out A.I.D. policy as articulated in worldwide and Asia-specific policy guidance. The project also supports the development objectives of the six-year (U.S. FY 1982 - FY 1987) package of U.S. economic assistance to Pakistan and complements other USAID/Pakistan projects in the agriculture sector.

1. A.I.D. Policy "Cornerstones"

a. Policy Dialogue

The MART project will provide an opportunity for USG and GOP officials to expand their on-going dialogue on several agricultural policy issues. These include: the basic organization of agricultural research and, in particular, the allocation of resources between Federal and Provincial research organizations; increased participation of farmers in the identification and application of improved agricultural

technologies; the relationship between research and extension; the role of the agricultural universities in research and extension; and, the participation of the private sector in agricultural research.

b. Technology Transfer

The purpose of the MART Project is to strengthen Pakistan's capacity to undertake agricultural research. To achieve this purpose, the project will introduce and/or strengthen the use of new and improved appropriate technologies in several fields. In the field of management and administration, the project will seek to improve research planning, financial management, management information systems, and research support operations. With regard to research methods, the project will seek to strengthen and expand the use of farming systems research as a complement to traditional commodity and disciplinary approaches. In the field of information transfer, the project will assist in developing new and improved methods for the production and dissemination of research findings.

c. Institution-Building

The MART Project is basically an institution-building project. The ultimate goal of the Project is to create an institutional environment which is conducive to not only attaining but also maintaining research excellence well beyond the life of the project. As a result of the project, Federal and Provincial research organizations, the agricultural universities, and agricultural training facilities should be better equipped and better able to train scientists who can carry out scientific research that responds to the needs of Pakistani farmers and contributes to the achievement of Pakistan's agricultural production goals.

d. Private Sector

One of the activities planned under the Research Management and Administration component of this project is aimed at enlisting the cooperation and increasing the participation of the Pakistani private agribusiness sector in the identification of priority agricultural research topics, in the conduct of such research, in the planning of and participation in mutually beneficial and appropriate training programs, and in the dissemination of relevant technologies to farmers.

2. A.I.D. Strategy

a. Asia Regional Strategy

The MART Project supports and is consistent with the basic strategy A.I.D. has established for the Asia Region. As articulated in the Asia Regional Strategic Plan (November 1983), this strategy:

i. places overall emphasis on "analysis and reform of economic policies, the design of science and technology elements in the program, and the strengthening of institutions critical to the development process; and,

ii. singles out agriculture as a priority sector, and within agriculture, support for research, extension and education, with emphasis on the transfer of technology and institutional development.

b. USAID/Pakistan Development Strategy

A.I.D. is the lead donor in the agricultural technology "sector" in Pakistan. The Mission's strategy in this area, as stated in its FY 1986 Country Development Strategy Statement (CDSS), dated January 1984 is two-fold: "firstly, to build the technological foundations for yield and productivity gains and secondly, to facilitate the policy and institutional shifts which will permit structural modernization of the sector."

The MART Project is one of several major projects A.I.D. is financing in Pakistan in the agriculture sector. Agriculture is one of the two major sectors that USAID/Pakistan has, in the context of the six-year economic assistance package, targeted for priority assistance. The project specifically supports two strategic objectives identified in the Mission's FY 1986 CDSS:

i. "increased cropping intensities and increased crop yields through the application and extension of agricultural technology at the farm level"; and,

ii. "increased privatization in the commodity producing sectors."

3. Other USAID/Pakistan Projects

The MART Project is designed as a follow-on to and will build upon the achievements of the Agricultural Research Project(391-0296), which terminates in June 1985. The latter project has been particularly successful in strengthening the capabilities of PARC to coordinate agricultural research on a national scale and in establishing the NARC as the centerpiece of the entire agricultural research network. The MART Project broadens the focus and emphasis of the previous project to strengthen the performance and increase the participation of the Provincial agricultural research and training institutions, the agricultural universities, and the domestic private agribusiness sector in the conduct of agricultural research, training, outreach and information transfer activities in Pakistan.

The MART Project is most closely linked to and will reinforce and complement the objectives of the FY 1984 Transformation and Integration of the Provincial Agricultural Network in the NWFP (TIPAN) Project (391-0488). Both MART and TIPAN are designed to strengthen the policy and operational linkages among agricultural research, education, and extension; TIPAN focus on one province, the NWFP, while MART is national in its focus. The Information Transfer component of the MART Project will augment resources available for the NWFP Agricultural University's Communications Unit by providing short-term technical assistance,

training seminars, and workshops that can be used by NWFP-AU Unit personnel. MART's Training for the Agricultural Research Network component will utilize the NWFP's agricultural training and research facilities as one of the sites for nationwide efforts to improve the professional performance of scientists and extension personnel. The personnel needs assessment to be conducted under MART will assist the NWFP-AU in its long-term planning and projections regarding student enrollment and faculty recruitment. Management improvement interventions developed under MART will be implemented in the NWFP as well as in the other provinces in Pakistan and will therefore reinforce and accelerate the pace of reform in the agricultural system in the NWFP by strengthening the provincial agricultural and training facilities in the NWFP. Similarly, as the NWFP-AU develops into a center of teaching and research excellence, its faculty and graduates will become a source of skilled, farmer-oriented technical assistance available to the entire agricultural research network, including PARC and NARC. In the beginning of the TIPAN project, personnel from the PARC talent pool will serve, on an interim basis, in key management/administration positions at the NWFP-AU while permanent staff are being recruited and trained abroad. In general, the overall linkages between the two projects will be in the sharing of information, personnel, technology, and ideas which will emanate from efforts carried out simultaneously and in tandem to strengthen Pakistan's agricultural sector at both the provincial and national levels. This integration and complementarity will be facilitated by having a representative of the NWFP-AU as a member of the Project Coordinating Committee chaired by PARC, which will be established under the MART Project.

The A.I.D.-financed Forestry Planning and Development Project (391-0481) is linked to the MART Project primarily through its research and training components. Integration of activities under the two projects will be facilitated through the existing institutional framework of the Forestry Research Technical Committee of PARC, which is comprised of both Federal and Provincial forestry officials as well as PARC agriculturalists. In addition, it is anticipated that personnel from the Pakistan Forestry Institute (PFI) in Peshawar will participate in the development of in-country training programs to be financed under the MART Project and that MART Project activities will involve NWFP forestry research facilities at PFI and the Provincial Forestry Department as well as other research facilities under the Forestry Departments in other provinces. The Development Support Training (DST) Project (391-0474) will provide support to the MART Project in two major areas. The DST contractor, the Academy for Educational Development (AED), will provide participant placement and support services for all Pakistanis trained outside of Pakistan under the MART Project. In addition, resources, in the form of technical assistance and possibly testing services, will be drawn from the DST Project to support various activities under the Training for the Agricultural Research Network component of the MART Project. These activities include preparation of uniform guidelines and selection criteria for overseas participant training programs, administration of the TOEFL and other required tests, and possibly assistance in the conduct of the personnel needs assessment, development of the long-term

training plan, and development of tailored, in-country career development courses. The Mission will seek economies of scale in the implementation of both MART and DST by combining resources where possible to undertake similar activities under both projects.

The Tribal Areas Development Project (391-0471) encompasses seven Agencies of the NWFP, along its border with Afghanistan. The people of the Area will form part of MART's target beneficiary population. In particular, MART Project resources will be available to assist with the land development and cropping pattern demonstrations to be undertaken in Bara, and with research and technical assistance in the irrigated and non-irrigated agricultural components of the project.

The Gadoon-Amazai Area Development Project (391-0485) is operating in one of the major opium-poppy producing areas of the NWFP to provide farmers with alternative sources of income. The geographic focus of this Project has been expanded to support the GOP's Special Development and Enforcement Plan for Opium-Poppy Growing Areas, by including other poppy-producing areas of the NWFP. MART research will directly benefit the area, while experience gained through the GAAD Project will be fed into MART's research system. Similar linkages will be established with a parallel project, funded by the Department of State's Bureau for International Narcotics Matters (INM), being implemented in the Malakand Agency in the NWFP.

The research activities of the MART Project will both support and benefit from activities under the three components of the recently-approved Food Security Management Project (391-0491). The Economic and Policy Analysis component will provide guidelines for priority research and analytic topics, while research under the MART Project will supply data to the Agricultural Data Collection component. The MART Project will also contribute to the generation of improved technology transfer in storage design, grain quality maintenance and pest control under the Post-Harvest Management component. In fact, the research program in storage technology development under the FSM Project will be coordinated by PARC and implemented by Pakistani research institutes, such as the Vertebrate Pest Control Center in Karachi, which falls under the jurisdiction of PARC. PARC will assign one of its staff to coordinate the research program under FSM and will establish a Research Coordinating Committee for all food storage research financed under FSM.

MART Project activities should also result in technologies which permit the more efficient use of seed, water, fertilizer, and other agricultural inputs. As this knowledge is transferred to Pakistani farmers, the impact of the fertilizer and agricultural equipment provided under the Agricultural Commodities and Equipment (ACE) Program (391-0468) and the benefits of improved watercourses and irrigation systems under the On-Farm Water Management (391-0413) and the Irrigation Systems Management (391-0467) Projects will be enhanced. In addition, ACE Program funds will be used to procure commodities to support activities under the MART Project.

H. Relationship to GOP Policies and Priorities

The growth strategy for Pakistan's economy in the GOP's Sixth Five-Year Plan (1983-1988) contains five major policy objectives, of which four are specific to the agricultural sector. Paraphrased, these four objectives are: increased agricultural yields through more efficient use of primary inputs and technology; an expansion of export markets for wheat, rice and other agricultural commodities; increased self-sufficiency in oilseeds; and, the establishment of agro-industries for processing agricultural surpluses. The overall agricultural development goal of the GOP is to at least maintain the steady sector growth rate of the last five years (over four percent per annum).

There have been several recent indications of the importance the GOP attaches to agricultural research and to increasing the capacity of its agricultural research institutions. As part of an austerity program, the Government recently announced an across-the-board budget cut of 14 percent. Agricultural research, however, was exempt from this cut. In a speech delivered at the inauguration of the National Agricultural Research Center (NARC) on March 27, 1984, President Zia announced two incentives for agricultural scientists: (1) a Pride of Performance Award; and, (2) a technical pay increase of 20 percent in researchers' salaries. It is also significant that the Sixth Five-Year Plan explicity states that agricultural research and, particularly, the strengthening of research organizations, is a high priority.

The Sixth Plan recognizes the need to strengthen public and private sector institutions and to improve the agriculture sector's human resource base if its objectives are to be achieved. The Plan's development goals, objectives and policies are inherently linked to improve the nation's productive base. Paramount attention is directed toward agriculture and the rural sectors. The need for generating appropriate technology through research and communicating those findings in a form and manner acceptable to the target audiences has been explicitly identified.

The MART Project will assist the GOP to achieve these specific objectives by providing resources to: improve the planning, management and administration of agricultural research; strengthen the research network's capacity to generate appropriate technologies; and, facilitate the transfer of technology to target audiences.

I. Project Rationale

Agriculture dominates the economy of Pakistan. Accounting for about 30 percent of GDP, it employs more than half the labor force. USAID's FY 1986 CDSS dated January 1984, in its review of the sector, states that "the last decade has been characterized by stagnating yields, with the exception of wheat... even for new varieties, yields have remained well below those achieved under comparable conditions in other countries." The analysis suggests that growth over the last 10 years is importantly explained by continued acreage expansion made possible by investments in irrigation. Both land and water resources are limited, and

future increases in agriculture, therefore, must be achieved principally through increasing per-acre yields. The potential for such increase in Pakistan is considerable; studies have proven that increased inputs combined with well-timed water releases and improvements in farm practices can substantially raise crop yields in the short and medium run. In the longer run, however, sustained agricultural growth will only be achieved through major efforts to strengthen the institutional framework for research, extension and other elements of the agricultural system.

Regarding Pakistan's institutions, the CDSS notes:

> "Pakistan is simultaneously institutionally rich and institutionally poor. There is certainly no dearth of organizational structure and systems. A fairly broad base of colonial institutions has been added to with enthusiasm over the past 35 years. Most sectors have too many institutions, but too few strong institutions."

This is certainly true of Pakistan's agricultural research network, as has been noted above. The country is now faced with the need to allocate scarce resources to a plethora of agricultural research institutes whose scientists are inadequate in number, inappropriately trained and unmotivated, and whose facilities are insufficiently equipped to stimulate them and to provide the resources required to generate new, improved and relevant technologies. Pakistan's 65 research institutes and 162 stations, substations, centers and laboratories are all competing for operating funds, which are estimated to be only between 10 percent and 20 percent of total budgets. Although there is a centralized institution, the Pakistan Agricultural Research Council (PARC), with a mandate to coordinate research efforts, the Provincial institutions remain independent, conducting mainly discipline and commodity-oriented research with little emphasis on small-holder production problems. For agricultural research, the basic problem is that the rapid growth of the institutional infrastructure has surpassed the country's capacity to manage it.

The MART Project is part of an integrated USAID effort (along with the TIPAN and Agricultural Research projects described previously) to help Pakistan deal with these institutional issues. The MART Project will provide a model for strategies to reduce duplication of effort and resource misallocation and to increase coordination and resource generation. The ultimate goal of all elements of the Project will be to generate and transfer technologies that will increase per-acre yields and hence agricultural growth in Pakistan.

As this Background Section has noted, MART is a vital part of AID's agricultural sector strategy, and its objectives are high priorities of Pakistan's Sixth Five-Year Plan. The Project is consistent with the Asia Bureau's strategy and complements other projects in the Mission's portfolio as well as those of other donors in the agriculture sector. Its design is based on lessons learned by AID in 39 countries around the

world, as well as experience gained in past projects in Pakistan. And it adequately takes into account and reflects the findings and recommendations of the October 1983 evaluation of the A.I.D.-financed Agricultural Research Project. MART draws on the U.S. comparative advantage in agricultural research, education and technology transfer. It will operate in an area of significant potential for increased productivity based upon the project's plan to harness the considerable human and physical resources that exist in Pakistan's entire agricultural research network.

III. DETAILED PROJECT DESCRIPTION

A. Project Goal and Purpose

The sectoral goal to which this project will contribute is to increase agricultural production, farm income and rural employment. The purpose of the project is to strengthen the performance of the national agricultural research system to generate and disseminate quality and relevant agricultural technologies to the farmers of Pakistan.

Achievement of the project purpose will be demonstrated by the existence of the following conditions upon completion of the Project:

1. operational linkages strengthened between Federal and Provincial research organizations and among the agricultural universities and research and extension agencies;

2. long-term institutional linkages established between the Pakistani national agricultural research network and selected regional and international research centers;

3. a critical mass of research skills and managerial talent in place within the national agricultural research network;

4. increased capacity at the national and provincial levels to plan, manage, and evaluate Pakistan's agricultural research needs and priorities;

5. capacity institutionalized within the national agricultural research network to produce and disseminate new technologies in a form and manner that responds to the needs of client groups (farmers, agro-industry, extension, research scientists, agricultural educators, planners and policy-makers);

6. strengthened capability in the management, accountability, and utilization of financial resources within the national agricultural research network;

7. expanded in-service training capacity at the Federal and Provincial levels to present career development courses on a continuing basis to all levels of agricultural research, scientific support and outreach personnel;

8. improved capacity at the Arid Zone Research Institute (AZRI) to plan and carry out effective research on agricultural problems applicable to the arid and high altitude areas of Baluchistan and similar areas of Pakistan;

9. improved research capability and programs for wheat and maize with an expanded outreach activity applicable to the major wheat and maize production areas of Pakistan;

10. selected commodity research programs generating relevant technological packages which contribute to GOP agricultural production goals;

11. a multi-disciplinary farming systems research program institutionalized; and,

12. mechanisms identified and being implemented to increase the participation of the Pakistani private agribusiness sector in the identification, conduct, and dissemination of research.

B. Project Outputs

The project will produce the following outputs:

1. management improvement interventions designed and implemented throughout the national agricultural research network in the areas of research planning, research methods, organization and administration, information flow, and financial management;

2. at least 40 different special studies in the area of farming systems research;

3. a completed study to identify possible financial mechanisms to improve the flow of funds for agricultural research;

4. a completed two-year plan including benchmarks for increased Pakistani private sector opportunities in the selection of priority agricultural research topics, in the conduct of such research, in the planning of and participation in mutually beneficial training programs, and in the dissemination of appropriate technology to farmers;

5. a revised and improved financial records maintenance and reporting system established at PARC and the Provincial agricultural research institutes;

6. management improvements in the area of research/outreach integration, field-tested and demonstrated in Islamabad District and replicated nationwide;

7. 140 individuals trained overseas in degree and non-degree programs and 500 individuals trained in-country in research management and administration and related topics;

8. a fully equipped and staffed multi-media production studio at the NARC;

9. at least 450 individuals trained in-country and 9 individuals trained in degree programs overseas in communications;

10. a Technical Information Transfer Committee established and institutionalized;

11. at least 100 video documentaries, recordings, media campaigns, and other technical information packages produced and distributed to target audiences;

12. a completed personnel needs assessment for the agricultural research network over the next 10 years and a comprehensive training plan;

13. at least 50 agricultural training facility and university staff trained in survey and evaluation methods, teaching methods, and curriculum development;

14. physical and staff expansion at the NARC training facility;

15. uniform guidelines established for participant selection, pre-departure preparation, placement, and academic supervision of overseas degree and non-degree programs;

16. four types of in-country professional improvement programs for agricultural personnel developed and implemented;

17. a 10-year long-range plan developed for station and on-farm trials to be conducted by AZRI;

18. about 25 research and extension personnel at AZRI and from Baluchistan province trained in the U.S., at ICARDA, and in third countries in research methods and operations;

19. at least 12 major field surveys and field research programs designed and implemented by AZRI staff in collaboration with provincial agricultural research and extension personnel;

20. institutionalized capacity among Pakistani scientists to continue a genetic maintenance program and research on disease-resistant varieties of wheat and maize;

21. a 10-year plan for wheat and maize research developed; and,

22. about 25 scientists trained in the U.S, and at CIMMYT in technical subjects related to wheat and maize production.

C. Project Components

The project consists 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 are 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 will include: 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 facilities in all four provinces, and the agricultural universities in the Sind, Punjab, and the Northwest Frontier. The fourth component addresses 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. Such research is critical to achieve significantly increased agricultural yields in Pakistan. The MART Project will strengthen the capability of AZRI, which is located in Quetta, Baluchistan, 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. The fifth component will 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.

1. Research Management and Administration (RMA)

The October 1983 external evaluation of the on-going A.I.D.-financed Agricultural Research Project concluded that the project had laid a "sound basis.....for an effective national research program." The evaluation, however, stressed the critical need to strengthen research particularly at the Provincial level and to improve the management and administration of research throughout Pakistan. Opportunities for improvement were specifically identified in the following areas: research planning; research support operations; the use of farming systems research; the allocation and accounting of financial resources; the participation of agricultural universities in research and outreach activities; and, cooperation between the public and private sectors in agricultural research. This project component involves activities which encompass all of these areas.

a. Systems Analyses

Weaknesses in research management have been singled out as the principal constraint to improving the performance of the agricultural research network in Pakistan. Within the management area, research planning, the system of rewards and incentives, and information flow have been identified as particularly weak. It is generally acknowledged that a shift is needed from administratively repetitive, control-oriented management techniques to an approach that emphasizes participatory management, problem-solving and management by objectives.

While many of the problems are known, their causes and the most appropriate and feasible means by which to address them need to be critically examined. For example, linkages between research and extension are recognized as being weak. Is the explanation for this problem technical, e.g., that research has produced little to extend? And/or is it one of information flow, e.g., that research findings are not packaged and disseminated in ways that field agents and farmers can

readily understand and use? And/or is the problem organizational, e.g., that interaction between researchers and field agents is rare for want of bureaucratic incentives and/or institutionalized procedures to ensure that such collaboration occurs? What solutions that are acceptable and implementable in Pakistan can be identified to address this problem?

This project sub-component will be divided into two phases. Phase 1, which will cover the first 12-18 months of the project, will involve the implementation of a series of systems analyses, by teams of expatriate and Pakistani specialists, which are designed to: increase the coordination of research activities nationwide; increase the participation of extension agencies and the agricultural universities within the agricultural research network; improve the flow of information and financial resources within the network; and, strengthen the managerial and administrative capacity of research entitites at both the Federal and Provincial levels. The teams will undertake indepth analyses in the following general areas, identify the problems and their causes, and propose alternative solutions:

i. Research Planning: the process by which research priorities are established, research topics are identifed and approved, research activities are scheduled, and research programs are evaluated;

ii. Research Methods: systems of operation and procedures followed to conduct both station research and on-farm trials, and the extent of complementarity and interaction between traditional commodity and disciplinary research methods and farming systems research;

iii. Organization and Administration: methods of financial and personnel allocations, decision-making processes, standard operating procedures, administrative reporting, and channels of communication between research entitites at the Federal and Provincial levels, among those at the Provincial level, and among units within individual research organizations;

iv. Information Flow: systems of data collection and analysis and the flow of information from farmers through extension to researchers, operations reporting by field managers to program directors, and information sharing among Federal and Provincial research entities, between research and extension agencies, and between research organizations and the agricultural universities. (The packaging and dissemination of research findings will be addressed under the Information Transfer component of this project.); and,

v. Financing: budgeting, disbursement, maintenance of financial records, financial control, and financial reporting.

It is anticipated that about three teams will spend three to four months each to conduct these analyses and prepare their reports. Analyses will focus on PARC, NARC, AZRI, the Provincial agricultural research and training institutions, the agricultural universities, and the Coordinated

Wheat and Maize Programs. On the basis of the findings and recommendations of the teams, participating Pakistani entities, with the assistance of expatriate long-term technical advisors, will develop an action plan to implement specific management improvement interventions.

Phase 2 of this sub-component, which will cover the remaining 3-1/2 - 4 years of the project, will involve the phased implementation of these management improvement programs throughout the national agricultural research network. For each intervention, detailed workplans, including implementation schedules and procedures, will be developed; specific modifications to existing systems or new systems defined in detail, documented and approved by relevant parties; and, the modifications and/or new systems implemented either on a pilot basis initially or throughout the system, depending on the nature of the intevention. New or revised manuals or standard operating procedures will also most likely have to be prepared. Appropriate staff will have to be familiarized with the revised or new procedures, and, in some cases, specific staff will have to be trained or retrained. PARC, with the assistance of both short-term and long-term expatriate and Pakistani consultants, will assume the lead role for implementing and evaluating all the interventions undertaken in Phase 2 of this sub-component.

It is anticipated that recommendations emerging from the analyses in Phase 1 will require the computerization of certain management sub-systems, including information systems and resource allocations. Accordingly, funds have been provisionally programmed under the project to procure appropriate hardware and software for micro-computers, and to acquire micro-computer components over the life of the project to update and maintain the computer systems. Short-term technical assistance will be provided to help install the computers, train Pakistani personnel in their use, and conduct periodic evaluations of systems operations.

The analyses are also likely to identify the need for U.S., third country and in-country training for Pakistani personnel in such fields as financial management, research methods and computer systems operations. Provision has therefore been made in the project budget for training in these and related areas. (See Section IV.D., Training Plan.)

The services of three long-term consultants will be provided to assist PARC, NARC and the Provinces to design and implement the management improvement interventions and to undertake the specific studies defined below. The three individuals include: (1) a research planning/farming systems specialist; (2) a provincial research planning and management specialist; and, (3) a research operations and support specialist.

b. Specific Studies and Interventions

In addition to the general systems analyses described previously, special studies or programs will be undertaken in the following five areas which have been singled out as major concerns in the area of research planning and operations:

i. Farming Systems Research

The project will provide funding for up to ten special studies each year throughout Pakistan in the area of farming systems research. The studies will be conducted by individual researchers or teams of researchers composed of biologists and social scientists, most of whom will be drawn from Pakistani universities with some assistance by short-term expatriate specialists. The ultimate purpose of these studies is to develop and institutionalize a farming systems research program in Pakistan and to integrate this program with the traditional commodity and disciplinary research programs.

ii. Funding of Agricultural Research

The October 1983 evaluation of the on-going A.I.D.-financed Agricultural Research Project identified the lack of timely availability of Federal GOP funds budgeted for research activities as a key constraint to effective research management. Federal regulations require that PARC submit monthly justifications to the Ministry of Finance for the disbursement of budget allocations. This monthly budget review process slows down the rate of release of funds from the Ministry of Finance to PARC to the extent that disbursements often lag two months or more behind scheduled budget allocations. As a result, the flow of funds is inadequate to meet seasonal requirements and often prevents the timely completion of experiments. PARC frequently does not receive its budget allocation for the last two months of the fiscal year if disbursements from prior months lag behind. Short-term consultants will therefore be provided to assist PARC to critically examine this process and identify possible financial mechanisms to address this problem. Depending on the nature of the recommendations emerging from this study, project funds may be made available to implement a revised or new system.

iii. Private Sector Participation in Agricultural Research

Agricultural production is the largest privately-owned and operated sector in Pakistan's economy. Private farmers, private agribusiness operators and private distributors and marketers of agricultural produce are the backbone of this vital component of the national economy. Worldwide experience has demonstrated that where private interests are positioned to benefit from and utilize agricultural research, that research is most effective when:

(1) the private sector has a voice in the framing of the national agricultural research agenda; and,

(2) the private sector itself conducts considerable amounts of that research and finances some of that research.

There are research problems which require public financing because there is no way to capture the benefits. Non-hybrid seed development is an example. There is much research, however, which is most naturally handled on the basis of private sector financing and execution. Hybrid seed development in crops such as maize is an obvious example.

This project seeks to achieve four objectives with respect to the private sector role in agricultural research:

(1) the strengthening of formal institutional mechanisms to enable the private sector to have an effective voice in establishing the overall national research agenda in agriculture;

(2) the development of mutually beneficial and relevant training programs, involving joint participation and shared costs, which make better use of existing communication resources and facilities;

(3) an increase in the share of publicly-financed research which is conducted by private farmers, private laboratories and private agribusinesses on a contract basis; and,

(4) an increase in the share of agricultural research which is financed and conducted by private firms on a proprietary basis.

A.I.D. and the GOP recognize the desirability of achieving the four objectives stated above. Accordingly, short-term expatriate specialists will be provided to assist PARC to identify ways to promote an increased private sector role in agricultural research. The first step in this process will be to conduct a study to examine the constraints and identify opportunities to increased participation of the Pakistani private agribusiness sector in identifying, conducting, financing and disseminating agricultural research. As a result of this study, PARC will prepare a two-year plan which shall include, at a minimum, benchmarks for increased Pakistani private sector opportunities in the selection of priority agricultural research areas and in the planning of and participation in training programs, and for increased private sector contracting for the conduct of agricultural research and the dissemination of appropriate technology to farmers. The study will also serve as the basis for a formal plan to increase the amount of agricultural research financed by the private sector on a proprietary basis. The possibility of Pakistani/expatriate joint ventures in proprietary research in such areas as hybrid seeds, livestock feeds and agrichemicals will also be considered.

iv. Bookkeeping and Accounts

The October 1983 evaluation identified an immediate need to develop an adequate system to maintain financial records and a financial reporting system in PARC and the provincial institutes. The project will therefore finance the services of a Pakistani management/accounting firm for up to 40 person-months to assist PARC and the provinces to strengthen their bookkeeping operations. The Pakistani firm, supplemented by short-term expatriate consultants, will provide on-the-job training as well as organize and conduct financial management courses of three to eight weeks in duration for approximately 160 employees of Federal and Provincial research organizations. A.I.D. may also arrange two-week tours for key financial managers from these institutions to observe the financial management operations in agricultural research institutes in such countries as the Philippines, Thailand and India.

v. Research/Outreach Integration

The systems analyses described previously will identify management improvements in the area of research/outreach integration, and these will be field-tested and demonstrated in Islamabad District by PARC with the assistance of short-term expatriate extension specialists. Islamabad District was chosen because of its unique status. PARC was recently given overall responsibility for the development of the agricultural sector within the District. This includes the responsibility for extension. A pilot area, therefore, exists in which research and extension activities are under the direction of a single government agency with a degree of autonomy atypical of the rest of Pakistan. Islamabad District will serve as a living laboratory for testing and demonstrating off-station research, communication efforts, information transfer methods, farming systems research, and extension approaches, which can then be replicated nationwide.

d. Summary of Inputs

A U.S. contractor, competitively selected and hired under a direct A.I.D. contract, will provide three long-term specialists for a total of 120 person-months and about 110 person-months of short-term technical assistance. The farming systems research specialist will work directly with the Crop Sciences and Social Sciences Divisions within PARC. The Provincial research planning and management specialist will reside in Faisalabad and will work with all four Provincial research directorates. The research operations specialist will be based at the NARC in Islamabad, but his area of responsibility will include the entire Federal and Provincial research network. A Pakistani management/accounting firm, selected competitively and hired under a host country contract with PARC, will work primarily with the Finance Division in PARC and the Offices of Finance in the Federal and Provincial research institutes.

An estimated 44 Pakistanis from the Federal and Provincial research network and the agricultural universities will be sent abroad for long-term U.S. degree or non-degree training. An additional 94 individuals from these organizations will receive short-term training in the U.S. or third countries. Several hundred individuals will participate in a variety of in-country training programs and seminars.

Project funds have also been budgeted for vehicles, agricultural commodities and equipment, and computer hardware and software. (See Annex H.) Most of these commodities will support Provincial research operations.

2. Information Transfer

The purposes of the Information Transfer component are to: (a) make research results more readily available to the general public and potential end-users; and, (b) disseminate the information in ways which respond to the needs of client groups and which ensure that the information will be properly and effectively utilized. A considerable

amount of improved technology has been generated by research organizations in Pakistan. However, information concerning these technologies must be packaged so it is better understood and acceptable to target audiences or client groups. The latter include other members of the research community, GOP policy-makers, agricultural universities, agro-industries, extension services, farmers, and the general public. To address this need, the MART Project will finance technical assistance and training in the production and dissemination of media and target audience-oriented technical information packages and the construction and equipping of a multi-media production studio at the NARC.

a. Production Studio

The studio will be located on the NARC campus in Islamabad and will fall under the administration of PARC. It will be built in conjunction with the proposed expansion of the NARC training facility (See the Training Component.) The studio is intended to serve the needs of all the member institutions of the Federal/Provincial agricultural research network, including the agricultural universities.

The studio facilities will include:

i. a video production unit with high-performance, professional video cameras, recorders, editing facilities and control room;

ii. a sound production unit with professional recorders, mixers and audio filters;

iii. five portable electronic multi-media field production units to be used throughout the research network; and,

iv. twenty portable multi-media display units to be used throughout Pakistan in support of the seminar, conference, and training facilities of the research network.

The project will finance the short-term services of a U.S. architectural and engineering consultant to design the preliminary architectural layout of the studio in collaboration with a short-term expatriate electronic media specialist. The latter will design the layout of the electronic equipment for the studio and develop equipment specifications.

The electronic equipment installed in the studio will be high-performance, professional-grade production equipment. The production equipment will include 3/4" format, PAL standard high-band video recorders, 3-tube and 1-tube color video cameras, open-reel audio recorders, audio-mixers and filters, monitoring equipment and playback equipment. During the final phase of construction, the electronic media specialist will return to install and test the studio equipment. The specialist will also train Pakistani production engineers in the operation and maintenance of the equipment.

The design should meet the following general requirements:

i. a 100 m^2 video facility with lighting, settings for discussion panels, a ceiling height of no less than 6 m, and a soundproof, lightproof, air-conditioned environment;

ii. a 60 m^2 sound facility with settings for readers, sound reflectors, a ceiling height of no less than 4 m and a soundproof, air-conditioned environment;

iii. a 30 m^2 master control room with visual access to both video and sound studios, a false floor for cable runways, and an air-conditioned environment;

iv. a 30 m^2 electronic editing facility attached to the control room with an air-conditioned environment; and,

v. four administrative offices and equipment storage space.

To facilitate servicing and to ensure that all components are fully compatible, the communications equipment will be tendered as single lot and will have specifications compatible with the mass communications standards of Pakistan. The Pakistan Television Corporation produces and broadcasts its video programming using the Phase Alternating Line (PAL) video standard. Video equipment of this standard is not manufactured in the U.S. The U.S. manufactures equipment of the National Television Standards Committee (NTSC) video standard, and PAL and NTSC video standards are not compatible. An illustrative list of communications commodities, including mobile production and presentation vans, is provided in Annex H.

The design and construction of the studio will be done by the same contractors hired to design and construct the expansion to the NARC training facility. Both facilities will be located in the same building. The layout of the facilities and space requirements will be prepared by a short-term U.S. consultant. Thereafter, a competitively selected Pakistani A&E firm will be contracted to use the approved preliminary layouts to prepare final construction plans, specifications and bid documents and to supervise construction. The construction work will be carried out by a competitively selected Pakistani construction firm.

A.I.D. will finance the total costs for A&E services and construction. It is anticipated that A&E work will take approximately 4 months and the construction work 18 months. With time allotted for tendering procedures and A.I.D. and PARC reviews, the training center/production studio facility should be completed about 27 months after the A&E contracting procedures are initiated. (See Engineering Analysis, Annex L.)

b. Information Packages

While construction is underway, PARC will recruit 17 professional and 13 support personnel to staff the studio. A.I.D. will provide a long-term expatriate information transfer specialist for three

years to assist PARC to assess the information needs of client groups, train studio staff (with the assistance of short-term specialists), and produce information packages. The proposed staffing pattern for the production studio is as follows:

1	Director
3	Producers
3	Script-writers
8	Multi-media engineers (camerapersons, electronic editors)
2	Graphic artists and set designers
2	Secretaries
2	Stenographers
1	Clerk
8	Drivers/General Assistants
30	

The Director will be responsible for all aspects of media production within the studio and will report directly to the Chairman of PARC. He will monitor the production schedule of the studio and promote the dissemination of materials produced by the studio. The individual occupying this position should have an educational background in mass communications and skills in script-writing and directing multi-media productions.

The producers will be responsible for the preparation and tailoring of programming to the scientific community, outreach workers, farmers, and the general public. They will manage all aspects of program production, including conceptualization, background research, script- writing, recording, editing and final assembly. These individuals should have educational backgrounds in agricultural disciplines, training and experience in production techniques, and skills in video camera and video recorder operations. The producers will lead the electronic field production teams described below.

The script-writers will assist the producers to conduct background research on production topics. They will maintain regular contact with research scientists and assist the producers and scientists in preparing scripts in styles, languages and forms appropriate for the target audiences. They should possess skills in scientific technical writing, creative writing and journalism.

The electronic media engineers will be responsible for the operation of the production studio equipment. They should have skills in all aspects of video and sound production equipment, including video camera operation, video editing, sound recording, sound mixing and program duplication for dissemination. One of the engineers will be assigned as the manager of the production studio control room.

To promote and maintain national level coordination of the information transfer activities within the research network, a Technical Information Transfer Committee will be established. The committee of up to 8 individuals could be drawn from PARC; NARC; selected Provincial agricultural research institutes; Provincial agricultural information services and extension agencies; national television and radio corporations; national newspapers; and, agricultural universities. The committee will meet about every six months to review and approve workplans for the multi-media production studio. It will also review technical information being considered for dissemination, establish priorities for production schedules, and evaluate the work accomplished during the previous six months.

The production studio staff and other members of the agricultural research community will be trained in production and information transfer techniques by short-term expatriate consultants and Pakistani research and extension personnel. While the studio is being completed, training will focus on the use of existing equipment and facilities.

When the studio is completed, the training teams will provide instruction to agricultural research personnel in the use of the new equipment. Through the assistance of A.I.D. and other donors, the agricultural research network has been provided with equipment and facilities that can be used to support this activity. These facilities include equipment and production studios for scientific photography, printing and graphic arts. In addition, a facility to house a multi-media research library has been established at the NARC. However, at the present time, the library contains only single-medium (printed) material, consisting of approximately 4,000 volumes (planned capacity is 35,000) plus microfiche material provided by the Food and Agriculture Organization (FAO). The MART Project will finance the acquisition of additional equipment and reference material for this library.

In addition to hands-on training in the use of hardware, workshops will be conducted to facilitate interaction between research scientists and studio personnel who produce the information packages. The script-writers will especially need to work closely with scientists to ensure the accuracy of the technical content of the materials throughout the production and presentation process.

The flow of information among the scientists of the research network will also be enhanced by the production of video documentaries and recordings of travelling seminars, workshops, conferences and training sessions by the electronic field production teams. These teams will edit and assemble this recorded information into documentaries and training tapes.

The production studio staff will be required to create programs in styles and forms appropriate for the media used and the audience targeted. Assessments will be undertaken to identify the most appropriate media for use in the transfer of agricultural information to each target group. These assessments will be conducted by NARC staff and the expatriate information transfer specialist in collaboration with the Department of

Communications at the NWFP Agriculture University at Peshawar. (The establishment of this Department is one activity under the proposed FY 1984 A.I.D.- financed Transformation and Integration of the Provincial Agricultural Network (TIPAN) Project.)

Production studio staff will also work closely with Provincial research and extension agencies to plan and produce media campaigns on relevant agricultural problems for farmers. Possible campaign topics include, for example, better use of insecticides and improved cultural practices for corn borer control, and intercropping of vegetables in fruit orchards to increase food production. The production staff will be responsible for mobilizing the resources of the national agricultural research network to disseminate problem-solving information quickly and effectively.

The project will also finance multi-media display units, mounted in two vans, to be used in experiments in agricultural extension research. These vans will be used by production studio staff in experiments to determine the effectiveness of various modes of communication in transferring technical information at the village level. The multi-media vans will be equipped with permanently-mounted video and sound equipment to facilitate the presentation of technical packages of information to groups of farmers.

The studio will also produce and package technical material aimed at agro-industries. Production topics will focus on current agro-technology in areas such as the manufacture of farm machinery, milling operations, food processing, food storage, food transportation and food marketing. The productions will stress profit-oriented, problem-solving technology relevant to the agro-industries of Pakistan. The studio will also initiate the production of multi-media programming specifically designed to apprise policy-makers of the activities of the national agricultural research community.

c. Summary of Inputs

A long-term expatriate information transfer specialist will be assigned for three years to the Science Information Directorate of PARC. He will work closely with PARC's Technology Transfer Division and the staff of the new Multi-Media Production Studio at NARC. Approximately 26 person-months of short-term technical assistance will also be provided. In addition, A.I.D. will finance all the A&E and construction costs for the facility as well as the equipment and commodities required to make the studio operational.

Up to 9 graduate study fellowships in the U.S. will be made available in subject areas related to the transfer of agricultural information, i.e., mass communications or rural sociology, video and sound production, and technical writing. In addition, 5 in-country training courses will be held each year over the life of the project. Fifteen trainees will attend each three-week course for a total of 450 people trained in a wide range of topics in communications by the end of the project. Each year, two courses will focus on scientific presentations and documentaries, two on mass media productions, and two on multi-media productions for target

audiences. Each course will be led by a team of expatriate consultants and professionals from within the national agricultural research network. Courses will be organized by PARC and will be held at various locations throughout Pakistan.

The GOP will hire thirty additional professional and non-professional individuals to staff the production studio. The costs for the land on which the studio will be constructed and operating and maintenance costs for the facility will also be borne by the GOP.

3. Training for the Agricultural Research Network

The purpose of this component is to improve the capacity of the agricultural research community in Pakistan to: (a) identify personnel needs; (b) define appropriate education and skill development programs to meet those needs; and, (c) develop and institutionalize in-service, in-country career development courses to train existing and new personnel. To achieve this objective, the following activities will be undertaken:

a. implementation of a personnel needs assessment and preparation of a long-term training plan;

b. training of NARC and Provincial training facility staff;

c. physical expansion of the NARC training facility;

d. development and initial implementation of tailored in-country training courses; and,

e. development of guidelines for the selection, pre-departure preparation, and supervision of overseas degree and non-degree training programs.

a. Personnel Needs Assessment and Training Plan

Under this sub-component, the PARC Training Office, with the assistance of a long-term expatriate agricultural training specialist and short-term specialists, will conduct a comprehensive personnel needs assessment of the agricultural research network over the next ten years. The assessment will cover requirements for research scientists, technicians and support personnel for PARC, NARC, and all provincial agricultural research and training institutions. A comprehensive training plan, based on the assessment, will then be prepared. While the plan will include overseas training (both degree and non-degree), emphasis will be placed on in-country training, particularly at the universities and the existing training facilities at the NARC and in the Provinces. Funding will be provided under this Project to launch the implementation of this comprehensive training plan.

b. Training Facility Staff

The personnel needs assessment described above will include an analysis of training facility personnel needs. Likely training needs in this area, for which MART Project funds have been provisionally programmed, include the following:

i. long-term graduate degree programs at U.S. universities to improve training skills in such areas as survey and evaluation methods, curriculum development and teaching methods;

ii. study tours to appropriate universities and research and training facilities outside Pakistan by scientists, training officers and administrative leaders from the agricultural universities, the Provinces, PARC and NARC. The overseas universities selected should have solid linkages to the research and extension programs at the state and federal levels. One possible site is the University of the Philippines at Los Banos. The quality of the training at Los Banos is high, and the University's activities are integrated with research programs in the country through the Philippines Council for Agricultural and Resources Research. Such a tour might also include a visit to the International Rice Research Institute (IRRI) to observe its training, research and outreach programs; and,

iii. traveling seminars by the Directors of the six training facilities (NARC and the five Provincial centers) to the National Agricultural Training Center in Thailand.

c. Expansion of In-country Training Facilities

The NARC training facility consists of two teaching laboratories and two seminar rooms with a total capacity of 80 students. In 1983, the facility was used for 29 training courses, conferences, seminars, symposia and workshops, involving approximately 500 participants. The facility is clearly inadequate for current training needs and grossly inadequate for the projected future demand. The MART Project will therefore support an expansion of the existing facility by financing the construction and equipping of two seminar/workshop rooms, a dry and a wet laboratory, and three staff offices as well as a hostel and quarters for visiting scientists. These facilities will be designed and built in conjunction with the multi-media production studio under component 2. Details of construction costs are provided in the Engineering Analysis in Annex L.

d. In-Country Training Courses

This sub-component is designed to strengthen the capacity of the NARC training facility and the Provincial training facilities to plan, develop, conduct and evaluate short-term career development and professional improvement seminars and workshops. Up to ten person-months of short-term, subject matter specialists will be provided to work with training institute staff to identify and design appropriate training courses. Courses in specific research disciplines and in technical

writing, preparation and presentation are among those likely to be developed. A short-term evaluation specialist will also be provided to develop a system for assessing training program effectiveness and end-use.

The subject matter specialists will assist in developing the following four types of professional improvement programs for agricultural personnel:

i. short courses in research methods concentrating on farming systems and field-oriented approaches to research. (The short-term specialists will work closely with the expatriate long-term farming systems consultant under component 1 of this project.);

ii. sabbatical research programs involving exchanges of personnel between Pakistani universities and research institutes, both in Pakistan and abroad;

iii. short courses on research management and administration. These courses will be developed following the results of the systems analyses under component 1 of this project;

iv. "traveling seminars", based on the model successfully used in the wheat and maize programs, to enable research, extension and training personnel to travel together to field sites to apply their skills in the observation and analysis of agricultural problems.

e. Guidelines for Overseas Training

Eventually, Pakistan should be able to provide M.Sc. and Ph.D. training at local universities in most agricultural disciplines. However, advanced degree training abroad will be required for at least the 10 year period covered by the comprehensive training plan to be prepared under this component. Experience under the on-going A.I.D.-financed Agricultural Research Project and previous and on-going other donor-supported projects, has shown that the agricultural research community could benefit significantly from guidelines for the selection, pre-departure preparation, placement and academic supervision of Pakistani degree and non-degree candidates sent overseas for training. The rigorous and consistent application of such uniform guidelines will enable the agricultural research community to maximize the efficient use of financial resources, both GOP and externally provided, for overseas training. Use of such guidelines will ensure that appropriate and qualified candidates are selected for relevant training, and that adequate preparations have been made for the timely and efficient execution of their training programs.

The expatriate training specialist will assist the PARC Training Office prepare Pakistan-specific guidelines. The first step in this process will be to examine the experience gained and lessons learned from previous overseas training programs. Files available at PARC and other GOP institutions on agricultural personnel who have received overseas training will be analyzed, and interviews will be conducted with former

participants. The results of this returned participants' survey will be used to prepare guidelines for overseas training, which will include criteria for selection of candidates.

A plan for pre-departure English and academic preparation programs for prospective participants will also be developed. This plan will include: identification of the site(s); preliminary schedules for these programs; an illustrative curriculum; required teaching aids; a description of program goals and objectives; staff requirements; and, arrangements for the administration of standard U.S. tests, including the TOEFL and the GRE. PARC Training Office will also prepare guidelines for academic program supervision and standard degree program profiles at the M.Sc. and Ph.D. levels. Resources available under the A.I.D.- financed Development Support Training (DST) Project will be drawn upon to develop the English language and academic preparation programs and the degree program profiles.

Lessons learned from the returned participants' survey on the conduct of in-country thesis work will be translated into guidelines which shall define: the role of the local advisor; resources required to support the student; the role of the overseas degree-granting institute; and the sequencing of events for the conduct of the research and report preparation. These details will be discussed with participants and the overseas degree-granting institutions prior to the departure of the participants for overseas training. This will ensure that adequate arrangements have been made and agreed to by all relevant parties for in-country thesis support.

Similar guidelines will be prepared for overseas non-degree training aimed at developing specific skills to meet the requirements of particular commodity and disciplinary research programs. The international agricultural research centers are one source of this kind of training.

f. Summary of Inputs

Implementation of this project component will involve primarily the Training Office at PARC, the NARC training facility, and the five Provincial training facilities. A long-term training specialist will be assigned to PARC for three years. The services of a short-term evaluation specialist and selected subject matter specialists for up to 13 person- months of effort will also be provided . The same short-term expatriate A&E consultant, local A&E firm and local construction contractor involved in the construction of the multi-media production studio under component 2 of this project will be responsible for the construction program under this component. A.I.D. will also provide equipment and commodities for the expanded NARC training facility and the five existing Provincial training facilities. (See Annex H.)

The GOP will hire an additional 14 staff members at the NARC training facility as follows: 6 Scientific Officers (2 each in English Language, Evaluation and Training); 2 Administrative Assistants; 2 Junior Assistants; and 4 Drivers. In addition, facility operating and maintenance costs will be borne by the GOP.

4. Arid Zone Research

This component is designed to strengthen the capacity and capability of the Arid Zone Research Institute (AZRI) in Baluchistan to generate and disseminate quality and relevant technologies aimed at increasing agricultural production in Pakistan's non-irrigated areas. The existing staff lack proper training, and the Institute lacks adequate supplies and equipment to conduct research. The project will address these deficiencies by providing technical assistance, in-country and overseas training and commodity support.

Under a Collaborative Agreement with the International Center for Agricultural Research in Dry Areas (ICARDA), A.I.D. will finance the services of expatriate research scientists to work with Pakistani scientists at AZRI to plan and conduct research programs and to organize and conduct workshops at AZRI and the Provincial training facility in research methodologies, mixed farming and on-farm research. ICARDA will provide five research specialists to work full-time at AZRI, two for three years each and three for four years each. The services of one of the specialists among the latter group--a germ plasm evaluation agronomist-- will be financed by ICARDA from its core budget. The other four specialists will be financed by A.I.D. The project will also provide up to 30 person-months of short-term technical assistance in specialty areas.

Surveys and field and laboratory research will be conducted by teams composed of AZRI staff members, ICARDA scientists, faculty members from agricultural universities in Pakistan, and Baluchistan Province scientists associated with the Agricultural Research Institute (ARI) in Quetta. Provincial extension personnel will also participate in field research and outreach activities. The use of the team concept is intended to demonstrate the merits of research/outreach integration and will provide the national and provincial scientists with experience in all aspects of research including experimental design, survey methods, field and laboratory research methods, the use of equipment, interdisciplinary approaches to research in a farming systems context, and data analysis and presentation. Specific activities to be undertaken include:

a. adaptation trials of imported and local varieties of cereal grains, legumes, forage and pasture grasses;

b. demonstrations and verification studies on farmers' fields of technologies that have proven superior on research stations; and,

c. special studies on such topics as range and livestock management, mixed farming, animal nutrition and livestock marketing.

a. Field Surveys

The ICARDA farming systems research (FSR) specialist will work with his counterparts at AZRI to plan and conduct surveys in Baluchistan Province to identify constraints to increased agricultural

production. The surveys will be carried out by teams of ICARDA, AZRI and Provincial ARI scientists and Provincial extension personnel. Studies will focus on gaining an understanding of current practices and problems in such areas as mixed farming (crops and livestock), crop production, animal husbandry, plant pathology and crop and livestock marketing.

The FSR specialist should be a social scientist, preferably an agricultural economist, with some training and experience in rural sociology and in cropping and grazing patterns of arid areas. He will supervise a series of studies of socio-economic factors that influence farm and livestock management in the dry areas of Pakistan. These studies will focus on such topics as the decision-making patterns of the various tribes in Baluchistan, agricultural price policies and structures (including cost factors and farmgate and market prices) and farmer risk analysis. The FSR specialist will also supervise diagnostic studies designed to identify researchable ideas and will ensure that socio-economic variables are taken into account in the design, conduct and analysis of field trials. He will organize and conduct workshops to train AZRI staff, provincial extension officials and university personnel in farming systems research and extension methods.

b. Field Research

ICARDA will provide three long-term agricultural scientists, one long-term extension specialist, and short-term specialists to assist AZRI conduct a program of field research designed to improve crop and animal production in Baluchistan and the other dry areas of Pakistan.

The germ plasm evaluation scientist will be primarily responsible for the evaluation, over a range of environments, of germ plasm of cereals, food legumes, forage and pasture species from local cultivars, ICARDA collections and other sources. This scientist should have experience with the generally stable but low-yielding varieties characteristic of the arid highlands and be familiar with the source banks of "best bet" germ plasms for these environments. He will evaluate the performance of the germ plasm for various plant types using a number of criteria including yield, stress and disease resistance, grain/straw quality and adaptive characteristics.

The range management/livestock scientist will be responsible for the design and testing of a viable, integrated range/forage/grazing management system that satisfies the demands of sheep and goat owners and conserves the natural resource base. This specialist will identify and test crops suitable for grazing, fodder and hay and straw production. He will conduct surveys designed to identify the principal causes of mortality and morbidity among livestock herds and the extent to which mortality/fertility rates can be influenced by improved animal health and nutrition practices. This scientist will also supervise research into what types of feed supplements should be introduced to augment currently available animal feed in the dry areas.

The extension specialist will be responsible to ensure that the extension services of Baluchistan and other dry areas of Pakistan are integrated into the farming systems research approach that will be developed at AZRI. In particular, extension personnel will be involved in diagnostic surveys and in on-farm verification trials. The extension specialist will develop methods to transmit research findings to the farming and herding communities. He will ensure the involvement of the extension services in the monitoring of the adoption and diffusion process, identifying problems therein and contributing to research on solutions to those problems.

The soil/water nutrient agronomist will focus on a number of soil, water, drainage and cultivation issues. This scientist will study the impact of various cultivation methods (including the current animal- powered, minimum tillage techniques and the inevitable increase in the use of tractors and mounted tillage equipment) on the fragile soils that characterize Baluchistan and other dry areas of Pakistan. He will also study various water harvesting techniques, including the currently used "Bundat" system, and alternative methods such as contour cultivation, contour strip cropping, weed control and suppression of evapo-transpiration.

Field research on known problems will begin before the surveys are completed. The results of the surveys will lead to the preparation of a comprehensive plan for station and on-farm trials to be carried out over a period of five to ten years. Likely areas of research include:

i. evaluation, over a range of environments, of various sources of cereal grain, food legume, forage and pasture germ plasm. Sources of germ plasm will include local cultivars and collections from ICARDA and CIMMYT. Comparative evaluations of germ plasm performance will enable plant types with superior yield, stress and disease resistance, grain/straw quality and adaptive characteristics to be identified;

ii. trials of selected annual and perennial legumes and grasses suitable for rangeland production and stabilization and adapted to existing animal management systems in Baluchistan. Adaptive factors to be considered will include seed availability, established herder grazing practices, costs and nutritive values;

iii. a comparative study of sown fodder crops with and without irrigation;

iv. demonstrations at research sites and at the farm level of superior crop production technologies such as rotation; weed management; fertilizer use; cultural methods; and, the role of summer crops. Technologies selected for demonstration should promote more efficient utilization of land and water resources by increasing the efficiency of soil/water/plant response interactions. This will logically involve a parallel and detailed study of soil water balances in different environments and plant use efficiency; and,

v. testing of improved technologies in farmers' fields. Farmer management practices will be utilized where practical so that economic feasibility and social acceptability may be determined under existing farming systems. On-farm testing should lead to more effective dissemination of recommendations to the animal husbandry/farming community. Research extension linkages will be strengthened through the participation of agricultural and livestock extension personnel in research and outreach activities.

Special emphasis will be placed on rangeland and livestock research due to the importance of livestock in the agricultural systems of Baluchistan. Research designs will emphasize crop/livestock interactions. Straw yields, for example, may assume equal importance with grain yields in some mixed farm management systems in Baluchistan. Similarly, rotations of food and feed crops will be given an importance equal to pure food crop rotations.

Studies in range management will also be a priority area of investigation at AZRI. Experience on the Maslakh Range (where open, unmanaged grazing has been prohibited for 20 years) has demonstrated the potential productivity of the rangelands in Baluchistan. A "systems approach", involving integrated studies of range management and livestock management, will be used to identify interactions and trade-offs involving such factors as range regulation and improved feed production. Evidence from other countries raises questions as to whether increased feed availability would reduce or increase the pressure on the range.

Specific range management and livestock research activities at AZRI are likely to include:

i. range ecology studies to develop an information base for the formulation of a coherent range management program. A reference herbarium using international nomenclature will be developed;

ii. a survey of range types. Range type mapping will be done first on experimental areas and demonstration management units. Detailed mapping may be extended to other areas as operational range management is expanded or developed. This will lead to the development of a general range type map;

iii. a study of grazing impact on the most important range types utilizing a series of exclosures approximately one hectare in size. The exclosures will not only provide a scientific base for a range management program, but will also provide a focal point for interaction with livestock operators and government offcials on the potential production of rangelands;

iv. studies designed to show the relationship of range plants and supplemental feeds for livestock nutrition;

v. development of an outreach/extension/demonstration program for technology transfer in cooperation with extension personnel; and,

vi. a study of the factors affecting and governing the management and marketing of livestock produced under range conditions.

c. Training

The most important output of the Arid Zone Research component will be a strengthened capacity at AZRI to plan and carry out agricultural research in the dry areas of Pakistan. Formal, non-formal and on-the-job training is therefore of critical importance to the success of this component's activities.

i. Formal Training

In order to upgrade the capabilities of existing staff, the project will provide fellowships for U.S. graduate degree training in range management, animal husbandry, agricultural economics, agronomy, plant breeding, crop protection, soil science and extension. To the maximum extent possible, preference will be given to Baluchis for these fellowships. For planning purposes, a total of 216 person-months of degree training has been budgeted. This includes both Masters and Ph.D. studies. Some degree of flexibility may be required in the timing of scholarship awards due to the difficulties expected in identifying suitable candidates. In some cases, higher degree students, particularly those studying for Ph.D. degrees, will undertake their thesis research in Baluchistan. Upon completion of their degree training, all participants will be required to serve at AZRI for a specified period of time. Through the A.I.D.-funded DST project, provision will be made for English language training to ensure that candidates for overseas training meet TOEFL test requirements prior to departure for the U.S.

ii. Non-Formal Training

Each year, ICARDA conducts six-month practical, field-oriented courses for junior scientists and senior technicians. These courses are in agronomy and breeding of cereals, food legumes and forage and pasture crops. Project funds will be made available to enable AZRI scientists and research assistants to attend these courses. In subject areas where ICARDA does not conduct a six-month course, the project will sponsor visits by AZRI staff to work with ICARDA scientists in relevant disciplines such as soil science, animal husbandry, economics and crop rotations. In each of the first four years of the project, two scientists will receive short-term, practical training at ICARDA for a period of between one and six months. If the required expertise does not exist at ICARDA, candidates may be sent for short-term training to other institutions either in the U.S. or other international centers. For planning purposes, 64 person-months of short-term training has been programmed.

iii. Informal or On-the-Job Training

All surveys and field research activities will be carried out by teams composed of AZRI and ARI scientists, provincial extension personnel, faculty from agricultural universities in Pakistan

and long and short-term ICARDA specialists. The participation of Pakistan agricultural personnel in these activities will provide valuable on-the-job training. Training will also be provided in the use and maintenance of computers.

ICARDA personnel will also organize workshops in Pakistan on key subjects of relevance to the AZRI research program, such as research methods (on-farm research for crops and animals, the role of social and economic factors in agronomic and animal research) and the interactions between crop and livestock systems. These courses will be attended by Pakistani research, university and extension personnel. Instruction support will be provided by long and short-term advisors, previous participants and training and communications facilities developed through other components of this project.

d. Summary of Inputs

ICARDA will provide five long-term expatriate scientists as follows:

	Person-Months
Germ Plasm Evaluation Specialist (Core Funded and Team Leader)	46
Soil/Water Nutrient Agronomist	48
Farming Systems Research Specialist	48
Range Management/Livestock Specialist 3/	36
Extension Specialist	36

ICARDA will also provide a total of 30 person-months of short-term consultants in the following illustrative areas: agro-meteorology, microbiology, plant protection, computer systems analysis, soil conservation, livestock, sociology, training, moisture nutrients, and research management and planning. Although the long and short-term ICARDA experts will be based at AZRI in Quetta, they will be made available to the entire MART project and are likely to spend some of their time in other parts of Pakistan.

A.I.D. will also finance the costs of overseas training described previously and commodities to be used to support the research activities at AZRI. (See Illustrative List of Commodities, Annex H.)

The GOP will provide:

i. salaries and related costs of the national scientists and support staff associated on a full or part-time basis with AZRI;

ii. local costs required for operating and maintaining the institution and research demonstration programs;

iii. suitable office accommodations, laboratory space and facilities and work and storage rooms at AZRI; and,

3/ This consultant will be provided by a U.S. educational institution under a sub-contract with ICARDA as will some of the short-term consultants.

iv. use of the land and field research facilities of AZRI headquarters and its substations.

5. Wheat and Maize Coordinated Programs

For the past decade, the International Wheat and Maize Improvement Center (CIMMYT) has been working with Pakistani scientists to introduce high-yielding cereal grain varieties in Pakistan and to conduct weed control and disease resistance trials. Results from this work have been impressive. From a position as a net wheat importer, Pakistan is now self-sufficient in wheat. To a large extent, increased wheat production has resulted from increased use of improved seed developed through PARC and CIMMYT research. The number of tons of improved wheat seed in use by Pakistani farmers increased by 56 percent between PFY 1975/76 and PFY 1979/80.

Despite these gains, there remain several critical problems in maize and wheat production. A gap of 50 to 80 percent exists between the yields of progressive farmers applying a complete package of proven technologies in wheat and maize and the yields of average farmers using traditional methods. In recent years, PARC and CIMMYT scientists have been moving their trials from the research station to farmers' fields in an attempt to identify the constraints to both adoption and proper use of improved varieties. This work needs to be continued for several more years to identify the interventions necessary to close the yield gap. In addition, the yields of progressive farmers using current high-yielding varieties will not be maintained unless the capacity is institutionalized among Pakistani scientists to continue a strong genetic maintenance program and research on disease-resistant varieties.

The MART Project will therefore support the following activities carried out through the Nationally Coordinated Wheat and Maize Programs, which will build on the research Pakistani and CIMMYT scientists are conducting under the on-going A.I.D.-financed Agricultural Research Project (391-0296):

a. the continuation of efforts to produce high-yielding varieties (HYV) of wheat and maize that are adapted to Pakistani conditions;

b. the development of a detailed agro-ecological analysis that will permit the identification of wheat and maize zones in Pakistan;

c. the establishment of larger and more accessible farmer research and verification areas in representative locations that will permit the generation, testing and revision of production techniques appropriate to Pakistani conditions; and,

d. the increased use of farming systems research methods to ensure that the generation of researchable ideas and the development and extension of new technologies are done in ways that maximize their chances of adoption by farmers.

These activities will be carried out under two sub-components: (a) Germ Plasm Development and Evaluation; and, (b) Outreach/On-Farm Research.

a. Germ Plasm Development and Evaluation

The MART Project will reinforce and strengthen a long-term participatory relationship between Pakistan and CIMMYT in wheat and maize germ plasm development and evaluation. Pakistani and CIMMYT scientists will continue to introduce and evaluate wheat and maize genetic materials under the national and international germ plasm exchange and testing programs. Continuous participation in the international wheat, triticale and barley germ plasm uniform nursery trials will enable Pakistani scientists to rapidly develop or adopt varieties that are disease resistant and suitable to Pakistani conditions. Participation in CIMMYT's international maize testing programs will enable Pakistan to accelerate the process by which maize varieties are introduced, thus obviating the need for a lengthy and expensive varietal breeding program. By the end of the project, Pakistani scientists will assume complete responsibility for the management, conduct and evaluation of the wheat and maize program.

b. Outreach/On-Farm Research

CIMMYT scientists will assist Pakistani scientists to develop a 10-year plan for wheat and maize research. The plan will establish research priorities and will focus on the complementarities of FSR and traditional commodity and disciplinary approaches to agricultural research. As a first step in this process, CIMMYT and Pakistani scientists will prepare a detailed agro-ecological analysis for wheat and maize. This analysis will be prepared from data assembled by wheat and maize breeders on varietal needs and disease incidence. Established zones will be divided into sub-zones based on the homogeneity of cropping patterns, soil types, rainfall and farm management practices. The analysis will be used to identify research priorities and to plan maize and wheat production programs and on-farm verification trials.

The gap between what is technically feasible under controlled research station conditions and what is technically, economically and socially feasible under farmer conditions needs to be closed. CIMMYT and Pakistani scientists, working as teams with provincial extension personnel, will plan and carry out a program of demonstrations and on-farm trials to test the feasibility on farmers' fields of technologies developed at the stations. Initially, diagnostic surveys of the sub-zones mapped out in the agro-ecological analysis will be conducted to identify researchable ideas and to elicit farmer cooperation in conducting on-farm research. Teams of biological and social scientists will work with farmers in these sub-zones to identify, from the farmers' point of view, the most critical constraints to increased farm production and productivity.

On the basis of the results of the surveys, simultaneous trials of new technologies on research stations and selected farmers' fields will be undertaken. Consistent with maintaining the integrity of the new technology, farmers will be permitted to use their own management techniques in on-farm trials. Comparative multi-variate analysis of the conditions under which the new technologies are employed on the stations and on farmers' fields should identify those factors responsible for differences in production and productivity. Necessary modifications in the technology itself and/or in the outreach program by which technologies are extended will than be made to optimize the chances of more widespread adoption of improved technologies by Pakistani farmers.

c. Summary of Inputs

This component will be implemented by PARC with the assistance of CIMMYT. CIMMYT will be responsible for the recruitment and technical backstopping of long and short-term expatriate scientists and will coordinate the international germ plasm exchange and testing program and a long and short-term training program for Pakistani scientists.

Using its core support financing, CIMMYT will post an agricultural economist in Islamabad to work in the South Asian Region of Pakistan, India and Nepal. Approximately 50 percent of this economist's time will be allocated to work in Pakistan. The CIMMYT economist will assist PARC to develop an improved capacity for social science research in Pakistan's agricultural research system at the national and provincial levels. Specifically, the economist will:

i. develop methods to integrate economic analysis into on-farm research. Most of the economist's efforts will be directed at the Wheat and Maize Programs, but he will also work with other projects that have on-farm research components (e.g., the Barani Research Project at NARC and the proposed A.I.D.-funded TIPAN project in the NWFP);

ii. work with Pakistani economists on specific projects at the macro-level to improve allocation of research resources. Examples of such projects include studies of the potential demand for maize in food, feed and industry and the comparative advantage of wheat versus alternative crops in export markets;

iii. provide informal guidance in the field and formal training courses on specific research methods such as diagnostic surveys or the use of micro-computers. Where possible, these courses will include both biologists and social scientists to facilitate interdisciplinary communication;

iv. arrange for training of agricultural economists in short courses at CIMMYT or for post-graduate degrees; and,

v. from time to time, organize workshops to promote communication among disciplines and economists working at different levels.

The MART Project will fully finance the services of 3 additional CIMMYT scientists: a wheat agronomist and a maize agronomist each for three years and an extension agronomist for four years. The CIMMYT wheat and maize agronomists will assist Pakistani wheat and maize scientists to:

i. develop ten-year plans for a germ plasm evaluation and genetic material maintenance research program;

ii. design and implement specific research activities identified under the plans;

iii. develop an agro-ecological analysis, detailed to the sub-zone level, for wheat/maize production and maximization in Pakistan;

iv. design and implement production research and outreach packages to be tested and evaluated in similar agro-ecological areas; and,

v. organize and conduct a series of training seminars and workshops in support of the primary wheat/maize program objectives.

The extension agronomy advisor will assist Pakistani research, extension and university staff to develop and carry out an expanded on-farm adaptive research and verification program for the National Coordinated Wheat and Maize Programs. In addition to developing the linkages between on-station research and the farmer, the extension specialist, as a member of the wheat and maize research teams, will be responsible for developing farming systems research methods for wheat and maize research. The advisor will also assist the NARC Extension Officer to develop and implement the extension plan for the Islamabad District laboratory under component 1 of this project. He will develop and present to extension agents short training courses on agronomic extension techniques.

The project will also finance the services of eight person-months of short-term CIMMYT experts as needed in such fields as cereal technology, cytogenetics, mechanization, equipment/instrument use and maintenance, crop geography delineation and weed control.

Scholarships for scientists to study in the U.S. for graduate degree training will be financed under the project in several subject areas, including production agronomy, cytogenetics, pathology and cereal technology. A total of 216 person-months of M.Sc. and Ph.D. training is budgeted for this purpose. In certain cases, gradute students, particularly those studying for Ph.D. degrees, will undertake their thesis research in Pakistan.

In addition to higher degree training, the project will finance short-term training, for approximately 10 to 15 scientists at CIMMYT for periods of between three to six months each, in such areas as breeding/pathology, agronomy, cytogenetics, and cereal technology. For planning purposes, 64 person-months of short-term training has been programmed. Also, about $50,000 has been allocated to enable Pakistani personnel to participate in appropriate regional conferences developed or sponsored by CIMMYT.

The project will also finance vehicles for the long-term technicians directly funded by the project, a Claas large plot combine, Hege plot combines, Wintersteiger seeders and other equipment and commodities needed to support the Coordinated Wheat and Maize Programs. (See Annex H.)

The GOP will provide: (i) salaries and related costs of the national scientists and support staff associated on a full or part-time basis with the Coordinated Wheat and Maize Programs; (ii) some of the local costs associated with demonstration programs; (iii) suitable office accommodations for expatriate and Pakistani scientists, laboratory space and facilities and work and storage rooms at the research institutes; and, (iv) the land and field research facilities of the Federal and Provincial research institutions and sub-stations.

IV. IMPLEMENTATION PLAN

A. Implementation Schedule

Project activities will take place over a period of approximately five years, beginning in August 1984. An illustrative implementation schedule is presented in Table 3. As soon as the Project Agreement is signed and conditions precedent have been met, A.I.D., with the concurrence of the GOP, will:

1. negotiate and award a contract to ICARDA to assist in the implementation of the Arid Zone Development component;

2. issue a Request for Proposals, evaluate offers, and negotiate and award a contract to a U.S. firm to assist in the implementation of the first three components of the project;

3. procure project vehicles and household and office supplies and equipment for the long-term resident expatriate consultants;

4. arrange for the contracting of a short-term U.S. A&E consultant to develop the facility layout and initial plans for the expanded training facility and the multi-media production studio; and,

5. arrange for the contracting of short-term U.S. consultants to assist in the development of a monitoring and evaluation plan for the project.

The GOP, with the concurrence of A.I.D., will:

1. negotiate and award a contract to CIMMYT to assist in the implementation of the Wheat and Maize Coordinated Programs component;

2. issue a Request for Proposals, evaluate offers, and negotiate and award a contract to a Pakistani management/accounting firm to assist PARC and the Provincial research institutions to strengthen their financial management/bookkeeping operations;

3. issue a Request for Proposals, evaluate offers, and negotiate and award a contract to a Pakistani A&E firm to provide engineering and construction supervision services for the expanded training facility and the multi-media production studio;

4. issue a Request for Proposals, evaluate offers, and negotiate and award a contract to a Pakistani construction firm to construct the two facilities;

TABLE 3

ILLUSTRATIVE IMPLEMENTATION SCHEDULE

PROJECT START-UP

DATE	ACTIVITY
July 1984	Project Paper Approved and Project Agreement signed
August 1984	Conditions Precedent Met
August 1984	Project Vehicles and Household/Office Furniture/Equipment Ordered
August 1984	Solicitation Documents Prepared/Issued for CIMMYT, ICARDA, Pakistani Accounting Firm and U.S. Contractor (for components 1,2 and 3)
September 1984	Contract Signed with CIMMYT
November 1984	Contract Signed with ICARDA
December 1984	Contract Signed with Pakistani Accounting Firm
January 1985	Contract signed with U.S. Contractor for Components 1, 2, and 3
January 1985	Vehicles and Household/Office Furniture and Equipment Arrive

COMPONENT 1: RESEARCH MANAGEMENT AND ADMINISTRATION

DATE	ACTIVITY
September 1984	Commodity Lists and Specifications Developed
November 1984	Commodity Procurement Initiated
January 1985	Pakistani Contractor Initiates Work on Financial Management (FM)
February 1985	Systems Analyses Initiated with Assistance of Short-Term Consultants of U.S. Contractor for Components 1,2 and 3
April 1985	Funding Procedure Study Initiated
June 1985	FM Observation Training Tour in India and Philippines

Component 1: Continued

June 1985	Computer Hardware-Software Requirements Identified and Ordered
June 1985	Long-Term Advisors Arrive In-country
July 1985	Funding Procedure Study Completed
July 1985	FM In-service Training Plan Prepared
July 1985	Work Begins on Development of Provincial Research Plans
July 1985	Farming Systems Research Work Initiated
August 1985-1986	FM In-country Training courses Conducted at NARC Training Facility
August 1985-December 1985	Commodities Arrive In-Country
August 1985	Socio-economic Studies Initiated
August 1985	Baseline Survey of Islamabad District Initiated
September 1985	Implementation of Management Improvement Interventions Initiated
September 1985	Long-term U.S. Training Initiated
November 1985	Baseline Survey of Islamabad District Completed
December 1985-November 1986	Computer Hardware-Software Arrives and Systems Installed at PARC, NARC, AZRI and Wheat and Maize Programs
January 1986	Study of Private Sector Participation Initiated
January 1986	5-Year Provincial Research Plans Developed with Additional 5-Year Projections
June 1986	Computer Training at AIT in Thailand Initiated
October 1986	FM Observation Training Tour to Thailand

COMPONENT 2: INFORMATION TRANSFER

DATE	ACTIVITY
August 1984	Short-term U.S. A&E Consultant Arrives In-country to Prepare Layout Plans
December 1984	A&E Contract Signed with Pakistani Firm
February 1985	Design Work Completed, Reviewed and Accepted
April 1985	Construction RFP Issued
May 1985	Proposals Evaluated and Pakistan Construction Firm Selected
May 1985	Multi-Media Studio Commodity Specifications Prepared
June 1985	Construction of Multi- Media Production Studio Initiated
June 1985	Long-Term Consultant Arrives
July 1985	Commodities Ordered
September 1985	Long-term Training Initiated
January 1986	Commodities Arrive
December 1986	Construction Completed
January 1987	Commodities Installed

COMPONENT 3: TRAINING FOR THE AGRICULTURAL RESEARCH NETWORK

DATE	ACTIVITY
June 1985	Long-Term Training Consultant Arrives
June 1985	Construction of Expanded Training Facility Initiated
July 1985-December 1985	Personnel Needs Assessment and Training Plan for Agricultural Research Completed
September 1985	U.S. Long-term Training Initiated
January 1986-1988	Observation Training in India and Thailand Initiated
June 1986	Implementation of Tailored In-Country Training Programs Initiated
December 1986	Construction completed

COMPONENT 4: ARID ZONE RESEARCH

DATE	ACTIVITY
November 1984	Commodities Identified and Ordered
January 1985	ICARDA Advisors Arrive
April 1985	Life of Project Work Plan Developed
June 1985	Commodities Arrive
August 1985	Range Research Advisor Arrives
September 1985-1989	Research, Studies and Training as Defined in Work Plan Conducted

COMPONENT 5 : WHEAT AND MAIZE COORDINATED PROGRAMS

DATE	ACTIVITY
October 1984	Wheat and Maize Agronomists and Agricultural Economist Arrive
January 1985	Agro-Ecological Analyses Initiated for Wheat and Maize
March 1985	Long-Term Extension Agronomist Arrives
March 1985	Research Plan (5-Year Plus 5-Year Projection) for Wheat and Maize Prepared
November 1985	New Programs of Wheat and Maize Research, Including Farming Systems Approaches, Initiated
January 1986-1989	Outreach and Off-Station Research Program Expanded for Wheat and Maize

EVALUATION

DATE	ACTIVITY
March 1985	Short-term Evaluation Specialists Arrive In-country
June 1985	Evaluation Criteria and Comprehensive Monitoring and Evaluation Plan Developed
July 1987	Mid-Project Evaluation Conducted
July 1989	Final Project Evaluation Conducted

5. finalize the list of project commodities and equipment, including specifications, issue Invitations for Bids (IFBs) and/or Requests for Proposals (RFPs), evaluate offers, and make awards for the procurement of required research commodities and other equipment;

6. identify a preliminary list of training needs and proposed candidates for overseas training in priority subject areas; and,

7. constitute the Project Coordinating Committee and the Technical Information Transfer Committee.

Under all five components of the project, the first year or two will be devoted to the conduct of a variety of systems analyses and special studies, the preparation of long-term training and research plans, and design activities related to the construction program. During this period, commodities will be procured, and a significant amount of both overseas and in-country training activities will have been initiated. By the end of the third project year, it is anticipated that: implementation of many interventions in the area of research management and administration will be well along; the results of several key studies in such areas as farming systems research, private sector participation, financing of the agricultural research network, research/outreach integration, arid zone research, and wheat and maize research will be available; a variety of field research and field demonstrations will be in progress; the construction program completed; and, the in-country career development training program launched. The first external evaluation is tentatively scheduled to occur at the end of the third project year to assess progress to date and to identify the need for any necessary fine-tuning or possible redirection of project activities during the remaining two years of the project.

B. Administrative and Monitoring Arrangements

1. A.I.D. Responsibilities

The USAID/Pakistan Office of Agriculture and Rural Development (ARD) will have overall responsibility for managing the project. ARD will assign a senior U.S. direct-hire Assistant Agricultural Development Officer, with a technical background in agricultural research and demonstrated capabilities in managing a multi-faceted agricultural research program, to serve as Project Manager. He will work full-time on the MART Project and will be assisted by two full- time, Pakistani associates, one with specific skills in research planning and management, and the other with skills in project documentation and resource accountability and control.

The Project Manager will be assisted in contracting and procurement actions by USAID/Pakistan's Office of Project Development and Monitoring, which will be supplemented by AID/Washington's Offices of Contract

Management and Commodity Management; in construction activities by the Office of Engineering; in financial and disbursement matters by the Office of Financial Management; in overseas training activities by the Office of Human Resources and Training; in evaluation by the Program Office; in logistical and administrative support activities by the Office of Management; and, in legal matters by the Office of the Regional Legal Advisor. Collectively, these staff resources are considered adequate to handle USAID/Pakistan's monitoring and administrative responsibilities under this Project.

A.I.D. will be responsible for: (a) negotiating and awarding a contract to a U.S. firm to provide technical advisory services for the Research Management and Administration, Information Transfer, and Training for the Agricultural Research Network components; (b) negotiating and awarding a contract under the Collaborative Assistance mode to the International Center for Agricultural Research in Dry Areas (ICARDA) to assist in implementing the Arid Zone Research component; (c) arranging for the services of a short-term U.S. architectural and engineering (A&E) consultant to design the preliminary architectural layout of the production studio and expanded training facility on the NARC campus; (d) arranging for the services of all expatriate short-term evaluation specialists; (e) purchasing directly all project vehicles and all household and office equipment and supplies for long-term consultants as well as assisting PARC in the procurement of the remaining off-shore commodities; (f) arranging for the short-term and long-term training of participants outside of Pakistan; (g) providing sufficient staff to participate in the scheduled project evaluations and to liaise with host country staff in the implementation of this project; and, (h) inspecting and certifying for payment construction installations.

2. GOP Responsibilities

The GOP agency responsible for the overall implementation of this Project is the Pakistan Agricultural Research Council (PARC), a semi- autonomous organization within the Ministry of Food, Agriculture and Cooperatives. The four Provincial Secretariats of Agriculture, through their Departments of Research and Extension, will be responsible for implementing activities in their respective provinces in accordance with the existing Federal/Provincial divisions of authority and responsibility in Pakistan. Where authority and responsibility lie with the provinces, PARC will play a coordinating and monitoring role.

The Arid Zone Research Institute (AZRI) in Quetta, Baluchistan will be primarily responsible for implementing the Arid Zone Research Component. Implementation of the Wheat and Maize Coordinated Programs component will be the responsibility of PARC and the National Agricultural Research Center (NARC) under the Nationally Coordinated Programs. The agricultural universities and Provincial agricultural training facilities will participate both as implementors and beneficiaries of project activities. To facilitate coordination and implementation of the project, a Project Coordinating Committee, composed of representatives

from the Federal and all four Provincial Governments and each agricultural university, will be established under the chairmanship of PARC.

The GOP will be responsible for: (a) negotiating and awarding a contract to the International Wheat and Maize Improvement Center (CIMMYT) to assist in implementing the Wheat and Maize Coordinated Programs component; (b) negotiating and awarding a contract to a Pakistani management and accounting firm to assist PARC and the Provincial agricultural research institutes to strengthen their bookkeeping operations; (c) negotiating and awarding a contract to a Pakistani A&E firm to prepare final construction plans, specifications and bid documents and to supervise construction of the new media production studio and expanded training facility on the NARC campus; (d) negotiating and awarding a contract to a Pakistani construction firm to provide construction services for the two facilities on the NARC campus; (e) procuring the majority of local and off-shore commodities required for all five components of the project; (f) identifying suitable candidates for both long-term and short-term overseas training; (g) arranging for all in-country training activities; (h) hiring 30 new and 14 additional staff for the studio and expanded training facility, respectively; and, (i) providing sufficient staff to participate in the scheduled project evaluations and to serve as counterparts to the expatriate advisors in the implementation of this project.

The budgetary and staffing levels of PARC and the Provincial Secretariats and Departments are considered adequate to undertake these responsibilities.

C. Procurement Plan

1. Technical Assistance

Table 4 summarizes the proposed technical assistance plan by project component. A total of 564 person-months of long-term expatriate assistance and 288 person-months of short-term assistance, consisting of 206 person-months of expatriate and 82 person-months of local consultants, will be provided to assist the GOP implement the MART Project. Fourteen (14) long-term expatriate consultants are contemplated, consisting of nine (9) consultants for three years each and five (5) for four years each. Five consultants will be provided by one U.S. firm to work on components 1, 2, and 3. ICARDA will provide five consultants to assist implement component 4 and will finance one of the advisors from its core budget. Similarly, CIMMYT will provide four consultants to assist in the implementation of component 5 and will finance one of the advisors from its core budget.

TABLE 4

PROPOSED TECHNICAL ASSISTANCE PLAN

	Nature of Services Required	Estimated Level of Effort (Person-Months) LT	ST	Contract Mode
AGEMENT RATION	a. Financial Management, Accounting, Bookkeeping	-	40	Competitively let host country contract with Pakistani firm
	Sub-Total	-	40	
	b. Other Research Management/Administration			
	Research Management/Farming Systems Research Specialist	48	-	Competitively let direct A.I.D. contract with U.S. firm
	Provincial Research Planning and Management Consultant	36	-	
	Research Operations and Support Consultant	36	-	
	Systems Analysts	-	26	
	Computer Systems Analysts	-	14	
	Financial Management Consultants	-	4	
	Technical Agricultural Research Consultants	-	40	
	Agribusiness Consultants	-	6	
	Socio-economic Consultants	-	6	
	Extension/Rural Development Specialists	-	14	
	Sub-Total	120	110	

TABLE 4
(Continued)

Project Component	Nature of Services Required	Estimated Level of Effort (Person-Months) LT	ST	Contract Mode
2. INFORMATION TRANSFER (IT)	Information Transfer Specialist	36	-	Same competitively let direct A.I.D. contract with U.S. firm in (1b) above
	Multi-Media Engineer	-	6	
	Media Production Specialists	-	20	
	Sub-Total	36	26	
3. TRAINING FOR THE AGRICULTURAL RESEARCH NETWORK (TARN)	Agricultural Training Specialist	36	-	Same competitively let direct A.I.D. contract with U.S. firm in (1b) above
	Training Evaluation Specialists	-	3	
	Manpower Assessment Consultants	-	4	
	Curriculum/Materials Specialists	-	6	
	Sub-Total	36	13	
4. ARID ZONE RESEARCH (AZR)	Germ Plasm Evaluation Scientist a/	48	-	Direct A.I.D. contract under Collaborative Assistance mode with ICARDA
	Soil/Water Nutrient Agronomist	48	-	
	Farming Systems Research Specialist	48	-	
	Agriculture Extension Specialist	36	-	

TABLE 4
(Continued)

Project Component	Nature of Services Required	Estimated Level of Effort (Person-Months) LT	ST	Contract Mode
4. ARID ZONE RESEARCH (Continued)				
	Range Management Livestock Specialist b/	36	-	
	Specialists in Agro-Meteorology, Microbiology, Plant Protection, Computer Systems Analysis, Soil Conservation, Livestock, Sociology, Training, Moisture/Nutrients, and Research Management and Planning	-	30	
	Sub-Total	216	30	
5. WHEAT AND MAIZE COORDINATED PROGRAMS (WMCP)	Maize Agronomist	36	-	Non-competitive host country contract with CIMMYT
	Wheat Agronomist	36	-	
	Extension Agronomist	48	-	
	Agricultural Economist a/	36	-	
	Specialists in Cereal Technology, Cytogenetics, Mechanization, Equipment/Instrument Use and Maintenance, Crop Geography Delineation, and Weed Control	-	8	
	Sub-Total	156	8	

TABLE 4
(Continued)

Project Component	Nature of Services Required	Estimated Level of Effort (Person-Months) LT	ST	Contract Mode
6. OTHER	a. Expatriate A&E Services for IT and TARN Components	-	1	Direct A.I.D. IQC or PSC
	b. Local A&E Services for IT and TARN Components	-	24	Competitively let host country contract with Pakistani firm
	c. Construction Services for IT and TARN Components	-	18	Competitively let host country contract with Pakistani firm
	d. Evaluation Specialists	-	18	Direct A.I.D. IQC or PSC
	Sub-Total	-	61	
	TOTAL c/	564	288	

a/ These consultants will be financed from the core budgets of their parent organizations; A.I.D. project funds will be used to finance only local support costs for these two individuals.

b/ This consultant will be provided by a U.S. educational institution under a sub-contract with ICARDA as will some of the short-term consultants.

c/ All long-term technical assistance will be provided by expatriate consultants whereas 206 person-months of short-term assistance will be provided by expatriates and 82 person-months by Pakistani consultants.

A total of six major contracts is contemplated as follows:

1. a competitively let direct A.I.D. contract with a U.S. firm for components 1, 2, 3;

2. a direct A.I.D. contract under the Collaborative Assistance Mode with ICARDA for component 4;

3. a non-competitive host country contract with CIMMYT for component 5 (Annex F. contains a request for approval of a justification for non-competitive procurement);

4. a competitively let host country contract with a Pakistani management/accounting firm to assist PARC and the provincial research institutes strengthen their bookkeeping and financial management operations;

5. a competitively let host country A&E contract with a Pakistani firm to provide design and construction supervision services for the expanded training facility and the multi-media production studio; and,

6. a competitively let host country construction contract with a Pakistani firm to construct the two facilities.

In addition, A.I.D. will arrange for the contracting of short-term expatriate consultants, through Personal Services Contracts (PSCs) or Indefinite Quantity Contracts (IQCs), to provide A&E services, to assist in establishing a monitoring and evaluation plan and, to participate in scheduled project evaluations.

2. Commodities

The commodities to be procured for this project fall into the following general categories; (a) 64 project vehicles and spare parts, valued at an estimated $583,500 and consisting of 14 station wagons, 12 land cruisers, 5 15-passenger vans, 32 pickup trucks, and 1 flatbed truck; (b) computers and associated hardware and software packages valued at approximately $380,000; (c) multi-media production and processing equipment valued at an estimated $450,000; (e) combines and plot seeders for the Wheat and Maize Coordinated Programs valued at an estimated $ 150,000; (f) audio-visiel and other commodities for the NARC and Provincial training facilities valued at $343,500; (g) household/office equipment and supplies valued at an estimated $480,000; (h) furniture and supplies for the production studio and expanded training facility valued at $200,000; and (i) a variety of research equipment and commodities for the entire agricultural research network valued at $2,846,000. The total amount allocated for commodities for this project is $5,433,000 and will be financed by A.I.D. from two sources: $2,933,000 under the MART Project and $2,500,000 under the FY 1984 tranche of the Agricultural Commodities and Equipment Program (391-0468).

A.I.D. will procure directly all the project vehicles and all the household and office equipment and supplies. The remaining commodities will be procured by PARC, following A.I.D. procedures for host country contracting. Consultants will be provided to assist PARC finalize equipment lists, prepare specifications, and evaluate bids. PARC will float all the tenders and make awards, with the approval of A.I.D.

All commodities procured with ACE Program funds will have their source and origin in the U.S. or Pakistan. The same applies to those commodities procured with MART Project funds, with the exception of the project vehicles, the multi-media production and processing equipment, and the combines and plot seeders. Annex F contains requests for source/origin/nationality waivers for these three categories of commodities whose source and origin will most likely be Japan for the first two categories and West Germany and Austria for the latter category. Annex H provides an illustrative list of all the commodities to be procured for this project.

D. Training Plan

The project will finance degree and non-degree training in the United States and third countries, and short courses, seminars and workshops in Pakistan. A total of 246 Pakistanis will participate in overseas training and 4,705 will participate in training courses in Pakistan over the life of the project. Section III provides a description of the purpose and nature of training activities likely to be financed under the Project for all 5 components. The projected numbers of participants in overseas and in-country training programs are presented in Table 5 through 7.

TABLE 5

Proposed Participant Training Plan by Project Component and Category

Project Component	U. S. Short-Term -PM-	U. S. Short-Term -No-	U. S. Long-Term -PM-	U. S. Long-Term -No-	THIRD COUNTRY Short-Term -PM-	THIRD COUNTRY Short-Term -No-
1. Research Management and Administration	292	86	1128	50	54	24
2. Information Transfer	-	-	240	9	-	-
3. Training for the Agricultural Research Network	-	-	240	10	20	20
4. Arid Zone Research	36	6	216	9	28	7
5. Wheat and Maize Coordinated Programs	-	-	216	9	64	16
TOTAL	328	92	2040	87	166	67

KEY: PM = Person-Months
No = Number of Participants

TABLE 6

Projected Source of Overseas Training Participants by Federal and Provincial Organizations

	RMA		IT		TARN		AZR		WMCP		TOTAL	
	FED	PROV	FED	PROV	FED	PROV	FED	PROV	FED	PROV	FED	PROV
LONG-TERM (U.S.)	9	41	5	4	2	8	-	9	2	7	15	72
SHORT-TERM (U.S.)	14	72	-	-	10	10	-	6	-	-	24	88
SHORT-TERM (THIRD COUNTRY)	6	18	-	-	-	-	-	7	4	12	10	37
TOTAL	29	131	5	4	12	18	-	22	6	19	49	197
										TOTAL	246	

KEY:

RMA = Research Management and Administration
IT = Information Transfer
TARN = Training for the Agricultural Research Network
AZR = Arid Zone Research
WMCP = Wheat and Maize Coordinated Programs

TABLE 7

Proposed In-Country Training Plan

	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL	
	IND	CRS	IND	CRS	IND	CRS	IND	CRS	IND	CRS	IND	CRS
Training Programs:	740	38	740	38	740	38	740	38	665	35	3625	187
Travelling Seminars:	120	2	240	4	240	4	240	4	240	4	1080	18
TOTAL	860	40	980	42	980	42	980	42	905	39	4705	205

KEY: IND = Individuals
CRS = Courses

Specific requirements for U.S., third country and in-country training will be identified by the GOP implementing organizations with the assistance of the principal project contractors, namely, ICARDA, CIMMYT and the U.S. contractor for components 1 through 3. Utilizing the PARC-approved training and research plans as a guide, the GOP organizations will identify: (a) training courses and institutions able to meet training needs; and, (b) categories and numbers of personnel who require training. Administrative, logistical and financial arrangements for all long and short-term training in the U.S. and third countries will be handled by the Academy for Educational Development, the contractor under the A.I.D.- financed Development Support Training (DST) Project. In-country training courses will be designed and implemented by GOP implementing organizations, with the assistance of both long-term and short-term consultants.

E. Construction Plan

PARC will contract directly with a local A&E firm through competitive procedures to design and supervise the construction of the proposed facilities. The work required is not complicated. The proposed architectural and structural designs will be similar to recently constructed facilities for which there are plans and specification already available. A short-term U.S. architectural planning consultant with expertise in research and training facilities will prepare preliminary layouts for use by the local A&E firm. This will ensure maximum utilization of interior building space and proper layout of building uses and equipment requirements. During construction, the Pakistani A&E firm will provide full-time, on-site supervision with monthly progress reports sent to A.I.D. and PARC.

Construction of the facilities will be performed by a Pakistani construction firm contracted by PARC, using A.I.D. approved host country competitive procurement procedures. The work is proposed to be done under one contract. Periodic inspections will be undertaken by the A.I.D. Office of Engineering (See the Engineering Analysis in Annex L for further details.)

F. Evaluation Plan

Two formal external evaluations of the project are tentatively scheduled to occur in July 1987 and July 1989. These evaluations will be undertaken by teams of short-term expatriate and possibly Pakistani consultants and will include, as resource personnel, staff from the Provincial Research Institutes, PARC, NARC, AZRI, provincial training facilities, the agricultural universities, and USAID/Pakistan; members of the Project Coordinating Committee; members of the long-term resident advisory teams; and, possibly representatives from AID/Washington, CIDA, IBRD, and FAO. Each evaluation will require about 2 months to complete.

To lay the basis for these evaluations and to provide a system of continuous monitoring and evaluation throughout the life of the project, a team of experts in research administration and management, training, evaluation, communications, research planning, and research methods will

be contracted by A.I.D. to assist PARC and USAID/Pakistan to identify baseline data requirements and to develop specific evaluation criteria, quantifiable performance benchmarks (specifically as they relate to the institutional objectives of the project), and a comprehensive monitoring and evaluation plan. It is anticipated that this activity will take place early in calendar year 1985 and will involve up to three short-term consultants for about 8 weeks each.

The monitoring and evaluation plan developed by the short-term consultants will, inter alia, define the specific areas and issues to be addressed during the two external evaluations. In general, the 1987 evaluation, which is scheduled to coincide with roughly the mid-point of the project, will enable project managers to evaluate project progress to date and to make any necessary revisions in the design or focus of the project. The 1989 evaluation will measure the success of the project in achieving its stated purpose, the end of project status indicators, and the proposed outputs defined in Section III. of the Project Paper and in the Logical Framework in Annex E.

V. PROJECT ANALYSES

A. Technical Analysis

1. General

The principal finding of the technical analysis is that a great deal more can be accomplished within the existing institutional framework using existing financial, human and physical resources through improvements in research management. This does not imply that additional resources are not needed. Funding for research operations is limited; additional trained personnel are needed in several disciplines; additional facilities are needed for in-country training and for the production and dissemination of agricultural information packages; and, additional commodities and equipment are needed at research establishments. The MART Project will provide funding to help meet many of these needs. It will also try to increase overall resources available for agricultural research by identifying ways to increase the participation of the domestic private agribusiness sector in the identification, conduct, and dissemination of research activities. In the final analysis, the most important constraint to improved agricultural research performance is the way existing resources are allocated and managed.

In terms of allocation, what is needed most urgently is a shift of research resources and priorities from the center to the periphery: from the Federal level to the Provincial level and from the research station to the farmers' fields. The MART Project will achieve this end in several ways. First, most project resources will be allocated to support provincially-based research operations. Second, a major effort will be devoted to support research specifically geared to the development of Baluchistan Province and other dry areas through support to the Arid Zone Research Institute. Third, the use of farming systems research (FSR) will be strengthened and expanded in the Federal and Provincial research institutes.

FSR methodologies will be particularly important to the success of the Project as they should systematically reveal the many reasons for the production gap. The reasons for farmer resistance to the adoption of improved technologies will be better understood and addressed through the farming systems approach. Two critical needs are: (a) the diagnosis of agricultural problems from the farmers' point of view; and, (b) the testing of the biological and socio-economic acceptability of improved technologies through the participation of farmers in field trials. There are cases where farmer non-adoption is not a function of the technology itself but the manner in which the technology is extended. To address this problem, the MART project will assist PARC to improve its methods of packaging and disseminating research findings. This includes increased collaboration between scientists and extension personnel and increased use of the mass media to transfer technical information to target audiences.

The need for increased efficiency in the use of existing resources--i.e., better management--will be addressed in several ways. First, the project provides for improvement in the performance of existing human resources through the institutionalization of in-country training programs. These will be conducted at the NARC and Provincial training facilities. Second, the project will help PARC and the Federal and Provincial research organizations improve research planning, operations, and evaluation by: (a) conducting systems analyses to identify specific management problems, their causes, and the relationships among them; (b) providing long-term technical assistance in planning, management and research operations to the various research organizations and to the Nationally Coordinated Wheat and Maize Programs; and, (c) financing a variety of long and short-term training in management skills. Third, the project will improve efficiency in the use of financial resources by: (a) financing the services of a Pakistani consulting firm to help improve the bookkeeping operations of both Federal and Provincial research organizations; (b) arranging for the computerization of financial management operations; and, (c) examining alternative funding mechanisms to alleviate cash flow problems.

2. Research Management and Administration (RMA)

The three sub-components of the RMA component (the conduct of systems analyses and implementation of management improvement interventions; the conduct of special studies; and, the pilot testing of research/outreach integration demonstrations) are not expected to encounter technical problems in implementation, since all three activities build on a base of similar prior activities within the participating organizations. Furthermore, an appropriate mix of technical assistance, training and commodity inputs will be provided to ensure the technical feasibility of the activities.

The areas proposed for examination under the systems analyses sub-component are based on a preliminary study that determined that research planning, research methods, organization and administration, information systems and resource allocation are the most critical problem areas. This preliminary work examined the availability of data and technical support in Pakistan for the proposed studies and concluded that they could be carried out with little difficulty. In all five areas, the specific studies proposed are closely related to prior work in other countries, including major studies of agricultural research in the USA. As noted above, several problems in research management and administration have already been sufficiently identified that specific interventions can be programmed even before the completion of the systems analyses.

There is an immediate need for assistance in the maintenance of financial records and in the development of a financial reporting system in PARC and in the provincial institutes. To respond to this need, the project will engage the services of a Pakistani accounting firm that will, with the assistance of short-term expatriate consultants as needed, organize and conduct financial management courses for approximately 160 employees of Federal and Provincial research organizations. The availability of personnel and other resources needed to implement better maintenance of financial records and development of a financial reporting system

throughout the agricultural research network is not expected to create a problem, since the new system uses essentially the same level of resources as the existing system. The methodology is well-developed and has proven to be completely applicable to Pakistani conditions.

The pilot research/outreach integration activity of the RMA component will use the Islamabad Federal District as a "living laboratory", reinforcing the use of farming systems research with outreach integration demonstrations. The complexity of Pakistani farming systems requires research which is tailored to select technologies and practices that fit the farmer environments. The systems approach of this sub-component, with its emphasis on the totality of the farmer's agricultural environment, will provide for close association with the farmer. This research methodology is chosen for developing suitable types of technology that socially "fit" and are acceptable within the rural community. This approach is technically feasible for farmer adoption. The very nature of the feedback mechanism inherent in the farming systems approach will guarantee high pay-offs from resources allocated to cereal crop and livestock production research. A systems evaluation will indicate which devices and distribution models are appropriate and useful within the real resource bases of farming communities.

3. Information Transfer (IT)

The purpose of the IT component is to make the results of research more available and accessible to the general public and to potential users. A great deal of improved technology has already been developed by the various agricultural research organizations in Pakistan; however, information about these technologies needs to be packaged scientifically in ways that will make the technologies more understandable and acceptable to target audiences. These target audiences include the agricultural universities and other members of the research community, policy-makers in the GOP, agro-industries, extension services and the general public.

A successful agricultural research program is dependent on effective demonstration of research results. The IT component of the project establishes a permanent mechanism to help meet that need on a mass media cost-effective basis. The feasibility of this project approach has been proven by analytic studies conducted throughout the world. The technologies which will be employed are well-established and have proven feasible in other countries. With the assistance of expatriate consultants, the provision of modern equipment, and adequate training, both on-the-job and formal, there should be no technical difficulties in introducing the new technologies, adapting them to Pakistani conditions, and training staff in their use.

4. Training for the Agricultural Research Network (TARN)

The TARN component is aimed at improving the capacity of the agricultural research network in Pakistan. It will assist PARC to identify personnel needs in agricultural research and provide in-country, in-service professional career development courses for agricultural personnel. An important output of this component will be a strengthened and rational use of the provincial and PARC training centers. As with

the other components, the TARN component is directed towards the improvement of an existing system. The availability of manpower and other resources needed to implement the TARN component is not expected to create a problem, since it utilizes essentially the same type of resources as the existing system now being used. The project will expand the capacity of the system by enlarging the PARC training institute at NARC. Technical feasibility is assured by the provision of the technical assistance, supplies and other inputs needed to carry out the proposed activities.

5. Arid Zone Research (AZR)

The AZRI component is aimed at strengthening the research capacity of the Arid Zone Research Institute (AZRI) in Baluchistan Province. The project will provide the services of expatriate research scientists on a long and short-term basis to assist Pakistani scientists at AZRI plan and carry out research activities involving cereal grains, forages, rangeland and livestock. The principal output expected from the AZR component is an improved capacity at AZRI to plan and carry out effective research that addresses the agricultural problems of arid and/or high altitude areas of Pakistan.

Linkages are to be established and maintained between AZRI and other related in-country, regional, and international agricultural research institutions during project implementation. AZRI will also exchange information with the agricultural extension services and the agricultural universities in Pakistan.

The overall research plan in the AZR component takes into account the existing farming conditions in Baluchistan and other similar arid areas in the country. The natural, economic, and social conditions that affect change have been carefully analyzed with respect to this project component. The expatriate scientists provided by the project will assist AZRI scientists to monitor the quality of the research as it is performed and to evaluate the final product. This system will provide essential feedback to the entire Pakistani agricultural research network as well as quality control of the product. The assistance of the expatriate scientists to AZRI will also be critical to overcoming any technical and administrative difficulties that are encountered during the institution-building process of this activity. The conclusion of the technical analyses of the AZR component is that the planned activity is highly feasible and does not present any serious technical problems. It is fully implementable as planned in the Pakistan context.

6. Wheat and Maize Coordinated Programs (WMCP)

The principal output expected from the WMCP component is the development of improved varieties and agronomic production techniques that will increase yields for wheat and maize. Despite impressive increases in wheat and maize production in recent years, there still exists a large gap between production potential, as demonstrated on farmers' fields, and the actual production of the average farmer. The project proposes to help close this gap with a series of research and extension activities.

The analyses of the WMCP component show that the component is technically feasible, with high pay-off potential from the resources allocated to the appropriate mix of technical assistance, training and commodity inputs proposed. This conclusion is based on a thorough analysis of the current wheat and maize research programs in Pakistan. The high yielding varieties of wheat and maize now being utilized in the country will require a substantial amount of research to prevent genetic deterioration. The activities planned in the WMCP will include on-farm testing of results in coordination with the extension services. The planned training programs will be adapted to Pakistan and will complement on-the-job training provided by expatriate technicians.

The technical analysis carried out has demonstrated the appropriateness and the viability of the on-farm oriented research activities. The complexity of the social and technical aspects of Pakistani farming systems requires the proposed type of research which is tailored to select technologies and practices that fit the environment in which farmers must cultivate wheat and maize.

7. Conclusion

The overall conclusion of the technical analysis comple[illegible] the project's five components is that the activities [illegible]posed f[illegible]ing are feasible and do not present any serious technical problems. Each of the components is fully implementable as planned in t[illegible] Pakistani context. In each case, this conclusion is based on a thorough analysis of the current situation, including the technical capacity of proposed implementing agencies and a detailed examination of the technical aspects of the activities proposed.

B. Administrative Analysis

The MART Project was designed with a number of administrative considerations in mind. These include the administrative capabilities of PARC and PARC's administrative relationship with the Provincial research organizations. Recognition is given to the Provincial Governments' desire to maintain a certain degree of independence or autonomy and at the same time, to strengthen their position as full partners with PARC in developing an operational, national research network. The analysis concludes that the Project is administratively feasible. It makes adequate provision for the coordination and administrative support needed to implement each project component and the project as a whole.

1. Assessment of PARC

a. PARC Autonomy

PARC will be the GOP institution responsible for the overall management and implementation of the Project. PARC is an autonomous organization established under Ordinance No. XXXVIII of 1981. It is governed by a twenty-nine member Board of Governors, which is headed by the Minister of Food, Agriculture and Cooperatives and comprised of both Federal and Provincial officials. The Executive Committee of PARC

consists of the Chairman (PARC) and five full-time Board Members. This Committee is the principal administrative body of PARC and is responsible for executing all policies and discharging all Council functions.

The Chairman of the Executive Committee is delegated broad powers to manage the affairs of the Council. For example, a new Agricultural Research Division has recently been created to facilitate the prompt processing and disposal of issues relating to agricultural research. The Chairman of PARC has been appointed as Secretary to the Government of Pakistan of this Division, which is a unique distinction. No other autonomous body has this advantageous characteristic.

b. PARC Staffing

The staff of PARC has increased from 168 in PFY 1977/78 to about 1,000 in PFY 1983/84. Increases have occurred in all categories - technical, administrative and financial. The competence of staff in key positions on the administration and financial side is adequate. Moreover, the Project provides resources specifically targeted to enhance the capabilities of staff in these areas.

c. PARC Management System

Research management is highly specialized and requires administrative procedures different from those followed in typical government departments. During PFY 1981/82, PARC introduced the Coordinated Agricultural Research Planning System of Pakistan (CAREPLANS). This system involves researchers and users of research results in the planning process. Essentially, the various steps involved are: identification of problems; establishment of priorities; formulation of proposals; evaluation of proposals; approval of proposals; assigning of research projects to various institutions; implementation of research projects; accomplishment reporting; and, accomplishment evaluation. The CAREPLANS is at the evolutionary stage. The set of research priorities determined under this system has been used to identify researchable ideas and to formulate proposals. The MART project will assist PARC in developing procedures needed to implement this system.

PARC is also developing the Current Research Information System of Pakistan (CRISP) to provide a basis for national coordinated agricultural research planning and evaluation. This is an automated system for storing and retrieving information of research projects. All Provincial, Federal and autonomous organizations are expected to send relevant information to CRISP. When the system is fully operational, it will be possible to retrieve summaries of all research programs in the country. CRISP will be an invaluable tool to implement the information transfer component of this Project.

d. Financial Management

Levels of funding in PARC's current and development budget vary substantially from year to year. PARC must prepare a monthly request to the Ministry of Finance for funding which, after a lengthy

approval process, results in releases of funds approximately two months later. The amount in the approved annual allocation is generally not realized due to the two-month delay. Funds not received by June 30 are lost for that budget year.

Delays and reduced funding to PARC are reflected in releases to projects at NARC and the provinces. Budgetary delays and reductions directly affect payment of salaries, procurement of seeds, fertilizer, food for experimental animals, and gasoline, and the conduct of both research and training programs. Budget fluctuations requiring a reduction of employment, sometimes followed by re-employement, adversely affect project operations and have a dampening effect on morale at all levels. An agreement with the Ministry of Finance to release GOP funds to PARC on a quarterly basis would alleviate the bureaucratic delays associated with monthly requests and provide continuity to project operations.

The line of communication from PARC through its Project Coordinators to the Provincial research institutes and agricultural universities require strengthening, especially with regard to budget allocations. PARC expects shortly to install a micro-computer for use in its Finance and Accounts Division and other PARC Offices. This will be done in coordination with the installation of a computerized accounting system and the implementation of other improvements in PARC's Financial Management System which will be provided under the MART Project.

e. Nationally Coordinated Research Programs

Figure 3 summarizes the actual and proposed Nationally Coordinated Research Programs. Nationally coordinated commodity research programs are formulated in cooperation with Provincial and Federal research facilities and the agricultural universities. In accordance with existing regulations, these Programs are headed by a staff member of PARC. After approval by the Executive Board, a PARC coordinator is appointed to be responsible for administration of the Program, the provision of funds, and evaluation of progress. A principal investigator is appointed at each participating unit. The investigator establishes a technical committee to provide technical and administrative guidance to the Coordinator and to determine the technical content of the program. Each Coordinated Program consists of a number of research projects, all of which contribute to the goals of the agreed upon Program.

With Project assistance, PARC will continue to provide manpower and financial support to the Nationally Coordinated Commodity Research Programs. PARC goals and procedures are not well understood in the provinces, however, and there are no published national objectives useful to designers of research project proposals. Hence, proposals are frequently made by universities and facilities without the necessary guidance on research policy. This often results in wasted energies or in research efforts that are inconsistent with national/provincial needs. As part of its focus on improved management and administration, the MART Project will assist PARC to address these problems.

Figure 3

(ACTUAL AND PROPOSED)

NATIONALLY CO-ORDINATED RESEARCH PROGRAMMES OF PARC, 1981-82

CROPS

* WHEAT, BARLEY & TRITICALE
* MAIZE, SORGHUM & MILLET
* RICE
* OILSEEDS
* FOOD LEGUMES
* POTATO
* VEGETABLES
* SUGAR CROPS
* FODDER & FORAGE
* HONEYBEE MANAGEMENT

LIVESTOCK

* DAIRY CATTLE BREEDING
* BUFFALO PHYSIOLOGY
* GOATS
* SHEEP & WOOL
* POULTRY
* MEAT & MEAT TECH.
* ANIMAL NUTRITION
* LIVESTOCK DISEASES
* AQUACULTURE

SOIL & WATER

* SALINE AGRICULTURE
* SOIL PRODUCTIVITY
* MICRONUTRIENTS
* BIOLOGICAL NITROGEN FIXATION
* BARANI WATER CONSERVATION
* WATER MEASUREMENT
* CONSUMPTIVE USE OF WATER

SOCIAL SCIENCES

* CROPPING PATTERNS
* YIELD CONSTRAINTS
* FARM MANAGEMENT
* AGRI. RES. DATA BASE

IN ADDITION PARC IS OPERATING 94 PROJECTS AT THE VARIOUS RESEARCH INSTITUTES/UNIVERSITIES IN THE PROVINCES

f. Agricultural Research Career Structures

The new agricultural technologies needed to increase production can be generated by competently executed research programs. In Pakistan, there are many productive research scientists and examples of good research. Yet, these are usually exceptions against a general background of poor research output generated by a poorly motivated scientific community. Most scientists tend to engage in routine experimentation using standard agricultural techniques. Agricultural scientists need to be encouraged to tackle relevant production problems facing the country. Research leaders must create a climate in which trained scientists utilize their knowledge and talents in a manner which is intellectually stimulating and professionally rewarding. Good staff morale is an essential ingredient for scientific success. Morale is, in turn, dependent on the scientist's perception of his/her work, status in the community, salary level and the provision of adequate resources to enable projects to be properly executed.

The MART Project will assist PARC to develop a personnel management system to identify, train, attract and retain permanent staff. PARC now has more than 1,000 personnel. These staff are a mixture of permanent employees, temporary employees and people on deputation who feel insecure in their employment and constantly seek promotion opportunities elsewhere. To be a quality-oriented research systems facilitator, PARC must devote resources and energies to improve the institutional environment to enable scientists to work effectively and feel good about themselves and their organization.

g. Use of Training Opportunities

The research organizations in Pakistan consistently cite "lack of trained personnel" as an important factor limiting the progress of agricultural research. A major reason for the lack of trained personnel is that an inadequate proportion of the available overseas scholarships and funds for training courses is actually used by the GOP. Bureaucratic procedures at the Federal and Provincial levels consume an inordinate amount of time to select a candidate for overseas training. Those selected are often not the young scientists with decades of future work to offer. More frequently, individuals are chosen by seniority or by other considerations. Discouragement and disincentive for the younger scientists result from this selection procedure.

The need for professional training in research management is evident. The primary need is to assess research achievement on an individual merit basis. In addition, some carefully planned study tours for selected middle-level research supervisors, followed by intermittent consultancy visits, would provide useful training. MART will assist PARC to establish a national procedure to select outstanding young scientists for overseas training and attendance at overseas seminars and study groups.

In summary, PARC now has the authority to conduct, promote and coordinate agricultural research. Past efforts have focused on the reorganization of PARC and the identification and implementation of research management concepts and procedures within PARC. This has resulted in a more functional organization and the development of competent leadership. The shortfall of well-planned and relevant management training programs, however, has impeded the full implementation of already-defined management procedures and concepts. Assistance is needed to help PARC increase its capacity to manage its programs, and this is the major objective of the MART Project.

2. Provincial Reserch Organizations

Agricultural research is conducted by both Federal and Provincial research facilities, centers, colleges and universities of agriculture. There is an urgent need to: (a) clearly delineate the responsibilities between the Federal and Provincial government; and, (b) provide a suitable mechanism for close and effective coordination among all organizations engaged in agricultural research. This Project seeks to establish appropriate mechanisms to promote effective coordination within the national research network, using PARC as the facilitator.

At present, PARC's major function is to promote research in the field of agriculture and allied subjects by funding research projects submitted to it for financial assistance. This function has never been challenged. In fact, the Provincial Governments support PARC because it meets its obligations to the Provincial agricultural research organizations (to the extent possible) within its limited financial resources. PARC's main thrust will be to supplement and not supplant the provincial efforts in the field of agricultural research to ensure overall balanced development of agriculture in all the provinces. The MART Project seeks to assist PARC upgrade its efforts, primarily in cooperation/collaboration with the provincial governments, to develop nationally coordinated research projects, and to strengthen the research capability of the provinces, especially those provinces where agricultural research efforts are particularly weak.

The expatriate agricultural experts involved in the design of the MART project concluded that a centralized planning/coordination and decentralized execution system of agricultural research in Pakistan is feasible. For example, it has been pointed out that modern agricultural research methodology now requires liaison with international organizations concerned with agricultural research. PARC (as a Federal agency) has the only authority to develop these linkages for Pakistan. Another important function of PARC is to supplement and strengthen the research capability of provincial governments. This includes important resource facilities in the form of library services, research information, advanced training within the country and abroad, the provision of sophisticated equipment and its maintenance and repair, the provision of the services of experts as and when needed by the provinces for specific tasks and the supply of improved, exotic germ plasm of plant and animal origin.

3. Administrative Feasibility of Project Components

a. Resources Management and Administration

PARC has a well-staffed financial division. It is headed by a Financial Advisor who is a senior civil servant (Joint Secretary) and whose services are placed at the disposal of PARC by the Ministry of Finance. He acts as an ex-officio Member (Finance) of the Executive Committee. Other key staff include a Director, a Deputy Director and an Accounts Officer with adequate support staff.

The accounts of the Council are maintained in a form prescribed by the Federal government in consultation with the Auditor General of Pakistan. These are audited annually by one or more auditors who are chartered accountants appointed by the GOP upon the advice of the Auditor General. The Council is required to furnish an annual report on the conduct of its affairs which includes a summary of the accounts and the audit report.

A review of the current financial management system revealed a need to improve the system both at the Federal and Provincial levels. Under this project, PARC will install micro-computers for use in the Finance and Accounts Division. MART will help PARC, the Provincial governments and the agricultural universities strengthen, streamline and computerize their financial management systems, and establish strong links between the Executive Committee, the scientists and cooperating facilities. It will also assist PARC develop better management capability for its professional staff. Delegation of greater authority to staff to permit decisions to be made rapidly at their own levels within the framework of GOP rules and regulations will be promoted.

b. Information Transfer

PARC's charter includes the generation, acquisition and dissemination of information relating to agriculture. It has recently been given the responsibility for extension activities within the District of Islamabad. PARC, in collaboration with USDA, has instituted an automated system called the Current Research Information System of Pakistan (CRISP) to store and retrieve information on research projects in Pakistan. CRISP is designed to store in the computer descriptive information on each research project collected from all organizations (federal, provincial, autonomous and private) engaged in agricultural research and to retrieve this information for the use of scientists as and when needed. It will describe each project in terms of research problem area, field of science, commodity, research activity, location and subject.

Agricultural extension is carried out at the provincial level. The provinces are performing this activity in accordance with their limited resources. PARC, however, supplements the efforts of the Provincial Governments. Its activities include:

i. coordinating, streamlining and accelerating information transfer and communication support of extension services;

ii. holding national/international conferences/workshops on selected topics;

iii. providing maximum communication media support through the Ministry of Information and Broadcasting; putting selective spot announcements and slogans on all the radio and television stations; regularly publishing the journal Progressive Farming and crop and livestock manuals;

iv. undertaking research in agricultural extension techniques currently in operation to identify weaknesses/deficiencies, wherever they exist, and suggest remedial measures;

v. preparing and supplying extension materials such as slides, flip charts, wall newspapers, pamphlets and leaflets to provincial extension workers; and,

vi. acquiring information of benefit to the farmers from all sources and disseminating it to all concerned.

CRISP is not fully functional. PARC and the Provincial Governments are weak in mass communications capability. They have some facilities in the form of library, photography, reprography, printing and graphic arts, but these have to be substantially strengthened. There is a need to establish a studio with video and sound production capacities to expand and improve the effectiveness of the overall information transfer system. MART will enhance the information transfer capability of PARC and the provinces, and help produce and disseminate information of benefit to farmers, scientists, extension workers and other potential users.

c. Training for the Agricultural Research Network

A major constraint in agricultural research in Pakistan is the lack of high-level, experienced and trained personnel to address complex problems of agricultural production in an effective manner. This is particularly true for the provinces. PARC, with A.I.D. and World Bank assistance, has trained over 100 scientists abroad in the various disciplines of agriculture. They have returned and are located at PARC/NARC and in the provinces. The needs within the provinces are substantial, and present training programs cannot meet their needs.

No long-term (five to ten-year) national training plan has been prepared for the country on the basis of carefully considered present and projected needs of the various federal and provincial organizations engaged in agricultural research. There is an urgent need to formulate a national training plan responsive to the needs of the country.

PARC has established a Directorate of Training to program and process candidates for training abroad. They have developed adequate competence and streamlined procedures for this purpose, particularly for training in the United States. PARC has also established a training facility at NARC where numerous training courses have been conducted at the national level

with international assistance. It is now recognized that existing training facilities at NARC are not adequate. The NARC and provincial training facilities need to be expanded to meet the country's needs.

MART will improve the capacity of the agricultural research network in Pakistan to identify its personnel needs in agricultural research. The project will provide in-country, in-service professional career development courses for agricultural personnel at NARC and the provincial facilities.

d. Arid Zone Research

The Arid Zone Research Institute (AZRI) was established by PARC with headquarters at Quetta (Baluchistan). Three sub-stations are located in the provinces--one each at Umerkot (Sind), Bahawalpur (Punjab) and D.I. Khan (NWFP). The main objective of the institute is to develop techniques for more efficient management of agricultural resources in arid and semi-arid areas. AZRI is committed to test and develop an integrated approach to farming systems for different types of arid areas in the country.

The institute is in the formative stage. It requires substantial aid in the form of technical advisory services, commodities and training facilities to convert it into a viable research institute. Baluchistan has more than 40 percent of the geographical area of Pakistan and arid lands constitute about 60 percent of the total area. Development of these areas is an enormous task.

Pakistan's competence in dry areas research is seriously inadequate. Under a collaborative arrangement with ICARDA, the MART project will support and strengthen the research capability of AZRI.

e. Wheat and Maize Coordinated Programs

PARC has organized a number of Nationally Coordinated Commodity Research Programs in cooperation with the agricultural universities and provincial and federal research facilities. The philosophy behind such programs lies in a systematic attack on national problems through coordinated planning and resource allocation. The coordination provides the necessary leadership to plan and execute research programs and the requisite facilities. These projects are exclusively financed by PARC. A number of coordinated projects are currently in operation in Pakistan. Of these, the most important are for wheat and maize, which are being implemented in collaboration with CIMMYT.

The Wheat and Maize Coordinated Programs are sufficiently strong in the provinces. However, they need continued collaboration with CIMMYT for the supply of germ plasm and training facilities. A continuation of efforts is necessary to maintain and improve upon the gains already made by developing high-yield and disease/stress resistant varieties for the various agro-ecological zones of the country. The MART Project will support and further strengthen the wheat and maize research programs to serve as a model for the other Coordinated Programs.

In short, the administrative structure required to implement MART is in place. Although viable, it needs to be strengthened. This, in fact, is one of MART's purposes. The project proposes to supply strategic human and financial resources, directed at the problems which now prevent the existing structure from being efficiently used.

C. Social Soundness Analysis

1. Introduction

The success of the MART Project requires changes in the behavior, expectations, and frame of reference of a large group of professional agricultural researchers, extension agents, and farmers. Specifically, it requires quantum increases in the level of communication among these three major groups of actors in the system. To be successful, the Project must, in addition, introduce and make effective a previously unaccustomed level of discipline and accountability in the research and extension systems. Moreover, it must succeed in promoting interdisciplinary research in a system which has not been pursuing this approach.

None of the foregoing will occur immediately. Achievements will be incremental and evolutionary. The main test of the Project's social soundness is whether the project provides the necessary concepts, resources and systems needed to bring these changes about and whether the social, cultural and institutional framework in Pakistan will permit these changes to occur, given the necessary resources.

Before these issues are addressed, it is pertinent to note that Pakistan's research system has moved far in the directions indicated in this Project Paper. Through its leadership and, to some extent, through its control of budgets, PARC has increased the level of communication and coordination among research elements in the national system. Likewise, through its Nationally Coordinated Research Program, PARC has begun to influence the behavior of provincial research institutions. The creation of the National Agricultural Research Center (NARC) is a landmark in the creation of a focal point for the coordination of Pakistan's agricultural research efforts. Its modern facilities and equipment and its ample experimental fields have attracted the attention of Pakistan's agricultural research community. At high levels in the GOP, there is a clear political will to use NARC as effectively as possible to contribute to the realization of Pakistan's agricultural production goals. Moreover, there is a recognition that research cannot be effective until it helps the great majority of small farmers who are the backbone of agriculture in Pakistan.

2. Research-Research Relationships

The objective of the MART Project is to establish a Federal/Provincial research system capable of serving its principal client group--the farmers of Pakistan. This requires improved technology transfer between strengthened national/provincial research and extension systems. Many of the problems involve the human equation and their role

within the system. The perception is that people involved in the system tend to work in isolation and remain aloof or indifferent to either the national goals of their organization or to the needs of their client groups. Historically, there is no real test to measure the effectiveness or attempt to inject accountability into the system. In this regard, inertia plays a significant role. There is a tendency on the part of researchers to continue in this mode. This project, complemented by a strong GOP commitment, offers several means to overcome this inertia within the research system.

First, the Project offers direct financial support to high priority research endeavors which will attract provincial researchers to the system and enhance their willingness to cooperate. Second, the Project offers attractive training opportunities for a broad range of provincial researchers and agricultural educators who hitherto have been neglected in this respect. Third, the Project offers opportunities for intellectual interchanges in the form of seminars and workshops, which will provide researchers and agricultural educators from the four provinces of Pakistan opportunities to exchange information and compare results. This is not a feature of the existing system and should long way to enhance the knowledge and prestige of the researchers and educators. Underpinning these advantages will be PARC's substantial influence over budgetary allocations for all agricultural research. In addition, NARC itself and the opportunity to visit or work at the Center will provide an attractive focal point for researchers and educators from all parts of Pakistan. Finally, the project at the very outset seeks to bolster the resources available to the provincial research system in ways that will enhance PARC's constructive influence over the performance of that system.

The completion of the present construction phase at NARC coupled with President Zia's recent announcement of increased incentives for agricultural researchers greatly boosted the moral of researchers nationwide. These events added to the prestige that NARC and its parent organization, PARC, have within the research system. In effect, the new facility has signaled a change in the way agricultural research is conducted in Pakistan, and expectations of researchers themselves are considerably higher than in the past. Thus, given the tangible incentives and benefits offered by this Project, the Mission has concluded that it is feasible to develop an efficient, responsive and coordinated national/provincial research system in Pakistan.

3. Research-Extension Relationships

There is limited experience in Pakistan in having research and extension systems work together in a coordinated way to produce and deliver benefits to the farmers in the field. A traditional gap between researchers and extension agents persists to this day. This gap is widened to some extent by the fact that researchers are generally better educated and prepared than extension agents. Feelings persist on the part of extension agents that researchers have nothing to offer, and researchers believe that extension agents are not competent enough to understand and appreciate their work.

A process to bring research and extension workers together has begun under the existing A.I.D.-financed Agricultural Research Project. Many research institutions conduct trials on farmers' fields which involve joint participation and collaboration among scientists and extension workers. Production maximization campaigns conducted by PARC for major crops that feature travelling seminars involve both researchers and extension agents. Special efforts on high priority crops, including wheat, maize, rice and cotton, have proven that researchers and extension personnel can work together when resources are committed and the priorities are made clear.

This Project will intensify efforts to institutionalize and provide for the perpetuation of close linkages and cooperation between research and extension as the rule and not the exception. The judgement of the design team, the Mission and, more importantly, the GOP is that this can and must be achieved. The particular elements of the Project intended to bring this about are the inclusion of extension specialists on the NARC staff; the provision of training opportunities for extension agents; the provision of improved communications technologies to be delivered by the research network to interface with the extension programs; and, the focus on delivering financial, physical and technological resources on a sustained basis to provincial research and extension systems.

Two other projects being initiated in 1984 will complement this effort and help continue a process toward institutionalized cooperation of the research and extension systems. The World Bank is planning a $100 million project to improve the extension system. This project includes provisions for strong linkages with the research system and will strengthen the human resource base of the extension system. It will encourage extension personnel to be better prepared and knowledgeable of research information and have better capacities to translate these results for the farmers.

The other complementary project is the A.I.D.-financed TIPAN Project. The latter project provides for the unification of the education and research functions and stronger ties to the extension system in the Northwest Frontier Province (NWFP). This project has strong development similarities to the Ludhiana University Project in India, sponsored with A.I.D. assistance, which has significantly contributed to quantum jumps in food production in the Indian Punjab. The Provincial government in the NWFP has agreed to unify agricultural education, research and extension. It could be the model that may eventually take hold in other provinces of Pakistan and contribute to resolving institutional shortcomings that have worked against agricultural development since Independence.

Change is required in the attitude that research and extension are independent elements in a system that depends on their coordination. The change may be slow, but the MART Project and the above two complementary projects should bring the realization of the desired results. Prerequisites to effect these changes include:

a. a GOP commitment that will promote closer coordination between the research and extension systems;

b. an existing government institution capable of directing resources to support its elements and implement the policy;

c. the creation of systems of accountability and rewards for performance; and,

d. the assurance that the research and extension systems have adequate resources in place to implement the policy. The NARP Project assures that these conditions will be met.

4. Farmer Response

The central question remaining is: Given the improved research and extension systems and a closer coordination between those systems, will the farmer respond and take advantage of the improved technologies and information that is made available? With a few notable exceptions, Pakistan's extension system has had little to offer the average farmer in the past. It also lacked the means to deliver what it did have. Only a small percentage of farmers had consistent, positive experience in working with extension agents. Their problems never came to the attention of research scientists because of the communications gap between the research and extension systems. Another obstacle in the path of farmer acceptance of technical information has been the tightly-controlled price structure for major commodities in Pakistan. Prices were controlled to benefit the urban consumer rather than to assure adequate levels of production. In these circumstances, farmers had little incentive to seek or to accept better ways of doing things. As a result of these two weaknesses, Pakistan has not progressed rapidly in modernizing its agriculture. Basic inputs such as chemical fertilizers were accepted only gradually, and Pakistan's progress towards self-sufficiency in basic grains was achieved more slowly than it might have been. Moreover, it was achieved on the basis of research done primarily in other countries, namely at IRRI in the Philippines and CIMMYT in Mexico.

Conditions with respect to the foregoing constraints are changing. The on-farm and farming systems research being advocated are helping farmers identify and resolve agronomic problems. Good farming systems research requires direct communications among farmers, extension agents and research scientists. It provides farmers first-hand experience in the problem-solving process and more timely accessibility to research results.

In addition, Pakistan has moved far toward market pricing of agricultural products and agricultural inputs. Prices for basic grains approximate world market prices; fertilizer subsidies will be eliminated within a few years; and, Pakistan is moving toward recovery of canal system operation and maintenance costs through user fees. In short, farmers will have first-hand knowledge of the advantages of improved technologies in terms of output, and the incentives necessary to encourage them to seek more efficient ways to produce a higher level of output.

The [illegible] Project will promote and encourage the farming systems research approach and make a concentrated effort to upgrade media resources in preparing and publishing research results. The use of radio, television and video presentations will professionally enhance the work of the extension agent who, in the past, has had too few tools to meaningful interact with the farmer. The increased effectiveness in communication will be enhanced by the fact that the Project will also develop a higher quality product in terms of research results. In fact, the use of media will expand a traditional means of transfer of information from farmer to farmer: farmers may be called upon to relate their successful experiences to other farmers through the media. Often, this form of communication is more effective than communication between extension agents and farmers.

1. Beneficiary Analysis

Direct beneficiaries of this project include the research scientists, extension agents, agricultural university staff and agricultural training facility personnel, who will be the recipients of increased resources and training opportunities, and who will be exposed to continuous opportunities for upgrading their knowledge on the job. The ultimate beneficiaries are the farmers whose incomes should rise as a result of increased agricultural production, and the consumers who will benefit from more plentiful and available agricultural products.

This project will not have a significant impact on women, except for their proportional participation in increased economic prosperity. Women play significant roles in agricultural research, especially in laboratory work, and will be eligible for the training opportunities that this Project offers. In addition, farming systems research must necessarily take into account the role of women since they contribute significantly to agricultural production. In many agricultural areas of Pakistan, women provide much of the labor required in planting and harvesting crops. For this reason, special efforts will be made to identify opportunities for women to participate in farming systems research field activities, in order to ensure that the needs of female agricultural workers and farmers are responded to in the context of their specific tasks and roles within the agricultural system.

Potential benefits to the general population of Pakistan are very high. Despite having 17 percent of its arable land under irrigation, and despite the fact that most of the country enjoys a nine-month growing period which would permit two or three crops per year, Pakistan's agricultural production equals only a little more than 100 percent of the production that would be expected from only one crop per year. In other words, if existing technology were to be applied immediately across the board in all of Pakistan, production could increase exponentially. However, this Project deals only with one element of the complex of conditions that tend to constrain Pakistan's agricultural production.

Fortunately, other elements of the problem are being addressed concurrently: the GOP is systematically attacking constraints imposed by artificial prices; it plans to move input distribution into the private sector which performs the job much more efficiently, and without subsidy; and, it is investing a high level of resources and expertise in the improvement of irrigation systems and the policies that adversely affect their efficiency. Systematic, positive changes in the policy framework for agricultural development and concurrent improvement in the systems supplying inputs to the agricultural sector will assure that the information generated by the MART Project will be sought and used by the farmers of Pakistan. Since it is the agricultural sector in Pakistan which is the mainstay of the country's economic growth, this Project should make a significant contribution to the economic development and quality of life of the country.

D. Economic Analysis

1. Project Benefits

The economic benefits from agricultural research can take a number of forms. The most obvious is increased output, either from domestic consumption or for sale in foreign markets. The development of shorter season varieties of wheat, for example, could conceivably double wheat crop production in Pakistan. In a like manner, short-season, edible oil crops could be adapted for production on cotton or rice fallow lands. Benefits from research could also take the form of improved commodity quality such as varieties better adapted to the length of the growing season, or crops with greater disease resistance. Another economic benefit could be in the balance of trade. Domestic oilseed production could reduce the need for increasing foreign exchange expenditures for edible oil and high protein livestock and poultry feed. Improved cotton varieties bred for disease resistance or for higher lint quality could generate increased export earnings.

The MART Project will provide assistance in four major areas: research management; information transfer; training; and, agricultural research on wheat, maize and the arid zone. Each of these activities is likely to have indirect economic benefits. That is, all these activities will result in the production of new information about agricultural technology, which, when made available to farmers and combined with other inputs such as land, labor, equipment, fertilizer, seeds, water and improved agricultural practices, will increase output. These other inputs may be the same ones used previously or may represent additional inputs. Some part of the additional output that results from this total package of inputs may be attributed to the knowledge or information produced by research activities.

The component of this project that is designed to improve the management and administration of agricultural research has the potential for producing much larger benefits per dollar of investment than standard

agricultural research projects. The reason for this is that this component is expected to improve the productivity of agricultural scientists through better management of their time and of the resources necessary to conduct research. The project should be cost-effective because a small incremental cost will produce relatively large increases in the output of agricultural research. Better planning and management should produce a larger number of completed research studies that are relevant to Pakistani agricultural conditions for very little extra cost.

The information transfer component also has the potential for multiplying benefits from the agricultural research that is carried out in Pakistan. Agricultural research produces virtually no benefits if it is not made available to farmers or if farmers do not use it. As stated previously, a significant production gap exists between farmers' actual performance and that which would be expected if recommended practices were used. This low performance could result from lack of farmer usage of extension information and/or other constraints. This component is expected to employ modern media methods to transfer knowledge in a persuasive manner directly to farmers and indirectly to them through extension activities.

Research is only one component of a system of mutually interdependent and complementary ingredients which affect agricultural productivity. It is difficult to separate out the benefits of each of these component ingredients. Scientists, as well as the public, often focus on the visible product of research--improved technology. James Bonnen has pointed out that, since factors of production interact, it is an intellectual misunderstanding to attribute incremental increases in productivity exclusively to technology.[4/] New technology packages, improved human capital, and institutional change complement each other. He says that there is no way to distinguish clearly the marginal returns to these factors of production. Thus, the rate of return commonly attributed to R&D or technology is mostly a product of these complementary factors.

2. The Interrelationship Between International Centers and National Research Centers

The high-yielding varieties of wheat and rice commonly grown in Pakistan were introduced by the International Research Centers. The MART Project will finance the services of CIMMYT and ICARDA scientists to provide support to research in both irrigated and arid rainfed areas. Research and technology transfer from the Centers to Pakistan will accelerate the process by which new technologies are made available to local farmers.

4/ James T. Bonnen, "Historical Sources of U.S. Agricultural Productivity: Implications for R&D Policy and Social Science Research, "Michigan Agricultural Experiment Station Journal, Article No.: 10940, 1983.

The results of the work at CIMMYT on high-yielding varieties of wheat were quickly adopted in India and Pakistan during the 1960s and 1970s. The IRRI-type rice, on the other hand, was adopted at a slower pace and required more systematic screening and the adaptation of complementary technologies. For rice the first generation income stream was only 46 percent as great as that for wheat in the first generation. However, the second generation income stream for rice was 174 percent that for wheat. The periods under consideration were PFY 1966/67, 1969/70 and 1970/71-1972/73.

Sterling Wortman has delineated the many positive impacts of the International Research Centers on national systems. He argues that the Centers produce useful technology, train people, and set standards of performance.5/ The Centers also facilitate a greater interchange of information among scientists. Through international cooperation, field tests, and experiments, the Centers draw scientists together, allowing them to base conclusions on much more substantial experimentation. However, after noting all these positive effects of international research, Wortman points out that quantitative assessments of the impact of the international system on national research and production and investment cannot be precise.

3. Returns to Research

The economic consequences of research have been studied for the past 30 years, beginning with T. W. Schultz's published results in 1954. The analytical approaches to calculating economic returns to research have been expanded and refined over the years. Robert E. Evenson 6/ discussed three bodies of economic studies, with somewhat different methodologies and coverage, used to determine the returns to agricultural research. The studies consistently agree that research enables increased production from a given resource and that the economic value of that production is very high relative to the cost of the research. These results hold true in both developing and developed countries.

A summary of agricultural research productivity studies carried out between 1958 and 1980 included 32 annual internal rates of return ranging from 11 percent on wheat research in Columbia to 110 percent on farm management research and agricultural extension in the U.S.A. Only four

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5/ Sterling Wortman, "Impact of International Research on the Performance and Objectives of National Systems," in Research Allocation and Productivity in National and International Agricultural Research, eds. Thomas M. Arndt, Dana G. Dalrymple and Vernon W. Ruttan, University of Minnesota Press, 1977, pp. 323-335.

6/ Robert E. Evenson, "Economic Dimensions of Agricultural Research Programs," presented at the International Seminar on Science and Agriculture, National Agricultural Research Center, Islamabad, March 28, 1984.

are below 20 percent; nine in the 20 to 30 percent range; 14 in the 30 to 40 percent range; and 35 exceeding 40 percent. These returns compare favorably with normal returns expected from public and private investment (15 to 20 percent) or from roads and irrigation systems (3 to 10 percent).

In a study of the economic returns to cereal grains research, Evenson estimated that the marginal benefits were five times higher in developing than in developed countries for science-oriented research and 3.5 times higher for technology-oriented research.[7] The relative difference in magnitudes of the estimated income streams does not indicate that researchers in developing countries are more efficient but it does reflect two factors. First, developing countries' research skills are relatively low-priced-- they cost less than half those in developed countries. Second, and more importantly, the size of the estimated income streams reflects the fact that the ratio of research capital to conventional factors of production is only one-fifth as high in developing countries. Using this small investment base and adding research knowledge which exists and can be adapted from elsewhere, the marginal product of research will be high if standard productivity relationships hold.

4. Returns to Research in Pakistan

Carl E. Pray has estimated that the rate of return to investments in agricultural research and extension in the Punjab are impressive, albeit lower than rates of return in other countries.[8] His calculations of the social rate of return for the period 1947 to 1975 range from 17 to 49 percent, but on the basis of his most realistic assumptions, the internal rate of return during this period was 30 to 37 percent. Rates of return for developing countries run, for the most part, in the range of 40 to 60.[9] Over one-third of the 24 separate studies reported rates of return of 75 percent or higher, half were 50 percent and below, with the remainder in the 50 to 75 percent range. Few were below the rates reported for the Pakistan Punjab.

7/ Robert E. Evenson, "Comparative Evidence of Returns to Investments in National and International Research Institutions," in Resource Allocation and Productivity in National and International Research, op. cit., pp. 237-264.

8/ Carl E. Pray, "The Economics of Agricultural Research in British and Pakistani Punjab, 1905-1975," Ph.D. Thesis, University of Pennsylvania, 1978.

9/ V. W. Ruttan, "Agricultural Research Policy," University of Minnesota Press, 1982, pp. 242-43.

The Punjab Department of Agriculture has conducted research in a number of disciplinary areas, but quantitative evidence is available only on the contribution of plant breeders. This evidence is in the form of acreages under new varieties and the effects of these varieties on per acre yield, cost of production and quality of the crop. The estimates of benefits will be on the low side because they ignore the outputs of other disciplines. Pakistan had the highest proportion of its cropland in high-yielding varieties of wheat from the late 1960s through the 1970s, but its proportion of planted acres in high-yielding varieties of rice was exceeded only by the Philippines during the same period.

Pakistan has bnenefited greatly from the research on wheat and rice at CIMMYT and IRRI. In Pakistan, per acre yield increases have accounted for one-third of the increased output in wheat and rice since 1950. These increases stem from the interaction of fertilizer, water and new seed. Carl Pray calculated that in the Pakistan Punjab, the greatest increase in yield per acre was in American cotton, 64 percent, followed by wheat and rice, 51 and 47 percent, respectively.10/

Nagey estimated an index for on-farm constraints to yields for new crop varieties over old.11/ Yield advantage estimates of HYVs of wheat were determined in Pakistan under rainfed and irrigated conditions. The experiments were designed to delineate the effects of various constraints on yields. The treatments included the comparison of a popular pre-dwarf variety of wheat grown under normal farmer conditions of low fertilization and no weeding with a HYV with recommended application of fertilizer and two weedings. The yield advantage for rainfed and irrigated land for varietal improvement were 16 and 43 percent, respectively.

The adaptive research carried out in Pakistan has increased the benefits from CIMMYT and IRRI research. The first varieties of wheat introduced directly from Mexico all had red grain and were not adopted widely. It was only with the release of white-grained Mexipak that had been selected and tested in the Punjab that high-yielding varieties of wheat spread rapidly. One imported variety of rice, IR-8, has been released and, because of its low quality, has never achieved much success in the Punjab. Local research has benefits beyond accelerating the adoption of and adapting the results of international research to Pakistan. The benefits reach a maximum and then decline because new disease and pest problems develop with the spread of new varieties and eventually bring their yields down. In the absence of local research stations, it would take much longer for breeders in Mexico or the Philippines to hear of

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10/ Carl E. Pray, "The Returns to Agricultural Research and the Distribution of These Returns in Pakistani Punjab," University of Minnesota, October 1981.

11/ Joseph G. Nagey. "Estimating the Yield Advantage of High-Yielding Wheat and Maize: The Use of Pakistani On-Farm Yield Constraint Data, "The Pakistan Development Review, Vol. XXII, No. 3 (Autumn 1983).

these problems and to begin breeding varieties resistant to pests. In order to reduce the probability of a surprise disease attack, such as rust in wheat, genetic maintenance research is essential. Without at least this level of research input, there will be a retrogression in research knowledge and agricultural productivity could decline. Even though wheat and rice breeding can be carried out abroad, the actual adaptations must be done by local researchers.

In the case of cotton, the new varieties were produced almost entirely by the Department of Agriculture in cooperation with the Pakistan Central Cotton Committee. Many varieties of cotton have been imported and rejected. Only after breeding these varieties with local varieties have they been economically useful in Pakistan. The alternative source of new varieties was local, private firms. However, the difficulty in capturing the gains due to new varieties of a self-pollinating crop means that there is little incentive to invest in the long range and uncertain research process. This is particularly true where there is government interference in the markets for agricultural inputs and outputs.

In sugarcane, the situation is much like cotton. No imported varieties were successful until the 1970s, and it is still not clear how successful they will be. Cane breeding in the Punjab is expensive because cane does not flower there except under special conditions. Also, the profitability of sugar production depends on government trade barriers. It, therefore, seems unlikely that the sugar factories would have undertaken a large investment in breeding. Another possibility is that factories would develop a large program to import improved varieties. Some mills have imported varieties, but there is little evidence to suggest they have succesfully spread to farmers.

The benefits from local research in Pakistan are most evident in cotton and sugarcane. The benefits from wheat and maize innovations should also be attributed in part to Pakistani research because the local efforts had an important impact on the time of introduction and the speed and level of diffusion of new varieties. Local research has probably had the least impact on rice.

5. Returns to Non-Research Activities

Other components of the MART Project are complementary to the technology that will be introduced through external and internal research. These components include management, construction and training plus some extension through mass media programs. The training component of this project will add to the number of agricultural scientists in Pakistan and will improve the technical and managerial skills of existing scientists employed in various research establishments. The benefits

resulting from this training investment are likely to be significant. Data from a World Bank study show that the rates of return for investment in training in developing countries are greater than for physical infrastructure investments--14.9 percent for higher education and 12.8 percent for physical infrastructure projects. The 14.9 percent is an average for 11 developing countries with a range from 8 percent in Colombia to 23 percent for Mexico and Venezuela. It also covers all fields, not just agricultural training. The management and media programs are likely to produce rates of return larger than for agricultural research itself.

Management is a factor which cannot be measured as a single component, but the consequences of good management can be measured in increased output. The timely flow of research funds, the setting of meaningful targets for research output, and the transfer of research results and improved technology to farmers will increase productivity. Improved management, whether on the research station or on the farm, results from efficient use of limited resources. In order to be cost-effective, no resources can be wasted, but the most limited ones must be used most efficiently and effectively. The transfer of existing technology and improved management should have positive benefits from farm production, farm income, and consumer welfare.

A recent PARC publication estimates the impact of several constraint factors affecting production in selected crop categories.12/ Insufficient application of fertilizer is proportionately the greatest cause of low wheat yields in Sind and NWFP, while improper weeding or lack of it is the main management practice causing low wheat yields in Punjab Province. Improper tillage is responsible for over half the gap between "actual" and "recommended practice" in rice production in the Punjab. Insufficient application of fertilizer causes the second largest gap in rice output. Poor management practices causing the gap in maize production are caused in nearly equal proportions by insufficient application of fertilizer, poor selection of varieties and improper tillage methods in Punjab and NWFP. The actual yield for maize is half of what could be attained if recommended practices were used.

The socio-economic results in the report indicate that 100 percent of Punjab wheat farmers use fertilizer but only 27 percent apply the recommended quantity. High price was stated as the reason for this level of input by 58 percent of the farmers. In barani (dryland) areas, only 3.4 percent of Punjab wheat farmers use fertilizer; 70 percent named price as the reason for low usage.

12/ Annual Report 1981/82. Pakistan Agricultural Research Council, Islamabad

Weeding is the second most important contributor to the production gap between "actual" and "recommended practice" performance. Survey results show that only 33 percent of farmers in irrigated and 27 percent in barani areas weed their wheat, but over half the farmers in barani areas graze the weedy areas and 20 percent in irrigated areas follow this practice. Only 25 percent of farmers who did not weed named high labor charges as the reason. The report did not indicate why farmers do not employ recommended farm management practices, but the yield gaps indicate that actual output is much below what could be attained if recommended management practices were followed.

If the production results of the CIMMYT supervised on-farm trials in wheat production were achieved as a national average over the next five years, the impact on national production would be as follows:

a. Average yield would increase from the present 1.59 metric tons to 2.8 metric tons per hectare;

b. With no change in present wheat acreage, the total crop would be 21.8 MMT instead of the projected 15.1 MMT at present growth rates;

c. There would be a 5 MMT exportable surplus from the same acreage sown to wheat in PFY 1982/83, based on Nagy's projected wheat requirements;13/

d. With this achievement, 70,000 acres that would have to be devoted to wheat production at the lower growth rate would be released for oilseed or new crop production; and,

e. Annual yield growth rate per hectare would rise from the current 4 percent to 12 percent.

The efficiency results of the transfer of existing technology to farmers would have far-reaching income effects and social benefits.

13/ Joseph C. Nagey, "Pakistan's Experience in Science Based Agriculture," Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, Minnesota, June 1983.

E. FINANCIAL ANALYSIS

1. General

The total estimated cost of the project is $34.4 million. Financial resources will be provided from four different sources: (a) a $30 million A.I.D. grant under the Management of Agricultural Research and Technology (MART) Project; (b) $2.5 million worth of commodities under the A.I.D.-financed Agricultural Commodities and Equipment (ACE) Program; (c) a GOP contribution equivalent to about $1.1 million; and, (d) an estimated $750,000 in the form of technical advisory assistance from the core budgets of two of the proposed contractors under the MART Project, namely, the International Wheat and Maize Improvement Center (CIMMYT) and the International Center for Agricultural Research in Dry Areas (ICARDA). The total A.I.D. contribution to the program is equivalent to 95 percent while that of the GOP and CIMMYT/ICARDA are 3 percent and 2 percent, respectively.

Five summary tables are provided on the following pages: Table 8 summarizes project costs by fiscal year and source of funding; Table describes project costs by expense category and source of funding; Table 10 depicts project costs by project component, expense category, and source of funding; Table 11 summarizes the A.I.D. contribution by fiscal year and expense category; and, Table 12 presents the data in terms of foreign exchange and local costs. The budget tables do not include the $2.5 million under the ACE Program nor the estimated $750,000 contribution from CIMMYT and ICARDA.

A.I.D. project costs are defined as anticipated earmarkings or commitments of funding through, e.g., Project Implementation Orders (PIOs), contracts, purchase orders, or Project Implementation Letters (PILs). In the budget tables, A.I.D. dollar grant funds are shown by U.S. fiscal year in accordance with the anticipated schedule of earmarkings and commitments of funds. The proposed obligation schedule of A.I.D. grant funds for the MART Project is as follows (by U.S. fiscal year): FY 1984 = $5 million; FY 1985 = $5 million; FY 1986 = $10 million; and, FY 1987 = $10 million.

Inflation was calculated for A.I.D. project costs as follows: 5 percent per year for all foreign exchange costs; 12 percent per year for local construction costs; and, 10 percent per year for all other local costs, all compounded annually. An inflation factor of 10 percent per year compounded annually was also applied to GOP costs, except for local salaries where PARC's existing salary scale with its established annual increments was used as a basis for the calculations. A contingency factor of 10 percent was used for both the A.I.D. and GOP contributions. Local costs are expressed as dollar equivalents at the exchange rate of U.S. $1.00 = Rs 13.00.

TABLE 8

SUMMARY OF PROJECT COSTS a/ BY FISCAL YEAR AND SOURCE OF FUNDING
(In $000)

Source of Funding	U.S. Fiscal Year b/ 1985	1986	1987	1988	1989	Total
A.I.D. Grant c/						
FX	5821	4111	4760	2986	1125	18803
LC	3353	2806	2794	1403	841	11197
Sub-total	9174	6917	7554	4389	1966	30000
GOP d/	100	195	265	279	296	1135
TOTAL e/	9274	7112	7819	4668	2262	31135

a/ Inflation = 5 percent for all FX costs; 12 percent for local construction costs; and, 10 percent for all other local costs, all compounded annually.

b/ For purposes of this table, U.S. Fiscal Year 1985 corresponds to Pakistani Fiscal Year (PFY) 1984/85, U.S. FY 1986 to PFY 1985/86, and so forth.

c/ A.I.D. dollar grant project costs are defined as anticipated earmarkings or commitments of funding through, e.g., PIOs, contracts, purchase orders, and PILs.

d/ Expressed as dollar equivalents at the exchange rate of US $1.00 = Rs 13.00.

e/ Does not include: (i) approximately $2.5 million under the Agricultural Commodities and Equipment Program (391-0468) for the importation of agricultural research commodities and equipment; and, (ii) approximately $750,000 worth of technical advisory assistance from CIMMYT and ICARDA from their core budgets.

TABLE 9

SUMMARY OF PROJECT COSTS a/
BY EXPENSE CATEGORY AND SOURCE OF FUNDING
(In $000)

Expense Category	Life of Project Funding: A.I.D. Grant b/ FX	LC	GOP Contribution c/	Total d/
1. Technical Assistance				
a. Short-Term Expatriate	2604	964	-	3568
b. Long-Term Expatriate	5481	2297	-	7778
c. Local Contractors	-	419	-	419
Sub-Total	8085	3680	-	11765
2. Training				
a. U.S.				
i. Short-Term	1341	265	-	1606
ii. Long-Term	4789	251	-	5040
b. Third Country	403	120	-	523
c. In-Country	-	2000	-	2000
d. Sabbaticals/Conferences	-	148	-	148
Sub-Total	6533	2784	-	9317
3. Commodities				
a. Computers	380	-	-	[illegible]
b. Vehicles	584	-	-	[illegible]
c. Other Commodities	1312	657	-	1969
Sub-Total	2276	657	-	2933
4. Other Costs				
a. Construction	-	1660	-	1660
b. Evaluation	200	100	-	300
c. Farming Systems Studies	-	300	-	300
d. Other Studies/ Demonstrations	-	1000	-	1000
e. Vehicle Operation/Local Staff/ Facility O&M	-	-	1032	1032
Sub-Total	200	3060	1032	4292
Total	17094	10181	1032	28307
Contingency (10%)	1709	1016	103	2828
GRAND TOTAL	18803	11197	1135	31135

a/ Inflation = 5 percent for all FX costs; 12 percent for local construction costs; and, 10 percent for all other local costs, all compounded annually.

b/ A.I.D. dollar grant project costs are defined as anticipated earmarkings or commitments of funding through, e.g. PIOs, contracts, purchase orders, and PILs.

c/ Expressed as dollar equivalents at the exchange rate of US $1.00 = Rs 13.00.

d/ Does not include: (i) approximately $2.5 million under the Agricultural Commodities and Equipment Program (391-0468) for the importation of agricultural research commodities and equipment; and, (ii) approximately $750,000 worth of technical advisory assistance from CIMMYT and ICARDA from their core budgets.

TABLE 10

SUMMARY OF PROJECT COSTS a/
BY PROJECT COMPONENT, EXPENSE CATEGORY AND SOURCE OF FUNDING
(In $000)

Project Component	Life of Project Funding A.I.D. Grant b/ FX	LC	GOP Contribution c/	Total d/
1. Research Management and Administration				
a. Technical Assistance	2817	1316	-	4133
b. Training	3977	1206	-	5183
c. Commodities	546	97	-	643
d. Other Costs	100	650	123	873
Sub-Total	7430	3269	123	10832
2. Information Transfer				
a. Technical Assistance	768	337	-	1105
b. Training	551	412	-	963
c. Commodities	591	124	-	715
d. Other Costs	25	444	545	1014
Sub-Total	1935	1317	545	3797
3. Training for the Agricultural Research Network				
a. Technical Assistance	643	367	-	1010
b. Training	608	377	-	985
c. Commodities	269	256	-	525
d. Other Costs	25	1241	304	1570
Sub-Total	1545	2241	304	4090
4. Arid Zone Research				
a. Technical Assistance	2378	1041	-	3419
b. Training	827	388	-	1215
c. Commodities	380	90	-	470
d. Other Costs	25	413	30	468
Sub-Total	3610	1932	30	5572
5. Wheat and Maize Coordinated Programs				
a. Technical Assistance	1479	619	-	2098
b. Training	570	401	-	971
c. Commodities	490	90	-	580
d. Other Costs	25	312	30	367
Sub-Total	2564	1422	30.	4016
Total	17094	10181	1032	28307
Contingency (10%)	1709	1016	103	2828
GRAND TOTAL	18803	11197	1135	31135

a/ Inflation = 5 percent for all FX costs; 12 percent for local construction costs; and, 10 percent for all other local costs, all compounded annually.

b/ A.I.D. dollar grant project costs are defined as anticipated earmarkings or commitments of funding through, e.g. PIOs, contracts, purchase orders, and PILs.

c/ Expressed as dollar equivalents at the exchange rate of US $1.00 = Rs 13.00.

d/ Does not include: (i) approximately $2.5 million under the Agricultural Commodities and Equipment Program (391-0468) for the importation of agricultural research commodities and equipment in support of the RMA ($1.5 million), TARN ($250,000), AZR ($600,000) and WMCP ($150,000) components; and, (ii) approximately $750,000 worth of technical advisory assistance from ICARDA (about $550,000 for the AZR component) and CIMMYT (about $200,000 for the WMCP component) from their core budgets.

TABLE 11

SUMMARY OF A.I.D. FUNDING[a] BY EXPENSE CATEGORY AND FISCAL YEAR
(In $000)

Expense Category	U.S. Fiscal Year[b] 1985	1986	1987	1988	1989	Total[c]
1. Technical Assistance						
a. Short-Term Expatriate	789	840	914	688	337	3568
b. Long-Term Expatriate	2866	1992	2124	796	-	7778
c. Local Contractors	190	138	91	-	-	419
Sub-Total	3845	2970	3129	1484	337	11765
2. Training						
a. U.S.						
i. Short-Term	190	466	491	381	78	1606
ii. Long-Term	544	1170	1481	1266	579	5040
b. Third Country	84	113	175	127	24	523
c. In-country	400	400	400	400	400	[illegible]
d. Sabbaticals/Conferences	12	12	12	112		148
Sub-Total	1230	2161	2559	[illegible]286	1081	9317
3. Commodities						
a. Computers	300	20	20	[illegible]	20	[illegible]
b. Vehicles	584	-	-	-	-	[illegible]
c. Other Commodities	1769	-	200	-	-	[illegible]
Sub-Total	2653	20	220	20	20	[illegible]
4. Other Costs						
a. Construction	292	818	550	-	-	[illegible]
b. Evaluation	-	-	150	-	150	[illegible]
c. Farming Systems Studies	120	120	60	-	-	[illegible]
d. Other Studies /Demonstrations	200	200	200	200	200	[illegible]
Sub-Total	612	1138	960	200	350	[illegible]
Total	8340	6289	6868	3990	1788	[illegible]
Contingency (10%)	834	628	686	399	178	[illegible]
GRAND TOTAL	9174	6917	7554	4389	1966	[illegible]

a/ Inflation = 5 percent for all FX costs; 12 percent for local construction costs; and, 10 percent for all other local costs, all compounded annually.

b/ A.I.D. dollar grant funds are shown by fiscal year in accordance with anticipated schedule of earmarkings and commitments through, e.g., PIOs, purchase orders, contracts, and PILs.

c/ Does not include approximately $2.5 million under the Agricultural Commodities and Equipment Program (391-0468) for the importation of agricultural research commodities and equipment.

[illegible]

[illegible]	FY 1985 FX	FY 1985 LC	FY 1986 FX	FY 1986 LC	FY 1987 FX	FY 1987 LC	FY 1988 FX	FY 1988 LC	FY 1989 FX	FY 1989 LC	Total FX	Total LC	Total
1. Technical Assistance													
a. Short-Term Expatriate	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
b. Long-Term Expatriate	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	-	[illegible]	[illegible]	[illegible]
c. Local Contractors		[illegible]	-	[illegible]	-	[illegible]	-	-	-	-	-	[illegible]	[illegible]
Sub-Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2. Training													
a. U.S.													
i. Short-Term	172	18	597	69	418	73	294	87	60	18	1541	265	1806
ii. Long-Term	490	54	1102	68	1409	73	1209	57	379	-	4789	251	5040
b. Third Country	63	19	90	33	124	51	101	24	23	1	403	120	523
c. In-Country	-	400	-	400	-	400	-	400	-	400	-	2000	2000
d. Sabbaticals/Conferences	-	12	-	12	-	12	-	112	-	-	-	148	148
Sub-Total	727	503	1589	572	1951	608	1604	681	662	419	6533	2784	9317
3. Commodities													
a. Computers	300	-	20	-	20	-	20	-	20	-	380	-	380
b. Vehicles	584	-	-	-	-	-	-	-	-	-	584	-	584
c. Other Commodities	1312	457	-	-	-	200	-	-	-	-	1312	657	1969
Sub-Total	2196	457	20	-	20	200	20	-	20	-	2276	657	2933
4. Other Costs													
a. Construction	-	292	-	818	-	550	-	-	-	-	-	1660	1660
b. Evaluation	-	-	-	-	100	50	-	-	100	50	200	100	300
c. Farming Systems Studies	-	120	-	120	-	60	-	-	-	-	-	300	300
d. Other Studies/ Demonstrations	-	200	-	200	-	200	-	200	-	200	-	1000	1000
Sub-Total	-	612	-	1138	100	860	-	200	100	250	200	3060	3260
Total	5291	3049	3738	2551	4328	2540	2714	1276	1023	765	17094	10181	27275
Contingency (10%)	530	304	373	255	432	254	272	127	102	76	1709	1016	2725
GRAND TOTAL	5821	3353	4111	2806	4760	2794	2986	1403	1125	841	18803	11197	30000

a/ Inflation = 5 percent for all FX costs; 12 percent for local construction costs; and, 10 percent for all other local costs, all compounded annually.

b/ A.I.D. dollar grant funds are shown by fiscal year in accordance with anticipated schedule of earmarkings and commitments through, e.g., PIOs, purchase orders, contracts, and PILs.

c/ Does not include approximately $2.5 million under the Agricultural Commodities and Equipment Program (391-0468) for the importation of agricultural research commodities and equipment.

2. Summary Cost Estimates and Financial Plan

a. A.I.D. Contribution

Allocation of the total A.I.D. contribution of $32.5 million by expense category is as follows: 36 percent for both local and expatriate technical assistance; 28 percent for both local and overseas training; 16 percent for commodities; 10 percent for other costs including construction, field studies and demonstrations, and evaluation; and, 10 percent for contingency. Approximately $11.3 million has been provisionally allocated in the A.I.D. budget to cover the estimated costs of 480 person-months of long-term and 188 person-months of short-term expatriate technical assistance. The 480 person-months of long-term assistance consists of 8 consultants for three years each and 4 consultants for four years each; A.I.D. grant funds have been budgeted for the total costs of these 12 consultants and also the local support costs only of one ICARDA and one CIMMYT consultant, for 4 and 3 years, respectively, both of whom will be financed from the core budgets of their parent organizations. The $7.8 million allocated for long-term technical assistance translates into roughly $16,000 per person-month of assistance; the latter figure includes salary, fringe benefits, allowances, international and local travel and per diem, vehicle operating expenses, local office support, materials and staff housing and utilities, overhead, fixed fee, home office backstopping, and dependent travel and allowances. For short-term technical assistance, the average works out to about $13,000 per person-month, which includes salary, fringe benefits, allowances, overhead, fixed fee, international and local travel and per diem, and other related costs. The $419,000 budgeted for local consultants covers the estimated costs of 40 person-months of assistance by a local management/accounting firm and about 24 person- months of assistance by a local A&E firm. The $9.3 million budgeted for training includes: 328 person-months (or 92 individuals) of U.S. short-term training; 2040 person-months (or 87 individuals) of U.S. long-term training; 166 person-months (or 67 individuals) of third country short-term training; and, approximately 5000 individuals trained in-country.

The allocation of 64 percent of A.I.D. resources for training and technical assistance is indicative of the major institution-building nature of this project. It also takes into account the facts that: (i) the project is national in focus and will involve thousands of Pakistanis who work within the national agricultural research network at PARC, NARC, AZRI, the four provincial training facilities, the 65 research institutes and 162 substations, centers, and laboratories engaged in agricultural research throughout Pakistan, the three existing agricultural universities, and extension staff in all four provinces; (ii) transfer of appropriate technology to Pakistan in both the management area as well as the sciences is a major objective of the project; and, (iii) on-the-job training by resident experts is not only highly desirable but essential to ensure that management skills and methodologies are effectively implemented and that individuals trained overseas apply their skills in meaningful and productive ways. Because of the importance attached to training under this project, A.I.D. will finance the international travel costs for all participants attending

both short-term and long-term training in the U.S. and third countries. A participant training travel waiver, which exempts the GOP from having to cover these costs, has been signed by the USAID/Pakistan Mission Director and is included in Annex K.

Of the $32.5 million A.I.D. contribution, $21.3 million or 66 percent will be used to finance foreign exchange costs. The remaining $11.2 million or 34 percent will be used to finance local costs associated with: technical assistance (33 percent); training (24 percent); construction (15 percent); field studies/demonstrations (11 percent); commodities (6 percent); evaluation (1 percent); and, contingency (10 percent). To the maximum extent possible, A.I.D. grant funds which are used to finance local costs will be disbursed in U.S. dollars in order to maximize the balance of payments impact of the program, in accordance with the overall objectives of the renewed USG-GOP economic and development assistance program. A Foreign Assistance Act (FAA) Section 612(b) certification has been signed by the USAID/Pakistan Mission Director and is included in Annex C.

Allocation of the total A.I.D. contribution by project component is as follows: Research Management and Administration = 37 percent; Arid Zone Research = 18 percent; Wheat and Maize Coordinated Programs = 12 percent; Training for the Agricultural Research Network = 12 percent; Information Transfer = 11 percent; and, contingency = 10 percent. These percentages include the projected allocation of the $2.5 million in commodities which will be financed with U.S. FY 1984 ACE Program funds as follows: RMA = $1.3 million; TARN = $250,000; AZR = $600,000; and, WMCP = $150,000.

b. GOP Contribution

The GOP is expected to contribute the equivalent of about $1.1 million or 3 percent of the total cost of the program as shown in Table 13. This estimate does not include the recurrent budgets of participating local research and training facilities without the project but reflects only the additional costs to the GOP as a result of the project. These costs fall into four categories as follows: local staff salaries and related costs = 35 percent; facility operations = 29 percent; vehicle operation = 21 percent; facility maintenance = 5 percent; and, contingency = 10 percent. Expenses for vehicle operation include only the 50 field vehicles which will be procured by A.I.D. and turned over immediately to the GOP for use by Pakistani personnel on project-related activities. The 14 vehicles to be procured by A.I.D. to support the expatriate advisors during their tour in Pakistan will be maintained and operated with A.I.D. project funds; at the conclusion of the project, these vehicles will be turned over to the GOP.

The remaining GOP costs relate to the expanded training facility and the new multi-media production studio on the NARC campus. Table 14 summarizes the cost estimates for local staff and facility operating expenses by PFY for the life of the project. As shown in Table 14, the 14 additional staff for the training facility and the 30 additional staff for the production studio will be phased in over the 5-year life of the project. Both facilities are not expected to be completed until the third project year; hence annual facility maintenance costs, which have been estimated at 1 percent of the estimated construction cost for the

TABLE 13

SUMMARY OF GOP CONTRIBUTION a/ BY EXPENSE CATEGORY AND FISCAL YEAR
(In $000)

Expense Category	PFY 1984/85	PFY 1985/86	PFY 1986/87	PFY 1987/88	PFY 1988/89	TOTAL
Vehicle Operation	40	44	49	54	60	247
Local Staff b/c/	29	73	96	99	103	400
Facility Maintenance b/d/	-	-	17	19	21	57
Facility Operations b/e/	22	60	79	82	85	328
Sub-Total	91	177	241	254	269	1032
Contingency (10%)	9	18	24	25	27	103
Total	100	195	265	279	296	1135

a/ Expressed as dollar equivalents at the exchange rate of US $1.00 = Rs 13.00. These estimated costs do not include the recurrent budgets of participating local research and training facilities without the project, but reflect only the additional costs to the GOP, as a result of the project. The above estimates reflect expenditures.

b/ For both the expanded training facility and the new multi-media production studio on the NARC Campus.

c/ For 14 and 30 additional staff at the expanded training facility and new production studio, respectively. (See Table 14)

d/ Estimated at 1 percent of construction costs each year during the first five years of the facility.

e/ Estimated at 75 percent of total staff salaries (See Table 14).

TABLE 14

SUMMARY OF GOP CONTRIBUTION [a] FOR LOCAL STAFF AND FACILITY OPERATING EXPENSES BY PAKISTANI FISCAL YEAR

Expense Category		PFY 1984/85	PFY 1985/86	PFY 1986/87	PFY 1987/88	PFY 1988/89	Total
I. Staff Salaries [b]							
A. Media Production Studio							
Director	1	59,100	61,020	62,940	64,860	66,780	314,700
Producer	3	-	39,960 (1)	121,680 (3)	127,080 (3)	132,480 (3)	421,200
Script Writer	3	-	39,960 (1)	121,680 (3)	127,080 (3)	132,480 (3)	421,200
Multi-Media Engineer	8	79,920 (2)	243,360 (6)	334,080 (8)	348,480 (8)	362,880 (8)	1,368,720
Graphic Artist and Set Designer	2	-	62,520 (2)	65,400 (2)	68,280 (2)	71,160 (2)	267,360
Secretary	2	20,064 (1)	41,088 (2)	42,048 (2)	43,968 (2)	45,880 (2)	193,048
Stenographer	2	20,064 (1)	41,088 (2)	42,048 (2)	43,968 (2)	45,880 (2)	193,048
Clerk	1	11,016 (1)	11,292 (1)	11,568 (1)	11,844 (1)	12,120 (1)	57,840
Driver	8	19,440 (2)	58,704 (6)	78,912 (8)	80,448 (8)	81,984 (8)	319,488
	30						
Sub-Total (A):	In Rs:	209,604	598,992	880,356	910,008	951,644	3,556,604
	In US $:	16,123	46,076	67,720	70,462	73,203	273,584
B. Training Facility							
Training Officer	2	39,960 (1)	81,720 (2)	85,320 (2)	88,920	92,520	388,440
Admin Assistant	2	20,064 (1)	41,088 (2)	42,048 (2)	43,968 (2)	45,880 (2)	193,048
Junior Assistant	2	11,016 (1)	22,308 (2)	22,860 (2)	23,412 (2)	23,964 (2)	103,560
Scientific Officer (English Language)	2	39,960 (1)	81,720 (2)	85,320 (2)	88,920 (2)	92,520 (2)	388,440
Scientific Officer (Evaluation)	2	39,960 (1)	81,720 (2)	85,320 (2)	88,920 (2)	92,520 (2)	388,440
Driver (Bus)	4	19,440 (2)	39,264 (4)	40,032 (4)	40,800 (4)	41,568 (4)	181,104
	14						
Sub-Total (B):	In Rs:	170,400	347,820	360,900	374,940	388,972	1,643,032
	In US $:	13,108	26,755	27,762	28,842	29,921	126,388
Total (A+B):	In Rs:	380,004	946,812	1,241,256	1,290,948	1,340,616	5,199,636
	In US $:	29,231	72,8[illegible]	95,482	99,304	103,124	399,972
II. Facility Operations: [c]	In Rs:	285,003	781,120	1,024,036	1,065,032	1,106,008	4,261,199
	In US $:	21,923	60,086	78,772	81,926	85,078	327,785
GRAND TOTAL	In Rs:	665,007	1,727,932	2,265,292	2,355,980	2,446,624	9,460,835
	In US $:	51,154	132,918	174,253	181,229	188,203	727,757

a/ Dollar equivalents were calculated at the exchange rate of US $1.00 = Rs 13.00.

b/ Numbers in parentheses refer to numbers of staff on board in each category in each year. Incremental increases in salary each year corresponded to existing PARC salary scale. No inflation factor was applied.

c/ Estimated at 75 percent of total staff salaries plus 10 percent for inflation, beginning in PFY 1985/86.

first five years of the facility, have been budgeted beginning in project year 3. Beginning in year 1 of the project, however, activities under both the Information Transfer and Training for the Agricultural Research Network components will be initiated and will accelerate during the ensuing years of the project. Accordingly, operating expenses for the two facilities have been budgeted beginning in project year 1. The estimates used for operating expenses were arrived at by applying a factor of 75 percent to the estimated local salaries and associated costs. This figure is considered reasonable in view of the considerable travel that will be required by local staff to perform their duties and also the relatively large volume of materials and amount of equipment that will be utilized by the facilities.

The four categories of inputs under the GOP contribution, namely, vehicle operation, facility maintenance, local staff, and facility operations, also constitute the only recurrent costs which will result from this project and will have to be borne by the GOP once A.I.D. input terminates. In project year five, the total amounts to about Rs 3,497,000 or the equivalent of about $269,000 per year (at an exchange rate of U.S. $1.00 = Rs 13.00). This amount of funds is small when compared with the savings that will accrue to the GOP as a result of the improved management of the entire agricultural research network and the resultant more prudent and efficient use of financial resources within the system, both GOP as well as externally provided resources.

c. CIMMYT and ICARDA Contributions

As mentioned previously, ICARDA will provide one consultant, a germ plasm evaluation specialist, who will also serve as team leader, full-time for 4 years to assist AZRI implement the Arid Zone Research project component. The estimated costs of the services of this consultant including salary, travel, overhead, and the like is $550,000 for the entire four-year period. Similarly, CIMMYT will provide an agricultural economist for 3 years from its core budget to assist in implementing activities under the Wheat and Maize Coordinated Programs as well as participate in other program activities. The individual will be posted in Islamabad as a Regional Officer and will spend at least 50 percent of his time working in Pakistan. The estimated cost of his services in Pakistan is $200,000 over the three-year period. These estimates do not include local support costs for both of these advisors, since those expenses will be financed out of the A.I.D. grant.

3. Methods of Implementation and Financing

Table 15 provides a summary of the proposed methods of implementation and financing for the A.I.D. contribution under the MART Project by project component, in accordance with A.I.D.'s Payment Verification Policy Implementation Guidance dated December 30, 1983. No departures from the three preferred methods of A.I.D. financing are contemplated for this project, except for the proposed use of direct L/COMs for host country contracts for procurement 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.

TABLE 15

METHODS OF IMPLEMENTATION AND FINANCING
(A.I.D. CONTRIBUTION ONLY)

PROJECT COMPONENT	METHOD OF IMPLEMENTATION	METHOD OF FINANCING	ESTIMATED AMOUNT (US $ 000)
RMA	TA-AID Competitive Institutional Contract a/	Direct Payment	3867
	TA-HC Competitive Institutional Contract	HC Reimbursement or Direct Payment	266
	Participant (Overseas) Training (through DST contractor) b/	FRLC	4380
	Local Training (PILs to earmark funds)	HC Reimbursement	803
	Commodities (Vehicles and Household/ Office) - AID Procurement	Direct Payment	143
	Commodities (Computers and Research Equipment) - HC Procurement	Direct L/COM or Direct Payment	500
	Local Studies (PILs to earmark funds)	HC Reimbursement	600
	Other Costs (Evaluation) c/	Direct Payment	150
		Sub-Total	10709
IT	TA-AID Competitive Institutional Contract a/	Direct Payment	1060
	TA/A&E - IQC (AID Direct) d/	Direct Payment	5
	TA - HC Competitive A&E Contract e/	HC Reimbursement or Direct Payment	40
	Participant (Overseas) Training (through DST contractor) b/	FRLC	576
	Local Training (PILs to earmark funds)	HC Reimbursement	387
	Commodities (Vehicles and Household/ Office) - AID Procurement	Direct Payment	162
	Commodities (A/V, Materials, Furniture) - HC Procurement	Direct L/COM or Direct Payment	553
	Construction - HC Contract f/	HC Reimbursement or Direct Payment	432
	Other Costs (Evaluation) c/	Direct Payment	37
		Sub-Total	3252

TARN	TA-AID Competitive Institutional Contract a/	Direct Payment	882
	TA/A&E - IQC (AID Direct) d/	Direct Payment	15
	TA - HC Competitive A&E Contract e/	HC Reimbursement or Direct Payment	113
	Participant (Overseas) Training (through DST contractor) b/	PRLC	667
	Local Training (PILs to earmark funds)	HC Reimbursement	318
	Commodities (Vehicles and Household/ Office) - AID Procurement	Direct Payment	207
	Commodities (Furniture, Materials) - HC Procurement	Direct L/COM or Direct Payment	318
	Construction - HC Contract f/	HC Reimbursement or Direct Payment	1228
	Other Costs (Evaluation) c/	Direct Payment	38
		Sub-Total	3786
AZR	TA-AID Collab. Assist. Contract with ICARDA	Direct L/COM	3419
	Participant (Overseas) Training (through DST contractor) b/	PRLC	732
	Third Country Training (at ICARDA) g/	Direct L/COM	163
	Local Training (PILs to earmark funds)	HC Reimbursement	320
	Commodities (Vehicles and Household/ Office) - AID Procurement	Direct Payment	299
	Commodities (Research Equipment) - HC Procurement	Direct L/COM or Direct Payment	171
	Local Studies (PILs to earmark funds)	HC Reimbursement	401
	Other Costs (Evaluation) c/	Direct Payment	37
		Sub-Total	5542

WMCP	TA-HC Contract with CIMMYT	Direct L/COM	2098
	Participant (Overseas) Training (through DST contractor)	FRLC	511
	Third Country Training (at CIMMYT)g/	Direct L/COM	140
	Local Training (PILs to earmark funds)	HC Reimbursement	320
	Commodities (Vehicles and Household/ Office) - AID Procurement	Direct Payment	274
	Commodities (Research Equipment) - HC Procurement	Direct L/COM or Direct Payment	306
	Local Studies (PILs to earmark funds)	HC Reimbursement	299
	Other Costs (Evaluation) c/	Direct Payment	38
		Sub-Total	3986
		Total	27275
	Contingency	Direct Payment or HC Reimbursement	2725
		GRAND TOTAL	30000

a/ Same contract.

b/ The Development Support Training (DST) Project contractor (Academy for Educational Development) is a non-profit organization and hence is elibible for a FRLC.

c/ Same contracts

d/ Same contract

e/ Same contract

f/ Same contract

g/ These training funds will probably be incorporated into the contracts of ICARDA and CIMMYT, respectively.

NOTE: Some of the funds under all components for local training and local studies may be included in the long-term major TA contracts under the respective components, in which case the method of financing will be the same as for the TA contract.

KEY: RMA = Research Management and Administration
IT = Information Transfer
TARN= Training for the Agricultural Research Network
AZR = Arid Zone Research
WMCP= Wheat and Maize Coordinated Programs

F. Narcotics Impact Statement

The MART Project is not designed specifically to reduce the supply of or demand for illicit drugs in Pakistan. Nonetheless, the Project may be expected to provide significant support to efforts directed at reducing opium poppy acreage and production. The production of raw material for conversion into illicit drugs is based largely on economic advantage within a sociological and environmental context typical of the arid or minor irrigated zones of Pakistan. Since wheat, maize and animal husbandry are the principal land use alternatives to poppy cultivation in most of the opium production areas, this Project will reinforce the eradication campaign by increasing the productivity of wheat and maize through research. The introduction of farming systems research may also provide a better understanding of the problems and constraints faced by farmers so that additional interventions may be identified as alternative production options in the future. Technology developed through research and adapted to the socio-economic context of poppy-growing areas may also provide the necessary incentives for decreasing the number of new starts in poppy production.

G. Environmental Analysis

As a project focused mainly on research, training, and technology transfer, the MART Project is exempt from the requirements for an environmental analysis, as discussed in the Agricultural Education, Research and Extension PID, upon which this project is based. An Initial Environmental Examination (IEE), which recommended a negative determination, was included in the PID and approved at the time of PID approval. This determination still holds for the redesigned project.

The MART Project is primarily an institution-building project. The training and technical assistance provided will enhance Pakistan's capability to use its resources in environmentally sound ways. Research activities supported by this project will take place under controlled conditions and will not have a significant impact on the environment. The location of the proposed buildings to be constructed on the NARC campus will be based on an existing and approved Physical Master Plan for the NARC, which is considered technically and environmentally sound. A negative determination for this project is therefore reaffirmed.

VI. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

A. Conditions Precedent

1. Conditions Precedent to First Disbursement

Except as A.I.D. may otherwise agree in writing, prior to any disbursement of funds under this Project, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee shall furnish to A.I.D., in form and substance satisfactory to A.I.D.:

a. a written opinion of Counsel acceptable to A.I.D. that this Agreement has been duly authorized and/or ratified by, and executed on behalf of the Grantee, and that it constitutes a valid and legally binding obligation of the Grantee in accordance with all of its terms; and,

b. a written statement setting forth the names and titles of the persons holding or acting in the Office of the Grantee and representing that the named person or persons have the authority to act as the representative or representatives of the Grantee, together with a specimen signature of each such person certified as to its authenticity.

2. Condition Precedent to Selected Disbursement

Except as A.I.D. may otherwise agree in writing, prior to any disbursement of funds under this Project, other than for technical assistance, vehicles, household and office equipment, other project commodities, and training activities, or to the issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee shall furnish to A.I.D., in form and substance satisfactory to A.I.D., documentation that a Project Manager at the Pakistan Agricultural Research Council (PARC) and Project Representatives in each of the four provinces have been designated.

B. Covenants

1. Director-General of the National Agricultural Research Center (NARC)

Except as A.I.D. may otherwise agree in writing, the Grantee covenants that it will recruit and hire, within one year of the execution of this Agreement, a qualified person to fill the post, on a permanent basis, of Director-General of the National Agricultural Research Center (NARC).

2. Arid Zone Research Institute (AZRI) Personnel

Except as A.I.D. may otherwise agree in writing, the Grantee covenants that it will fill the personnel vacancies existing at AZRI as of the date of this Agreement as soon as possible but, in no event, not later than two years from the date of the signing of this Agreement.

3. Agricultural Training Facility and Multi-Media Production Studio Staff

The Grantee covenants to: (a) establish permanent posts for each additional administrative and professional staff member required for the expanded Agricultural Training facility and the new Multi-Media Production Studio located on the campus of the National Agricultural Research Center (NARC), and to reflect these in the regular recurrent budget of the Pakistan Agricultural Research Council (PARC); (b) accord all professional technical staff of the Agricultural Training facility and the Multi-Media Production Studio, the status of "scientists", having the same remuneration and promotion opportunities as research scientists within PARC and the Federal and/or Provincial research network, and, (c) afford the Agricultural Training facility and Multi-Media Production Studio sufficient managerial and operational autonomy to carry out each of their respective mandates and, further, allow said facilities to operate as national facilities under the direct control and management of PARC.

4. Host Country Counterpart Assignment

Except as A.I.D. may otherwise agree in writing, the Grantee covenants that it will identify and have promptly assigned to AZRI, the Pakistan Agricultural Research Council (PARC), the National Agricultural Research Center (NARC), and such other research facilities as A.I.D. from time to time may designate by Project Implementation Letters (PILS), sufficient Pakistani scientists with appropriate technical qualifications to serve as counterparts to all project-financed consultants.

5. Post Training Employment

Except as the Parties may otherwise agree in writing, the Grantee, acting through its Ministry of Food, Agriculture and Cooperatives, shall make every reasonable effort to require that each person trained under this Project works in activities related to agricultural research in Pakistan for not less than three times the length of time of his or her training program provided, however, that in no event shall such an individual be allowed to work in agricultural research activities for less than one year nor be required to work in agricultural research activities for more than five years from the date of that individual's completion of training. The Grantee shall, further, not approve extensions in the trainee's permitted time abroad if such extension shall allow the trainee to remain abroad beyond that time required for his or her training program.

6. Mechanisms for Funding Agricultural Research

Except as the Parties may otherwise agree in writing, the Grantee covenants to prepare a report within 24 months of the signing of this Agreement to: (a) analyze the problems created by the present funding mechanisms for the agricultural research network in Pakistan; (b) identify the causes of said problems; and, (c) propose alternative financial procedures to remedy said problems.

7. Private Sector Participation in Agricultural Research

A.I.D. and the GOP recognize the desirability of effectively incorporating the expressed research needs and requirements of the domestic private agribusiness sector into the research agenda of national and provincial research agencies, and the desirability of private agribusiness organizations contracting for a progressively greater share of research financed by this project. Accordingly, except as the Parties may otherwise agree in writing, the Grantee covenants to prepare and provide, a report within 36 months after the signing of this Agreement, in form and substance satisfactory to A.I.D., establishing a two-year plan for increasing opportunities for the Pakistani private sector in the above cited areas. This plan shall include consideration of such issues as A.I.D. may, from time to time, establish in PILs but, at a minimum, shall establish benchmarks for increased Pakistani private sector opportunities in the selection of priority agricultural research topics, in the conduct of such research, in the planning of and participation in mutually beneficial and appropriate training programs, and in the dissemination of relevant technologies to farmers.

C. Negotiating Status

The Project as described in this Project Paper has been fully discussed with appropriate GOP officials. The GOP supports the project as designed, and there is no reason why the Project cannot proceed to implementation as soon as the Project Agreement is signed. No legislation is required to implement the Project as described.

PROJECT PAPER

PAKISTAN - MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY

391-0489

VII. A N N E X E S

AIID INFO AMB DCM ECON CHRON

VZCZCIIO718
PP RUEHIL
DE RUEHC #3277/01 3220022
ZNR UUCUU ZZH
P 180210Z NOV 82
FM SECSTATE WASHDC
TO AMEMBASSY ISLAMABAD PRIORITY 3203
BT
UNCLAS STATE 323277

AIDAC

E.O. 12356: N/A
TAGS:
SUBJECT: APAC REVIEW - AGRICULTURAL EDUCATION, RESEARCH AND EXTENSION PID (391-0477)

1. SUMMARY: APAC REVIEWED AND APPROVED THE PID NOVEMBER 4. BECAUSE OF MAJOR CONCERNS REGARDING LONG-TERM VIABILITY OF THE UNIVERSITY PROPOSAL, APPROVAL OF THIS COMPONENT IS CONDITIONAL ON THE FINDINGS OF A SEPARATE PRE-DESIGN ASSESSMENT TO BE CARRIED OUT BY INDEPENDENT EXPERTS FAMILIAR WITH INSTITUTIONAL DEVELOPMENT OF THIS TYPE IN THE SUBCONTINENT. TEAM WILL BE FIELDED ASAP TO AVOID DELAYING THE OVERALL PROJECT DESIGN, AND PREPARATIONS FOR OTHER DESIGN ACTIVITIES MAY PROCEED IN PARALLEL WITH THIS EFFORT. FOR EXAMPLE, PREPARATION AND CIRCULATION OF RFI FOR TITLE XII TEAM WILL PROCEED IMMEDIATELY ALTHOUGH WE WOULD EXPECT THE SPECIAL ASSESSMENT TO BE COMPLETED PRIOR TO ARRIVAL IN PAKISTAN OF TITLE XII TEAM. SPECIAL STUDY IS DESCRIBED BELOW, PARA 5, AND HAS ALSO BEEN ELABORATED IN A SEPTEL LISTING QUESTIONS TO BE EXAMINED.

2. MANAGEMENT PROGRAM FOR TECHNOLOGY DEVELOPMENT: APAC RECOGNIZED IMPORTANCE OF THIS COMPONENT AS MECHANISM FOR ESTABLISHING FORMAL AND INFORMAL LINKAGES AMONG AGRICULTURAL INSTITUTIONS. DISCUSSION FOCUSSED ON DIFFICULTIES INHERENT IN PROCESS GIVEN THE CURRENT DISAGGREGATED SYSTEM. SUCCESS IN LINKING EDUCATION, RESEARCH AND EXTENSION WOULD SEEM TO REQUIRE THAT A DECISION FOR CHANGE BE MADE BY THOSE IN AUTHORITY; THAT A STRUCTURE FOR LINKAGES BE DEVELOPED; AND THAT LEVERAGE AND INCENTIVES FOR CHANGE EXIST THROUGHOUT THE SYSTEM. PP SHOULD CLEARLY RELATE THE PROPOSED INPUTS TO THE OBJECTIVES, I.E., HOW WILL RESEARCH PROPOSALS RESULT IN INTER-DISCIPLINARY AND INSTITUTIONAL LINKAGES? HOW WILL THE PROJECT HELP THE GOP ORGANIZE AND MANAGE THE TOTAL SYSTEM?

3. APAC DISCUSSED THE FARMING SYSTEMS APPROACH. PP SHOULD DEFINE THE ORGANIZATIONAL AND MANAGEMENT ASPECTS OF THIS APPROACH AND SPELL OUT IN DETAIL HOW THE EFFORT WILL AIM AT STRENGTHENING RESEARCH AND EXTENSION SYSTEMS AT THE REGIONAL LEVEL AS WELL AS BUILDING MODELS THAT

CAN BE APPLIED NATIONWIDE. THE APPROACH SHOULD CAREFULLY SHOW HOW THE INSTITUTIONS INVOLVED WILL BE ORCHESTRATED TO INTERACT WITH CLIENT FARMERS AND/OR-FARMER ORGANIZATIONS. PP SHOULD DISCUSS HOW THE APPROACH SELECTED CAN SIGNIFICANTLY ALTER CURRENT PROCESSES RELATED TO TECHNOLOGY TRANSFER AND WHY THE APPROACH SELECTED IS PERCEIVED TO BE THE MOST APPROPRIATE ONE FOR PAKISTAN. PP SHOULD SPELL OUT THE SPECIFIC SEQUENCE OF EVENTS THAT SHALL OCCUR IN ORDER THAT THE RESEARCH DEVELOPED AT THE RESEARCH SITE WILL BE ADOPTED AT THE FARM LEVEL. SIMILARLY, BENCHMARKS FOR ASSESSING PROGRESS ON INSTITUTIONAL DEVELOPMENT OBJECTIVES SHOULD BE INCLUDED.

4. UA-NWFP: APAC CONCERNS RELATED TO FEASIBILITY OF LINKING A UNIVERSITY TO OTHER KEY INSTITUTIONS IN THE AG SECTOR WHEN THE HISTORICAL, POLITICAL AND ADMINISTRATIVE CONTEXT IS CHARACTERIZED BY ETHNIC AND BUREAUCRATIC DIVISIONS, ISOLATION AND TERRITORIAL JEALOUSIES. THE REWARD SYSTEM HAS NOT SUPPORTED EFFECTIVE RESEARCH LINKED TO FARMERS' NEEDS. NOT ONLY THE UNIVERSITY, BUT OTHER INSTITUTIONS MUST BE WILLING TO CHANGE IF DESIRED LINKAGES ARE TO OCCUR AND AN EFFECTIVE UNIVERSITY CAPABLE OF EXERCISING A-DEVELOPMENT IMPACT IS TO BE LEFT AT PROJECT END. BECAUSE THIS CONCERN RELATES TO THE BASIC FEASIBILITY OF THE UNIVERSITY COMPONENT,-IT WAS DECIDED THAT AN INDEPENDENT ASSESSMENT BY A HIGHLY EXPERIENCED TEAM OF PROFESSIONALS SHOULD PRECEDE FULL SCALE DESIGN OF THIS COMPONENT BY THE TITLE XII TEAM. SUCH PEOPLE AS RALPH CUMMINGS AND GORDON MCLEAN ARE BEING CONTACTED AS HAS BEEN INDICATED IN SEPTEL. IT IS HOPED THAT SUCH A STUDY COULD BE COMPLETED BY FEBRUARY 1.

5. A NUMBER OF MAJOR ISSUES TO BE EXAMINED DURING THE DESIGN PROCESS HAVE BEEN TRANSMITTED BY SEPTEL. THE EXTENT TO WHICH THESE QUESTIONS SHOULD BE COVERED BY THE SPECIAL STUDY GROUP AS DISTINGUISHED FROM THE DESIGN TEAM ITSELF IS STILL UNDER DISCUSSION, AND THE QUESTIONS THEMSELVES MAY BE FURTHER REFINED. IN SOME CASES, IT IS LIKELY THAT THE SPECIAL STUDY GROUP WOULD MAKE INITIAL JUDGMENTS, BUT IN DEPTH ANALYSIS WOULD BE LEFT TO THE DESIGN TEAM.

6. OTHER DESIGN ISSUES:

(A) CONTRACTUAL RELATIONSHIP WITH ICARDA: MISSION SHOULD BE AWARE THAT SINCE AN ORIGINAL PROPOSAL WAS MADE BY ICARDA A GRANT OR COOPERATIVE AGREEMENT (WHICH AS YOU KNOW PERMITSMORE USAID INVOLVEMENT IN IMPLEMENTATION THAN A GRANT) CAN BE MADE WITHOUT COMPETITION, BUT THIS MODE GIVES LESS MISSION CONTROL THAN A CONTRACT. IF A CONTRACT IS PREFERRED, IT WILL BE NECESSARY TO JUSTIFY AND OBTAIN A WAIVER OF COMPETITION. IF ICARDA IS

ULTIMATELY SELECTED TO DESIGN AZRI COMPONENT, MUST HAVE ASSURANCE THAT COMPETENT RANGE MANAGEMENT AND LIVESTOCK TECHNICAL CAPABILITY IS AVAILABLE. ICARDA SHOULD BE ENCOURAGED TO GO OUTSIDE ITS CORE STAFF FOR THIS EXPERTISE, PREFERABLY TO WESTERN U.S. UNIVERSITIES. FYI: MISSION SHOULD BE AWARE THAT APAC HAD A NUMBER OF FEASIBILITY QUESTIONS ABOUT THIS COMPONENT (AZRI) ALSO, BUT WAS REASSURED BY FACT THAT PRE-DESIGN TEAM NOW IN PAKISTAN WILL HAVE A HARD LOOK AT ALL ASPECTS OF THE FEASIBILITY OF THIS COMPONENT. END FYI.

(B) CRITERIA FOR RESEARCH PROPOSALS UNDER COMPONENT TWO NEED TO BE DEVELOPED TO ASSURE THEY FOCUS ON APPLIED RESEARCH AND INCLUDE POTENTIAL IMPACT ON INSTITUTIONAL OBJECTIVES AND PRAGMATIC DEVELOPMENTAL OBJECTIVES.

(C) A AND E SERVICES: IT WAS DECIDED THAT A U.S. A AND E FIRM WOULD BE CONTRACTED AS SOON AS POSSIBLE THROUGH A COMPETITIVE PROCESS, TO PARTICIPATE IN BOTH PROJECT DESIGN AND PROJECT IMPLEMENTATION. APPROPRIATE CAVEATS CONCERNING THE NEED FOR PROJECT APPROVAL WILL BE INCLUDED IN REQUESTS FOR PROPOSALS. OUR THOUGHTS ON SEQUENCING OF THIS CONTRACT AND THE REI FOR TITLE XII TEAM, TO ENSURE NECESSARY CLOSE COORDINATION, WILL BE SUBJECT SEPTEL.

(D) THE EXTENT TO WHICH HIGH TECHNOLOGY EQUIPMENT SHOULD BE INCLUDED IN THE UNIVERSITY COMPONENT SHOULD BE CAREFULLY EXAMINED AND JUSTIFIED.

(E) GIVEN THE SIGNIFICANCE OF THE PROJECT AND POTENTIAL DIFFICULTY IN IMPLEMENTING IT, THE NEED FOR A COMPREHENSIVE MONITORING AND EVALUATION PLAN WITH APPROPPIATE BENCHMARKS OF PROGRESS IS ESPECIALLY IMPORTANT. PP SHOULD INCLUDE A MONITORING ANDEVALUATION PLAN AS OUTLINED IN STATE 270149. IN ADDITION, ASIA/DP WILL POUCH TO USAID RECENT EVALUATIONS AND STUDIES OF OTHER AGRICULTURAL RESEARCH PROJECTS. PP SHOULD REFLECT THE RELEVANT FINDINGS OF THESE REPORTS.

(F) SER/COM HAS ADVISED THAT SOURCE AND ORIGIN OF COMMODITIES SHOULD BE U.S. ONLY. LOCAL COST FINANCING MAY ALSO BE AUTHORIZED IN ACCORDANCE WITH HANDBOOK 1B, SECTION 5A1D3; BOTH OCEAN AND AIR TRANSPORTATION SHOULD BE LIMITED TO U.S. FLAG ONLY. A SER/COM MEMO ON PROCUREMENT WAS HAND CARRIED BY CARPENTER.

(G) A PPC MEMO WITH SUGGESTIONS FOR PP DESIGN IS BEING POUCHED. SHULTZ
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#3277

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ZNR UUUUU ZZH
O 1203362 AUG 83
FM AMEMBASSY ISLAMABAD
TO SECSTATE WASHDC IMMEDIATE 6772
BT
UNCLAS ISLAMABAD 13750

AIDAC

FOR ASIA/PD - PRATT AND ASIA/DP - SMUCKER

E.O. 12356 N/A
SUBJECT CHANGES IN USAID/PAKISTAN PROJECT PORTFOLIO

1. SUMMARY THIS CABLE ADVISES AID/W OF CHANGES MISSION HAS MADE IN THE PACKAGING OF PROJECT ACTIVITIES IN PRIMARILY THE AGRICULTURE SECTOR PORTFOLIO. THE REASONS FOR THESE CHANGES ARE ALSO PROVIDED BELOW. ALL CHANGES HAVE BEEN DISCUSSED WITH AND AGREED TO BY THE GOP'S ECONOMIC AFFAIRS DIVISION, OFFICIALS OF THE GOVERNMENT OF BALUCHISTAN FOR THE BALUCHISTAN AREA DEVELOPMENT PROJECT , OTHER APPROPRIATE GOP OFFICIALS, AND THE EMBASSY. END SUMMARY.

2 BALUCHISTAN AREA DEVELOPMENT PROJECT (391-0479):
A MISSION HAS DECIDED TO INCLUDE FUNDING FOR THE ROADS COMPONENT OF THIS PROJECT IN THE PROJECT ITSELF RATHER THAN TO PROGRAM FUNDS FOR THE BALUCHISTAN ROADS COMPONENT UNDER THE RURAL ROADS PROJECT (391-0480). THIS DECISION WAS BASED ON THE FOLLOWING CONSIDERATIONS:
(1) SINCE THE BALUCHISTAN PROJECT IS SCHEDULED FOR OBLIGATION IN FY 1984 AND THE RURAL ROADS PROJECT IS SCHEDULED FOR OBLIGATION IN FY 1985, THE MISSION WANTS TO AVOID POSSIBLE TIMING PROBLEMS RELATED TO THE AVAILABILITY OF FUNDS; (2) INCLUSION OF FUNDING FOR THE ROADS COMPONENT IN THE BALUCHISTAN PROJECT WOULD BE MORE MANAGEABLE AND ADMINISTRATIVELY LESS COMPLEX SINCE MISSION WOULD HAVE TO DEAL WITH ONLY THE GOVERNMENT OF BALUCHISTAN TO OBTAIN NECESSARY APPROVALS AND RELEASES OF FUNDING; THE RURAL ROADS PROJECT WILL MOST LIKELY BE IMPLEMENTED BY THE FEDERAL MINISTRY OF LOCAL GOVERNMENT AND RURAL DEVELOPMENT, AND THE INVOLVEMENT OF THIS MINISTRY WOULD REQUIRE SIGNIFICANTLY MORE WORK IN TERMS OF MANAGEMENT AND COORDINATION FOR THE MISSION;
(3) MISSION ALSO BELIEVES THAT INCLUSION OF FUNDING FOR THE ROADS PROGRAM IN THE BALUCHISTAN PROJECT WILL ENSURE THAT BALUCHISTAN DOES NOT FALL VICTIM TO THE POSSIBILITY OF A REALLOCATION OF FUNDS IN FAVOR OF SIND AND PUNJAB UNDER THE RURAL ROADS PROJECT; FURTHERMORE MISSION IS CURRENTLY CONTEMPLATING A PHASED APPROACH UNDER THE RURAL ROADS PROJECT WHEREBY FUNDS FOR THE FIRST SEVERAL YEARS OF THE PROJECT WOULD BE AVAILABLE ONLY FOR INSTITUTIONAL STRENGTHENING ACTIVITIES AND ONLY AFTER CERTAIN CONDITIONS HAVE BEEN MET WOULD A.I.D. PROVIDE FUNDS FOR ROAD CONSTRUCTION. THEREFORE, MISSION

IS PROGRAMMING AN ADDITIONAL DOLS 10 MILLION FOR THE BALUCHISTAN PROJECT AND, AT THIS POINT, HAS REDUCED THE TOTAL LOP FUNDING OF THE RURAL ROADS PROJECT ACCORDINGLY FROM DOLS 50 MILLION TO DOLS 40 MILLION. (B) IN ADDITION, MISSION HAS DECIDED TO INCLUDE THE ARID ZONE RESEARCH INSTITUTE AZRI COMPONENT OF THE AGRICULTURAL EDUCATION, RESEARCH AND EXTENSION PROJECT (391-0477) UNDER THE BALUCHISTAN PROJECT. AS YOU KNOW, AZRI IS LOCATED IN QUETTA, BALUCHISTAN. INCLUSION OF THIS COMPONENT IN THE BALUCHISTAN PROJECT WILL ENSURE THAT THE RESEARCH PROGRAM UNDERTAKEN AT AZRI RESPONDS TO THE UNIQUE NEEDS OF BALUCHISTAN, IN CONSONANCE WITH THE PAKISTAN AGRICULTURAL RESEARCH COUNCIL PARC, SUPPORTS OTHER BALUCHISTAN PROJECT ACTIVITIES IN THE AGRICULTURAL SECTOR, AND IS COORDINATED WITH THE TRAINING AND PLANNING ACTIVITIES PROPOSED UNDER THE BALUCHISTAN PROJECT. ALSO, WHILE MOST OF THE OTHER ACTIVITIES PLANNED UNDER THE BALUCHISTAN PROJECT WILL BENEFIT THE SOUTHERN PART OF THE PROVINCE, THE AZRI COMPONENT WILL BENEFIT THE NORTH AS WELL AND THUS FROM A SOCIO-POLITICAL POINT OF VIEW, PROVIDES FOR A MORE BALANCED PROJECT. MISSION IS THEREFORE PROGRAMMING AN ADDITIONAL DOLS 10 MILLION FOR THIS COMPONENT UNDER THE BALUCHISTAN PROJECT. APPROPRIATE ADJUSTMENTS WILL BE MADE IN THE AGRICULTURAL EDUCATION RESEARCH AND EXTENSION PROJECT. IN SUMMARY, THE LOP FUNDING FOR THE BALUCHISTAN PROJECT HAS BEEN INCREASED FROM DOLS 30 MILLION TO DOLS 50 MILLION. THE PROJECT PURPOSE, PROJECT TITLE, AND LIFE OF PROJECT REMAIN THE SAME AS THAT IN THE APPROVED PID.

3. RURAL ROADS PROJECT (391-0480): IN ACCORDANCE WITH PARA.2 ABOVE LOP FUNDING HAS BEEN REDUCED FROM DOLS 50 MILLION TO DOLS 40 MILLION. GIVEN THE STAGE OF DEVELOPMENT OF THIS PROJECT AND MISSION'S DESIGN WORKLOAD (AS WELL AS IMPLEMENTATION WORKLOAD) IN FY 1984, MISSION HAS DECIDED TO MAKE THIS AN FY 1985 PROJECT. PLANS ARE TO SUBMIT THE PID TO AID/W IN THE SPRING/EARLY SUMMER OF 1984. AS FURTHER DEVELOPMENTS OCCUR, WE WILL ADVISE AID/W ACCORDINGLY.

4. AGRICULTURAL EDUCATION, RESEARCH, AND EXTENSION PROJECT (391-0477) BASED ON SEVERAL CONSIDERATIONS, INCLUDING THE NATURE OF THE PROJECT COMPONENTS, GOP PC-1 (PROGRAM

PLANNING DOCUMENTS: REQUIREMENTS, INSTITUTIONAL RELATIONSHIPS THE STAGE OF DEVELOPMENT OF INDIVIDUAL COMPONENTS, AND THE DESIRE TO EASE THE MISSION MANAGEMENT BURDEN BY CREATING DISCRETE MANAGEMENT UNITS TO STREAMLINE FISCAL & ADMINISTRATIVE PROCEDURES. MISSION HAS DECIDED TO SPLIT THIS PROJECT INTO TWO PROJECTS AS FOLLOWS:

A PROJECT NO. 391-0488

PROJECT TITLE NORTHWEST FRONTIER PROVINCE AGRICULTURAL UNIVERSITY

LOP TEN 10 YEARS

LOP FUNDING: DOLS 35 MILLION (A.I.D. DOLLAR GRANT)

PROJECT PURPOSE TO STRENGTHEN AND IMPROVE THE EDUCATIONAL RESEARCH AND OUTREACH CAPABILITIES OF THE NEWLY CREATED AGRICULTURAL UNIVERSITY IN THE NORTHWEST FRONTIER PROVINCE

INITIAL OBLIGATION: FY 1984 PACD: FY 1994

B PROJECT NO 391-0489

PROJECT TITLE MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY

LOP SEVEN 7 YEARS

LOP FUNDING. DOLS 20 MILLION (A.I.D. DOLLAR GRANT)

PROJECT PURPOSE. TO STRENGTHEN THE CAPABILITY AND EXPAND THE CAPACITY OF THE GOP TO UNDERTAKE RELEVANT AND QUALITY AGRICULTURAL RESEARCH THROUGHOUT THE COUNTRY.

INITIAL OBLIGATION FY 1984 PACD: FY 1991

MISSION PLANS TO CANCEL PROJECT NO.391-0477 (AGRICULTURAL EDUCATION, RESEARCH, AND EXTENSION) ACCORDINGLY. PLEASE NOTE THAT THE MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY PROJECT INCLUDES BOTH THE MANAGEMENT PROGRAM FOR TECHNOLOGY DEVELOPMENT AND THE NETWORK RESTRUCTURING COMPONENTS OF THE APPROVED PID. IN ADDITION, THE TOTAL LOP FUNDING FOR THE AZRI COMPONENT IN THE BALUCHISTAN PROJECT (DOLS 10 MILLION THE NWFP AGRICULTURAL UNIVERSITY PROJECT DOLS 35 MILLION AND THE MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY PROJECT (DOLS 20 MILLION EQUALS THE TOTAL LOP FUNDING OF DOLS 65 MILLION IN THE APPROVED PID FOR THE AGRICULTURAL EDUCATION RESEARCH AND EXTENSION PROJECT.

5. AGRICULTURAL PRODUCTION, DISTRIBUTION, AND STORAGE PROJECT (391-0476 THE PID FOR THIS PROJECT, WHICH WAS APPROVED IN JULY 1982 INCLUDED FOUR COMPONENTS (FOOD SECURITY EDIBLE OIL INDUSTRY, FRUIT AND VEGETABLE MARKETING AND AGRO-INDUSTRIAL FUND), AND DOLS 75 MILLION WAS PROGRAMMED FOR THE PROJECT. SUBSEQUENT TO PID APPROVAL, THE MISSION ELIMINATED THE AGRO-INDUSTRIAL FUND COMPONENT AND REDUCED THE TOTAL LOP FUNDING TO DOLS.55 MILLION, IN

ACCORDANCE WITH GUIDANCE FROM AID/W. AS YOU KNOW, DURING THE LAST YEAR OICD HAS BEEN ASSISTING THE MISSION UNDERTAKE A COMPREHENSIVE EDIBLE OIL STUDY. BASED ON THE RESULTS OF THE STUDY. INFORMAL DISCUSSIONS WITH AID/W OFFICIALS, AND THE RECOGNITION BY THE MISSION OF THE NEED FOR CONSIDERABLE FOLLOW-UP DISCUSSIONS WITH SENIOR GOP OFFICIALS ON THE FINDINGS AND IMPLICATIONS OF THE STUDY, MISSION HAS DECIDED, TO ELIMINATE DEVELOPMENT AT THIS TIME THE EDIBLE OIL INDUSTRY COMPONENT OF THE PROJECT. THE SAME CONSIDERATIONS DESCRIBED IN PARA. 4 ABOVE FOR THE AGRICULTURAL EDUCATION, RESEARCH AND EXTENSION PROJECT WERE THE BASIS FOR THE MISSION'S DECISION TO DIVIDE THE REMAINING TWO COMPONENTS OF THE AGRICULTURAL PRODUCTION, DISTRIBUTION AND STORAGE PROJECT INTO TWO SEPARATE PROJECTS AS FOLLOWS:

(A PROJECT NO 391-0490

PROJECT TITLE FRUIT AND VEGETABLE MARKETING IN THE NWFP

LOP: SIX 6. YEARS

LOP FUNDING DOLS 20 MILLION (A.I.D. DOLLAR GRANT)
PROJECT PURPOSE TO DEVELOP THE CAPABILITY OF THE FRUIT AND VEGETABLE DEVELOPMENT BOARD TO DIRECT AND COORDINATE

THE INCREASED PRODUCTION AND IMPROVED MARKETING OF FRUITS AND VEGETABLES IN THE NORTHWEST FRONTIER PROVINCE OF PAKISTAN

INITIAL OBLIGATION: FY 1984
PACD FY 1984
(B PROJECT NO 391-0491

PROJECT TITLE FOOD SECURITY MANAGEMENT

LOP SIX 6 YEARS

LOP FUNDING: DOLS 25 MILLION (A.I.D. DOLLAR GRANT)

PROJECT PURPOSE TO STRENGTHEN NATIONAL FOOD SECURITY POLICY PLANNING AND IMPLEMENTATION AND TO IMPROVE THE DISTRIBUTION AND STORAGE OF BASIC STAPPES

INITIAL OBLIGATION: FY 1984

PACD: FY 1990

THIS PROJECT WILL CONSIST OF THREE MAJOR SUB-COMPONENTS AS FOLLOWS

(I DATA COLLECTION. TO IMPROVE THE ACCURACY, TIMELINESS AND UTILITY OF PRIMARY AND SECONDARY AGRICULTURAL DATA COLLECTED AT THE FEDERAL AND PROVINCIAL LEVELS IN PAKISTAN DOLS 7.5 MILLION); (II) ECONOMIC AND POLICY IMPLEMENTATION ANALYSIS: TO IMPROVE ECONOMIC AND POLICY IMPLEMENTATION ANALYSIS FOR THE STATISTICAL/ECONOMETRIC ESTIMATION OF PARAMETERS BASIC TO THE UNDERSTANDING AND EXPLANATION OF THE FOOD AND AGRICULTURE SECTOR, AND TO ORGANIZE AND MANIPULATE THE ESTIMATED ECONOMIC PARAMETERS TO GAIN INSIGHT INTO THE POTENTIAL OUTCOMES RESULTING FROM ALTERNATIVE FOOD SECURITY POLICY CONSIDERATIONS (DOLS 7.5 MILLION ; AND III) POST-HARVEST MANAGEMENT: TO ADDRESS CRITICAL CONSTRAINTS IN THE CEREAL GRAIN POST-HARVEST MANAGEMENT SYSTEM FOR IMPROVED NATIONAL FOOD SECURITY (DOLS 10 0 MILLION .

MISSION PLANS TO CANCEL PROJECT NO. 391-0476 (AGRICULTURAL PRODUCTION, DISTRIBUTION AND STORAGE) ACCORDINGLY. PLEASE NOTE THAT THE TOTAL LOP FUNDING FOR THE ABOVE TWO PROJECTS IS DOLS 45 MILLION WHICH IS DOLS 10 MILLION LESS THAN THE AMOUNT PROGRAMMED BY MISSION FOR THE AGRICULTURAL PRODUCTION, DISTRIBUTION, AND STORAGE PROJECT.

6. ALL OF THESE CHANGES AND THE RESULTANT ALTERATIONS IN THE OBLIGATION SCHEDULES FOR THESE PROJECTS WILL BE REFLECTED IN THE CONGRESSIONAL PRESENTATION TO BE SUBMITTED BY THE MISSION IN SEPTEMBER.

7. DONOR LION AND LINDA LION WILL BE IN AID/W ON TDY CONSULTATION DURING THE WEEK OF AUGUST 15 AND WILL BE AVAILABLE TO MEET WITH APPROPRIATE AID/W STAFF TO DISCUSS THE CONTENTS OF THIS CABLE IF DEEMED NECESSARY. KING
BT

AID10 INFO AMB DCM ECON CHRON/13

ANNEX A.3

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PP RUEHIL
DE RUEHC #4408 2390256
ZNR UUUUU ZZH
P 270004Z AUG 83
FM SECSTATE WASHDC
TO AMEMBASSY ISLAMABAD PRIORITY 0227
BT
UNCLAS STATE 244408

AIDAC

E.O. 12356: N/A
TAGS:
SUBJECT: CHANGES IN USAID/PAKISTAN PROJECT PORTFOLIO

REF: ISLAMABAD 13750

1. ASIA BUREAU UNDERSTANDS AND ACCEPTS USAID'S RATIONALE FOR PLANNED PORTFOLIO CHANGES IN THE AGRICULTURE SECTOR AS DESCRIBED IN REFTEL. THESE CHANGES SHOULD, OF COURSE, BE REFLECTED IN YOUR CONGRESSIONAL PRESENTATION. IN ADDITION, IF YOU INTEND SOME FLEXIBILITY IN SHIFTING FUNDS FROM ONE COMPONENT OF BALUCHISTAN TO ANOTHER, AFTER PROJECT OBLIGATED, THIS ELEMENT SHOULD BE DESCRIBED IN CONGRESSIONAL PRESENTATION (AS WELL AS PP).

2. ALL PROPOSED PROJECTS AND PROJECT COMPONENTS HAVE BEEN PRESENTED IN PIDS WHICH WERE APPROVED BY AID/W. THERE IS THEREFORE NO NEED FOR ADDITIONAL PIDS ON THE RE-NAMED PROJECTS.

3. FOR PROJECTS 391-0489 (MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY) AND 391-0490 (FRUIT AND VEGETABLE MARKETING IN NWFP) WHICH ARE PROJECTED

AT DOLS 20 MILLION LIFE OF PROJECT FUNDING, MISSION IS AUTHORIZED TO APPROVE PROJECT PAPERS. EAGLEBURGER
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TO SECSTATE WASHDC PRIORITY 2635
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UNCLAS ISLAMABAD 03733

AIDAC

FOR ASIA/PD-MATHESON

E.O. 12356 N/A
SUBJECT: MANAGEMENT OF AGRICULTURAL RESEARCH AND
- TECHNOLOGY (391-0489) AND BALUCHISTAN AREA
- DEVELOPMENT (391-0479) PROJECTS.

REFERENCE: (A) 83 ISLAMABAD 13750 (B) 83 STATE 244408

1. BY REFTEL (B), AID/W CONCURRED IN MISSION'S DECISION TO INCLUDE THE ARID ZONE RESEARCH INSTITUTE (AZRI) COMPONENT IN THE BALUCHISTAN AREA DEVELOPMENT PROJECT (BALAD) AND AN INCREASE OF DOLLARS 10 MILLION FOR THE BALAD PROJECT FOR THAT COMPONENT. ALSO BY REFTEL (B), AID/W AUTHORIZED MISSION TO APPROVE THE PROJECT PAPER (PP) FOR THE MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY PROJECT (MART) AT A FUNDING LEVEL OF DOLLARS 20 MILLION.

2. AS YOU KNOW, SINCE THOSE DECISIONS WERE MADE IN AUGUST/SEPTEMBER, 1983, MISSION HAS MADE CONSIDERABLE PROGRESS IN DESIGNING BOTH PROJECTS. ON THE BASIS OF THIS DESIGN WORK AND DURING RECENT INTENSIVE REVIEW PROCESS IN PREPARATION OF PPS FOR BOTH PROJECTS, MISSION AND GOP HAVE CONCLUDED THAT AZRI COMPONENT SHOULD BE SHIFTED TO THE MART PROJECT FOR THE FOLLOWING REASONS:

(A) A PRINCIPAL CONSIDERATION FOR INCLUDING AZRI IN THE BALAD PROJECT WAS TO PROVIDE GEOGRAPHICAL BALANCE IN TERMS OF PROJECT ACTIVITIES. MOST PROJECT ACTIVITIES WERE PLANNED TO BENEFIT PRIMARILY THE SOUTHERN PART OF THE PROVINCE WHILE THE AZRI COMPONENT WOULD BENEFIT PRIMARILY THE NORTH. RECENT DISCUSSIONS WITH PROVINCIAL OFFICIALS HAVE CONFIRMED THAT THE SOCIO-POLITICAL CONCERNS WHICH ORIGINALLY CONTRIBUTED TO THIS PROGRAMMING DECISION ARE NO LONGER WARRANTED.

(B) AZRI IS A FEDERAL ORGANIZATION (AND PART OF THE NATIONAL AGRICULTURAL RESEARCH SYSTEM) WHILE ALL OTHER IMPLEMENTING ENTITIES UNDER THE BALAD PROJECT ARE PROVINCIAL. THIS WOULD REQUIRE A DUPLICATION OF PLANNING DOCUMENTS AND COORDINATION OF PROJECT OPERATIONAL ACTIVITIES AT TWO LEVELS OF GOVERNMENT AND WOULD UNNECESSARILY COMPLICATE MANAGEMENT OF THE

PROJECT. HOWEVER, THE GOVERNMENT ENTITIES INVOLVED UNDER THE MART PROJECT ARE THE SAME AS THOSE FOR THE AZRI COMPONENT.

(C) THE OVERALL OBJECTIVE OF THE AZRI COMPONENT IS TO IMPROVE AGRICULTURAL RESEARCH. THIS IS ALSO THE CASE WITH THE MART PROJECT. AZRI, THEREFORE, LOGICALLY BELONGS IN MART.

3. WHILE AZRI'S CHARTER PERMITS IT TO CONDUCT RESEARCH IN ALL ARID AREAS OF THE COUNTRY, APPROPRIATE LANGUAGE WILL BE INCLUDED IN THE MART PROAG TO ENSURE THAT THE RESEARCH ACTIVITIES AZRI CONDUCTS UNDER THIS PROJECT RESPOND TO THE UNIQUE NEEDS OF BALUCHISTAN AND THAT THE INSTITUTE'S RESEARCH PROGRAM REMAINS FOCUSSED ON BALUCHISTAN.

4. ACCORDINGLY, MISSION PLANS TO REPROGRAM DOLLARS 10 MILLION FROM BALAD TO MART FOR THE AZRI COMPONENT. THEREFORE, THE NEW LOP FUNDING LEVELS FOR EACH PROJECT ARE: BALAD EQUALS DOLLARS 40 MILLION AND MART EQUALS DOLLARS 30 MILLION.

5. THE AZRI COMPONENT WAS APPROVED BY AID/W AT THE PID STAGE AS PART OF THE FORMER AGRICULTURAL EDUCATION, RESEARCH AND EXTENSION PROJECT (391-0477). ALL OTHER MART COMPONENTS WERE ALSO CONCURRED IN BY AID/W AT THE TIME OF APPROVAL OF THAT PID. SINCE AID/W HAS ALREADY AUTHORIZED THE MISSION TO APPROVE THE MART PP AT A FUNDING LEVEL OF DOLLARS 20 MILLION AND INCLUSION OF THE AZRI COMPONENT INCREASES LOP FUNDING TO DOLLARS 30 MILLION, MISSION REQUESTS AN AD HOC REDELEGATION OF AUTHORITY TO THE USAID/PAKISTAN MISSION DIRECTOR TO APPROVE THE MART PROJECT AT A FUNDING LEVEL OF UP TO DOLLARS 30 MILLION.

6. LINDA LION, CHIEF OF O/PDM, PLANS TO ARRIVE AID/W ON FRIDAY MARCH 2 AND WHILE SHE WILL BE ON ANNUAL LEAVE UNTIL MARCH 9 (AND THEN PLANS TO ATTEND ALL MEETINGS SCHEDULED MARCH 9-16 BEGINNING WITH FOOD SECURITY MANAGEMENT PROJECT COMMITTEE MEETING ON MARCH 9), SHE COULD BE AVAILABLE TO DISCUSS THIS MATTER FURTHER, IF DEEMED NECESSARY, WEEK OF MARCH 5.

PIEASE ADVISE. RATTRAY
BT
#3733

UNCLASSIFIED

ACTION AID-5 INFO AMB DCM ECON/2

ANNEX A.

VZCZCIL0772
PP RUFHIL
DE RUEHC #1380 1280746
ZNR UUUUU ZZH
P 170716Z APR 84
FM SECSTATE WASHDC
TO AMEMBASSY ISLAMABAD PRIORITY 6305
BT
UNCLAS STATE 111380

AIDAC

E.O. 12356: N/A
TAGS:
SUBJECT: DELEGATION OF AUTHORITY TO APPROVE MART PROJECT IN MISSION

REF: ISLAMABAD 5733

A/AID HAS APPROVED DELEGATION OF AUTHORITY TO MISSION DIRECTOR, USAID/ISLAMABAD TO AUTHORIZE MANAGEMENT OF AGRICULTRUAL RESEARCH AND TECHNOLOGY PROJECT MART, 391-0489 AT LIFE OF PROJECT FUNDING LEVEL NOT TO EXCEED DOLS 30 MILLION. SHULTZ
BT
#1380

NNNN

UNCLASSIFIED STATE 111380

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON D.C 20523

ACTION MEMORANDUM FOR THE ADMINISTRATOR

FROM: Charles W. Greenleaf, AA/ASIA

SUBJECT: Pakistan: Delegation of Authority for Mission Project Approval

Problem: USAID/Pakistan has requested an ad hoc delegation of authority to the Mission Director to authorize the Management of Agricultural Research and Technology Project (MART, 391-0489) at a life-of-project funding level of $30 million in ESF funds.

Background: The proposed MART Project is a management improvement program which will strengthen the GOP's capacity to undertake relevant and quality agricultural research throughout the country. It will do so by helping to establish a network of formal institutional linkages among agricultural education, research and extension agencies.

This project concept was originally presented as part of a PID for a larger, multi-faceted project entitled Agricultural Education, Research and Extension (AERE). This PID was approved in November 1982 at a $65 million life-of-project amount. Subsequently, in August 1983 the Mission decided (with AID/W concurrence) to restructure the project, treating its several components as separate projects, in order to simplify its implementation.

The research management activities were re-titled "Management of Agricultural Research and Technology" (MART), and since the projected funding level was $20 million, the Mission was authorized to approve the PP. Another component of the old AERE project was designed to upgrade the research capabilities of the Arid Zone Research Institute (AZRI) in Baluchistan and to address other development needs in that province which historically had not been adequately covered by national programs. Assistance for AZRI was, therefore, planned as a component of the Baluchistan Area Development Project.

The Mission now proposes to include the proposed assistance to AZRI within the MART project. The project objectives and institutional framework of the two

activities are closely related. Their implementation would thus be simplified. The inclusion of AZRI, at $10 million, would bring the MART life-of-project total to $30 million, which exceeds the Mission Director's delegated approval authority.

Discussion and Justification: Project design and approval schedules for FY 1984 were based on the assumption that MART and AZRI (as a discrete component of a Baluchistan Area Development Project) would be separate activities and that MART would be approved by USAID under delegated authorities because life of project funding for MART was projected to be $20 million. USAID and the Asia Bureau now agree that because of their similar goals and complementary activities AZRI should be added to MART to simplify management and implementation.

Ordinarily it would be a simple matter to combine the two projects and seek authorization in AID/Washington. However, the Mission is concerned that the additional time required for AID/W review and approval would jeopardize achievement of the Agency's accelerated obligation goals.

The integrated project is no more difficult to justify than the separate activities were, and we are satisfied that the Mission is fully capable of designing and approving this project in Pakistan without further review in Washington.

Both the AZRI and management/networking elements of MART were reviewed in Washington at the PID stage. No issues were raised which, on substantive grounds, would require AID/W approval of the PP. With regard to the management element, the Bureau APAC reporting cable emphasized the need for (a) development of linkages among participating institutions; (b) a linkage between the research activities carried out under the project and the project's institutional and inter-disciplinary objectives; and (c) detailed information on how research and extension systems at the regional level will be strengthened and how these institutions will interact with farmers.

The Mission is fully capable of addressing these and other design questions. USAID/Pakistan is well staffed in the skill areas required. We have been involved in upgrading agricultural research capabilities in Pakistan since 1969, and the proposed project builds on lessons learned under the current Agricultural Research project (391-0296), which is nearing completion.

With regard to AZRI, no major policy or design issues were raised.

The Mission is facing a heavy design workload for FY 1984 (six project papers, a substantial PAAD amendment, a major project paper amendment, and one PID). Given these plans, and the extra time required for AID/W review and approval of a project (about two months), it would help us to meet our accelerated obligation targets if this activity could be approved in the Mission. All other planned new projects which exceed $20 million will be brought to Washington for your approval.

In short, this project presents the opportunity to reduce Mission and AID/W workload, and, consistent with the objectives of our Asia Bureau "experiment", to expand Mission responsibility. There are no important policy or other design issues which cannot be fully addressed by the Mission.

Recommendation: That you approve USAID/Pakistan's request for an ad hoc delegation of authority to approve the MART project at a level of $30 million by signing below.

Approved A.B. Kimball

Date April 13, 1984

Attachment: Delegation of Authority Cable

Clearances: GC, H. M. Fry 4/4/84
PPC, R. A. Derham APR 6 1984

PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual funding sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Fund.

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

A. GENERAL CRITERIA FOR PROJECT

1. Continuing Resolution Unnumbered; FAA Sec.634A; Sec.653(b)

(a) Describe how authorizing and appropriations Committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that amount)?	(a) Congressional Notification and Congressional Presentation. (b) Yes, assistance is within the FY 1984 operational year budget.

2. FAA Sec.611 (a) (1): Prior to obligation in excess of $100,000, will there be (a) engineering, financial other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

(a) Yes

(b) Yes

(2)

3.	FAA Sec.611 (a) (2): If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	No further legislative action is required.
4.	FAA Sec.611 (b) : Continuing Resolution Sec.501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973?	N.A.
5.	FAA Sec.611 (e). If Project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?	Yes, Mission Director's 611(e) certification is included in the Project Paper.
6.	FAA Sec.209. Is project susceptible of execution as part of regional or multi-lateral 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. Nevertheless, the IBRD and CIDA will be implementing agricultural research programs during the life of the AID project, and the latter has been designed to complement and reinforce the activities of these two donors as well as the FAO which is also involved, in a limited way, in agricultural research activities in Pakistan.

(3)

7.	FAA Sec.601 (a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competion; (c) encourage development and use of cooperatives, and 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 (b) Yes (c) No (d) Yes (e) Yes (f) No
8.	FAA Sec.601 (b). Information and conclusion 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 Sec. 612 (b), 636 (h) ; Continuing Resolution Sec. 503. 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-funded project. Nevertheless, the GOP and Provincial Governments will contribute the equivalent of $ 1.1 million over the life of the project, or about 3 percent of total project costs, to help finance local costs. The Mission Director has certified the disbursement of U.S. dollars in lieu of U.S. Treasury-owned excess rupees to cover some of the local costs under this project. This action is consistent with one of the major objectives of the renewed economic assistance program to Pakistan which is to maximize the balance of payments impact of the program.
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?	U.S. owned excess Pakistani rupees have been fully programmed in support of other projects.

(4)

11.	FAA Sec.601 (e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes
12.	Continuing Resolution Sec.522. 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?	N.A.
13.	FA Appropr. tion Sec.525: Will the funds for this project be used to lobby for abortion?	No

B. FUNDING CRITERIA FOR PROJECT

1.	Development Assistance Project Criteria	This is an ESF-financed project.
	a. FAA Sec.102 (b), 111, 113, 281(a). 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 technolog, spreading investment out 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 the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better	N.A.

(5)

life, and otherwise encourage democratic private and local governmental 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. N.A.

b. FAA Sec.103, 103A, 104, 105, 106, 107. Is assistance being made available: (including only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source) N.A.

(1) [103] for agriculture, rural development of nutrition; if so (a) extent to which activity is specifically designed to increase productivity and income of rural poor; 103A if for agriculture research, full account shall be taken of the needs of small farmers, and extensive use of field testing to adapt basic research to local conditions shall be made; (b) extent to which assistance is used in coordination with programs carried out under Sec.104 to help improve nutrition of the people of developing countries through encouragement of increased production of crops with greater nutritional value, improvement of planning, research, and education with respect to nutrition, particularly with reference to improvement and N.A.

(6)

expanded use of indigenously produced foodstuff; and the undertaking of pilot or demonstration of programs explicitly addressing the problem of malnutrition of poor and vulnerable people; and (c) extent to which activity increases national food security by improving food policies and management and by strengthening national food reserves, with particular concern for the needs of the poor, through measures encouraging domestic production, building and national food reserves, expanding available storage facilities, reducing post harvest food losses and improving food distribution.	N.A.
(2) [104] for population planning under Sec.104(b) or health under Sec.104(c); if so, (i) extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.	N.A.
(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens non-formal education, makes formal education more relevant, especially for rural families and urban	

(7)

poor, or strengthens management capability of institutions enabling the poor to participate in development; and (ii) extent to which assistance provides advanced education and training of people in developing countries in such disciplines as are required for planning and implementation of public and private development activities.

(4) [106; ISDCA of 1980, Sec.304] for energy, private voluntary organizations, and selected development activities; if so, extent to which activity is: (i) (a) concerned with data collection and analysis, the training of skilled personnel, research on and development of suitable energy sources, and pilot projects to test new methods of energy production; (b) facilitative of geological and geophysical survey work to locate potential oil, natural gas, and coal reserves and to encourage exploration for potential oil, natural gas, and coal reserves; and (c) a cooperative program in energy production and conservation through research and development and use of small scale, decentralized, renewable energy sources for rural areas; N.A.

(ii) technical cooperation and development, especially with U.S. private and voluntary or regional and international development, organizations; N.A.

(iii) research into, and

evaluation of, economic development process and techniques;

(iv) reconstruction after natural or manmade disaster; N.A.

(v) for special development problems, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development, especially small labor intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

c. [107] is appropriate effort 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. N.A.

d. FAA Sec.110 (a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the better cost-sharing requirement been waived for a "relatively le st developed" country)? N.A.

e. FAA Sec.110 (b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? N.A.

(9)

f. 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.	N.A.
g. FAA Sec.122 (b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	N.A.
Development Assistance Project Criteria (Loans Only).	
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% of the enterprise's annual production during the life of the loan?	N.A.
Project Criteria Solely for Economic Support Fund	

(10)

a. FAA Sec.531 (a). Will this assistance promote economic or political stability? To the extent possible, does it reflect the policy directions of FAA Section 102?

Yes. This project has as its prime goal to improve the performance of the agricultural research network in Pakistan to enable it to contribute to the country's agricultural production goals, which will clearly promote both economic and political stability. The project also reflects the policy directions of FAA Section 102.

b. FAA Sec.531 (c). Will assistance under this chapter be used for military, or paramilitary activities?

No.

ANNEX C.1.

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

MISSION TO PAKISTAN

Cable : USAIDPAK

HEADQUARTERS OFFICE
ISLAMABAD

Office of the Director

MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY (391-0489)

FAA SECTION 611 (e) CERTIFICATION

I, Donor M. Lion, the principal officer of the Agency for International Development in the Islamic Republic of Pakistan, having taking into account, among other things, the maintenance and utilization of projects in the Islamic Republic of Pakistan previously financed or assisted by the United States, do hereby certify, pursuant to Section 611 (e) of the Foreign Assistance Act of 1961, as amended, that, in my judgement, the Islamic Republic of Pakistan has both the financial capability and the human resources capability to effectively implement, utilize, and maintain the proposed Management of Agricultural Research and Technology Project (391-0489).

This judgement is based upon the project analyses as detailed in the Management of Agricultural Research and Technology Project Paper and is subject to the condition imposed therein.

Jimmie M. Stone
Acting Director
USAID/Pakistan

8/8/84
Date

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

Cable : USAIDPAK

HEADQUARTERS OFFICE
ISLAMABAD

Office of the Director

MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY (391-0489)

FAA SECTION 612 (b) CERTIFICATION

A major purpose of the $1.625 billion economic assistance program negotiated between the Governments of the United States of America and Pakistan, acknowledged by both governments and a primary reason for both governments having decided to develop an economic assistance package, is to provide balance of payments assistance to Pakistan.

I have carefully reviewed the advisability of disbursing United States dollars in lieu of United States-owned excess foreign currency to pay for local costs of projects being implemented in Pakistan. In light of the United States Government's objectives concerning the program, I have determined that it would be prejudicial to U.S. interests and goals to pay for all local currency costs with United States-owned rupees. Such a procedure would prevent the U.S. from providing the maximum amount of balance of payments support under the economic assistance package, and would consequently undercut one of the basic objectives of the program. The objective of providing balance of payments assistance to Pakistan can best be achieved by disbursing United States dollars to pay for local costs of the program. Section 612(b) of the Foreign Assistance Act of 1961, as amended, authorizes the administrative official approving the voucher to determine that local costs will be funded with direct payment of dollars for the program. Pursuant to this provision, Handbook 19 requires that the Mission Director (or his designee) make a determination as to the reason in any instance where United States dollars are used (disbursed) when United States-owned foreign currency is available. Where dollars are used for local cost financing, USAID/Pakistan will, therefore, make disbursement to the Government of Pakistan in U.S. currency.

In view of the above rationale, I, Donor M. Lion, Principal officer of the Agency for International Development in Pakistan, pursuant to

FAA SECTION 612(b) CERTIFICATION (Continued)

Section 612(b) of the Foreign Assistance Act of 1961, as amended, do hereby certify the need to disburse United States dollars to cover local currency costs in lieu of using United States-owned excess rupees under the Management of Agricultural Research and Technology Project.

Jimmie M. Stone
Acting Director
USAID/Pakistan

8/8/84
Date

Telegram : ECONOMIC
Telex : ECDIV No. 05-834
Secretary-General
Phone:820629

GOP LETTER OF REQUEST
FOR ASSISTANCE

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

Islamabad, the 7th August, 1984.

Subject:- Management of AGricultural Research and Technology Project(391-0489).

Dear Mr. Lion:

As part of the agreement between our two Governments on a six-year $ 1.625 billion economic assistance program, the Government of Pakistan formally requests from A.I.D. thirty million dollars(U.S.$ 30,000,000) in United States grant assistance to fund a Management of Agricultural Research and Technology Project.

Subject to the availability of funds, I understand that $ 30,000,000 will be provided over a five-year period to strengthen the performance of the national agricultural research system to generate and disseminate quality and relevant agricultural technologies to the farmers of Pakistan. Funds provided by A.I.D. for this project will be used to procure technical advisory assistance, training, commodities, and construction services and to support field demonstrations and studies required, amongst other things, to:

1. increase the capacity at the national and provincial levels to plan, manage, and evaluate Pakistan's agricultural research needs and priorities;
2. strengthen the capability within the national agricultural research network to manage, account for, and utilize financial resources;
3. strengthen the operational linkages between Federal and Provincial research organizations and among the agricultural universities and research and extension personnel;
4. establish long-term institutional linkages between the Pakistani national agricultural research network and selected regional and international research centres;

contd.....

5. establish a critical mass of research skills and managerial talent within the national agricultural research network;
6. institutionalize a multi-disciplinary farming systems research program;
7. institutionalize the capacity within the national agricultural research network to produce and disseminate new technologies in a form and manner that responds to the needs of client groups (farmers, agro-industry, extension, research scientists, planners, and policy-makers);
8. expand the in-service training capacity at the Federal and Provincial levels to present career development courses on a continuing basis to all levels of agricultural research, scientific support and outreach personnel;
9. improve the capacity of the Arid Zone Research Institute(AZRI) to plan and carry out effective research on agricultural problems applicable to the arid and high altitude areas of Baluchistan and similar areas of Pakistan;
10. improve the research capability for wheat and maize with an expanded outreach activity applicable to the major wheat and maize production areas of Pakistan;
11. strengthen selected commodity research programs to enable them to generate relevant technological packages which contribute to GOP agricultural production goals; and,
12. develop and implement mechanisms to increase the participation of the Pakistani private agribusiness sector in the identification, conduct, and dissemination of research.

I also understand that, subject to the availability of funds to A.I.D. for this purpose, approximately two and one-half million dollars (U.S.$ 2,500,000) may also be provided from the Agricultural Commodities and Equipment Program to finance research equipment and commodities for the MART Project.

The Government of Pakistan assures the United States Government of its full cooperation in carrying out the Management of Agricultural Research and Technology Project. The necessary clearances, personnel, financial, and other inputs required of us will be provided in an expeditious manner.

Once the Project Agreement is signed, A.I.D. is hereby authorized to proceed with the procurement of technical assistance and commodities and arrangements for training for all components of the project and to commit and disburse funds as necessary and in accordance with the terms and conditions of the Project Agreement to carry out these project activities.

We look forward to a continued, combined effort by both our Governments to implement a productive and beneficial program for the people of Pakistan.

Yours sincerely,

(Ejaz Ahmad Naik)

Mr. Donor M. Lion,
Director,
USAID Mission
Islamabad.

PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

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

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Program or Sector Goal:	*Measures of Goal Achievement:*		*Assumption for Achieving Goal Targets:*
The broader objective to which this project contributes: -To increase agricultural production, farm income and rural employment	-Increased production and availabilities of food and fiber -Decreased food imports -Improved foreign exchange situation -Increased per capita income	-Published data on agricultural production, yields, and rural employment -GOP planning budget documents -Basic socio-economic data -AID project reports -Field observations	-Continued GOP commitment to the agricultural sector in gener and to agricultural research in particula as evidenced by adequ budgetary allocations and favorable policie -Required inputs for agricultural producti are consistently avai able at affordable prices -Weather conditions are favorable
Project Purpose:	*Conditions That Will Indicate Purpose Has Been Achieved: (EOPS)*		*Assumptions for Achieving Purpose and Outputs:*
To strengthen the performance of the national agricultural research system to generate and disseminate quality and relevant agricultural technologies to the farmers of Pakistan	-Operational linkages strengthened between Federal and Provincial research organizations and among the agricultural universities and research and extension agencies -long-term institutional linkages established between the Pakistani national agricultural research network and selected regional and international research centers	-Project evaluations -Special surveys, studies and reports -Published agricultural area and production data -AID and GOP project records -Field observations -PARC and Provincial research reports and records and scientific publications	-GOP continues to accord high priority to agricultural research in terms of policy support and financial commitment -PARC mandate in agricultural research supported and reinforced both Federally and Provincially -Adequate local research and support personnel provided to the project

...../2

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
	-A critical mass of research skills and managerial talent in place within the national agricultural research network -Increased capacity at the national and provincial levels to plan, manage, and evaluate Pakistan's agricultural research needs and priorities -Capacity institutionalized within the national agricultural research network to produce and disseminate new technologies in a form and manner that responds to the needs of client groups (farmers, agro-industry, extension, research, scientists, planners and policy-makers) -Strengthened capability in the management, accountability, and utilization of financial resources within the national agricultural research network -Expanded in-service training capacity at the Federal and Provincial levels to present career development courses on a continuing basis to all levels of agricultural research, scientific support and outreach personnel -Improved capacity at the Arid Zone Research Institute (AZRI) to plan and carry out effective research on agricultural problems applicable to the arid and high altitude areas of Baluchistan and similar areas of Pakistan		-International Centers collaborate on collegial basis -Technologies developed are socially and economically appropriate to farmers -GOP successfully fosters research and extension dialogue

Narrative Summary	Objectively Verifiable Indicators	Means of Verifications	Important Assumptions
	-Improved research capability and programs for wheat and maize with an expanded outreach activity applicable to the major wheat and maize production areas of Pakistan -Selected commodity research programs generating relevant technological packages which contribute to GOP agricultural production goals -A multi-disciplinary farming systems research program institutionalized -Mechanisms identified and being implemented to increase the participation of the Pakistani private agribusiness sector in the identification, conduct, and dissemination of research		
Outputs:	*Magnitude of Outputs:*		
-Management improvement interventions designed and implemented throughout the National Agricultural Research Network in the areas of research planning, research methods, organization and administration, information flow and financial management	10	-Project evaluations -Special surveys, studies and reports -Published agricultural area and production data -AID and project records -Field observations -PARC and Provincial research reports and records and scientific publications	-Sufficient GOP staff and resources will be made available -Project advisors are successful in transferring skills and technology to Federal and Provincial institutions -GOP prepares and approves PC-1s as needed -Qualified staff are selected for training -Necessary skills and materials are available locally for construction program -Adequate numbers of qualified personnel can be hired and retained to staff the production studio and expanded training facility
-Farming systems research studies completed	40		
-Study completed to identify possible financial mechanisms to improve flow of funds for agricultural research	1		
-Two-year plan completed including benchmarks for increased Pakistani private sector opportunities in the selection of priority research areas, in the conduct of such research, in the design and conduct of mutually beneficial training programs and the dissemination of improved technology to farmers	1		

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Narrative Summary	Objectively Verifiable Indicators	
Outputs:	*Magnitude of Outputs:*	
-Revised and improved financial records maintenance and reporting system established at PARC and the provincial agricultural research institutes	1	
-Management improvements in the area of research/ outreach integration, field-tested and demonstrated in Islamabad District and replicated nationwide	4	
-A fully equipped and staffed multi-media production studio at the NARC	1	
-A technical information transfer committee institutionalized	1	
-Video documentaries, recordings, media campaigns, and other technical information packages produced and distributed to target audiences	100	
-A completed personnel needs assessment for the agricultural research network over the next 10 years and a comprehensive training plan	1	
-Physical and staff expansion of the NARC training institute	1	
-In-country professional improvement programs for agricultural personnel developed and implemented	4	
-Uniform guidelines established for participant selection, pre-departure preparation, placement, and academic supervision of overseas degree and non-degree programs	1	
-A 10-year long-range plan completed for station and on-farm trials to be conducted by AZRI	1	
-Field studies and field research programs designed and implemented by AZRI staff in collaboration with provincial agricultural research and extension personnel	12	
-Institutionalized capacity among Pakistani scientists to continue a genetic maintenance program and research on disease-resistant varieties of Wheat and Maize	1	
-10-year plans for both Wheat and Maize Research Developed	2	
-Individuals traned in research management and administration, wheat and maize research and production, arid/non-irrigated agricultural research and production, communications, teaching methods and curriculum development	-U.S. Long-Term -U.S. Short-Term -Third Country Short-Term (including at CIMMYT and ICARDA) -In-Country	87 92 67 4705

Narrative Summary	Objectively Verifiable Indicators	Means of Verifications	Important Assumptions
Inputs:	*Implementation Target: (Type and Quantity)*		*Assumptions for Providing Inputs:*
1. A.I.D.			
-Short and long-term technical assistance	-See financial analysis, implementation schedule, and commodity, TA and training plans in the project paper	-AID and GOP project records and financial documents	-AID & GOP funding levels proposed are approved and disbursements are made on a timely basis
-Short and long-term academic and non-academic training in U.S. and Third Countries		-Project evaluations	-Appropriate overseas training programs can be identified
-In-country training			-Construction is undertaken according to agreed upon standards and practices and is certified for reimbursement by AID
-Seminars and Conferences			-GOP meets the conditions precedent
-Vehicles, computers, research equipment and other commodities			-Appropriate consultants can be recruited to provide required technical assistance
-Field studies and demonstrations			
-Evaluation			
-Construction of multi-media production studio and expanded training facilities			
2. GOP			
-Staff salaries and operating expenses			
-Operating and maintenance costs for newly constructed facilities			
-Vehicle operating costs			

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AIDAC

FOR ASIA/PD - MATHESON AND ASIA/PNS - MUTCHLER

E.O.12356 N/A
SUBJECT: MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY (MART) PROJECT (391-0489): JUSTIFICATION FOR NON-COMPETITIVE PROCUREMENT WITH CIMMYT

1. THIS CABLE TRANSMITS DRAFT LANGUAGE FOR A JUSTIFICATION FOR NON-COMPETITIVE PROCUREMENT WHICH THE MISSION WOULD APPRECIATE YOUR PROCESSING ASAP AND ADVISING US BY CABLE WHEN APPROVAL HAS BEEN GRANTED BY THE ADMINISTRATOR.

2. PROBLEM: YOU ARE BEING REQUESTED TO APPROVE THE NON-COMPETITIVE NEGOTIATED PROCUREMENT OF TECHNICAL SERVICES BY THE PAKISTAN AGRICULTURAL RESEARCH COUNCIL (PARC) FROM THE INTERNATIONAL WHEAT AND MAIZE IMPROVEMENT CENTER (CIMMYT) FOR THE IMPLEMENTATION OF THE WHEAT AND MAIZE COORDINATED PROGRAMS COMPONENT OF THE SUBJECT PROJECT.

3. BACKGROUND:

(A) COOPERATING COUNTRY: PAKISTAN

(B) AUTHORIZING DOCUMENT: PROJECT AUTHORIZATION DATED JULY 1984

(C) PROJECT TITLE AND NUMBER: MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY (391-0489)

(D) GEOGRAPHIC CODE OF PROJECT: 000 AND PAKISTAN

(E) DESCRIPTION OF SERVICES SOUGHT: TECHNICAL ADVISORY
(F) SUPPLIER OF SERVICES SOUGHT: INTERNATIONAL WHEAT AND MAIZE IMPROVEMENT CENTER (CIMMYT), EL BATAN, MEXICO

(G) ESTIMATED TOTAL VALUE OF CONTRACT: APPROXIMATELY DOLS 3,000,000 OVER 4 YEARS

(H) NATURE OF FUNDING: ESF GRANT

(I) TYPE OF CONTRACT: HOST COUNTRY

4. BACKGROUND:

(A) CIMMYT'S INVOLVEMENT IN AGRICULTURAL RESEARCH IN PAKISTAN DATES BACK TO THE MID-1960S. AT THAT TIME, INDIVIDUAL SCIENTISTS FROM CIMMYT PARTICIPATED IN AGRICULTURAL PROGRAMS IN PAKISTAN, WITH SUPPORT FROM BOTH THE FORD AND ROCKEFELLER FOUNDATIONS. IN 1971, CIMMYT SIGNED AN INSTITUTIONAL CONTRACT WITH THE PAKISTAN AGRICULTURAL RESEARCH COUNCIL (PARC) AND FORMALLY BEGAN PROVIDING ASSISTANCE TO PAKISTAN. WHEN FORD FOUNDATION SUPPORT WAS NO LONGER AVAILABLE FOR THE PROGRAM, A.I.D. MADE FUNDS AVAILABLE UNDER THE AGRICULTURAL RESEARCH PROJECT (391-0296) TO CONTINUE THE CIMMYT-PARC COLLABORATIVE RESEARCH PROGRAM. THE A.I.D.-FINANCED HOST COUNTRY CONTRACT HAS BEEN AMENDED FROM TIME TO TIME TO INCREASE THE LEVEL OF FUNDING AND EXTEND THE PERIOD OF PERFORMANCE. THE EXPIRATION DATE OF CIMMYT'S EXISTING CONTRACT WITH PARC IS SEPTEMBER 30, 1984.

(B) FOR THE PAST DECADE, CIMMYT HAS BEEN WORKING WITH PAKISTANI SCIENTISTS TO INTRODUCE HIGH-YIELDING CEREAL GRAIN VARIETIES IN PAKISTAN AND TO CONDUCT WEED CONTROL AND DISEASE RESISTANCE TRIALS. RESULTS FROM THIS WORK HAVE BEEN IMPRESSIVE. FROM A POSITION AS A NET WHEAT IMPORTER, PAKISTAN IS NOW SELF-SUFFICIENT IN WHEAT. TO A LARGE EXTENT, INCREASED WHEAT PRODUCTION HAS RESULTED FROM INCREASED USE OF IMPROVED SEED DEVELOPED THROUGH PARC AND CIMMYT RESEARCH. THE NUMBER OF TONS OF IMPROVED WHEAT SEED IN USE BY PAKISTANI FARMERS INCREASED BY 56 PERCENT BETWEEN PFY 1975/76 AND PFY 1979/80.

(C) DESPITE THESE GAINS, THERE REMAIN SEVERAL CRITICAL PROBLEMS IN MAIZE AND WHEAT PRODUCTION. A GAP OF 50 TO 80 PERCENT EXISTS BETWEEN THE YIELDS OF PROGRESSIVE FARMERS APPLYING A COMPLETE PACKAGE OF PROVEN TECHNOLOGIES IN WHEAT AND MAIZE AND THE YIELDS OF AVERAGE FARMERS USING TRADITIONAL METHODS. IN RECENT YEARS, PARC AND CIMMYT SCIENTISTS HAVE BEEN MOVING THEIR TRIALS FROM THE RESEARCH STATION TO FARMERS' FIELDS IN AN ATTEMPT TO IDENTIFY THE

CONSTRAINTS TO BOTH ADOPTION AND PROPER USE OF IMPROVED VARIETIES. THIS WORK NEEDS TO BE CONTINUED FOR SEVERAL MORE YEARS TO IDENTIFY THE INTERVENTIONS NECESSARY TO CLOSE THE YIELD GAP. IN ADDITION, THE YIELDS OF PROGRESSIVE FARMERS USING CURRENT HIGH-YIELDING VARIETIES WILL NOT BE MAINTAINED UNLESS THE CAPACITY IS INSTITUTIONALIZED AMONG PAKISTANI SCIENTISTS TO CONTINUE A STRONG GENETIC MAINTENANCE PROGRAM AND RESEARCH ON DISEASE-RESISTANT VARIETIES.

(D) THE MISSION AND GOP HAVE THEREFORE AGREED TO PROVIDE CONTINUED SUPPORT TO THE GOP'S NATIONALLY COORDINATED WHEAT AND MAIZE PROGRAMS UNDER THE FY 1984 MART PROJECT, WHICH IS ESSENTIALLY A FOLLOW-ON TO THE EXISTING AID-FINANCED AGRICULTURAL RESEARCH PROJECT. THE PROPOSED PROGRAM OF ACTIVITIES DESCRIBED BELOW WILL BUILD ON THE RESEARCH PAKISTANI AND CIMMYT SCIENTISTS HAVE BEEN CONDUCTING UNDER THE ON-GOING A.I.D.-FINANCED AGRICULTURAL RESEARCH PROJECT (391-0296), WHICH TERMINATES IN JUNE 1985:

- 1. THE CONTINUATION OF EFFORTS TO PRODUCE HIGH-YIELDING VARIETIES OF WHEAT AND MAIZE THAT ARE ADAPTED TO PAKISTANI CONDITIONS;

- 2. THE DEVELOPMENT OF A DETAILED AGRO-ECOLOGICAL ANALYSIS THAT WILL PERMIT THE IDENTIFICATION OF WHEAT AND MAIZE ZONES IN PAKISTAN;

- 3. THE ESTABLISHMENT OF LARGER AND MORE ACCESSIBLE ON-FARM RESEARCH AND VERIFICATION AREAS IN REPRESENTATIVE LOCATIONS THAT WILL PERMIT THE GENERATION, TESTING AND REVISION OF PRODUCTION TECHNIQUES APPROPRIATE TO PAKISTANI CONDITIONS; AND,

- 4. THE INCREASED USE OF FARMING SYSTEMS RESEARCH METHODS TO ENSURE THAT THE GENERATION OF RESEARCHABLE IDEAS AND THE DEVELOPMENT AND EXTENSION OF NEW TECHNOLOGIES ARE DONE IN WAYS THAT MAXIMIZE THEIR CHANCES OF ADOPTION BY FARMERS.

(E) THE PAKISTAN AGRICULTURAL RESEARCH COUNCIL (PARC) HAS REQUESTED THAT CIMMYT BE CONTRACTED TO CARRY OUT THE ABOVE PROGRAM, AND THE MISSION STRONGLY SUPPORTS THE GOP'S POSITION. UNDER THE PROJECT, CIMMYT WOULD BE RESPONSIBLE FOR THE RECRUITMENT AND TECHNICAL BACKSTOPPING OF LONG AND SHORT-TERM EXPATRIATE SCIENTISTS AND WOULD ALSO COORDINATE THE INTERNATIONAL GERM PLASM EXCHANGE AND TESTING PROGRAM AND A TRAINING PROGRAM FOR PAKISTANI SCIENTISTS. USING ITS CORE SUPPORT FINANCING, CIMMYT WOULD POST AN AGRICULTURAL ECONOMIST IN ISLAMABAD FOR THREE YEARS TO WORK IN THE SOUTH ASIAN REGION OF PAKISTAN, INDIA AND NEPAL. APPROXIMATELY 50 PERCENT OF THIS ECONOMIST'S TIME WOULD BE ALLOCATED TO WORK IN PAKISTAN. THE CIMMYT ECONOMIST WOULD ASSIST PARC TO DEVELOP AN IMPROVED CAPACITY FOR SOCIAL SCIENCE RESEARCH IN PAKISTAN'S AGRICULTURAL RESEARCH SYSTEM

AT THE NATIONAL AND PROVINCIAL LEVELS.

IN ADDITION, CIMMYT WOULD PROVIDE THREE OTHER SCIENTISTS: A WHEAT AGRONOMIST AND A MAIZE AGRONOMIST EACH FOR THREE YEARS AND AN EXTENSION AGRONOMIST FOR FOUR YEARS. THE CIMMYT WHEAT AND MAIZE AGRONOMISTS WOULD ASSIST PAKISTANI WHEAT AND MAIZE SCIENTISTS TO:

(1) DEVELOP TEN-YEAR PLANS FOR A GERM PLASM EVALUATION AND GENETIC MATERIAL MAINTENANCE RESEARCH PROGRAM;

(2) DESIGN AND IMPLEMENT SPECIFIC RESEARCH ACTIVITIES IDENTIFIED UNDER THE PLANS;

(3) DEVELOP AN AGRO-ECOLOGICAL ANALYSIS, DETAILED TO THE SUB-ZONE LEVEL, FOR WHEAT/MAIZE PRODUCTION AND MAXIMIZATION IN PAKISTAN;

(4) DESIGN AND IMPLEMENT PRODUCTION RESEARCH AND OUTREACH PACKAGES TO BE TESTED AND EVALUATED IN SIMILAR AGRO-ECOLOGICAL AREAS; AND,

(5) ORGANIZE AND CONDUCT A SERIES OF TRAINING SEMINARS AND WORKSHOPS IN SUPPORT OF THE PRIMARY WHEAT/MAIZE PROGRAM OBJECTIVES.

THE EXTENSION AGRONOMY ADVISOR WOULD ASSIST PAKISTANI RESEARCH, EXTENSION AND UNIVERSITY STAFF TO DEVELOP AND CARRY OUT AN EXPANDED ON-FARM ADAPTIVE RESEARCH AND VERIFICATION PROGRAM FOR THE NATIONAL COORDINATED WHEAT AND MAIZE PROGRAMS. IN ADDITION TO DEVELOPING THE LINKAGES BETWEEN ON-STATION RESEARCH AND THE FARMER, THE EXTENSION SPECIALIST, AS A MEMBER OF THE WHEAT AND MAIZE RESEARCH TEAMS, WOULD BE RESPONSIBLE FOR DEVELOPING FARMING SYSTEMS RESEARCH METHODS FOR WHEAT AND MAIZE RESEARCH.

CIMMYT WOULD ALSO BE REQUESTED TO: (1) PROVIDE UP TO EIGHT PERSON-MONTHS OF SHORT-TERM EXPERTS AS NEEDED IN SUCH FIELDS AS CEREAL TECHNOLOGY, CYTOGENETICS, MECHANIZATION, EQUIPMENT/INSTRUMENT USE AND MAINTENANCE, CROP GEOGRAPHY DELINEATION AND WEED CONTROL; (2) PROVIDE SHORT-TERM TRAINING AT CIMMYT FOR PERIODS OF BETWEEN THREE TO SIX MONTHS EACH, IN SUCH AREAS AS BREEDING/PATHOLOGY, AGRONOMY, CYTOGENETICS, AND CEREAL TECHNOLOGY; AND, (3) ARRANGE FOR PAKISTANI PERSONNEL TO PARTICIPATE IN REGIONAL CONFERENCES DEVELOPED OR SPONSORED BY CIMMYT. FUNDS WOULD ALSO BE PROVIDED IN THE CONTRACT FOR A LIMITED AMOUNT OF FIELD RESEARCH EQUIPMENT AND SUPPLIES TO SUPPORT THE RESIDENT ADVISORS' PROGRAM OF ACTIVITIES. THE TOTAL ESTAMATED VALUE OF THE PROPOSED FOUR-YEAR CONTRACT IS DOLS 3,000,000.

5. JUSTIFICATION:

(A) CIMMYT IS AN INTERNATIONAL AGRICULTURAL RESEARCH CENTER SUPPORTED BY THE GOVERNMENTS OF MANY DEVELOPED NATIONS, INCLUDING THE U.S., AS WELL AS PROMINENT INTERNATIONAL, PRIVATE AND OTHER DONOR INSTITUTIONS. A.I.D. CONTRIBUTES FUNDS ANNUALLY TO CIMMYT'S CORE BUDGET. CIMMYT IS RECOGNIZED WORLDWIDE AS THE FOREMOST AUTHORITY ON WHEAT AND MAIZE PRODUCTION TECHNOLOGY. IT HAS A STAFF OF OVER 150 SPECIALISTS WORKING IN RESEARCH, TRAINING AND OUTREACH PROGRAMS FROM ITS HEADQUARTERS IN MEXICO AND IN CONJUNCTION WITH NATIONAL CENTERS AROUND THE WORLD. CIMMYT STAFF ARE AVAILABLE TO PROVIDE TECHNICAL SERVICES, INFORMATION, TRAINING, AND SEEDS FOR TRIALS, BREEDING AND MULTIPLICATION. THE CENTER SERVES AS A WORLDWIDE INFORMATION, TRAINING, GERM PLASM REPOSITORY, AND BREEDING CENTER FOR WHEAT AND MAIZE.

(B) CIMMYT HAS TWO ON-GOING REGIONAL PROGRAMS IN THE AREA: THE ASIAN REGIONAL PROGRAM BASED IN THAILAND AND THE MIDDLE EASTERN REGIONAL PROGRAM BASED IN TURKEY. THESE PROGRAMS ARE STAFFED BY EIGHT SENIOR SCIENTISTS IN AGRONOMY, BREEDING AND ECONOMICS WHO HAVE BEEN PROVIDING SUPPORT TO THE PAKISTAN PROGRAM TO COMPLEMENT AND SUPPLEMENT THE SERVICES OF THE A.I.D.-FINANCED RESIDENT ADVISORS CURRENTLY IN-COUNTRY.

(C) CIMMYT HAS BEEN WORKING SUCCESSFULLY IN MAIZE AND WHEAT PRODUCTION RESEARCH IN PAKISTAN FOR AT LEAST 15 YEARS. MANY PAKISTANI AGRICULTURAL RESEARCHERS HAVE BEEN TRAINED AT CIMMYT. ACTIVITIES CONTEMPLATED UNDER THE PROPOSED CONTRACT ARE ESSENTIALLY A FOLLOW-ON TO THE WORK CIMMYT HAS BEEN SUCCESSFULLY UNDERTAKING IN PAKISTAN SINCE THE MID-1960S. NO OTHER ORGANIZATION HAS THE RESOURCES AND EXPERTISE OR THE INDEPTH KNOWLEDGE OF PAKISTAN'S CONDITIONS AND CONSTRAINTS IN THE AGRICULTURAL SECTOR AS THEY RELATE TO WHEAT AND MAIZE PRODUCTION. THE PROPOSED CONTRACT WITH CIMMYT WOULD ENABLE THE PROGRAM TO CONTINUE WITHOUT INTERRUPTION AND SUSTAIN THE MOMENTUM IN WHEAT AND MAIZE RESEARCH WHICH WAS ESTABLISHED WITH CIMMYT ASSISTANCE UNDER THE PREVIOUS A.I.D.-FINANCED AGRICULTURAL RESEARCH PROJECT (391-0296).

6. AUTHORITY: A.I.D. HANDBOOK 11, CHAPTER 1, PARAGRAPH 2.4.2. REQUIRES A WAIVER TO PERMIT NEGOTIATION WITH A SINGLE SOURCE. PARAGRAPH 2.4.2.A. LISTS THE CRITERIA TO JUSTIFY SUCH A WAIVER. THE CRITERIA THAT APPLY IN THIS INSTANCE ARE: (A) THE UNIQUE CAPABILITY OF CIMMYT BASED ON ITS PRIOR EXTENSIVE AND SPECIAL EXPERIENCE IN PAKISTAN, ITS

WORLDWIDE REPUTATION AND PERFORMANCE AS A CENTER OF EXCELLENCE IN WHEAT AND MAIZE RESEARCH, AND ITS SPECIALIZED FACILITIES SUCH AS A GERM PLASM REPOSITORY AND BREEDING CENTER FOR WHEAT AND MAIZE (PARAGRAPH 2.4.2.A.3); AND, (B) THE FACT THAT THE 3OP DESIRES TO UTILIZE CIMMYT FOR FOLLOW-ON WORK IN THIS NEW PROJECT ANT THAT IT CLEARLY HAS SPFCIAL CAPABILITY PY VIRTUE OF ITS PREVIOUS EXPERIENCE IN THE WORK (PARAGRAPH 2.4.2.A.4). PARAGRAPH 2.4.2 REQUIRES THAT IF THE TOTAL VALUE OF THE PROCUREMENT EXCEEDS DOLS 500,000, AS IS THE CASE IN THIS INSTANCE, THAT THE WAIVER MUST BE APPROVED BY THE ADMINISTRATOR.

7. RECOMMENDATION: THAT YOU APPROVE NEGOTIATION OF A CONTRACT BY THE PAKISTAN AGRICULTURAL RESEARCH COUNCIL WITH CIMMYT TO ASSIST IN THE IMPLEMENTATION OF THE WHEAT AND MAIZE COORDINATED PROGRAMS COMPONENT OF THE MART PROJECT. HINTON
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AIDAC

FOR ASIA/PD - MATHESON

E.O.12356 N/A
SUBJECT: MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY PROJECT (391-0499): VEHICLE WAIVER REQUEST

1. THIS CABLE TRANSMITS DRAFT LANGUAGE FOR A VEHICLE WAIVER FOR THE SUBJECT PROJECT AND REQUESTS THAT AID/W PROCESS SAME ASAP AND ADVISE MISSION OF DATE OF APPROVAL BY AA/ASIA.

2. PROBLEM: YOU ARE BEING REQUESTED TO WAIVE THE REQUIREMENTS OF SECTION 636(I) OF THE FOREIGN ASSISTANCE ACT AND TO WAIVE SOURCE/ORIGIN/NATIONALITY REQUIREMENTS FROM AIT GEOGRAPHIC CODE 000 (U.S. ONLY) TO AID GEOGRAPHIC CODE 935 (SPECIAL FREE WORLD) TO PERMIT THE PROCUREMENT OF PROJECT VEHICLES AND SPARE PARTS AS SPECIFIED BELOW.

3. BACKGROUND:

A. COOPERATING COUNTRY: PAKISTAN

B. AUTHORIZING DOCUMENT: PROJECT AUTHORIZATION DATED JULY 1984

C. PROJECT: MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY, 391-0489
D. GEOGRAPHIC CODE OF PROJECT: 000 AND PAKISTAN

E. IMPORTER OF COMMODITY: USAID/PAKISTAN ON BEHALF OF THE MINISTRY OF FOOD, AGRICULTURE AND COOPERATIVES, GOVERNMENT OF PAKISTAN.

F. DESCRIPTION OF COMMODITY (63 VEHICLES AND SPARE PARTS VALUED AT AN ESTIMATED DOLS 536,500):

(1) FOURTEEN (14) RIGHT-HAND DRIVE, CROWN 2800, DELUXE STATION WAGONS, MODEL MS 112RG SWKDS, 6-CYLINDER, 2,759 CC GASOLINE ENGINE, 4-SPEED MANUAL FLOOR-SHIFT TRANSMISSION AT DOLS 6500 EACH EQUALS DOLS 91,000

(2) TWELVE (12) RIGHT-HAND DRIVE LAND CRUISER STATION WAGONS, HEAVY DUTY SUSPENSION, DIESEL ENGINE, OFF-THE-ROAD UTILITY VEHICLES WITH SEATING CAPACITY

FOR 9 PASSENGERS AT DOLS 11,500 EACH EQUALS DOLS 138,000

(3) FIVE (5) RIGHT-HAND DRIVE HI-ACE 15-PASSENGER COMMUTER VANS, 4-CYLINDER, DIESEL ENGINE, 2466 CC AT DOLS 6,500 EACH EQUALS DOLS 32,500

(4) THIRTY-TWO (32) HI-LUX DOUBLE CABIN PICKUP TRUCKS, 4-CYLINDER, DIESEL ENGINE, 2188 CC AT DOLS 6,000 EACH EQUALS DOLS 192,000

(5) SPARE PARTS FOR THE ABOVE VEHICLES VALUED AT DOLS 83,000

TOTAL EQUALS DOLS 638,500

G. NATURE OF FUNDING: ESF GRANT

H. PROCUREMENT SOURCE/ORIGIN: JAPAN
4. DISCUSSION:

VEHICLES REQUIRED FOR THE MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY PROJECT MUST BE CAPABLE OF TRANSPORTING PERSONNEL AND EQUIPMENT IN ROUGH TERRAIN UNDER ALL CLIMATIC CONDITIONS. UNDER THE PROJECT, A.I.D. WILL FINANCE THE SERVICES OF FOURTEEN (14) EXPATRIATE ADVISORS AND SEVERAL HUNDRED PERSON-MONTHS OF BOTH EXPATRIATE AND PAKISTANI SHORT-TERM TECHNICAL ASSISTANCE OVER THE FIVE YEAR LIFE OF THE PROJECT. PROJECT ACTIVITIES REQUIRE EXTENSIVE FIELD VISITS BY A.I.D.-FINANCED CONSULTANTS AND GOP OFFICIALS IN CARRYING OUT THEIR ASSIGNMENTS WHICH WILL INCLUDE IN-COUNTRY TRAINING PROGRAMS, ON-THE-JOB TRAINING, TECHNICAL ASSISTANCE, FIELD RESEARCH, FIELD SURVEYS, AND FIELD DEMONSTRATIONS IN ALL 4 PROVINCES OF PAKISTAN. VEHICLES ARE REQUIRED FOR THESE PURPOSES.

THE VEHICLES MUST HAVE RIGH-HAND DRIVE, A CRITICALLY IMPORTANT SAFETY FACTOR IN PAKISTAN WHERE TRAFFIC MOVES ON THE LEFT-HAND SIDE OF THE ROAD. IT IS EXPECTED THAT PROJECT VEHICLES WILL TRAVEL LONG DISTANCES ON FREQUENTLY USED ROUTES WHERE RIGHT-HAND

DRIVE IS ESSENTIAL IN PASSING SITUATIONS TO ENSURE MAXIMIM VISIBILITY AND SAFETY. SINCE MOST FIELD VISITS WILL TAKE PLACE IN REMOTE AREAS WHERE THERE IS AN ABSENCE OF PAVED ROADS, AND ACCESS IS DIFFICULT, FOUR WHEEL DRIVE IS SIMILARLY DEEMED ESSENTIAL. AIR-CONDITIONING IS ALSO REQUIRED BECAUSE OF THE EXTREME TEMPERATURES (EXCEEDING 100 DEGREES FARENHEIT) WHICH ARE EXPERIENCED SEVERAL MONTHS OF THE YEAR IN PROJECT AREAS. CONSISTENT WITH A.I.D. HANDBOOK 1B, PARAGRAPH 4C2A.5(B), THE USAID/PAKISTAN MISSION DIRECTOR HAS EXAMINED THE NEED FOR AUSTERITY AND ECONOMY TO PROJECT ACCOMPLISHMENT AND HAS DETERMINED AIR-CONDITIONING IS JUSTIFIED. FINALLY, DIESEL ENGINES ARE REQUIRED FOR ALL FIELD VEHICLES SINCE THEY CAN BE EASILY SERVICED OWING TO THEIR WIDESPREAD USE IN PAKISTAN. DIESEL FUEL IS READILY AVAILABLE AND AFFORDS GREATER ECONOMY AS WELL.

A. DELUXE STATION WAGONS AND LAND CRUISER STATION WAGONS:

THE REQUESTED STATION WAGONS REQUIRED FOR THIS PROJECT HAVE THE NECESSARY CAPACITY TO TRANSPORT UP TO 9 ADULTS, AND THE DURABILITY SUITABLE FOR THEIR EXPECTED USE ON LONG TRIPS TO RELATIVELY REMOTE AREAS. STATION WAGONS WILL BE USED BY THE LONG-TERM EXPATRIATE ADVISORS AND THEIR PAKISTANI COUNTERPARTS FOR EXTENSIVE TRAVEL IN ALL FOUR PROVINCES OF PAKISTAN. THESE VEHICLES ARE LARGE ENOUGH TO SEAT AT LEAST 6 PASSENGERS COMFORTABLY AND UP TO 9 PASSENGERS IN TOTAL FOR LONG DISTANCE DRIVING AND HAVE SUFFICIENT CARGO SPACE TO TRANSPORT LUGGAGE AND FIELD EQUIPMENT AS NECESSARY. THE U.S. DOES NOT MANUFACTURE A VEHICLE THAT MEETS THE REQUIRED SPECIFICATIONS. THE AMERICAN MOTORS CORPORATION (AMC) MAKES A STATION WAGON (CJ-8) THAT WAS CONSIDERED AS AN OPTION, BUT THE CJ-8 IS NOT A COMPARABLE VEHICLE. THE CJ-8 IS PRIMARILY A UTILITY VEHICLE WHICH HAS A MAXIMUM SEATING CAPACITY FOR ONLY 5 PASSENGERS AND DOES NOT, IN THE MISSION'S JUDGEMENT, PROVIDE PASSENGER COMFORT FOR LONG DISTANCE DRIVING. SIMILARLY, NO CODE 941 COUNTRY MANUFACTURES VEHICLES WITH THE REQUIRED SPECIFICATIONS.

B. COMMUTER VANS:

THE REQUESTED 15-PASSENGER COMMUTER VANS ARE WIDELY USED THROUGHOUT PAKISTAN BY COMMERCIAL PASSENGER TRANSPORT FIRMS AND GOVERNMENT AGENCIES FOR THE MOVEMENT OF PERSONNEL. THE VANS HAVE THE NECESSARY HIGH ROAD CLEARANCE, HEAVY DUTY SUSPENSION, RUGGED CONSTRUCTION AND STABILITY REQUIRED FOR THE LESS-THAN-OPTIMUM ROAD CONDITIONS WHICH EXIST IN PAKISTAN, RANGING FROM HARD SURFACE TO DIRT TRACKS. THE LATTER FEATURE IS EXTREMELY IMPORTANT SINCE THE VANS WILL BE USED TO TRANSPORT TRAINEES FROM TRAINING FACILITIES TO RESEARCH AND DEMONSTRATION PLOTS, OFTENTIMES LOCATED AWAY FROM HARD-SURFACED ROADS. THERE ARE NO

U.S. OR CODE 941 COUNTRY VEHICLES MANUFACTURED THAT HAVE BOTH THE CAPACITY TO SEAT 12-15 INDIVIDUALS AND ALSO THE OTHER REQUIRED SPECIFICATIONS.

C. PICKUP TRUCKS:

THE DOUBLE-CAB, 4-WD, DIESEL PICKUP TRUCKS REQUESTED FOR THIS PROJECT HAVE THE REQUISITE LARGE OPEN CARRYING CAPACITY FOR HANDLING BULKY EQUIPMENT AND FOR TRANSPORTING RESEARCH PERSONNEL AS WELL AS THE MOBILITY FOR OFF-THE-ROAD USE. THE OVERALL SIZE, BOTH IN TERMS OF WIDTH AND WHEELBASE DIMENSIONS, LENDS ITSELF TO THE NEEDS OF RESEARCHERS AND OUTREACH PROGRAM PERSONNEL UNDER THE CONDITIONS CHARACTERISTIC OF RESEARCH SITES, WHICH ARE OFTEN MANY MILES AWAY FROM HARD-SURFACED ROADS AND FURTHER COMPLICATED BY NARROW CANAL BRIDGES AND NARROW STREET LANES SERVING AS ROADS THROUGH VILLAGES. THERE ARE NO U.S. OR CODE 941 COUNTRY VEHICLES MANUFACTURED WITH THE REQUIRED SPECIFICATIONS.

5. AUTHORITY: SECTION 636(I) OF THE FOREIGN ASSISTANCE ACT OF 1961 AS AMENDED REQURES A.I.D. TO PROCURE U.S.-MANUFACTURED VEHICLES BUT ALSO PROVIDES FOR SPECIAL CIRCUMSTANCES THAT MAY JUSTIFY WAIVING THIS REQUIREMENT. THE SPECIAL CIRCUMSTANCES WHICH

ARE DIRECTLY APPLICABLE IN THIS CASE ARE THE INABILITY OF U.S. MANUFACTURERS TO PROVIDE A PARTICULAR TYPE OF NEEDED VEHICLE (A.I.D. HANDBOOK 1, SUPPLEMENT B, CHAPTER 4C2D(1)(A)) AND THE LACK OF ADEQUATE SERVICE FACILITIES AND SUPPLIES OF SPARE PARTS FOR U.S.- MANUFACTURED VEHICLES (A.I.D. HANDBOOK 1, SUPPLEMENT B, CHAPTER 4C2D(1)(B)). HANDBOOK 1, SUPPLEMENT B, CHAPTER 4C2D(3) AND DELEGATION OF AUTHORITY NO. 40 AUTHORIZE ASSISTANT ADMINISTRATORS TO WAIVE SOURCE/ORIGIN/NATIONALITY REQUIREMENTS IN THIS INSTANCE.

6. CERTIFICATION: IN APPROVING THIS WAIVER REQUEST, YOU WILL BE CERTIFYING THAT EXCLUSION OF PROCUREMENT FROM FREE WORLD COUNTRIES OTHER THAN THE COOPERATING COUNTRY AND GEOGRAPHIC CODE 941 COUNTRIES WOULD SERIOUSLY IMPEDE ATTAINMENT OF U.S. FOREIGN POLICY OBJECTIVES AND THE OBJECTIVES OF THE FOREIGN ASSISTANCE PROGRAM.

7. RECOMMENDATIONS: THAT YOU APPROVE A WAIVER OF SECTION 636(I) OF THE FAA AND A SOURCE/ORIGIN/NATIONALITY WAIVER TO PERMIT PROCUREMENT OF THE REQUIRED VEHICLES FROM AID GEOGRAPHIC CODE 935 (SPECIAL FREE WORLD) COUNTRIES. HINTON
BT

D R A F T

ACTION MEMORANDUM FOR THE USAID/PAKISTAN MISSION DIRECTOR

From: PDM - Linda Lion, Chief/PDM

I. PROBLEM:

To obtain a source/origin/nationality waiver from A.I.D. Geographic Code 000 (U.S. only) and Pakistan to A.I.D. Geographic Code 935 (Special Free World) to permit the Pakistan Agricultural Research Council (PARC) to procure multi-media production studio equipment and research plot seeding and harvesting equipment and spare parts under the Management of Agricultural Research and Technology Project (391-0489).

II. BACKGROUND:

A. Cooperating Country : Pakistan

B. Authorizing Document : Project Authorization dated July 1984

C. Project Title and Number : Management of Agricultural Research and Technology (391-0489)

D. Geographic Code of Project : 000 and Pakistan

E. Importer of Commodities : Pakistan Agricultural Research Council, Ministry of Food, Agriculture, and Cooperatives, GOP.

F. Description of Commodities :

1. Multi-Media Production Studio Equipment (See Attachment 1 for Illustrative List):

: a. Video and sound production studio equipment valued at $150,000;

: b. Multi-media electronic field production unit equipment valued at $100,000;

: c. Multi-media display unit equipment valued at $150,000; and,

: d. Spare parts for the above equipment valued at $50,000

TOTAL = $450,000

2. Research Plot Seeding and Harvesting Equipment (See Attachment 2 for Specifications)

: a. One (1) Claas large plot/small grains combine valued at $30,000;

: b. Three (3) Hege small plot/small grains combines valued at $45,000;

: c. Four (4) Wintersteiger plot seeders valued at $48,000; and,

: d. Spare parts for the above equipment valued at $27,000

TOTAL = $150,000

G. Approximate Value of Commodities : $600,000

H. Nature of Funding : ESF Grant

I. Procurement Source/ Origin : Japan (for multi-media production studio equipment) and West Germany and Austria (for the research plot seeding and harvesting equipment)

III. DISCUSSION

A. Multi-Media Production Studio Equipment

The multi-media, video and sound studio and field production and display equipment and spare parts required under the Management of Agricultural Research and Technology Project will be utilized to support the development of a multi-media production studio on the campus of the National Agricultural Research Center (NARC) under the Information Transfer component of the project. During the formulation and design of the project, an analysis was undertaken of Pakistan's existing mass media facilities to determine if these facilities (namely, the Pakistan Television Corporation; the NWFP Agricultural University at Peshawar; and, Allama Iqbal Open University) had the capacity and capability to carry out the agricultural research/extension media work contemplated under the project. The findings of the analysis indicated the need to develop a new multi-media studio devoted exclusively to serve the unique and specialized needs of the entire agricultural research network in Pakistan.

To facilitate servicing and to ensure that all components are fully compatible, the communications equipment must have specifications compatible with the mass communications standards of Pakistan. The Pakistan Television Corporation produces and broadcasts its video programming using the Phase Alternating Line (PAL) video standard. Video equipment of this standard is not manufactured in the U.S. The U.S. manufactures equipment of the National Television Standards Committee (NTSC) video standard, and PAL and NTSC video standards are not compatible. Therefore a waiver is required.

B. Research Plot Seeding and Harvesting Equipment

The requested small grain planting and harvesting equipment will be used throughout Pakistan in support of the GOP's Nationally Coordinated Wheat Research Programs. The equipment will be utilized in the sowing and harvesting of small and large wheat research plots and adaptive trial plots, located both on research stations or on farmers' lands. The equipment must be easily transportable and equally manageable in small land areas, often times requiring movement of the equipment over irrigation ditches and through areas that are not accessible by road. In addition to these criteria, the equipment must be self-cleaning to ensure that plots are not contaminated by "hung-up" seed left over from previous plot planting or harvesting.

This type of equipment is used extensively throughout the world in small grain research and adaptive trial activities because of its ease of transport, maintenance and self-cleaning capability. Comparable equipment is not available in the United States as a standard production item. The institutions in the United States that require this type of equipment either procure the same type of equipment requested under this waiver or fabricate equipment themselves to meet their specific requirements.

Pakistan is using Hege combines and Wintersteiger planters in its agricultural research work so that in-country expertise exists in the operation and maintenance of this type of equipment. The amount of equipment available in-country is inadequate to meet the requirements of the project. The Mission has concluded that the equipment requested in this waiver is the only equipment available which fully satisfies the needs of this project.

IV. JUSTIFICATION:

Paragraph 5B4A of Supplement B of Handbook 1 provides for special circumstances that may justify waiving the authorized geographic code of a project. The special circumstance which is directly applicable in this case is the inability of U.S. or Pakistani manufacturers to provide the particular type of needed equipment. Handbook 1, Supplement B, Chapter 5B4C(2) and Delegation of Authority No. 40 authorize the USAID/Pakistan Mission Director to waive source/origin/ nationality requirements for procurements valued at up to $ 1,000,000.

V. **RECOMMENDATION:**

For the above reasons, it is recommended that you:

A. determine that special circumstances exist to justify waiving the requirement to procure U.S. or Pakistani manufactured equipment.;

B. waive the source/origin/nationality requirements set forth in Handbook 1, Supplement B, to permit the procurement of the required equipment from countries included in A.I.D. Geographic Code 935; and,

C. certify by signature below that, pursuant to Section 5B4c of A.I.D. Handbook 1, Supplement B, exclusion of procurement of the requirement equipment from Free World countries other than the Cooperating Country and countries included in A.I.D. Geographic Code 941 would seriously impede the attainment of U.S. foreign policy objectives and the objectives of the foreign assistance program.

Approved/__/ Disapproved/__/

_____
Donor M. Lion
Director

_____
Date

ATTACHMENT 1

Multi-Media Production Studio Equipment

1. Video and Sound Production Studio Equipment

Description of Commodity	Units
Color video camera/viewfinder/accessories	2
3-tube portable/studio, PAL [SONY DXC-6000] Color video camera	2
1-tube portable, PAL [SONY DXC-1800 PK] Videocassette editing recorders	4
3/4" tape format, PAL [SONY BVU-800P] Color video monitors	4
20" diagonal, PAL [SONY CVM-2000P] Control room video monitors	4
20" diagonal, PAL, B/W [SONY CVM-20KE] Camera switcher/effects generator	1
For keying, fading, blending [SONY SE6-2000]	1
Video time base corrector	1
[SONY BVT-500P] Video equipment mounting rack	2
Video patchboard and cables	1
Telecine adapter	1
Video accessories, tools, furniture	1
Video tape stock	100
Vectorscope	1
Waveform monitor	1
Lighting	1
Open-reel audio tape recorder including headphones, microphones accessories [TEAC X-1000M]	4

Audio mixer system, 6-channel, filters on each (TEAC System 20)	1
Audio amplifier, stereo	1
Speaker systems	2
Cassette audio tape recorder	2
Audio accessories, tools, furniture	1
Computer graphics generator	1
External sync, PAL [Euro Apple //e with video interface] Video-cassette recorder	3
1/2" VHS, PAL, external sync to dub for distribution [National NV-788 EN] Color television projection system	
200" diagonal, PAL/SECAM/NTSC 4.43 [SONY VKP-670WPS] Open reel to cassette duplicator	1
Cassette to cassette duplicator	1
Sub Total =	$ 150,000

2. <u>Multi-media Electronic Field Production Unit Equipment</u>

Portable Color video recorder 3/4" tape format, high-band performance, PAL [SONY BVN-100P]	5
Portable color video camera/accessories, single-tube, PAL, heavy duty tripod [SONY DXC-1800PK]	5
Portable color monitor, 4" diagonal, PAL[SONY PVM-4000P]	5
Portable audio cassette recorder/accessories	5
3/4" video tape stock	125
Open reel audio tape stock	125
Audio cassette tape stock	125

Battery chargers	10
Rechargeable batteries	50
Cable, connectors, misc. supplies	5
Tool kit	5
Cases for equipment	20
Sub-Total =	$ 100,000

3. Multi-Media Display Unit Equipment

Color video monitor/speakers, 27" diagonal, PAL/SECAM/NTSC 4.43/NTSC 3.58 [SONY KX-27PS1, SONY SS-X2A]	20
Video-cassette recorder, 3/4" format PAL/SECAM/NTSC 4.43 [SONY VO-5630]	20
Videoc-assette recorder, 1/2" format, PAL/SECAM/NTSC 4.43 [National NV-330EN]	20
Audio cassette recorder, professional system	20
Audio cassette recorder, simple	60
Carousel slide projector/accessories	20
Public address system	20
Cables, connectors, misc. supplies	20
Tool kit	20
Sub-Total =	$ 150,000
4. Spare Parts	50,000
TOTAL=	450,000

ATTACHMENT 2

Research Plot and Harvesting Equipment

1. One (1) Claas Compact 25 combine system Rautenschlein manufactured by Firma Otto Rautenschlein, D-3338 Schoningen, Postfach 146, Federal Republic of Germany.

2. Three (3) Hege single row, tool carrier plot combines manufactured by Hans-Ulrich Hege, Saatzuchtmaschinen, Domane Hohebuch, D-7112 Waldenburg/Wurtt, Federal Republic of Germany.

3. Four (4)Wintersteiger Plotman self-propelled tool carrier Seedmatic cell-disc plot seeders manufactured by F. Walter & H. Wintersteiger, A-4910 Ried Austria.

4. Spare parts for the above.

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FOR ASIA/PD - PAT MATHESON

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

1. THIS CABLE TRANSMITS DRAFT LANGUAGE FOR THE CN FOR THE SUBJECT PROJECT AND REQUESTS THAT AID/W PROCESS SAME ASAP AND ADVISE MISSION WHEN WAITING PERIOD EXPIRES AND MISSION CAN OBLIGATE FUNDS. TARGET DATE FOR OBLIGATION IS LAST WEEK IN JUNE 1984.

2. ACTIVITY DATA SHEET:

PROGRAM: PAKISTAN

TITLE: MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY

FUNDS: ECONOMIC SUPPORT FUNDS

PROPOSED OBLIGATION (IN THOUSANDS OF DOLLARS):
- FY 1984 EQUALS DOLS 5,000
- LOP EQUALS DOLS 30,000

NUMBER: 391-0489

GRANT

NEW

PRIOR REFERENCE: NONE
INITIAL OBLIGATION: FY 1984

ESTIMATED FINAL OBLIGATION: FY 1987

ESTIMATED PROJECT COMPLETION DATE: FY 1989

3. PURPOSE: TO STRENGTHEN THE PERFORMANCE OF THE NATIONAL AGRICULTURAL RESEARCH SYSTEM TO GENERATE AND DISSEMINATE QUALITY AND RELEVANT AGRICULTURAL TECHNOLOGIES TO THE FARMERS OF PAKISTAN.

4. BACKGROUND: THE MART PROJECT BUILDS ON THE CONSIDERABLE ACCOMPLISHMENTS THAT HAVE CHARACTERIZED

AGRICULTURAL RESEARCH IN PAKISTAN OVER THE PAST 37 YEARS AND, IN PARTICULAR, UPON THE GAINS ACHIEVED UNDER THE A.I.D.-FINANCED AGRICULTURAL RESEARCH PROJECT (391-0298), WHICH BEGAN IN 1969 AND WILL END IN 1985. THAT PROJECT WAS SUCCESSFUL IN LAYING A SOUND BASIS FOR AN EFFECTIVE NATIONAL RESEARCH PROGRAM BY ESTABLISHING THE PAKISTAN AGRICULTURAL RESEARCH COUNCIL (PARC) AS A COMPETENT AND FUNCTIONAL ORGANIZATION AND THE DRIVING FORCE BEHIND AGRICULTURAL RESEARCH IN PAKISTAN AND IN CONSTRUCTING AND DEVELOPING THE NATIONAL AGRICULTURAL RESEARCH CENTER (NARC) IN ISLAMABAD. THE MART PROJECT IS DESIGNED TO ADDRESS THE KEY CONSTRAINTS WHICH STILL REMAIN TO ESTABLISHING AN EFFECTIVE AGRICULTURAL RESEARCH NETWORK IN PAKISTAN AND TAKES INTO ACCOUNT THE LESSONS LEARNED FROM THE COMPREHENSIVE EXTERNAL EVALUATION CONDUCTED IN OCTOBER 1983 OF THE AGRICULTURAL RESEARCH PROJECT. THESE CONSTRAINTS RELATE PRINCIPALLY TO THE FACT THAT THE RAPID GROWTH IN THE AGRICULTURAL SECTOR'S RESEARCH INFRASTRUCTURE HAS OUTPACED THE COUNTRY'S CAPACITY TO MANAGE IT, WITH THE RESULTS THAT: (A) THERE IS AN INEFFICIENT USE OF FINANCIAL, HUMAN, AND TECHNOLOGICAL RESOURCES WITHIN THE SYSTEM; AND, (B) OPERATIONAL LINKAGES BETWEEN FEDERAL AND PROVINCIAL RESEARCH ORGANIZATIONS, AMONG RESEARCH ORGANIZATIONS AT THE PROVINCIAL LEVEL, AND BETWEEN RESEARCH ORGANIZATIONS, EXTENSION AGENCIES, AND THE AGRICULTURAL UNIVERSITIES ARE EXTREMELY WEAK.

5. PROJECT DESCRIPTION: THIS FIVE-YEAR PROJECT WILL PROVIDE TECHNICAL ASSISTANCE, TRAINING, COMMODITIES, CONSTRUCTION SERVICES AND SUPPORT FOR FIELD STUDIES AND DEMONSTRATIONS TO: (A) STRENGTHEN AND EXPAND THE HUMAN, PHYSICAL, AND TECHNOLOGICAL RESOURCES AVAILABLE WITHIN THE NATIONAL AGRICULTURAL RESEARCH NETWORK AND TO IMPROVE THE MANAGEMENT AND ADMINISTRATION OF THE SYSTEM, THE TRAINING CAPACITY, AND THE FLOW OF INFORMATION WITHIN THE SYSTEM AT THE FEDERAL AND PROVINCIAL LEVELS. PARTICIPATING ENTITIES WILL INCLUDE: 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 FACILITIES IN ALL FOUR PROVINCES, AND THE AGRICULTURAL UNIVERSITIES IN THE SIND, PUNJAB, AND NORTHWEST FRONTIER; (B) ADDRESS THE SUBSTANTIAL GAP THAT HAS EXISTED IN ARID HIGH ALTITUDE AGRICULTURAL RESEARCH FOR NON-IRRIGATED AREAS BY STRENGTHENING THE CAPABILITY OF AZRI IN QUETTA, BALUCHISTAN 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; AND, (C) 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.

6. RELATIONSHIP OF PROJECT TO A.I.D. COUNTRY STRATEGY: THE OVERALL A.I.D. STRATEGY IN PAKISTAN RELIES ON A BLEND OF RESOURCES TO REACTIVATE A LONG-TERM RELATIONSHIP IN DEVELOPMENT COOPERATION. PROJECTS ARE INTENDED TO MEET BASIC HUMAN NEEDS, CONTRIBUTE TO LONG-TERM DEVELOPMENT, BUILD A FOUNDATION FOR MORE RAPID ECONOMIC GROWTH, AND RELIEVE BALANCE OF PAYMENTS DIFFICULTIES. THERE IS A MAJOR FOCUS ON BUILDING INSTITUTIONAL CAPACITY IN BOTH THE PUBLIC AND PRIVATE SECTORS TO ENABLE PAKISTAN TO BETTER PLAN, MANAGE, IMPLEMENT AND BEAR THE RECURRING COSTS OF DEVELOPMENT ACTIVITIES. THE OVERALL GOAL OF ACTIVITIES IN THE AGRICULTURE SECTOR IS TO INCREASE PRODUCTIVITY AND FARMER INCOME. OVER THE COMING YEARS, A.I.D. WILL BE SUPPORTING THE GOP IN SEVERAL PROGRAMS TO ACHIEVE THIS GOAL. IT WILL BE MET THROUGH THIS PROJECT BY: INCREASING THE CAPACITY AT THE NATIONAL AND PROVINCIAL LEVELS TO PLAN, MANAGE, AND EVALUATE PAKISTAN'S AGRICULTURAL RESEARCH NEEDS AND PRIORITIES; STRENGTHENING THE CAPABILITY IN THE MANAGEMENT, ACCOUNTABILITY AND UTILIZATION OF FINANCIAL RESOURCES WITHIN THE NETWORK; ESTABLISHING THE CAPACITY TO PRODUCE AND DISSEMINATE NEW TECHNOLOGIES IN A FORM AND MANNER THAT RESPONDS TO THE NEEDS OF CLIENT GROUPS; STRENGTHENING SELECTED COMMODITY AND DISCIPLINARY RESEARCH PROGRAMS; EXPANDING IN-SERVICE TRAINING CAPACITY; STRENGTHENING OPERATIONAL LINKAGES BETWEEN FEDERAL AND PROVINCIAL RESEARCH ORGANIZATIONS AND AMONG THE AGRICULTURAL UNIVERSITIES AND RESEARCH AND EXTENSION AGENCIES; AND, INCREASING THE PARTICIPATION OF THE PAKISTANI PRIVATE AGRIBUSINESS SECTOR IN THE IDENTIFICATION, CONDUCT AND DISSEMINATION OF RESEARCH.

7. HOST COUNTRY AND OTHER DONORS: THE GOP IS EXPECTED TO CONTRIBUTE THE EQUIVALENT OF DOLS 1.1 MILLION OVER THE LIFE OF THE PROJECT TO FINANCE VEHICLE OPERATIONS, LOCAL STAFF SALARIES AND RELATED COSTS, AND FACILITY MAINTENANCE AND OPERATIONS. IN ADDITION, BOTH THE INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN DRY

ARIDAS' (ICARDA) AND THE INTERNATIONAL WHEAT AND MAIZE IMPROVEMENT CENTER (CIMMYT), TWO OF THE PROPOSED CONTRACTORS UNDER THE PROJECT, WILL CONTRIBUTE A TOTAL OF APPROXIMATELY DOLS 750,000 FROM THEIR CORE BUDGETS IN THE FORM OF STAFF SALARIES AND RELATED COSTS. THE MART PROJECT WILL COMPLEMENT AND ENHANCE THE IMPACT OF THREE PROJECTS BEING FINANCED BY THE WORLD BANK - A DOLS 24 MILLION AGRICULTURAL RESEARCH PROJECT TO EXPAND THE FACILITIES AT THE NARC; A TRAINING AND VISITATION PROJECT TO IMPROVE AGRICULTURAL EXTENSION SERVICES; AND A DOLS 10 MILLION THIRD EDUCATION PROJECT TO IMPROVE THE QUALITY AND OUTPUT OF TRAINED PERSONNEL FOR AGRICULTURE AND RURAL DEVELOPMENT IN ADDITION TO INCREASING THE SUPPLY OF QUALIFIED TEACHERS IN PRIMARY AND MIDDLE SCHOOLS -- AND A DOLS 15 MILLION BARANI (DRYLAND) RESEARCH PROJECT FINANCED BY THE CANADIAN INTERNATIONAL DEVELOPMENT AGENCY (CIDA) TO ASSIST NARC CONDUCT ON-STATION AND ON-FARM RESEARCH TO IMPROVE RAINFED CROP YIELDS UNDER TYPICAL FARMERS' CONDITIONS AND TO IMPROVE THE LABORATORY FACILITIES AT THE NARC FOR OIL CROP ANALYSIS.

5. BENEFICIARIES: DIRECT BENEFICIARIES INCLUDE THE RESEARCH SCIENTISTS, EXTENSION AGENTS, AGRICULTURAL

UNIVERSITY STAFF, AND AGRICULTURAL TRAINING FACILITY PERSONNEL WHO WILL BE THE RECIPIENTS OF INCREASED RESOURCES AND TRAINING OPPORTUNITIES AND WHO WILL BE EXPOSED TO CONTINUOUS OPPORTUNITIES FOR UPGRADING THEIR KNOWLEDGE ON THE JOB. THE ULTIMATE BENEFICIARIES ARE THE FARMERS WHOSE INCOME SHOULD RISE AS A RESULT OF INCREASED AGRICULTURAL PRODUCTION AND THE CONSUMERS WHO WILL BENEFIT FROM MORE PLENTIFUL AND AVAILABLE AGRICULTURAL PRODUCTS. SINCE IT IS THE AGRICULTURAL SECTOR IN PAKISTAN WHICH FUELS THE COUNTRY'S ECONOMIC GROWTH, THIS PROJECT SHOULD MAKE A SIGNIFICANT CONTRIBUTION TO THE ECONOMIC DEVELOPMENT AND QUALITY OF LIFE OF THE COUNTRY.

9. MAJOR OUTPUTS

	ALL YEARS
MANAGEMENT IMPROVEMENT INTERVENTIONS DESIGNED AND IMPLEMENTED THROUGHOUT THE NATIONAL AGRICULTURAL RESEARCH NETWORK IN THE AREAS OF RESEARCH PLANNING, RESEARCH METHODS, ORGANIZATION AND ADMINISTRATION, INFORMATION FLOW, AND FINANCING	10
FARMING SYSTEMS RESEARCH STUDIES COMPLETED	40
STUDY COMPLETED TO IDENTIFY POSSIBLE FINANCIAL MECHANISMS TO IMPROVE FLOW OF FUNDS FOR AGRICULTURAL RESEARCH	1
TWO-YEAR PLAN COMPLETED INCLUDING BENCHMARKS FOR INCREASED PAKISTANI PRIVATE SECTOR OPPORTUNITIES IN THE SELECTION OF PRIORITY RESEARCH AREAS, IN THE CONDUCT OF SUCH RESEARCH, IN THE DESIGN AND CONDUCT OF MUTUALLY RELATED TRAINING PROGRAMS AND THE DISSEMINATION OF IMPROVED TECHNOLOGY TO FARMERS	1
REVISED AND IMPROVED FINANCIAL RECORDS MAINTENANCE AND REPORTING SYSTEM ESTABLISHED AT PARC AND THE PROVINCIAL AGRICULTURAL RESEARCH INSTITUTES	1
MANAGEMENT IMPROVEMENTS IN THE AREA OF RESEARCH/OUTREACH INTEGRATION, FIELD-TESTED AND DEMONSTRATED IN ISLAMABAD DISTRICT AND REPLICATED NATIONWIDE	4
A FULLY EQUIPPED AND STAFFED MULTI-MEDIA PRODUCTION STUDIO AT THE NARC	1
A TECHNICAL INFORMATION TRANSFER COMMITTEE INSTITUTIONALIZED	1
VIDEO DOCUMENTARIES, RECORDINGS, MEDIA CAMPAIGNS, AND OTHER TECHNICAL INFORMATION PACKAGES PRODUCED AND DISTRIBUTED TO TARGET AUDIENCES	100

A COMPLETED PERSONNEL NEEDS ASSESSMENT FOR THE AGRICULTURAL RESEARCH NETWORK OVER THE NEXT 10 YEARS AND A COMPREHENSIVE TRAINING PLAN	2
PHYSICAL AND STAFF EXPANSION OF THE NARC TRAINING INSTITUTE	1
IN-COUNTRY PROFESSIONAL IMPROVEMENT PROGRAMS FOR AGRICULTURAL PERSONNEL DEVELOPED AND IMPLEMENTED	4
UNIFORM GUIDELINES ESTABLISHED FOR PARTICIPANT SELECTION, PRE-DEPARTURE PREPARATION, PLACEMENT, AND ACADEMIC SUPERVISION OF OVERSEAS DEGREE AND NON-DEGREE PROGRAMS	1
A 10-YEAR LONG-RANGE PLAN COMPLETED FOR STATION AND ON-FARM TRIALS TO BE CONDUCTED BY AZRI	1
FIELD STUDIES AND FIELD RESEARCH PROGRAMS DESIGNED AND IMPLEMENTED BY AZRI STAFF IN COLLABORATION WITH PROVINCIAL AGRICULTURAL	12

RESEARCH AND EXTENSION PERSONNEL

INSTITUTIONALIZED CAPACITY AMONG PAKISTANI SCIENTISTS TO CONTINUE A GENETIC MAINTENANCE PROGRAM AND RESEARCH ON DISEASE-RESISTANT VARIETIES OF WHEAT AND MAIZE	1
10-YEAR PLANS FOR BOTH WHEAT AND MAIZE RESEARCH DEVELOPED	2

INDIVIDUALS TRAINED IN RESEARCH MANAGEMENT AND ADMINISTRATION, WHEAT AND MAIZE RESEARCH AND PRODUCTION, ARID/NON-IRRIGATED AGRICULTURAL RESEARCH AND PRODUCTION, COMMUNICATIONS, TEACHING METHODS AND CURRICULUM DEVELOPMENT

- U.S. LONG-TERM	-	37
- U.S. SHORT-TERM	-	92
- THIRD COUNTRY SHORT-TERM (INCLUDING AT CIMMYT AND ICARDA)		37
- IN-COUNTRY	-	4705

10. A.I.D. FINANCED INPUTS:

		LIFE OF PROJECT (IN DOLS THOUSAND)
TECHNICAL ASSISTANCE	-	11,765
TRAINING	-	9,317
COMMODITIES	-	2,933
CONSTRUCTION	-	1,660
FARMING SYSTEMS RESEARCH STUDIES		300
OTHER FIELD STUDIES/DEMONSTRATIONS		1,000
EVALUATION	-	300
CONTINGENCY	-	2,725
- TOTAL	-	30,000

11. PRINCIPAL CONTRACTORS OR AGENCIES: INTERNATIONAL WHEAT AND MAIZE IMPROVEMENT CENTER (CIMMYT), INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN DRY AREAS (ICARDA), AND U.S. AND PAKISTANI PRIVATE FIRMS TO BE SELECTED COMPETITIVELY. RATTRAY
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ILLUSTRATIVE LIST OF PROJECT COMMODITIES

I. MART PROJECT-FUNDED COMMODITIES

SUMMARY	VEHICLES	OTHER	TOTAL
1. Research Management and Administration	$22,500	$620,500	$643,000
2. Information Transfer	102,000	613,000	715,000
3. Training for Agricultural Research Network	151,500	373,500	525,000
4. Arid Zone Research	153,500	316,500	470,000
5. Wheat and Maize Coordinated Programs	154,000	426,000	580,000
TOTAL $	583,500	$2,349,500	$2,933,000

COMPONENT 1 - RESEARCH MANAGEMENT AND ADMINISTRATION ($ 643,000)

Description of Commodity	Units	Total Cost	Year of Purchase
1. Computer components, hardware, software, peripherals and related items (specific items and numbers to be determined after completion of needs assessment during year 1 of the project)	-	$300,000	1985
2. Microcomputer components (for updating)	-	80,000	1986-1989
3. Vehicles:			
- Toyota Station Wagons (for U.S. Technicians)	3	19,500	1984
- Spare Parts		3,000	
Sub-Total =		22,500	
4. Household/Office Equipment/Supplies (for U.S. Technicians)	3 Sets	120,000	1984
5. Miscellaneous Research Commodities	-	120,500	1984-1989
TOTAL =		$ 643,000	

COMPONENT 2. - INFORMATION TRANSFER ($715,000)

1. Video and Sound Production Studio Equipment (Illustrative List to be procured in 1985)

Description of Commodity	Units
Color video camera/viewfinder/accessories	2
3-tube portable/studio, PAL [SONY DXC-6000] Color video camera	2
1-tube portable, PAL [SONY DXC-1800PK] Video-cassette editing recorders	4
3/4" tape format, PAL [SONY BVU-800P] Color video monitors	4
20" diagonal, PAL [SONY CVM-2000P] Control room video monitors	4
20" diagonal, PAL, B/W [SONY CVM-20KE] Camera switcher/ effects generator	1
For keying, fading, blending [SONY SYS-2000] Video time base corrector	1
[SONY BVT-500P] Video equipment mounting rack	2
Video patchboard and cables	1
Telecine adapter	1
Video accessories, tools, furniture	1
Video tape stock	100
Vectorscope	1
Waveform monitor	1
Lighting	1
Open-reel audio tape recorder including headphones, microphones, accessories (TEAC X-1000M]	4

Audio mixer system, 6 channel, filters on each [TEAC System 20]	1
Audio amplifier, stereo	1
Speaker systems	2
Cassette audio tape recorder	2
Audio accessories, tools, furniture	1
Computer graphics generator	1
External sync, PAL [Euro Apple //e with video interface] Video-cassette recorder	3
1/2" VHS, PAL, external sync To dub for distribution [National NV-788 EN] Color television projection system	1
200"diagonal, PAL/SECAM/NTSC 4.43 [SONY VKP-570WPS] Open reel to cassette duplicator	1
Cassette to cassette duplicator	1

Sub-Total = $150,000

2. Multi-Media Electronic Field Production Unit Equipment (Illustrative List to be procured in 1985)

Portable color video recorder 3/4" tape format, high-band performance, PAL [SONY BVU-100P]	5
Portable color video camera/accessories Single-tube, PAL, heavy duty tripod [SONY DXC-1800PK]	5
Portable color monitor, 4" diagonal, PAL [SONY PVM-4000P]	5
Portable open reel audio recorder/accessories	5
Portable audio cassette recorder/accessories	5
3/4" video tape stock	125
Open reel audio tape stock	125

Audio cassette tape stock	125
Battery chargers	10
Rechargeable batteries	50
Cable, connectors, misc. supplies	5
Tool kit	5
Cases for equipment	20

Sub-Total = $100,000

3. Multi-Media Display Unit Equipment
(Illustrative List to be procured in 1985)

Color video monitor/speakers, 27" diagonal, PAL/SECAM/NTSC 4.43/NTSC 3.58 [SONY KX-27PSI, SONY SS-X2A]	20
Video-cassette recorder, 3/4" format PAL/SECAM/NTSC 4.43 [SONY VO-5630]	20
Video-cassette recorder, 1/2" format, PAL/SECAM/NTSC 4.43 [National NV-330EN]	20
Audio-cassette recorder, professional system	20
Audio-cassette recorder, simple	60
Carousel slide projector/accessories	20
Public address system	20
Cables, connectors, misc. supplies	20
Tool kit	20

Sub-Total = $150,000

4. Spare Parts for Categories 1-3 $50,000

Description of Commodity	Units	Total Costs

5. Vehicles (to be procured in 1984)

- Toyota Station Wagon (for U.S. Technician)	1	$6,500

	- Toyota Land Cruisers (4-WD) (field vans for production crews)	7	80,500	
	- Spare Parts	-	15,000	
	Sub-Total =		102,000	
6.	Household/Office Equipment/Supplies (for U.S. Technicians)	1 Set	40,000	1984
7.	Furniture/Office Equipment for Studio	-	50,000	1986
8.	Miscellaneous Commodities/Supplies		73,000	1984-1989
	TOTAL =		$ 715,000	

COMPONENT 3. - TRAINING FOR THE AGRICULTURAL RESEARCH NETWORK ($525,000)

1. Vehicles (to be procured in 1984)

Description of Commodity	Units	Total Costs
Toyota Station Wagon (for U.S. Technician)	1	6,500
Toyota Land Cruisers	5	57,500
Toyota Pickups (double cab, diesel)	5	30,000
Toyota 15-passenger Vans	5	32,500
Spare Parts	-	25,000
Sub-Total =		151,500

2.	Household/Office Equipment for U.S. Technician	1 set	40,000	1984
3.	Furniture/Office Equipment for Training Facility/Dorms		150,000	1986
4.	Miscellaneous Training Supplies/Commodities		183,500	1984 1989
	TOTAL =		$525,000	

COMPONENT 4. - ARID ZONE RESEARCH ($470,000)

1. Vehicles (to be procured in 1984)

Toyota Station Wagon (for Technicians)	5	32,500	
Toyota Pickups (double cab, diesel)	9	54,000	
International Harvester Truck (5 ton/flatbed with removeable sides, 2x4, diesel)	1	47,000	
Spare Parts	-	20,000	
Sub-Total =		153,500	
2. Household/Office Equipment for Expatriate Technician	4 sets	160,000	1984
3. Miscellaneous Research Commodities/Supplies		156,500	1984-1989
TOTAL =		$470,000	

COMPONENT 5. - WHEAT AND MAIZE COORDINATED PROGRAMS ($580,000)

1. General (to be procured in 1984)	Units	
Hedge plot combine	3	
Wintersteiger seeders	4	
Claas large plot combine	1	
Sub-Total =		$150,000
2. Vehicles (to be procured in 1984)		
Toyota Station Wagon (for technicians)	4	26,000
Toyota Pickups (double cab, diesel)	18	108,000
Spare Parts		20,000
Sub-Total =		154,000
3. Household/Office Equipment for Expatriate Technicians (to be procured in 1984)	3 sets	120,000
4. Miscellaneous Research Commodities/Supplies		156,000
TOTAL =		$580,000

II. ACE PROGRAM - FUNDED COMMODITIES FOR THE MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY PROJECT

Summary Budget

($ 000)

Project Component	Commodities		
Research Management and Administration	Miscellaneous Equipment		1300
Training for the Agricultural Research Network	Audio-Visual Equipment	24	
	Agricultural Equipment and Materials	32	
	Office Equipment	69	
	Bus (35 passenger, U.S.)	35	160
Arid Zone Development	Research Support	262	
	Agronomy	72	
	Meteorological Equipment	30	
	Animal Range Equipment	73	
	Analytical Laboratory	28	465
Wheat and Maize Coordinated Programs	Seed Cleaner	8	
	Herbicide Spraying Equipment	10	
	Miscellaneous Demonstration and Research Equipment	50	
	Barani Seed Dril	7	75
Total			2000
Freight and Insurance			500
Grand Total			2500

Detailed Listing

COMPONENT 1. RESEARCH MANAGEMENT AND ADMINISTRATION ($1,300,000)

Miscellaneous vehicles and equipment required to upgrade programs, laboratories, etc., in provinces. List to be developed through needs survey

COMPONENT 3. TRAINING FOR THE AGRICULTURAL RESEARCH NETWORK (Illustrative List) ($160,000)

1. Audio-Visual Equipment

Description of Commodity	Units	Cost
Portable flipchart/chalkboard/tripod	12	$ 1,020
Small bulletin board	25	625
35mm camera with accessories	4	5,100
Slide mounter/viewer	6	3,000
16mm projectors	6	7,650
Transformers	12	1,500
Basic graphics kit/drawing table	5	5,000
		(23,895)

2. Agricultural Equipment and Materials

Description of Commodity	Units	Cost
Knapsack sprayers	30	$ 2,250
Mist blowers	6	1,800
Hand seeders	45	2,025
Soil testing kit	45	2,700
Sighting level	45	3,375
100m tape measure	6	300
Basic implement kit/pruning shears, saws, castrating knives, other tools	45	6,750
Addition to book library	1	8,000
Scales and measuring sets	6	330
Other equipment	1	5,000
		(32,530)

3. Office Equipment

Description of Commodity	Units	Cost
Typewriter/printers/microcomputer word processors	6	$ 18,000
Stencil cutters	5	14,250
Mimeograph machines	6	8,400
Thermofax copiers	6	4,200
Film storage boxes	8	600
4-drawer file cabinets	22	5,500
Large metal/lockable storage cabinets	22	6,380
Calculators	12	360
Desks/chairs/lamp sets	16	6,000
Other equipment	1	5,000
		(68,690)

4. Vehicles

Description of Commodity	Units	Cost
Bus—35 passenger	1	$ (35,000)

COMPONENT 4. ARID ZONE RESEARCH ($465,000)

1. Research Support

Description of Commodity	Units	Cost
Tractor—small	1	$ 10,000
Tractor—medium	1	25,000
Tillage equipment		20,000
Experimental plot planters, cone type	3	36,000
Experimental plot combines	2	48,000
Threshers	6	18,000
Ovens (various)		23,000
Scales and balances		14,000
Laboratory equipment (small)		11,000
Typewriters	3	3,000
Calculators	7	2,000
Office Furniture	16	48,000
Photocopiers	2	4,000
		(262,000)

2. Agronomy

Description of Commodity	Units	Cost
Trailers	2	$ 12,000
Augers	2	4,000
Neutron probes	3	9,000
Pressure plate apparatus	1	3,000
Soil shakers	2	2,000
Seed counters	2	5,000
Green area measurers	2	10,000
Microscopes	2	2,000
Plant soil grinders	2	2,400
Sample refrigerators	2	2,900
Harrows spike	1	500
Rotovators	2	1,500
Sprayers (backpack motorized)	4	1,500
Forage harvestar	1	2,500
Plant water status console	1	3,500
Compressor	1	1,000
Tune solarimeters	10	2,000
Integrators	10	1,[illegible]
Diffusion borometers	2	6,[illegible]
Infrared thermometer	1	500
		(72,300)

3. Meteorological Equipment

Description of Commodity	Units	Cost
Hygro thermographs	7	$ 3,500
Anemometer	6	3,000
Pyranometer	8	10,000
Stevenson Screens	6	3,000
Thermographs 3 point	6	7,000
Class A pans	6	300
Rain guages	50	2,500
Assman psychometer	1	500
		(29,800)

4. Animal Range Equipment

Description of Commodity	Units	Cost
Tripods and crates for weighting sheep	2	$ 1,000
Spring balances 0-100 kg, 0.5 kg divisions	3	400
Spring balances 0-25 kg, 0.1 kg divisions	3	400
Platform balances, 0-100 kg, 0.5 kg divisions	3	2,000
Eartags and applicators	1000/3	1,000
Injecting equipment		500
Fencing, sheep proof netting, post, gates	20 km	25,000
Metal digestibility crates	8	3,200
Balances 0-4000 g, 0.01 g divisions	3	6,000
Drying ovens, 2000 liters	3	10,000
Hammer mill for feed grinding	2	10,000
Deep freezers, 2000 liters	3	10,000
Micro Keldahl	2	1,200
Van Soest equipment	1	300
Soxhlet apparatus	1	500
Herbarium and plant collection equipment		2,000
		(73,500)

5. Analytical Laboratory

Description of Commodity	Units	Cost
PH meter and electrodes	1	$ 1,500
EL meter and cells	1	1,500
Spectrophotometer	1	6,000
Emission spectrophotometer	1	3,800
Muffle furnace	1	1,700
Chemical balances (electronic)	2	3,000
Glassware		5,000
Sieves (graded set)		600
Chemicals		4,500
		(27,600)

COMPONENT 5. WHEAT AND MAIZE COORDINATED PROGRAMS ($75,000)

Description of Commodity	Units	Cost
Seed cleaner (M2B)	4	$ 8,000
Herbicide spraying equipment		10,000
Miscellaneous Demonstration and Research Equipment		50,000
Barani seed drill	1	$ 7,000
		(75,000)

PROJECT DESCRIPTION FOR INCLUSION IN PROJECT AGREEMENT

A. Project Goal and Purpose

The sectoral goal to which this project will contribute is to increase agricultural production, farm income and rural employment. The purpose of the project is to strengthen the performance of the national agricultural research system to generate and disseminate quality and relevant agricultural technologies to the farmers of Pakistan.

B. Project Components

The project consists 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 are 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 will include but are 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 Northwest Frontier. The fourth component addresses 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. Under this component, funds will be provided to strengthen the capability of AZRI, which is located in Quetta, Baluchistan, 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. The fifth component will 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.

1. Research Management and Administration

Under this project component, a series of systems analyses will be undertaken by teams of specialists to identify the problems and their causes and propose alternative solutions in the areas of research planning, research methods, organization and administration, information flow, and financial management. Recommendations emerging from these analyses are intended to be translated into specific management improvement interventions which will be implemented throughout the national agricultural research network under the direction of PARC, with the assistance of long-term and short-term consultants. A number of special studies and interventions are also planned, including those in

the areas of farming systems research, funding of agricultural research, private sector participation in agricultural research, bookkeeping and accounts, and research/outreach integration.

2. Information Transfer

The purposes of this component are to: (a) make research results more readily available to the general public and potential end-users; and, (b) disseminate the information in ways which respond to the needs of client groups and which ensure that the information will be properly and effectively utilized. Activities contemplated under this component include, by illustration, technical assistance and training in the production and dissemination of media and target-oriented technical information packages and the construction and equipping of a multi-media production studio on the campus of the NARC.

3. Training for the Agricultural Research Network

This component is designed to improve the capacity of the agricultural research community in Pakistan to, amongst other things: (a) identify personnel needs; (b) define appropriate education and development programs to meet those needs; and, (c) develop and institutionalize in-service, in-country career development courses to train existing and new personnel. To achieve this objective, the following activities are contemplated: (a) implementation of a personnel needs assessment and preparation of a long-term training plan; (b) training of NARC and Provincial training facility staff; (c) physical expansion of the NARC training facility; (d) development and initial implementation of tailored in-country training courses; and, (e) development of guidelines for participant selection, pre-departure preparation, and academic supervision of overseas degree and non-degree training programs.

4. Arid Zone Research

This component is designed to strengthen the capacity and capability of AZRI in Baluchistan to generate and disseminate quality and relevant technologies aimed at increasing agricultural production in Pakistan's non-irrigated areas. It is expected that A.I.D. will enter into a Collaborative Agreement with the International Center for Agricultural Research in Dry Areas (ICARDA), to finance the services of expatriate research scientists to work with Pakistani scientists at AZRI, at the Provincial Agricultural Research Institute in Baluchistan, and Provincial extension staff to plan and conduct research programs and to organise and conduct training programs at AZRI and the Provincial training facility in research methodologies, mixed farming, and on-farm research. Specific activities to be undertaken include, by illustration: (a) adaptation trials of imported and local varieties of cereal grains, legumes, forage, and pasture grasses; (b) demonstrations and verification studies on farmers' fields of technologies that have proven superior on research stations; and, (c) special studies on such topics as range and livestock management, mixed farming, animal nutrition, and livestock marketing.

5. Wheat and Maize Coordinated Programs

This project component will support, amongst other things, the following research and outreach activities carried out through Pakistan's Nationally Coordinated Wheat and Maize Programs: (a) the continuation of efforts to produce high-yielding varieties of wheat and maize that are adapted to Pakistani conditions; (b) the development of a detailed agro-ecological analysis that will permit the identification of wheat and maize zones in Pakistan; (c) the establishment of larger and more accessible on-farm research and verification areas in representative locations that will permit the generation, testing and revision of production techniques appropriate to Pakistani conditions; and, (d) the increased use of farming systems research methods to ensure that the generation of researchable ideas and the development and extension of new technologies are done in ways that maximize their chances of adoption by farmers.

C. Illustrative Implementation Plan

1. A.I.D. Responsibilities

A.I.D. will be responsible for: (a) negotiating and awarding a contract to a U.S. firm to provide technical advisory services for the Research Management and Administration, Information Transfer, and Training for the Agricultural Research Network components; (b) negotiating and awarding a contract under the Collaborative Assistance mode to the International Center for Agricultural Research in Dry Areas (ICARDA) to assist in implementing the Arid Zone Research component; (c) arranging for the services of a short-term U.S. architectural and engineering (A&E) consultant to design the preliminary architectural layout of the production studio and expanded training facility on the NARC campus; (d) purchasing directly all project vehicles and all household and office equipment and supplies for long-term consultants as well as assisting PARC in the procurement of the remaining off-shore commodities; (e) arranging for the short-term and long-term training of participants outside of Pakistan; (f) providing sufficient staff to participate in the scheduled project evaluations and to liaise with host country staff in the implementation of this project; and, (e) inspecting and certifying for payment construction installations.

3. GOP Responsibilities

The GOP agency responsible for the overall implementation of this project is the Pakistan Agricultural Research Council (PARC), a semi-autonomous organization within the Ministry of Food, Agriculture and Cooperatives. The four Provincial Secretariats of Agriculture, through their Departments of Research and Extension, will be responsible for implementing activities in their respective provinces in accordance with the existing Federal/Provincial divisions of authority and responsibility in Pakistan. Where authority and responsibility lie with the provinces, PARC will play a coordinating and monitoring role.

The Arid Zone Research Institute (AZRI) in Quetta, Baluchistan will be primarily responsible for implementing the Arid Zone Research Component. Implementation of the Wheat and Maize Coordinated Programs component will be the responsibility of PARC and the National Agricultural Research Center (NARC) under the Nationally Coordinated Program. The agricultural universities and Provincial agricultural training facilities will participate both as implementors and beneficiaries of project activities. To facilitate coordination and implementation of the project, a Project Coordinating Committee, composed of representatives from the Federal and all four Provincial Governments and each agricultural university, will be established under the chairmanship of PARC.

The GOP will be responsible for: (a) negotiating and awarding a contract to the International Wheat and Maize Improvement Center (CIMMYT) to assist in implementing the Wheat and Maize Coordinated Programs component; (b) negotiating and awarding a contract to a Pakistani management and accounting firm to assist PARC and the Provincial agricultural research institutes to strengthen their bookkeeping operations; (c) negotiating and awarding a contract to an A&E firm, probably Pakistani, to prepare final construction plans, specifications and bid documents and to supervise construction of the new media production studio and expanded training facility on the NARC campus; (d) negotiating and awarding a contract to a construction firm, probably Pakistani, to provide construction services for the two facilities on the NARC campus; (e) procuring the majority of local and off-shore commodities required for all five components of the project; (f) identifying suitable candidates for both long-term and short-term overseas training; (g) arranging for all in-country training activities; and, (h) providing sufficient staff to participate in the scheduled project evaluations and to serve as counterparts to the expatriate advisors in the implementation of this project.

ILLUSTRATIVE

SUMMARY OF PROJECT COSTS BY EXPENSE CATEGORY AND SOURCE OF FUNDING
(In 000s)

Expense Category	FY 1984		Life of Project Funding a/	
	A.I.D. Grant (In $)	GOP (In Rs)	A.I.D. Grant b/ (In $)	GOP c/ (In Rs)
1. Technical Assistance	2,919	-	11,765	-
2. Training	360	-	9,317	-
3. Commodities	1,721	-	2,933	-
4. Other Costs	-	1,300	3,260	13,416
Sub-Total	5,000	1,300	27,275	13,416
Contingency	-	-	2,725	1,339
TOTAL	5,000	1,300	30,000	14,755

a/ Subject to the availability of funds to A.I.D. for this purpose and to the mutual agreement of both parties to proceed at the time of each subsequent increment.

b/ For Pakistan Fiscal Year 1984/85 (July 1, 1984 - June 30, 1985).

c/ Does not include approximately $2.5 million under the Agricultural Commodities and Equipment Program (391-0468) for the importation of agricultural research commodities and equipment, subject to the availability of funds to A.I.D. for this prupose.

ANNEX J

REPORT

of the

EVALUATION TEAM

(Executive Summary)

Project 391-0296

Strengthening Agricultural Research

in

PAKISTAN

October, 1983

I. EXECUTIVE SUMMARY

A. The Development Problem

Agriculture is the largest single sector of the Pakistan economy, accounting for 32 percent of the Gross Domestic Product (GDP) and employing 55 percent of the nation's labor force. It earns 80 percent of the country's foreign exchange through export of agricultural and agro-based commodities and provides sustenance to over 70% of the population directly and indirectly.

The country's population of 90 million is increasing at the rate of 3 percent per year. A major objective of the Fifth Five Year Plan (1978/79 to 1982/83) was to achieve a growth rate of 6 percent per annum in agriculture. This would not only keep pace with population growth but also permit increases in per capita consumption and would increase earnings of foreign exchange.

To achieve this goal the government took steps to make agricultural inputs and credit more easily available and provided incentives in the form of higher prices for major commodities. Allocations of funds for agricultural research were increased and major changes were made in organization and management of research at the federal level. Agricultural growth fell short of the 6 percent target, averaging slightly above 4 percent per year over the five year period, due more to increases in area than to increases in yield per acre.

The inadequacy of the Pakistan agricultural research system to support a high rate of growth in agriculture has long been recognized. At the time of Independence (1947) the very substantial agricultural research system of undivided India was left largely in India. Not one of the national institutes was located in territories which constituted Pakistan.

B. The Project and Its Evolution

The Government of Pakistan invited high level teams of U.S. scientists to work with Pakistani counterparts to review the Pakistani Agricultural Research System and suggest measures for improving the situation. Joint Pakistani-American teams undertook extensive reviews in 1968 and again in 1973. Beginning in 1969 AID entered into a series of Project Agreements with the Government of Pakistan for strengthening its agricultural research system. The initial agreement provided dollar and rupee grant funds to support the research program

of the then West Pakistan, and now Punjab Agricultural University, Faisalabad. This was followed in 1974 by a major program of loan and grant funds to the Pakistan Agricultural Research Council (PARC), based largely on the recommendations of the 1968 and 1973 joint Pakistan-American teams.

While the official starting date for this project is 1969, no significant activities for strengthening the research system were undertaken until the 1974 grant agreement, which focused on development of a national system through PARC. The purpose of the project was, and remains, "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". Specifically, the project provided support to PARC, the counterpart Pakistan agency responsible for implementing the project, to support development of coordinated national research programs for major commodities and disciplines, in cooperation with provincial institutes, and for construction of a National Agricultural Research Center at Islamabad to undertake research in areas of national importance where such research is not currently being undertaken, or is seriously inadequate, and it can best be done at a well equipped, staffed and funded central institution.

Several problems arose early in implementation of the project, largely because it was initiated before adequate staffing and managerial resources had been established at PARC. Reviews in 1976 and 1977 led to a redesign of the project in 1978, giving higher priority to building an institutional base which could eventually support a comprehensive research program.

As a result of application of Section 669 of the Foreign Assistance Act, $737,950 of the grant funds authorized in 1974 were not obligated. Then, in 1979 disruptions at the American Embassy caused resident technical advisors to be sent home. This severely reduced AID's ability to support and monitor the project for some time.

The project was again amended in April 1982, extending it for another three years and adding funds to complete construction of the NARC, equip the facility and further strengthen the managerial and research capabilities of the center. The 1982 agreement increased the rupee grant

component by Rs.29,700,000. Total USAID funds available to the project from its inception in 1969 amount to $6,200,000 in development loan funds, $4,792,000 in dollar grants, and Rs.155,200,000 in Mondale rupee grants.

C. Evaluation Purpose and Methodology

The purpose of this evaluation is to assess the impact of the project on strengthening the research capability of the Pakistan agricultural research system. A team of six persons was engaged for three weeks for the task. Prior to arrival of the team PARC carried out a comprehensive internal evaluation. Its findings provided the team with up to date information on progress by the project. The team also visited agricultural universities and provincial research institutes in Northwest Frontier Province and in Punjab and the National Agricultural Research Institute (NARC) in Islamabad. PARC officials provided relevant published documents and supplied additional information and clarifications in discussions with team members. Other recent assessments of the Pakistan agricultural research system, including studies by the University of Minnesota in 1982 and of selected aspects of the system by the International Services for National Agricultural Research (ISNAR) in 1983 were helpful to the team.

D. Overall Assessment

The Team concludes that the Project has been highly successful, especially in the last five years, in realization of its objectives. Generally a sound base has been laid for an effective national research program for supporting agricultural progress.

Progress during the earlier years of the project was slow largely because the Council was not at that time staffed or organized to use aid well. It lacked leadership and had numerous organizational and administrative problems. Project reviews in 1976 and 1977 identified many of the problems. The Mission responded appropriately by redesigning the project in the 1978 project agreements.

Meanwhile, the Government of Pakistan has taken important steps for improving the structure of PARC and staffing it with competent senior officers and a good complement of junior support staff. The Ordinance of 1981 gave the Council a semi-autonomous status and authority to organize, plan and execute with greater freedom. Also the Chairman was given the status of Secretary to Government of Pakistan, Agricul-

tural Research Division, a step which the team believes significantly enhances his flexibility and effectiveness.

Physical progress fell far behind original targets. However, since the 1982 amendment progress has essentially met the revised schedule. At NARC, the training and conference center though inadequate in terms of future needs is essentially complete and in operation. Most of the staff residences have been constructed. The administration and office building and the main laboratory block including installation of furniture and equipment are well advanced and can be expected to be in operation by March of 1984.

The Farm Service Center has been remodelled and improved. Facilities have been developed for the plant genetic resources unit and for coordinating units of several national coordinated research programs. Good progress has been made on land shaping and development of the irrigation system for the portion of the 1395 acre site scheduled to have permanent irrigation.

National Coordinated Programs, the major vehicle for center/provincial cooperation on research projects of national scope and importance, have been instituted in nine areas. Coordinated programs on (1) wheat, barley and triticale; (2) maize, sorghum and millet; (3) rice; and (4) oilseeds are furthest advanced and are developing patterns of operation and performance which may, with appropriate modifications, be followed by other such projects.

Apart from a farming systems seminar and a livestock husbandry baseline study of selected barani area villages no farming systems studies have yet been initiated by NARC. A seminar on Farming Systems Research was held at NARC this past year. It was well attended and there was considerable interest but so far no worthwhile progress has been made in this area. At the present time NARC is inadequately staffed in agricultural economics and other social sciences needed to support a well rounded farming system research program. The project provides for technical assistance of a regional agricultural economist from CIMMYT who will be stationed here early next year. (Only 50 percent of this assignment is to be allocated to Pakistan).

The project has made some progress in developing stronger linkages with extension. Trials on farmer

fields are being carried out by most research institutions. PARC is involved in production maximization campaigns for major crops and the "travelling seminars" initiated under the national coordinated programs feature cooperation between scientists and extension workers.

Substantial amounts of laboratory equipment, vehicles and farm implements have been provided for NARC and the cooperating provincial centers. This should substantially enhance their research capabilities.

Manpower development has been an important feature of the project. 105 participants have been sent abroad for advanced degrees or for short-term non-degree training. Of these 78 have already returned to Pakistan and the additional 27 are currently undergoing training at U.S. institutions and the International Rice Research Institute in Manila, Philippines. Of these 27, 20 are in the U.S. and 7 at IRRI. With few exceptions, the returned participants are employed in their sponsoring institutions in the specialties for which they were trained.

The project also provides for advanced degree training of a large number of agricultural scientists at Pakistan agricultural universities. Until recently reponse to this opportunity has been poor, reflecting a general concern that local degrees have little value and that post graduate training in Pakistan needs strengthening. While the agricultural universities have some competent staff, several disciplines are not well staffed with trained scientists. They lack facilities, equipment and research funds for an adequate education, particularly at the M.Sc and Ph.D levels.

The project is nationwide in scope, but in reality has given relatively greater emphasis to development at the National Agricultural Research Center (NARC). This was necessary since, previously, the center was not in a strong enough position to provide leadership and support needed for a balanced national program. A good base is now emerging at the center. It will need further support to maintain the momentum and to strengthen its administration and management. In several disciplines such as agricultural economics, weed science, horticulture, dryland soil management and support services there remains a need to upgrade scientific competencies. Now a relatively greater emphasis should be given to building up the capabilities of the provincial intitutes and agricultural universities.

E. Project Design and Policy Implications

While the project began officially in 1969, the team considers the relevant start of the activity being project agreement of 1974. In the agreement the project focused on PARC as the responsible counterpart agency and spelled out a specific program for strengthening the national

system. It was a far too ambitious program considering that PARC was not at that time adequately organized or staffed to effectively use aid. Accordingly, progress was very disappointing and the option of cutting losses and terminating the project must have been considered. The 1976 and 1977 reviews acknowledged little progress but identified the major problems. The 1978 redesign made appropriate changes which helped the project survive the disruptions of 1979 and 1980. The 1982 amendment provided the additional support to assure a successful conclusion. The history of the project illustrates the importance of undertaking institution-building projects of this kind with patience and flexibility. A decade is not a long time in such a development process and AID should be prepared to allow at least that much time for satisfactory progress.

F. Lessons Learned

1. Perhaps the most important lesson learned has been that in the development of institutions time, patience, perseverance and flexibility are of utmost importance. The decision to stay with it, but to modify and redesign to adjust to a very dynamic situation has been the key to success of this project.

2. An improved system of national coordination in Pakistan for organizing and managing research as well as for setting research priorities is absolutely necessary to effectively mobilize scientific resources for solving agricultural production problems.

3. A large number, though insufficient, of well-trained, committed individuals of all categories - scientific, technical, and administrative exist in Pakistan but require fair salary scales and good opportunities for advancement and responsibility, if they are to be attracted and retained.

4. Adequate facilities and support services must be constructed to create an environment in which will-trained Pakistani scientists can conduct professionally satisfying research, this is an important incentive for attracting competent staff and encouraging production research.

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5. Research objectives cannot be followed up and achieved without adequate levels and continuity of research funding. This continues as a big problem in the Pakistan agricultural research context.

6. Educational institutions in Pakistan cannot play an effective role in the agricultural research - extension - education network unless their scientific staff also regularly carry out mission oriented research, and unless these staff members also have excellent access to refresher training and to reference facilities.

7. Pakistan's agricultural extension's input to research and education could be more effective if there were a more careful collection and a well-managed flow of information from farmers, through extension, to these bodies.

8. Merger of Pakistan's agricultural research institutions with the agricultural universities is imperative to optimize resource use, minimize waste and maximize human efforts per unit investment.

RECOMMENDATIONS

The following recommendations are grouped by major areas and arranged in priority order with each group.

A. Organization and Administration

1. The administrative structure of NARC should facilitate its role as a national centre of excellence complementing and supporting provincial research and educational institutions. An organizational chart (page 39a) is proposed in which lines of responsibility will determine the kinds of competence needed in the major posts of the organization. The position of Director General has only recently been filled on an "acting" basis. The vital importance of this position requires that it be filled on a permanent basis with an individual who not only has exceptional competence and understanding of basic and applied sciences but also has outstanding ability for management, leadership and public relations (p. 38).

2. The staffing of NARC is especially weak in the following areas: horticulture, agricultural economics and other social sciences, entomology/integrated pest management, dryland soil management and weed control. Staffing of these sections be upgraded as soon as possible to provide minimum critical mass for intellectual interation (p. 7).

3. A portion of the PARC Headquarters and NARC salaries and operating costs, in addition to construction, commodities and training, is funded under USAID and World Bank projects. In case of any follow-up activities USAID should concentrate its funding on development activities (p. 46).

4. Delays and uncertainties in release of funds by the Ministry of Finance (MOF) to PARC adversely affect operations of NARC and PARC funded projects. Firm commitment by MOF for regular release of GOP funds quarterly would correct this problem (p. 48).

5. PARC should review the lines of communication from PARC, through project coordinators and directors, to projects at institutes and universities, especially in communicating budgetary changes. After going through the annual budget process, each level should have plans for areas to be changed/modified in the event of budgetary increases or decreases to say 10%, 20% and 30% (p. 46).

6. PARC should consider initiating changes in its ancial management system, and placing it in line with its other management improvements. This would include improving the accounting system, as recommended by the World Bank in 1981 (p. 46).

7. PARC and project coordinators should explore possibilities of increased use of staff members of research institutes and universities where PARC-funded projects are located. This would benefit the institutions and PARC by more efficiency in utilizing staff members. It would also reduce the need for releasing project employees in times of budget restrictions and provide additional research experience, especially for university staff members (p. 45).

B. Research Management

While the NARC Training Centre has provided a facility for conducting training much more needs to be done to provide NARC the capability in multi-media instruction of scientists, extension workers, farmers and teachers.

1. NARC now has good facilities for improving staff training programs. It should emphasize the in-service and pre-service curriculum, including social, economic and management courses for national and provincial staffs. It is not recommended that NARC establish degree programs (p. 15).

NARC may, however, initiate certificate/diploma courses later on in specialized fields for which adequate facilities can be provided.

2. In collaboration with the University Grants Commission, NARC should, as soon as possible, develop a section which provides for sabbatical research for in-country scientists and a locus for supervision of thesis requirements (pp. 15; 39a).

3. There is need for improvement of management skills at all levels. It is recommended NARC arrange for a series of short courses in management skills, communication and coordination for senior and mid-level managers (p. 18).

4. A very useful set of procedures for allocation of plots and services has been initiated by the Farm Services Division. These should be institutionalized as soon as possible (p. 17).

5. There is a shortage of competent laboratory and field technicians. It is recommended a training program be initiated at NARC to train personnel for such positions. Also a career program should be established for this level of staff that would allow career promotions and, for the most competent, opportunities for degree training and advancement to the scientist level (p. 16).

6. Proper and timely maintenance of laboratory and field equipment is a problem. It is recommended the training section, in conjunction with Laboratory Management and the Farm Services Division, develop well-trained teams in the required specialties which would be available for training and maintenance in critical areas at national and provincial centres (p. 17).

C. Manpower Development

1. Improvement in the quality of in-country degrees should have high priority. Strengthening the research capability of the agricultural universities is essential. This will require additional funding by PARC for research equipment and facilities in the national agricultural research programs. PARC's role as advisor to the University

Grants Commission should be institutionalized to assist the Commission in raising minimum standards for degrees from these institutions (p. 35).

2. While ultimately Pakistan should be able to provide adequate MSc and PhD training at local agricultural universities in most disciplines, requirements for advanced degree training abroad will continue for several years. Donor organizations should continue to give this high priority. However, this should be preceded by an assessment of manpower needs at all levels by province, institute and discipline for scientific and support staff competencies. Training should be prioritized according to needs of the research network program (p. 35).

3. While participants sent abroad for training have generally met their training objectives, this program would be improved by more rigorous screening of candidates. The PARC Training Office should arrange within-country language training for promising candidates who do not meet TOEFL standards for satisfactory college work (p. 35).

4. Scientists at many research institutes, especially in the provinces, are hampered by a lack of access to current scientific literature. Aid donors should consider providing essential books and journals to the provincial research institutes and universities and assist in developing arrangements for linking the new library facilities at NARC with the provincial libraries so as to provide scientists at all locations easy access to current scientific literature (p. 23).

5. Greater opportunities should be provided for scientists at research institutions to maintain communication with other scientists concerned with similar or related problems. This would include, first of all, participation in a stepped up program of seminars, workshops, conferences, etc. under NARC auspices. It should also include expanded opportunities for participation in international meetings and faculty exchange programs (p. 15).

D. Outreach

1. It is recommended that PARC assign high priority to selection and appointment of (a) a Farming Systems Coordinator and (b) member (Social Scie es). This will contribute to and provide the support and direction needed for an improved outreach program and in getting farming systems research underway (p. 25).

2. PARC needs to increase its ability to convince the government at the highest level that continued research is essential to produce more, of better quality at less cost, to meet the needs of food, feed and fibre for the fast growing population on a progressively sustained basis and also ensure overall economic development of the country. To this effect a series of reports including PARC's own experience of the maximization projects should be prepared and presented to the Government which clearly indicates that agricultural research is one of the best forms of investment as well (p. 31).

3. The travelling seminar system has proven useful. It could be developed as an especially useful means to achieve sustained consultation among research scientists and senior staff of the departments of agriculture. The program needs to be continued with particular attention to such interaction and be one that can focus on farmers' current production problems (p. 31).

4. Often the results of research do not get transformed into technology available to farmers until the private sector makes an effort and investment in production and marketing. The research institutions need to publicize accomplishments which have potential for commercial development. Such opportunities are clearly there for the seed industry and for manufacturers of farm implements. The private sector has a vested interest in research that leads to commercially viable technology and should be encouraged to provide financial support for agricultural research.

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO PAKISTAN

Cable : USAIDPAK

HEADQUARTERS OFFICE
ISLAMABAD

THE DIRECTOR

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

A.I.D. Handbook 10, Chapter 15B1, 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 $1.625 billion economic assistance program 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 both short and long term training programs. The consequence has been that Pakistani participants have, on numerous occasions, been denied worthwhile and much needed training, inhibiting the achievement of project targets. Provinces and the Federal Government have been developing, or not developing, training priorities and nominations on the basis of availability of travel funds rather than on a basis of future projected, anticipated, and objective human resources development needs and requirements.

I have carefully reviewed the advisability of requiring full GOP funding for travel costs for participant training 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 both short and long term training, I have determined that it would be prejudicial to U.S. development interests to require at this time that the GOP pay the international participant travel costs for GOP/USAID program training. Other donors in Pakistan, including the UK, CIDA, UN, IBRD, Germany, etc., pay round-trip transportation costs for their long and short term participants.

Therefore, on all Mission-funded training programs, USAID/Pakistan shall be responsible for the 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 15B1a, I, Donor M. Lion, 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 and authorize payment with USAID/Pakistan loan and grant funds for travel costs as specified above for all USAID-financed projects in Pakistan.

Donor M. Lion
Director
USAID/Pakistan

4/24/84
Date

ENGINEERING ANALYSIS ANNEX

The proposed construction program at the NARC under the MART Project will include: (1) expansion of the existing Training Center; (2) expansion of the existing kitchen and cafeteria facilities; and, (3) construction of additional dormitory space for students and visiting scientists. This physical plant expansion will serve the immediate increased needs of the research center under the project. The new facilities are not expected to involve any changes to existing facilities other than perhaps minor remodelling to add to the cafeteria and kitchen space as required.

The existing Training Center has a capacity for 50 students. Four new classrooms will be added to accommodate up to 300 more students. In addition, two laboratories for 30 students each, a reading room, a micro-computer laboratory with 15 work stations, a multi-media production studio, and ancillary facilities will be provided in the expanded Training Center. The total floor area to be added to the Training Center will be about 30,000 square feet.

The existing cafeteria and kitchen will be expanded to serve an additional 100 persons. An additional 40 rooms will be added for student dormitories, and eight visiting scientist quarters will also be constructed.

The proposed construction will be carefully designed in keeping with a general Master Plan for physical expansion at NARC. The plan provides for expansion by repetition of building blocks such as dormitories and laboratories. The NARC site consists of about 22 acres and contains an administration block, laboratories, hostels, a cafeteria and a Training Center; there is ample space available for the proposed expansion. There are various options which can be considered for the additional facilities, and these will be reviewed and analyzed closely during the preliminary design phase in order to establish the most appropriate design in terms of function, use of space, and harmony and adaptability of new facilities for long-term use and potential future expansion.

USAID proposes to contract a short-term U.S. A&E consultant to analyze and develop preliminary interior layouts to establish optimum use of space and compatibility of existing and new building use, functions and operations. Therefore, a local A&E firm will be competitively selected and contracted to prepare final designs and bid documents and to supervise construction. The contracting for construction will also be done on a competitive basis. It is proposed to have only one contractor for all the construction, including the installation of all required services. The principal technical requirements for design and construction of the proposed buildings are summarized below.

Building Safety and Architecture

The expanded Training Center and two residential blocks will be designed and constructed in accordance with the U.S. Uniform Building Code (UBC) Zone 2 seismic requirements. Reinforced concrete framed construction is proposed for all three buildings, which will be limited to two storeys.

The architectural design, including the use of solar energy applications, will remain basically the same as the existing buildings to maintain a harmony between existing and new facilities. New buildings will have an exterior surface of naturally weathering glazed fairface brick which has been used throughout the complex. The use of landscaping materials, paving and water features will be utilized to achieve climate control objectives and to create interesting and attractive outdoor spaces which will relate to and merge with the existing landscape design of the complex. The proposed buildings will also incorporate the use of natural ventilation for internal climate control, as well as proper solar orientation to augment daylighting of building interiors and to take advantage of solar heating during winter months.

Water Supply

Water supply for the new buildings is readily available at the NARC site as the water supply system for existing buildings was purposely designed to handle expansion of the facilities. Water is supplied to the NARC site by the Capital Development Authority (CDA), which also supplies the rest of Islamabad.

Sewage Disposal

The existing NARC complex currently utilizes leach fields for sewage disposal. It is proposed that the same system be utilized for the additional sewage disposal needs of the proposed buildings. The leach fields will be constructed adjacent to the existing leach fields where there is adequate space for expansion.

Construction Material Availability

The materials required for the proposed construction are generally available in-country in adequate supply. The importation of materials, if any, would be limited to the air-conditioning package unit for the multi-media production studio in the Training Center as well as any specialized equipment or spares that may be required for it.

Environmental Impact

A negative determination is recommended for the project as the project will not have a significant effect on the human environment. The existing physical Master Plan will serve as the basis for locating the proposed buildings. The plan is considered technically and environmentally sound.

Construction and A&E Costs

Construction costs for the proposed buildings were derived by a careful analysis of prevailing building rates and of actual construction costs of the NARC buildings which have recently been completed. A&E design fees have been estimated on the basis of current U.S. and Pakistan experience for similar building types.

As described above, the proposed construction program does not pose any unusual technical problems as it is simply another phase to meet the expansion needs at NARC. No technical design or construction problems are foreseen, and the cost estimates are considered reasonable in view of recent USAID experience with the type of facilities proposed.

Table 1 provides an illustrative implementation plan for the construction program. Table 2 presents cost estimates in 1984 rupees, and Table 3 summarizes total funding requirements in U.S. dollars by year and expense category.

TABLE 1

ILLUSTRATIVE IMPLEMENTATION PLAN FOR THE CONSTRUCTION PROGRAM AT THE NARC

Activity	Action by	Time Required (Months)
AID contracting of U.S. consultant and PARC contracting of local A&E firm	O/ENG and Contracts Officer and PARC	3
Preparation of preliminary plans	Local A&E Firm	1
Approval of preliminary plans	AID and PARC	0.5
Preparation of detailed design, construction drawings and tender documents	Local A&E Firm	2
Tendering/Review of tenders/Award of tenders	AID and PARC	2
Construction	Local Construction Contractor	18
TOTAL		27

TABLE 2

COST ESTIMATES FOR THE CONSTRUCTION PROGRAM AT THE NARC

FUNCTIONAL SPACE	AREA (IN SQ.FT.)	UNIT CONSTRUCTION COST (IN 1984 Rs)	TOTAL CONSTRUCTION COST (IN 1984 Rs)	UNIT COST OF FURNITURE (IN 1984 Rs PER SQ.FT. OF COVERED AREA)	TOTAL COST OF FURNITURE (IN 1984 Rs)
1. a. 1 Classroom for 150 participants	2400	320	768,000	35	84,000
b. 3 Classrooms for 50 participants (16 sq.ft./person)	2400	320	768,000	35	84,000
2. Storage Room	1200	320	384,000	40	42,000
3. Reading Room for 30 people ((20 sq.ft./person)	600	320	192,000	35	21,000
4. Microcomputer Laboratory with 15 work-stations (60 sq.ft./station)	900	320	288,000	100	90,000
5. 2 Laboratories for 30 participants each (35 sq.ft./person)					
A. 1 'Wet' Laboratory	1050	320	336,000	200	210,000
B. 1 'Dry' Laboratory	1050	320	336,000	100	105,000
6. 4 Office Rooms for principal and staff (240 sq.ft./office)	960	320	307,000	35	33,600
7. Cafeteria (to be expanded if possible or new dining space for about 100 people) (16 sq.ft./person)	1600	320	512,000	35	56,000
8. Kitchen with pantry	600	320	192,000	100	60,000
9. Common Room/Recreational Room for 50 people (25 sq.ft./person)	1250	320	400,000	35	43,750

TABLE 2 (Continued)

COST ESTIMATES FOR THE CONSTRUCTION PROGRAM AT THE MARC

FUNCTIONAL SPACE	AREA (IN SQ.FT.)	UNIT CONSTRUCTION COST (IN 1984 Rs)	TOTAL CONSTRUCTION COST (IN 1984 Rs)	UNIT COST OF FURNITURE (IN 1984 Rs PER SQ.FT. OF COVERED AREA)	TOTAL COST OF FURNITURE (IN 1984 Rs)
10. Reception Area	600	320	192,000	35	21,000
11. Toilets	600	320	192,000	10	6,000
12. Add 35 percent for walls and circulation	5,320	320	1,702,400	-	-
(1 - 12) SUB-TOTAL	20,530		6,569,600		856,350
13. Audio Visual Production Unit					
a. Video Production Studio	1,110	800	880,000	100	110,000
b. Sound Production Studio	700	600	420,000	100	70,000
c. Master Control Room	200	410	82,000	80	16,000
d. Dubbing/Distribution Studio	200	410	82,000	80	16,000
e. Video Editing Room	200	410	82,000	80	16,000
f. Electrical Panel Room	100	410	41,000	50	5,000
g. Staff Room	300	350	105,000	50	15,000
h Equipment Storage Room	400	350	140,000	35	14,000
i. Maintenance Room	150	350	52,500	35	5,250
(a-i) SUB-TOTAL	3,650				267,250
Add 35 percent for walls and circulation	1,280	350	448,000	10	12,800

TABLE 2 (Continued)

COST ESTIMATES FOR THE CONSTRUCTION PROGRAM AT THE NARC

FUNCTIONAL SPACE	AREA (IN SQ.FT.)	UNIT CONSTRUCTION COST (IN 1984 Rs)	TOTAL CONSTRUCTION COST (IN 1984 Rs)	UNIT COST OF FURNITURE (IN 1984 Rs PER SQ.FT. OF COVERED AREA)	TOTAL COST OF FURNITURE (IN 1984 Rs)
j. Plant room for package air conditioning unit	600	310	186,000	10	6,000
k. Storage room for package plant spares, technician's room, etc.	400	310	124,000	30	12,000
l. Cost of air-conditioning plant including installation of air-conditioning for 5000 sq.ft.		250 per sq.ft. of air-conditioned area	1,250,000	-	-
(13) SUB-TOTAL	6,000		3,892,500		298,050
(1-13) SUB-TOTAL	26,530		10,462,100		1,154,400
14. Residential accommodation for 40 persons (1 room and adjoining bath shared by 2 people) obtained by construction of 1 whole block similar to existing hostel	9,850	310	3,053,500	35	344,750
15. Residential accommodation for 8 visiting scientists (comprising 8 flats of 1 room and attached toilet and kitchenette), i.e. construction of Ground floor only of Hostel Block with internal plan suitably codified	4,925	310	1,526,750	50	246,250

TABLE 2 (Continued)

COST ESTIMATES FOR THE CONSTRUCTION PROGRAM AT THE NARC

FUNCTIONAL SPACE	AREA (IN SQ.FT.)	UNIT CONSTRUCTION COST (IN 1984 Rs)	TOTAL CONSTRUCTION COST (IN 1984 Rs)	UNIT COST OF FURNITURE (IN 1984 Rs PER SQ.FT. OF COVERED AREA)	TOTAL COST OF FURNITURE (IN 1984 Rs)
16. Covered car parking for 6 official vehicles including micro-buses	1,500	100	150,000	-	-
(1-16) SUB-TOTAL			15,192,350		1,745,400
17. Contingency (15 percent of above)			2,278,350		261,810
TOTAL			17,471,200		2,007,210
Grand Total (Construction + Furniture) in 1984 Rupees = Rs 19,478,410					
18. A&E Costs For preparation of preliminary designs, detailed drawings, tender documents, and full-time, on-site supervision of construction		—10 percent of construction cost—			1,741,200

TABLE 3

SUMMARY OF FUNDING REQUIREMENTS FOR CONSTRUCTION PROGRAM AT THE NARC BY YEAR AND EXPENSE CATEGORY a/

(In US $)

Expense Category		FY 1985	FY 1986	FY 1987	Total
1. Construction	1984 Costs	260,760	651,900	391,140	1,303,800
	12% inflated	292,051	817,743	549,512	1,659,306
2. Furniture	1984 Costs	-	-	149,800	149,800
	10% inflated	-	-	199,234	199,234
3. Local A&E Services	1984 Costs	78,240	26,080	26,080	130,420
	10% inflated	86,064	31,557	34,686	152,307
4. U.S. Short-Term A&E Consultant		20,000	-	-	20,000
Totals (including inflation)		398,115	849,300	783,432	2,030,847

a/ Based on 1984 estimates in Table 2 of Engineering Analysis Annex. (US $1.00 = Rs 13.40).

SOCIAL SOUNDNESS ANALYSIS

This analysis is in two parts. Part One treats the role of the Department of Agriculture and of Agricultural Research in Pakistani society. Part Two deals more explicitly with Baluchistan Province.

PART I:

Role of the Department of Agriculture and Agricultural Research in Pakistan Society[1]

I. The Emergence of a Department of Agriculture: Its Larger Socio-Political and Administrative Context

Prior to proceeding with an analysis of the National Research Program this project seeks to strengthen, it is essential to present an empirical-historical narration of the process out of which it has emerged. This will be done by (a) placing the attempts of a colonial administration towards agrarian development in its larger socio-political and administrative context; and (b) elucidating factors which hindered the Agriculture Department from evolving into the efficient information management service that it was theoretically meant to be.

A. Revenue as the Administrative Service Par Excellence: District Management

Initial efforts at routinizing British administration in the subcontinent were directed towards revitalizing and consolidating land tenure and revenue systems operative earlier as an integral part of the Mughal bureaucracy. An elaborate paraphernalia, both in terms of personnel and procedures, existed for the purposes of revenue collection and land record keeping. This was brought into operation within reorganized administrative units headed by British civil servants. An important characteristic of the new bureaucracy was its differentiation, at least, between the "personal authority" and "official authority" of the incumbent of an office.

Districts, as the reorganized administrative units were called, were placed in charge of Collectors/Deputy Commissioners, their main business, apart from collection of land revenue and maintenance of land records, being the preservation of law and order. These functions were executed through a series of posts. The district was divided into tehsils, each under a tehsildar. The tehsils were further divided into circles placed in the charge of kanungos, and then every two to four villages within a circle had a patwari responsible for maintaining records.

Towards the upward end of the system, Deputy Commissioners reported to Commissioners who were administrative heads of two or more districts, which were termed divisions, responsible either directly or through the Office of the Chief Secretary to the Governors of the province.

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[1] Prepared by Jamshid Tirmizi, USAID/Pakistan, AID Liaison Office, Lahore, March 1984.

The civil service was to be composed of an exceptional cadre of men in administrative control of the country. Emboldened with the powers of taxation, magistracy and police, the prestige of civil servants was naturally high. Civil servants were expected to represent government in maintaining contact with the population, dealing with every emergency and, in general, supervising anything affecting government in the district. It is from within this cadre that Secretaries to the various departments of the government, including Agriculture, were normally appointed.

B. Engineering as the Technical Service Par Excellence: Natural Resource Management

Once the administrative institutions were in place and functioning, British rule in India diverted its attention towards infrastructural development necessary to harness the natural resource potential of their colony. This heralded the era of great engineering projects like the laying of railway networks linking distant corners of the subcontinent or the construction of canal systems, tapping the water resource base of riverine plains and the subsequent colonization of virgin agricultural land. Vast forest tracts were also brought under state control and management.

Government Departments of Irrigation and Forestry were established. The principle of bureaucratic line hierarchy formed an inherent characteristic of these organizations, but corresponded to technical areas of competence such as canal systems or forests and portions thereof, rather than territorial units of districts or divisions as in the administrative services.

The Irrigation and Forestry Department were delegated limited magisterial powers restricted to administering populations in the use of public utilities under their jurisdiction. Considering the importance of water in the economy of an agricultural habitat and that of timber or firewood in a forest, the members of the technical services wielded considerable influence with the populations.

The fact that canal systems or forests followed natural boundaries not necessarily corresponding to artificial administrative units, and that members of these departments possessed technical expertise not necessarily found in revenue officials, led to an independent functioning of the natural resource management services.

C. Agriculture as the Advisory Service Par Excellence: Information Management

Commerce and export of agricultural commodities were an important ancillary to British rule in India. The subcontinent had experienced famines and scarcities, whether man-made or natural, since time immemorial. The great famine of Bengal and Orissa in 1866 prompted the appointing of a commission which strongly recommended the

establishment of a Department of Agriculture in India. The Cotton Trade Commission in 1869 went even further by recommending one in each province. Whereas the latter was not implemented until long thereafter, the former recommendation crystallized in 1871 in the shape of a Department of Revenue, Agriculture & Commerce of the Government of India. With subsequent famine Commissions in 1880, 1898 and 1901, provincial governments could see the writing on the wall and started responding to the need for organizing agriculture at their own level.

In the territories that now constitute Pakistan, the province of the Punjab was the first to institute, in 1905, a Department of Agriculture under a Deputy Director. This was followed by the establishment of an Agricultural College and Research Institute at Faisalabad on an existing 50-acre experiment farm. An officer of the Imperial Services was appointed Professor of Agriculture and made principal.

The Deputy Director, the Agriculture Extension Service, the Agricultural College and the Research Institute reported directly to the provincial Director of Land Records and Agriculture in Lahore. However, it was the extension service which was considered to be the line department. An agriculture extension staff was posted at all levels corresponding to the district administration: extra assistant directors at the district level, agricultural assistants on the tehsil level and field assistants within village circles.

The Department of Agriculture was not an "operating" Department. Unlike, for example, the Forestry and Wildlife Department, which maintained public utility works and collected user charges, the activities of the Department of Agriculture were limited purely to advisory and demonstrative ones. With no material services to benefit the average farmer or magisterial powers to harm him, the status and prestige enjoyed by members of the Agriculture Department could not be as high as that of technical or administrative services.

The civil service and its world view was not very conducive to an enhanced, independent role for the Agriculture Department. There has always been a tradition that prompts revenue officers to act on behalf of the government as the "steward of a great estate," land being deemed in origin to be the property of the state. This was obvious when the Department, at its inception, was appended to the Director, Land Revenue. Moreover, the particular functions revenue officers performed in connection with land, involving the recording of crops through a regular system, registration of all land transactions and settlement of land litigation placed their lower staff in more intimate contact with both landowners and farmers than that of any other department. It is clear because of this linkage that initial efforts of the government toward agricultural improvement were dependent upon the district administration as the most plausible leaders of agrarian development placing the

Department of Agriculture in a subordinate position supportive of that role. This expediency of the moment, however, has proved to be in the long term a major constraint to the development of scientific agriculture in Pakistan in more than one way.

D. Factors for project Consideration

The strong bureaucratic line hierarchy that is necessary to identify levels of authority in services administering populations within territorial units or is required in the technical maintenance and administration utilities or large public works need not have been an inherent characteristic of an organization whose principal function was to collect and disseminate information. Whereas official line hierarchy was a necessary precondition to the effective fulfillment of mandates of both the Revenue and Engineering Departments, it manifested itself primarily as an internal control hierarchy within the Agriculture Department. Given the status, prestige and privilege differential between the administrative, technical and advisory services, the choice of new entrants seeking a career in the government followed that order of preference.

Given the normative and linguistic structure of the bureaucracy, it was only anglicized, liberal arts-educated and articulate individuals who could meet the standards of the administrative service peer group. High mark-scoring, not necessarily anglicized or articulate, professionally-trained students with a background in natural sciences made welcome entrants to the technical services. It was average mark-scoring, rural high school science graduates, unexposed to and inarticulate within the dominant anglicized normative pattern who found a natural ground in the Agricultural College for eventual induction into the Department. This should by no means imply that these initiates lacked caliber—far from it. They were highly intelligent individuals well-integrated and outstandingly expressive within the context of their own indigenous cultural pattern, but had passed the age which allows itself to be readily addressed by a socialization process conducive to the internalization of the linguistic and normative patterns of a foreign culture.

Subordination of the Department to the administrative services; inarticulation at inter-departmental meetings in the districts; and overshadowing of its status and prestige by that of the administrative and technical services; all of these factors led the Agriculture Department into an introspective view of itself, the administration and its own public mandate. This introspection was even more pronounced at Faisalabad where the other parts of the Department, its Agricultural College and Research Institute were located.

This introspection manifested itself in two ways. On the interactional level, members of the department took recourse to their own indigenous cultural patterns with which they were comfortable and familiar, and the

appropriate elements of which they could use with considerable agility in setting their goals and orienting their action: extended kinship or biradri relationship characteristic of agrarian communities underlying most behavior.

On the organizational level, as explained above, official authority was "misdirected" towards an internal control line hierarchy as a goal in itself and incumbent of higher positions were pressed into leadership roles patronizing fellow kinsmen grouped into rival kinship factions within the community. Manifestations of these initial characteristics, in one form or the other, dot the social setting of the department even today.

II. The Differentiation Process of the Department of Agriculture: Education, Research and Extension

The elements of Pakistan's agricultural establishment -- extension, education and research -- are the results of a continuing process of differentiation from a common nucleus: the Punjab Agricultural College and Research Institute, Faisalabad. This Institution and the department under the jurisdiction of which it is operative represents the first attempts at organizing agricultural activity as an object of state concern in Pakistan.

The socio-political and administrative context of colonial agrarian development in Sind and NWFP was similar to that in the Punjab. As a result, the agriculture departments in the Sind and in NWFP developed the same introverted character as had emerged in the Punjab. This was aggravated by the fact that prior to the establishment of parallel institutions in their own provinces, initial entrants to the Sind and NWFP Departments were socialized in the kinship-dominated structure of the Agricultural College and Research Institute at Faisalabad.

The element of conflict, on the basis of informal kinship groupings, that was underlying the internal organization of the Department in both its extension and research segments was institutionalized in the student body of the college. Student federations were formally organized under kin group denomination and their alliances, political maneuverings and occasional violent clashes gave explicit symbolic expression to the changing power configurations within the Department. These internal strains, combined with political upheaval and change in the larger society caused a process of diferentiation for the agricultural establishment that was characterized by three district temporal and structural phases. It is as a consequence of this differentiation process that we can today speak of a separate research component within Pakistan's agricultural establishment. A brief look at these three phases, therefore, becomes essential.

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A. The Horizontal Segmentally Differentiated* Establishment, 1947 to 1961

At the time of its emergence as a sovereign state, Pakistan was comprised of four provinces: Sind, Punjab, NWFP and East Pakistan (Bangladesh today). Baluchistan was under the direct administration of the Governor General through his agent. Whereas East Pakistan will not be dealt with in this analysis, Baluchistan will be referred to as a province.

The integrated structure of the Punjab Agriculture Department -- where research and teaching personnel were often the same and could be transferred to extension and vice versa -- found itself replicated in varying degrees in all provinces.

In Sind the research and teaching personnel were more or less the same: integrated under the administrative control of the Principal at the Agriculture College and Research Center initially at Sakrand which was later shifted to the more urban setting of Tandojam. Both the Principal and Deputy Director, Extension, whose staff was posted in administrative territorial units, reported to the Director, Sind Agriculture Department.

In the NWFP the Director of the Agricultural Research Station at Turnab was the provincial department head with research personnel and extension field staff reporting to him. Education was imparted at Islamia College, Peshawar, where separate classes in agriculture were held, but agriculture students had to go to the Punjab Agricultural College for their examinations. In 1954, the classes at Islamia College were upgraded to a full-fledged Agriculture College at Peshawar University. Agricultural education has always been a subject of the Provincial Education Department in the NWFP.

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*Societal differentiation is characterized by a structural and a coordination or control aspect. A unit can 'divide' itself into similar or dissimilar units. This division is represented by a segmentary-functional pair of terms. Once divided, these units can either be coordinated or controlled on an 'egalitarian' or a 'hierarchical' basis. The suggested pair of terms appropriately representing the alternative are horizontal-vertical. This conceptual construction allows an analysis to incorporate not only the often used distinction between segmentary and functional differentiation in general sociology, but also the frequently employed horizontal and vertical differentiation in the Sociology of Organizations. From an evolutionary point of view, for example, a clan or a federation of clans would signify horizontal-segmentary differentiation; an empire would base itself between vertical-segmentary differentiation and vertical-functional differentiation; whereas a modern organizational state would swing between the pendulum vertical-functional differentiation and horizontal-functional differentiation.

Baluchistan had an Agricultural Research Station focused mainly on horticulture, for which the agro-ecology of the province was favorable. The Director of this station was in charge of both research and a very effective horticultural extension program which, in variance to the other provinces, did not correspond to territorial administrative units. Baluchistan has had no facility for agricultural education to date, with their educational requirements being met by other provinces.

The effects on agricultural research of an undifferentiated department in which research, education and extension were under centralized control with no delegation of powers, and where personnel were transferred from one branch of activity to the other because of joint seniority irrespective of their qualifications or fields of specialization, were manifold. Research, as well as education and extension,was burdened with the internal socio-political and administrative problems of the Department as a whole. Research was found participating in the resolution of problems not necessarily originating within its own sphere of activity.

With a dearth of trained manpower with which to work, a frequent change in section heads who were not necessarily qualified in the specialties of these sections because of mobility within the department, and a centralized one-man control depriving section heads of administrative and financial powers, led to a diffuse nature of research activity [illegible] specialization.

On the national level, Pakistan's agricultural establishment in this first phase was differentiated segmentally, i.e., into similar four units, and controlled horizontally, i.e., as constitutionally equal, independent units. In the absence of any coordination, whether horizontal or vertical, four isolated and more or less replicated patterns and spheres of activity emerged.

B. The Horizontal Functionally Differentiated Establishment, 1961 to 1971

In 1958 martial law was declared in Pakistan, abrogating the Constitution and disbanding the provinces. A uniform administration popularly known as the 'one unit' was implemented all over the country dividing it into West and East Pakistan. The old provincial ministries and departments were wound down and personnel and institutions were placed at the disposal of the West Pakistan Agriculture Department headquartered at Lahore. The process of change initiated by this political move was to lead to a complete transformation of the previous amalgamated structure of the old provincial agriculture departments.

Agricultural education in the Punjab and Sind which had, historically, been an integral part thereof, and had played the role of 'reproducing' the value system of the establishment was divorced from the Department of Agriculture and placed under the supervision of the West Pakistan Education Department. This was similar to a pattern that the NWFP was following from the very beginning. Simultaneous to this move, the Punjab Agriculture College at Faisalabad was reorganized into a full-fledged University of Agriculture for West Pakistan.

Research was delinked from education with which it had emerged historically, and all four Agricultural Research Stations in the country were upgraded to Regional Institutes. Directors were appointed to head the institutes at Tarnab in the Peshawar region, Faisalabad in the Lahore region, Sariab in the Quetta region and Tandojam in the Hyderabad region. These regional Directors of Agriculture Research reported directly to the Director, West Pakistan Agriculture Department, who was the department head and to whom the extension services were also responsible.

Extension was consolidated earlier within territorial administrative units and was placed under regional Directors of Extension at Hyderabad, Lahore, Quetta and Peshawar.

Extension and research personnel of the old departments were reorganized under uniform seniority in a new service set up known as the West Pakistan Agricultural Services (WPAS). However, separate cadres and seniority were maintained for research and extension with no transfer of personnel as in the previous phase which occurred between the two. The research personnel who had opted for teaching within the new educational setup automatically left the Department of Agriculture at the time of the split and were integrated into the West Pakistan Education Service.

The consequences of this complete reorganization of Pakistan's agricultural establishment for agricultural research were manifold. An attempt was made in a uniform department to develop equally the infrastructure of the four regional institutes both in terms of buildings and laboratory equipment. The delinking of the research institutes from both extension and education stopped the overflow of internal problems originating in these areas but not concerned with the public mandate of the department into research, allowing research greater ease in fulfilling its own functions. The concept of integrated research and extension fell apart — the wisdom of which is doubted to this day.

A separate cadre of research personnel country-wide resulted in increased mobility through transfer of staff to different areas, opening up the parochial character of the previous phase. Annual department program meetings brought together researchers from all regional institutes giving an impetus to cooperation through the exchange of research material. Coordinated programs between institutes on wheat, maize and rice also saw their beginning under the new setup.

Institutes could no longer be indifferent towards the quality of their research since they were now overwhelmed by visits from researchers of other institutes. Competition raised the sensitivity towards the quality of research; where an oversight was possible earlier, Directors of Institutes could not afford negligence towards quality at the risk of being labelled "inefficient." Narrow kinship group goals and priorities had to give way to technical and functional considerations.

In situations of promotion and training allocations where an "identity" other than merely the 'professional' had to be portrayed, kin group loyalties, although still important, were diffused and their place taken by regional and ethnic differences.

On the organizational level the upgrading of research institutes resulted in the decentralization of authority, raising the administrative and financial powers of the section heads and allowing them more flexibility in work. Weak sections were strengthened with qualified personnel transferred on promotion within the service from other regional institutes or through direct recruitment open to competition. Administrative and financial powers and increasingly qualified staff provided an impetus to the research program. Diffuse research characteristics of the previous phase gave way to accelerated specialization within the various sections.

The status and prestige of the research staff was elevated in the new organizational setting. Exclusive residential facilities on research stations, increase kin pay and promotions, enhanced training opportunities, and horizontal mobility went a long way toward improving their working conditions. The importance the government was giving agriculture during the 'green revolution' also added to a congenial atmosphere.

In summary, the national agricultural establishment in the decade from 1961-1971 presented a horizontal functionally differentiated structure. Education, extension and research were reorganized into three separate organizations on the basis of functionality and were contrasted horizontally as three equally important dissimilar functional spheres of activity. Although the new arrangement had positive consequences for the development of research, the gap between education, research and extension continued to widen.

C. The Horizontal Functionally Differentiated Segmentary Establishment, 1972-Onwards

In 1971, Pakistan found itself in the grip of another major political upheaval which culminated in East Pakistan seceding into an independent nation -- Bangladesh. The unitary administration of the previous decade was abandoned and replaced by a parliamentary form of government with the provinces of Baluchistan, Sind, Punjab and the NWFP restored as constituent elements. These events brought in another era of extensive reorganization within the administrative and state structure, including the agricultural establishment.

As an initial step, the staff of the West Pakistan Department of Agriculture including both research and extension was repatriated to the provinces of domicile on their existing pay scale and grade. Research and extension remained differentiated organizationally as did their respective cadres.

A change in nomenclature transformed regional research institutes and extension directorates into provincial establishments reporting to the Secretary, Department of Agriculture in their respective provinces. A host of other functional directorates, which need not be discussed here, such as Farm Machinery, On-Farm Water Management, and Soil Conservation, were also incorporated into the provincial establishments.

The development of agricultural research under the new arrangement reflected the resource availability and agricultural policy of the provincial governments. Whereas NWFP, Sind and Baluchistan continued to operate their departments at levels of the previous phase, Punjab, after provincialization, sought to upgrade its Directorates of Research and Extension to be headed by Director Generals. Punjab, as a province, also expanded its research infrastructure by elevating certain research sections into Divisions with Directors. Mono-crop research institutes for rice and sugarcane were established with Directors heading them. NWFP and Sind followed suit with the former establishing a Maize Institute at Pir Sabak and the latter establishing a Rice Institute at Dokri. The promotions that accompanied infrastructural development in the Punjab, however, did not occur in the NWFP and Sind.

The introduction of a national pay scale in the wake of a country-wide government services' reform accompaying the political change in the beginning of 1972, brought at par, in theory at least, the administrative, technical and other services including agriculture. This was an attempt on the part of a government trying to ameliorate the injustices of the traditional status differential between these services. Not that this change made any considerable difference, but it did help to elevate the confidence and sense of participation as public servants of those within the agriculture departments. In the Punjab this sense was supplemented by increased promotion opportunities.

Within the research institutes themselves the specialization which emerged in the previous decade consolidated itself in the 1970s. Specialization which was necessary then in order to rectify the diffuse nature of research, resulted in isolated sections pursuing their own work, oblivious of an interdisciplinary approach essential to meet the exigencies of national priorities. The sense of competition and pride of work arising out of the cross-regional transferability of research scientists in a consolidated, national department diminished within the atmosphere of provincial seclusion. Kin group loyalties particular to parochial cultural settings reacquired considerable importance.

In contrast to the amalgamated, undifferentiated structure of the 1950s, provincial departments in this third phase, while institutionalizing the systematic gains of a functionally differentiated structure significant of the previous decade, simultaneously inherited its lack of coordination between education, research and extension. The agricultural establishment of Pakistan after provincialization in late 1972 can therefore be categorized as a horizontal functionally differentiated segmentary establishment. In other words, four functionally differentiated units controlled horizontally as four equal and similar units or segments. However, similar to the first phase in the absence of any coordination, whether horizontal or vertical, four isolated and more or less replicated patterns and spheres of activity have emerged.

III. Factors for Project Consideration

The gains of inter-regional collaboration characteristic of a natioally-unified department could not be institutionalized within the new provincial setup. A host of federal organizations conducting research relevant to agriculture had evolved independently over the years with the mandate to apply particular technologies such as nuclear technology to agriculture. In the absence of all coordination due to horizontally-controlled, independent units within provincial boundaries, these organizations were conducting their own agricultural research. This replicated even further the endeavors of the four isolated provincial units, making it necessary in the national interest to look at research separately at least in concept from the real, on-ground socio-political and administrative segments in which it was embedded.

It was out of this conceptual identification, national necessity and inputs of donor assistance that a national research 'system' within Pakistan's horizontal, functionally differentiated segmentary agricultural scenario was institutionalized in the shape of the Pakistan Agriculture Research Council (PARC).

Horizontally-controlled, independent similar units were highly se towards any external efforts at guiding their performa[illegible] t amount to them conceiving these inputs as an infringement of their [illegible]thority. "Coordination," even for functional exigencies is considered synonymous with "control" due to the particularistic socio-political and administrative context of Pakistan's state organizational and public sector development.

This equation of "Coordination" and "control" is also reflected, on the one hand, in the relations between the three functionally differentiated units -- education, research and extension -- within the individual provinces and, on the other hand, in the behavior of the units themselves. Integrated internally on the basis of bureaucratic line hierarchy, specific sections and mono-crop-focused divisions in the same research institutes pursue their own lines of specialization with negligible coordination. Given this situation PARC is faced with the difficult mandate of providing coordination in research and is perpetually confronted with the risk of its input being shunned as "control."

PARC's National Coordinated Research Projects (NCRP), however, have met acceptance and have provided an effective mechanism towards an 'opening up' of geographically scattered 'closed' segmentary research 'systems.' NCRP has enabled a flow of federal finances into provincial research, directly providing operational funds, supplementary staff, vehicles and an autonomy to the provincial institutes from their Departments of Finance in the spending of these federal resources without simultaneously losing their own authority and control. In the same vein, PARC supports the provinces in processing training; in maintaining liaison with the international research community; in establishing sophisticated laboratories beyond the scope of provincial budgetary constraints; and in the development of well-documented libraries.

Controversy and provincial apprehensions, however, arise whenever PARC chooses to exercise the option of its mandate "to establish a research center as and when necessary to fill in the gaps in the overall programs of agricultural research." Arguments accompanying any attempts by PARC to establish research centers under its direct administrative control are based on the premise that agriculture is a provincial subject, and allocations toward federal research infrastructural development are a displacement of resources originally meant for the provinces.

PARC, however, is placed in a dilemma of either fulfilling or not fulfilling its public mandate. Given the sparse agricultural infrastructure of regions historically neglected by the national development endeavor, and given the history of research establishments under provincial control lapsing into isolation, PARC, out of an "insight into the necessity," must allocate federal resources toward nationally-relevant and deficient areas of research.

Given the shortage of local, indigenous trained manpower in regions previously deprived of the advantages of the national mainstream development, a desire for provincial control appears to be an internal problem characteristic of bureaucracies sensitive to any attempts at sharing areas of competence. This is even more relevant where these bureaucracies are themselves not staffed by indigenous or local manpower.

The expansion in neglected areas of development of a research infrastructure that concentrates on area-specific agro-ecological and socio-economic problems can go a long way toward improving socio-economic conditions. However, all rational attempts, whether provincial or federal, at infrastructural and institutional development demand utilizing whatever qualified and trained local manpower is available.

The development of a National Research Network is best served by a "charismatic" pattern of leadership which PARC undoubtedly provides. A "charismatic" leadership pattern perpetuates the necessary dynamics for change and prevents a setting in of routinization. However, the "charismatic" pattern which is rare by the virtue of its very nature, cannot be institutionalized. It is essential, therefore, for any attempt at strengthening the National Agricultural Network to institutionalize PARC's role on a rational and continuing basis, taking advantage, however, of its present leadership pattern.

The structure of Pakistan's national research setup today is one of vertical-segmentary differentiation. PARC's funding of NCRP operations in the various provinces is a function of the population size, the research infrastructure, and the availability of trained human resources in each province. In the 'control' or use of NCRP resources during actual implementation the larger and more developed provinces are placed vertically above the lesser developed and smaller ones. This unconscious, structural status differential between four constitutionally equal units leads to a lack of consensus on PARC's role.

The ideal alternative would be to frame a National Agricultural Research Plan which prioritizes all research along two main dimensions: agro-ecology and socio-economics. This would lead to a functional differentiation of the four existing units along the parameters of agro-ecology and socio-economics, horizontally in control of federal resources. Research insight on agro-ecological and socio-economic parameters could then be transferred from the province where it originates to other provinces having tracts of similar habitats.

Provincial research institutes in this ideal system would be geared on their existing horizontally-controlled, functionally differentiated sections/divisions pattern towards flexibility. With the institutionalization of a project and program approach these institutes would process priorities of the National Research Plan through vertical coordination with the relevant section or division taking a temporary lead. Their 'control' can continue to lie horizontally as independent sections.

A social feasibility and beneficiary impact of the project's various components is presented in the Social Soundness Analysis Summary in the main body of the Project paper.

PART II:

Social Soundness Analysis: Baluchistan[2]

I. INTRODUCTION

1. The Province/Land

Baluchistan with an area of 347,190 sq. kms and a population of 4.3 million is the largest, most sparsely populated and most arid of the four provinces of Pakistan. The province borders: Afghanistan and Iran to the north and west, NWFP, Punjab and Sind from north and east and the waters of Arabian Sea wash 725 kms of its coast in the south. The province has diverse climatic and physical features. The western parts of the province include extensions of Iranian and Afghanistan deserts, rest of the province being mountainous with large and small generally fertile valleys in between the mountains. The climate generally varies with elevations which range from sea level to over 13,000 feet. Similar variations occur in precipitation levels. The mean annual rainfall varies from less than an inch in western parts of the province to more than 16 inches in some areas in the northeast.

Table 1

Height, Temperatures, Rainfall in Selected Areas of Baluchistan

Location	Height Meters	----Temperature----- Means of Maximum	Means of Minimum	Mean Annual Rainfall in mm (Mean of 10 yrs)
Quetta	1589	25.6	5.6	233.8
Zhob	1407	27.3	11.2	274.3
Khuzdar	1225	29.0	12.9	213.5
Panjgur	1050	27.4	13.1	114.3

[2] The material presented in this annex was drawn from a social soundness analysis compiled by Dr. Nek M. Buzdar, USAID/Pakistan, ARD dated May 17, 1983.

Various Baluch and Pathan tribes with their main groups across the borders in Afghanistan and Iran largely lead a subsistence life, raise animals (mainly sheep and goats) and crops (mainly cereals) and large numbers of them are still nomadic and semi-nomadic.

Baluchi, Pushto and Brahvi are the main languages spoken in the province although Punjabi, Urdu and Sindhi/Saraiki are also spoken by minority or settler groups. According to 1972 census about 65% of the Province's total labor force was engaged in crop and animal raising and fishing whereas 15% were engaged in construction and other production related labor work and about 10% in trade and sales services. The remaining 10% of the provincial labor force was engaged in technical, administrative and some unclassified works. But outside of Quetta and a few other large towns close to 100% of the people depend on crop and animal raising and fishing for their livelihood.

2. Major Agricultural Activities in the Province

It has been estimated that about 70,000 people living in 32 villages on the Baluchistan coast produce 71,66[illegible] tonnes of fish annually. It is harder to estimate numbers of people engaged in crop and animal raising; many people switchover from one to the other and many are engaged in both activities. But it is known that the overwhelming majority of Baluchistan's population is engaged in crops and animal raising. Out of the [illegible] Baluchistan land area of 34.7 million hectares about 19 million hectares have been reported as used. Out of this area only [illegible] million hectares is reported to be under cultivation and the remaining is classified as rangeland with a negligible area under forests. The actual area under crops during 1980-81 was only 432,433 ha. Wheat is by far the most important crop grown in Baluchistan (185,288 ha: 42.8 percent of the total area) followed by sorghum (12.59 percent), rice (9.25 percent), oilseed crops (9.18 percent) and fruits (7.25 percent) of the total area under crops.

Wheat is the staple food of the Baluch people and is grown throughout the province. Deciduous fruit crops as well as potatoes, onions and other vegetables are grown in the central and northern highlands. The canal irrigated areas in the extreme southeast produce rice, fodder crops and oilseeds besides wheat while dates are grown over large areas in the southwest.

According to the Livestock Department, Baluchistan estimates 94 percent of the total usable land in Baluchistan is classified as rangeland and there are 8.81 million head of sheep, 7.72 million goats, 0.7 million cattle and 0.2 million camels in the province. The main animal producing areas are Khuzdar and Kalat districts in central Baluchistan and Kohlu, Loralai and Zhob districts in the northeast.

3. Agricultural Institutions

a. AZRI

AZRI, with its headquarters at Quetta, was established in 1973, with the mandate to undertake research and studies in farming systems and production practices in arid areas of Pakistan particularly Baluchistan. AZRI's efforts in recent years, with the help and cooperation of ICARDA, has been oriented toward increasing agricultural yields through the identification of local technical and socio-economic constraints to increased productivity and through the introduction of improved practices and varieties tried elsewhere and proved beneficial under similar conditions.

The AZRI staff is under complement and needs to be strengthened in both number and training. The staff is almost 100 percent non-Baluch, non-Pathan and the research efforts and investigations in the interior of Baluchistan because of a lack of local languages capability and socio-economic conditions awareness is limited.

b. Other Relevant Departments

The following table shows the Agricultural Extension Department staff obtained for four southwestern districts but will give a general idea about the staff position in Baluchistan as a whole.

The Agricultural Extension Department staff have traditionally been responsible for improved seeds, provision of insecticides, pesticide and fertilizers to the farmers. The Department is still the main source of improved seeds, fertilizers, insecticides and pesticides although the partial removal of government subsidies has reduced the use levels of the later in the province.

The Animal Husbandry Department is providing some services to the animal raisers. The Department has 46 veterinary hospitals and two hundred and fifty-three dispensaries in the province. The coverage is insufficient and considering that only 1,023,000 animals could be vaccinated during 1979-80 out of a total animal population of 20 million. Most of the staff is posted at district headquarters which are normally in agricultural valleys and away from pastoral areas. The stockmen are posted in rural areas but still on the road sides. The Department's activities have been confined to a limited introduction of improved animal breeds and some animal disease prevention and cure related services.

Table 2

Agricultural Extension Staff
Posted at Four Southwestern Districts

Staff Designation	Districts			
	Panjgur	Turbat	Gwadar	Kharan
EADA (Extra Assistant Director of Agriculture)	1	1	1	1
AHO (Assistant Horticultural Officer)	0	1	0	0
EADA (Farm) (Extra Assistant Director of Agriculture)	0	1	0	0
Agr. Officer	3	4	1	'
FA (Field Assistant)	16	21	12	17

NOTE: The Agricultural Machinery Maintenance Department has an Agricultural Engineer in each district and Livestock Department has a Veterinary Assistant Surgeon and five to ten stock men in each district.

The Agricultural Machinery Maintenance Department has large and small bulldozers which it makes available to the farmers on subsidized rates. The rates of Rs. 150 per hour for large bulldozers and Rs. 90 for small bulldozers are very cheap considering that privately renting even a tractor would cost more. The demand by the farmers is high and in some districts people have been waiting for the last two years for their turn. The availability of subsidies and the fact that bullocks are expensive to keep under dry conditions of Baluchistan there is a tendency towards more widespread use of agricultural machinery.

4. Political, Administrative and Ethnic Background

Up to about the middle of 19th century various Baluch tribes living in areas today called Pakistani and Iranian Baluchistan and in adjoining areas in Afghanistan were more or less independent, only occasionally accepting suzerainty of rulers in the west, east or north., The British rulers of India incorporated parts of Baluchistan into their empire in 1854. The areas of Baluchistan along the Afghanistan border were

administered directly and were known as British Baluchistan. These areas included most of the present day districts of Quetta and Sibi Divisions. The rest of Baluchistan: the States of Kalat, Kharan, Las Bela and Mekran were administered according to the policy of indirect rule under which local rulers--Khans, Nawabs and Sardars were confirmed on their positions, paid some yearly remunerations and made responsible to the Empire Baluchistan became part of Pakistan in 1947, integrated into One Unit, the Province of West Pakistan in 1955 and made a separate province in 1970. At present, the province has four divisions administratively headed by Commissioners and 17 districts administered by Deputy Commissioners or Political Agents. The province is divided into diverse linguistic, cultural and ethnic regions. The three districts of Pishin, Zhob and Loralai in the northeast bordering Afghanistan and NWFP are mainly Pushto speaking and are culturally akin to the Pathans of Afghanistan and NWFP. The districts of Quetta and Sibi are inhabited by mixed Baluch, Pathan and Sindhi speaking groups. Elements of Sindhi language and culture are also found in Kachhi, Nasirabad and Las Bela districts which are otherwise predominantly Baluch districts. The Kalat and Khuzdar districts in central Baluchistan are inhabited by Brahvi speaking Baluch tribes. The remaining districts of Bugti, Kohlu, Chagai, Kharan, Panjgur, Turbat and Gwadarare puroly Baluchi speaking areas. Besides the above mentioned Sindhi elements there are other minority ethnic groups in the province. Along the entire length of the coast particularly in Mekran Division large numbers of negroid people (former slaves) are found. An immigrant tribe called "Hazara" from Afghanistan is of Mongoloid origin and speaks Persian. Other small ethnic and linguistic groups are also found in the province.

II. OBJECTIVES OF THE SOCIAL SOUNDNESS ANALYSIS

About 40 percent of the total cultivated area in Baluchistan (wide fluctuations with rainfall quantity and seasons) is under any form of permanent irrigation three-fourths of all this irrigated area is canal irrigated and lies in one small district of the province. There are millions of hectares of land potentially usable and productive if either irrigation is provided or varieties of crops are evolved through research which would require less water to complete their life cycle. Even in areas of Baluchistan where the rainfall is sufficient (12 inches and above) to produce dryland crops, the yields at present are extremely low because of incidence of diseases and non-availability of improved and high-yielding varieties. Research facilities in Baluchistan are geared towards research on irrigated crops on the pattern of Sind and Punjab. For agricultural development in Baluchistan it is important to establish and strengthen a research organization concentrating on problems of dry farming. The study of socio-economic environment in which agricultural production takes place should be an important component of the research program. Some general comments about this environment at this stage may provide guidance to those undertaking the

design and implementation of research programs planned for the future.

The socio-economic institutions and organizations in the rural and tribal areas of Baluchistan may be great obstacles or great vehicles and facilitators for the adoption and disseminations of res s. This social soundness analysis is intended to identify and describe the institutions, groups and administrative structures and arrangements, which will effect or be effected by project activities. The description of socio-cultural systems will also provide some guidance to design and implement AZRI and other similar projects in Baluchistan. Project objectives must conform to the social norms and customs and traditions of the Baluch peoples if the programs are to succeed.

This analysis should also indirectly help to identify project activity areas as well as groups of people where activities would have the maximum impact on the people of the sub-areas and the people of Baluchistan.

III. SOCIO-CULTURAL CONDITIONS

The social organization of Pathan or Baluch cannot be generalized. Islam and Pakistani political, economic and social systems do have influence in molding social systems in all of Pakistan, but Baluchistan is unique in having the least of these influences because of its difficult terrain and hostile physical environments. The typical topographic and climatic conditions also necessitated typical social, economic and political organizations. For example tribal organizations were necessary for a nomadic people if they were to protect their movable property--the animals and were to exclude groups other than fellow tribesmen from the common tribal rangelands. The family tribal and religious institutions were all based on the necessity to share the meagre resources of the society and make subsistence survival possible for a maximum number of people.

It is possible to describe various social and cultural issues, on ethnic, and linguistic bases, i.e., on the basis of Pathan and Baluch. But it appears that basically there is no significant difference between the Baluch and Pathan. In fact if taken into detail each Baluch and Pathan tribe will have certain customs and traditions different from others. Even different sections of the same tribe may be different. There are some tribes (e.g., Bizenjo and Mohammad Hasni) which have sections speaking Baluchi and some other sections speaking Brahvi. Neither language nor ethnicity nor religion nor any other single characteristic can make a complete and effective criterion to classify groups. Probably the two most economically, socially and politically diverse groups in Baluchistan are those of crop raisers and animal raisers. Even these two groups are sometimes engaged in both animal and crop raising defying separate categorization. But these groups can be defined as those mainly animal raising

and those mainly crops raising.

1. The Pastoralists

Whether Baluch or Pathan the pastoralists are the most poor, the most untouched and uninfluenced by outside forces and the most typical Baluch and Pathans. The traditions and values most Baluch and Pathan cherish like hospitality, courage, leading hard rough and simple life and honesty are all found among nomadic and semi-nomadic animal raisers. It is generally believed, particularly among the Baluch tribesmen, that you lose most of your Baluch characteristics if you settle in a village and start crop raising or just take to any profession other than shepherding animals. Very few animal raisers send their children to school and one reason often cited for not sending children to school is that doing so will make children less manly and hard working, less war-like, weak and unable to perform the traditional Baluchi jobs later in life.

Among the pastoralists generally the tribal organization and solidarity is strong. The pastoralists are also generally more egalitarian and less hierarchical societies. The family system is more closely bonded together and relationships are stronger. An individual has more security and "insurance" provided by the family and tribe.

Pastoral women work along side their men although there is division of labor. Animal shepherding and sale of animals and purchase of household necessities as well as other "outside" activities are carried out by men. The women fetch fuelwood and water, sew, clean and cook besides raising the children. Pastoralist women do not wear veils and no seclusion from men takes place. Among both the Baluch and Pathan tribes a man has to pay for his bride. Such payment is very high and in the beginning of 1983 in the northeast of Baluchistan the payment varied between 40,000 and 100,000 rupees. The women also work much harder than men and particularly in cases when a payment is made for her (sometimes girls are exchanged) the man treats her as a maid. In these areas women do not inherit property.

2. The Agriculturalists

Traditionally agriculture settlements were confined to areas with kareze, spring and perennial or semi-perennial river water sources. The extent of rainfall contributes greatly as a basis for permanent settlement only in areas of the northeast where annual average rainfall exceeds 10". The agriculturalists normally live in valleys and the animal raisers on the surrounding hills and mountains. The pastoralists and the agriculturalists carry out trade with each other. Some mountainous and desert rangelands cannot support animals anymore. But in general resources are being more optimally used and comparative advantages being availed by specializing in grain production in one

area and animal production in the other. Agricultural settlements are connected with big towns and the outside world. Some education has been introduced and the traditional tribal organization has weakened so that relationships and alliances are based on different interests and considerations. Social organizations different from tribal organizations have developed. Life is more individualistic and there is less unity and solidarity among village people. The leadership here may be based on land ownership and wealth rather than on the traditional Baluch characteristics or social order.

The women of irrigated landowners (even small ones) normally do not work, are secluded and wear veils. The tenant or sharecropper or wage worker's women do not wear veils and work alongside their men. The dry or rainfed landowners seem to be different from irrigated landowners. Their women work alongside men. In such areas there is one activity in agriculture, that of harvesting, where women are considered more efficient than men. In southern Baluchistan, traditionally, slaves worked on big landlord's lands (in Mekran owner of a 10-acre irrigated land is a big landlord). These former slave families, not having migrated to Karachi and other places, remained with their former masters and worked on the land. These groups called "Waqib", "Golam" and "Darzadag" work on land along with other women. In Mekran women can be seen not only working on land but also in trade and business. In Gwadar women run shops and other businesses and there are many fisherwomen and also women engaged in fish business.

Also in Mekran, which is the least tribal among Baluch areas, it was stated by landowners interviewed that women inherit land and actually get the share fixed in Islam (daughter getting half of what a son gets). Unlike most of the rest of Baluchistan the women get the actual transfer of land in official records. In other irrigated areas and most of non-irrigated agricultural areas, women normally do not inherit land and other property. Tribal, sub-tribal and localized differences in role of women and inheritance are prevalent all over Baluchistan.

IV. THE ROLE OF RELIGION

Both Baluch and Pathan are strict in ritual religion; prayers, fasting. But sometimes the customs and traditions take precedence over religion in personal, social, economic and political matters. Generally the Pathan tribes are more religious than the Baluch tribes. The Pathan tribes in the northeast are more strict in religion than the Baluch in the same area. Generally among both Baluch and Pathan the pastoralists are less religious than the agriculturalists.

The political role of mullah or the religious man is also significantly different in Baluch and Pathan areas. This difference was practically demonstrated during the 1970 general elections.

A religious party called Jamiat-i-Ulema-Islam contested elections against all the seats in Baluchistan. This religious party won all the provincial assembly seats in the Pathan areas and did not win a single seat in the Baluch areas.

The "mullah" has an important social position in the village in Pathan areas. On the other hand among the Baluch the mullah is not politically important; he performs certain religious functions and ceremonies and is paid for those services. He has very little social or political influence. In personal and economic matters religion seems to have little influence on people's decision making. Both Baluch and Pashtun claim for themselves huge dowries for their daughters or sisters and could care less about religious prohibition of this. Some Baluch Pathans, particularly those of Pishin, indulge in big scale usury which is against Muslim religious laws.

V. LEADERSHIP

Most of the pastoralists have well defined traditional leadership systems. Even though their traditional organizations have been modified due to outside influences, still compared to agriculturalists, they retain most of the traditional political economic and social systems of the past. The family organization, its traditional role, the role of elder and sub-tribal leader, and most other traditional roles are still in tact although the high chief or sardar of big tribes has a changed role in some cases often with a degree of resistance. The lower level hierarchy of Malik, Wadera, Takari and Safed Rish: the sectional and sub-tribal leadership has not changed. It is these people who are important leaders and have major grass root following. These leaders have little education and/or knowledge of the outside world. This type of leadership is mostly hereditary but it is common to replace an ineffective and unpopular Malik by the section of the tribe although normally the replacement is his brother or cousin.

In settled agricultural areas the leadership is both hereditary and land and wealth based. Generally hereditary leadership, land ownership, contacts with government and some education all go together. Changes in these areas are more rapid. The spread of education and opportunities of work in the urban areas and in the Middle East are fast changing the traditional leadership structure. But at this time the traditional leadership structure although weak, still is the predominant one.

VI. FORMAL/GOVERNMENT APPROVED LEADERSHIP

Like the rest of Pakistan, formal leadership at the local government level is vested in the union council system. The people elect their representatives to the union councils whose

members elect a representative for tehsil council and tehsil councils elect members for district councils. Traditionally the elders in Baluchistan, the Sardars, the Maliks and Mirs were all government men and belonged to the government-in-power party. The introduction of a system like that of local councils has not make any difference because the Maliks automatically became members and the chief, the chairman and in this way the existing local leadership system is just be confirmed by the government. During the last two decades this system has been slightly disturbed as certain chiefs opposed the government and the systems introduced by it. At present there seems to be a transitional, and confused situation and it is hard to state it in general terms. But it can safely be said that where the traditional leadership is cooperating with the government and union council members and traditional leaders are the same, there are less groupings and less conflicts among people. As a whole this system like its predecessor of the 60s, the basic democracies system is too new to have taken any roots among people and has still not proved to be a substitute for the traditional leadership system. Therefore, in areas where the local council and traditional leadership is not the same the traditional leadership in general has more following among the people.

VII. LAND AND ANIMAL HOLDINGS

According to the latest Agricultural Census Organization reports only 1 percent of the total holdings in Baluchistan have acreage of 250 and above. Majority of the holdings 86 percent are between 1-50 acres. The 1 percent with holdings of 250 acres and above own 31 percent of the total cultivated land in Baluchistan.

A general survey of the province reveals that except in the canal irrigated recently settled areas, holdings in case of all irrigated land are small. In the northern deciduous fruit growing areas as well as in the date growing areas of the south the holdings are very small and mostly below 10 acres. A survey of the rainfed areas also shows holdings in the range of 10-15 acres.

In case of sheep and goat herds the census organization estimates are that 37 percent of all the sheep flocks range in size between 70-200 animals and 26 percent have animals above 200 sheep. In case of goats 28 percent of all herds are 76-200 in size and 1 percent have more than 200 goats each. Generally the socio-economic and resource availability conditions in Baluchistan make herd sizes below 50 and over 200 uneconomic and irrespective of the census organization estimates. It appears that the majority of the sheep and goat flocks fall within this range.

VIII. USE OF NEW TECHNOLOGY

New high yielding varieties of cereals, fruit crops and vegetables have been introduced in Baluchistan and adopted, in some cases, on a big scale. In case of wheat, for example. 39 percent of the total area under wheat in Baluchistan was under high yielding improved varieties during 1980-81. In case of rice, 60 percent of the total area under the crop was under IRRI varieties. New high yielding varieties of apples, grapes, and other deciduous fruits are also grown. No new varieties of any significance have as yet been introduced in case of date which cover about one-third of the total provincial area under fruits.

In the past, efforts have been made by livestock department to introduce some exotic high mutton and wool yielding sheep and goat breeds. Such efforts have not been successful and local sheep and goat and other animal breeds are still the predominant ones raised in the province.

A pair of skinny bullocks pulling a handmade plow is the predominant scene throughout the length and breadth of the province. Various government subsidies, high expenses and low productivity of bullocks provided incentives for many farmers to use machinery particularly tractors for leveling, plowing, bund-making and sowing purposes. The number of such farmers is not big but mainly located on the roadsides their numbers seem impressive.

The use of fertilizers is also limited to the canal irrigated areas and to the orchards, mainly apple growing areas. In non-irrigated areas, the extent of fertilizer use is negligible. The insecticides, pesticides use has further declined after the recent partial withdrawal of government subsidies. The seeds, fertilizers, and pesticides are distributed by the Agriculture Extension Department.

IX. THE MEDIA (TV, RADIO AND NEWSPAPERS)

The Quetta TV station does not cover much area beyond its immediate vicinity in the valley and then not many people can afford TV sets. There are two national dailies published from Quetta and also more than a dozen other periodicals and daily newspapers. The newspapers do reach a significant section of population, including farmers, but the very low literacy rate - close to zero among farmers and definitely zero among animal raisers make newspapers a less effective medium.

Radio is the most effective means of reaching the farmer and animal raisers. Radio transistors are found almost everywhere, even in the most remote mountain herder villages. Quetta radio station produces programs in Baluchi, Pushto and Brahvi and these programs can very effectively be used to spread and disseminate any information to the farmers. There are some problems of weak transmission and different dialects spoken by different tribes

but still it seems to be the only means to communicate with remote area farmers and animal raisers.

X. CONCLUSIONS AND RECOMMENDATIONS

1. Considering the remoteness and general backwardness of Baluchistan, the adoption of new agricultural machinery and new crop varieties has been very rapid in the past. This might have been mainly because of the fact that tractor substitute bullocks are more expensive to raise than in other provinces and because most of the irrigated area of the province where improved varieties can be adopted is concentrated in limited geographical areas of the province. For example, canal irrigated area which makes up about 75 percent of the total irrigated area in the province lies in one small corner in the extreme southeast of the province. Most karezes are in the same general area in the southwest and so are tubewells in the north. Introduction and spread of new technologies has, therefore, not been a big problem in the past. Any new varieties and other technology developed for rainfed areas will be more difficult and expensive to introduce as such areas are spread throughout the province. More thorough studies with respect to socio-economic as well as agronomic and cultural conditions of the province need to be undertaken.

2. As is mostly the case elsewhere, the progressive farmers, the initial adopters and the risk takers will be the relatively richer and bigger landlords and animal owners. These would also most probably be the local formal or informal or both, leaders. In the beginning it may be hard to work in rural areas of Baluchistan without the cooperation of these people.

3. The agricultural extension and livestock department staff is nowhere near adequate but they are the only presence in the rural areas. Efforts should be made to work in cooperation with them and strengthen their existing organizations.

4. Since radio reaches wide segments of crops and animal raising population, Baluchi, Pushto and Brahvi language programs be used to disseminate technical and other information.

5. The objective of AZRI collaborative project "to study current farming systems and production practices to identify technical as well as socio-economic constraints to increasing productivity" cannot be achieved unless some local Baluch are involved at this and later stages (at present there is none). This is not based on consideration other than that almost 100% of Baluch farmers and animal raisers are illiterate and unlike

Punjabi and Sindhi illiterate farmers, for a Baluchi illiterate farmer, Urdu is "like Greek to him".

6. In each of the 17 districts in Baluchistan, there are mountainous areas 5,000 feet and above. But except in areas lying in roughly 100 miles radius around Quetta, there is no large scale cultivations in those high altitude areas. And because of lack of water generally there is not even much animal raising although some of Baluchistan's important range lands are found in such areas which except for a short time in summer, largely remain utilized. This would suggest that there is a need to carry out a portion of the research in areas of lower elevations since the central AZRI location is atypical of much of the Baluchistan Province.

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