A.I.D. EVALUATION SUMMARY - PART I

PN-AAY-730

1. BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS
2. USE LETTER QUALITY TYPE, NOT DOT MATRIX TYPE

IDENTIFICATION DATA

A. Reporting A.I.D. Unit:

Mission or AID/W Office USAID/Islamabad
(ES# FY88-1)

B. Was Evaluation Scheduled In Current FY Annual Evaluation Plan?
Yes [X] Slipped [ ] Ad Hoc [ ]
Evaluation Plan Submission Date: FY ___ Q ___

C. Evaluation Timing
Interim [X] Final [ ]
Ex Post [ ] Other [ ]

D. Activity or Activities Evaluated (List the following information for project(s) or program(s) evaluated; if not applicable, list title and date of the evaluation report.)

Project No.	Project /Program Title	First PROAG or Equivalent (FY)	Most Recent PACD (Mo/Yr)	Planned LOP Cost (000)	Amount Obligated to Date (000)
391-0479	Baluchistan Area Development Project	1984	12/90	$121,000	$45,000

ACTIONS

E. Action Decisions Approved By Mission or AID/W Office Director

Action(s) Required	Name of Officer Responsible for Action	Date Action to be Completed
1. Mission to expand Makran vo-tech program to include all of Baluchistan, with 55 scholarships planned for FY1988.	Gant, HRD	August 1988
2. Mission to continue support to P&D computer cell in Quetta through May 1989, when the cell should be fully operational and the prospects for maintaining it should be good.	Traister, RAO	Summer 1989
3. Completion of the socio-economic survey to be carried out by PSC, with assistance from PDM and PRO.	Traister, RAO Mailloux, PDM Addleton, PRO	Summer 1989
4. Special Development Activities (SDAs) to continue, with special attention given to construction and/or improvements in female schools.	Traister, RAO	Ongoing
5. Small scale water sector projects will continue through 1988. Prior to departure of water engineer, analysis and documention will be completed for water-related activities.	Traister, RAO	Ongoing
6. Mission to conduct internal review of bidding process for large-scale construction projects.	George, ENG	Summer 1988
7. Steps to be taken to improve utilization of existing ACE equipment, and to order new items where appropriate (new equipment will be ordered as needed in January 1989).	Traister, RAO Bilecky, CC	Summer 1988

(Attach extra sheet if necessary)

APPROVALS

F. Date Of Mission Or AID/W Office Review Of Evaluation: (Month) March (Day) 31 (Year) 1988

G. Approvals of Evaluation Summary And Action Decisions:

	Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer	Mission or AID/W Office Director
Name (Typed)	R. Traister	Ata Mohammad Jafar ACS(D) P&D GOB-QTA	J. Addleton	J. Norris
Signature	[signature]	[signature]	[signature]	[signature]
Date	May 5, 1988	May 8, 1988	April 23, 1988	May 13, 1988

ABSTRACT

H. Evaluation Abstract (Do not exceed the space provided)

The main purpose of the Baluchistan Area Development (BALAD) project is to accelerate the integration of Baluchistan province into the socio-economic mainstream of Pakistan. In particular, it seeks to improve the quality of life for the people of Makran, a remote and isolated corner of southwestern Baluchistan, through improvements in basic infrastructure (roads and water) and human resource development. The main purpose of the evaluation was to assess implementation progress to date, where possible identifying "problem areas" and ways to accelerate implementation. The evaluation did not generate new data but was rather based on reviews of existing documentation and conversations with key project personnel.

Major findings and conclusions included the following: (1) Institution building as planned in the Project Paper has not been possible, primarily due to lack of counterparts; (2) The special vocational-technical training program was well received and at this initial stage promises some success; (3) Construction of major sub-projects including the Kech River Bridge and Bela-Awaran road have been delayed due to mobilization difficulties by local contractors; (4) Special Development Activities (SDAs), primarily schools, have been well-received but offer limited visibility; (5) Road maintenance and water programs developed by the TA team are starting to have an impact, but the cost is high and long-term maintenance will pose problems; and (6) baseline socio-economic data on Makran has been attempted but has no immediate utility for BALAD management. After a one year delay, implementation is finally moving forward and most of the management "bugs" have been resolved.

The evaluators noted the following "lessons learned:" (1) Existing institutional weaknesses become even more marked in remote areas such as Makran; (2) a "rolling" planning process makes more sense than an overly detailed PP; (3) a variety of flexible contracting mechanisms will prove useful; (4) Missions should not underestimate the management-intensity of pioneering projects such as BALAD; (4) Data collection works best when it is driven directly by project requirements; (5) In highly visible and "political" projects such as BALAD there is clear need to show at least some results quickly; and (6) The simpler the initiative, the better.

COSTS

I. Evaluation Costs

1. Evaluation Team Name / Affiliation	Contract Number OR TDY Person Days	Contract Cost OR TDY Cost (U.S. $)	Source of Funds
Robert LaPorte, TvT Associates Ralph O. Hill, TvT Associates Jonathan S. Addleton, USAID/Islamabad	IQC No. PDC-0085-I-00-6108-00	$54,470	ESF (Project Funds)

2. Mission/Office Professional Staff Person-Days (Estimate) 40 days

3. Borrower/Grantee Professional Staff Person-Days (Estimate) 15 days

A.I.D. EVALUATION SUMMARY - PART II

SUMMARY

J. Summary of Evaluation Findings, Conclusions and Recommendations (Try not to exceed the three (3) pages provided)
Address the following items:

- Purpose of evaluation and methodology used
- Purpose of activity(ies) evaluated
- Findings and conclusions (relate to questions)
- Principal recommendations
- Lessons learned

Mission or Office:	Date This Summary Prepared:	Title And Date Of Full Evaluation Report:

The main purpose of the BALAD project is to accelerate the integration of Baluchistan province into the socio-economic mainstream of Pakistan and to improve the quality of life for the people of Makran through improving roads and water infrastructure in Makran and by strengthening Baluchistan's planning, management, and human resources.

The main purpose of the evaluation was to assess progress of project implementation to date, where possible identifying "problem areas" and ways to accelerate implementation. During the course of the evaluation, the three-person team visited Islamabad, Quetta, Karachi and the project area, examining all relevant files and discussing aspects of the project with about fifty USAID and Government of Baluchistan officials. The document/file review and information collected through interviews/discussions form the basis for the evaluation report.

Major findings, conclusions and recommendations include:

1. The GOB is unable to properly staff the Project Planning and Monitoring Unit (PPMU) in Turbat and the lack of Government of Baluchistan (GOB) counterparts is making institutionalization impossible. In the meantime, the process established which has the technical assistance (TA) team playing a lead role in design and implementation, with the PPMU serving as a liason and PC-1 processing office, should continue.

2. The vocational-technical training program is well received and should continue, possibly for all of Baluchistan.

3. After a shaky start, the TA team has overcome most of its early management problems and enjoys a good working relationship with the local administration. The current team should remain intact as long as possible but the overall contract should not extend beyond 1989.

4. The computer cell at the Planning and Development Department in Quetta is storing data that should be useful in preparing future provincial annual development plans. Support currently offered to the cell should continue.

5. The socio-economic survey has generated data but its usefulness for BALAD managment is minimal. The existing data should be properly analyzed and presented, possibly first for Gwadar District and then for Turbat District.

6. The schools constructed under the SDAs (Special Development Activities) program are well received locally but have relatively limited impact in the Division as a whole. The SDA school schemes still have a useful role to play and should be continued. During the remainder of the project, a conscious effort should be made to construct and/or rehabilitate female schools, an issue which has not so far been adequately addressed under the project.

7. The long-standing concern that nothing is in place on the ground is finally being resolved, especially with the implementation of some water sub-projects and the signing of contracts for the Kech River Bridge and Bela-Awaran road. The SDA schemes and water projects should continue. If possible, an effort should be made to preserve some of the experience gained in the water sector prior to the departure of the incumbent water engineer in 1989.

8. The involvement of the Mission in project implementation has been much greater than originally envisaged in the Project Paper (PP). This support will have to continue throughout the duration of the project.

9. The local contractor for the Bela-Awaran road has demonstrated neither the capability nor the strength of purpose to contract this important link to Makran Division in the 30-month time period provided. There are sufficient grounds for cancelling this contract. The local contractor for the Kech River bridge has been slow to mobilize but here the recent signs are more encouraging.

10. Experience in the above two construction projects raises serious doubts about the capabilities of local firms to mobilize quickly and undertake major construction works in remote areas such as Makran. USAID/Islamabad should review its tendering process with the objective of securing higher quality bids for better qualified firms in the future.

11. Road maintenance has only recently been underway, making it difficult to comment on activities undertaken by the provincial Communications and Works (C&W) department thus far. Their capabilities seem marginal. Equipment purchased separately under the Agricultural Commodities and Equipment (ACE) program needs to be placed in running condition, with phase II equipment properly specified and ordered soon.

12. Although some road counts have been undertaken, they are not being made on a systematic basis. Such traffic counts should be maintained to ascertain seasonal variations and possible increases in traffic due to improved road services.

13. Selection criteria adopted by the TA team for water activities appear acceptable and in accordance with demonstrated need, project viability, and recognized engineering concepts. The long-term effectiveness of such projects is difficult to measure at this time as in most instances there has been no rainfall nor sufficient time to gather and analyze data.

Major "lessons learned" include:

1. In remote areas such as Makran it is difficult for host governments to deliver on commitments to provide adequate counterparts. Existing institutional weaknesses within the country become even more marked.

2. In projects such as BALAD the PP can rarely offer more than broad outlines and general directions about where the proposed project should go and what will be its major outputs. A "rolling" planning process makes more sense.

3. An array of contracting modes and mechanisms can be helpful. The variety of vehicles available--USAID purchase order, USAID direct contract, reimbursement to PPMU, etc.--introduced some flexibility that would not have been possible had only one mechanism been relied upon.

4. Based on responses received to the original RFP for TA in BALAD, experienced firms able to offer useful TA in isolated areas such as Makran immediately appear to be absent. The Mission must be prepared to design, manage and monitor some activities from a distance.

5. Data collection works best when it is driven directly by project requirements. The PP goal of collecting baseline data for the entire Division in a myriad of economic social areas as a way to judge project impact is unrealistic; even if changes were to occur, it is unlikely they could be attributed to the project alone. Several special "targeted" studies examining specific issues would have been more beneficial. The cost and effort expended in a data collection exercise should be commiserate with its final utility.

6. Socio-economic data of any variety is difficult to collect and the process takes longer than anticipated, especially in difficult regions such as Makran where project activities are regarded with some suspicion.

7. There are few if any local contractors able to move quickly on large construction projects such as major bridges and roads.

8. In highly visible projects such as BALAD there is clear need to show at least some results quickly. SDA-type schemes need to be put in place quickly to demonstrate to local communities that activities are indeed aimed at benefitting them. Such flexible and quick-response mechanisms need to be emphasized from the beginning.

9. The simpler the initiative, the better. In addition, it is important that the success of one activity not be contingent on the success of others.

10. The needs of Makran are very basic--roads, water, electricity. More complicated later interventions will not make sense until the basic infrastructure is first in place.

ATTACHMENTS

K. Attachments (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier; attach studies, surveys, etc., from "on-going" evaluation, if relevant to the evaluation report.)

(1) Complete Evaluation Report

(2) BALAD Broject Brochure

COMMENTS

L. Comments By Mission, AID/W Office and Borrower/Grantee On Full Report

The evaluation was relatively complete and responded to the scope of work. The evaluation was informative and answered specific questions posed. It did not however raise any unexpected issues. The evaluation team spent about 50 percent of their time in the field and were able to grasp both the complexities involved in managing the project as well as the various impacts of project outputs. With references to comments on large-scale construction, considerable progress has been made on the Kech River Bridge while construction on the Bela-Awaran Road has still not moved forward.

There was not evidence of any particular biases on the part of the evaluation team. The findings and lessons learned generally concur with the concusions reached by USAID staff and well informed host country officials.

XD-AAX-730-A
ISN 55925

INTERIM EVALUATION

OF THE

BALUCHISTAN AREA DEVELOPMENT PROJECT

(391-0479)

Prepared for the U. S. Agency for International Development under
Indefinite Quantity Contract No. PDC-0085-I-00-6108-00

December 1987

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INTERIM EVALUATION OF THE BALUCHISTAN AREA DEVELOPMENT PROJECT (BALAD)
PROJECT NO. 391-0479

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LIST OF ACRONYMS

A&E	Architectural and Engineering
ACE	Agricultural Commodities and Equipment Program
ACS/D	Additional Chief Secretary (Development), GOB
ADP	Annual Development Plan
BALAD	Baluchistan Area Development Project
C&W	Communications and Works Department, GOB
COP	Chief of Party
CP	Conditions Precedent
DC	Deputy Commissioner
DWC	Divisional Working Committee
ENG	Office of Engineering, USAID/Islamabad
GOB	Government of Baluchistan
HRD	Office of Human Resource Development, USAID/Islamabad
IFB	Invitation for Bid
I&P	Irrigation and Power Department, GOB
LBI	Louis Berger International, Inc. (Contractor)
MIS	Management Information System
NWFP	North West Frontier Province
P&D	Planning and Development Department, GOB
PDIF	Project Design and Implementation Fund
PDM	Office of Project Development and Monitoring, USAID/Islamabad
PID	Project Identification Document
PIL	Project Implementation Letter
PIO	Project Implentation Order

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PIR	Project Implementation Report
PSC	Provincial Steering Committee
PSC	Personal Services Contractor
PP	Project Paper
PPMU	Project Planning and Management Unit
PROMIS	Project Management Information System
RAO	Regional Affairs Officer
SDAs	Special Development Activities
SKB	Saadullah Khan Brothers (Contractor)
TA	Technical Assistance
TADP	Tribal Areas Development Project
USAID	United States Agency for International Development

PREFACE AND ACKNOWLEDGMENTS

The Interim Evaluation of the Baluchistan Area Development Project (BALAD--Project Number 391-0479) was initiated on November 1, 1987 and completed on December 10, 1987. The members of the evaluation team were:

Dr. Robert LaPorte, Jr., Team Leader, Professor of Public Administration at The Pennsylvania State University; Fulbright Research Scholar at the Lahore Graduate School of Business Administration (1986-87); specialist on the administrative system of Pakistan; team member on four assignments for USAID/Islamabad, including the Tribal Areas Development Project Interim Evaluation (1985) and a pre-PID team for BALAD (1982); consultant to the U.S. Department of State, the World Bank, and USIA; lecturer in the American Participant Program of USIA/USIS; author of two books and several professional journal articles on administration and development in Pakistan;

Ralph O. Hill, senior highway and civil works engineer with 35 years of service, principally with World Bank projects in various countries; recently served for three and one-half years as Chief Advisor to the National Highways Board in Pakistan assisting in the design and construction supervision of several hundred miles of dual carriageway between Karachi and Peshawar; and

Jonathan S. Addleton, Mission Evaluation Officer, Office of Program, USAID/Islamabad; he has worked with USAID in Pakistan for three years and lived in the country for nearly twenty years; in addition to overseeing the Mission's Evaluation Plan, he coordinates budgeting, WID and PVO activities, and the preparation of Action Plans, Congressional Presentations and various other strategy and reporting documents.

Ralph O. Hill and Robert LaPorte, Jr. were contracted by TvT Associates of Washington, DC. Jonathan Addleton was assigned to the team by USAID/Islamabad.

Imtiaz Kazi, Chief, Special Development Programs, Planning & Development Department, Government of Baluchistan (GOB), served as the GOB's representative on the evaluation team and participated to the extent that time away from his other duties allowed. Mohammad Saleem, Program Specialist, Office of Project Development and Monitoring, USAID/Islamabad, served as evaluation team facilitator and representative from a technical office..

There are many individuals that the team members would like to thank for their assistance. These include: GOB officials in Quetta including S.R. Poonegar (Chief Secretary), and Fateh Khan Khajjak (Additional Chief Secretary); Makran Division administrators, including Rashid-uz-Zafar

(Commissioner), Abdul Aziz Lasi (Deputy Commissioner/Turbat), Mir Abdullah Jan (Deputy Commissioner/Gwadar), Iqbal Hussain (Assistant Commissioner/Gwadar), and Akbar Baluch (Assistant Commissioner/Panjgur); the Technical Assistance Team in Turbat, including David Jones (Chief of Party), David Douglas (Water Engineer), and Ned Herring (Road Engineer); and Mirza Masood Ahmad (Deputy Director, PPMU/Turbat). Their generous hospitality and patience with our numerous questions are greatly appreciated.

The team members would also like to thank the USAID Mission for its hospitality and great ability to deal with the logistics of this evaluation. Robert Traister (Regional Affairs Officer/Quetta and Project Officer for BALAD) very generously gave his time, knowledge and hospitality to the team and accompanied them along the tortuous roads between Karachi and Turbat. Robert Nachtrieb (Chief, PDM), Robert Mathia (Deputy Chief, PDM), Gene George, (Chief, Office of Engineering), Roy Haftorson (Deputy Chief, Office of Engineering) Sahibzada Zahid Noor (Engineering Program Manager, Office of Engineering), Pervez Ghani (Project Engineer, Office of Engineering), and Andra Herriot, (Acting Chief, Office of Human Resource Development) all generously shared their knowledge and perceptions regarding BALAD.

A special thanks goes to our team facilitator, Mohammad Saleem, whose amazing project memory and careful preparation of materials was greatly appreciated. Special thanks also goes to Imtiaz Kazi who also put up with the road trip to Turbat.

Last but not least, we want to thank Arshad Mahmood, Ms. Fariha Hasan and Tariq Nazir for putting this report on the computer.

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I. EXECUTIVE SUMMARY

The Government of Pakistan and USAID have designed and are implementing three area development projects--Tribal Areas Development (TADP) and Northwest Frontier Area Development (NWFADP) in the Northwest Frontier Province (NWFP) and Baluchistan Area Development (BALAD) in the Makran Division of southern Baluchistan. Interestingly--but not supprisingly--the projects have encountered problems and delays in implementation that those who planned the projects could not have anticipated. (NWFADP also includes a crop substitution effort designed to support the elimination of poppy cultivation and is therefore not strictly comparable.)

The scopes of work for the teams for the interim evaluations of both TADP and BALAD have or had an almost identical phrase:

> The project is behind schedule and is encountering [BALAD] experiencing [TADP] delays which the Mission is attempting to resolve.

The BALAD evaluation team examined files in Islamabad, Quetta, Karachi and Turbat and interviewed or discussed aspects of the project with close to 50 USAID officials and GOB divisional and district administrators in Makran Division. All three districts in Makran were visited and both completed and planned project sites were examined. The document/file review and the data from the interviews/discussions combined to form the basis for the conclusions and recommendations which follow.

Conclusions

1. Institution building as planned in the PP was impossible to implement primarily due to the lack of GOB counterparts.

2. The Makran Vocational-Technical training program was well received by officials and the people of Makran.

3. Construction of the major sub-projects (the Kech River bridge and the Bela-Awaran road) has been delayed due to delayed mobilization by the contractors.

4. SDA schemes have generally been well received at a local level but have limited visibility on a Division-wide basis.

5. The TA Team now has a process in place that leads to completed minor road works, road maintenance and water schemes. Although these schemes are clearly welcomed, long-term maintenance will likely pose difficulties.

6. C&W with primary TA Team support and some USAID Office of Engineering assistance is now engaged in road maintenance and rehabilitation.

7. The collection of baseline socio-economic data on Makran has occurred but has no utility for BALAD management.

After a one year delay, things are happening in Makran and most of the management "bugs" have been resolved. As the PP drafters realized, however, BALAD's SDA, minor roads and water schemes are costly and management-intensive.

Recommendations

1. The Vo-Tech program should be continued.

2. USAID/Islamabad should review its tendering process with the objective of securing higher quality bids from better qualified firms on major construction projects.

3. Efforts should be made to continue and expand SDA and water resource activities while the TA team is in place. Once the LBI contract expires, no additional small scale development activities should be undertaken by an outside contracting firm.

4. If a "BALAD II" is undertaken, the main feature should be completion and/or continuation of major infrastructure activities initiated so far, in particular the Bela-Awaran-Turbat road.

High visibility projects are the ones desired both by the administration and the local community in Makran at this moment in time. The SDA served a very useful purpose of at least demonstrating to some

Makranis that USAID could produce at least some of the goods it had promised. This is not to say that small scale schemes should be discontinued--they do provide benefits at the community level and should continue as long as a mechanism is in place for properly designing and monitoring their construction. Given financial constraints, investments in roads or energy (which is not part of BALAD) potentially have greater payoffs and can be seen and used by more people.

II. BACKGROUND

A. Country Context

The Islamic Republic of Pakistan attained independence from Great Britain on August 14, 1947. The new nation included the eastern portion of Bengal, the western portion of Punjab, the Northwest Frontier Province (NWFP) and the tribal agencies contained within it, Sind Province, and the Khanate of Kalat and adjacent areas which now compose Baluchistan Province. (Gwadar on the Makran coast did not accede to Pakistan at that time. In 1958, a settlement was reached between the Government of Pakistan and the Sultanate of Oman which exercised sovereignty over Gwadar formally transferring the area to Pakistan.)

The people of Pakistan are hetrogeneous in terms of language, culture and ethnicity. The major languages are Urdu, Punjabi, Sindi, Pushtu, Siariki, Baluchi and Brahui. Minor languages include those spoken by peoples in the Northern Areas, Bengali (spoken by those who chose not to join Bangladesh in 1971), and Farsi (spoken by the refugees from Afghanistan and Iran). English is spoken by the elite and some members of the middle class.

Culture and traditions vary greatly across the length and breadth of the country. Ethnic/racial differences range from the descendents of African slaves in Makran to the fair-skinned Pukhtuns of the NWFP. Social systems vary as well. In Sind and Punjab, large zamindars and waderas have traditionally dominated, though "canal colony" areas in both provinces sometimes reflect more equitable land distribution patterns. Tribal organization dominates in the NWFP and the tribal agencies. In Baluchistan, the role of the tribal Malik in the northern Pushtu-speaking areas is limited, while the sardari system is still quite strong in the central portions of the province. In Makran, little remains of the old sardari system which once dominated.

United States assistance to Pakistan began in the early 1950s and has continued at varying levels ever since. The Soviet invasion of Afghanistan in December 1979 precipitated a highly visible strengthening of the relationship, including the provision of $1.625 billion in economic assistance over six years (FY1982-FY1987). In addition to programs in agriculture, energy, health and population, the new aid package included a further area of emphasis--assistance to the most underdeveloped (or "lagging") areas of the country, namely the tribal agencies of the NWFP and the province of Baluchistan.

Two projects--Tribal Areas Development (TAD) and Baluchistan Area Development (BALAD)--were designed as part of this "lagging areas" strategy. Both projects were experimental, marking the first time a major donor had attempted to design and implement

development projects aimed exclusively at these regions. U.S. contracting firms also had no prior experience working in the tribal areas of the NWFP or the remote areas of Baluchistan. The amount of outside information available (scholarly and otherwise) was limited. The overall goal in each project was fairly circumscribed from the beginning--to make limited, visible interventions in order to further promote integration of these areas into the economic and social mainstream of Pakistan.

GOP support for initiatives of this kind is clear. The Sixth Five Year Plan (1983-1988) included a special chapter on Baluchistan stating that "efforts would be made to redress past neglect and draw Baluchistan into the mainstream of the national economy." Under a formula used to allocate funding to provinces, Baluchistan and the NWFP each receive 5 percent of the total federal Annual Development Plan (ADP) budget; the remaining 90 percent is divided among all four provinces on the basis of population. In the early 1980s, the GOP also developed Special Development Plans for Baluchistan and the NWFP. These "wish lists" were made available to foreign donors and are regarded as supplemental to the annual ADPs.

USAID involvement in a Baluchistan area development activity was agreed upon as early as 1981. In 1982, several pre-design teams were sent to Baluchistan to undertake field investigations that would provide USAID with basic information regarding the province. In early 1984 the Project Identification Document (PID) was developed and by summer 1984 the Project Paper (PP) was approved. In the course of developing the PP, USAID decided to limit the project's scope of operations from Baluchistan as a whole to the province's least developed area--Makran Division. As the project developed, activities were concentrated on only two of the three districts in Makran (Turbat and Panjgur), excluding the coastal area of Gwadar. These steps were taken as part of an effort to concentrate activities and make the project more manageable.

B. Project History

The initial Baluchistan Area Development (BALAD) Project Agreement was signed on August 30, 1984. A.I.D. life of project funding for the proposed five-year effort was placed at $40 million with an additional imputed value contribution (from GOB) estimated at approximately $5.8 million in rupee equivalents. The PP and the PC-1 indicated three main areas of activity: (1) road construction, upgrading, and maintenance; (2) water sector improvements; and (3) improved planning, management, and human resource development. Subsequently, the life of project was extended by one year to December 31, 1990. A.I.D. funding was also increased in August 1987 to $45 million, primarily to finance additional road design activities.

Policy conditionality was kept to a minimum. Condition Precedents (CPs) in the original grant agreement did support important initial steps such as the formal establishment of a Project Planning and Management Unit (PPMU) in Turbat, appointment of a project director, and provision of a site for the project headquarters. After extensions, all CPs were met within eight months of project signing. Covenants relating to training and road maintenance remain operative. The latter in particular is very much an issue and will have to be adequately addressed as the various road components of the project move forward.

Although some important pre-implementation activities such as the drafting of PIO/Ts were completed prior to the initial obligation, general project mobilization required well over a year. Two expatriate PSC engineers--one short-term, one long-term--arrived in Turbat during the first half of 1985 to begin pre-implementation work related to roads and water. The long-term technical assistance (TA) contract with Louis Berger International, Inc., (LBI) was signed in September 1985. The TA team was fully mobilized by April 1986 with the arrival of the last of the planned core team of four long-term expatriates. Two of the original four team members were later replaced, including the Chief of Party (COP) who left in September 1986. A third team member (the Regional Planner) was not replaced when he departed prematurely in October 1986 and his activities are covered through short-term TDY assistance.

Construction of the project headquarters complex in Turbat began in December 1985 and was completed in April 1987. Temporary quarters were arranged elsewhere in Turbat at the time this construction was underway.

As BALAD matured, three additional activities were added, (1) construction of the Kech River Bridge near Turbat, (2) expansion of a portion of the planned Bela-Awaran road from a planned 55 kilometers to 101 kilometers, (3) design of the Awaran-Turbat road; and (4) implementation of a Makran Vocational-Technical training program which has largely replaced the original training program described in the PP. All three activities have high visibility and have attracted substantial attention in the press and among the people of Makran In addition, the two dams planned in the PP were cancelled on technical grounds (with one of the three meeting local resistance).

Construction contracts for the Kech River Bridge and Bela-Awaran road were signed in August 1987. The planned road maintenance activity is now underway. Under the Special Development Activities (SDA) program, 22 schools in the area have been constructed or expanded. About 23 water-related schemes are finished or nearly complete, along with phase one of the Turbat town road activity. The approximately 50 Makrani students selected for the special vocational-technical program are now finishing their intensive English language program and are being placed in various technical training programs in the United States.

BALAD has also received direct support from three other A.I.D. activities, the Agricultural Commodities and Equipment (ACE) program, the Development Support Training Project (DSTP), and the Project Design and Implementation Fund (PDIF). Approximately $3.0 million in ACE funds has been used to procure essential equipment such as 17 jeeps, three 300 KVA generators, and heavy machinery such as trucks and bulldozers for use by the GOB Communications and Works (C&W) Department on road activities. Some additional ACE procurements (valued at $1.5 million) are planned. DSTP is being used to fund at least half of the cost of overseas vo-tech programs for fifty young Makranis. Finally, close to $340,000 in PDIF funds have helped finance a number of special implementation activities including hydrological studies for three proposed dam sites, the long-term PSC engineers and A&E services for the project headquarters in Turbat.

Other donor activity in Makran Division is fairly limited. Asian Development Bank funding is being used to construct a fish harbor in Pasni and the Japanese are financing construction of a power plant in the same coastal town. The Chinese are building small power plants in Panjgur and Turbat. Finally, some remnants of the UNICEF Baluchistan Integrated Area Development (BIAD) project are evident in Makran in the form of capped tubewells, unused for lack of adequate provisions for operation and maintenance.

III. PROJECT COMPONENTS

A. Engineering and Construction

1. General Description of Engeering and Construction Components

BALAD consists of three principal components directly related to engineering and construction: (1) roads and bridges; (2) water sector improvements; and (3) Special Development Activities (SDA).

The centerpiece of the road component is appropriately the reconstruction of the Bela-Awaran road (101 kilometers) to modern standards, to be followed by the probable reconstruction of the Awaran-Turbat road (255 kilometers). This road serves as the principal link into and out of Makran Division and will considerably reduce the time required to travel to Karachi. The road upgrading and maintenance activity is designed to improve and rehabilitate priority roads to assure improved access into, out of and within Makran. In addition, it will strengthen and improve the road maintenance capability of C&W. Other selected road improvement activities are underway or planned, including one major bridge (over the Kech River at Turbat), improvements of town roads in Turbat, and the provision of culverts.

The various water sector activities aim at providing a balanced selection of karez and surface water improvements in Turbat and Panjgur districts.

The SDA program thus far is aimed at the construction of schools, though health facilities and other improvements that would lead to immediate benefits to the people of Makran are also contemplated.

A variety of contracting modes have been used for all these activities, including A.I.D.-direct contracts, PPMU contracts reimbursed by USAID through a revolving fund, and direct USAID purchase orders. As one member of the TA team commented, the flexibility implied by several possible contracting mechanisms was a positive feature. When one method proved impractical or slow, another could be tried in its place.

The analysis below addresses issues in the evaluation SOW relating to selection criteria, design work, supervision and effectiveness of sub-project activities, impact of the completed facilities on the local population, and progress to date.

2. Bela-Awaran Road

The planned reconstruction of the Bela-Awaran road (and its planned extension from Awaran to Turbat) is widely perceived as one of the main contributions USAID can make to development in Makran. Road construction will actually begin 40 kilometers west of Bela. Plans include 6.6 meter-wide paved double surface treatment with 1.5 meter

graded shoulders. Numerous drainage structures such as small bridges and box and pipe culverts are also included in the design prepared by the A&E firm (STV/LYON/ACE joint venture). Realignment modifications included in the design reduces the total distance from Bela to Awaran from 110 kilometers to 101 kilometers. Implementation of this design activity was carried out effectively and within schedule.

Selection criteria for the Bela-Awaran road needs little further elaboration here. The planned section is the worst bottleneck in the principal link into and out of Makran, winding through hills and mountains and across dry river beds. The present track was not designed to any engineering standards; it simply emerged from centuries-old caravan routes. Traffic is often immoblized for days following rain.

Following approval of the design work, USAID prepared a list of pre-qualified firms to bid on the activity. Eight out of 90 firms applying were interviewed and only two--Saadullah Khan Brothers (SKB) and Nazir & Company--were initially prequalified. At the recommendation of the USAID Contracting Office NASA and Shahzaman were added to the list in order to increase the competitiveness of the selection process.

Bids closed on June 7, 1987. The A&E firm, in evaluating the bids stated that NASA's response was marginal. However, as the lowest bid, the A&E firm recommended NASA should be selected as the USAID direct contractor if they fulfilled and guaranteed three conditions: (1) adequate and sufficient construction equipment; (2) a capable project management team; and (3) sufficient financial backing. At that time, NASA was engaged in an agreement with a foreign firm committed to providing necessary equipment, the project management team, and sufficient financial backing. A contract providing for a 30-month construction period and mobilization by December 14, 1987 was therefore signed in August 1987.

On October 30, 1987, NASA informed USAID that their agreement with a foreign partner had been cancelled but that they were pursuing a similar agreement with another foreign partner. Contingent on approval of this agreement and an explanation of their inability to mobilize on time, USAID would consider extending the final date of mobilization. Other problems with the contract included poor coordination between NASA staff in Islamabad and on the project site, failure to provide laboratory equipment on-site, and poor liaison between NASA staff and USAID.

3. Kech River Bridge

Although bridge construction was not included in the original PP, this activity was added to directly connect the city of Turbat to the Mand-Turbat-Awaran road. It consists mainly of two approach embankments, connected in the center by a reinforced concrete-piled bridge spanning the Kech River.

The A&E contract for the bridge was signed in April 1986 and the IFB for contruction issued in February 1987. Although the bridge component was included in response to local wishes to demonstrate that something concrete was underway to help the people of Turbat, the bridge component clearly already has had a somewhat mixed reception. A number of people commented that water in the Kech river affects traffic as infrequently as two or three days in a year, and that the money for the bridge could better be spent on other road improvement activities.

Mobilization problems have also been encountered with SKB, the contractor selected to construct the bridge under a direct USAID contract. Some equipment (small mixer, dozer without blade, roller, pile-driver, truck, front-end loader, etc.) has arrived on-site, along with a small supply of steel. Contractor offices and support staff quarters have also been constructed. All these represent about 10 percent of the level of effort required for mobilization, though the mobilization period expired on September 30, 1987.

4. Roads Maintenance, Rehabilitation and Improvement

A major component of BALAD involves the upgrading and maintenance of 600 kilometers of category I roads and 900 kilometers of category II roads. The former category includes all roads connecting district and divisional headquarters, roads connecting population and agricultural production centers with Karachi, and any other roads carrying high volumes of traffic. The latter covers other roads, particularly those carrying low volumes of traffic but connecting outlying towns and agricultural production areas with district centers (see road map in Annex N).

Upgrading of category I roads includes widening and cutting as well as minor realignment and construction of low water crossings. Simultaneously, BALAD aims at establishing an effective C&W Road Maintenance group in Makran Division to carry out road maintenance plans developed by the TA team in Turbat and approved and financed by USAID. The plan requires adequate equipment (graders, dozers, trucks, front-end loaders, rippers, etc.) as well as skilled mechanics, equipment operators, and supervisors.

Using improvement of category I roads as a starting point, the following roads in Makran have been assigned highest priority: (1) Turbat-Mand; (2) Turbat-Hoshab, and (3) Turbat-Gwadar.

The Turbat-Mand road is the most used "highway" in Makran with a traffic count (according to the PP) of 250 vehicles per day. The road, frequently overlaid with loose gravel and boulders, has developed into a single or occasionally double track between ridges of loose gravel. The alignment is generally adequate, though some improvements in curves, bunds, and a few nullah approaches would be desirable. The TA team gave this road first priority, proposing a continuous improvement operation

progressing westward from Turbat using a large field force of C&W and TA team personnel supervising the work under a Force Account system. Under this system, the C&W charges USAID for the labor it employs and rent of equipment on a daily basis. Following approval of the workplan by USAID, work started on August 29, 1987. The 125-kilometer length was covered in exactly one month.

The Turbat-Hoshab road was considered in two sections. The first (Turbat-Sami) is currently being built as a raised embankment with single-lane aphalt surfacing by local contractors under C&W direction. It appears to be the longest paved stretch of road in all of Makran. Most of the nullah crossings have not yet been bridged. The second section (Sami-Hoshab) is similar to the Turbat-Mand road. Although the overall deficiencies are not as severe, a number of drainage structures are required and would be included in any design of the planned Awaran-Turbat road. Interim maintenance and improvement, proposed by the TA team along the lines of that undertaken on the Turbat-Mand road, began on October 17, 1987. By November 17, 1987 the field grading team had made good progress and reached kilometer 105.

The Turbat-Gwadar road was given lowest priority among Category I roads because of its low traffic count (estimated at about 90 vehicles per day). Generally, it is also in the best condition. The TA team has suggested rehabilitation of only intermittent sections.

The approved road maintenance work plan for C&W/Makran covering the above road network is provided in Annex I. Supervision and quality of the road maintenance undertaken to date appears quite satisfactory. Road widening to two lanes in particular is helping to facilitate traffic movement. Almost all the traffic consists of trucks, buses, and pick-ups. The local population should benefit through reduced travel times and possibly lowered costs of imported items. Overall, the maintenance activity appears to be off to a good start and should continue. In the opinion of the TA team, the Force Account System is more flexible and workable than the Fixed Amount Reimbursement (FAR) system.

Concurrently with the road maintenance activities, the TA team is designing low water crossings and culverts. Some of the former use wire mesh gabions, which are likely to be easy to construct and maintain. Fourteen low water crossings are now under tender. These road improvements, although not formally part of the road maintenance plan, should make important contributions toward improving the road network in Makran.

Other road improvement activities are also contemplated such as the Talar Gap project, a short but serious transport bottleneck on the Turbat-Gwadar road. This major undertaking, expected to cost Rs. 4.5 million, is in a mountainous area and involves alignment improvements and extensive drainage construction. The proposal has been examined in detail and appears reasonable.

Another small but fairly visible activity--paving of selected Turbat town roads--should be mentioned. This scheme, which involves drainage as well as paving, was developed partly in response to community concerns that not enough project activities were underway. Phase I involved 300-400 meters of roads in the heart of Turbat town and is complete. Phase II involves 555 meters and covers the main "dual carriageway" into Turbat town. A local contractor is carrying out this activity.

Approximately $3 million in heavy equipment and related accessories has been provided to the BALAD project under the ACE program in support of road improvement activities. The possibility of additional equipment is being assessed. Although a specifications list was drawn up in the early stages of the project by a TDY engineer, much of the equipment received thus far is not adaptable to the work required for proper road rehabiliation and maintenance. The result has been a management-intensive exercise involving frequent trouble-shooting which is amply documented in the project literature (see, for example, LBI correspondence on "Report on ACE Equipment Received at Turbat" dated 16 September 1987, "ACE Equipment Parts Support" dated 15 October 1987, and "ACE Equipment Technical Support" dated 27 October 1987).

The problems should be resolved to some extent by additional equipment provided under phase II of the ACE procurement program. Specifications have already been written for several items, including a portable crushing plant, vibratory roller, dump truck, water truck, hydraulic crane, truck/tractor, and loader/backhoe. This listing does not address a significant deficit in workshop and POL facilities at each of the C&W depots in Turbat, Gwadar, and Panjgur (for example, there are no tire service tools, no electricity or water, no lifts and hoists and no fuel storage facilities). Some of these items could also be included in additional procurements. A portable crushing plant costing at least $400,000 (not including front loaders) would appear to be the least of the C&W priority needs in Makran.

Finally, the TA team is carrying out fairly extensive training relating to the ACE-procured dozers. Motor grader operators are receiving on-the-job training in the field. C&W is rotating grader operators into and out of the road maintenance crews at intervals in order to allow all the operators to participate. A two day training exercise in air compressor tools was carried out in early November involving 15 C&W personnel. A similar training exercise is planned for later in November with a larger group of contractors and C&W personnel at one of the check dam sites near Turbat.

5. General Description of Water Resource Development

Briefly, the PP stated that activities related to water development would include underground water utilization and karez improvement; design and construction of dams and diversion structures for retention, storage and use of surface water runoff; and On Farm Water Management.

With regard to water utilization and karez improvement, the following means of improving flow of water from karezes were to be investigated and developed: (1) drilling to connect existing mother wells to deeper aquifers thereby increasing water flow; (2) capping of karezes to reduce maintenance expenses, prolong operational life and free up scarce, specialized labor for additional ground water projects; and (3) construction of small delay-action dams to increase recharge into the karezes. Two medium sized surface water development activities would also be undertaken--the Kil Kaur storage dam and the Goberd diversion dam. On Farm Water Management activities included watercourse improvement from karezes and precision land leveling.

All projects are identified by the District Coordination Committees (DCC). The identification is apparently based on applications from individuals or politicians. The BALAD TA personnel are not directly involved in this process. However, they do occasionally submit projects to the DCCs for approval which have been observed in the field or brought to their attention directly by sarrishtas (karez managers) or water users. The DCCs has generally accepted these schemes.

Projects are then approved at a Divisional Working Committee (DWC) meeting in Turbat which the Commissioner (Makran) chairs. The committee also includes representatives from the line agencies and the Deputy Commissioners of the three districts of Makran. Additionally, the DWC has been requested by the Project Director to identify approximately 50 percent more projects than BALAD anticipates designing and constructing.

After identification by the DWC, the BALAD sociologist visits each site and collects relevant information such as the identity of the sarrishta, project type and location, and physical data about the status of the karez or water source. Requests for activities not contained within the BALAD scope of work, such as the karez cleaning or extension, are eliminated at this point. After this initial screening BALAD engineers accompanied by the sociologist visit those sites, which still appear suitable, to perform an initial assessment as to the viability of the project. The TA team then initiates feasibility and design studies.

6. Karezes

Karez borings are conducted on an exploratory basis since criteria for undertaking them are virtually nonexistent. With respect to mechanical borings (an activitity which involves the mobilization of equipment from outside of Makran), karezes are selected in a limited area (for example, within 30 kms of Turbat) to reduce mobilization costs.

From the list of karez improvement project approved by the DWC, BALAD staff attempts to select those karezes which need improvement most, those whose owners display interest and maintain their karezes, and those which introduce new design concepts into the area. Each scheme is first screened to determine if the requested activity is mostly involved with

normal maintenance such as karez cleaning or extension, or an improvement activity. Priority is given to schemes which will provide supplemental water to the karez.

Priority is also given to schemes which will introduce new ideas to the karez owners who may be able to understand and duplicate them. This includes infiltration galleries and syphons across nullahs whose water flow during high rainfall periods frequently destroy the ditches built to carry karez discharge across such channels. Priority is also given to those karezes which are currently inoperative but which appear to possess a good chance for revival. Since karez rehabilitation includes many wide varieties of activities and each case is examined individually, most karez schemes identified by the DWC are not recommended. Further details on the various types of karez improvement schemes is provided in Annex H.

The BALAD TA team investigated the drilling of small-diameter bore holes by local contractors up to several hundred feet in depth (or as required) near karez mother wells to intercept deeper confined (artesian) aquifers. This aquifer, if encountered, would increase the rate of water supply to the karez. Borings were completed in 25 wells in 10 karezes under USAID direct contracts. Fourteen more borings have been tendered by PPMU and work orders issued on 19 November 1987. To date, there are not sufficient data collected to determine the full effectiveness of this approach to increase water flow to the karezes.

The TA team was also obligated to devise a series of cost effective techniques for minimizing erosion by "capping" of the open wells which serve the karezes. This activity has been dropped due to lack of interest by the karez owners.

The main impact of such activities thus far is that supplemental water is provided to the karez. In some instances, a definite increase has been measured. The same observation also applies to infiltration galleries. Whether this benefit will remain permanent is subject to continuous checking of data (such as water flow levels) to determine increases or decreases in discharge and adequate maintenance of the facility.

The impact of the various karez improvement/rehabilitation schemes is rather varied and very project specific. In some cases, dead karezes are revived which can cause reclamation of dying command areas and crop producing land. In other cases such as nullah crossings or capping, maintenance costs are reduced. Additionally, infiltration galleries do provide supplemental water to the karez, as long as they are properly maintained and repaired.

7. Dams

The most important nullahs in an area are first selected based on the relative size of the catchment area as determined from topographical maps and the empirical evidence of the number of karezes, indciating that a shallow aquifier of suitable permeability for a recharge scheme may exist. This is then verified by permeability and infiltration tests when possible. However, since no drilling rig is directly available to BALAD, a detailed investigation for many sites would cost more than the proposed schemes. Nullah identification must be verified by field investigation since maps of sufficient quality for determining karez characteristics and location are not available.

Nullahs which have been selected recharge from three to fifteen karezes. The specific nullah is then investigated for a suitable site. The physical aspects of each nullah which are taken into consideration are the availability of suitable abutments, subsoil characteristics, the potential reservoir area, distance from the target karezes, cost per storage unit, and accessibility for construction. If possible the dam is located immediately upstream from the beginning of the alluvial fan.

When a site is determined to be feasible the dam is designed as either a gabion weir, an earthfill dam or a combination thereof. The actual types chosen are dependent on the width of the nullah and the size of the potential reservoir. If the nullah is narrow enough so that essentially its entire width is required for a spillway to pass the design storm volume, a gabion weir is designed. These weirs are placed in series on narrow nullahs. If the nullah width is in excess of the minimum width, a combination of earth bund and gabion overflow section is designed. If the nullah is wide, the abutments suitable, and the potential reservoir area large, an earthfill dam with an outlet conduit is designed.

The design is based on the reservoir size and the projected life of the dam. Conservative estimates of Curve Number are used in estimating storm runoff. Estimates of sedimentation from data collected during the ACE study for the Kil Kaur Dam (USAID, 1985) are used to estimate the life of the dam. If the projected life is less than 10 years, the 25-year storm under Type III runoff conditions is used; if the projected life is between 10 and 20 years the 50-year return period is used; if over 20 years the 100-year storm is used. The damsite scheme is then considered from the point of view of detrimental effects on downstream water users. Schemes which are considered to have potential negative impacts on downstream water users are rejected.

The TA team under its scope of work was required to monitor the construction of two or more medium-sized surface water development activities which were to be designed and constructed by established Pakistani or joint venture Pakistan-American firms under separate contracts. To date the feasibility of this activity was investigated and recommendations were made to USAID. Projects included the Kil Kaur Dam

and the Goberd Diversion Weir both of which have been shelved or cancelled due primarily to objections from downstream karez users.

The TA Team designed and provided or will provide construction supervision of local contractors for the following check or delay action dams:

Shappuk Kaur	Completed 27 October 1987
Tusak Miskeen Kaur	Work Started 20 October 1987
Shahwani Kaur	Completed 30 July 1987.

At least eight other dams are in process with PC-1's submitted, work started or under consideration.

To date, it is rather difficult to estimate the full effectiveness of such activities. First, most of the construction of the various components such as check dams, deep tubewell borings, watercourse improvements, etc. has taken place only within the last year. There has not been sufficient time to gather and analyze data to determine the final viability of such structures

7. Other Water Projects and On Farm Water Management

Water source improvements are undertaken in those instances where measurable seepage losses or periodic destruction of the watercourse produce excessive maintenance costs and interruptions of the water supply. This activity has been concentrated in nullah crossings which constitute the major hazard to watercourses in the project areas.

The TA Team extensively investigated, designed and improved watercourses carrying water from the karez outlet to villages and command areas. The introduction of syphons across nullahs was probably the most important since they would guarantee water supply during heavy flooding periods. Originally, this water was carried across nullahs by a ditch contructed at the top of an earthen and granular embankment which could be and was frequently washed out. Another improvement was to line such watercourses with contrete which eliminates seepage losses. Some of these activities are described in Annex H.

The TA team was also required to assist in carrying out an On Farm Watercourse improvement program in Makran Division. However, the TA team request to USAID to fill Irrigation Agronomist positions (expatriate and local) has not been approved. It is now probably too late to initiate this important aspect of watercourse improvement which would encourage effective utilization of more of the karezes' water discharge.

9. Special Development Activities (SDA) Program

The PP did not originally identify in detail the nature of the SDA program now in effect. However, it did state that such activities would be identified during implementation as a function of the planning process. Although the PP referred to the SDA program as following major infrastructure rather than preceeding it, SDAs were among the first activities to be initiated, allowing BALAD management to respond early to complaints that not enough was happening on the ground.

Selection criteria included that the required scheme (1) be consistent with the GOB's Special Development Plan; (2) be acceptable to the local administration in Makran; (3) complement existing or planned infrastructure; (4) be self-sustaining without requiring major changes in local social practices or technical skills; (5) enhance the government's ability to provide services to the area; (6) contribute to strengthening the private sector; (7) be socially and technically sound; and (8) be economically justified.

Project selection was to be through the District Coordination Committees and the Divisional Working Committee. This arrangement is currently in place, though initial selections were influenced by Col. Anwar, the first PPMU Director.

The SDA component that has developed so far consists entirely of the design and construction of additional school classrooms or other school-related work such as latrines and boundary walls. Maternity and health centers appear on the list of planned SDAs, though none so far have been either tendered or built.

All SDA construction activities are undertaken by local contractors. Initially, supervision was facilitated uner the joint direction of Pat Vosse (USAID PSC and Assistant Project Officer and PPMU Chief of Section (Roads). Following Vosse's departure combined with the inability of the PPMU to provide adequate monitoring, construction supervision has been a TA team responsibility under its Head Construction Engineer. Construction work observed in Turbat and other areas appeared acceptable.

SDA construction ordinarily involves expanding existing schools rather than building new ones. In many instances the new rooms replace or supplement existing katcha huts or canopies. At least one classroom is usually occupied immediately upon completion. It appears that the new schools are needed and appreciated. The main problem, especially in remote areas, concerns the retention of teachers assigned to schools. Lack of residential facilities for teachers is a further problem, especially for women. Further comments on SDA school utilization are provided in Annex G.

10. Turbat Headquarters Complex

The design and construction of the BALAD Headquarters Complex in Turbat provided a needed office building, residential quarters for staff, storage and maintenance buildings for equipment and supplies, and power and water facilities for the BALAD project. In fact, the complex is one of the more elaborate and impressive facilities of any type in Turbat and could be put to a variety of uses by the GOB once the project is over.

Design of the buildings and layout of all facilities appeared adequate. Although construction in some areas of the compound is acceptable, work in other areas is only marginally adequate. Total cost for construction is Rs. 24.4 million, with the design prepared by Engineering Consultants and construction carried out by Al-Nasir. The LBI team prepared a long list of faults/problems attributed to poor workmanship and/or materials. Based on this list, the contractor is providing a maintenance team for a period of one year to rectify faults, subject to inspection and approval by LBI. The costs of this work is estimated at approximately Rs. 80,000 which is being withheld from the final contractor's payment. This arrangement appears workable and fair.

B. Institutional Development and Data Collection Activities

Two institutional development activities were planned for the BALAD Project, (1) the development of the Project Planning and Management Unit (PPMU) in Turbat, and (2) the development of a Computer Cell in the GOB Planning and Development (P&D) Department in Quetta. The PP also called for the collection of base-line data to help monitor the impact of BALAD on the population of Makran.

1. PPMU/Turbat

The PP called for the development and institutionalization of a PPMU located in Turbat to design, implement and monitor the development activities of BALAD. The LBI TA team was to provide technical assistance and train GOB personnel assigned to the PPMU. The concept of a divisional based unit of this nature had two roots: (1) the development of similar units in Punjab; and (2) the provincial P&D Department's desire to establish branch offices in all five divisions of Baluchistan.

The PPMU has never been staffed to the level planned. Of the six senior staff positions assigned to it, only two slots have been filled. Consequently, the TA team has had to design, implement and monitor almost all of the projects under BALAD, including the SDAs. The role that PPMU now plays is limited due to lack of professional staff. The Deputy Director of the PPMU provides a cover letter for each activity designed and places tender notices in appropriate places. The TA team designs the projects, works with local contractors in the bidding process and monitors their performance. In summary, the PPMU has not and does not perform the tasks assigned to it in the PP.

There are two reasons for this situation. First, the GOB has not been able to supply the manpower required. It is a well recognized fact that government officials do not want to serve in the Makran and the GOB does not have the inducements to make these positions attractive. Second, the PPMU has had three directors over a span of two years. The current Deputy Director (who serves as Director) enjoys a good relationship with the TA team but does not possess the required support from GOB necessary to make the PPMU the dynamic institution as envisioned in the PP. When the TA Team leaves, the PPMU will not be capable of continuing the technical work necessary. GOB has no plans to upgrade the present rank levels or increase the staff size of the PPMU. At the same time, there is no indication that GOB will terminate the PPMU.

2. P&D/Quetta

P&D/Quetta was assigned an expatriate Regional Planner as part of the BALAD Project. The Regional Planner, provided as part of the TA team effort, was to advise P&D in a number of areas, including how to increase its ability to plan, prioritize and monitor development projects. Although the PP envisaged a two-year assignment, the Regional Planner ultimately spent less than nine months on the project. According to the files, he was asked by the Additional Chief Secretary (ACS)/Development to examine several GOB departments and agencies and suggest ways of improving their operations. In addition, he was responsible for developing training programs and assisting in the establishment of a computer facility to assist P&D in organizing data essential to its planning and monitoring functions.

From the files, it appears that the impact of the Regional Planner has been marginal. Recommendations made in various reports, letters, and memos have had little impact or follow-up. A couple of short training courses in computer use for provincial officials were arranged. A computer cell was established to assist P&D along the lines recommended by the Regional Planner. This latter effort was supplemented by an on-the-job training program provided by a short-term LBI expatriate consultant and is continuing with the assistance of a local (Pakistani) Systems Analyst supplied by the RAO/Quetta. The four IBM PCs purchased have been used to store and retrieve data for the current GOB ADP. Data from previous ADPs are also being stored. The System Analyst is planning a series of computer usage seminars for senior P&D staff.

3. Data Collection and Monitoring

Built into BALAD through the PP was the task of collecting, analyzing and monitoring base-line socio-economic data on Makran Division. This responsibility was originally assigned to the Regional Planner. A PhD agricultural economist originally from Baluchistan was also hired on a PSC basis to design and implement the socio-economic survey in Makran Division. The survey commenced in December 1986 and data collection and storage were completed in July 1987. The data are stored on the PCs in the P&D Department in Quetta and the original

questionnaires (some 3,000) are located at BALAD headquarters in Turbat. The TDY consultant filed his close-out report in August 1987.

A review of the consultant's report indicates that the exercise is still incomplete. There is little analysis of the data and there is still some question as to its accuracy and validity. Several problems were encountered in the data collection, including some suspicions regarding its ultimate purpose. The survey was limited to Gwadar and Turbat districts and excluded Panjgur. In its present form, the survey is not useful to project management or, more broadly, GOB. Decisions that depend on the data cannot be made because of the incomplete nature of the survey report and the area it covered.

Another data collection effort is being carried out by the Water Engineer in Turbat. Although these data have not been analyzed, they are likely to be useful to USAID or other donors who might want to assist Baluchistan in karez improvement, water course improvement, and check and delay dam construction. If continued, this data collection exercise will represent the most significant systematic effort carried out thus far on water resource development in Makran.

Regular project monitoring is carried out primarily through periodic documents such as the Management Information System (MIS) and quarterly progress reports provided by the TA team and the semi-annual Project Implementation Reports (PIRs) and Project Management Information System (PROMIS) documents prepared by the Office of Project Development and Monitoring (PDM), USAID/Islamabad Although these reports do indicate progress made in achieving planned inputs and outputs, they do not provide information on the impact of project activities on the local population.

C. Training and Human Resource Development

Basically, two activities have been attempted under this category. These include (1) the Makran Vocational-Technical Training Program and (2) the training of local staff and contractors. The former is a structured, formal activity and was a shift in emphasis from the original project and has largely replaced the more scattered and complex formal training activities described in the PP. The latter is an unstructured, informal activity which has been a by-product of other BALAD activities.

1. Makran Vo-Tech Training Program

As in the case of the SDA initiative, the Makran Vo-Tech Training Program was attempted to provide some immediate evidence of USAID's intention to assist in the development of Makran. Unlike SDA, the Vo-Tech program had high visibility from the start. There are several individuals (in GOB and USAID) who claim authorship of the idea. Regardless, the idea of sending 50 Makrani students to the United States for vocational training was received favorably by the GOB and the population of Makran.

The program was managed by the Office of Human Resource Development (HRD), USAID/Islamabad. Announcements were published in local newspapers. Over 250 individuals applied. USAID/Islamabad interviewed 97 and 55 were selected for training. The tested English language ability of the applicants was below that required by U.S. institutions, making further language training necessary. After a two-month preliminary English language and orientation program in Islamabad, half the group was sent to Singapore and the other half to Jacksonville, Florida for continued English instruction. Five students dropped out before leaving Pakistan and two others have since returned from overseas, leaving 48 active participants still abroad.

The results of the training program are not yet clear since the students are only now completing their English language training and are only just beginning to be placed in technical training institutions in the United States. In discussions with officials in Quetta, Turbat, Panjgur, and Gwadar (as well as Hub and Karachi) the universal reaction to the program so far is very positive. There is a consensus that upon return from the U.S. most of the students will return to Makran, though the extent of this return is clearly problematic.

The initial selection of the Makrani students was made by USAID/Islamabad rather than GOB. This relieved the provincial as well as local political leaders and administrators from the criticism of favoritism since they could respond by saying that USAID selected the training candidates on merit. Students selected came from all three districts of Makran Division, the largest number coming from Turbat.

Regarding the selection process, the Evaluation Team received only one comment during the interviews conducted. One local official indicated that perhaps the Commissioner of Makran Division should have been involved in the selection process and that the traditionally loyal "notables" should have had some nominees reserved for their sons. (This latter comment is reminiscent of the policy the British pursued in attaining and retaining the loyalty of sardars.)

Although the impact of the Makrani student training program is not yet known, those individuals interviewed by the Evaluation Team indicated that the program should be continued. One respondent indicated that the province-wide program proposed by HRD should set-aside more nominees for Makran than the other four divisions in Baluchistan because of Makran's status as an economically "lagging" area.

Finally, this program is one BALAD activity so far that has the unreserved support of the Chief Minister. When he visited the students during their orientation in Islamabad, he was pleased with the reception he received by the students.

2. Training of Local Staff and Contractors

The training activity conducted by the TA team and short-term TDY consultants has been on an informal basis with local staff and local contractors who bid on SDA activities water and minor road construction projects. (The training of the employees assigned to the P&D computer cell in Quetta and the planned seminars on computer usage for senior P&D officials have already been mentioned. On-the-job training for C&W employees in road maintenance is just beginning and will also not be discussed here.)

Limited on-the-job training has occurred among the more than 100 project staff located in Turbat. Recruitment of local Makrani Baluch has been a problem, especially in the technical and administrative areas. The two senior-most Makranis on the staff (the sociologist and the head construction engineer) have in fact spent most of their lives outside Makran. Even more typically, the secretary trained in word processing skills is from Karachi and will likely return there when the BALAD project is finished. There has been limited training of line department (or nation building department) personnel. C&W personnel have received training to operate ACE equipment. On the other hand, Irrigation and Power (I&P) has distanced itself completely from the water projects designed and implemented by BALAD for reasons unknown to the evaluation team.

According to the TA team, local contractors have substantially improved their ability to bid on BALAD contracts. This process began at ground zero in terms of the ability of local contractors to even complete the necessary forms. In addition, the quality of the work performed by local contractors has improved as a result of the TA team's close monitoring of their work and its explanations where appropriate why some of the completed work is unacceptable to BALAD. Interestingly enough, although the local contractors are Makrani Baluch, many of their workers come from outside Makran--Pukhtuns and Afghan refugees who work on karez projects and Baluch from other parts of Baluchistan.

IV. INSTITUTIONAL ROLES AND WORKING RELATIONSHIPS

For a project that was designed to make important but simple interventions, the organizational relationships have become quite complex (See "BALAD Organizational Charts," Annex C). The complexity resulted from decisions that had to be made as the project unfolded. The PP defined institutional roles but further role definition and clarification resulted from events that occurred after the project commenced operations (see "Project Milestones," Annex B). For example, the delay in Berger's mobilization caused the USAID Regional Affairs Officer (RAO)/Quetta to become more involved in project management. Poor performance by LBI's local partner, Republic Engineering, Republic's termination from the project and the resulting court case against LBI further increased the role of USAID and led to the hiring of Yaqoob Brothers as the local labor contractor. The PDM also saw its work load increase in backstopping BALAD and serving as the technical office in Islamabad for the project.

The lack of staff for the PPMU placed greater burdens on the TA Team and increased the work load of the Office of Engineering, USAID/Islamabad. The desire to achieve more immediate impacts caused the Office of Human Resource Development (HRD), USAID/Islamabad, to develop the Makran Vocational Technical Training Program. Finally, the decision to design and construct the Kech River Bridge and the Bela Awaran Road through AID Direct Contracts further expanded the role of the Office of Engineering, USAID/Islamabad.

The pressure to deliver visible results on the ground was responsible for institutional role changes in almost all cases cited above. The sources of pressure included the GOB and the response of USAID/Islamabad to this pressure. Perhaps understandably, the divisional administration and the people of Makran expected completed USAID projects as early as 1985, given the fact that USAID had sent several TDY teams to Baluchistan starting in September 1982. The fact that LBI had to change their Chief of Party after only one year set the project back by at least one year. The additional fact that the PPMU Director left after one year and PPMU has never been staffed to its planned level further delayed the project, causing USAID to redefine PPMU's role and also redefine the role of the long term LBI TA Team and the roles of the RAO and ENG. The inadequate performance of the Regional Planner and his departure after only 10 months caused USAID to "jerry rig" support for P&D Department/Quetta, GOB. All of the above were unforeseen events.

The role of the Provincial Level Steering Committee, chaired by the Additional Chief Secretary/Development, has been to approve both the annual workplan and the budget for BALAD. This role has not changed radically from what was envisioned in the PP. Line

agencies, however, are not adequately represented because apparently they choose not to attend Committee meetings regularly. The role of the Division Level Working Committee, chaired by the Commissioner/Makran, has also not radically changed. These units continue to meet, identify projects and approve them for implementation once they are designed by the LBI TA Team.

Satisfactory working relationships now exist between and among the principal organizational units in BALAD. For the SDAs, the LBI TA Team provides the PPMU with technical assistance required to initiate and complete these projects. The minor road schemes are handled by the LBI TA Team and local contractors. The same is true for the water projects. The LBI TA Team is also actively involved with C&W on road maintenance activities and grading of the road between Turbat and Hoshab. The Makran Vo-Tech Training Program, managed by HRD out of USAID/Islamabad, is well underway and plans are being made for follow-on programs. In summary, a process has finally been established and effective implementation of projects is now underway. Relationships as they now exist are protrayed in "BALAD Organizational Charts" (See Annex C).

V. SITE ACCESSIBILITY AND LOCAL COOPERATION

Site accessibility was recognized as a problem from the outset. Quetta as well as Karachi are each a two-day road trip from Turbat, much of it over dirt tracks. The entire division of more than 33,000 square miles has less than 60 miles of metalled roads. A sense of isolation, restrictions on movement and temperature extremes makes long-term tours of duty in Makran difficult. The fact that much of the project activity is concentrated around Turbat or Panjgur eases to some extent accessability problems. Nevertheless, even relatively short engineering inspections can be hard on vehicles as well as staff.

Security concerns have also at times affected site accessibility. All project staff must be accompanied by militia levees in the field. In some instances, planned trips have to be postponed or even cancelled due to a specific security problem or the temporary inavailability of guards. Not surprisingly, project work carried out under the shadow of levee guards tends to distance project staff from the local population.

The BALAD Project has also experienced a strike led by four Baluch engineers which disrupted project activities for a week in May 1987.

Local cooperation is also clearly related to overall security concerns. BALAD commenced in 1984 amidst considerable suspicion and cycnism on the part of the more politically active local populace. Three years later, much of that suspicion and cynicism still persists. Construction of major physical infrastructure such as the Bela-Awaran road or Kech River Bridge has yet to begin. Not enough of the smaller construction activities such as schools or water projects have been completed to have an appreciable impact on popular perceptions. Not surprisingly, completion of the projct headquarters in Turbat is not seen as making any real contribution to development in Makran.

The issue of employment of Baluch in project activities has been a constantly recurring theme. One of the first questions asked by Baluch primary students when the evaluation team stopped in one village was, "How many Baluch work for your company?" Efforts have in fact been made to hire locals and some serve on the project staff. Nevertheless, lack of skilled Baluch willing to serve in Makran has been a problem and will constitute a continuing concern throughout the life of the project.

Makran is generally viewed as one of the more politicized regions of Baluchistan. The most vocal part of that politicized population--the Baluchistan Students Organization (BSO)--opposes all BALAD activity. For example, the baseline data collection as well as the training program for Makrani students were both dismissed for their alleged connections with more sinister "intelligence gathering" activities. Outright ignorance combined with rhetoric further distorts popular perceptions about the

project. For example, one recent medical graduate informed the evaluation team that the languishing Mirani Dam project (never actually included as a BALAD activity in any case) could have made far more "important" contributions to the country than Tarbela Dam!

At an operational level, security concerns have on occasion affected implementation directly. Three project vehicles were damaged in two serious rock-throwing incidents in January 1986 and small acts of vandalism have occurred periodically throughout the life of BALAD. All such incidents appear to originate with political groups opposed to the idea of a project at all. The usual response of the actual beneficiaries following such events is to reiterate their support and request that work continue. On a project-by-project basis, according to the LBI TA Team and district administrators, local support is generally good.

Although security concerns and occasional vandalism clearly complicates implementation, they do not appear to reflect the views of most of the Makran population. On the contrary, there is evidence of high popular demand for some project activities. More than 200 students applied for the Makrani vo-technical program. Similarly, more than 400 proposed sub-projects are said to be pending in the District Commissioner's office in Panjgur alone. The impossibility of ever fulfilling this enormous demand may pose problems of a different sort as the project begins to wind down in 1989. The usual view seems to be that assistance of any kind is welcome, but should be more expansive and at a more rapid pace.

VI. CROSS-CUTTING ISSUES

A. Sustainability

The main benefit likely to be sustained after A.I.D. involvement ends is an improved transportation link between Turbat and Karachi via Awaran and Bela. A number of trunk roads are also likely to be improved through better maintenance and selected rehabilitation activities such as the Talar Gap realignment and the construction of assorted small bridges and culverts.

The various water resource schemes are likely to result in some benefits at the local level, though only a small proportion of the total number of karezes in Makran Division will be covered by these schemes. The school construction activities will have some impact, given the limited education base which already exists in Makran, especially with respect to female education. The education--and overseas experience--of the 48 Makrani vo-tech students can be expected to have an impact for many years to come.

Although BALAD was not designed as purely a "bricks and mortar" project, the high visibility projects at the end of the project will almost certainly be roads and the bridge. This is not an indictment of project management but rather a statement on the principal need in Makran at this time. It is also a statement on present availability of human resources in the GOB and the difficulties that the GOB has in posting government officials in Makran. Adequate counterparts have not been available to BALAD from its inception and are unlikely to be provided in necessary numbers by the end of the project. PPMU as an entity, the development of which was one of the institution-building objectives of the project, is unlikely to be sustained once the TA team departs.

B. Impact on Women

The PP correctly stated that "the project will not affect directly the relative position of women in Makran." Even the indirect impact of the project on females has been slight thus far. The baseline data collection exercise does include limited gender-specific information. Although females were eligible for the Makran vo-tech program, none applied. Perhaps the most significant project activity--road construction and rehabilitation--would appear to be largely gender-neutral.

The PP did not provide for potable water development activities. In spite of the fact that water resources projects are designed to provide water primarily for irrigation, a by-product has been water for household purposes and improved watercourses and more efficient water delivery is having a favorable impact in limited ways. Although special provisions for washing have not been included in designs, engineers in the water resources section appear sympathetic to this concern and anticipated including such provisions in the future.

Three of the 22 SDA school buildings completed under BALAD have been for primary school girls. Problems with each one illustrate the kinds of problems facing female education in Makran. One is temporarily closed for lack of a teacher (a teacher is expected to be appointed soon), a second is run on an ad hoc basis by two male teachers from a neighboring high school, and the third is operated by two local women with limited education. Other problems such as lack of boundary walls and enclosed latrines have been sorted out and the additional classrooms should make a useful albeit limited contribution to female education. In some instances, one additional room is likely to be used as quarters for the teacher. However, this should not be viewed as a problem--the fact that there is a resident female teacher at all is in most instances a positive development.

Additional SDA activities related to females such as health centers or more schools are being contemplated which would directly benefit females. If given higher priority, completion of such schemes would allow BALAD to impact favorably on women in more tangible if still limited ways than has been the case during the first half of the project. Given the extremely low female literacy rate in Makran (hardly more than one percent), the construction of additional schools or classrooms for girls would constitute a particularly worthwhile contribution. There are only 24 operational girls primary schools in the entire division (as well as five middle schools and three high schools). Additions to only a dozen primary schools under the SDA program would mean that fully half of all primary schools for girls in Makran Division had been improved!

C. Environmental Impact

Environmental issues have not become a major issue under BALAD. The region is sparsely populated in terms of all types of life--plant, animal and human. Water development activities are making more water available for cultivation and household use. Road activities aim at benefitting the local population by promoting more trade and exchange of commodities between Makran and other major cities within Pakistan. Schools and other facilities underway as part of the SDA program should produce a long-lasting favorable impact on the people of Makran.

D. Lessons Learned

There are several lessons that have been learned (or relearned as the case may be) from BALAD. These include:

1. In remote areas such as Makran it is difficult for the host government to deliver on its commitments to provide adequate counterparts in project planning, design, implementation, or monitoring. Existing institutional weaknesses within the country are even more marked in remoter areas such as Makran.

2. In projects such as BALAD the PP can rarely offer more than broad outlines and general directions about where the proposed project should go and what will be its major outputs. A "rolling" planning process is the only one likely to make sense in the long run.

3. An array of contracting modes and mechanisms can sometimes be helpful. In response to the need to develop some concrete activities quickly, a variety of approaches--USAID purchase order, USAID direct contract, and reimbursement for PPMU activities--were tried. All are now in place, serving to provide a degree of flexibility in implementation that would not be possible if only one contracting mode has been utilized.

4. Based on the proposals received when the BALAD Project RFP was issued, there appears to be few experienced American consulting firms who could or can supply the kind of experienced technicians and managers who are willing to live in such an isolated and confining place as Turbat. Therefore, USAID must be prepared to continue to design, manage and monitor construction projects from a long distance (e.g. Islamabad).

5. Data collection works best when it is driven directly by project requirements. The PP goal of collecting baseline data for the entire Division in a myriad of economic and social areas as a way to judge project impact is unrealistic--even if dramatic change were to occur over several years, it is highly unlikely to be attributable to BALAD alone. A half dozen special "targeted" studies examining specific issues or problems directly relevant to the project would have been more beneficial than the complex and comprehensive survey which ultimately was attempted. The cost and effort expended in a data collection exercise should also be commiserate with its final utility.

6. Socio-economic data of any variety is difficult to collect and the process takes much longer than anticipated, especially in difficult regions such as Makran where project activities in any case are regarded with suspicion.

7. There are few if any local contractors (Pakistani) who are able to move quickly on large construction projects (such as the Kech River bridge and Bela-Awaran road) in remote areas such as Makran. Therefore, USAID must be prepared to pay higher costs to attract firms from outside Pakistan. Of course contracting with a non-local firm is no guarantee of success but at least the contractor base is widened, allowing USAID more choice in the selection process.

8. In a highly visible project such as BALAD there is a clear need to show at least some results quickly. In the PP, the SDA schemes were expected to follow major infrastructure activities

because the designers wanted the PPMU to gain some construction experience with skilled engineers working on the large projects before taking on SDA schemes on their own. In reality, they came first as a quick way to demonstrate that the project was in fact seeking to help local communities. A flexible and quick-response mechanism such as SDA is important in projects such as BALAD and should be viewed as such from the beginning.

9. The simpler the initiative, the better. In addition, it is important that the success of one activity is not contingent on the success of others. In the design stage, there was evidence of some conflict between those advocating a more complex approach (in terms of data collection, more complex farm-based interventions, etc.) and those stressing simple, direct, interventions with more immediate impact. The decision to focus on a single Division (Makran) rather than the entire province was very much on-target. The attempt to limit initiatives to three main areas (roads, water, institution-building and human resource development) was appropriate. Even then, the project became considerably more complex than initially anticipated.

10. The needs of Makran are very basic--roads, electricity, and water. Makran is quite isolated and much of the population is more oriented to Oman and the Middle East than Pakistan. To breakdown the isolation, Makran has to be linked with Karachi and the people of Makran have to be shown that the GOP and GOB are serving them. Therefore, to assist in this effort, USAID should continue to build roads and pursue water projects which have larger impacts than a solitary karez association. When electricity comes to Makran, karezes will be rapidly replaced by tube wells.

With respect to positive and negative impacts, the construction of a fairly elaborate project headquarters in Turbat to house project staff resulted in some negative reaction from the local community as well as government officials. They felt it was only to house "expensive expatriates" and was not necessary, at least until there was some other evidence of project activity benefitting the community at large. (In fact, there have never been more than three expatriate staff at Turbat, while the entire staff--including GOB officials--working out of the complex exceeds 100.) Once the project is completed and the facility is turned over to the GOB (for administrative purposes or possibly even a hospital), this negativism should disappear.

A number of positive effects from BALAD are clearly evident and others should follow as project implementation proceeds. The water projects have mostly been well-received. The school construction and expansion is welcomed and utilized. The road improvements are already having a positive effect in terms of lowered travel times and less wear on vehicles. Potentially, both the Bela-Awaran road and the Kech River bridge (in that order) will provide very positive effects on transportation in Makran.

VII. CONCLUSIONS AND RECOMMENDATIONS

As stated in the Project Paper:

> The purpose of the project is to accelerate the integration of the Makran Division of Baluchistan into the socio-economic mainstream of Pakistan and to improve the quality of life in Makran through improved roads, water and agricultural infrastructure and strengthening Provincial and Divisional planning, management and human resources. ("Pakistan: Baluchistan Area Development [BALAD]," p. 23)

The scope of work for the evaluation team stated:

> The project is behind schedule and is encountering a number of difficulties and delays which the Mission is attempting to resolve. The evaluation team will be expected to assist the Mission identify ways to accelerate implementation of this project. (Scope of Work, p.1.)

It is clear from the BALAD documents and files and from data derived from interviews with the principals involved that difficulties and delays have been a part of BALAD from its inception. It is also clear that the nature and direction of BALAD has changed significantly from what was envisioned in the PP. USAID/Islamabad was under no illusion that working in Makran would be easy. Much of what could have gone wrong did in fact occur and the management of BALAD has had to constantly adjust to events that were unplanned and could not be anticipated.

Before presenting the conclusions and recommendations, it might be useful to briefly review the accomplishments and failures of BALAD to date. The project started on the ground in February 1985 with the arrival in Turbat of the USAID PSC engineer. Lapse time from his arrival until the evaluation team began its work was two years and eight months. During that period, the BALAD project headquarters was completed, 23 water schemes have been completed or are nearing completion, and additional classrooms provided to 22 schools. Road maintenance activities were initiated and the first phase of road improvements in Turbat town was complete. Designs were completed and construction contracts were signed for the Kech River bridge and the Bela-Awaran road, although both contractors have experienced mobization problems. The Makran Vo-Tech Training program has sent 48 Makranis to the United States for training. The GOB P&D Department has established a Computer Cell and has assigned four individuals to work under the supervision of a local Systems Analyst supplied by the RAO/Quetta. Major commodities--including four land cruisers and four pick-ups (directly under BALAD) and 17 jeeps, three large generators, and approximately $3 million in assorted heavy equipment (directly under ACE)--have arrived on-site. Attempts to institutionalize the Project Planning and Management Unit (PPMU) have largely come to an end. Only minimal training other than the Vo-Tech program has taken place.

The impacts of the activities of BALAD are difficult if not impossible to measure at this time. Most water projects have yet to experience a rainy season. The evaluation team was able to secure only limited comments on BALAD activities from the local population either at project sites (few locals were around) or from local notables because of the impending local bodies election. The 48 Makrani students have not returned from training in the U.S. Those parts of the road (Turbat-Hoshab) that have been rehabilitated make passage easier. Although traffic does appear to have increased since the PP was drafted, there is no evidence that this increase has been as a result of USAID-assisted activities. Most of the SDA schools are utilized and room additions to only three female primary schools has meant an improvement of approximately eight percent of the female primary schools in Makran.

Major Conclusions and Recommendations

1. CONCLUSION: The GOB is unable to properly staff the PPMU in Turbat and the lack of GOB counterparts is making institutionalization impossible.

RECOMMENDATION: The "fate" of the PPMU will be decided by GOB; USAID should do little more than wait and see what emerges. Institutionalization of PPMU as originally contemplated in the PP is not possible without GOB counterparts. In the meantime, the process established which has the LBI TA Team playing a lead role in terms of design and implementation, with the PPMU serving as a liason and PC-1 processing office, should continue.

2. CONCLUSION: The Makran Vo-Tech Training program was well received by the general population, local notables, divisional and district administration, provincial administration, and provincial political leadership. Strong demand exists for a continuation of this program.

RECOMMENDATION: The Makran Vo-Tech program should be continued with HRD playing the leadership role. If sufficiently large to have a wider impact, similar training initiatives should be considered for all of Baluchistan.

3. CONCLUSION: After a shaky start, the LBI TA team seems to have overcome most of its management problems and enjoys a good working relationship with the PPMU and district administration. Their experience, however, has been costly in terms of time.

RECOMMENDATION: The current TA team should remain intact as long as possible but the overall LBI contract should not be extended beyond 1989. The principal BALAD activities at that time will be the Kech River bridge (Engineering); and the Bela-Awaran Road, hopefully extended to Turbat (Engineering). Some engineering support will be required from USAID/Islamabad to inspect SDAs, roads and water activities underway when the LBI TA Team departs.

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4. CONCLUSION: The P&D Department's Computer Cell in Quetta is storing ADP data that will be useful in the preparation of future ADPs. Introduction of computers to P&D is a small but nonetheless important step in the computerization of provincial departments in Baluchistan.

RECOMMENDATION: BALAD should continue to support the Computer Cell until the present Systems Analyst, who has a one-year contract, has had the opportunity to strengthen the skills of the existing staff and train the dozen or so senior P&D Department officials in the use of the computer for planning, management and analysis purposes.

5. CONCLUSION: The Socio-Economic Survey has generated data but its usefulness for BALAD management remains in doubt. In its present form of uninterpreted statistical data, it will have no further utility.

RECOMMENDATION: The data from the Socio-Economic Survey should be properly analyzed. This analysis need not be elaborate and may be in large part simply descriptive statistics. USAID--either through its in-country IQC mechanism or under the LBI contract--should first have the results of the 800 questionnaires for Gwadar analyzed and documented on a pilot basis. If the results appear reliable and useful, a similar exercise should be undertaken for the Turbat data (2,200 additional questionnaires). If appropriate, the final reports for both districts could be published by the PPMU as an addition to GOP and GOB information resources available on Makran.

6. CONCLUSION: The SDAs (schools) are well received by the local population but the impact from their use is still to be determined. Much of this activity is welcomed at the local level, but in most cases the impact is not highly visible in the Division as a whole. Nevertheless, SDA schemes can make worthwhile albeit limited contributions at the local level throughout the remaining life of the project. In addition, women's concerns are only being addressed marginally under the project. Given the low starting point of female education in Makran, construction of even a few additional school rooms for girls would have a favorable impact on this largely neglected sector.

RECOMMENDATION: The SDA school schemes still have a role to play in the project and should not be phased out. During the remainder of the project, a conscious effort should be made to construct and rehabilitate female schools. Improvement in a dozen primary schools for girls--in effect resulting in upgrading of 50 percent of the primary school facilities for girls in Makran--is not an unreasonable goal provided teachers (and students) are available. To ensure that these schools are actually used, this effort should be undertaken in cooperation with the Division Educational Officer for Girls.

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7. CONCLUSION: The long-standing concern that nothing is in place on the ground is finally being resolved. A process has been established to select, design and construct water sector sub-projects that should begin to counter claims that nothing has been done to benefit the people of Makran. Construction of the Bela-Awaran-Turbat road still remains the key means for addressing this concern and allowing the project to leave something tangible behind that the whole population can readily see.

RECOMMENDATION: The SDA schemes and water projects underway and planned should continue. Although expensive (when the cost of TA is included), they do have a favorable impact at the community level. In the case of water, the overall effort can be justified if the experience gained by these activities is properly analyzed and documented prior to the departure of the water resources engineer in 1989. This task should be explicitly given to the water resources engineer, possibly supported by short-term TDY assistance.

8. CONCLUSION: USAID Islamabad (ENG, PDM, Contracts, Procurement, and HRD) continue to supply important support and/or direct services to BALAD. The involvement of the Mission in project implementation has turned out to be much greater than that envisaged in the PP.

RECOMMENDATION: USAID/Islamabad (Engineering, PDM, Contracts, Procurement and HRD) should continue to provide the same level of support services to BALAD.

9. CONCLUSION: With respect to the Bela-Awaran road, NASA has demonstrated neither the capability nor strength of purpose to construct this important link to Makran Division in the 30-month time period provided. There are now sufficient grounds for cancelling this contract.

RECOMMENDATION: A "Notice to Cure" (extend the mobilization period) should not be issued. After cancellation of the contract, USAID should immediately advertise the Bela-Awaran project for bidding open to joint ventures of American and Pakistani firms. If construction equipment is to be brought in from the Middle East or similar locations, USAID should send a competent mechanical engineer to inspect and test such equipment prior to shipping.

10. CONCLUSION: With respect to the Kech River bridge, SKB is derelict in not mobilizing sooner. However, the contractor does appear to have the necessary experience, required equipment in Pakistan, and an apparent urge to perform satisfactorily.

RECOMMENDATION: Recent indications regarding SKB's commitment to fulfilling its contractual obligations are somewhat encouraging. If the December 10, 1987 mobilization date is exceeded and contract provisions allow, then and thereafter SKB should be charged daily damages.

11. CONCLUSION: Experience with the Kech River bridge and the Bela-Awaran road construction contracts raise serious doubts about the capabilities of local firms (Pakistani) to mobilize quickly and undertake major construction works (such as roads and bridges) in a remote area like Makran.

RECOMMENDATION: USAID/Islamabad should review its tendering process with the objective of securing higher quality bids from better qualified firms on major road/bridge construction projects in remote areas.

12. CONCLUSION: Road maintenance activities have been going on for approximately three months, making it premature to comment definitively on C&W operations at this time. There are agreements to expand C&W staff commensurate with the increased workload and to some extent this is already taking place. There is apparently little or no increase in C&W's commitment to infrastructure development. For example, there are unfinished major equipment maintenance workshops in Turbat and Panjgur with no tools or other repair equipment. In Turbat, several items of construction equipment are awaiting repair. C&W/Makran also does not have the capability to undertake significant road maintenance or shingling. They have neither front-end loaders nor dump trucks nor rock crushers. Such work is usually performed by contrators. In addition, their rollers are barely operable and are ill-suited for shingling work.

RECOMMENDATION: ACE equipment procured for BALAD should be placed as quickly as possible in running condition by correcting errors in manuals and procuring missing spare parts to completely fulfill the function of each item as it was originally intended. Phase II ACE equipment (that extra amount of equipment needed to satisfactorily complete the maintenance and rehabiliation activities) should be ordered as fast as possible with full detailed specifications added. In addition, USAID should continue to press the GOB on the release of spare parts from Quetta.

13. CONCLUSION: Although some road counts have been undertaken, they are not being made on a systematic basis. Such information could affect priority scheduling of road maintenance activities and may help measure the impact of road construction or improvements.

RECOMMENDATION: Traffic counts at specific locations need to be maintained to ascertain seasonal variations and any possible increases in traffic due to improved road surfaces.

14. CONCLUSION: Selection criteria adopted by the TA team for water activities appear quite acceptable and in accordance with demonstrated need, project viability, and recognized engineering concepts. The long-term effectiveness of such projects is difficult to measure at this time as in most instances there has been no rainfall nor sufficient time to gather and analyze data. If, in the future, electricity is supplied to the Division, many of the current water supply schemes (karezes) would become useless.

OBSERVATION: The increase of water supply to the karezes may be able to be achieved by another tactic generally related to design of roads crossing a large alluvial fan. The general design approach involves damming the large nullahs on the alluvial fan at locations above the roadway embankment, excavating cross channels in both essentially less than perpendicular directions to the major nullah flow and directing these cross channels to produce a more controlled flow network to road culverts. This approach has been used extensively in flash flood areas in the United States, specifically to limit the number of culverts or bridges which would have to be constructed on the alluvial fan. The additional advantage of using this method in Makran is that more time and opportunity would be available for downward percolation of flood water through the alluvial fan material.

15. CONCLUDING COMMENT: Although the evaluation team was not asked to directly address the issue of a possible "BALAD II," the main features of such an intervention should be fairly clear in view of the above recommendations. The most important intervention is still basic infrastructure such as the Bela-Awaran-Tubat road which is central to any follow-on activity. Other possible activities such as water schemes and assorted small-scale construction are extremely management intensive and unlikely to be accompanied by institution-building in the foreseeable future. Further donor activities such as the Mirani Dam or even integrated approaches to rural development are unlikely to be successful unless the basic infrastructure is first in place.

ANNEX A:

EVALUATION SCOPE OF WORK

I. ACTIVITY TO BE EVALUATED:

Project Title: Baluchistan Area Development
Project Number: 391-0479
USAID Funding: $45 million (grant)
LOP Dates: FY 84 - FY 90
PACD: 12/31/90

II. PURPOSE OF THE EVALUATION:

This is an interim evaluation and the first to be undertaken for this project. The project is behind schedule and is encountering a number of difficulties and delays which the Mission is attempting to resolve. The evaluation team was instructed to assist the Mission identify ways to accelerate implementation of this project. The Project Paper called for an evaluation in the third quarter of FY 1986, approximately 12 months after the long-term technical assistance team began their duties. The long term construction staff started arriving from 11/9/85, and the team was fully mobilized by August, 1986. The project has been underway long enough to justify a detailed look at the way in which various institutions are interacting with each other and the extent to which project objectives are being met.

III. BACKGROUND:

The Government of Pakistan (GOP) formulated a Special Development Plan for the Baluchistan Province in August, 1980 to attract foreign donor support to participate in the economic development of the area. The Baluchistan Area Development (BALAD) Project Agreement was signed on August 30, 1984. The purpose of the project is to accelerate the integration of the Makran Division into the socioeconomic mainstream of Pakistan and to improve quality of life in the Makran Division, one of the least developed regions in Pakistan's least developed province. The six-year project focuses on infrastructure activities that directly benefit the people of the region. The project consists of three components: (1) road construction, upgrading, and maintenance; (2) water sector improvements; and (3) improved planning, management, and human resources. In addition, project funds from the Agricultural Commodities and Equipment (approximately $3 million) and Development Support Training (approximately $500,000) activities are being used to promote the overall development objectives of the BALAD Project.

The road construction, upgrading, and maintenance component is designed to improve and rehabilitate priority roads to assure adequate access into, out of, and within Makran Division. In addition, it would strengthen and improve the road maintenance capability of the Communications and Works (C&W Department in that area. The water sector improvements are designed to

provide a balanced selection of karez and surface water development activities. The planning, management, and human resources development component includes: support to the Government of Baluchitstan's Planning and Development Department at Quetta which has development responsibilities throughout Baluchistan; support for a Project Planning and Management Unit (PPMU) designed to improve performance and effectiveness of human resources in Makran; and a Special Development Activity (SDA) Fund.

IV. STATEMENT OF WORK:

A. Objectives: (1) To assess progress to date in implementing the Baluchistan Area Development Project, including progress in achieving objectives and targets as originally conceived in the Project Paper; (2) review and evaluate the project management and process issues with a view toward making recommendations, based on a detailed analysis of problems/constraints, host government institutional capabilities, and socio-political realities, as to possible changes in project strategy, implementation arrangements and approach, specific program activities and/or the overall design of the project. This exercise will require that the team examine the planned targets, outputs and activities, the nature of administrative arrangements, the existing capabilities of the implementing agencies, the performance of the TA contractor, and the planned implementation schedule and procedures, the financial plan, administrative/organizational arrangements, and if required, a change in the overall design of the project.

B. Specifically, the evaluation team shall:

(1) Assess overall implementation progress to date for the civil work sub-activities pertaining to the road, water resources development, and special development activities of the project, (including Bela-Awaran Road and Turbat Headquarters Complex.) (Lead Responsibility-Engineer)

(2) Examine the selection criteria, design work, supervision and effectiveness of all sub-project construction activities as well as the impact of the completed facilities on the local population. (Lead Responsibility-Engineer)

(3) Assess the institutional roles and working relationships among the P&D Department, the line agencies, the steering committee, the PPMU, the long-term contractors, AID, and other entities involved in the project. (Lead Responsibility-Public Administration Specialist)

(4) Evaluate the effectiveness of PPMU in implementing project activities and assess GOP progress in staffing PPMU and other key line agencies in Makran Division. (Lead Responsibility-Public Administration Specialist)

(5) Review of the status of key implementation activities, including success in meeting CPs and covenants, status of commodity procurements, and financial and operational management arrangements. (Lead Responsiblity-AID/W Representative)

(6) Identify and describe actual project outputs to date, contrasting these with outputs as detailed in the Project Paper. (Responsiblity-All Three Team Members)

(7) Review and assess the activities in place aimed at training and human resources development for Makran Division. (Lead Responsibility-Public Administration Specialist)

(8) Review and evaluate the effectiveness of data collecton and monitoring activities in place and planned. (Responsibility-AID/W Representative and Public Administration Specialist)

(9) Evaluate the effectiveness of long-term technical assistance in building and strengthening institutions concerned, in particular developing contracting, management, and monitoring skills at the PPMU, and improving planning and monitoring skills at the P&D Department. (Responsibility-AID/W Representative and Public Administration Specialst)

(10) Examine on site accessibility and local cooperation and their effect on the overall progress of the project. (Responsibility-All Three Team Members)

(11) Evaluate the economic feasibility and social impact on the local population of alternative sub-projects to be undertaken with remaining funds originally allocated for the Kil Kaur Dam. (Responsibility-All Three Team Members)

(12) Examine the problems/constraints which delayed project implementation and make recommendations to accelerate implementation. (Responsiblity-All Three Team Members)

V. CROSS-CUTTING EVALUATION ISSUES:

The following questions should also be briefly addressed by the evaluation team. These questions are general to all AID mid-term and final project evaluations:

1. Sustainability:

(A) Which benefits are likely to be sustained after AID funding ends?

(B) What has been the performance of the Project Planning and Management Unit (PPMU) to date and should it be continued? If not, what alternative modes should be pursued if any?

2. Women and Development:

How has the project had an effect on women?

3. Environmental Impact:

To what degree have environmental questions been an issue?

4. Lessons Learned:

(A) What specific lessons have been learned which can be applied toward the redesigning of the project?

(B) What have been the positive/negative effects of the project.

ANNEX B:

PROJECT MILESTONES

1984

August 1984	Initial Project Agreement signed for $40 million
April 1985	Conditions Precedent (CPs) relating to establishment of Provincial Level Steering Committee in Quetta, Project Planning and Management Unit (PPMU) in Turbat, and Divisional Level Working Committee in Turbat formally accepted under PIL Number Six.

1985

February 1985	Long-term expatriate PSC engineer arrives in Turbat for two years to begin pre-implementation activities
September 1985	Contract signed with long-term TA consultant Louis Berger International, Inc. (LBI)
November 1985	COP for LBI long-term TA team arrives in Turbat
December 1985	Construction started on Project Headquarters complex in Turbat

1986

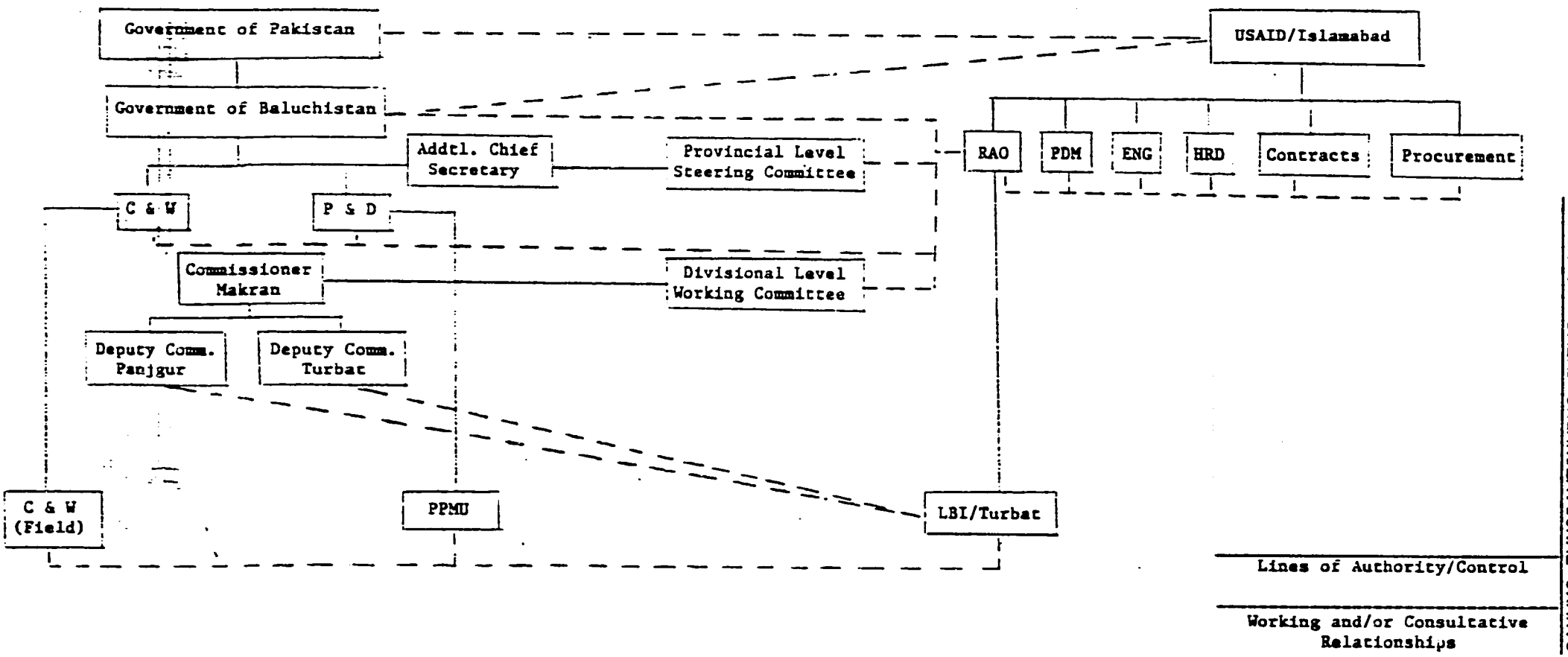
February 1986	Contract signed for design/supervision of 101 kilometer Bela-Awaran road
April 1986	LBI fully mobilized with arrival of last of planned four-person expatriate TA team
April 1986	Work begins in PPMU-sponsored Special Development Activities (SDA) schemes
July 1986	Col. Anwar, first PPMU Director, departs Turbat
September 1986	Original COP for LBI TA team departs post
November 1986	New COP for LBI TA team arrives in Turbat
December 1986	Long-term USAID PSC completes tour of duty at Turbat
December 1986	Baseline socio-economic data collection exercise begins in Gwadar and Turbat districts

1987

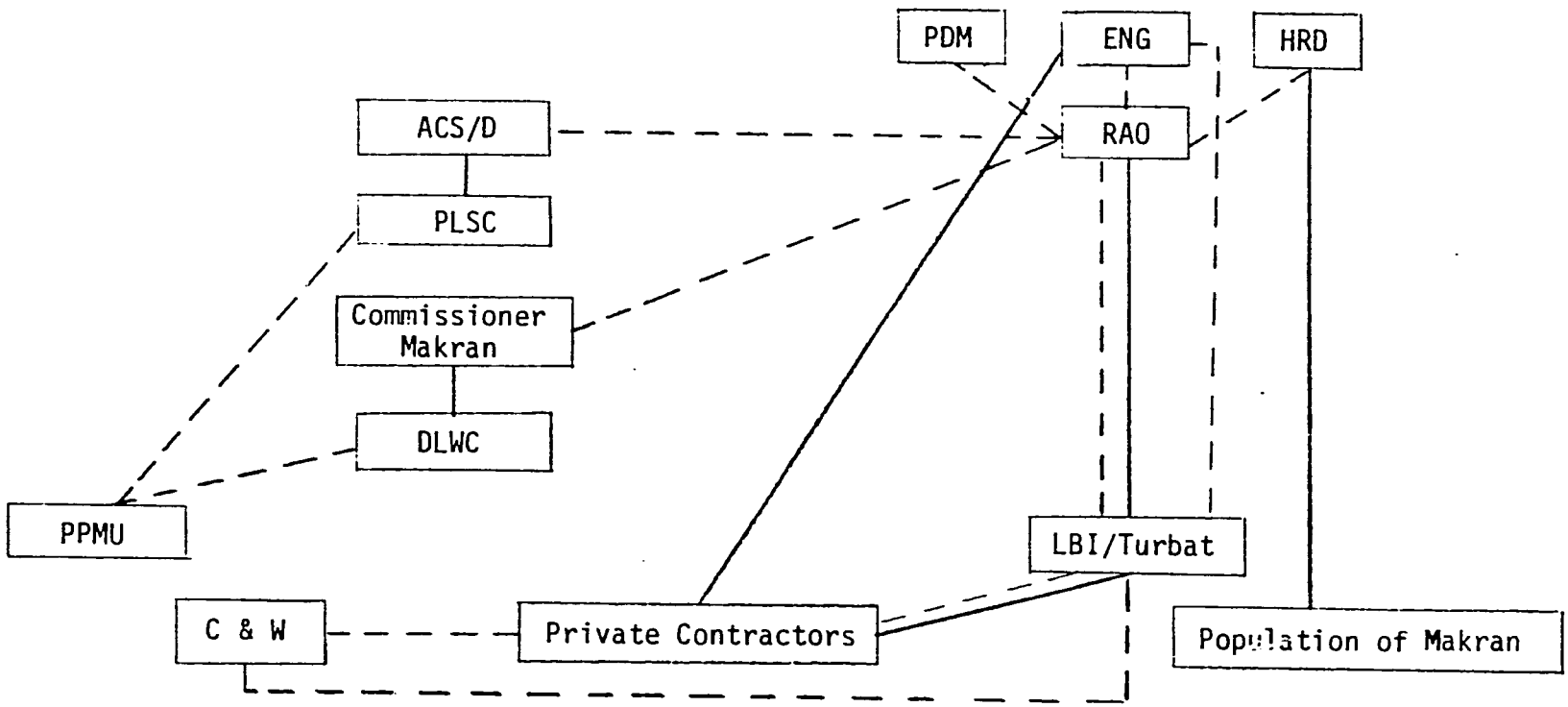
January 1987	LBI sub-contract with local firm Republic terminated
April 1987	Completion of Project Headquarters Complex in Turbat
April 1987	Four micro computers installed at GOB Planning and Development Department in Quetta
April 1987	Approximately 50 Makrani students depart for ESL training in Singapore and Florida under special vocational/technical training program
May 1987	One-week strike led by Baluch junior engineers at BALAD project headquarters in Turbat
July 1987	Agreement for road maintenance activities with C&W reached under PIL Number fourteen.
August 1987	TDY consultant report issued summarizing implementation and main results of the socio-economic survey
August 1987	Contract signed with SKB for construction of Kech River Bridge and NASA for construction of Bela-Awaran Road
September 1987	Road maintenance activity starts with C&W on Turbat-Mand road
September 1987	Project Amendment signed with GOP increasing life of project funding for BALAD to $45 million to fund design of Awaran-Turbat road
December 1987	Initial interim evaluation complete

ANNEX C: BALAD ORGANIZATIONAL CHARTS

BALAD Project Policy Process



BALAD Project Implementation Process



Project Activities

Road Maintenance	(LBI/ENG)
Water Projects	(LBI)
SDAs	(PPMU/LBI)
Minor Roads	(LBI)
Kech Kaur Bridge	(ENG)
Bela-Awaran Road	(ENG)
Vo-Tech Program	(HRD)

——————————— lines of authority/control

- - - - - - - - - - - - - - information/consultative lines

ANNEX D:

ANNOTATED LOGICAL FRAMEWORK

LOG FRAME STATEMENT IN PROJECT PAPER	CURRENT STATUS
I. PROGRAM GOAL: The rapid socio-economic development of the more remote areas of Pakistan.	Too early to make substantive comment here. If "rapid" development occurs in Makran, BALAD alone would not be the only factor.
Measures of Goal Achievement: Increased income and better services for the people of Makran, narrowing differences with more developed areas of Pakistan.	Too early to make substantive comment here. Some activities such as improved road maintenance, expanded school facilities, and improved water efficiency are making limited contributions.
Means of Verification: Socio-economic data on the area, planning and budget documents, field observations	Project-related information is available in planning, monitoring and budget documents. Baseline socio-economic data collected for Turbat and Gwadar districts but not yet properly analyzed.
Important Assumptions: (1) continued GOP commitment to Baluchistan through adequate budget and staff support; (2) local emphasis on development activities continues.	GOP is interested in development in Makran, but manpower and staffing constraints have been a problem throughout the life of the project.
II. PROJECT PURPOSE: To accelerate the integration of Baluchistan into the socio-economic mainstream of Pakistan and to improve the quality of life for the people of Makran through improving roads and water infrastraucture in Makran and strengthening Baluchistan's planning, management and human resources.	Some activities contributing to this purpose have been completed, but most significant project components are only just beginning. Completion of the Bela-Awaran road is likely to have the biggest impact in terms of "integration."
Measures of Project Achievement: Expanded Production and increased farm income together with improved quality of roads and water system.	See above.

Means of Verification: Results of project evaluations, data collected by Planning and Development units.	Initial interim evaluation complete. Relevant data collection by Planning and Development units is not occuring, though some relevant data does appear in regular project reporting documents. Some baseline data collected for Gwadar and Turbat districts but not yet properly analyzed.
Assumptions for Achieving Purpose: (1) development program carried out as agreed; (2) local cooperation in Planning and Development; (3) projects are supported in timely and appropriate fashion; and (4) major implementation bottlenecks are avoided or broken.	Despite some delays and difficulties, basic assumptions remain intact. Much of the planned program is now being carried out, albeit following some delays and/or modifications. GOP/GOB commitment is clearly present at higher levels, but manpower constraints constitute a continuing problem at the project level. Implementation bottlenecks are dealt with as and when they occur.
III. PLANNED OUTPUTS: (1) improved primary road system through new construction, upgrading of existing roads and betterment of maintenance methods; (2) improved availability of water for agricultural production in Makran by supporting a range of water activities from improving the efficiency of existing karezes to medium scale diversion structures and dams; and (3) improved planning and management capability and human resource availability of GOP and Makran through practical experience and training.	Major road construction contract was signed in August 1987 but work has yet to begin. Extensive road maintenance program recently started. Nearly two dozen small-scale water projects are complete or nearing completion and many more are planned or under design. Lack of manpower has stymied development of a Project Planning and Management Unit in Turbat. However, an extensive vocational-technical training program for Makrani students is underway. A computer cell is also being established in the GOB Planning and Development Department in Quetta.
Magnitude of Outputs: See Annex E	See Annex E

Means of Verification: Project and USAID records; project evaluations; field observations.	Initial interim evaluation is complete. Project outputs are effectively tracked in a variety of regular reporting documents such as quarterly reports from the TA team and PIR and PROMIS reports from USAID.
Assumptions for Achieving Outputs: (1) line agencies cooperate in program; (2) Planning and Development units carrying out assigned functions effectively; (3) roads and irrigation systems have impact on production and input; (4) sufficient technically appropriate sites found for irrigation and agricultural programs; (5) area residents are responsive to and participate actively; (6) advisory assistance effective both in substance and institution building.	Many of these assumptions are not being met, at least to the extent anticipated in the Project Paper. C&W is now cooperating on the road maintenance program. Major dam sites anticipated were rejected as not being technically feasible. A computer cell is being established at the Planning and Development Department in Quetta, but the Project Planning and Management Unit in Turbat has never had enough staff to be effective. Though most area residents appear to be responsive, vandalism and security concerns on occasion cause difficulty. Initial TA effort was not very effective, but current team is now making contributions. However, all efforts at institution-building are being hampered for lack of counterparts.
IV. PLANNED INPUTS: (1) technical assistance and other personnel services; (2) commodities; (3) operations (incuding training); (4) construction; (5) GOP staff, facilities, and ongoing programs.	To varying degrees, all of the planned inputs are being provided.

Implementation Target (Type and Quantity):		Actual (9/30/87)	
Personnel:	$7.7 million	Personnel:	$2.2 m earmarked,
Commodities:	1.2 million		$1.7 m expended
Construction:	26.5 million	Training:	.2 m earmarked,
Operations;	0.7 million		.1 m expended
Inflation/Cont.:	3.9 million	Commodities:	.8 m earmarked
GOP inputs:	5.8 million (equivalent)		.6 m expended
		Constrn:	30.0 m earmarked
			3.1 m expended
		Other	1.3 m earmarked
			.2 m expended

Means of Verification: USAID and GOP project records and financial documents; project evaluations.	Initial interim evaluation is complete. Information required is available, primarily in USAID financial documents.
Assumptions for Providing Inputs: (1) Necessary contracts completed in a timely manner; (2) facilities are made available as planned; (3) commodities and services made available through this and other AID projects as planned; (4) qualified expatriate and Pakistani personnel in place when needed; (5) funding approved as proposed and disbursements timely.	Key assumptions met to some extent, though not always as quickly as anticipated in Project Paper. Necessary contracts have been completed, facilities made available, commodities provided, personnel found, and funding approval received. On average, the project is at least one year behind schedule.

ANNEX E:

STATUS OF PLANNED OUTPUTS

PP STATEMENT (BY END OF PROJECT)	CURRENT STATUS
A. Roads	
Improved maintenance of 900 kilometers of roads.	125 kilometers of roads (Turbat-Mand) covered twice. 105 kilometers of Turbat-Hoshab road covered once. Eight cycles of 900 kilometers will be performed during remainder of project.
Rehabilitation of 600 kilometers of roads.	Only limited rehabilitation is planned (Turbat town roads, Talar Gap relignment, etc.). However, maintenance in some instances also involves considerable rehabilitation.
Survey, design, and construction of 55 kilometers of paved road.	101 kilometer Bela-Awaran road surveyed and designed; construction contract signed in August 1987 but firm not yet mobilized. RFP for survey and design of 255 kilometer Awaran-Turbat road now being drafted.
Training of 143 staff in C&W.	No formal training anticipated; limited on-the-job training occurring in the context of road maintenance activities.
Establishment of a rolling multi-year road improvement planning process.	Planning process and documentation for road maintenance activities is complete.
	Survey and design for Kech River bridge complete; construction contract signed in August 1987 but firm not yet mobilized.
B. Water	
Vertical bores drilled in 95 karez wells.	Ten hand bores complete; two others nearly complete.
Improved maintenance (capping) of 95 karez systems.	Karez maintenance activities are not being undertaken under BALAD.

Construction of 35 gabion small delay action dams, 12 small delay action earthfill dams.	Two small delay action dams complete.
	One siphon complete, another nearing completion; two infiltration galleries nearing completion; five karez extensions complete.
Improvements in 144 watercourses, leveling of 4,175 acres under On-Farm Water Management (OFWM) activities.	OFWM activities not formally a part of the project, though in one way or another many of water schemes address OFWM issues.
Construction of Kil Kaur Dam, Goberd Diversion Structure.	Prefeasibility studies of Kil Kaur, Goberd complete, along with a third dam (Niwan Kaur). Kil Kaur and Niwan Kaur rejected as not being technically feasible. Hydrological studies of Goberd are continuing, but scheme may be rejected for lack of local support and technical concerns.
Establishment of a rolling multi-year water resource planning process.	Available hydrological data in Turbat remains limited; multi-year planning process not yet established, though data are being collected and future plans include many small-scale water schemes.
3. <u>Other</u>	
Improved capability for designing and reviewing new development projects as well as monitoring, managing and evaluating them.	Installation of 4 computers in P&D/Quetta resulting in somewhat improved capability. Provincial ADP has been computerized. PPMU established in Turbat but capabilities extremely limited due to manpower constraints.
A prototype divisional P&D Unit evolved from PPMU at Turbat that meets Baluchistan's needs.	Unlikely to occur as a result of this project.

(PP includes a long list of various short-term and long-term training programs, both in-country and abroad)	Vo-tech program for Makrani students largely supercedes training program described in PP. 48 students are in the US being placed in various courses, having completed intensive English language training in Singapore, Florida, and Arizona. Limited informal on-the-job training occuring among project staff in Turbat. Also, capability of local contractors strengthened. Twenty-two SDA schemes complete (mainly school construction/ expansion projects), others planned.

ANNEX F:

STATUS OF KEY IMPLEMENTATION ACTIVITIES

I. Activities Completed or Underway

Name of Activity	Location	District	Date work Awarded	% Work Complete
A. Roads				
Improvement of Turbat Roads/Drainage Phase-I	Turbat Bazar	Turbat	11/02/86	100
Construction of Culvert	41.7 KM Towards Mand (Khairabad)	Turbat	08/09/87	20
Improvement of Turbat Roads/Drainage Phase-II	Turbat Bazar	Turbat	10/19/87	0
C&W Road Maintenance Operation	Makran Roads	Makran Division	N/A	Ongoing
Kech River Bridge	Kech River	Turbat	08/10/87	0
Bela-Awaran Road	Bela-Awaran	Las Bela	08/17/87	0
B. Water				
Siphon on Ugetabad Karez	Kallage	Turbat	10/19/86	100
Siphon on Tump Karez	Kalatuk	Turbat	10/13/87	25
Siphone on Sirikan Karez	Kallage	Turbat	06/09/87	95
Improvement of Khudabad Water Course	Sordo	Panjgur	10/12/87	75
Siphon on Ghousabad/ Noorabad Karez	Washbud	Panjgur	10/12/87	30
Three Siphons on Attabad Karez	Sardul	Panjgur	10/12/87	10
Extension of Kaisak Karez	Kaisak	Turbat	04/09/86	100

Extension of Ugetabad Karez	Miri Kalak	Turbat	04/09/86	100
Extension of Chalo Karez Karez	Challo	Turbat	04/09/86	100
Extension of Miri Karez	Miri	Turbat	04/09/86	100
Extension of Sirikan Karez	Sirikan	Turbat	04/09/86	100
Infiltration Gallery on Churro Karez	Chaitkan	Panjgur	08/04/87	65
Drilling & Rehab of Nokabad Karez	Koshkalat	Turbat	06/17/87	25
Siphon on Zainden Daz Karez	Zainden Daz	Panjgur	10/20/87	30
Infiltration Gallery on Nakam Karez	Sordo	Panjgur	08/04/87	70
Infiltration Gallery On Takhan Karez	Sari Koran	Panjgur	08/04/87	50
Delay Action Dam On Miskeen Kaur (A)	Jusak	Turbat	10/18/87	10
Delay Action Dam on Miskeen Kaur (B)	Jusak	Turbat	10/25/87	0
Delay Action Dam on Miskeen Kaur (C)	Jusak	Turbat	10/28/87	10
Delay Action Dam on Shappuk Kaur	Shappuk	Turbat	06/17/87	100
Delay Action Dam Shahwani Kaur	Jusak	Turbat	04/12/87	100
Hand Boring of Challo Karez	Challo	Turbat	12/09/86	100
Hand Boring of Tump Karez	Shahi Tump	Turbat	12/09/86	100
Hand Boring of Baluchabad Karez	Solband	Turbat	12/09/86	100
Mechanical Drilling of Hitan Karez	Kaisak	Turbat	11/19/87	0

Hand Boring of Sohrani Karez	Sohrani	Turbat	04/07/87	100
Mechanical Drilling of Phullani Karez	Kalatuk	Turbat	11/19/87	0
Hand Boring of Phulabad Karez	Turbat	Turbat	11/17/87	0
Mechanical Drilling of Soragi Karez	Turbat	Turbat	11/19/87	0
Hand Boring of Mirabad Karez	Chaitkan	Panjgur	05/18/87	100
Hand Boring of Nakam Karez	Sordo	Panjgur	0518/87	100
Hand Boring of Abdullahabad Karez	Essai	Panjgur	05/18/87	100
Hand Boring of Nokan Karez	Tasp	Panjgur	05/18/87	100
Hand Boring of Mir Ketchi Karez	Khudabdan	Panjgur	05/18/87	100
Hand Boring of Bullo Karez	Mand	Turbat	10/17/87	15
Hand Boring of Hilakuk Karez	Mand	Turbat	10/17/87	0
Hand Boring of Razai Karez	Turbat	Turbat	04/07/87	100
Hand Boring of Gharibabad Karez	Bullo	Turbat	10/17/87	15
Mechanical Drilling of Maliki Karez	Turbat	Turbat	11/19/87	0
Mechanical Drilling of Koshak Karez	Turbat	Turbat	11/19/87	0
Mechanical Drilling of Tump Karez	Shahi Tump	Turbat	11/19/87	0
Mechanical Drilling of Ghaibon Karez	Turbat	Turbat	11/19/87	0

Mechanical Drilling of Hothabad Karez	Turbat	Turbat	11/19/87	0
Mechanical Drilling of Gowarkop Karez	Turbat	Turbat	11/19/87	0
Mechanical Drilling of Shakarabad Karez	Turbat	Turbat	11/19/87	0
Mechanical Drilling of Gat Karez	Sharak	Turbat	11/19/87	0
Mechanical Drilling of Sikuni Karez	Sharak	Turbat	11/19/87	0
Mechanical Drilling of Mir Mir Karez	Turbat	Turbat	11/19/87	0

C. Special Development Activities (SDA)

Construction of Two Rooms at Girls Primary School	Shahi Tump	Turbat	04/28/86	100
Construction of Two Rooms at Boys Primary School	Solband	Turbat	06/15/86	100
Construction of Three Rooms at Boys Middle School	Tolgai (Dast)	Turbat	11/02/86	100
Construction of Two Rooms at Boys Primary School	Malant	Turbat	06/15/86	100
Construction of Two Rooms at Girls Primary School	Kalatuk	Turbat	04/28/86	100
Construction of Boundary Wall & Toilet in Girls Primary School	Kalatuk	Turbat	10/17/87	75
Construction of Two Rooms in Boys Primary School	Darchko (Balnigore)	Turbat	04/28/86	100
Construction of Two Rooms in Boys Primary School	Sorakbazar	Turbat	04/28/86	100

Construction of Two Rooms in Boys Primary School	Gardank (Buleda)	Turbat	07/24/86	100
Construction of Two Rooms in Boys Primary School	Gohrag Baugh	Turbat	06/15/86	100
Construction of Two Rooms in Boys Primary School	Kumbail	Turbat	06/15/86	100
Construction of Two Rooms in Boys Primary School	Wakai	Turbat	07/24/86	100
Construction of Two Rooms in Boys Primary School	Mirri	Turbat	06/15/86	100
Construction of Two Rooms in Girls Primary School	Sharak	Turbat	06/15/86	100
Construction of Boundary Wall & Toilet in Girls Primary School	Sharak	Turbat	10/17/87	0
Construction of Two Rooms in Boys Primary School	Panchi Kan	Panjgur	06/15/86	100
Construction of Two Rooms in Boys Primary School	Kalari Proom	Panjgur	06/15/86	100
Construction of Primary School	Shah Patan	Panjgur	06/15/86	100
Construction of Three Class Rooms in Boys Primary School	Sari Kalat	Panjgur	11/02/86	100
Construction of Two Rooms in Boys Primary School	Mir Mir (Kalatuk)	Turbat	04/28/86	100
Construction of Two Rooms in Boys Primary School	Bidrang	Turbat	04/28/86	100
Extension of High School	Mand	Turbat	04/24/86	100

Construction of Two Rooms in High School	Nasirabad	Turbat	04/22/86	100
Construction of Two Rooms in High School	Turbat	Turbat	04/22/86	100

II. Selected Planned Activities (PC-1s Approved)

Name of Activity	Location	District	Date PC-1 Approved	Date tender Floated
A. Roads				
Low Water Crossing	43.7 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing on Rodan Kaur Nullah	45 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing on Bozani Kaur	82 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing on Ziarat Kaur	83 KM Towards Mand	Turbat	11/08/87	11/19/87
Causeway on Barat Kaur	86 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing on Shahedani Kaur	88.5 KM Towards Mand	Turbat	11/08/87	11/19/87
Culvert/Causeway on Tolidar Kaur	90.5 KM Towards Mand	Turbat	11/08/87	--
Construction of Causeway on Hotel Kaur	91.8 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing on Hotel Kaur	92 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing on Mokandar Kaur	94 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing on Tastabak Kaur	110 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing on Gharibabad Kaur	51.5 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing on Khorjo Kaur	68.5 KM Towards Mand	Turbat	11/08/87	11/19/87

Low Water Crossing Near Tump	69.5 KM Towards Mand	Turbat	11/08/87	11/19/87
Low Water Crossing ON Mahoi Kaur	81 KM Towards Mand	Turbat	11/08/87	11/19/87
Improvement of Docup Gap	90 KM Towards Mand	Turbat	11/08/87	11/19/87

B. Water

Siphon on Tump Karez	Shahi Tump	Turbat	04/03/86	07/21/87
Delay Action Dam on Pardan Kaur	Washbud	Panjgur	11/08/87	11/03/87
Delay Action Dam on Zankani Kaur	Sirikan	Turbat	07/29/87	--
Mechanical Drilling of Haftari Karez	Absar	Turbat	05/12/87	10/08/87
Deep Drilling of Shaida Karez	Buleda	Turbat	05/12/87	--
Deep Drilling of Muslimabad Karez	Buleda	Turbat	05/12/87	--

C. Special Development Activities (SDA)

Construction of Maternity Home*	Gram Kan	Panjgur	05/15/86	--
Construction of Basic Health Unit*	Zahran	Gwadar	05/15/86	--
Construction of Two Quarters*	Zahran	Gwadar	05/15/86	--
Construction of Two Rooms in Boys Primary School*	Gazi Line Ormara	Gwadar	09/10/86	--
Construction of Two Class Rooms in Boys Primary School*	Zahran	Gwadar	09/10/86	--
Construction of Two Rooms in Girls Primary School*	Sui	Gwadar	09/10/86	--

Three two-classroom primary schools have been constructed for girls at Shahrak, Shahi-Tump and Kalatuk in Turbat district. The buildings of two schools in Shahi Tump and Kalatuk are lying idle due to unavailability of local female teachers and absence of boundary walls, as expressed by the Divisional Education Officer for Women, Mrs. Zakia Durrani. According to Mrs. Durrani, she has already appointed a femaïe teacher for the girls school at Shahi Tump and expects to utilize the classrooms soon. However, the girls school in Shahrak is being used for boys by the male teachers from high schools with the efforts of the village people. There are, however, a considerable number of female students registered in the school.

All SDA schools constructed in Turbat and surrounding areas, including Nasirabad and Solband, have been occupied. There are a good number of students in these schools. It was also observed that in most of the primary schocls (like Mir Mir and Mirri) even two class rooms are insufficient to house a large number of students. Students sometimes take classes under the shade of trees and locally-made facilities.

Additional class rooms have been constructed for high schools at Turbat and Nasirabad. These have been also occupied; there are a huge number of students available in these schools. The rooms built for the extension of Mand High school have not been occupied at present. An interview with the teachers indicates that they intend to utilize the rooms for a library and science laboratory in the near future. They believe they will need more rooms for the school in the future.

Panjgur district has four completed USAID financed SDA schools. Three of them are centrally located. The fourth is located at Proom about 100 kilometers west of Panjgur. Contact was established with the Deputy District Education Officer in absence of District Education Officer of Panjgur district. He expressed his overall satisfaction at the smooth running of the SDA schools in Panjgur area. He said that the class rooms of all these schools are being utilized as there are a significant number of pupils available in these schools.

All three schools visited in the Panjgur area were found to be running well with a large number of students. All rooms of all three schools are under occupation. There were also an adequate number of teaching staff available in all three schools (Panchi-Kahn, Sari Kalat and Shah Patan). One room of each of these schools is engaged for evening classes for adult education, a new program started by the governement to eradicate illiteracy in the country.

The SDA school in Proom of Panjgur district was found closed at the time of my visit. Personal interviews with village elders indicated that there used to be about 50 students available up to fifth class one year ago. The school has been closed since the disappearance of the teacher.

ANNEX G:

REPORT ON UTILIZATION OF SDA ACTIVITIES

The following report, lightly edited from a memorandum prepared by Abdul Rashid Baloch (BALAD sociologist) for David Jones (LBI COP) provides further background on the utilization of SDA school schemes in Turbat and Panjgur districts. The report is dated 27 September 1987. In some instances, the situation has changed since the report was written:

A complete and thorough review of SDA schools financed by USAID and GOB and constructed under the overall supervision of BALAD project has been carried out in connection with enquiring into the matter of utilization of class rooms. These schools are constructed at various areas throughout Makran division, namely Dasht, Nagor, Buleda, Tump, Mand, Turbat and surrounding areas in Turbat district. Another four schools have been completed and handed over to education department in Panjgur district.

Consultations were made with responsible officials of the education department both in Panjgur and Turbat districts. Interviews with the officials of Education Department of Turbat district revealed that the schools constructed and handed over to them are operating to the satisfaction of the department in terms of utilization of classrooms. However, inability to hire an adequate number of teachers for the remoter areas like Dasht and Nagor in Turbat district, and Proom in Panjgur district is causing problems.

My own observations and personal interviews with village notables further corroborates the statements made by the Education Department officials of Panjgur and Turbat districts. It was established that a reasonable number of students are attending the SDA schools in Dasht and Nagor areas up to fifth class. It was seen that there are about 60 pupils per school in an average village of 200 houses in Dasht and Nagor areas. This could be considered an encouraging sign of an inclination toward sending children to school. Both class rooms of the two-room schools constructed at Darchko, Sorak bazar, Gohrag Bagh and Kumbail have been occupied. Most of these schools visited during school time were found occupied by the students.

These schools still lack appropriate staffing and teaching facilities, as acknowledged by officials of the Education Department in Turbat district. But this has always been a problem. All schools in Dasht and Nagor areas are being managed by only one teacher. The teacher and students ratio is frustrating, but the education department is striving to improve the staffing level. The unavailability of staff is mainly due to a reluctance to be posted to these stations, since there is a scarcity of basic necessities for the teachers. This is acknowledged by the village elders who take responsibility for providing board and lodging for the teachers as there is no other alternative source available from the Education Department.

Construction of Two Rooms in Girls Primary School*	Kupper	Gwadar	09/10/86	--
Construction of Boundary Wall for High School*	Turbat	Turbat	09/10/86	--
Drinking W/Supply Scheme Phase 1*	Tahdeem (Zamoran)	Turbat	06/18/86	--
Construction of Boys Primary School*	Sarawan	Panjgur	06/18/86	--

* Indicates USAID and/or PPMU approval for tendering not yet received

Table to show status of SDA school classroom utilization as indicated in Abdul Rashid Baloch report:

	Name of School	Location	No. of Class Rooms	Utilization of Class rooms as advised by Education Officials	Utilization of Class rooms as found when visited
1.	Govt. Primary School, Darchko	Nagor	2	2	2
2.	Govt. Primary School, Sorak Bazar	Nagor	2	2	2
3.	Govt. Primary School, Gohrak Bagh	Nagor	2	2	2
4.	Govt. Primary School, Kumbail	Dasht	2	2	2
5.	Govt. Primary School, Turbat	Turbat	2	2	2
6.	Govt. Primary School, Mirri	Miri,	2	2	2
7.	Govt. Primary School, Kalatuk	Kalatuk	2	Nil	Nil
8.	Govt. Primary School, Mir Mir	Mir Mir	2	2	2
9.	Govt. Primary School, Solbadd	Solband	2	2	2
10.	Govt. High School, Nasir-abad	Nasirabad	2	2	2
11.	Govt. Primary School, Malant	Malant Tump	2	2	2
12.	Govt. High School, Mand	Mand	2	2	2
13.	Govt. G.Primary School, Shahrak	Shahrak	2	2	2
14.	Govt. G.Primary School, Tump	Shahi Tump	2	Nil	Nil

Name of School	Location	No. of Class Rooms	Utilization of Class rooms as advised by Education Officials	Utilization of Class rooms as found when visited
15. Govt. Primary School, Kalat	Panjgur	3	3	3
16. Govt.Primary School, Shah Patan	"	2	2	2
17. Govt. Primary School, Panchi Kahan	"	2	2	2
18. Govt. Primary School, Proom Kalary	Proom Panjgur	2	Nil	Nil
19. Govt. Primary School, Bidrang	Hoshab	2	2	2
20. Govt. Primary School, Gurdank	Buleda	2	Nil*	Nil*
21. Govt. Primary School, Tolegai	Dasht	2	Nil*	Nil*
22. Govt. Primary School, Wakai	Buleda	2	Nil*	Nil*

* Recently handed over to Education Department

ANNEX H:

REPORT ON WATER RESOURCE ACTIVITIES

The following descriptions of various water activities undertaken by BALAD is taken directly from a document written by the LBI water engineer David Douglas and is illustrative of the types of water schemes underway in Makran:

I. SIPHONS AND WATERCOURSES

A. Activity: Uget-Abad Siphon

Location: Kalmer of Uget-Abad Karez in Kalatuk Village, approximately 20 kilometers west of Turbat on Turbat-Mand road.

Description: A siphon using 10 inch diameter PVC pipe was placed across nullah of approximately 105 meters length to replace an earthen embankment which formed the existing channel.

Purpose: The kalmer was reported to be washed out frequently, causing excessive repair costs and interruption of water supply. The seepage losses, although unfortunately not measured, were undoubtedly considerable based on measurements since collected in similar nullahs. Additional command area was also opened up on the north side of the existing command area by realigning the watercourse.

Construction Started: 10/25/86
Construction Completed: 01/30/87 (approximately)

Status: Operational

Cost: Rs.108,686

Special Problems: Design problems involved uncertainty about maximum and minimum flow rates since only one month worth of measurements were available. Contractor took excessive amount of time on this scheme due to non availability of PVC pipe in Karachi. The problem apparently arose due to the fact that sufficient orders are required by the manufacturer before a production run is started. Contractor and PPMU complained that the drawings were too complex and the contractor's inability to interpret the drawings was demonstrated. The contractor was, however, cooperative and the work satisfactory. Insufficient field personnel are available on the BALAD staff for adequete construction supervision.

Results: The scheme is operating successfully and the previous watercourse has been washed out by flooding. New command area appears to have been opened up by the karez owners. The lack of sediment buildup in the silt trap is encouraging for maintenance free siphon operation in the watercourse. The scheme introduced PVC for siphons rather than RCC

channels as are usually constructed in Makran. The project was completed for approximately 70 percent of the PC-1 estimate for a concrete siphon and will function much better. Open trench excavation is done with nearly vertical walls and appears to be more stable than anticipated due to the consolidated nature of the nullah bed material.

Recommendations:

1. Measurements of the seepage losses in watercourses should be collected before future schemes are constructed to establish the benefit cost ratios.
2. Karez flow rate data should be collected on a variety of typical karezes of varying sizes and in various locations to establish maximum and minimum flow rates for watercourse improvement design.
3. PVC pipe should be procured by the BALAD project and stockpiled for distribution to the contractor. This procedure will save both time and money.
4. Since contractor appear to be incapable of interpreting drawings or of planning projects, more experienced and responsible construction inspectors are required for the project.

B. Activity: Siri-Kan Siphon and Watercourse Lining

Location: Kalmer of Siri-Kan Karez in Siri-Kan Village, approximately 10 kilometers west of Turbat on Turbat-Mand road.

Description: A siphon using 10 inch diameter PVC pipe was placed across two nullahs of approximately 46 and 35 meters length to replace the existing channel. Portions of the existing channel were lined but were in a poor state of repair and were leaking. The lined sections of Siri-Kan kalmer were replaced.

Purpose: The kalmer was reported to be washed out frequently causing excessive repair costs and interruption of water supply. The conveyance losses over the project length, due to seepage and channel overtopping, were observed to be over 50 percent when measured on April 5, 1987. The project is designed to reduce the losses and the kalmer maintenance costs.

Construction Started 06/10/87
Construction Completed: 11/0/87

Status: Construction completed

Cost: Rs.220,817 (estimate)
Rs.51,170 for PVC pipe for siphons, supplied by BALAD Project to contractor

Special Problems: Contractor took excessive time on this scheme due to poor planning. He encountered routine problems such as running out of steel and concrete. Surveying pegs were place on downstream watercourse but were removed. The contractor subsequently installed the downstream siphon outlet and watercourse at incorrect levels. It was determined that sufficient freeboard was available in the channel to contain the backwater at maximum flow conditions so the work was not removed. Some leakage in the siphon was encountered around the bend sections. This problem was solved by encasing the leaking portion in concrete.

Results: Water losses are considerably reduced in the Siri-Kan Kalmer. Siphon and watercourse are operating effectively. The siphons and watercourse are designed to operate between flow rates of 0.5 to 1.75 cusecs 9th maximum observed flow rate in Siri-Kan in 1987-1987 was 1.5 cusecs).

Recommendations:
1. Zed joint PVC pipe should be used in future siphon construction to prevent leakage.
2. More qualified construction supervisors are required to supervise the contractors.
3. Watercourse improvement work should be accelerated since enormous savings of water can be realized with minimal expenditure.
4. Channel linings should, in the future, contain a turnout for clothes washing.

II. KAREZ BORINGS

One method of providing supplemental water to the karezes in Makran has been to drill small diameter borings, using hand operated percussion techniques, inside the mother well of karezes. Reports from sarrishtas about the success and productivity of these borings have been ambiquous. Figures quoted in the Project Paper (page 37) reporting on the results of Irrigation Department drilling are unsubstantiated.

Borings using hand percussion drilling techniques have been completed in a variety of locations and the supplemental flow rates has been verified. It appears that mechanical boring will be cost effective. Boring with a mechanical rotary rig is now being contracted. It was estimated in the Project Paper (page 70) that a 15 percent increase in flow could be realized by boring. Increases in karezes bored thus far are, when successful, in this order of magnitude.

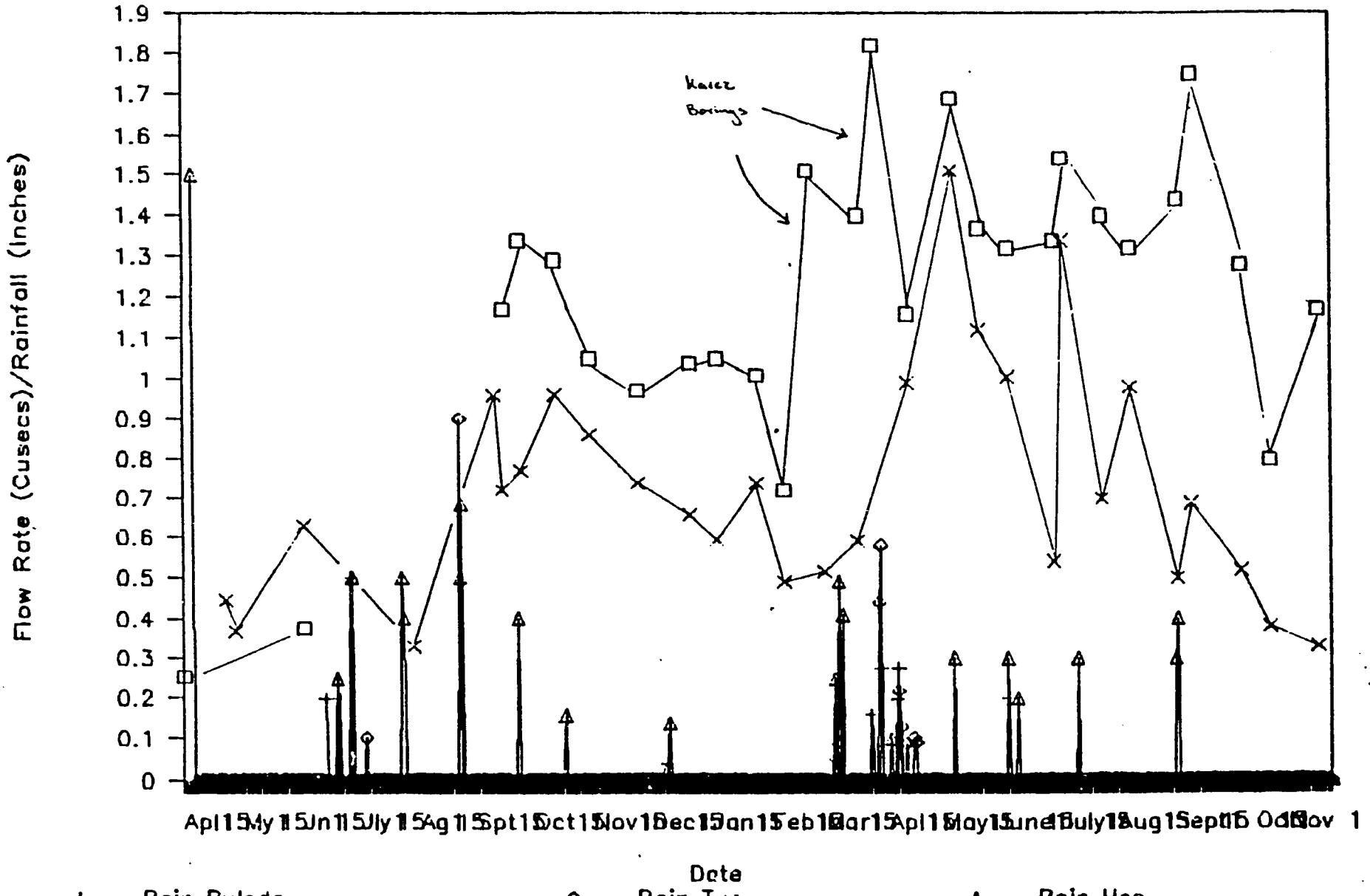
There is no evidence of regional confined aquifers in Makran (WAPDA, 1985). It appears that any confined aquifers are localized in extent. The major source of supplemental water from karez borings appears to be from shallow artesian conditions in the karez underflow. For this reason, it is recommended that all boring be undertaken in the recharge area of karezes rather than in the command areas as previously suggested (Ayub, 1985).

Estimates for the cost of karez boring presented in the Project Paper (page 37), Rs.25,000, are similar to actual costs incurred, approximately Rs.30,000 per well. The cost of mechanical boring will be approximately Rs.53,000 per well. The increase in boring diameter and the installation of well screen and gravel will, it is thought, sufficiently increase the life and productivity of the wells to justify the additional expense.

The response of sarrishtas to the hand borings has been ambiguous. Many sarrishtas have expressed the view that hand borings are not acceptable but that mechanical borings will benefit their karezes. Five sarrishtas have, thus far, not allowed hand boring in their karezes.

Karez Flow Rates Challo–Siri–Kan

Turbat, 1986–1987



A. Project Activity: Hand Boring in Karezes (Turbat)

Location: Challo, Tump, Rizai, Sohrani, and Baluchabad Karezes located in the Turbat vicinity.

Description: Small diameter, approximately 2 inch, borings are advanced to a maximum depth of 150 feet inside the recharge zone, i.e. in or near the mother well, of the karez to provide supplemental water from shallow artesian conditions. Boring is accomplished using hand operated percussion techniques.

Purpose: To provide supplemental flow by gravity to existing karezes. An increase in flow of ten percent is the target.

Construction Started: 12/09/86
Construction Completed: 07/07/87

Status: Operational

Cost: Rs.100,161

Special Problems: Insufficient bids were received when the project was first tendered. Only two bids were received the second time. Karez workers who traditionally do the hand boring are not sophisticated enough to understand bidding procedures. Although the work was excessively slow no particular problems were encountered. Hand boring provides very small diameter hole and it is impossible to drill if hard material is encountered. No meaningful samples can be collected. Collecting flow measurements inside the karez to monitor the results is extremely difficult. Two sites, Shaida and Muslimabad, were abandoned since the sarrishtas did not want the borings, even though the karezes were recommended by the DWC for this work. These karezes were substituted with Sohrani and Razai. The work at Azian was abandoned due to hard rock in the subsurface.

Results: Although difficult to verify, each of the completed borings appeared to be at least marginally productive. Flow increases appeared to range from 5 to 20 percent. At Challo karez very shallow borings, less than 20 feet, produced positive results. Since no regional confined aquifer is known to exist in the Turbat area (WAPDA, 1984) it would appear that the supplemental water is being produced by tapping the underflow beneath the karez rather than a true confined aquifer.

Recommendations:

1. Borings should concentrate on the recharge zone of the karezes since the source of the water does not appear to be a confined aquifer.
2. Borings should be cased with perforated PVC pipe to extend the life of the wells.
3. Since the results of this pilot project indicate that chances for success are a good mechanical rig of some sort should be purchased. An auger rig of the type used in soil exploration programs would be ideal. Larger diameter holes, four or six inch, suitable for the installation of PVC strainer and gravel envelopes should be completed.

4. Karez flow rates should be monitored periodically to determine long term results.

Table: Karez Borings (Turbat)

Karez	Boring	Depth Feed	Completion Date	Casing	Supplemental Flow (Cusecs) Jan	Feb	Mar	Apr	May
Baluchabad	1	159	01/23/87	No	0.15	0.12		0.21	
Chailo	1	47	02/05/87	No		0.53			
	2	13	03/04/87	No				0.13	
	3	16	04/10/87	No				0.42	0.40**
Tump	1	81	03/12/87	Yes*			0.3**		
	2	86	04/12/87						
Sohrani	1	27	04/22/87	Yes				0.37	0.50**
	2	16	04/27/87						
	3	21	04/29/87						
Razai	1	21	04/30/87	Yes					
	2		04/30/87						

* Casing removed and destroyed by vandals
**Measurements taken at karez mouth only.

B. Project Activity: Hand Boring in Karezes (Panjgur)

Location: Mir Ketchi, Nokay, Nakam, Mirabad, and Abdullahbad Karezes located in the Panjgur vicinity.

Description: Small diameter, approximately 2 inch, borings are advanced to a maximum depth of 150 feet inside the recharge zone, i.e., in or near the mother well, of the karez to provide supplemental water from shallow artesian conditions. Boring is accomplished using hand operated percussion techniques. If sufficient water or hard rock are encountered before 150 feet the hole is terminated and additional borings in the same karez are attempted.

Purpose: To provide supplemental flow by gravity to existing karezes. An increase in flow of ten percent is the target.

Construction Started: 05/18/86
Construction Completed: 10/25/87

Status: Operational

Cost: Rs 54,310

Special Problems: Insufficient bids were received when the project was tendered. Karez workers who traditionally do the hand boring are not sophisticated enough to understand bidding procedures. Although the work was excessively slow no particular problems were encountered. Hand boring provides very small diameter hole and it is impossible to drill if hard material is encountered. No meaningful samples can be collected. Collecting flow measurements inside the karez to monitor the results is extremely difficult. One approved karez, Luqmanabad, was abandoned since the sarrishta indicated that he did not want the work in his karez.

Results: At least one of the borings in each karez, with the exception of Abdullahabad and Nakan was successful in providing supplemental water.

Recommendations:
1. Boring should concentrate on the recharge zone of the karezes since the source of the water does not appear to be a confined aquifer.
2. Borings should be cases with perforated PVC pipe to extend the life of the wells.
3. Since the results of this pilot project indicate that chances for success are good a mechanical rig of some sort should be purchased. An auger rig of the type used in soil exploration programs would be ideal. Larger diameter holes, four or six inch, suitable for the installation of PVC strainer and gravel envelopes should be completed.
4. Karez flow rates should be monitored periodically to determine long term results.

Table: Karez Borings (Panjgur)

Karez	Boring	Depth Feet	Casing	Flow Rate Cusecs Upstream	Downstream	Flow Increase Cusecs/Percent
Mir Ketchi	1	45	45			
	2	60	60	1.34		
	3	50	50		1.56	0.22/16.4
Haukay	1	15	no			
	2	35	no	0.48		
	3	70	70		0.56	0.08/16.7
	4	30	no			
Mirabad	1	51	51	0.00		
	2	55	no		0.06	0.06/100
	3	45	no			
Naka	1	56	no			
	2	45	no			
	3	54	no			
Abdullahabad	1	156	no			

III. DELAY ACTION DAMS

Much of the recharge to the karezes is accomplished by infiltration of surface runoff in the permeable sediments of the alluvial fans associated with the nullahs from which karezes originate. In the Kech, Rackhshan, and Nihing valleys significant recharge is also coming from the rivers. Due to the scant vegetative cover and steep topography much of the surface runoff is lost. Small delay action dams have been designed to check this runoff and increase the infiltration opportunity time thereby enhancing the recharge of the shallow aquifers from which the Karezes feed.

As per the Project Paper (page 39), a variety of designs have been considered. Both gabion and earthfill dams as wellas combinations thereof are being constructed. Sites are typically selected above the alluivial fan and upstream from several taroet karezes. The small check dams are also designed to operate as water spreading devices where feasible. All dams are constructed to be permeable.

Many relatively large so called delay action dams have been constructed in Baluchistan. All of the delay action dams constructed by Irrigation Department appear to be storage dams with no outlets. Based on observations of the sedimentation in the reservoirs of these dams, the low permeability in the subsurface, and of the evaporation rate in Makran (over 100 inches per year, WAPDA 1984) these dams, probably function as evaporation ponds. One such dam, costing approximately Rs. 3,000,000, in the village of Sharrak, appears to be responsible for the death of the only karez located downstream from the dam. The BALAD Project has designed a similar earthfill delay action dam, Zankani, which will, by use of an outlet conduit, function as a delay action dam. The flow in the nullah will be controlled to more closely approximate the infiltration capacity of the nullah.

The target karezes located downstream from each of the damsites are being monitored on a bi-weekly basis and the effects of the dams will, thus, be available for analysis. A variety of designs and of the project scales have been provided and monitoring of the downstream karezes will provide data rational planning of construction of delay action dams in the future.

The response of sarrishtas to the construction of delay action dams of any sort has been nearly universally positive. Although there has been vandalism of monitor wells and bench marks established at the sites there has been no stated opposition to check dam construction on nullahs. The construction of dams on the main rivers upstream from karez owners is, however, widely opposed.

Table: Details on Check Dams

Dam	Location	Catchment Sq.Miles	Type	Design Flow Cusecs	Reservoir Acre Feet	Cost Rs	Cost/Acre-Foot Rs
Shappuk	Turbat	8*	Gabion Weir	4000/25Yr	10	300,000	30,000
Zankani	Turbat	14.5	Earthfill	9000/100Yr	320	3,500,000	10,937
Miskeen A	Turbat	3.6	Earthfill/ Gabion	1200/25Yr	14	294,00	21,000
Miskeen B	Turbat	4.2	Earthfill/ Gbion	1700/25Yr	18	430,000	23,889
Miskeen C	Turbat	7.2	Earthfill/ Gabion	3800/25Yr	20	843,000	42,150
Miskeen Total		15			52	1,567,000	30,135
Niwan	Panjgur	19.1	Gabion Weir	7500/25 Yr	20	466,600	23,330
Pardan	Panjgur	25	Earthfill/ Gabion	7600/25Yr	80	874,000	10,925
Shahwani	Turbat	13.5	Gabion Weir	5600/25Yr	17	250,000	14,706

* Estimate, no map available

A. Activity: Shahwani Trial Check Dam

Location: Shahwani nullah, approximately 6 kilometers east of Turbat on the north side of the Turbat-Hoshab road.

Description: A small stone weir with a gabion overflow section was constructed as a trial check dam.

Purpose: The structure was intended as a trial to observe local construction techniques, to investigate using only gabion overflow sections on check dams, and to observe sedimentation during the coming rainy season. The dam was intended as a trial to be constructed before the winter rainy season. The dam would operate to increase recharge into the shallow aquifer in the vicinity of Jusak from which several karezes, currently dead due to the declining water table, driver their water.

Construction Started: 04/27/87
Construction Completed: 07/30/87

Status: Operational

Cost: Rs.204,164

Special Problems: The scheme was planned as a trial structure to collect information about contractors abilities with gabion work as well as to collect some experience of the operation of the proposed check dams during the winter rainy season. The scheme was proposed to cost less than $10,000 so that a purchase order type contract would allow quick contracting and construction. Contracting took much longer than expected and the project missed the rainy season.

Results: The scheme was not begun in time for the winter rainy season and was therefore expanded by the addition of an apron for scour protection to enhance the life of the project. The contractors' operation was well organized and proceeded without significant delay. The gabion work was far better than expected. The contractor was responsive and cooperative.

Recommendations:

1. Gabion construction should use gabions woven at the site. The woven gabions will be superior to the manufactured spot welded gabions available in Karachi.
2. Gabion wire of SWG 10 gauge is sufficient. No 2 bars (1/4 inch dia) are insufficient for gabion perimeter reinforcement. Future gabion work will specify 3/8 and 1/2 inch dia perimeter reinforcement on a trial basis.
3. Gabion work should be encouraged since the contractors are able to perform unexpectedly well at this work.

B. Activity: Nelan Cutoff Wall

Description: A cutoff wall, or subsurface dam, was to be placed across Nelan Kaur and keyed into impermeable shale at a depth of approximately 16 feet. A drain on the upstream side of the wall would feed directly into Nelan karez. Subsurface flow in Nelan Kaur would be collected and stored in the alluivial soil behind the cutoff wall and above the impermeable shale.

Purpose: The purpose of the scheme was to harvest the subsurface flow in the Nelan Kaur and the feed this water directly into the karez as needed. Nelan karez, the sole source of water to the Nelan shareholders, is experiencing declining flow rates.

Construction Started: 04/12/87
Construction Completed: 07/27/87

Status: Project abandoned, a new scheme is under consideration.

Cost: Rs.40,756

Special Problems: Project was abandoned when the excavation revealed that impermeable materials began at a depth of approximately 3 feet below the surface and appeared relatively homogeneous throughout.

Results: The materials encountered in the excavation revealed insufficient porosity and permeability to transmit or store significant volumes of water. The project was abandoned as infeasible.

Recommendations:
1. An alternate scheme to provide supplemental water to Nelan karez should be investigated. The karez is currently being lowered by the shareholders.
2. A more thorough investigation is required prior to implementation of schemes. A budget for small exploration work should be established.
3. An alternate site for a cutoff wall should be located to introduce this concept to the area.

C. Activity: Shappuk Check Dams (3020)

Location: Shappuk nullah, approximately 1.5 kilometers noth of the Turbat Hoshab road on Shappuk Kaur, approximately 40 kilometers east of Turbat on the Turbat.

Description: Two small gabion weirs were constructed on Shappuk Kaur to operate in series as delay action dams and water spreading devices. The weirs are designed, as per the Project Paper, to be raised as they fill with sediment. Downstream aprons have been designed to protect against scour. Spillway design is based on 25 year 24 hour storm under AMC III conditions. A third weir may be added downstream under a separate contract.

Purpose: The scheme is designed to increase the infiltration to the shallow acquifer from which the three downstream karezes in Shappuk feed.

Construction Started: 06/17/87
Construction Completed: 10/25/87

Status: Operational

Cost: Rs 316,675

Special Problems: The contractor did not provide for the specified perimeter reinforcement in his bid due to his inability to understand the specifications. His claim to recover this additional cost was analyzed and accepted. Upstream dam has a smaller reservoir area than anticipated due to survey error. The upstream dam should be raised by one gabion course to increase the reservoir area. The monitor wells installed during the dam site exploration program were destroyed by vandals.

Results: Contractor did an excellent and well organized job. Monitoring of the downstream karezes is continuing on a bi-weekly basis but no rains have yet occurred.

Recommendations:
1. Gabion wire of SWG gauge is sufficient. No. 3 bars should be used for perimeter reinforcement.
2. Contractor is not providing gabion partitions. The construction is acceptable and future plans should reflect this construction.
3. Gabions placed entirely beneath the ground surface do not require perimeter reinforcement. Future plans should reflect this construction.
4. If a third downstream weir is added the upstream weir should be raised by one course as a part of the same contract.

IV. KAREZ IMPROVEMENT/REHABILITATION

The karezes in Turbat are generally in poor state of repair. Many of the karezes are dead from lack of maintenance or from declining water tables. As stated in the Project Paper (page 70), the typical karez requires on the order of Rs. 55,000 for annual cleaning costs. It was proposed that by capping the karzes the cleaning costs could be reduced. Newly constructed karezes, particularly prevalent in the Tump and Buleda areas, have very well constructed karez wells. The spoil berms around these wells are well developed with appropriate drainage and the well concrete capping would be a significant improvement on this construction.

In Turbat little interest has been shown in karez capping. This is probably due to the fact that of the problems facing the Turbat karez owners maintenance is a relatively minor item. The central problem is the declining water table. Turbat farmers are unanimous in their recollection that the Kech was perennial within the lifetime of the present generation. Ten year moving means and the deviation from the mean of the rainfall record also indicate that the last two decades have been particularly dry and that most of the Turbat karezes were constructed in wetter times. The continual deepening and lengthening of the karezes also shows the struggle to chase the declining water table.

In response to the overwhelming requests from karez owners for karez extension rather than for capping the BALAD Project has expanded this category of activity to include any sort of karez improvement, giving preference to those improvements which will provide supplemental water to the karez. Karez improvements undertaken by the BALAD project include the construction of infiltration galleries to provide supplemental water from nullahs to karezes, construction of pipelines over sections of karezes crossing nullahs where perennial maintenance problems occur, and karez capping in selected areas.

A. Activity: Karez Extensions

Location: Challo, Uget-abad, Miri, Siri-Kan, and Kaisak karezes, all in Turbat district.

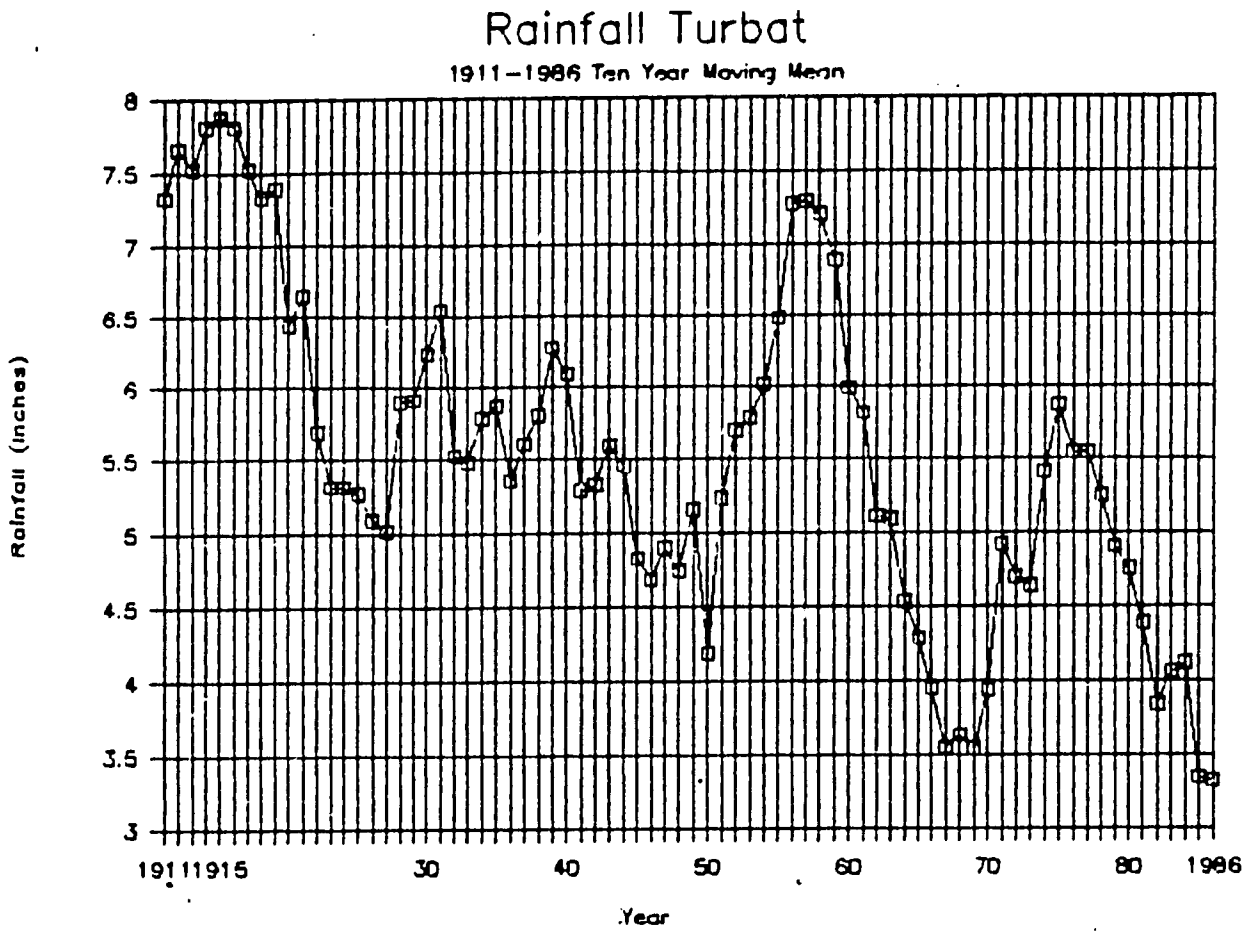
Description: The karezes were extended upstream by the addition of one well and the connection of this well by karez tunnel. Traditional labor techniques were used.

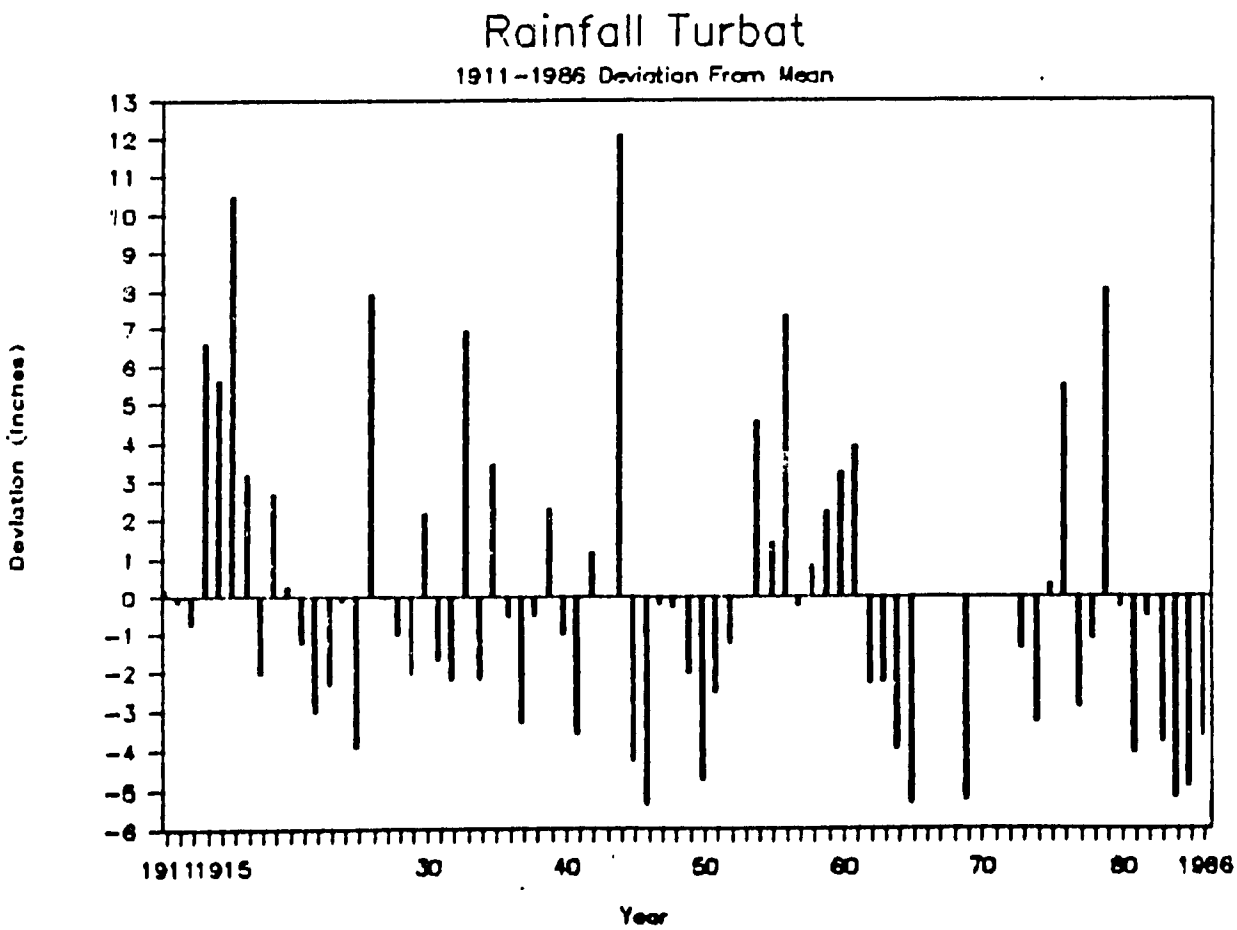
Purpose: Karez extension is the most ubiquitous technique of providing additional irrigation water in Makran. One main purpose of the scheme was to observe the effects of karez extension and to collect data on the current practices of karez enhancement.

Construction Started: 04/15/86
Construction Completed: 07/15/86

Status: Operational

Cost: Rs. 150,000 (Rs 30,000 for each extension)


Rainfall Turbat
1911-1986 Ten Year Moving Mean
Rainfall (inches)
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
19111915
30
40
50
60
70
80
1986
Year


Rainfall Turbat
1911-1986 Deviation From Mean
Deviation (inches)
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
19111915
30
40
50
60
70
80
1986
Year

Special Problems: Measuring of flow rates at the karez mouths proved difficult. V notch weirs were installed at each karez and assurances were given by the concerned sarrishtas that the weirs would be protected and that assistance would be given for collection of measurements. No assistance was forthcoming and most of the weirs were removed. Lump sum payments were made for excavation work although there was considerable variation in the actual work.

Results: Significant increases in the flow rates at each of the karezes were realized. Some measurements were collected and indications of increases ranging from 5 to 20 percent were recorded. It was observed that karez flow rates change drastically and rapidly in response to climatic conditions.

Recommendations:
1. Collection of long term flow rates is essential since it is obvious from the data collected that karez flows change rapidly and drastically seasonally. Maximum and minimum flow rates must be known for design of watercourse improvements. Portable current velocity meters should be procured for this purpose.
2. Any future karez excavation work should be paid on a unit cost rather than a lump sum basis.
3. Karez extension and deepening are the most frequently requested projects from the karez owners. Karez extension and deepening is usually done to maintain existing flow rates rather than to increase water supply and thus are maintenance rather than improvement activities, and are not recommended for financing by the BALAD Project.

B. Activity: Churro Infiltration Gallery

Location: Churro Karez, Chitkan, Panjgur

Description: Churro karez originates as a kaurjo in the Rakhshan River and passes into a karez. Churro was completely dry in August 1987. The project involved extending the open channel of the kaurjo upstream by approximately 400 meters and then placing 100 meters of strainer pipe as an infiltration gallery upgradient beneath the Rakhshan.

Purpose: The purpose of the scheme was to revive this ephemeral karez and to provide perennial flow from the subsurface flow in the Rakhshan. A further purpose is to introduce the idea of karez extension by infiltration gallery, an idea with potential for widespread applications on mullahs throughout Makran. The karez is now operating and providing approximately 1 cusec of irrigation water to the karez owners.

Construction Started: 08/04/87
Construction Completed: 11/00/86

Status: Operational, infiltration gallery still under construction.

Cost: Rs 289,961 (estimate)

Special Problems: Churro was retendered once due to high rates quoted by contractors in initial tenders, all premiums were over 40 percent. Tendering was difficult even the second time dur to confusion among the contractors in how to fill out their bids. Contractors were also reluctant to bid as the USAID terms of payment were different to the normal GOB procedures. These problems were solved by a series of meetings with the contractors. No particular problems in design or construction have been encountered.

Results: The karez was immediately revived. The flow rate recorded in October 1987 averaged over 0.5 cusecs. Since this is the driest portion of the year it is probable that the flow rate will increase considerably during the winter rainly season. The flow rate is being monitored bi-weekly to determine the benefits of the scheme.

Recommendations:
1. A detailed investigation of the use of the water at Churro karez should be undertaken. Since this karez was dead and the command area is dying Churro is an ideal situation to observe the results of increased water supply.
2. Flow rates at Churro should be monitored throughout the year to assess the performance of the infiltration gallery.

C. Activity: Nakam Pipeline and Infiltration Gallery (3056)

Location: Nakam Karez, Sordo, Panjgur

Description: Nakam karez originates in Parwan Kaur and hs been completely dead for a number of years. The karez is dead due to the collapse of the shallow tunnel which flows beneath Parwan Kaur and is exposed to saturation when the nullah floods. The project provides a pipeline across the Parwan Kaur, constructed of PVC pipe laid in an open trench, so that the karez will operate without the requirement of maintaining the tunnel across the nullah. The project will also provide an extension of the karez by a 300 meter infiltration gallery upstream along Parwan Kaur. The infiltration gallery consists of 300 mm strainer pipe (0.032 inch slot size) laid beneath the water table and backfilled with a gravel filter envelop.

Purpose: The purpose of the scheme was to revive this dead karez, to solve the maintenance problem where the karez crosses the nullah, and to provide perennial flow from the subsurface flow in the Parwan Kaur. A further purpose is to introduce the idea of karez extension by infiltration gallery, an idea with potential for widespread applications on nullahs throughout Makran.

Construction Started: 08/04/87
Construction Completed: 1//00/86

Status: Under Construction

Cost: Rs 157,152 (estimate)

Special Problems: Nakam was retendered once due to high rates quoted by contractors in initial tenders, all premiums were over 40 percent. Tendering was difficult even the second time due to confusion among the contractors in how to fill out their bids. Contractors were also reluctant to bid as the USAID terms of payment were different to the normal GOB procedures. These problems were solved by a series of meetings with the contractors.

Shareholders from Faqirabad karez, which originates approximately 700 meters upstream from Nakam on the same nullah, have strongly opposed the project after construction was started. They are concerned that Nakam will take water from Faqirabad karez. The water levels were surveyed. It was found, as expected, that the portion of Faqirabad near to Nakam is only a channel conveying water and is approximately 1 meter above the water table, thus not a recharge section of the karez. Although we are convinced that there will be no impact, and although the upstream and of the infiltration gallery is more than 1500 feet, as stipulated by the GOB for the minimum distance between mother wells, from the mother well of Faqirabad, the Faqirabad shareholders are not satisfied. As the command areas of these two karezes are adjacent it appears to be a longstanding dispute which originated when Nakam was converted from a kaurjo to a karez several years ago. The shareholders of Faqirabad have received no support from the local authorities. The BALAD project is currently proposing a similar infiltration gallery for Faqirabad and considering a check dam which would benefit both parties.

The contractor has demonstrated his ability to understand the work and the drawings and has organized the job very well.

Results: Nakam was tendered with separate bids for constructing the pipeline with an RCC conduit, the usual Makran practice, and with PVC pipe. Since the PVC construction, as expected, was less expensive and certainly easier, the pipeline was constructed with PVC supplied by the BALAD project. The infiltration gallery is still under construction and will be monitored upon completion.

Recommendations:
1. PVC should be used for all karez or watercourse pipelines as it is less expensive and easier construction.
2. The command area of Nakam karez should be monitored to determine the impact and response to reviving the karez.

D. <u>Activity</u>: Takhan Infiltration Gallery

Location: Takhan Karez, Sari Koran, Panjgur

Description: Takhan karez runs parallel to the Rakhshan River and was dying until recently extended. A karez extension, using PVC strainer pipe with a filter envelope as an infiltration gallery, is placed beneath the Rakhshan River to collect ground water flowing beneath the emphemeral river and feed it directly into Takhan karez. The infiltration gallery is being constructed at the closest point between the karez and the Rakhshan. According to the sarrishta, the karez had been extended beneath the Rakhshan in the past but the tunnel could not be maintained.

Purpose: The purpose of the scheme is to provide supplemental water to Takhan karez by the addition of a maintenance free infiltration gallery. A further purpose is to introduce the idea of karez extension by infiltration gallery, an idea with potential for widespread applications on nullahs throughout Makran.

Construction started: 0/8/87
Construction Completed: underway

Status: Under Construction

Cost: Rs. 313,595 (estimate)

Special Problems: Takhan was retendered once due to high rates quoted by contractors in initial tenders, all premiums were over 40 percent. Tendering was difficult even the second time due to confusion among the contractors on how to fill out their bids. Contractors were also reluctant to bid as the USAID terms of payments were different to normal GOB procedures. These problems were solved by a series of meetings with the contractors.

Some portions of the excavation were much harder than anticipated due to an unexpected layer of caliche. The contractor has submitted a variation claim which will be evaluated. Since the excavation side slope is much steeper than expected, for the same reason, the total cost will probably not be affected. The contractor has demonstrated his inability to understand the drawings or the contract but has organized the job relatively well and has been cooperative. The work has been satisfactory but requires close superivision.

Results: The PVC strainer pipe has been installed beneath the water table. The inflitration galleryi is still under construction and the results will be monitored.

Recommendations: None provided

E. Activity: Kohosi Karez Rehabilitation:

Location: Kohosi Karez, Ab-Sar, Turbat

Description: Kohosi karez has its source in Ab-Sar and crosses Doccrum Kaur to reach the command area. The karez has been dead for several years due to the collapse of the karez beneath the river. Significant water and acceptable gradients were demonstrated upstream from the collapsed portion. The project involves the reexcavation of the karez and lining of the channel with a pipeline to reduce maintenance. An additional part of the project would connect an artesian well located near the morther well to the karez to provide additional recharge. The project also involves the cleaning of the upstream portions of the karez by the sarrishta at his own expense. This portion of the karez has been allowed to deteriorate since the karez has been dead.

Purpose: The scheme would revive the dead karez and reduce the future maintenance cost. The scheme would also provide supplemental water from an existing tubewell which was drilled for that purpose but never utilized. Karez lining has been suggested as a solution to the karez maintenance problem. The BALAD project has suggested this solution only in portions of karezes passing beneath nullahs and in case where the water level is expected to be mainteained, i.e. where a supplemental source of water is being developed.

Constructed Started: 5/16/87
Constructed Completed: underway

Status: Under Construction

Cost: Rs. 408,500 (estimate)

Special Problems: Upon reexcavation of the karez it was determined that the karez channel was too tortuous for the installation of pipe. It was also determined that only a relatively small portion of the karez was totally collapsed. The work has been suspended pending the completion of the sarrishta's portion of the upstream karez cleaning.

Results: The portion of the karez crossing the Doccrum nullah will be protected by backfilling and sealing the reexcavated wells. The results of the upstream water supplementation scheme are pending the completion of the karez cleaning by the sarrishta.

Recommendations:
1. Karez rehabiliation projects which involve any work component by the sarrishta should begin only when the sarrishta's work is accomplished.
2. Lining inside of karezes should only be attempted in cases where the karez is shallow enough for open trench excavation.

ANNEX I:

ROAD MAINTENANCE WORK PLAN

The following report constitutes the workplan for USAID-funded road maintenance activities in Makran. The plan was approved by USAID on 26 July 1987 and deals only with the Priority I road networks in the Division:

GENERAL:

C&W/ Makran is responsible for maintaining and upgrading 1,600 Kilometers of roads. Of this network, USAID has identified 900 kilometers as Priority I road. One of the objectives of the Baluchistan Area Development Project (BALAD) is to provide funding and technical assistance to the C&W Department in the maintenance of its Priority network. The following road maintenance work plan has been developed by the C&W Department in close cooperation with the Project Planning and Maintenance Unit (PPMU) and the BALAD Technical Assistance Team as a step in obtaining final GOB and USAID approval and funding for the program.

OBJECTIVE:

The objective of this project is to establish a systematic and regular program of road maintenance of the Division's Priority I network. It is further intended that C&W personnel will be trained in improved techniques of road maintenance which will thereby raise the quality of road maintenance in the Makran.

The work plan detailed below gives a specific breakdown of equipment and personnel required to successfully implement the program. Also included are specifications to which the work will be expected to conform, method of work, and a probable schedule and cost breakdown of maintenance for each segment of road. The project will be funded through a Force Account system.

PLANT:

a) List of Equipment to be Supplied by C&W (with % of time assigned to maintenance work

a)	Komatsu 125 HP Graders	3 No. (100%)
b)	Bedford Supply Truck	1 No. (100%)
c)	Toyota Pickup	1 No. (50%)
d)	Mobile Workshop	1 No. (50%)
e)	Mitsubishi Equipment Trailer and Prime Movcer	1 No. (100%)
f)	Caterpillar D-6 Dozer OR,	1 No. (100%)
g)	Caterpillar D-8 Dozer	1 No. (100%)

Note: Equipment items e, f, and g are for provincial use depending on availability and severity of existing road conditions.

b) Equipment Hire Rates (Rs./Hour)

a)	Komatsu 125 HP Graders	330.00
b)	Bedford Supply Truck	200.00
c)	Toyota Pickup	178.00
d)	Mobile Workshop	231.00
e)	Mitsubishi 25 Ton Equipment Trailer and Prime Mover	436.00
f)	Caterpillar D-6 Dozer OR,	472.00
g)	Caterpillar D-8 Dozer	590.00

Notes:

(1) Rates are based upon current C&W/Quetta equipment hire rates.

(2) The above rates are fully inclusive of operators, supervisors, mechanics, and other support staff salaries, and minor machine repair and maintenance costs.

(3) Payments will be made based on actual hours of plant operation. USAID will not reimburse for equipment idle time.

(4) Costs for major repair and overhaul of equipment, including parts, will be reimbursed separately by USAID as part of the BALAD equipment repair program for the Department's machinery.

PERSONNEL:

C&W shall have available the following personnel for the road maintenance program. (The Dozer operator and Mitzubishi transporter driver is provincial subject to the inclusion of said equipment in the program).

1 No. Activity Manager
4 No. Grader Operators
1 No. Dzoer Operator
4 No. Greasers
4 No. Assorted Mechanics/Helpers
5 No. Drivers
4 No. Supervisors

USAID shall assign the following personnel to provide technical support and monitor the maintenance activities:

1 No. Junior Engineer
1 No. Program Assistant
1 No. Equipment Specialist (Part time)
1 No. Senior Engineer (Part time for Supervision)

A project field allowance shall be paid to all participating personnel on the following basis:

Senior Staff (Grade 6 or above)	Rs.120/day
Junior Staff (below Grade 6)	Rs.100/day

SPECIFICATIONS:

The existing road surface shall be subject to minor cutting and widening through successive gradings to provide a traveled way width of not less than 6.1 meters. An additional width shall gradually be provided through successive gradings to accommodate the drainage swale shown in the typical section (see diagram).

-- Along sections where the roadway is depressed, the mounded shoulders on the downslope side of the roadway shall be removed and reshaped through successive gradings to permit drainage of water from road surface. The material removed from the shoulders shall be moved into the traveled way and shaped in an effort to gradually raise the elevation of the roadway. The mounded shoulder on the upslope side of the roadway shall be left in place to act as a barrier to overland sheetflow although excess shoulder material not required to maintain the berm shall be used to raise the level of the roadway. A swale shall be cut on the upslope side to drain the road and collect sheetflow that has penetrated the berm. See Attachment 1 which gives the typical road section.

-- The finished surface shall be leveled along uniform and smooth lines.

The roadway surface shall be shaped to provide a camber of between 1%/2% and 3% to allow adequate drainage of the traveled way.

MAINTENANCE WORK METHODS:

One grading of the entire network will be completed before maintenance operations are repeated on any section of the roads. Each crew will be comprised of three Komatsu graders, one Bedford supply truck, and the Toyota Mechanic Truck and Mitsubish Mobile Workshop on a part-time basis. One dozer may be employed to assist on sections of road where severe cross-sectional deficiencies exist. C&W staff would be accompanied by members of the TA team staff who would provide technical assistance and record all pertinent data regarding the operation. BALAD inspectors will monitor equipment usage, work progress, compliance with the project specifications, and subsequent performance of the road.

Maintenance procedures will consist of three graders operating in tandem approximately 200 meters apart. The first two graders shall make passes along each edge of the road cutting the shoulder and shaping the roadway as set forth in the specifications. The dislodged shoulder material will be deposited as a wind row along the center of the road. The third and final pass along the centerline will form a raised crown from the wind row.

The grading to be performed in this program will be most effective in areas where the ground comprises well-graded silty, sandy gravels which will compact fairly well after grading, without watering and rolling, by the passage of vehicles. The BALAD field staff will note those sections of road, where the natural ground is excessively clayey and where the use of grading of an

already compacted surface proves to be deleterious. Such areas will not be regarded under this program and shall be considered for reshingling or possibly relocation.

METHOD OF MEASUREMENT AND PAYMENT:

Work shall be measured according to the hours of equipment usage in the field each day. The BALAD TA Team field staff will record the number of hours each piece of equipment was involved in actual road maintenance work. Transit time of machinery to and from the work site will be included in the measurement but equipment idle time will not be deemed eligible for reimbursement. The TA field staff will also record the daily participation of C&W personnel for purposes of determining the project field allowance.

Payments will be made on a monthly basis under a Force Account system as detailed in Project Implementation Letter No. 14. Based on the hourly equipment hire rates given above, the amount of payment for completed road maintenance work will calculated each month from the total hours of usage for each machine as measured by the TA field staff.

SCHEDULE:

Two possible maintenance schedules and cost breakdowns are given below. The first alternative allows for grading Priority I roads only. The second and more realistic proposal includes for grading sections of Priority II roads on return trips to Turbat to maximize the efficiency of equipment usage. In general, one grading of the entire network will be completed before maintenance operations are repeated on any section of the road network. An exception to this way be made on the return trip along the Turbat-Hoshab road. The schedule and cost estimate are based on the following assumptions:

1) The average completion rate of maintenance work will be 20 Km/Day.

2) The cost of grading will be Rs.357/Km.

3) On the return trip to Turbat, 15% of the recently graded road length will be regraded.

4) Costs for time for equipment return to Turbat will be reimbursed.

5) ALTERNATIVE 1:

   Priority I and II roads will be graded in the following sequence: Turbat-Mand, Turbat-Hoshab-Awaran-Panjgur -Hoshab-Turbat, Turbat-Gwadar-Pasni-Turbat.

PROBABLE ROAD MAINTENANCE SCHEDULE AND COST BREAKDOWN:

ROAD SEGMENT	LENGTH (Km) Grading	Add'l Passes	Return Trip	COST (Rs.) Grading	Add'l Passes	Return Trip	Total Cost (Rs.)	Time Compl (Day)
Turbat-Mand	122	18	104	43,554	6,426	4,145	54,125	7
Turbat-Hoshab*	70	11*	59	24,990	3,927	2,352	31,269	4
Hoshab-Awaran	155	-	-	55,335	-	-	55,335	8
Awaran-Panjgur	190	-	-	67,830	-	-	67,830	10
Panjgur-Hoshab	161	-	-	54,477	-	-	57,477	8
Hoshab-Turbat	70	-	-	24,990	-	-	24,990	4
Turbat-Gwadar	190	-	-	67,830	-	-	67,830	10
Gwadar-Pasni	78	10	57	27,846	3,570	2,272	33,688	5
Pasni-Turbat	107	3	20	38,199	1,071	797	40,067	6
Totals	1143	42	240	408,051	14,994	9,566	432,611	62

* Excludes paved section of Turbat-Sharak road
* Optional

Assuming that ten Fridays and three holidays will fall within each maintenance cycle, the project field allowance will be paid for 75 days. Excluding the dozer operator and transporter driver and noting that the Activity Manager will be paid at the senior staff rate, the total field allowance reimbursement to be disbursed from the project funds for each maintenance cycle will be Rs.129,000. (Personnel assigned to the Mechanic Truck and Mobile Workshop are assumed to participate in the program on 37 days of each cycle.)

The total estimated cost of the project for each cycle of road maintenance is Rs.561,611 or approximately US $32,650.

6) ALTERNATIVE 2

Priority I roads will be graded in the following sequence: Turbat-Mand, Turbat-Hoshab-Awaran-Panjgur, Turbat-Gwadar.

PROBABLE ROAD MAINTENANCE SCHEDULE AND COST BREAKDOWN

ROAD SEGMENT	LENGTH (Km) Grading	Add'l Passes	Return Trip	COST (Rs.) Grading	Add'l Passes	Return Trip	Total Cost (Rs.)	Time Compl (Day)
Turbat-Mand	122	18	104	43,554	6,426	4,145	54,125	7
Turbat-Hoshab*	70	11*	59	24,990	3,927	2,352	31,269	4
Hoshab-Awaran	155	-	-	55,335	-	-	55,335	8
Awaran-Panjgur	190	-	-	67,830	-	-	67,830	10
Panjgur-Hoshab	-	-	161	-	-	64,417	6,417	1
Turbat-Gwadar	190	29	161	67,830	10,353	6,417	84,600	12
Totals	727	58	485	259,539	20,706	19,331	301,967	42

Assuming that seven Fridays and two holidays fall within each maintenance cycle, the project field allowance will be paid for 51 days. Excluding the dozer operator and transporter driver and noting that the Activity Manager will be paid at the senior staff rate, the total field allowance reimbursement to be disbursed from the project funds for each maintenance cycle will be Rs.87,720. (Personnel assigned to the Mechanic Truck and Mobile Workshop are assumed to participate in the program on 25 days of each cycle.)

The total estimated cost of the project for each cycle of road maintenance is Rs.389,687 or approximately US $22,650.

ANNEX J:

DESCRIPTION OF METHODOLOGY EMPLOYED IN THE EVALUATION

Three methodological techniques were employed in gathering data for this evaluation: (1) a review of existing files and documents; (2) interviews with USAID and GOB officials and others; and (3) site visits to all three districts in Makran and many of the sub-projects completed, underway, or planned under BALAD.

Files and Documents

The team spent most of the initial week in Islamabad reviewing pertinent documents and files dated from September 1982 to the present. Related BALAD files and documents were also reviewed in Quetta, Karachi and Turbat. Extensive notes were taken on the files and copies of particularly relevant material made for possible future reference.

Interviews

The evaluation team also interviewed or held discussions with officials from both countries. Nearly fifty people were contacted. Notes on these interviews are available with USAID in Islamabad. Interview locations included Islamabad, Quetta, Karachi, Turbat, Gwadar, Hub and Panjgur. The interview format was unstructured.

Site Visits

Site visits were conducted in all three Makran districts of Makran. In Turbat (where most project sites are located), the evaluation team traveled along the Kech Kaur (both west and east). Most visits in Panjgur were conducted in or around the district headquarters. Some members of the evaluation team also visited Gwadar.

Although some local people were contacted during the course of the evaluation, the bulk of the interviews were held with GOB administrative personnel and the LBI technical staff in Turbat. On the Kech Kaur trips, the Water Engineer (LBI) accompanied the team and freely and frankly discussed the projects under his direction. In the site visits of the SDAs and the minor roads project, either the Water Engineer or the LBI COP accompanied members of the evaluation team.

The evaluation team drove from Bela to Awaran and from Awaran to Turbat to get a "feel" of the area and what BALAD had to say about these regions. Road trips were also taken by various members of the evaluation team from Panjgur to Turbat and Gwadar to Turbat, though in these latter instances BALAD officials did not accompany on the trips.

ANNEX K:

BALUCHISTAN AREA DEVELOPMENT PROJECT FINDINGS/CONCLUSIONS/RECOMMENDATIONS MATRIX

FINDINGS	CONCLUSIONS	RECOMMENDATIONS
1. Institution building has failed.	GOB unable to provide counterparts.	USAID can only wait and see what GOB does with PPMU.
2. Demand exists for vocational-technical training in U.S.	Makran Vo-Tech training program was well received.	Vo-Tech program should be continued.
3. Delays in getting projects on ground due to management of LBI TA Team.	Most management problems have been solved but it has been costly in terms of time.	Current LBI TA Team should remain intact but overall LBI contract should not be extended beyone 1989.
4. Computerization taking place in P&D/GOB.	P&D Computer Cell storing and analyzing data for ADP.	BALAD should continue support for Computer Cell until training is complete.
5. Socio-economic survey has generated data.	Data useless in its present form for BALAD project management.	Data should be properly analyzed starting with data from Gwadar District.
6. Demand exists for schools.	Schools built through SDA are well received and have positive impact on female education.	Continue to use SDA as mechanism to build schools, especially for females.
7. Demand exists for water projects although proper maintenance is a concern.	Water projects have positive impact.	Water projects still have to undergo a rainy season but data gathered by Water Engineer are important and should be analyzed.
8. USAID/Islamabad provides important support services for BALAD.	USAID/Islamabad support for BALAD much greater than anticipated.	USAID/Islamabad should continue to provide the same level of support for BALAD.
9. Bela-Awaran road very important for development of Makran Division.	NASA does not have capacity nor strength of purpose to construct Bela-Awaran road.	USAID-NASA contract should be cancelled and road construction should be retendered.

10. Kech Kaur bridge is important but less so than Bela-Awaran road.	Road contractor (SKB) slow in mobilizing.	IF SKB is not mobilized by December 10, 1987, SKB should be charged daily damages.
11. Road infrastructure important for Makran.	Experience with local construction firms very unsatisfactory.	USAID should review its tendering process to secure better qualified firms.
12. Demand for road maintenance in Makran Division.	Need for additional road maintenance equipment.	Purchase needed equipment using ACE as mechanism.
13. Road count data required for scheduling road maintenance.	Data are not systematically collected.	Traffic counts need to be made and monitored.

ANNEX L:

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ANNEX M:

LIST OF INDIVIDUALS INTERVIEWED/CONSULTED

I. USAID

Eugene Staples
Director, USAID/Islamabad

Robert Traister
RAO/Quetta

Robert Nachtrieb
Chief, Office of Project Development & Monitoring

Robert Mathia
Deputy Chief, Office of Project Development & Monitoring

Laurier Mailloux
Assistant Project Development Officer,
Office of Project Development & Monitoring

Mohammad Saleem
Program Specialist,
Office of Project Development & Monitoring

Gene George
Chief, Office of Engineering

Zahid Noor
Engineering Program Manager,
Office of Engineering

Pervez Gani
Project Engineer,
Office of Engineering ENG

Andra Herriot
Acting Chief, Office of Human Resource Development

Iftikhar Ahmed
Participant Training Specialist
Office of Human Resource Development

II. GOVERNMENT OF BALUCHISTAN

S.R. Poonegar
Chief Secretary, Government of Baluchistan
Quetta

Fateh Khan Khajjak
Additional Chief Secretary
Planning & Development Department
Quetta

Sardar Sharif
Secretary, Planning & Development Department
Quetta

Abdul Rahim Khan Zarkhoon
Secretary, Communication and Works Department
Quetta

S. Asghar Ali
Chief Economist, Planning & Development Department
Quetta

Mohammad Amin
Chief Engineer, Irrigation Department
Quetta

Imtiaz Kazi
Chief, Special Development Programs
Planning & Development Department
Quetta

Nasir Khosa
Deputy Commissioner, Kalat

Anwar Ahmed Khan
Deputy Commissioner, Lasbela

J. D. Baluch
Superintending Engineer (Makran)
Turbat

Abdus Salam
Sub-Divisional Officer
C&W Machinery Maintenance Sub-Division
Turbat

Shah Mohammad
Executive Engineer
C&W Machinery Maintenance Sub-Division
Turbat

Shahid Khan
Chief of Section (Admin.)
Planning & Development Department, Government of Baluchistan
Quetta

Hafeezur Rehman
Deputy Secretary/Services, Government of Baluchistan
Quetta

Babar Yaqoob
Deputy Secretary/Finance, Government of Baluchistan
Quetta

Rashid-uz-Zafar
Commissioner, Makran Division
Turbat

Abdul Aziz Lasi
Deputy Commissioner, Turbat

Mir Abdullah Jan
Deputy Commissioner, Gwadur

Iqbal Hussain
Assistant Commissioner, Gwadur

Zakia Durrani
Divisional Educational Officer for Girls, Makran Division
Turbat

Akbar Baluch
Assistant Commissioner, Panjgur
Panjgur

Salim Raza
Executive Engineer, Communications & Works
Panjgur

III. BALAD PROJECT STAFF AT TURBAT

Louis Berger International (LBI)

David Jones
Chief of Party (LBI)

David Douglas
Water Engineer (LBI)

Ned Herring
Road Engineer (LBI)

Abdul Rashid Baluch
Sociologist

Mohammad Ali Baluch
Head Construction Engineer

Khurram Wadood Khan
Construction Supervisor

Mohammad Saleem
Heavy Equipment Specialist

S. Ahmad Shah
Systems Analyst

Daulat Kamal
Administrative Officer

PPMU (Government of Baluchistan)

Mirza Masood Ahmad
Acting Project Director

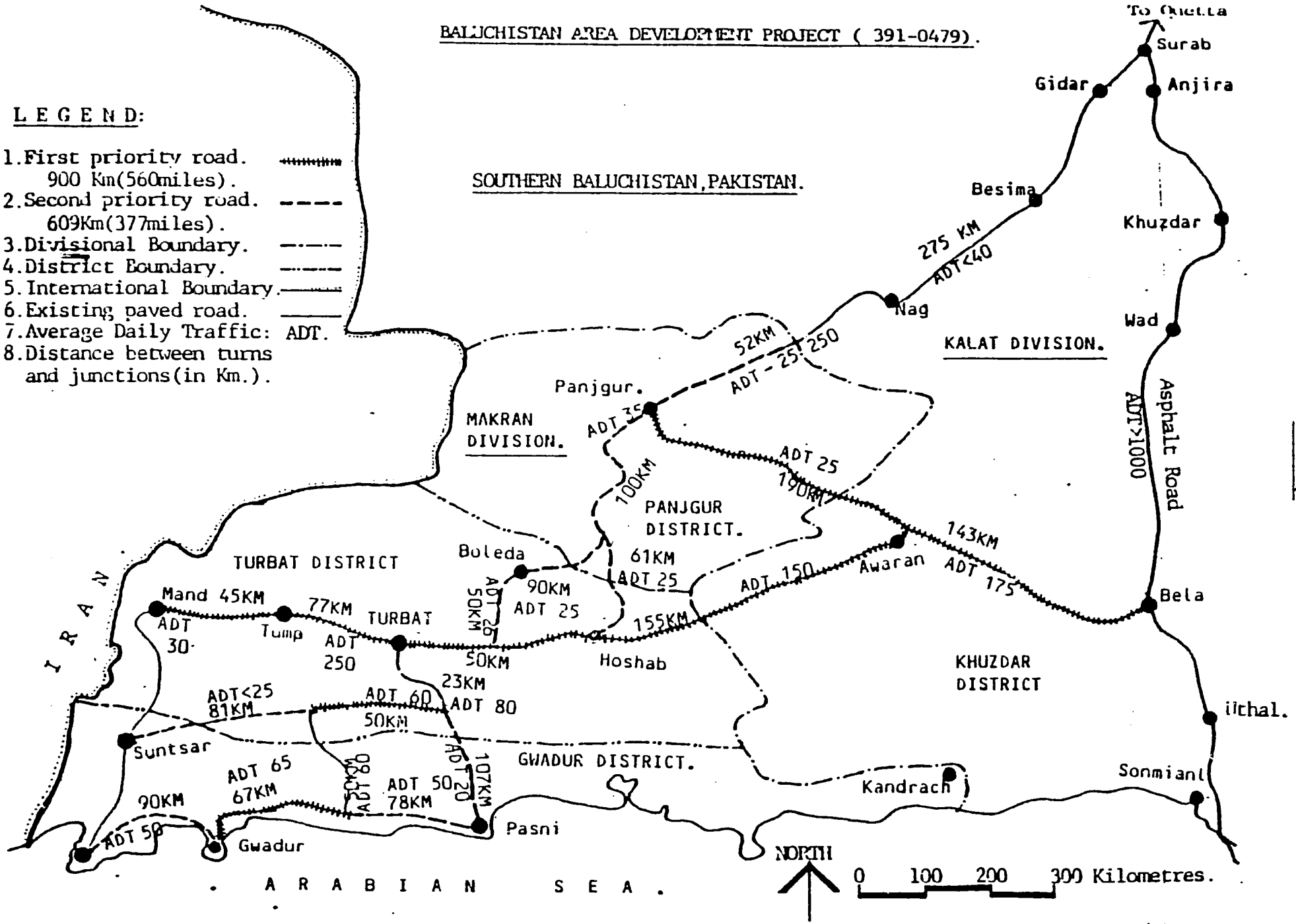
IV. OTHERS

Larry Grahl
American Consul General
Karachi

Shahid Hamid
Deputy Commissioner, Karachi South

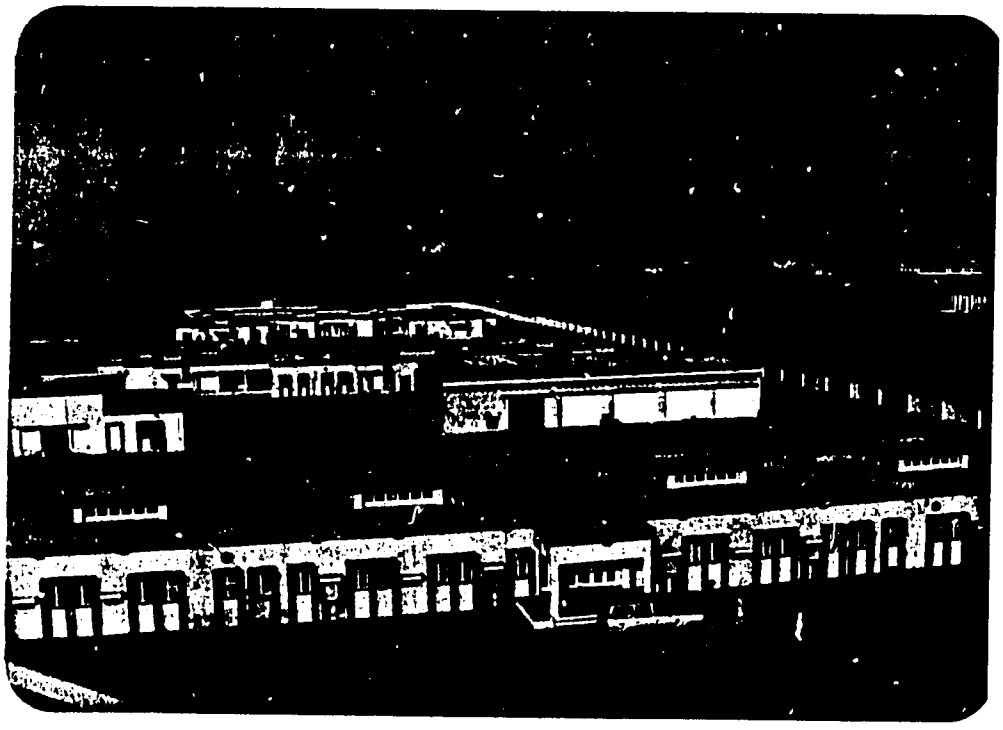
Syed Atta Abbas
Systems Analyst
P&D Department
Quetta

BALUCHISTAN AREA DEVELOPMENT PROJECT (391-0479).



ANNEX O:

PHOTOGRAPHS

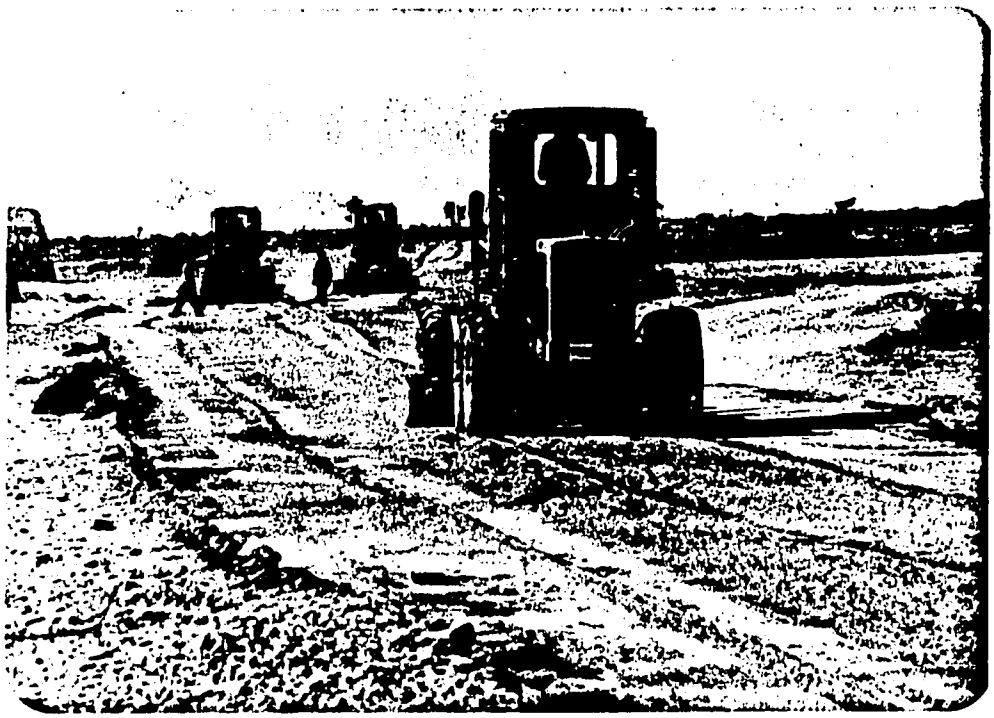


Completed BALAD Headquarters Complex in Turbat.

Typical Traffic on Proposed Bela-Awaran Road Connecting Makran Division with National Transportation Network.

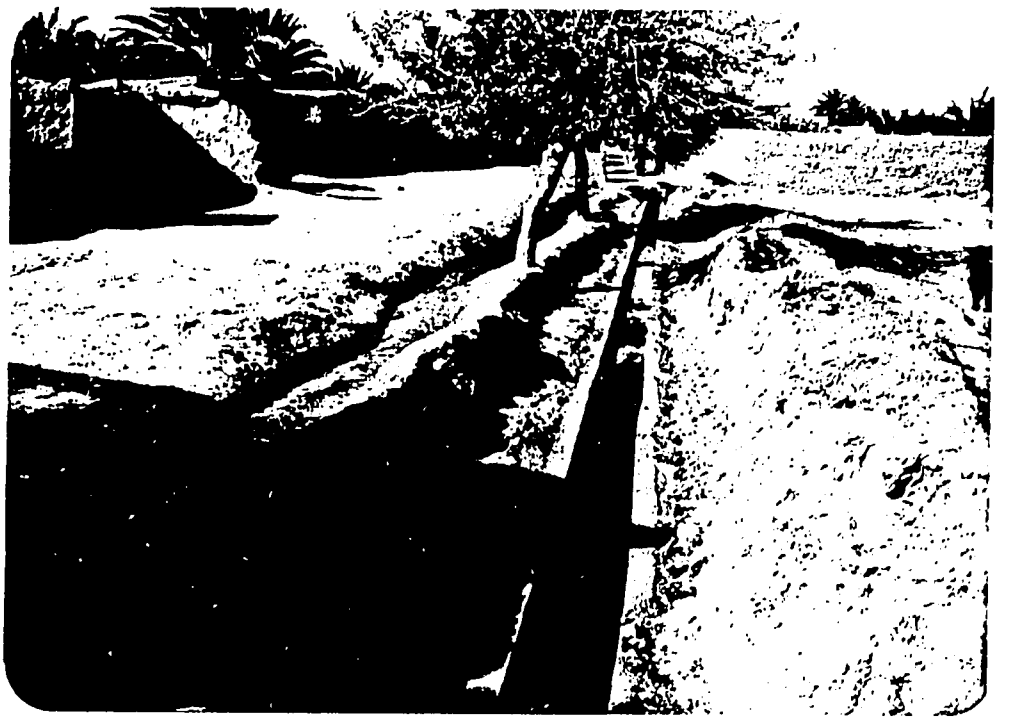
Two Additional Classrooms Provided to an Existing GOB Primary School in Panjgur District Built Under the BALAD SDA Program.

Additional Classroom Being Built Under the BALAD SDA Program will Alleviate Overcrowding in this Girls' Primary School.



Typical Grading Operation for USAID-Financed Road Maintenance in Makran Division.

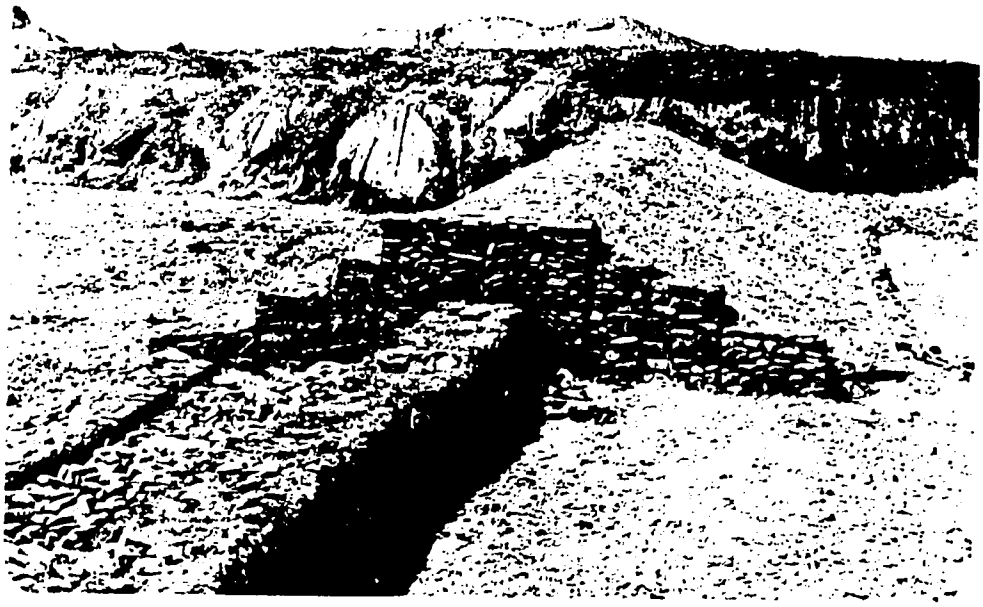
Road Rehabilitation Operation Using Dozer Equipment Provided for BALAD Under the ACE Program.



Watercourse Improvement in Panjgur District.

Infiltration Gallery Scheme Nearing Completion in Panjgur District to Provide Additional Ground Water.

Typical Syphon Operation Nearing Completion in Turbat District to Carry Water Safely Across Nullahs.



Completed Gabion Check Dam in Turbat District.