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UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

ISLAMABAD, PAKISTAN

IRRIGATION SYSTEMS MANAGEMENT PROJECT

PHASE II

Project Number 391-0467

QUARTERLY REPORT

Eleventh Quarter, Ending 30 June 1992

HARZA ENGINEERING COMPANY
Contractor

DEVELOPMENT ALTERNATIVES, INC.
Subcontractor

ASSOCIATED CONSULTING ENGINEERS-ACE (PVT) LTD
Subcontractor

Contract Number 391-0467-C-00-9830-00

Harza Engineering Company / Development Alternatives, Inc.
Associated Consulting Engineers - ACE (Pvt) Ltd

IRRIGATION SYSTEMS MANAGEMENT PROJECT - PHASE II

QUARTERLY ACTIVITIES REPORT Quarter Ending 30 June 1992

Background

The overall objective of the Irrigation Systems Management Project is to increase agricultural production through increasing the safety of water delivery and improving reliability and equity in water delivery to the watercourses. The basic charge to Harza/DAI/ACE and the ISM Project is to support and assist the institutional development of the four Provincial Irrigation Departments and the Federal Coordination Cell to build the capacity to provide sustained and proper operation, maintenance, and management of the rehabilitated irrigation system. The focus of activities is on rehabilitation/redesign of canals and drains, improved operation and maintenance of the rehabilitated facilities, and improved management and maintenance of construction equipment.

The contract for technical services was signed on 28 September 1989 and technical assistance services started on 20 October 1989. The Technical Assistance (TA) Team includes a Chief of Party and four Provincial Advisors (PAs) plus technical specialists in design, operation and maintenance (O&M), equipment and workshops (E&W), training, monitoring and evaluation (M&E), and computerization. During the quarter, the TA Team now comprised six expatriate advisors and 16 Pakistani technical staff plus expatriate and local experts on short-term assignment.

Summary of Activities

The expatriate and local technical advisory team remained at full strength until near the end of the quarter, when the Workshop and Equipment Advisor departed on the end of his assignment. Preparations continued for rehabilitation of gates and civil works at Balloki Barrage and completion of work at Jinnah Barrage. The O&M Equipment Trial continues in all provinces and efforts were made to overcome constraints. A draft of the Manual for Surface Drainage was reviewed by delegates of the PIDs and representatives of other agencies in a workshop held in April. A draft of a Hydraulic Monitoring Manual was prepared and distributed for review. Construction equipment utilization improved in all provinces except NWFP, where it was constrained by external factors, such as fuel shortage. The pace of construction machinery overhaul using USAID-provided spare parts improved in the Sindh, NWFP, and Balochistan workshops. All USAID supplied equipment, with minor exceptions, in all mechanical workshops has been made operational and is in use. Assistance continued to be given to the agencies carrying out the program for evaluating the impact of rehabilitation of canals and drains. The computer installation program was essentially completed in all provinces. Assistance continued in arrangements for in-country and off-shore training.

Staffing

Expatriate

Resident Staff. All provincial advisors were at post in Pakistan except for short vacation absences. The Chief of Party was out of the country from 8 to 25 May on vacation. Mr Thomas Liston, Equipment and Workshop Advisor, completed his resident assignment and departed Pakistan on 7 April.

Short-Term Assignments

Drainage Expert. Mr. Richard Wenberg, formerly National Drainage Engineer of the U.S. Soil Conservation Service, arrived on 14 January and departed on 8 May, completing the second of several assignments leading to the preparation of a manual for planning, design, and maintenance of surface drainage systems for irrigated areas.

Equipment Maintenance and Overhaul Expert. Mr. George Miller arrived in Pakistan on 17 January and departed on 7 April. During this time he worked on the Project intermittently, having come to Pakistan primarily for another project. His activities were primarily concerned with activating USAID-supplied equipment in the Balochistan Irrigation Department Mechanical Workshop in Quetta. He carried out similar assignments earlier at the Sindh and NWFP PID Workshops.

Local Staff

Most of the local staff are provided by Associated Consulting Engineers-ACE (Pvt) Ltd under subcontract to Harza. All of the scheduled local staff were in place during the quarter. During the quarter, these included up to 12 full-time and 2 part-time engineers and over 30 supporting staff.

Three local engineers are employed as individual contractors to Harza as experts in Equipment/Workshop, Training, Monitoring and Evaluation, and Computerization. Mr. J. K. Jaffrey, Metallurgy Expert, continued on short-term assignment, primarily for advice in upgrading foundries at the Mughalpura and Jamshoro Workshops and in preparations for casting rollers and bushings for gate roller train replacement at Jinnah and Balloki Barrages.

Utilization of Staff Time

	<u>Person Time</u>		
	<u>Budget</u>	<u>Used</u>	<u>Remaining</u>
Expatriate Resident	274	194	80
Expatriate Short Term	58	32	26
Home Office	62	33	29
Local Professional	539	393	146
Local Support	2112	824	1288

Provincial Activities

Punjab

The Equipment and Workshop Advisor (E&WA) completed his assignment and has returned to the United States, however, the efforts to improve the utilization of the workshops and construction equipment in the Punjab have not diminished. The rehabilitation of Jinnah and Balloki Barrages continues to receive much of the effort from the Punjab Provincial Irrigation Department (PPID), USAID, and the Technical Assistance (TA) Team. Meetings are being held biweekly by the barrage subcommittee for planning and tracking the work progress. Training, computerization, and the O&M Equipment Trial Program continue to require major assistance from the TA Team. Work continued on the development of the Surface Drainage Manual during the quarter. The TA Team continues to assist the local agencies contracted to carry out the Impact Evaluation studies.

Rehabilitation/Civil Works. There is a strong effort by the PPID, USAID, and the TA Team to complete the remaining rehabilitation work on Jinnah Barrage, and, in addition, rehabilitate a number of gates of Balloki Barrage. The entire effort must be completed before Project Agreement Completion Date (PACD) of 4 June 1993.

The following is the rehabilitation work remaining to be accomplished on Jinnah Barrage:

- (a) resurface and replace roller tracks on final ten gates,
- (b) replace all wire rope,
- (c) manufacture and replace roller trains for all gates,
- (d) repair overhead walkway.

Work has commenced at both the Mughalpura and Bhalwal workshops in the fabrication and manufacturing of the roller trains. This is a very large task and will require a great deal of foundry and machine work.

For Balloki Barrage, there are plans (subsequently modified) to rehabilitate 15 of the 35 gates, manufacture and replace the roller trains for 15 gates, rebuild the overhead walkway, repair the erosion damage to the downstream pacca and flexible aprons, repair any damaged lifting mechanisms, and carry out repairs on the adjoining canal regulators.

The current plan is that the gate repairs of Balloki will be accomplished by closing off the opening between the piers of a selected gate by means of a needle/stop log bulkhead which was designed by the XEN of Balloki Barrage and approved by the Head of the Irrigation Department Directorate of Design. When the gate opening has been closed, the gate will be raised and removed. As quickly as possible, either a new gate or a rehabilitated gate will be installed. The removed gate will be taken to a nearby work site and the lower one third (4 1/2 feet) will be replaced with a new pre-manufactured section. The gate will be sand blasted,

inspected, and any additional needed repairs will be performed. After all repairs are completed the gate will be painted with special anti-corrosive epoxy paint and returned to the barrage where it will be used to replace the next gate removed. The process will repeat itself until all of the 15 planned gates are completed.

By utilizing the needle/stop log arrangement, the gate repair is planned to start immediately following the flood season, possibly by mid-September. If all work proceeds as planned, it is anticipated the task can be accomplished by the PACD. One of the major activities is the casting and machining necessary to manufacture the roller train assemblies and other replacement parts. To assist the Mughalpura and Bhalwal workshops in this activity, Mr. J. K. Jaffery, Metallurgist, has returned to the TA Team.

Operation and Maintenance. The O&M Equipment Trial program is being undertaken at four Divisions in the Punjab. The program has been underway for a period of seven to nine months, with two divisions having part or all of their equipment for seven months, and one division for nine months. The percentage of usage varies from a low of 29 percent for the Kirana Division to a high of 75 percent for the Bahawalpur Division.

The main difficulty appears to be due to funds not being specifically allocated for the operation and maintenance of the equipment. In some cases, individual PID officials have provided operating funds from existing maintenance and repair (M&R) funds. This lack of funding, and the resulting under utilization, has made it very difficult to monitor the effectiveness and suitability of the O&M equipment.

There were 16 Suzuki Jeeps provided to the Punjab Irrigation Department to be used in support of the O&M Equipment Trial program. To date, ten have been assigned to their designated locations. Other vehicles (Suzuki Pickups) which were obtained for use in the O&M Equipment Trial Program, but were temporarily assigned to other locations, have been given over to the O&M Trial locations in very bad condition. Some of the locations where they are currently assigned do not have funds to repair and overhaul the vehicles. The result is that there is a lack vehicles to support the equipment trial program.

Equipment and Workshops. Spare parts for two D8K Dozers were delivered to the Mughalpura Irrigation Workshop under a USAID sponsored overhauling program in 1991. A total overhaul of one dozer was completed approximately six months ago but it remains in the workshop awaiting payment for labor charges by the Machinery Division. During the Equipment Task Force meeting of 23 June 1992, the Machinery Division was instructed to make payment on 1 July 1992, remove the Dozer and place it into operation (this was done early in July). The work of overhauling the remaining dozer is moving very slowly. The matter of the slow pace of the overhaul program has been brought to the attention of the Equipment and Workshop Task Force on several occasions. The parts to overhaul four WABCO Scrapers should be arriving soon so it is urgent that the rate of progress increase in order to complete the overhaul before the PACD.

An effort was made by the TA Team to encourage the XEN Equipment Division, Faizalabad to work with the XEN Bhalwal Irrigation Workshop (BIW). The objective was to utilize spare parts stored at BIW to repair construction equipment with the Faizalabad Division. This effort was made early in the quarter, but at this date no action has been taken.

The utilization of construction equipment improved slightly in this quarter, with about 60 percent of the available equipment being used on irrigation works. This would indicate insufficient work is being given to the Equipment Divisions to utilize the equipment which is currently operational and available.

There has been increased utilization of the three irrigation workshops in the Punjab. The Mughalpura Irrigation Workshop (MIW) began manufacturing the necessary materials for the barrage rehabilitation effort. The foundry facilities at MIW are being upgraded, with the work to be completed in the next quarter.

The MIW has completed the manufacture of four sand blasting machines. These machines are planned to be used on Balloki Barrage gates starting in July 1992. There will be an attempt to sand blast and paint the top three quarters of the downstream side of the gates, with the remaining downstream quarter to be sand blasted and painted either during closure or when the gate is removed for renovation (plan subsequently modified).

The Bhalwal Irrigation Workshop (BIW) has started casting rollers for the Jinnah Barrage roller trains. There are still some problems with quality control but the TA Team Metallurgist is working very closely with the XEN and his staff to assure the necessary specifications for the rollers are met. The casting of the 2000 rollers needed for Jinnah Barrage is expected to be completed by the end of October 1992.

The Multan Irrigation Workshop has shown some positive movement during this quarter with the fabrication of five small headworks gates. These gates were fabricated and installed at various locations by the workshop. The workshop has received orders for another 80 gates. It is anticipated that this will become a regular operation for this workshop, and, possibly, larger gates can be produced at this location in the near future.

There has been activity in the vehicle repair and overhaul section of the Multan workshop, with two vehicles being overhauled during this quarter. The TA Team recommended to the E&W Task Force to request the Chief Engineer, Multan Zone, to either require or strongly encourage vehicles and equipment under his jurisdiction be brought to this workshop for repair and overhaul. The Chief Engineer, Multan Zone, responded positively to this request.

Monitoring and Evaluation. The plan for the providing equipment for the hydraulic monitoring program was issued during the quarter. ACDP has started the training program for personnel responsible for using the equipment. The delivery date of the equipment is unknown, however, it is anticipated that it will be

received in the third or fourth quarter of 1992. The USAID Project Officer, and TA Team members met with representatives of ACOP and the International Irrigation Management Institute (IIMI) to discuss this Program. IIMI has been working on a similar activity, with emphasis on the utilization of the data by management to operate and maintain the canal system. The Provincial Advisor will keep IIMI informed of the actions and progress in ISM-II program and seek their input.

The Principal of the Punjab Engineering Academy (PEA) has also expressed a desire to receive one set of the equipment and to establish a hydraulic monitoring course at PEA.

Computerization. Seventeen of the twenty planned computer rooms have been renovated. The computers and air conditioners have been installed in the completed locations and are currently operational. The Provincial Advisor made an unannounced visit to three locations in Faizalabad and observed that all of the computer systems were being utilized for PPID work. It is hoped that the remaining computer rooms will be renovated early in the next quarter. As soon as the rooms are completed, the TA Team will arrange to have the computers and air conditioners installed.

The PPID Computer Cell also has received additional computer hardware which is being used to undertake departmental work. The outputs of the cell during the quarter included:

- Safety Application Pertaining to Cuts and Breaches,
- Enhancement and Additions to the Revenue Billing Application,
- Increasing the scope of the Canal System Analysis Application to incorporate and generate cross-sections along with L-sections and also to contain structure data for outlets.

During the quarter, an additional Systems Analyst was added to the TA Team. His major duties will be to assist the Senior Systems Analyst in providing support to the PPID Computer Cell, to provide data processing assistance to the agencies contracted to carry out the Impact Study, and to provide assistance as needed in supporting the new computer locations established under the ISM-II computerization program.

Training. In the workshops, training was provided to foundry personnel in proper methods of making sand molds and in quality control for producing the components of the gate roller trains. The TA Team mechanical engineers continue to provide on the job training in the overhaul program and in the operation and maintenance of the workshop machinery.

Mid-level managers are continuing to be given appropriate management training in country through the Pakistan Institute of Management. Three mid-level managers were provided training in three different sessions by the PIM during the quarter. Ten XENs and 29 SDOs received training at the Punjab Engineering Academy during the quarter. ACOP provided training to five persons in the use of hydraulic monitoring equipment. Attendance during this session was expected to be 20 persons. ACOP will give six more of

these training sessions in the Punjab before the PACD, providing there is sufficient interest.

The Provincial Advisors from Sindh and Balochistan came to Lahore and participated as trainers in a course entitled "Divisional Engineering Application Module". The course was held at the Punjab Engineering Academy and was primarily for training of the trainers. The session was attended by four senior faculty members of the Academy along with two XENs and three SDOs from the PPID.

Sindh

The Sindh Provincial Advisor worked on the ISM-II Project for the remainder of the quarter after returning from R&R leave in the United States on 26 April. USAID restrictions on travel to interior Sindh were not relaxed during the quarter. The RSO's temporary suspension of travel to Hyderabad during the period caused cancelation of a trip planned there in mid-May but it was possible for him to go to Lahore for five days on a training assignment at the end of May and make a two day trip to Hyderabad in mid-June.

In early June, the PPC's attention was again called to the need for a letter to USAID giving PID concurrence to the scope of work and cost estimate for remodelling of committee room into offices or a justified modification so a PIL could be prepared. Action has been pending on this item which would release the MIFC room for a long time and, if not done soon, there may not be time to do the work before the end of the Project. The last few days of Ramazan followed by Eid-ul-Fitr in early April and Eid-ul-Azha in mid-June slowed project progress during the quarter.

Rehabilitation Design. From 23 May to 4 June three members of the ISM-II Technical Assistance Team presented training at the Punjab Engineering Academy (PEA) on the division-level engineering computer-spreadsheet course they had developed. The Sindh PA taught three of the applications. The course is an introduction to computer spreadsheets and gives basic applications for computer solutions of commonly recurring division-level engineering problems. This "training of trainers" exercise was for PEA instructors who are expected to start giving several sessions of the course for irrigation personnel from the divisions of all Provincial Irrigation Departments, starting next quarter.

Operation and Maintenance. At the beginning of the quarter, the first draft of a Surface Drainage Manual was distributed for review. In the latter part of April, a two-day national workshop on the manual was attended by four PID officers from Sindh.

The Divisions and Subdivisions participating in the O&M Equipment Trial Program were visited by the Trial Coordinator and the Sindh TA Design Engineer in late May to check usage and advise on more effective utilization. They were accompanied by representatives from Millat Tractor, who checked and serviced the tractors, and from JECO, who inspected and made plans to correct the structural defects in some of the implements. After about seven months

of the trial, the Sindh Province tractors have been found to be utilized about 59 percent of the target usage of 100 hours per tractor per month. One of the main problems appears to be that there has been no special allocation of funds for operation of the O&M Trial equipment. The shortage of funds affects fuel, lubricant, minor tool, and operator availability. It is reported that instead of performing routine maintenance work, the equipment is mainly being used to forestall emergencies by strengthening canal banks subject to failure. This would appear to be a justified use during the abkalani season and equipment should be fully utilized. Twelve motorcycles were reported to have been purchased by USAID to supplement the O&M Trial equipment for Jamrao Division.

Computer files with data for O&M units in the divisions under Kotri Barrage, Rohri Canal Circle, and Nara Canal Circle were considered reasonably complete in mid June. The files were installed on the new computers in the offices of the Chief Engineer Kotri Barrage, and Superintending Engineer Rohri Canal Circle. The 6,674 miles of channels in these 16 irrigation divisions comprise about 55 percent of the total length of canals in the Province. Work continued on obtaining physical feature and operating information from the various barrages and circles for completion of the O&M Manual.

Equipment and Workshops. Jamshoro Irrigation Workshop has received very little new work from the field this quarter. This lack of activity has been attributed to the end of the PID fiscal year on 30 June, with all funds having been spent. It is also understood that a change in financial procedures now requires the civil divisions to deposit funds for work to be done in advance, where previously, mechanical divisions could work against suspense accounts without deposits. Overhaul of two Dresser scrapers was completed early in the quarter; since then only repair of a tractor trolley, rebuilding the sprockets and track of a D8 dozer, rebuilding of gears for a dragline, and overhaul of Leyland truck engine have been done. Threading of gate lift rods in advance of need was done to lessen the under utilization of the workshop.

The upgrading of the cupola furnace was nearly completed during the quarter, with firebrick lining of the chimney the main work left to do. Due to the extremely hot weather, there is a reluctance to get on with this job. A contract was signed for installation of the engine dynamometer and upgrading of the clean water supply for the workshop. At the end of the quarter, the site had been cleared and the foundation for the water settling tank was nearly finished.

As is usual at the start of the flood season, there was above normal utilization of all types of earth moving equipment in the field. The fleet of Wabco scrapers and D8 bulldozers was fully engaged at Larkana Bund. All Dresser self-elevating scrapers worked on bund strengthening in Guddu Barrage region. Utilization of hydraulic excavators on canal clearance work was very high.

During the quarter, four supervisory/computer staff of Jamshoro Workshop visited irrigation workshops in NWFP and Punjab to share problems and solutions with personnel doing similar tasks

in other provinces. They were given orientation on operation and maintenance of the Rockford Planer, operation of foundry facilities, and gate fabrication techniques. Demonstrations were given at the Peshawar Workshop on implementation of the Mainsaver computer program.

The Mainsaver program is being used for generation of stores accounts. Repair work orders were generated for rehabilitation of the Dresser scrapers.

Monitoring and Evaluation. Work on the two canal systems selected for impact monitoring is behind schedule. At the end of the quarter, rehabilitation work on Nagnah Distributary was reported to be 54 percent completed. Puran Distributary was estimated to be 12 percent and Puran Minor 8 percent complete. It seems probable that rehabilitation of these canals will not be finished in time for post-rehabilitation hydraulic and agro-economic evaluation to be started before the end of 1992.

Computerization. Air conditioners, the last major item of equipment under the computerization expansion program, were delivered to all locations scheduled to receive them. Under the same program, the Systems Analyst distributed recently received consumable supplies (computer paper, ribbons, etc.). The local area network (LAN) for the Central Computer Cell was installed and is completely operational. Essentially all equipment and supplies under the computer expansion program have been received except for a few specialized consumables (plotter paper, tape cartridges, etc.).

The System Analyst conferred with representatives of BCI, the USAID contractor for computer training in Sindh, and finalized the scheduling of courses which started in early June.

The existing PID computer maintenance contract expires on 30 June; a new contract, which also includes equipment furnished under the computerization expansion project, should be negotiated as soon as possible. At the request of the PPC, the Systems Analyst has reviewed over 600 applications received for the Grade 17 and 18 computer cell supervisory positions and made a short list of ten recommended applicants for each position.

Training. Two Executive Engineers attended courses presented by the Pakistan Institute of Management. One attended "Development Course for Managers" in Karachi; the other "Problem Solving and Decision Making Skills" in Lahore. Eleven PID personnel participated in training module sessions given at the Punjab Engineering Academy in Lahore. One XEN, 2 SDOs, and 4 Subengineers attended "Construction Specifications"; 2 SDOs and 2 Subengineers attended "O&M of Canal Systems".

Six Subengineers and four SDOs attended a hydraulic monitoring training class given by ACOP in Hyderabad. Nineteen PID personnel received formal computer given by BCI in Karachi.

Northwest Frontier Province

Rehabilitation Design. Sedimentation data was collected from ACOP for use in a sample design using the Hydraulic Design Criteria (HDC) method, developed in Phase I of the ISM Project, with the intention of also preparing a sample design for the same reach using a Manning/Lacey approach. The problematic channel selected is the Michni Branch.

The HEC-1 hydrologic design software was installed on a computer in the Chief Engineer's Design Cell. It is a tool for generating floods and determining the adequacy of a selected size of spillway and dam height. This is particularly useful for the design of earthen dams. The TA Design Engineer commenced training PID personnel in the use of the software.

The TA Design Engineer taught a one-week long course at the Punjab Engineering Academy in the use of Lotus 123 software as part of the "training for trainers" for the division-level engineering computer spreadsheet training module.

Operation and Maintenance. The originals of the O&M Manual were sent to USAID, Islamabad, for final printing.

Visits were made to Bannu during the quarter to witness the O&M Equipment Trial. Although a second orientation and training session was provided, equipment that was transferred in April to new locations in the Southern Irrigation Circle remained essentially idle because of lack of funds. A meeting was held in Peshawar with members of the PID, TA Team, and USAID, chaired by the Secretary, to discuss funding for the O&M Equipment Trial. The SE Southern Circle will develop a budget by the end of the quarter adequate to run the trial equipment and funds are to be made available at the beginning of the financial year.

Preparation of the 1992-93 Maintenance Work Plan commenced during the quarter. A workshop to review and comment on the draft Manual for Surface Drainage, held at Bhurban, was attended by three representatives of the PID.

Equipment and Workshops. The equipment overhaul program was in full swing during the quarter. The engines of a 225 excavator and a D8K dozer are being overhauled using spare parts supplied by USAID. The hydraulic circuits, steering clutches, and pneumatic controls of an H30 excavator were repaired at Gandialli Dam. The power sprocket of an additional 225 excavator was reworked and the rotary seals, generator, and bushings of the buckets were repaired. A complete engine overhaul was done for a pickup truck. Major repairs were carried out on the clutch and gear box of a well drilling rig.

The radial drill machine was activated and commissioned during the quarter. It is now 90 percent operational. The reverse operation of the spindle has not been activated. A search has been carried out in the market to find a replacement for the defective solenoid.

Training in rewinding of electric motors was arranged for workshop staff at the Mughalpura Irrigation Workshop in Punjab. Electrical motor rewinding was initiated during the quarter and is in progress.

The gate manufacturing program was completed during the quarter. All nine gates have been manufactured and installed. Minor adjustments and rectifications are still required on four gates before the work can be certified for reimbursement.

The renovation work for the service facility in D.I. Khan was halted due to lack of funds.

Mainsaver activities continued during the quarter, but at the end of the quarter the hard disc of the Mainsaver computer required repair. The computer staff of the Jamshoro Irrigation Workshop in Sindh visited the Peshawar workshop during the quarter and received training in the use of the Mainsaver program.

On-the-job training continued throughout the quarter for mechanics.

Computerization. During the quarter, the Finance Department gave approval to hire six data entry operators, but approval to hire a programmer and a systems analyst was withheld. These positions had been previously approved by the P&D Department and are considered essential to the sustainability of the computerization program in the Province.

The Systems Analyst and the Design Engineer carried out computer training throughout the quarter, especially for clerks and SDOs in Bannu, D.I. Khan, Kohat, Swabi, Mardan, and Mingora. The TA Team, along with the USAID Systems Analyst, assisted the PID in the operation, maintenance, and trouble shooting required to operate the 28 computers now in its possession.

Typical outputs from the Chief Engineer's Computer Cell during the period are listed below:

- Revised Stay List of Officers,
- Monthly Expenditure Statement of Budget Section,
- Reappropriation Statement under Demand 8,
- District and Scheme Wise Provincial ADP for 1992-93,
- Bimonthly Report on Chief Minister's Directives.

At the end of the quarter, the System Analyst and the Provincial Advisor attended a computer activities meeting in Islamabad. In this meeting the activities and problems in the four provinces were presented and discussed.

Monitoring and Evaluation. Input was provided for the USAID Purpose Level Monitoring report for the period ending 31 March. The review meeting was held in Islamabad in June.

Mechanical equipment utilization reports were prepared monthly and forwarded to the TA Team M&E Specialist.

Training. Two XENs attended mid-level management courses at the Pakistan Institute of Management. The first course was entitled "Development Course for Managers", and the second course was entitled "Problem Solving and Decision Making Skills".

One XEN from the NWFP attended a course entitled "Design Strategy" and two SDOs attended a course entitled "Construction Engineering Specifications" at the Punjab Engineering Academy in Lahore. Five SDOs attended a training session entitled "O&M of Canal Systems" at the Punjab Engineering Academy.

Ten members of the NWFP PID participated in a training course presented by ACOP on the use of hydraulic-monitoring equipment.

In-house computer training continued throughout the quarter. In Peshawar, the TA Design Engineer provided training to engineers in the use of spreadsheet software. He travelled to Bannu, Kohat, and Swabi to provide computer training. During the quarter, he was involved in providing computer training to 11 engineers and ten other staff members of the PID.

Balochistan

Two members of the Technical Assistance Team resigned in this quarter. Mr. Abdul Majid Chaudhry, Civil Engineer, resigned on 7 May. Mr. Chaudhry will come back to Quetta for a couple of short term assignments to support the preparation of the Annual O&M Work Plan. Miss Shamshad Kousar, Project Secretary/Computer Instructor, resigned on 1 June. The PID Computer Cell will continue the training she was conducting.

A curfew was imposed because of political disturbances and unsafe conditions in the city and the interior of the Province. This situation severely limited office and field activities. Also, a strike of the PID clerical staff and Mechanical Workshop workers obstructed the computerization and overhauling activities.

Rehabilitation Design. There has been no change in the status of the Design Cell, with no appointments of technical staff except for the Chief Engineer Design.

The rehabilitation work on the Nari Canal system has not been started so far and it will not be possible for the PID to complete the execution of rehabilitation work by the end of year 1992. Because of the delay in rehabilitation, it will not be possible to complete the post-rehabilitation evaluation within the Project period.

An inspection visit was made to Sibi, where the lining of the Subsraig Channel was observed. This channel is the continuation of Khajjak Branch, which takes off from Nari Canal.

Operation and Maintenance. Some information for the preparation of the Annual Maintenance Work Plan has been received through the Provincial Coordinator. It was thoroughly reviewed and returned with comments. Data from the remaining divisions is still

awaited. The main problems with the data received so far are lack of information regarding the funds allocated during 1991-1992 for each scheme under M&R, expenditure for repairs executed as of 30 June, 1992, unrealistic demand of funds, and some confusion regarding the description of "O&M Repairs Required".

Field visits were paid by TA Team each month to Pat Feeder Division to monitor the O&M Equipment Trial program and guide the field staff. The O&M Trial Coordinator conducted a four day visit to monitor the performance and use of the equipment. He was accompanied by JECO and Millat staff. They together inspected the machinery, serviced it, fixed and replaced faulty parts. The average percentage utilization for the Province is 37. A fifth set of equipment was delivered to Pat Feeder Division, and was assigned to Goth Tagia Sub Division. Information was given that some of the equipment was used effectively to control a breach in the Pat Feeder Canal.

Equipment and Workshop. The serious law and order situation led to imposition of curfew in Quetta during April and May and, therefore, work progress was affected adversely during the quarter. However, during the available times when work could continue, there have been notable achievements under the guidance supervision of the TA Team mechanical engineers.

Two FIAT Allis dozers, for which spare parts were supplied by USAID, were completely overhauled at Pishin Irrigation Division. Field tests after repair are satisfactory. Workshop support to field formations continued very effectively and five machines were repaired in the field by the workshop staff. Two lubrication trucks, which were parked idle in the workshop since their arrival, were commissioned and handed over to field units and are being utilized very effectively.

At present, work on Cat D7G, J.I. Case, 5 FIAT dozers and one Lorain crane is in hand. PID Balochistan specifically requested Harza for additional assistance for this work. Another mechanical engineer from the Lahore office was sent to Quetta to assist the resident mechanical engineer. The quality of work being done in workshop is proving acceptable to the field divisions and that appears to be a factor in more work load being provided to the workshop. Moreover, Balochistan Government has sanctioned special funds for repair of machines, which has enhanced activities in the workshop.

Construction equipment utilization is increasing steadily and there is nearly optimum utilization of all the available equipment with PID Balochistan. The potential work load for construction of delay action dams, spurs, flood fighting, desilting, widening of canals and strengthening of canal banks is so large that it exceeds the capacity of the total available equipment with PID Balochistan. Most of the equipment with the Department has already exceeded its normal useful life, which is why the Balochistan Government is sanctioning special funds for emergency repairs to the machines.

The TA Team prepared a status report for each individual piece of construction equipment and prepared spare parts requirements for

each unit to make it work worthy. All the Circles and Divisions in the province were visited to thoroughly inspect the machines. On the request by the Chief Engineer, the TA Team prepared specification for a number of items of O&M equipment which are to be provided to Balochistan Government under Japanese Aid.

On-the-job training by the TA Mechanical Engineers remained as an ongoing activity during the quarter. Nominations for trainees to participate in mechanics and operators course at the Construction Machinery Training Center at Islamabad were made by the Department and it is expected that all the available training slots for Balochistan will be utilized this year.

Not been much progress was made in implementation of the Mainsaver program. However, all the stores inventories and fresh consignments of spare parts have been entered into the inventory module of the program. Opening of work orders has not yet started. The Workshop XEN, who is also responsible for implementation of the Mainsaver program, is proceeding to the United States for a special training course on use of the Mainsaver program. Two workshop personnel are already trained for computer operations and two more have been nominated for computer users training.

Recommendations for workshop improvements made by Mr. George Miller, Equipment Advisor, during his short-term assignment ending in April, are being followed up.

Monitoring and Evaluation. Hydraulic monitoring by ACOP and agro-economic monitoring by WMED for pre-rehabilitation conditions of the Nari Canal System have been completed but interim reports on the evaluation of the data have not been completed as yet. A contract for rehabilitation of the Nari Canal System still has not been executed, so there is doubt as to whether the post-rehabilitation monitoring can be carried out.

Computerization. The renovation of all computer rooms has been completed. Five computers are installed in the training room at Quetta, four in the Computer Cell, one in Loralai, one in Sibi, and two in Quetta Circle. One air conditioner was delivered and installed in the computer room at Loralai. The installation of the generator in the Chief Engineer's Building was completed.

Two months training to a second batch of nine persons was completed on 16 May by the TA Team with the support of the Computer Cell. They were given training in DOS, Word Perfect, and Lotus.

Field visits to follow up the use of the micro-computers and performance of the trained staff were severely impeded by the curfew and a clerks' strike. In a visit to Sibi, excellent performance by the clerk in charge was observed. Another three days of training/follow-up is recommended for the Loralai staff, which the PID Computer Cell will conduct once the strike is over.

The PID has requested USAID computers and air conditioners for new computer rooms in Pat Feeder and Makram Circles. USAID will try to provide used air conditioners and the Harza/ISM-II micro-computers will be transferred to the Circles just before the

Provincial Advisor leaves. The PID will rehabilitate the rooms with its own funds.

Training. The Balochistan Provincial Advisor, along with the Sindh PA and NWFP Civil Engineer, conducted two weeks "Training the Trainers" course on "Division Engineering Applications" for staff of the Punjab Engineering Academy. The Academy will conduct the training for PID engineers in future courses

One SE attended a mid-level management training session titled "Problem Solving and Decision Making Skills". held at the Pakistan Institute of Management, Lahore. One XEN attended a mid-level management training session titled "Principles of Good Management", also held at the Pakistan Institute of Management, Lahore.

Two Assistant Engineers attended a two-week session of the "Construction Specifications" training module at the Punjab Engineering Academy in Lahore from. Two XENs and three SDOs attended a session of the "O&M of Canal Systems" training module, also at the PEA. Twenty three Subengineers attended a 12-week training session in "Surveying and Estimation" at the PEA, starting 18 April.

One participant attended the three month training course of Mechanic III at the Construction Machinery Training Center in Islamabad.

Federal Office

The office of the Chief of Party continued in its primary responsibility to support the functioning of the Provincial offices. These include liaison with the Federal Coordination Cell and with USAID, coordination with subcontractors, DAI and ACE, arrangements for specialists on short-term assignment, USAID contract administration, and all financial management.

O&M Equipment Trial Program. The Program comprises a one-year trial of the use of light mechanized equipment, based on a standard farm tractor, for routine maintenance of canal banks by irrigation subdivisions. The Program is being implemented in 27 subdivisions, under nine divisions, in all four provinces. The Program is being monitored and an evaluation will be prepared.

The trial program remained in progress during the quarter. Activities in the different provinces are described above. Utilization of the equipment was monitored by the O&M Trial Coordinator in Punjab and by the Coordinator and the TA Civil Engineers in the other provinces. The level of utilization varies considerably among the participating divisions, and utilization appears to have generally decreased during the quarter. The main reason for low utilization continues to be difficulty in obtaining funds needed for operations.

All locations were visited by the Coordinator accompanied by representatives of the tractor and implements suppliers to service and repair the equipment and to provide needed replacement parts. One additional set of tractor and implements each was provided to

Punjab, Balochistan, and NWFP. Motorcycles were supplied to subengineers in one division in each province to evaluate their effectiveness for increasing mobility. Arrangements were initiated by USAID to procure additional items of equipment based on recommendations of participants in the discussion workshop held in Lahore in March. These consist of chisel ploughs for the subdivision equipment sets, priming tanks for the sprinkler trailers, and two tractor-drawn self-loading scrapers for special testing.

Hydraulic Monitoring. Procurement of hydraulic monitoring equipment to equip 13 circles for a pilot program is in process by USAID. Delivery is expected in the fourth quarter of calendar 1992. A draft "Hydraulic and Sediment Monitoring Manual" was prepared in Harza's home office. Copies of the draft were sent to the Provincial Irrigation Departments, ACOP, and IIMI for review. Comments will be incorporated and the manual should be completed in the next quarter. A program of training in hydraulic/sediment monitoring by ACOP for PIDs' personnel was initiated, as described in the provincial reports above. This program gives emphasis to the circles that are scheduled to receive the equipment.

Surface Drainage Manual. An interim draft of the Surface Drainage Manual was distributed to delegates nominated by the Provincial Irrigation Departments and to representatives of other agencies concerned with aspects of surface drainage. They were asked to review the draft and to attend a discussion workshop held in Bhurban on 20-21 April. In the workshop, comments were made on the draft on a chapter by chapter basis. These comments were recorded and consolidated and sent to each of the participants. The comments are being used in preparation of the final draft of the Manual.

The Drainage Engineer departed Pakistan on 12 May for the United States, where he continues to work on the Manual on an intermittent basis and is obtaining relevant reference material. He is scheduled to return to Pakistan in August. It is expected that the Manual will be completed in the last quarter of this calendar year.

Training. The Training Specialist continued to assist the Federal Coordinator in facilitating overseas training, to provide liaison between provincial offices and federal agencies on status of training nominations, and to work closely with the USAID Training Engineer in making arrangements for in-country training. In order to facilitate financial arrangements, Harza continued to administer payment of travel and subsistence costs for in-country trainees, on the basis of a Purchase Order issued by USAID.

Details of specific training activities are given in the reports of provincial activities.

Monitoring and Evaluation. Information was collected and assembled for a USAID Purpose Level Monitoring Report for the period October 1991 - March 1992, which was presented on 9 June.

The three agencies participating in the Study of the Impact of Rehabilitation of Canals and Drains, ACOP, WMED, and PERI, completed all field work for pre-rehabilitation conditions and were involved in data base preparation and data analysis.

ACOP essentially finished their first draft report on analysis of pre-rehabilitation conditions of the Nagnah Canal system, with reports on the other seven systems to be completed on a schedule extending to November 1992. Preparation of data bases and analysis of pre-rehabilitation agro-economic conditions by WMED and PERI progressed slower than planned. An Assistant Systems Analyst was added to the TA Team staff to, among other things, assist the agencies in data management and analysis. Both agencies are expected to complete draft reports during the next quarter.

Both ACOP and WMED started collection of post-rehabilitation data on the Chowki Distributary system in NWFP. This is the only system for which rehabilitation work has been completed. Progress on the other seven systems in the Impact Study has fallen further behind schedule. It is now planned that post-rehabilitation data collection for these systems will be initiated in kharif 1993. Special arrangements for completing the Impact Study after the Project Assistance Completion Date (PACD) are being explored.

Computerization. Installation of the 60 sets of computer equipment of the computerization expansion program to the end-users in NWFP, Sindh, and Punjab was completed except for three sets in Punjab. Air conditioners, the last to be provided items of equipment, were delivered to all renovated computer rooms and were in process of installation by EGS. In addition, all computer systems in Balochistan, that were delivered in an earlier procurement, were installed in renovated computer rooms.

Specific computerization activities are described in the provincial reports above.

Highlights of Planned Activities in Next Quarter

Irrigation Departments will be encouraged to complete Annual Maintenance Work Plans for the 1992-93 fiscal year.

The Hydraulic and Sediment Monitoring Manual will be finalized after receiving any comments from the reviewers.

Intensive liaison will continue with the involved agencies of the Punjab PID on preparations for rehabilitation of gates and other facilities at Balloki Barrage and completion of rehabilitation works at Jinnah Barrage.

Assistance will be provided to complete the renovation of the foundry facilities and the installation of the engine dynamometer at Jamshoro Workshop in Sindh.

Emphasis in technical assistance at workshops on utilization of USAID-supplied spare parts in overhaul of construction machinery will continue.

Monitoring of the O&M Equipment Trial will continue through field visits to all of the participating divisions. Assistance will be given to USAID for procurement of additional equipment, as recommended in the O&M Equipment Trial Workshop.

Assistance will continue to be provided to WMED and PERI in organization of the pre-rehabilitation data bases and in data analysis. Draft reports by ACOP, WMED, and PERI will be reviewed.

The draft of the Manual for Surface Drainage will be revised based on comments in the workshop held in April.

A seminar will be held to demonstrate a computer program for revenue billing and recording, developed by the Punjab Computer Cell, for top management officials of the Irrigations Departments and the Federal Government.

On-going technical assistance activities will continue. These include assistance in canal system design improvement, assistance in O&M planning, mechanical workshop training and assistance in equipment repair and overhaul, assistance in computerization, monitoring and evaluation activities, and assistance in the off-shore and in-country training programs.