AGENCY FOR INTERNATIONAL DEVELOPMENT
USAID/PAKISTAN

- INTERIM EVALUATION -

IRRIGATION SYSTEMS MANAGEMENT PROJECT
(391-0467)

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SECTION I - SUMMARY: FINDINGS AND RECOMMENDATIONS

PREVIOUS AID EXPERIENCE

Findings - A comparison of the ISM Project design and implementation processes was made in the context of AID's previous experience with irrigation projects. AID's experience in the past resulted in the evolution of five broad areas of concern:

Involvement

Analysis

Flexibility

Integration, and

Equity

The ISM Project Paper as the primary planning and implementation guidance document addresses these concerns in considerable detail. The implementation process has adhered to the intent and purpose in a satisfactory manner with the degree of flexibility necessary to meet day to day problems and necessary adjustments without deviating from the long-term project objectives.

While this interim evaluation addresses only that portion of the project presently being implemented, attention was given to those portions (Research and CWM) of the project as yet not but soon to be implemented to see if the rehabilitation, design and management/planning aspects contribute to the overall objectives.

The O&M effort meets this criteria as a first step in assuring the delivery of water to the ultimate user. An observation by the team was that a good number of the farmers lack an appreciation of the O&M process and the work associated with it in terms of the benefits accruing to them because of the work. In particular the

value of adequate drains is not adequately understood. The farmer does not demonstrate the sense of responsibility that he should toward maintenance of the canals and drains when rehabilitated. The farmer and his livestock accelerate the need for O&M activities through bank cutting and allowing his buffalo to use the canals and drains as wallows. This is a social aspect of the O&M process which must be dealt with in the long run as an educational process rather than just an enforcement procedure.

Recommendation - Present efforts toward determining the impact of canal and drain rehabilitation on the farmer should be accelerated as well as expanded in order to learn how to create a sense of responsibility and participation by the farmer toward O&M efforts. The CWM component will address the social issues but the evaluation team feels that this work could be started in the rehabilitation schemes now being implemented. An extension education approach could be carried out through the village council structure as one means to get more involvement by the farmers.

THE PROJECT PAPER - AN IMPLEMENTATION DOCUMENT

Findings - As in nearly all cases, the project implementation process has met with some minor problems and setbacks that could not be readily identified during the design phase. Optimism is a characteristic that all planners and persons working in the development field posses by the very nature that they are interested in and involved in this area of endeavor. The ability to react in a positive manner is a trait that USAID/Pakistan personnel appear to be well endowed.

Because of the complexity of the project, the various integrated activities of the project were for reasons of clarity, presented as distinct components each falling within an identifiable discipline or course of action. The continued utilization of this presentation format in the procurement of services may have inadvertently contributed to the impression that integration and institutionalization was of lesser importance than was true. The problems experienced in the procurement of technical assistance is viewed as a possible indirect outcome of the mode of presentation. The earlier results appeared to seriously tax the Mission's resources and efforts to adhere to the implementation process and the concerns identified through worldwide AID efforts. It is very important to note, however, that earlier deficiencies in orientation and implementation as related to and associated with the technical assistance procurement process appears to be in the process of being satisfactorily resolved.

Recommendations - The Project Paper while meeting all concerns of the Agency, is not at times an effective document for some procurement purposes other than as an information source. In future procurement actions, the scope of work for services should be more explicit as to how these services fit into the integrated project. This may require additional efforts to prepare each document on its own merit and intent with less reliance upon the existing narrative as presented in the Project Paper.

THE USAID/PAKISTAN DOCUMENTATION PROCESS

Findings - A review of the implementation documentation process for which the Mission has prime responsibility was made. From the signing of the Project Agreement on June 5, 1983 to the present the process of extensive documentation preparation and presentation has been of considerable magnitude. The time frame within which this has occurred was shortened because of early anticipation of requirements by the Mission with much effort expanded toward before-the-fact preparation. Total agreement on approaches and method of presentation was not always accomplished with the ease expected but at the same time the program progress did not suffer to any real extent because of the negotiation process. USAID/Pakistan has met its obligations in a very timely and appropriate manner.

Host country response and participation was satisfactory overall, however, implementation was delayed on a number of occasions because of slower than expected responses and actions. The team wishes to point out that for the most part the AID system and documentation process was new to many of the people involved. It still appears to be a problem in a number of instances at the PID operational level. This, however, appears to be basically a communication problem.

Recommendation - While substantial efforts are being made to inform and instruct all project associated personnel of AID's requirements and the system agreed upon for project implementation. There is an indication that even greater efforts would be very beneficial.

Another factor that appears to have contributed to a slower pace of implementation than anticipated inspite of careful preparation and forethought was the timing and arrival of the primary technical assistance contract team. The evaluation team would recommend that in the future when a large team is scheduled for a project that a chief of party position be established to provide overall direction. This chief of party and other technical team leaders should arrive one to two months ahead of the technical personnel inorder that they can become thoroughly conversant with the project and its priorities. In this way they would be in a better position to provide guidance to the technicians on program development and implementation priorities with the result that there would be a sharper focus on implementation from the very beginning.

COMMUNICATIONS

Findings - Difficulties in the communication process appears to the evaluation team as an area in which substantial improvement could be made at all levels and within and between the many organizations and institutions participating in the project. This statement should not be interpreted to mean that serious problems exist. This is not viewed as so by the evaluation team. Additional efforts, however, would facilitate the implementation process for all parties concerned. One must never lose sight of the fact that the speaker knows what is to be said and believes he does so while the reciever hears what he thinks he hears or hears what he wants to hear.

There were a number of instances during the evaluation that the evaluation team was made aware that there was misunderstanding relative to procedures and implementation processes. Most of the problems could be traced to a lack of information or understanding relative to the project, the AID system, the GOP system, the technical assistance role, and the individual(s) place and role in the project. The constant change or shifting of personnel and addition of personnel appears to have aggravated and perpetuated the situation even more. The evaluation team also became aware that the English/Urdu (etc.) language differences contributed materially in accentuating the communication difficulties.

Good communication is regarded as a must for the successful implementation and achievement of objectives. The complexity of the ISM Project and the vast number of persons and institutions involved necessitates that the most effective means of communication be developed and carried out through the life of the Project.

Recommendation - More effort and resources should be employed to develop effective communications between all parties concerned. This must be a joint effort but, AID can facilitate the process in conjunction with the GOP. It must be a continuing process because of the constant change in personnel. Strengthening the capacity of the Provincial Coordinator's offices to more effectively carry the message to the field is one area to which more attention and or resources should be given. While the project has been in force for eighteen plus months, additional efforts should be considered such as periodic orientation seminars down to the XEN level. The process

of establishing an effective communication system is a basic requirement for effective management. It is also part of the process by and through which institutionalization is accomplished. It can be thought of as a training activity.

TRAINING

Findings - The ISM Project has identified the need for training as a critical input required for attainment of the project objectives. The progress in training todate, especially external non-degree and degree is nearly nil. Recent progress toward the establishment of an in-country or inservice training program, while late in coming, is encouraging. The interest displayed by the Pakistan institutions participating in this effort appears to give evidence that the process can be institutionalized and become permanent (beyond life of the project) if adequate resources are provided. The value and need for training is not fully appreciated nor accepted by all in Pakistan. The mere availability of resources does not create a demand nor contribute to the institution-building process - a common mistake made by many donor agencies and technicians.

Recommendation - Consideration should be given to expanding the incountry training aspects of the project over the life of the project. Consideration might be given to the possibility of reducing the funding level for external training and increasing support to the incountry training program considering the difficulties posed by the time honored participant selection process. This is not to say that degree training is less important but it would, at this point,

be more effective use of funds. Such actions, however, should be delayed for six to nine months until a more accurate reading can be made as to whether or not the present problems are problems only of a temporary nature.

Much more attention needs to be given toward establishing incountry training on a permanent basis with sound institutional backing. High priority should be given to the training of trainers. This will mean that consideration for increasing the resources for educational institution staff receive a much higher priority than now contemplated or programmed. The PIDs and WAPDA will be the major benefactors in the long run if Pakistan educational institutions are able to graduate students who are better prepared to serve and function in their future roles within the PIDs and WAPDA.

REHABILITATION SCHEMES

Findings - The program of the physical rehabilitation of drains and canals funded under the project could be more fully utilized in meeting the larger objectives of the project that of assisting the government to develop an effective O&M program which is adequately funded and managed. The primary emphasis appears largely oriented toward the physical aspects wherein dredging of drains, repair of minor structures and strengthening of weak or badly deteriorated sections is an end in itself. The value of the work being done is not in question. The evaluation team is of the opinion that the very activity could serve as a major entry point or effective carrier for many of the activities that are planned for in the project at little or no additional cost.

PID personnel were not always well informed on the scheme approval process nor fully aware of the various institutional relationships and responsibilities. The fact that schemes were more often than not returned one or more times for correction and review documents the need for training in this area. The discussions also seemed to indicate that more effort was needed to educate the PID operational personnel as to the project concept and the PID personnels role in this process. This was previously discussed under the communication heading.

The great variance in equipment operations and operational skills was noticeable. Equally noticeable was the controversy relative to the economics of mechanical equipment use versus human and animal power. The evaluation team, while not taking sides, recognized that there was a need for an analysis of the two systems if an appropriate O&M system was to evolve out of the project - one which would be accepted and adopted. Without this effort and supporting empirical data, an O&M plan will only be another report for the bookshelf.

The ongoing rehabilitation schemes with little or no additional expense offers the opportunity for use as a "living laboratory" and or demonstration/training sites. Little has been done toward developing the parameters for impact evaluations. There are opportunities for before and after observations. The impact evaluation can serve as a very useful tool in developing O&M methodology and procedures.

Stabilizing drains to the extent possible and minimizing bank sloughing would appear to be problems that are appropriate for research and design efforts and demonstrations.

Recommendation - More effort should be made to integrate the physical work aspects of the rehabilitation schemes into the overall project approach instead of isolating the program as an end to itself. Consideration should be given as to whether or not pilot schemes should be selected and if necessary funded by the project so that they can be used as living laboratories for research and demonstration purposes. The "pilot approach" will be used in the CWM component of the project - why not this component also?

SECTION II - PROJECT SETTING AND RATIONALE

COUNTRY SETTING

1. The Agriculture Sector

Agriculture is the largest sector in Pakistan, accounting for about 32 percent of GDP, employing some 56 percent of the labor force, and contributing approximately 50 percent of export earnings. Irrigation is the single most important factor in agriculture, bringing lands under cultivation which would otherwise, because of insufficient rain, be left uncultivated or, if cultivated, produce less.

Irrigation lands account for 75 percent of total cropped acreage and 90 percent of the production of the major crops. On the average, yields on irrigation lands are higher than those in rainfed areas. However, crop yields, even in the irrigated areas, are low, measuring less than half of estimated potential yields. Cropping intensity, which under irrigated conditions should range from 130 to 150 percent, average about 100 percent for the Indus Plain. While factors such as inadequate funding for research, ineffective extension programs, and less than optimum availability of off-farm inputs contribute to this phenomenon, inefficient and ineffective water management is considered to be the principal constraint.

2. The Irrigation System

Pakistan has the world's largest contiguous irrigation system with a history spanning several hundred years. The Indus River and its major tributaries supply an irrigation network comprising of three major reservoirs with 15.3 million acre feet

total live storage capacity, 19 barrages/headworks, 12 link canals, and 43 canal commands. The total length of the canal system is about 40,000 miles, feeding a network of watercourses. Nine thousand miles of surface drains, to alleviate waterlogging and to control stormwater runoff, have been constructed over the years. The Indus system also includes over 13,000 publicly installed tubewells and about 200,000 private tubewells, which annually pump about 34 million acre feet. The contiguous system commands 34.5 million acres.

ISM PROJECT RATIONALE

The ISM Project fits within a broad set of GOP activities harnessing water resources for agriculture. An extensive irrigation system was developed in Pakistan in the last half of the 19th and first half of the 20th centuries. Since 1955, in a series of five years, the GOP has undertaken, with the assistance of numerous donors: (i) projects to further regulate the uncontrolled river flows in the Indus Basin, including the construction of the Mangla and Tarbela dams; link canals for intra-basin transfer of waters of major tributaries; and, major barrages (diversion dams); (ii) improvements of canal systems which supply water to irrigated land; (iii) development of groundwater through expanded public and private tubewell programs; and, (iv) a program to address salinity and waterlogging problems through a series of Salinity Control and Reclamation Projects (SCARPs), however, Pakistn's system is not yet designed to maximize agricultural output. The system is characterized by the following problems:

1. Deteriorated Canals and Drains

Canals and drains are in badly deteriorated condition due primarily to the absence of adequate and timely maintenance. Silt deposits have raised the beds of the channels, encroaching on the designed freeboard. Embankments, subjected to continuous stress from water flow, wind and rain erosion, and human and animal abuse, have deteriorated. These problems are compounded by canals carrying quantities of water much greater than their designed capacity. The end result, canal breaches with locational floods and interruption of downstream service to large farming areas, is a serious threat to the irrigation system, the lifeblood of Pakistan.

2. Financial Constraints

The ability to carry out maintenance is inhibited, for the most part, by financial constraints. As the system has grown and aged, the burden of operating and maintaining it has produced a severe financial burden on provincial governments. In periods of high inflation, budgetary allocations have remained almost constant, resulting in a decline in real terms. In addition, the cost of maintaining publicly-owned tubewells has made additional demands on these scarce resources. While staffing levels have been maintained, funds for operation and maintenance have not been adequate to keep up with requirements dictated by time and use.

Revenue generated by the system has not kept pace with either rising costs or agricultural income. In addition, the revenue collected by the provinces becomes part of a provincial general fund which is allocated yearly for all provincial recurring budgets. This practice places the Provincial Irrigation Departments (PIDs) in

direct competition for funds with education, health, and other provincial bodies. It is estimated, moreover, that even if the current level of water charges were earmarked for direct use by the PIDs, the resulting revenue would fall well below the amounts needed to cover the required cost of an adequate operation and maintenance program.

3. Waterlogging and Salinity

Irrigation systems often bring with them the dangers of waterlogging and salinity, caused by rising water tables and the deposit of salts following evaporation. Vast areas of the Indus system are threatened by this phenomenon. The problem is particularly serious due to minimal slope conditions in the lower region of the Indus basin where as little as one foot of drop in three miles is found.

In 1960, the GOP embarked on a program to address salinity and waterlogging problems through a series of Salinity Control and Reclamation Projects (SCARPs). By 1980, in six SCARP areas, 12,000 public tubewells had been installed in fresh groundwater zones and 1,300 in saline zones. An estimated 200,000 smaller tubewells have come into use in the same areas. These tubewells provide relief to rising water tables, and, in fresh zones, tubewells complement surface water supplies for irrigation. A 1978 survey conducted by the Water and Power Development Authority (WAPDA) showed improvement in soil salinity conditions compared to a similar study undertaken in the early 1960's. The improvement was largely attributed to the leaching effects of increased water supplies. Drainage channels are

an integral part of a campaign to combat waterlogging and salinity as well as means to carry off stormwater. Drains, however, have traditionally had last claim on resources for maintenance, and many are clogged with silt and vegetation.

4. Deficient Water Policies and Practices

The set of policies governing water and the roles of federal and provincial institutions in formulating and implementing water policy is a product of over eighty years of history. The present canal system has its genesis under the British Colonial Government and was constructed with two primary objectives: to obtain revenue from the sale of waste lands and to alleviate chronic famines by resettling farmers from poor areas. These objectives were best achieved by spreading available water over a large area and providing a relatively "sparse" supply to the areas served. This original allocation policy of "water spreading" has continued through the years. An illustrative per acre comparison between the Indus system and water delivery in the western United States is that the per acre delivery of water in Pakistan is about one-fourth of the amount delivered in U.S. irrigation schemes.

5. Institutional Gaps

The formulation and implementation of water policy and operational responsibilities are shared by several federal and provincial bodies. The Ministry of Water and Power, the principal federal body in the water sector, is charged with rationalizing overall water and power policy and investment programs. A semi-autonomous body, the Water and Power Development Authority (WAPDA), which falls under the Ministry of Water and Power, is the

planning and executing agency for major civil works. It is also the operating agency for the Tarbela and Mangla Dams, the Chasma Barrage, and the Chasma-Jhelum link canal. Specialized technical units within WAPDA are dedicated to: overall planning and systems analysis; hydrologic studies; surveys and research on water and agriculture; flood prediction; and, design and construction of major works.

Provincial governments have a role in formulating national water policy through consultations with the Ministry of Water and Power. Water charges are levied, collected, and become part of general revenues under provincial agencies. The provincial Irrigation Departments (PIDs) are charged with operation and maintenance of the irrigation system within each province. Provincial Agricultural Departments provide extension services to water users as well as manage a special program for watercourse rehabilitation and maintenance.

SITUATION SUMMARY

The current situation can be summarized as follows: 1/

(a) Despite the addition of storage capacity (most recently Tarbela), the emphasis remains on the engineering aspects of water delivery rather than water delivery to meet agricultural needs;

(b) The institutional responsibility and concern for water use ends at the final canal outlet (mogha) leaving an institutional vacuum in the irrigation area. The Provincial Agricultural Departments are not fully capable of assuming this responsibility;

1/ Revised Action Program for Irrigated Agriculture, Vol.1, 1979.

(c) Water rights are a product of historical accidents, determined by piecemeal allocations as each canal came on stream. These rights bear little relationship to water requirements; and,

(d) Conjunctive (simultaneous) use of surface water and tubewell pumpage, including publicly-owned tubewells under the SCARP program, is not well planned often resulting in wastage of water.

ISM PROJECT GOAL AND PURPOSE

The PROJECT GOAL is to increase agricultural production and farmer income by improving the management of irrigation water resources. progress toward goal achievement will be assessed by measuring the extent to which increases have occurred in project areas in overall crop production, yields and farm income. Progress will be verified by GOP agricultural production data. The major assumption for goal achievement is that GOP policies will continue to encourage canal and drain rehabilitation and maintenance, agricultural production, and increased farmer income.

The PROJECT PURPOSE is to increase the capabilities of institutions involved in irrigation planning, design, research, operation and maintenance, and to bring about policy changes needed for proper irrigation water management. End of project status indicators include the following:

1. PID capabilities improved by trained staff and additional equipment;

2. In-service training programs institutionalized by PIDs were needed;

3. Priority canal systems rehabilitated such that future operation and maintenance problems will be minimized;

4. Improved planning, design, and water management capabilities in government organizations;

5. Improved research capability at the following institutions:

a. Punjab Irrigation Research Institute;

b. Hydrology and Systems Analysis Organization, WAPDA;

c. Central Monitoring Organization, WAPDA;

d. Mona Reclamation Experimental Project, Punjab;

e. Lower Indus Water Management and Reclamation Research Project, Sind; and,

f. Sind Hydraulic Research Station.

6. Water charges are increased and rationalized such that water charges are more in line with water use;

7. Adequate funding is available for O&M through increased water rates, reduced expenditures for publicly owned tubewells, and/or other financial arrangements; and,

8. Canal freeboard is maintained on rehabilitated canals.

Major assumptions for achieving the purpose of this project are that: (1) adequate personnel and bnudgetary support will be provided by the GOP; (2) GOP and provincial agencies will adopt and utilize new technologies and systems for improved irrigation water management; (3) WAPDA and PID personnel involved in research activities at all organizational levels will be receptive and responsive to the policy and operational reforms required to undertake research and eventually to improve the overall irrigation system, and (4) farmers will respond favorably to the opportunities offered them by the improved management of water.

PROJECT OUTPUTS

The project is expected to produce the following outputs which together should achieve the project purpose:

1. Reliable, safe and stable water delivery by about 14,000 km of rehabilitated canals;

2. Prompt disposal of surface water by about 3,500 km of rehabilitated drains;

3. Increased farm employment by about 62,000 jobs;

4. Increased irrigation system construction employment throughout the project life by about 29,000 jobs;

5. Improved rehabilitation design criteria based upon the collection of hydraulic data to minimize maintenance requirements;

6. Improved operation and maintenance procedures;

7. Six Provincial Irrigation Workshops upgraded in the four provinces;

8. 162 WAPDA, university, and PID personnel will have completed long-term training in the U.S., including 90 non-degree, 13 Ph.D. and 59 M.S. degree candidates; 228 persons will have completed short-term training courses in the U.S., and 1,505 will have completed short-term incountry training courses, or a total of 1,895 personnel will have been trained;

9. A new procurement and inventory management system for earthmoving and workshop equipment and spare parts developed and institutionalized in the PIDs;

10. At least six priority research studies in water management completed; and,

11. A CWM feasibility study completed for the implementation of a CWM pilot program consisting of one or more subprojects in each of the four provinces (Punjab 4; Sind 1, NWFP and Baluchistan 1 each).

PROJECT COMPONENTS AND IMPLEMENTATION METHODOLOGY

Under the ISM Project, U.S. funding is or will be provided to render assistance to the GOP in the areas of -

1. Rehabilitation

Funds are being provided to carry out rehabilitation on selected canals and drains. Technical assistance is being provided through four teams of expatriate and local consultants as follows: Engineering, Equipment Management, Planning/Management and O&M. All of these teams are to be indirectly involved in the civil works component of this project, in such areas as improving canal rehabilitation design capability. Direct assistance is directed at the PID research facilities in the Punjab and Sind; improving the capability of staff at provincial irrigation workshops to maintain and operate equipment; and, improving the management and organizational skills within the PIDs.

Commodities are being procured for the rehabilitation works activity include a variety of earthmoving equipment, spare parts, workshop equipment (which is required to maintain the earthmoving machinery), and equipment to collect flow and sediment data on problematic canals rehabilitated under this project, which will be utilized for the purpose of evaluation and canal rehabilitation design.

2. Management

a. Institutional Improvement, Management and Technical Skills Development

Funds are and will be provided to assist in creating a situation where institutional improvements can be developed on site, capitalizing on the embodied experience of the staff while evaluating and testing new management and training techniques from outside.

b. Increasing the Operation and Maintenance(O&M) Capability of the PIDs

This project activity consists of the following courses of action which are designed to improve the O&M capability of the PIDs. Included is the procurement of new equipment, workshop improvement, technical assistance on equipment management, improved design capability and management training.

c. Improving Water Management at the Federal Level

To accomplish the above the Federal Coordinating Cell (FCC) will be strengthened, a Centralized Procurement Office (CPO) established and water monitoring capabilities strengthened.

3. Planning, Policy Implementation and Research

Emphasis will be placed on establishing the framework for further government action and emphasize the need for future programs to be directed toward increasing the productive use of the water delivered and a shift in the role of the government to provide a meaningful role for water users in the management of irrigation water.

The basic institutional structure and core of skilled manpower are in place; what is required is technical assistance to transfer skills and impart knowledge to existing staff and to carry out in-service training; commodities; and funds for critical research programs.

4. Command Water Management

a. Introduction

The rehabilitation works, institutional improvement, and planning and research components of this project will lay the foundation for the improved delivery of water through the canal system. The challenge which will remain for administrators of the water system, however, will be to address, with the active participation of water users, the complex set of questions related to water delivery and water use in order to manage water deliveries over the 34 million acres of irrigated land in Pakistan with the objective of increasing on-farm productivity of water use. Efficient and effective operation, maintenance, and management of the irrigation system is a necessary first step in the implementation of a strategy aimed at improving the productivity of the land and water resources in Pakistan.

Command Water Management (CWM) is the logical and essential next step to ensure that all relevant agencies cooperate to match water supplies with crop requirements in order to increase crop production. This project component has been developed and is being implemented in early 1985.

CURRENT PROJECT STATUS

Rehabilitation works (started in late 1983) that will serve as the primary mechanism through which the Engineering, Planning/Management, and Equipment Management technical assistance are working is currently well underway. Heavy equipment has and is being procured and ACOP is collecting data for this activity. The services of the primary contractor PRC/Checchi became available on April 1, 1984. The majority of expatriate advisors arrived in April and May, 1984.

Planning of research activities in which both the Engineering and Research teams are involved has begun. A short-term Research Definition Team has completed their initial study. Procurement of the Research Team (University of Idaho) is in process with estimated arrival in mid 1985.

SCOPE OF EVALUATION

This Interim Evaluation focuses largely on the activities that have been initiated during the past eighteen months. Emphasis was given to items 1-3 as defined above. In carrying out the evaluation within the context of Pakistan's requirements the evaluation team also considered the ISM Project in relationship to AID's previous experience with irrigation projects (based on A.I.D. Program Evaluation Report No.8 - "Irrigation and AID's Experience: A Consideration Based on Evaluations" and guidance received from the Asia Bureau.

SECTION III - THE PAKISTAN CONTEXT - EVALUATION BASE

PROJECT CONCEPT

1. DONOR RELATIONSHIP

The first component of the Irrigation Systems Management (ISM) Project funded by the United States Government through a ESF (Economic Support Funds) grant was designed to assist the Government of Pakistan (GOP) and the four Provincial Irrigation Departments (PIDs) to rehabilitate currently deteriorated surface irrigation and drainage systems and to improve Pakistan's institutional capacity to operate and maintain the systems. The attainment of these objectives are being further supported by the Irrigation Systems Rehabilitation (ISR) Project co-financed by the World Bank (IBRD) through its International Development Association (IDA) affiliate.

The ISM project is intimately linked to the IBRD's ISR project - implementation of the ISR project is dependent upon substantial A.I.D. support. While the IBRD project focuses almost exclusively on rehabilitation works the A.I.D. project (ISM) addresses in addition to rehabilitation works, efforts toward improving federal and provincial capability to plan, design, undertake research, and operate and maintain the country's irrigation systems so that reliable and equitable water supplies are available to the irrigated agricultural sector. The A.I.D. project is designed also to move forward toward the long-term goal of integrating water, land, and farmer resources under the organizational and methodology approach known as the Command Water Management (CWM) concept.

The A.I.D. financed ISM project and the Bank (IBRD) ISR project are administered in a parallel manner for rehabilitation of civil works in a ratio of about one-third to two-thirds. IBRD fully funds the services of a local supervisory consultant firm (National Engineering Services (Pakistan) Limited - NESPAK and the services of the local evaluation/data collection organization (Alluvial Channel Observation Project - ACOP). AID through ISM funds all of the expatriate technical assistance, training, earthmoving and workshop equipment and spare parts as well as hydraulic measurement and research equipment. Most of the equipment financed by A.I.D. is being provided under the A.I.D. supported Agricultural Commodities and Equipment Project (391-0468). Both the projects, ISM and ISR contain the same covenants which are aimed at ensuring that adequate financing of operation and maintenance (O&M) costs are available to prevent the deterioration of rehabilitated canals and drains.

2. ISM PROJECT DESIGN COMPONENTS AND OBJECTIVES

The ISM project as designed consists of four distinct but complementary and interrelated components as follows:

a. Rehabilitation Works;

b. Institutional Improvement: Management and Technical Skills Development;

c. Planning, Policy Implementation, and Research; and,

d. Command Water Management.

Rehabilitation Works

The objective of this component is to assist the GOP to: (1) rehabilitate and maintain about 14,000 km of surface canals and about 3,500 kms of surface drains; and, (2) strengthen human and physical resources and management operations to plan and design civil works activities and effectively operate and maintain (O&M) the entire system.

Institutional Improvement: Management and Technical Skills Development

The objective of this component is the attainment of institutional improvement at both the provincial (PID) and federal levels.

In order to increase the productivity of the PIDs to operate and maintain the entire canal delivery (to the mogha) and drain system the project components, as designed, provides for -

(a) The procurement (through ACE) of approximately $31 million of new earthmoving and workshop equipment and spare parts to increase the size of the O&M machinery pool and repair existing deadlined equipment;

(b) The rehabilitation of the physical plants of six PID machinery maintenance workshops, improve managerial and technical skills of staff and improve spare part inventory control and maintenance;

(c) The improvement of the control system (develop and institutionalize) to enable the PIDs to efficiently manage and operate machinery for preventative maintenance of civil works;

(d) The improvement and strengthening of the PIDs design capacity in order to reduce continuing maintenance demands in the canal and drain system.

(e) The provision of management training to PID personnel; and,

(f) The development and institutionalization of a Management Information System (MIS) to generate and disseminate information needed for management decision-making.

In order to increase the productivity of federal level bodies and to coordinate both water policies and storage supplies, the following activities were envisaged in the design formulation -

(a) The establishment of a Federal Coordinating Cell (FCC) to ensure effective implementation, coordination and supervision of the project;

(b) The establishment of a Central Procurement Office (CPO) to routinely order spare parts and to serve as an expeditious channel for emergency orders; and,

(c) The expansion and application of a water management computer modelling system to monitor total water supplies and scheduled distribution.

Planning, Policy Implementation, and Research

The objectives of this component are to:

(1) Strengthen the capacity of the PIDs to engage in the planning process for future projects in the water sector and to continue, with WAPDA (Water and Power Development Authority), the transformation of policy guidelines into action programs; and,

(2) Strengthen existing critical research programs in areas of water management both within and outside the Indus System.

Command Water Management

This component is intended to integrate the management of irrigation water at all levels within canal commands. The objectives of this pilot effort are to:

(1) Substantially increase agricultural production in selected pilot areas through improved water management;

(2) Develop water management techniques and programs which can be replicated throughout Pakistan;

(3) Reduce inequities in actual water deliveries at all levels; and,

(4) Build within the provincial agencies (i.e. Irrigation and Agriculture) and the federal level agencies a continuing and expanded capability for planning, implementing and operating integrated programs for irrigated agriculture.

INSTITUTIONAL AND HUMAN RELATIONSHIPS

Aside from the objectives set forth in the ISM and ISR Projects, an evaluation of the progress todate must consider the institutional and human factors and existing established procedures and system (s) under which the project was designed and through which is being implemented. The bilateral project agreement was signed between the GOP and the United States Government on June 5, 1983. It is from this date forward to the present (an elapsed period of eighteen plus months) that this interim progress evaluation is addressed. The judgments and inferences reached by the evaluation team and documented in this report must, of necessity reflect the historical and operational procedures and mode of work and human relationships developed over a period of time.

1. HISTORICAL REVIEW

Pakistan's irrigation system relates to a period of time spanning several hundred years. The present system represents extensive efforts carried out during the last half of the 19th and first half of the 20th century. Management practices established early on are still followed in many instances. Efforts prior to Pakistan's independence in 1947 were directed largely toward the

expansion and improvement of the irrigation works. After independence primary attention was given to completion of the Indus Basin Projects, under which required civil works were provided to compensate for the loss of river flow from India. Since 1955, in a series of five year plans, the GOP has undertaken, with the assistance of numerous donors: (a) projects to further regulate the uncontrolled river flows of the Indus Basin, including the construction of major dams, link canals for intra-basin transfer of waters of major tributaries, and major diversion barrages; (b) extension of canal and drain systems; (c) development of groundwater through expanded public and private tubewell programs; and, (d) a program to address salinity and waterlogging problems. While this progress was on-going the existing canals and drains deteriorated due largely to the absence of adequate and timely maintenance.

The ability to carry out the needed O&M programs was inhibited, for the most part, by financial constraints. As the system has grown and aged, the burden of operating and maintaining the system has produced a severe financial burden on the governments (federal and provincial). In periods of high inflation, budgetary allocations have remained fairly constant but have declined in real terms. In addition, the cost of maintaining publically owned tubewells has and is making increased demands on the scarce resources. While staffing levels have been maintained at a fairly constant level, funds for operations and maintenance have not been adequate to keep up with the requirements dictated by time and use.

2. HUMAN RESOURCE DEVELOPMENT

Human resource development has also been a victim of the times, political and geographical realignment, organizational restructuring and budgetary restrictions and level of compensation. This has occurred also during a period of time when substantial advancement has occurred in the fields of irrigation system research, design, operations and maintenance technology, management concepts and the economics of water delivery, maintenance and utilization. Personnel have not had the opportunity to participate in and/or assume the role for which they feel qualified to do so as members of the world's largest contiguous irrigation system. It is understood that a change in operating procedures and/or the introduction of recently developed technology introduced for the first time might be interpreted in some cases as a challenge to authority and well being.

INSTITUTIONAL RELATIONSHIPS

In Pakistan, a large and diverse array of public sector agencies and the private sector are involved in one manner or another in the planning, allocation, management, delivery and utilization of water from surface and underground sources for purposes of irrigated and watered agriculture. This is a phenomenon not exclusive to Pakistan - it occurs throughout most of the world including those countries exporting technology and planning and management guidance and assistance. The desire to maintain and if at all possible expand the sphere of influence of one's self and organization is a trait common to all persons and organization at

whatever level they currently occupy. Management is an inexact science - success is most often a result of the successful coupling of the human factor and organizational responsibility with a specific purpose or objective in mind.

The success of the Irrigation Systems Management Project as designed is likely to succeed if these priority focal points are established early on in the project. The Evaluation Team's approach in evaluating the critical management aspects of the project, must of necessity be subjective in nature.

TECHNICAL ASSISTANCE

The evaluation team placed special emphasis on the contractor's ability to manage and integrate its personnel resources into the project with all resources focused on the primary project objectives within the contractor's scope of work. The teams and their individual members' capability and capacity to identify priority areas of concentration within their general discipline assignment as related to the overall objectives was a primary concern of the evaluation team. Individual members were evaluated as to their ability to relate to the total contract effort and their ability to work and function within and through the existing system(s) in Pakistan.

SECTION IV - OBSERVATIONS AND CONCLUSIONS

REHABILITATION SCHEME DEVELOPMENT AND APPROVAL PROCESS

Discussions relative to the preparation and approval process as related to the rehabilitation schemes to be funded under the ISM project in a number of instances generated concern on the PIDs part relative to delays in rehabilitation scheme approval and that the process was cumbersome. Statements were made that AID returned schemes for revision and correction and imposed standards that were contrary to agreed upon policies and procedures. Organizations by name were held responsible for delays that prevented rehabilitation work to begin during the shut down periods. Further inquiry into these matters disclosed that NESPAK role or function in its review and approval role was not understood by the PID employees interviewed. This fact led the evaluation team to the conclusion that a fair number of the PID personnel at the operational level were not totally conversant with the overall project concept and especially the process for scheme development, presentation and approval process adopted and accepted jointly by the GOP/PID/NESPAK/AID project management personnel. It also appeared to the evaluation team that there was a degree of unwillingness on the part of some PID personnel to acknowledge the fact that in a number of instances the problems originated because of poor preparation of the schemes in first instance. This is according to NESPAK's evaluation based on the submitted schemes.

An analysis of the schemes (see Table 1) presented for review and approval to NESPAK shows that the percentage of schemes returned to the PIDs for clarification and correction ranged from zero to one hundred percent. Many schemes were returned more than once before they were accepted by NESPAK and sent forward for FCC and AID approval. It should be also noted that in a number of instances

TABLE 1

Tabulation - Schemes Returned for Revision
(Period Ending September 30, 1984)

Province	Received by NESPAK	Returned for Revision by PID	Revised Schemes Resubmitted to NESPAK by PID	PILs Issued
Punjab	29	27	18	7
Sind	6	5	5	5
NWFP	6	5	6	5
Baluchistan	2	-	-	2

the schemes returned by NESPAK to the PIDs for correction were not immediately re-submitted by the PIDs Two to three months time elapsed in a number of instances before the schemes were resubmitted by the PIDs for final review by NESPAK (This based on NESPAK's quarterly reports).

The implementation status is depicted in the following -

TABLE 2

Status of Scheme Implementation of 148 Schemes
As of January 1, 1985

		NWFP	Baluc-histan	Sind	Punjab
1.	Total No. of Schemes included in ISM Project (after incorporating the deletions)	9	3	88	48
2.	No. of Schemes scheduled upto June, 1985	8	3	42	24
3.	Schemes prepared by PIDs and submitted to NESPAK	10	2	65	32
4.	No. of Schemes under review/ observation by NESPAK and PIDs	4	2	59(*)	11
5.	"PIL" requested by NESPAK	6	2	6	21
6.	"PIL" issued by USAID	6	2	5	12
7.	Schemes under execution	3	-	-	9
8.	Schemes completed	3	-	5	-

(*) Most of them are back with the Department.

During the interviews with PID personnel the evaluation team attempted to identify the reason (s) for schemes not being accepted by NESPAK. Responses were very general in most cases. Computation errors, no provision of RD markers, exclusion of compaction, rate discrepancies, dressing, and differences in survey data and earthwork estimates were often the reasons for requesting scheme revision. There were a couple of instances where schemes were returned because the schemes were ineligible for undertaking in

Phase I (sedimentation studies and possible redesign required). It also appeared that the requirement for meeting specific CPs before schemes could be forwarded was not understood nor appreciated by the PID personnel functioning at the operational level.

Since the scheme approval process and inspection procedure was often brought up as a topic for discussion the evaluation team reviewed the process. The process as understood by the team is as follows for Phase I eligible schemes -

1. PIDs prepare the scheme for the rehabilitation of the canal or drain (this is most often done by the sub-engineer or the SDO).
2. Scheme forwarded to the XEN for review and approval.
3. Scheme forwarded to SE for review and approval.
4. Scheme forwarded to CE for review and approval.
5. Scheme forwarded to NESPAK with notification to PID ISM Project Coordinator that scheme in process.
6. NESPAK reviews scheme. If not acceptable returns scheme through PID ISM Coordinator to originator for revision.
7. If scheme acceptable NESPAK informally requests USAID/ARD engineer to review scheme.
8. USAID/ARD engineer with NESPAK and PID engineer carries out complete inspection and review of scheme. USAID engineer addresses the following aspects -

a. Is scheme an ISM authorized scheme?

b. Is work planned in conformity with the Reimbursement Agreement?

c. Is it technically and economically feasible?

d. Is it based on correct survey and engineering standards?

e. Are computations of quantities of work and costs correct?

In case where corrections were required this was discussed jointly with the PID and NESPAK engineer present at the inspection.

9. When the USAID/ARD engineer is satisfied with the scheme NESPAK initiates a request for issuance of the PIL through Provincial and Federal Coordinators.

10. USAID/ARD drafts PIL on receipt of request from Federal Coordinator. Draft cleared by O/FM, O/RLA, O/PDM and PIL issued by O/DIR.

In the meantime, PID completes their tendering procedures so work can be undertaken on issuance of PIL.

11. PIL sent to Federal Coordinator with copies to PID Coordinator.

12. PID notified work can commence.

13. During construction inspection of work is carried out by NESPAK and the USAID/ARD engineer. Site inspection reports are issued and corrective action taken if required at the time of the inspection.

14. Upon completion of work NESPAK certifies that the work is completed and to the standards and then notifies USAID/ARD engineer to carry out the final inspection.

15. Upon receipt of USAID/ARD engineer approval NESPAK initiates request for reimbursement.

While this process is lengthy it provides the necessary checks and balances required to authorize the disbursement of U.S. funds.

Some criticism of this process appears to be due in part to a less stringent enforcement of the approval procedure for IDA funded rehabilitation schemes, however, the IDA ISR funded scheme approval process appears to experience many of the same problems associated with the ISM funded schemes.

The conclusions reached by the evaluation team are the following:

1. Delays in the rehabilitation work is largely due to a lack of skills of PID personnel in developing and documenting scheme proposals. This conclusion was arrived at in spite of PID views that their personnel are well trained to carry out this responsibility because of PID employees long association and tenure in the organization.

2. The ISM rehabilitation review process, while lengthy, is not a constraint to successful project implementation although there appear to be opportunities to streamline or to speed up the the process. Earlier participation by AID and NESPAK during the scheme preparation phase might be considered. It would help eliminate the need for schemes

to be rewritten in a number of instances. The question of whether AID and NESPAK have adequate personnel resources to become involved at such an early point must be a consideration.

3. Well prepared schemes move forward in an acceptable manner and within a satisfactory time frame.
4. The rehabilitation schemes offer an opportunity for inservice training and demonstration which are not presently being fully recognized nor exploited.
5. The communication link to the operating/implementing personnel level is weak and requires additional attention above and beyond that already given if the apparent misunderstanding relative to organizational role and responsibility are to be minimized.

REHABILITATION SCHEME OBSERVATIONS

On site visits to some of the completed rehabilitation schemes and work in progress were made in all Provinces except Baluchistan. The latter was impossible because of the absence of responsible PID personnel (participating in meetings in Karachi, Lahore and Islamabad) and travel restrictions to the distant, isolated project sites. The sites visited were selected at random by the evaluation team from the list of ISM funded schemes. PID personnel were extremely helpful in arranging these visits and in all cases participated during the on-site visits and subsequent discussions. PRC personnel accompanied the team on all site visits and were present during all discussions relative to the rehabilitation

schemes. PRC personnel also played a major role in arrangements and logistical support.

The following schemes were visited during the field phase of the evaluation -

NWFP
- ISRP-UN-20 Peshawar Workshop
- ISRP-UN-19 Surizai Drain(work partially completed)
- ISRP-UN-12 Mian Gujar Canal(work completed and accepted by AID)
- ISRP-UN-14 Sangu and Sheikhan Branch Canals (work in process)

In addition to the above, site visits were made to the Warsak High level Pump Station, Warsak Syphon Canal and the Juay Sheikhan Syphon.

Baluchistan
- ISRP-UB-7 Anambar Irrigation Scheme (unable to visit as previously stated) (reported work as started)
- ISRP-UB-11 Quetta Workshop

Sind
- ISRP-US-48 Jamshoro Workshop
- ISRP-US-11 Bathoro Branch Drain(completed and accepted by AID)
- ISRP-US-9 Nagan Dhoro Outfall Drain(under planning)
- ISRP-US-40 Mashaikh Hoti Distributary(completed and accepted by AID)

Punjab
- ISRP-UP-52 Moghalpura Workshop
- ISRP-UP-54 Multan Workshop
- ISRP-UP-24 Buchar Kana & Ramkot Drains(Buchar Kana - work underway)

- ISRP-UP-23 Raiwind Drain(work underway)
- ISRP-UP-38 Ghazi Ghat Main Drain(scheme approved but no work)
- ISRP-UP-39 Ghazi Ghat Branch Drain

Also visited was the IDA funded ISRP-IP-2 Muzaffargarh Canal RD 207-290.

Relevant observations pertaining to the various schemes visited are given below except for the workshop schemes which are addressed in the following section entitled Workshop Rehabilitation and Upgrading.

North West Frontier Province

ISRP-UN-19 Surizai Drain -

The evaluation team was informed that before the rehabilitation work the drain virtually did not exist except as a shallow natural depression and that the water table was at the surface with the result that the cultivators had abandoned the areas along the drain. With the removal of the silt and the opening of the drain the water table was lowered by about five feet within a distance of about one half mile on either side of the drain. An area of about four thousand acres which remained abandoned is now being brought under plough and crops are being grown in some fields for the first time in ten years.

It was observed that considerable side sloughing is occurring in the cleaned drain channel. Also the spoil was left in piles at the edge of the bank so that man and animal were causing part of the spoil material to fall back into the channel. The side slopes of

1/2:1 appear to be too steep to stand up under such water logged conditions. Also no permanent inlet structures were visible. It was stated that the cultivators cut the banks at suitable sites to release the impounded water. There was no patrol road along the drain and R.D. markers were also missing. Temporary or permanent AID signs were not in evidence. Work todate has been carried out with human and animal labor.

ISRP-UN-12 Mian Gujar Canal

Work has been completed and accepted by AID on this scheme. The rehabilitation work on this canal consisted of providing stone pitching in the reach RD 15,500 to 19,000 whereas the total canal length is 36,000 ft. On enquiring, it was reported that this work has been done to strengthen the reach where there were frequent breaches due to weak banks and holing by borrowing rodents. The work consisted of strengthening of banks, compaction of sub-grade (this reported as being done by hand), provision of stone pitching one foot thick, and some reshaping of the unlined portions of the bed. The stone pitching was provided to the earthen section without allowing any consideration to the change in "n" value which may result in some undercutting when the canal is opened for water flow. No temporary or permanent AID signs were visible at the site.

ISRP-UN-14 Sangu and Sheikhan Branch Canals

The Sangu Canal takes off from the left side of the Bara River from a horseshoe bund type weir with gated control for the head regulator. Discharge is about 150 cs. during floods and 10 cs. during the perennial flow. The canal is about two miles long but

rehabilitation work comprises stone pitching on the sides in the reach RD 7,000 to 8,250 feet considered vulnerable to breaches and tampering adjacent to the adjoining flood channel.

The Sheikhan Canal off-takes from the right side of the Bara River from the same weir as for the Sangu Canal and also has a gated head regulator. It can pass a flood discharge of 150 cs. while the perennial flow is 16 cs. The total length is about two miles but rehabilitation work of stone pitching of sides is being done in reach RD 3,250 to RD 42,50.

In both the canals the earthen section has been pitched without giving due consideration to the change in value of "n". Temporary or permanent AID signs were not observed during the site visit.

Baluchistan Province

ISRP-UB-7 Anambar Irrigation Scheme

(as previously stated a site visit was not possible)

Sind Province

ISRP-US-11 Bathoro Branch Drain

Rehabilitation work on this drain has been completed and involved RD 28-37, 47-55 and 57-68. The total length of drain is 107 rds. Items of work involved earthwork on strengthening of banks (fills) and the provision of 15 permanent inlet structures. The team was informed that no equipment was used other than local labor using tractors and trailers for earth transport. Also stated was the fact that wheel tractors were used for compaction of fill. In RD 45-48 there was a serious weed growth problem although it existed to a lesser degree in other reaches of the drain channel.

Regarding AID signs, the team was told that temporary signs were fixed while work was in progress but later removed to the office.

ISRP-US-9 Nagan Dhoro Outfall Drain

The rehabilitation scheme for this drain has been prepared and its execution is included in the 1984-85 plan. According to PID personnel it has been received back from NESPAK for revision twice and once from AID. There were accusations that different signals were being given by each group. This could not be substantiated. The PID felt that their presentations were correct and that NESPAK (considered as AID) and USAID were impediments to the process.

Inspection of the drain revealed that condition of the outfall reach was deplorable (near absence of banks and bypassed inlets, side sloughing, etc). It was stated that the main items of work would involve bed clearance in reach RD 0-38 and raising of banks in reach RD 45-48 whereas the total length of the drain is 134 RD's. Plans include the use of dredgers for carrying out the bed clearance and rollers and wheel tractors for compaction on the bank raising portions of the scheme.

ISRP-US-40 Mashaikh Hoti Distributary

This distributary off takes from RD 807+500 left of Rohri Main Canal. The total length is 60 RDs and its head discharge is 192 cs. The rehabilitation work comprised raising of both banks and bridges (PID resources) and was completed in the year 1983-84 in the entire length. The work appeared to be well done.

Punjab Province

ISRP-UP-24 Buchar Khana and Ramkot Drains

Work has been initiated on the Buchar Khana Drain. The total length of the drain is 75 RDs but only RD 0-40 was inspected. The main work includes bed clearance and construction of dowel and inspection road (width 12 feet). New equipment (drag lines) procured under the ACE Project were being utilized. Of the two machines observed one operator was performing very well while the second less so with the result that the bed excavation was uneven and the slopes irregular (but within tolerance levels). The inspection road and dowel was being constructed with hand labor wherein it seemed feasible to use compactors and road graders. The latter are on the list of equipment to be procured under the second procurement tranche of the ACE Project.

New inlets are being constructed (excavation work in process) by a local contractor. It appeared to the evaluation team that compaction of fill around the inlets when installed will provide an opportunity for using available compaction (vibrating plate) equipment.

The Ramkot drain could not be inspected because of access difficulties.

It was observed that spoil was being handled several times in the construction of dowel and the inspection road. The evaluation team felt that here again there was an opportunity to demonstrate effectively the integration of equipment and operations.

ISRP-UP-23 Raiwind Drain

The drain is proposed to be rehabilitated in its entire length between RD 0 and 167. Work comprises restoration of bed to designed section and levelling and grading of the inspection road, providing a dowel, construction of permanent masonry inlet structures and fixing distance markers. Three draglines were working between RD 81 and 81+500. One of these was new (USAID) and two were already with the department. Two other old draglines were standing idle between RD 70 and 71 because of poor maintenance and lack of spare parts. The PID personnel reported that the workshop had been asked to evaluate the situation so that procurement of parts from stores could be initiated. The PID personnel reported this being a long process.

Lot of side sloughing could be seen in the drain prism between RD 70 and 81. The apparent reason is that in the outfall reach is in a deep cut section with a prevalent high water table. The side slopes of 1:1 are too steep to remain stable against the sub-soil water pressure and heavy surcharge of the spoil banks. Originally the drain was excavated in the 50's to drain a wide cup-shaped depression near the source of the drain and the outfall reach acted as a drainage cut. At that time the water table was not so high and to save cost the department provided a side slope of 1:1. However, during the last 35 years the water table has risen very high and the side slopes have become instable. If the present sloughing rate continues, it is likely that the outfall reach will soon become choked and nullify the very objective of draining the upper catchment.

ISRP-UP-39 Ghazi Ghat Branch Drain

Work has not started on this scheme although approved. Work was to have started in December 1984. A shortage of equipment was the main reason given for the delay. Only the tail was inspected.

ISRP-UP-38 Ghazi Ghat Main Drain

Work is underway on this drain with the excavation being done by draglines (3). A tremendous amount of silt is being removed and place on the spoil bank.The inspection road work is being carried out by human and donkey labor. Material is being handled several times. This scheme appears to lend itself to integrated equipment use since the quantities of spoil and earth to be moved is very sizeable while access is not a constraint.

Regarding design criteria, the team was informed that the drain was originally designed by WAPDA in 1976 and is being rehabilitated accordingly. The excessive side sloughing phenomenon seems to indicate that the side slope of 2:1 is unstable and steep in this reach. Due to this sloughing there was difficulty in measuring quantity of earth work since the quantity computed at the time of each measurement was likely to differ from the original computation.

Temporary signs were not observed on site.

ISRP-IP-2 Muzaffargarh Canal

This is an IDA funded scheme and was inspected between RD 177-206. Work on strengthening the banks was in progress through a contractor employing donkey labor and tractor-trailers. To the team this appeared to be scheme which could effectively use the dump trucks presently sitting unused in the stores area at Moghalpura.

The reason given for not using the trucks was a lack of loading equipment (to be ordered under the second tranche of equipment). Cost of operation was also given as a reason for not using the trucks.

GENERAL OBSERVATIONS

In the process of site visits a number of general observations were made. These included -

1. Much of the work being carried out is being done through the use of manual labor, donkey power and farm tractor-trailer units. It is acknowledged that portions of the work lends itself to this type of operation because of size of canal or drain or limited/restricted access to the problem sites. However, in isolated instances machinery was not being used where it could have been effectively employed. The answer given in these few instances was that it was more economical to employ hand labor than to use the equipment provided under the project.
2. At the sites where equipment was being used it was observed that the quality of work being done varied between operators of similar equipment thereby indicating a need for operator training. At one site visited (Juay Sheikhan Syphon) a dragline was not being used even though present on site because a qualified operator was unavailable. The previous operator had left PID employment and the PID was finding it difficult to obtain the services of a trained operator. Discussions often led to

the subject of operator retention because of low government salaries compared to higher salaries offered by the private sector or employment opportunities abroad or in Pakistan on major works projects. There was an expression of concern that the problem may become even more critical if and when the Kalabagh project comes on stream.

3. A special problem seems to exist relative to the use of dump trucks versus donkey labor or tractor-trailer for earth transport. The absence of correct front loading equipment was given as the reason for not utilizing the trucks (loaders on order but not yet received) as well as operating costs. In one instance the reason given was that tradition requires the hiring of local resources if the work is to proceed at a satisfactory pace.

4. In other instances equipment was reported to be deadlined because of poor maintenance and lack of spare parts. Conversations with PID staff indicated that the latter is basically a systems problem because spares in most cases are available but funds for purchasing spares from central stores and/or repair were difficult to obtain. It was reported that while funds were included in the work plan budget, the funds were often deleted from the budget. (The reason for receiving reports of this nature is not clear inasmuch as project funds budgeted for equipment being used for scheme construction clearly cover the cost of

repairs.) The system compounds the problem even more with stores under one division, repair and maintenance under another, equipment operation under another and the responsibility and financial resources yet under another.

5. The work control function was noticeably weak in a few instances. Control methods (staking, surveying, etc.) being below the acceptable standards has resulted in non-acceptance of PID design work (cost estimates) and the need to re-do staking work and quantity calculations.

6. The team also observed that some of the rehabilitation work while correcting the immediate problem often was of a temporary nature. Sloughing of drain banks continues to occur immediately behind the work. Spoil is being returned to its place of origin through the action of man and livestock when not spread but left on the berm in piles. Newly formed dowel is being deteriorated in the same manner. In one instance the spoil banks encroached on the farmers' land creating hard feelings. These are social aspects of the work. Stabilization of drain banks appears to be a topic for consideration in research and design efforts.

7. A difference of opinion seems to exist regarding use of equipment as to its utility in and on certain portions of the drain and canal system. Right of way, limited access, presence of structures (bridges, overhead water course conveyance structures) restrict the use of some large

equipment presently available, and the advantage of using smaller equipment has not been realized. In certain areas equipment can not work at an optimum efficiency level because of positioning (placed on the berm rather than in the channel box) difficulties. This is largely due to low bridges or watercourse structure under which the machinery can not move. Soil for dowel construction and road construction was handled several times because earth spreading equipment (road graders, dozers) were not present on site in conjunction with the earth spoil removal equipment. This appears to reflect a lack of experience in coordinated machinery use and operation.

It is the conclusion of the evaluation team that while the ongoing rehabilitation work is of extreme value and meets the immediate needs more attention needs to be given to developing solutions (research and design) to the problems and improving the institutional structure and management aspects.

The following conclusions highlight the actions deemed appropriate by the team to strengthen the O&M process utilizing the rehabilitation process as a carrier -

1. The ongoing rehabilitation work could effectively serve as a laboratory to -
   (a) Demonstrate effective machinery operation coupled with the training of operators.
   (b) Conduct cost effective studies on human/animal labor versus machine operations.

(c) Compare established operational procedures with improved technology.

(d) Train personnel on scheme preparation methodology and supervision and operation efficiency and quality control.

2. The problems and causes requiring rehabilitation could be identified and provide the basis for research (sloughing, bank cover etc.) and design modification.

3. Provide empirical data required to evaluate the impact value resulting from rehabilitation, develop an improved O&M systems approach and the integration/coordination at the planning, management and operational levels within the PID.

REHABILITATION AND UPGRADING PID WORKSHOPS

On-site visits were made to five of the six workshops included in the ISM Project for rehabilitation and upgrading. The workshops visited included the following -

Punjab -	Moghalpura (Lahore)
	Multan
Sind -	Jamshoro (Hyderabad)
Baluchistan -	Quetta
NWFP -	Peshawar

With the exception of the Jamshoro workshop, the evaluation team leader had visited the workshops during the latter part of 1983 as part of a previous consultancy so it is possible to make an assessment of changes occurring from that time to the most recent visit. It is on this basis that certain statements relative to change or static conditions are made.

The physical structures remain unchanged although progress toward rehabilitating and upgrading the workshops has progressed programatically. The services of a consulting architect was procured in late 1983 to carry out preliminary assessments on which basic architectural plans and funding estimates could be developed. Development of the detailed plans (Pioneer) were initiated in early 1984 and accepted by the PIDs and USAID in August 1984 for Punjab, Sind and North West Frontier Provinces. Originally the rehabilitation of the physical workshop buildings were to be done by the PIDs through their own resources, however, financial constraints prevented the PIDs from following this course of action. A decision was reached in that ISM funds (U.S.) would be used to cover this unforeseen situation. Agreement on a Fixed Amount Reimbursement-Percentage (FAR-P) was reached and PIL number 26 was issued on December 31, 1984 authorizing work to proceed on all workshops except the Baluchistan workshop.

The failure of Pioneer to design to earthquake standards resulted in a delay for approval in the case of the Baluchistan workshop. The Baluchistan submission is expected momentarily so that work on rehabilitating that workshop will start at approximately the same time as the other workshops.

The PIDs have prepared and let tenders. The PIDs estimate that all work will be completed within a three-six month period from the date of start up. The PIDs also projected that contractor mobilization should take no longer than two weeks once the go ahead was given to the contractor. The PIDs estimate that work will start in late March 1985.

It was observed that substantial activity has and is occuring at the various workshops and stores in spare parts inventory control and warehousing since the arrival (May-August 84) of the expatriate advisors. Equipment beyond salvage and repair is being slowly disposed off by standard GOP disposal procedures. Improved spare parts inventory control and storage activities are very noticeable. During this process new but outmoded spare parts are being uncovered which will require a modification in procedures for disposing of these spare parts for which there is no longer a use within the PIDs.

Activities in the various workshops and stores appear to be site specific oriented, while at the same time, many locations face similar problems. There appears to be insufficient coordination between the workshops on common problems and the development of solutions to the problems.

The question also arises as to the future of the associated training activities because of the delays incurred in the rehabilitation process. Some of the technical advisors associated with the workshops will be approaching their contract departure dates at about the time facilities are completed and shop equipment installed. The training program envisaged as a critical workshop and equipment activity will suffer unless provisions are made to carry it out in the project or through alternative means.

With the exception of a few minor pieces of shop equipment (procurred for the workshops under the ACE Project), all first tranche equipment and spares are at the respective sites. Equipment and spares have been inspected and is adequately stored for eventual use and installation. Spare parts have been inventoried and card

index systems are being incorporated into the system. The central Moghalpura store has progressed to the point that it appears ready for a computer control system. A decision on the establishment of a Central Procurement Organization should be forthcoming before this system is installed to ensure compatibility within the larger system.

Most of the workshops are fairly well staffed and possess, in a couple of instances, the shop equipment and capability to do substantial repair work if the heavy equipment were sent in for repair on a scheduled basis. Deadlined equipment was observed in several instances although the process for effecting the repairs has been set into motion. The existing resources appear not to be used to the extent possible because of the system or lack of control over the equipment.

The repair system is complicated and cumbersome. Repairs for down or deadlined machinery must be funded in large part by the division responsible for canal/drain O&M. If these funds are available then these funds can be passed on to the mechanical circle (they control and operate equipment as contractors to O&M). The mechanical circle then can pass on the funds to the workshop. The workshop can then purchase spares from the stores division. No money no parts - no parts no repair - no repair no machine - no machine no work - a catch 22 situation. The donkey seldom needs spare parts.

The conclusions reached by the evaluation team are as follows -

1. Rehabilitation and upgrading of the workshops will increase their capacity to do work and expand their technical competency through the physical improvement of

the work environment. Rehabilitation of the facilities and training of the personnel will have little impact on improving canal/drain system O&M unless there is an adequate funding mechanism put into force that will enable the workshops to function more effectively. More pertinent is the view that this process must be institutionalized with adequate management capabilities present and functioning.

2. There is an immediate need to incorporate or include the workshop/stores activities in the management aspects of the O&M process. Their problems and scope of interaction are much more than facility improvement and operator training.

3. Increased efforts should be expanded toward focusing in on priority problems in total rather than following a fragmented approach of addressing problems separately in four geographical areas. The use of human resources would be greatly enhanced. This is not to infer that the work done and improvements made todate are not fully recognized and appreciated and viewed as making a contribution to the overall effort.

PROJECT MANAGEMENT AND IMPLEMENTATION

The assessment of the myriad of responsibilities and activities falling under this heading was carried out through a process of personal interviews, review of files and documents and on-site visits to the various organizations and institutions involved with

the management and implementation of the project. Time limitations prevented the evaluation team from visiting all institutions and meeting with all of the personnel directly involved in the project. Annex B of this report consists of a listing of key persons contacted and interviewed during the evaluation process. Annex D presents the time frame of the evaluation and sites visited. Annex C contains a listing of major documents reviewed before and during the evaluation process. For purposes of presentation this section of the report is broken down into the following headings -

USAID/PAKISTAN-GOP Documentation Processes and Actions

USAID/ARD Management

GOP Management

PRC/Checchi Management and Implementation Progress

Certain project related management and implementation aspects addressed in earlier portions of Section III of this report are not repeated in this section although references are made to the previously stated observations and conclusions.

USAID/PAKISTAN-GOP DOCUMENTATION PROCESSES AND ACTIONS

A review of the documentation processes starting from the signing of the Project Agreement on June 5, 1983 to the present for which USAID was primarily responsible supports the evaluation team's conclusion that the process was carried out in an efficient and timely manner and did not impose any major constraints to the project implementation process. The AID process as dictated by statute created some minor delays in the implementation process - a situation not atypical to the ISM Project and Pakistan. These minor

delays were largely a result of the fact that a number of the GOP institutions involved in the process had had no previous experience with the AID system requirements.

The process by which the GOP counterparts were made aware of the required processes at the Federal level was considered very satisfactory. The process of familiarising the PIDs with the process was considered less satisfactory.

Early attention to the documentation and procurement of support items (vehicles, office and house furniture, equipment and technical assistance) definitely was a major factor contributing to implementation of the project in a very positive way.

It was the conclusion of the evaluation team that the major contributing factor was in essence a communication problem combined with the fact that the PIDs possessed a lesser degree of understanding of the project. This appeared to be especially true at the PID implementation and operational levels. A slower than expected delay by the PIDs in taking appropriate action in complying with project CP requirements definitely contributed to project delays in implementation.

USAID/ARD MANAGEMENT

During the eighteen plus months that the ISM Project has been in force, ARD management has substantially changed to meet the ever increasing work load related to project management and monitoring of a very complex program. Greater responsibility has been given to Pakistani staff members. Individuals have progressed from purely support role functions to that of management functions. This has

resulted in the development of a "esprit de corps" that has directly enhanced the quality and quantity of work and contributed to overall office efficiency. An increase in the number of American direct hire and contract (PSC) staff also made it possible to more fully define areas of responsibility and assume a greater workload as related to specific project components. This has enabled the ARD Office to maintain closer surveillance on the implementation processes as well as increasing the efficiency and management and monitoring responsibilities. It has also enabled the ARD Office to assume a more active role (necessitated in part by less than the totally satisfactory performance of a contractor in specific management and implementation aspects - this situation is now being corrected) in certain aspects of project implementation. These management and organization structural decisions are viewed by the evaluation team as timely and appropriate.

It was the evaluation team's opinion that some of the management problems associated with the establishment of relationships with GOP counterparts and program guidance with regard to the PRC/Checchi contract, during the initial stage of project implementation was due to insufficient USAID personnel to meet the requirements of the contract team and the absence of strong leadership from the contractor. Also the contract team's leadership arrived at the same time as the technicians with the result that there were about twelve new arrivals trying to establish themselves without adequate direction or program orientation forthcoming from within the contract. It appears that coordination and the

identification of priorities were never truly established and continued to deteriorate because of inadequate leadership and personnel changes within the contract. This situation has and is changing for the better at present with strong contract leadership now present. With the advent of two or three new teams (Research, Analysis and CWM) entering upon the scene in the near future, happenings of the past should provide some insight and guidance as to the tactics to be applied in the future.

The conclusions reached by the evaluation team as a result of its assessment of ARD management activities are as follows -

1. Management decisions have been appropriate and have/are being taken in a timely manner.
2. The project monitoring process is well developed and maintained and is being utilized to effect sound project direction.
3. The ARD Office enjoys a high "esprit de corps" among the ISM affiliated staff.
4. A congenial working relationship exists between the ARD staff and their Pakistani counterparts.
5. Communications could be strengthened and would enhance even more the project management, coordination and implementation processes.
6. Consideration should be given to scheduling the arrival of future advisory/consultant teams' so that the leadership personnel have the opportunity to become established before the balance of the team (s) arrive.

GOP MANAGEMENT

Aspects relative to the GOP management processes at the Federal and Provincial levels were considered in all phases of the interim evaluation. Factors considered most pertinent to the process included the following -

1. Degree of understanding the project concept, purpose and objectives.
2. Degree of understanding as related to the institutions and persons involved and their respective roles.
3. Counterpart relationships and association.
4. Degree of understanding of AID requirements and procedures as dictated by statute.

The evaluation team was well received by all Pakistani officials during the evaluation process. In many instances persons made themselves available outside normal office hours in order to accommodate the team's rather tight schedule. The degree of open and frank participation was especially appreciated and added greatly to the value of the exercise.

The evaluation team observed that while there was a full understanding of the project concept, purpose and objectives at the Federal and highest levels of the PIDs, the level of understanding at the lower operational and implementation levels appeared to be considerably less. The same can be said of the degree of understanding as related to institutional relationships, responsibilities and the cast of characters participating in the project implementation phases. Even less satisfactory was an understanding of AID procedural practices and requirements

established by statute. Efforts are constantly being made to correct the situation but it will require and is requiring constant attention.

The cause of this phenomenon appears to be centered around insufficient project orientation, inadequate communications and frequent reassignment of personnel at the lower operational levels. This dictates the need to facilitate and make more effective the role of the Provincial Coordinators in some instances. Also the large number of additional characters in the cast (NESPAK, AID, advisors, etc) imposed on an organizational system and structure of long standing and the introduction of new ways (AID) of conducting business has contributed greatly to the confusion. Additional effort seems in order to familiarize personnel with the existing system and what is required or needed to bring about changes.

The evaluation team made a special effort to assess the counterpart relationship concept. The findings varied from location to location and varied between disciplines or the specific activities being undertaken. In a number of instances very strong relationships have developed. This was especially true where the project concept and objectives were well understood by the PID personnel and the expatriate advisors. In a number of instances the counterpart concept was working less well because counterpart PID personnel and/or the Provincial Coordinator were burdened with many responsibilities (wearing several hats) with limited staff assistance.

In one instance the topic under investigation (water rates-repayment capabilities) effected active participation by counterparts because of the sensitivity associated with the subject. Directly affecting the development of strong counterpart relationships also was the physical separation (in some instances several miles) of office facilities. Greater interaction and effective use of expatriate advisor occurred where the offices were shared or in close proximity. The lack of continuity of personnel in the job also has had a negative effect on progress and the development of an understanding of the project and its workings.

The conclusions reached by the evaluation team relative to GOP/PID management are as follows -

1. There appears to be a need to improve the effectiveness of communications at all levels in order to eliminate misunderstanding over project implementation processes.
2. The role and function of the Provincial Coordinator's office and position should be reviewed as well as the support required to function as expected or desired.
3. Efforts should be made to ensure personnel continuity.
4. Greater effort should be expanded to ensure the utilization of technical assistance resources through the development of stronger counterpart association and utilization. This requires efforts from all sides and not just the Government of Pakistan.

PRC/CHECCHI MANAGEMENT AND IMPLEMENTATION PROGRESS

As an introduction to this section it seems appropriate to acknowledge that the contract has experienced difficulties that were directly a result of personnel and management deficiencies. The contractor did not provide the type of people the situation demanded in management. While individual members possessed the technical qualification, some persons lacked the broader insight or wider perceptive (combined-technical, management, administrative, planning) qualities that the job demanded. Past performance (period of about ten months - April, 1984 to December 1984) can only be classified as very poor in a number of instances.

Past problems have been recognized and positive action is being taken to correct the situation. The evaluation team feels that it would be inappropriate to further expand on past history but would prefer to direct its observations toward the future and identify areas for consideration for future endeavor. Many of the observations stated in previous and following sections of this report directly relate to PRC/Checchi's role in the future and are not repeated in this section.

The evaluation team's general observations were that the separate team approach (research, O&M, machinery and management) create or encourage the development of approaches that look inward rather than at the entire problem. For example, the management aspects of workshop operations - efforts largely restricted to the more tangible aspects of building rehabilitation, operation of shop tools, repair and equipment operator training - were receiving in

some instances low priority. During our observation tour it became evident, however, that the management aspects of the problems were understood by several of the machinery advisors. Valuable contributions to the understanding of some of thebasic problems and assistance in developing solutions appeared not to happen because of team drawn lines of responsibility. The separation of research and management as separate teams also appears to have led to a similar situation. The effective development of improved design criteria and its eventual acceptance and use is largely dependent upon institutional organization and management systems. The development of a research plan is looked upon as being fairly clear cut in respect to the technical aspects. Organizing and funding its implementation is largely dependent upon efficient management. Demonstration of equipment and establishing the economic parameters for its use is basically a research approach. Effective use of the equipment on-site is very much a management and training concern. Training cuts across all aspects and should not be looked upon as a separate area. The development of institutions for training needs both technical and management inputs during the establishment process. Research and provide inputs into the process of curriculum development and contribute to the process of course modification and change. All of these efforts need to be integrated if the process is to be institutionalized with permanency an objective.

The ongoing rehabilitation schemes for canals and drains should not be solely visualized as a physical process. More use could have been made of this activity as a living laboratory for all disciplines.

The project design, in the view of evaluation team, may have contributed to the problem substantially, not by intent but by form of presentation. Each specific activity was presented and discussed individually for clarity. The RFP also followed the same format for reasons of clarity. What appears to have happened is that the full consequence and intent of the project purpose was over shadowed by the details of the resources determined necessary to accomplish the purpose. The purpose clearly indicates that an integration of the various resources, if managed effectively, will result in purpose attainment - Institution Development for the long haul. Separating functions by disciplines only supports further the segmented approach characteristic of much of the existing O&M system and process in Pakistan.

A statement was made to the evaluation team leader during the interview process that the project activities for which the contract was responsible was an "O&M Project and that this should be the focal point for all inputs and activities from the present onward. The evaluation team's joint conclusion is that a major management constraint has been recognized and efforts are being directed toward correcting past difficiencies and weaknesses.

TRAINING

As part of the project implementation strategy, adequate resources have been programmed for undertaking training opportunities that will lead to the strengthening of institutional capabilities and the enhancement of technical skills in the PIDs. Progress toward the attainment of these objectives, however, has

been much slower than was expected. It appears that momentum is now being developed and that some obstacles have been overcome. It appears much brighter at this point that progress will continue and the program performance accelerated to the levels of earlier expectations. A look at the progress made during the next six to nine months will provide a more accurate assessment as to whether or not the targets will be fully met.

The evaluation team feels that the identification of some of the problem areas pertinent to the process should be mentioned. These are as follows -

1. Pakistan has a long established system for the selection, approval and processing of candidates for external training (both degree and non-degree). The system has changed little over the past twenty-five years. A statement based on experience of the team leader's association with the system and the process has taken on characteristics that make the procedure even more rigid than in the past. Changing the system will require modification and policy change at the highest levels of Government. Such action is well beyond the scope of the ISM Project and the personnel associated with it. Recognizing this fact and placing more effort toward working within and through the system is recognized as a positive step taken by the project personnel associated with the external training aspects of the project.

2. It appears that an earlier assumption was incorrect in that the provision of funding resources would automatically generate interest and participation by the PID's in developing incountry training programs and accelerate the external training programs. The evaluation team generated discussions in each province relative to various training aspects. The responses varied depending upon the individual or individuals participating in the discussions. The responses ranged from those who stated that no training was required to those who supported the need for both incountry career development training and external degree training. On too numerous occasions reasons (shortage of staff, release time from duty, etc.) were given why training options could not be considered or supported. Comments relative to the positive aspects supporting training were less often mentioned during the interviews. A notable exception was Baluchistan which identified the need to train sub-engineers in surveying and scheme design and preparation and had requested training assistance in this area. It should be also noted that the Sind was actively participating at the higher levels to establish a career development short course program.

3. The question was raised in each province relative to the need and value of a needs assessment study. The purpose being to identify training needs as to subject and numbers to be trained. Responses were generally positive in all cases but the responses appeared to vary in degrees of conviction. The team, however, sensed some reservation about active support in most cases. It was assumed that the responses may have reflected an unwillingness to step beyond the government directive that no one should approach a donor directly with a request for training. If interpreted correctly by the evaluation team this would explain much as to why it has been so difficult to generate responses relative to the identification of training needs. As a point of fact, the evaluation team leader carried out a ISM training plan exercise (September 19 - December 4, 1983) and met with similar resistance. One of the first activities to be undertaken by the contract (PRC) training advisor was a "needs assessment survey" under the terms of services of the contract (PRC/Checchi). It is the understanding of the evaluation team that a PRC management decision was made to discontinue this effort when positive results were not immediately forthcoming. The person involved in making this decision is no longer associated with the activity so no follow up possible. The need for carrying out the

"training needs assessment" is considered by the evaluation team to still be important and that it be done even if it requires additional staff to do so.

4. Another question posed by the evaluation team related to the depth and appropriateness of training of new graduates from higher educational degree institutions in Pakistan. This question generated varied responses. The consensus being that preparation in the civil engineering side was adequate but that preparation in irrigation hydraulics was less satisfactory. The responses in general reflected deficiencies in field application practices in both degree and diploma institutions. It should be noted that there were exceptions - some institutions more adequately providing field application opportunities. The discussions revealed that these deficiencies in new personnel were addressed by the PIDs through on-job training in the field at the beginning of each new officers appointment.

5. Questions were posed as to the merits of establishing a "career development - inservice training program". Responses were varied but as a whole the concept accepted. The question of money and release in many cases were raised. Reward for participation was also brought up on several occasions. This was also an issue concerning degree training.

6. Unsolicited responses were also received relative to re-assignment after training, loss of position as a result

of being sent for training and lack of promotion opportunities for trained personnel and salary scales. It is recognized that these are policy issues affecting all departments of government and that it is beyond the scope of the ISM Project to effect change. These are matters, however, that directly affect the project objective to strengthen institutional capabilities of the PIDs and the training activities.

There has been some substantial progress made during the past several months in training. Twenty-eight participants (Punjab-12; Sind-8; Baluchistan-6; NWFP-2) are enrolled in the 9 month "Training In Alluvial Channel Hydraulic Design" Course. Training was initiated on September 16, 1984 and four one-month courses were carried out at the Center of Excellence in Lahore. The third of three one-month courses in the series is just being completed at Mehran University in Hyderabad. Plans have been completed for courses 8 and 9 in Peshawar with the expected completion date of May 18, 1985. The training program has kept on target, class attendance and role has been constant and the contractor (Bureau of Reclamation) performance in developing the course, providing primary course leaders and support has been very satisfactory. Even more important, however, is the acceptance, inter-action and participation of the various Pakistani institutions and their desire to repeat the course. Equally important is the fact that the PIDs have and are supporting the course with students and other support activities. This can be

looked upon as a very successful activity made possible through ISM Project resources. Continuation of the course on a yearly basis appears to have support from the participating Pakistani personnel and institutions.

The request of Baluchistan to provide a two and one half month course on a permanent basis for sub-engineer training is being developed. Response to the original request was slow in coming but momentum is building up as the plans are being developed. It appears to the evaluation team that inadequate resources were first made available but that this is being addressed. It appears, however, that communications could be improved between all parties involved in the process with the result that smoother and quicker implementation would take place. There also appears to be a lack of unanimity on some policy decisions relative to approach and institutional relationships. Efforts toward solving these differences are in progress but should be accelerated.

Progress in establishing incountry short course programs has been slow in coming but progress at this point in time is encouraging. Twenty short (about one week each) courses have been identified for the Sind. The first two (Survey Brush-up Course and Embankment Construction Supervision and Control) courses are being developed through a task force (PRC Training Advisor, Chairman Department of Civil Engineering - Mehran University, and ISM Sind Coordinator) approach. Work toward this aim was initiated on December 15, 1984 with course start up scheduled for April 20, 1985. This activity is sited by the team in part as a result of positive

and current management decisions by the present PRC contractor management personnel.

Plans are under way to develop similar courses for the other three Provinces. The major difference being the incorporation of the other three PIDs needs under a single program approach. Comparison will be possible using the two approaches.

Training of equipment operators and mechanics has progressed only to the point that training offered has been provided by the equipment suppliers and manufactures. This training appears to meet the obligations of the suppliers but does not, in the evaluation team's view meet fully the needs. It is recognized that training on new shop equipment has been delayed because of the late start-up on the workshop rehabilitation activity. It appears to the evaluation team that there has been insufficient effort expanded to develop alternatives. The same can be said of equipment operator training especially since each rehabilitation scheme (canals and drains) offers the opportunity for on-the-job training.

Progress toward implementing the external (short-term and degree) training program has been fraught with problems largely beyond the control of the ISM Project personnel associated with the training aspects. A training workplan for 1985 has been developed and scholarships offered using the approved Pakistan mechanism. Minimal response was received by the December 31, 1984 deadline. A local hire employee was employed by the contractor basically to "chase paperwork" and to try to facilitate the identification of participants and expedite the process through the system. There have

been little results shown so far inspite of this extra effort. The evaluation team, while fully subscribing to the intent and purpose of external training can only propose the question as to whether or not the funds identified for external training be withdrawn or reduced and the funds used in support of an expanded incountry training program and the additional resources that might be required.

The conclusions reached by the evaluation team are as follows -

1. That while the overall training activity got off to a slow start, recent progress and momentum established relative to the incountry short course program for general engineering indicates potential success in this area and merits the use if necessary of additional personnel and funds to accelerate the process and insure that it is institutionalized in such a manner as to continue after ISM resources are no longer available.
2. The value of and need for external training is not questioned, but given the difficulties experienced todate this should be monitored closely and extra resources made available if necessary to correct the situation above and beyond the efforts being exerted today.
3. The canal and drain rehabilitation schemes could be more effectively used as programmed informal training sites for construction equipment operators and personnel responsible for planning, developing and presenting rehabilitation and O&M schemes.

4. Several of the advisors charged with training on shop equipment and engine/machine repair will complete their tours of duty before the workshops are rehabilitated and functional. Both AID, the GOP and the contractor are very aware of this and are developing procedures to meet the future requirements.

5. Given the experience todate and the problems encountered today on this component of the project, the training programs projected for the Research and the CWM components of the project might warrant review.

6. The experiences and problems faced in the ISM Project should be evaluated against all Mission supported projects in which there is a training component in order to access whether or not this is a special problem inherent to this project only. In all probability it is not an exception.

COMMUNICATIONS

The evaluation team feels little more need be said relative to their observations of problems that were caused by or intensified as a result of poor or insufficient levels of communications. The value of good communications was aptly demonstrated when the evaluation team leader had the opportunity to sit in on a portion of the CWM orientation presentation in Lahore. It was attended by persons from the many organizations that will be involved in the CWM component of the ISM Project. As a first general presentation it provoked much inter-change of views and identified concerns relative to institutional relationships and responsibilities. This excellent

example of the use of effective, purposeful communications only further highlighted the need for improving the communication channels for the ongoing activities.

The evaluation team's conclusion is that such an approach as mentioned above is still appropriate for this ongoing activity. Time and resources should be made available to correct this apparent deficiency.

SIGNS

The evaluation team observed that the congressional mandated requirement for the display of signs on activities in progress or completed was not being met in some instances. This fact is recognized by the project personnel and suitable action is being taken to remedy the situation.

CANAL REHABILITATION DESIGN

Although PID maintenance problems are substantially due to such factors as erosion from wind, rain and animals, important PID maintenance problems are also possibly a result of improper maintenance and the aging process of the system. Consequently, in order to address maintenance problems, consideration must be given to the design parameters.

Under the ISM Project, assistance is being provided to the PIDs to improve their ability to deal effectively with the problems by (1) assisting ACOP (Alluvial Channel Observation Project) to enlarge and increase its collection of basic hydraulic and sedimentation data on each canal to be rehabilitated; (2) training of PID

engineers in current design practices; and (3) strengthening, through a joint effort (PID engineers and expatriate engineering team), the PIDs capacity to design canals and increase O&M efficiency by utilizing the data collected by ACOP.

The GOP and AID are aware of the need to accelerate the program and steps are being taken to strengthen the activity. While making these adjustments attention should also be given to clarifying organizational relationships and responsibilities in order to strengthen the PIDs capability to collect and utilize data effectively in the design activities.

ACOP Data Collection

ACOP's participation in data collection as specifically related to the ISM activities was initiated in September 1983 (ACOP data collection work was initiated many years prior to the ISM start up). Additional equipment needed by ACOP to fully participate was already under procurement through the ACE Program before that date with arrival of most equipment before the end of 1983. The procurement of jeeps for ACOP under the ISM Project was delayed for a period but this did not delay implementation due to the cooperative efforts of ACOP, the Federal Coordinating Cell (FCC) and the Punjab PID. These organizations arranged for vehicles from other sources on a temporary basis so that ACOP's immediate mobility problem was solved. Fifteen project procured jeeps are now with ACOP and A.I.D. has requested the GOP to turn over an additional six that have been procured by A.I.D.

ACOP's work has progressed well, although not as rapidly as envisioned in the Project Paper. Data collection on about one third of the canals was completed in October 1984. Current plans, which past performance indicates are realistic, conforms to the schedule for canal rehabilitation within the project. The quality of work completed by ACOP is accepted as good by all concerned.

TABLE 3

ACOP MONITORING PROGRESS

Sr. No.	Province	Total Miles	Scheduled Upto 84-85	Uptill Required	31.12.84 Completed
1.	Punjab	739	492	348	569
2.	Sind	661	440	311	294
3.	NWFP	147	98	69	81
4.	Baluchistan	17	17	12	-
	TOTAL	1564	1047	740	944

Training of PID Engineers

This activity was previously addressed in the report under the Training Section. While the initial plan to train a core of qualified engineers to assist in canal design was delayed somewhat by the long time required to arrange a Participating Agency Service Agreement (PASA) with the Bureau of Reclamation (BUREC) to conduct the course, the course is scheduled to be completed in May 1985. This date still conforms fairly well with the scheduled design work.

Another activity has been initiated to train engineers in the utilization of computer models for analyzing the hydraulic data of

canals and studying what the effects would be over the long time periods. Alternative design interventions would result from the process. Under the leadership of the PRC contract Engineering Team (arrived May and September 1984) the "Simulation Cell" in Lahore has the objective of training a small group of PID engineers over an eighteen month period while institutionalizing this capability in the PID research, design, and/or planning organizations. The "Simulation Cell" was inaugurated in late February, 1985 and the training program is under preparation.

Design Work

The existing "Simulation Cell" will be a resource to assist in the project rehabilitation design work, although most design work will be carried out independently by PID field staff with the assistance from the PRC contract Engineering Team advisors (arrived April-May 1984). Groundwork for this is now being established. Progress toward this aim has resulted in the following activities -

1. Recent completion of draft design criteria. This is presently under review by the PIDs. A major function of the "Simulation Cell" is also to conduct studies that will lead to finalizing the design criteria in July 1985.
2. The recent development of programs for hand held calculators for use in design work.
3. Procurement of calculators.
4. On-going orientation workshops for engineers who will be involved in design work.

Although design criteria are at present only in the initial draft stage, they will be used as a basis to begin design work in the near future. A work plan has been prepared that provides for completion of design work on about one third of the AID funded canals over the next several months.

It is evaluation team's conclusion that the work undertaken todate is proceeding well and is close to target. Continued emphasis is required to streamline and strengthen the PIDs in carrying out their design functions.

IMPACT EVALUATION

During the evaluation team's visits to specific sites throughout the country it became quite apparent that most if not all effort was being directed toward the physical aspects of rehabilitation and operation of the system. Little or no attention was being given to the O&M process in relationship to agriculture/economic impact. This is not surprising since the system is viewed in general as a "transport system" by the PID personnel rather than a system delivering an essential production input.

Under World Bank funding provisions have been made to address this issue. The PIO (Planning and Investigation Organization) was identified as having that responsibility. There has been little or no effort directed toward this aspect.

The evaluation team can only conclude that this is a deficiency and that attention must be directed toward this end.

CENTRAL PROCUREMENT OFFICE (CPO)

Conditions Precedent 4.4 stipulates that disbursement for civil works rehabilitation activities commenced after the first twelve months of the signing of the project agreement would not be made until a Central Procurement Office was established to coordinate and administer the commodity process, including consolidating Provincial requests for spare parts during the life of the Project. This CP was not met and PIL number 30 was issued on January 30, 1985 extending the compliance date until December 4, 1985. It appears that this CP did not receive due consideration by the FCC and the PIDs until faced with the fact that no further work (repayment) was possible on rehabilitation works unless the CP was met. The extension of the compliance date was taken as a result of an indication that work on a CPO would be initiated immediately to meet the CP requirements and that a functioning CPO would be established within calendar year 1985. This process has been started with the assistance of PRC personnel - a work plan has been developed based on discussions between PRC team members and PID officials responsible for the stores management function. The plan was approved by AID (January 23, 12985) and is in the process of being reviewed by the PIDs.

Observations made by the evaluation team during its field visits to the PIDs appear to substantiate the need for such an organization or function. During the process of organizing the stores at Moghalpura and Jamshoro substantial quantities of new spare parts and even costly shop equipment were found. In the process large quantities of new D-25 crawler tractor parts were

identified. The unfortunate side of this discovery was that the D-25 is no longer in use in Pakistan - at least in the PIDs. This fact, however, does further support the rationale and need for such an organization and function as a CPO.

During the PID interviews, all PIDs responded in a positive manner to the teams queries about the value of and need for such an organization. The team carried their queries one step farther in asking if such an organization could also facilitate the exchange of equipment between PIDs if work requirements demanded such action. The replies were more negative in this regard. Ownership of machinery was the issue. The response was that it could be done if a PID was willing to sell the equipment and the other PID willing to buy it. At the same time there appeared to be considerable reluctance to enter into such a transaction. The idea of a central equipment pool with title residing with the federal government was suggested as a possibility by two of the PIDs.

The conclusions reached by the evaluation team are as follows -

1. The CPO concept merits additional study and warrants use of project resources to develop an acceptable course of action.
2. Efforts must be made to ensure that stores procedures in each of the PIDs be developed in accord with the CPO concept.

3. During the investigation phase attention should possibly be given to expanding the CPO concept to include machinery import and issuance based on work requirements. Assurance for proper control and maintenance might also be a function to consider. This might also ensure fuller utilization of workshop facilities and equipment scheduling.

4. If the CPO concept is adopted this could provide the focal point for further assistance in the equipment repair, and operational training at a reduced scale when the present equipment advisory team members complete their contracts.

ACE - EQUIPMENT IMPORTATION

One of the components of the ISM Project is to strengthen the capabilities of the PIDs in the field of equipment for workshops and O&M activities. The Agriculture Commodities and Equipment Program (ACE) is the vehicle under which this procurement has and is taking place. Originally $38 million was programmed (1982-26, 1983-6, 1984-6) for ISM but because additional funds have become available and the total input is now programmed a level of about $49 million.

The program has moved ahead with only minor difficulties - most of which is normal to the process. Todate approximately $22 million of equipment (approximately $13 million earthmoving & $9 million workshop, spares and laboratory equipment) has been procured during the 1983-84 period. An additional $16 million of earthmoving is in the tendering stage for 1985-86 delivery.

The work involved in this undertaking has and is of a substantial nature. The 1983-84 procurement involved a large number of institutions. The preliminary survey of the equipment held in the PIDs and the determination of additional requirements was undertaken by USAID consultants. NESPAK (on behalf of the GOP) finalized the list and reviewed the tenders for new heavy equipment and workshop machinery. EMMAY Associates (under contract with AID) developed the spare parts requirements for old earthmoving equipment. Laboratory equipment for ACOP was developed by ACOP with AID assistance. AEGIS International Corporation and Connel Brothers under AID contracts served as the purchasing agents.

The total procurement effort was of considerable magnitude. The equipment was received in numerous shipments, and cleared and reshipped from the Karachi port to seven locations throughout Pakistan through the efforts of the USAID Karachi office. The process of inspection at site and the preparation of receiving reports has been facilitated by PRC contract advisors. Operation and maintenance training by the suppliers was provided on a timely basis. Although not without some minor "glitches" the process was carried out satisfactorily with much credit due to the efforts of all persons involved.

The evaluation team concluded that the ACE Program was and is an effective vehicle in this process. Earlier procurement by using ACE facilitated the equipment's arrival in conjunction with the arrival of the technical advisors provided under the ISM Project.

Direct procurement using ISM funds would not have given the same results as related to the time frame. The use of ACE resources to procure the major portion of commodities was viewed by the evaluation team as being on innovative and prudent means of accelerating implementation of the project.

ANNEX A

SCOPE OF WORK FOR THE EVALUATION TEAM

The ISM Project Evaluation Team will:

1. Assess the overall implementation progress made to date by components/activities of the project. Test whether implementation is oriented toward the achievement of project purposes and ascertain to what extent these purposes have been achieved. Pinpoint areas where implementation is not directed toward achievement of the project purposes. The assessment of implementation progress will include:

a. The adequacy of institutional arrangements, systems of operation and work plans.

b. The performance in providing/utilizing project inputs, such as technical assistance, equipment for canal and drain rehabilitation, spare parts, workshop equipment, training of a cadre of engineers to effectively carry out irrigation systems rehabilitation, etc.

c. The institutional roles of, as well as level of coordination and working relationships among the Federal Project Review Board (FPRB), National Engineering Services of Pakistan (NESPAK), A.I.D., IBRD, WAPDA, WMEC, the Project Management Advisor, and the USAID-funded PRC/Checchi long-term technical assistance team.

d. The progress made in commodity procurement activity.

e. The performance of Agricultural Commodities and Equipment (ACE) Program as a means of providing equipment and training on that equipment to PIDs.

f. The status of workshop remodelling activities.

g. The progress made in irrigation systems rehabilitation activities.

h. The implementation of fixed amount reimbursement system including an examination of the adequacy of reimbursement and inspection criteria.

i. The adequacy of host country counterparts to all long-term consultants.

j. Progress in meeting operation and maintenance (O&M) budgeting requirements.

k. Progress made by the Government of Pakistan in establishing a Centralized Procurement Office (CPO) for the purpose of expeditious procurement of equipment and spare parts for PIDs.

2. Pinpoint those project activities that were scheduled to be initiated and/or completed during the first 18 months of the project's implementation but have not been launched. Suggest changes in the project implementation plan to accommodate these activities, keeping in view the problems which resulted in their not being implemented on schedule.

3. Identify problems/constraints hindering project implementation.

ANNEX B

LISTING OF PERSONS CONTACTED DURING THE EVALUATION

GOP

Mr. Ch. Altaf Hussain
Chief Engineering Advisor/
GOP Project Representative

Mr. F.H. Usmani
Federal Coordinator, ISM

NORTH WEST FRONTIER PROVINCE

Mr. Mohammad Amin Khattak
Secretary, Irrigation and Public Health
Engineering Department

Mr. Rab Nawaz Khan
CE and Provincial Coordinator, ISM

Mr. Akhtar Ali Ismaili
SE Peshawar Canal Circle

Mr. Allah Bakhsh Baloch
XEN Irrigation Tubewell Division

Mr. Hazrat Ullah Khan
XEN Peshawar Canal Division, Peshawar

Mr. Izharul Haq Qureshi
SDO Tubewell Irrigation
Sub Division Warsak Road, Peshawar

Mr. Khalid Ullah Baber
SDO Drainage Sub Division
Peshawar

Mr. Abdul Aziz
SDO Civil Canals Sub Division, Peshawar
Peshawar

Mr. Mohammad Rafiq
Sub-Eng. Drainage Section
Peshawar

Mr. Aun Mohammad Zaidi
Sub-Eng. Juay Sheikhan Section
Civil Canals Sub Division, Peshawar

BALUCHISTAN

Mr. Abdur Razik Khan
Secretary Irrigation and Power Department

Mr. Ghulam Sarwar
Technical Section Officer

Mr. Nadir Ali
SDO Mechanical

SIND

Mr. S.A.I. Zaidi
SE Mechanical Circle
Kotri Barrage Irrigation Region

Mr. Ghulam Sarwar Abro
XEN Central Sind Mechanical Division
Jamshoro

Mr. Mohammad Nawaz Dahar
SE Lower Sind Drainage Circle
Kotri Barrage Region

Mr. Niaz Hussain Sheikh
XEN Sajawal Drainage Division
Sajawal

Mr. Suleman Rajpar
XEN Thatta Drainage Division, Thatta

Mr. Mohammad Idrees Rajput
SE Rohri Canal Circle, Hyderabad

Mr. Ali Gohar Tunio
XEN Halla Division, Hyderabad

Mr. Mohammad Anees Siddiqui
XEN Mechanical Division, Hyderabad

Mr. Abdul Ghafoor Ch.
Asst. Eng. Workshop
Kotri Barrage, Jamshoro

Mr. Abdus Sattar Memon
XEN Lower Sind Drainage Division
Hyderabad

Mr. Mushtaq Ahmed Baloch
SDO Sajawal Drainage Sub-Division
Sajawal

Mr. Agha Inayat Ullah
SDO Tando Adam Sub-Division
Tando Adam

PUNJAB

Mr. Shamsher Khan Bhatti
Additional Secretary, Irrigation & Power Department

Mr. Mian Mohammad Afzal
Provincial Coordinator

Mr. Khalid Ahmed Khan
XEN Mechanical Workshop

Mr. Ali Mohammad Chaudhry
XEN Drainage Division, Lahore

Mr. Manzoor Ahmed Cheema
SDO Kasur Drainage Sub Division

Mr. Mian Mohammad Safdar
SE SCARP-III Multan

Mr. Mian Abdul Ghaffar
XEN Tubewell Division, Irrigation Multan

Mr. Abdul Wassey Khan
SE Muzaffargarh Canal Circle, Multan

Mr. Abdus Sami
Asst. XEN Drainage Sub-Division, Kot Adu

Mr. Mohammad Ramzan Bhatti
Asst. XEN Basira Sub-Division

Mr. Malik Mohammad Aslam
XEN Kot Adu Division, Kot Adu

ACOP

Mr. Ahmed Masood Chaudhry
Director General

NESPAK

Mr. Z.S.N. Janjua
Project Engineer

CENTER OF EXCELLENCE IN WATER RESOURCES ENGINEERING

Dr. N.M. Awan
Director

PRC/Checchi Contract

Mr. Vilen Wilhelm
Chief of Party

Mr. Max G. Williams
Design Engineer

Mr. Berend Bakker
Research Eng. (Alluvial Channels)

Mr. James W. Ball
Research Eng. (Hydraulic Machinery)

Mr. William O. Brown
Design Engineer

Mr. Mohammed Naseer
Planner (Projects & Budgets)

Mr. Thomas McCarthy
Management Advisor

Mr. Samuel T. Cooper
Training Advisor

Mr. Willard H. Rusk
Construction Management Advisor

Mr. Ray H. Tilton
Equipment Management Advisor

Mr. Alfred S. Pattan
Equipment Maintenance & Repair Advisor

Mr. Bernie Corpus
Equipment Management Advisor

Mr. Leslie D. Rios
Stores Advisor

Mr. Jamshed A. Khan

Mr. Robert Brown
O&M Advisor

Mr. Robert L. Berling
Consulting Engineer

USAID

Islamabad

Mr. Donor M. Lion

Mr. Allen C. Hankins

Mr. Russel B. Backus

Mr. Richard H. Goldman

Mr. John H. Foster

Mr. John R. Anania

Mr. John R. Quay

Mr. Jalil U. Ahmad

Mr. Muzammil H. Qureshi

Mr. Ali Hussain

Mr. Abdul Wasay

Mr. William D. McKinney

Mr. Jon A. Gant

Mr. Nasir Ali

Mr. M. Asif Bhattee

Karachi

Mr. William T. White, Jr.

Mr. Mohammad Anwar

Lahore

Mr. Donald N. Melville

Mr. S.A. Chughtai

Quetta

Mr. R.M. Traister

Mr. Masood H. Khan

OTHER

Mr. Donald G. McDonald
Consultant

Mr. Anis Youssef
IBRD-ISP Project Manager

Dr. Robert C. MacArthur
Civil Engineer
U.S. Army Corps of Engineers

ANNEX C

LISTING OF MAJOR DOCUMENTS REVIEWED DURING EVALUATION

Irrigation Systems Management Project paper - May 1983, USAID/Pakistan

ISM - Command Water Management (CWM) Component Project paper Amendment - January 1985, USAID/Pakistan

Final Report Irrigation Systems Management Research Design - November 1984, University of Idaho

PRC Contract 391-0467-C-00-4011-00, Effective Date April 1, 1984, USAID/Pakistan

Progress Reports - NESPAK (National Engineering Services (Pakistan) Limited)

Work Plan 1984-85 Irrigation Systems Rehabilitation Project, NESPAK, November 1984

"Funding Requirements for Adequate Irrigation System Operation and Maintenance", Development Alternatives, Inc., May 1984

World Bank Staff Appraisal Report (SAR) number 3717-PAK, dated April 9, 1982

Pertinent USAID/ARD Project Files -

- Project Agreement and amendments
- Fixed Amount Reimbursement (FAR-P) Rehabilitation Canals and Drains
- Fixed Amount Reimbursement (FAR-P) Workshop Rehabilitation
- Project Implementation Letters (PIL) number 1-33
- PIO/Cs, PIO/Ts, PIO/Ps
- PRC/Checchi Monthly and Quarterly Reports
- Rehabilitation Inspection Reports
- PRC/Checchi Work Plans
- General Correspondence (ISM) Files
- USAID/ARD Project Monitoring Reports and Charts
- ACE Equipment procurement files

Request for Proposals (RFP) 391-0467-007

Request for Expression of Interest (REI) - Research

Preliminary Diagnosis of Planning and Management Constraints within the Sind Provincial Irrigation Department, PRC (draft December 1984)

Structure and Functions of the Punjab Provincial Irrigation Department (PRC Trip Report June-July 1984)

Sind Provincial Irrigation Department Training Work Plan - PRC January 1985

AID Program Evaluation Report No.8 "Irrigation and AID's Experience: A Consideration Based on Evaluations", August 1983, AID/Washington

"Work Status of ACOP on Evaluation and Detailed Monitoring Programs Under Irrigation Systems Rehabilitation & Management Project" - Ending December, 1984, ACOP (WAPDA)

"Agreement between Federal Co-ordination Cell and Alluvial Channels Observation Project", ACOP July, 1983

ANNEX D

ISM EVALUATION TEAM SCHEDULE/ITINERARY

Preparation Phase

February 24, 1985:	Team leader arrived in Pakistan
January 24 - February 2,1985:	Documentation review
February 3, 1985	Contract signed with National Development Consultants, Lahore, which provided two persons for participation as member of Evaluation Team.

Field Work Phase

February 4-7, 1985:	North West Frontier Province (Peshawar and adjacent areas)
February 7, 1985:	Travel Peshawar-Islamabad
February 9-10, 1985:	Baluchistan Province (Quetta)
February 11, 1985:	Travel Quetta-Karachi
February 12-14, 1985:	Sind Province (Hyderabad and nearby areas)
February 15, 1985:	Travel Karachi-Lahore
February 16-17, 1985:	Punjab Province (Lahore and nearby areas)
February 18-19, 1985:	Punjab Province (Multan and nearby areas)
February 20-21, 1985:	Punjab Province (Lahore and nearby areas)
February 21, 1985:	Travel Lahore-Islamabad
February 22-March 4, 1985:	Document review and drafting of report
March 5, 1985:	Internal ARD review with Evaluation Team
March 6-11, 1985:	Completion and submission of report
March 12, 1985:	Mission Review of Evaluation Report
March 14, 1985:	Team leader departed Pakistan

ANNEX E

REPORT

by

NATIONAL DEVELOPMENT CONSULTANTS
Lahore, Pakistan

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C. Listing of Major Documents Reviewed During Evaluation

D. ISM Evaluation Team Schedule/Itinerary

E. Report - National Development Consultants