Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: **20-Oct-2003(Mon)**
Time:

Interviewer:
Name; TAKAHASHI Shinya
Position; Hydro-Geologist
JICA Preparatory Study Team

Interviewee:
Organization: **Drilling Division, WRPD&M Directorate, I&P Dept., GoB**
Address: **Siryad Road, Quetta**
Telephone **081 9211602**
E-mail:
Answered by: **Mr. Imram Durrani.**
Position: **Deputy Director, Drilling Division**
Office: **Office for Drilling Division, WRPD& M Directorate (ex-WAPDA)**

Subject: **Present status of library and laboratory of ex-WAPDA**
Answer:

- In 1993, monitoring activities of WAPDA was taken over by the Bureau of Water Resources (BoWR), I&P Dept., GoB that was established in the same year.
- The drilling activities were still operated under WAPDA till 1998.
- All the drilling activities that were operated not only WAPDA but also divisions under I&P dept., GoB were incorporated/integrated into the BoWR, I&P dept., GoB in 1998.
- BoWR was renamed into Water Resources Planning, Development and Monitoring (WRPD&M) Directorate, I&P dept., in year of 2002.
- Presently, WAPDA is in charge of power generation, transmission & distribution and tariff charging/collection.

*****

- The laboratory taken by WAPDA was totally not operational, no plan to reopen.
- The documents in the library have not been updated since 1993.

==End of Document==

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: **20-Oct-2003(Mon)**
Time:

Interviewer:
Name; TAKAHASHI Shinya
Position; Hydro-Geologist, JICA Preparatory Study Team

Interviewee:
Organization: **UNDP**
Address: **Zangi Lora Park, Sariab RoadQuetta**
Telephone **081 9211638, 449690, 445981**
E-mail:
Answered by: **Mr. Aijaz**
Position: **Irrigation officer**
Office: **Area Development Program Balochistan, UNDP**

Subject: **Activities**
Answer:

- Siphons were installed so that spring water flow running in opposite side of seasonal rivers was able to be utilized at this side too. Four inch pipe was buried across the seasonal rivers. The siphons have nothing to do with DADs.
- A comprehensive set of laboratory equipment was provided to WRPD&M for water quality testing. However, due to lack of proper engineer available for transfer of knowledge and technique, further assistance is being held up. It is the Directorate who should recruit proper engineers who are educated in chemical courses.
- Water quality analysis facilities are available In Agricultural Department, GoB.

*****

- Flat rate for electric power and wrong agricultural knowledge of farmers are main causes for water wastage.
- Farmers are thinking they should not loose opportunity (or a right) for pumping water as much as possible. Stopping pumping is thought to be loosing money that was already paid, explained.
- Farmers are pumping water even in winter because they think that giving water to the field even in winter will be good for their crop, explained.
- Only solution for the sustainable irrigation in Balochistan will be trickle irrigation. ADPM is strongly recommending the high efficiency irrigation system (trickle irrigation) rather than recharging groundwater, stated.

==End of Document==

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: **20-Oct-2003(Mon)**
Time:

Interviewer:
Name; TAKAHASHI Shinya
Position; Hydro-Geologist, JICA Preparatory Study Team

Interviewee:
Organization: **I&P Dept.,**
Address: **Sariab Road, Quetta**
Telephone **081**
E-mail:
Answered by: **Mr. Ashan Hidyat Khan**
Position: **Executive Engineer (Irrigation), I & P, Dept**
Office: **Branch office of I & P, Dept.**

Subject: **DADs fixed with siphon pipe**

Answer:

- Siphon structures have been installed to the following DADs to release the reservoir water over the dam through siphon pipe.
  - ✧ Balozai DAS; Khanozai DAS; Pechi DAD
- There are many others to which siphon system has been applied.
- A siphon structure consists of a MS pipe (4 – 6 inch dia) installed in the reservoir over the dam to the downstream of the dam; with a foot valve at the end of the pipe in the reservoir, a T shaped pipe with socket at the dam crest and slice valve at the end of the pipe downstream of the dam.
- Water is pored with the slice valve closed; from T-shaped pipe to fill up the pipe with water; T-shaped pipe is closed once the pipe is filled with water to the socket level of the T-shaped pipe; and the slice valve at the downstream end of the pipe is opened to release the water.
- The system does work well, according to the executive engineer.
- The system needs to be buried in the ground while working and to be dismantled once discharging is completed; for not to be stolen or vandalized.
- In addition, siphon is used during dam construction to drain water from the reservoir, because diversion facility is usually not equipped for construction.

==End of Document==

Answer Sheet for Questionnaire
On Preparatory Study on the Project
For Development of Flood Outflow Water in Balochistan Province
In the Islamic Republic of Pakistan

Date: 21-Oct-2003(Mon)
Time:

Interviewer:
Name; TAKAHASHI Shinya
Position; Hydro-Geologist, JICA Preparatory Study Team

Interviewee:
Organization: Forest Department
Address: Spinny Road, Quetta 83700 Pakistan
Telephone 081 9201137, E-mail:ccfforest@yahoo.com
Answered by: Dr. Mohammad Saleem, Chief Conservator
Mr. Manzooc, Conservator of Wild Life
Mr. Abdul Raziq, Conservator of Forest, Juniper Eco-system and National Park
Position: (see above)
Office: Forest Department and Fields

Subject: Water Shed Management

- Written strategies or policies for the Forest Department are not established.
- 'Balochistan Conservation Strategy' published by P&D and IUCN covers all the aspects.
- Programs are worked out on project basis.
- P&D instructed or declared water shed management should be included for DAD construction program (PC-I).
- At present, no coordination or no talk between Forest Department and I&P dept are made regarding Water Shed Management for DADs.
- No fund is shared for such water shed management of DAD.
- Earlier, personnel were invited to discussions for DAD. Presently no one are invited to such talks.

Field Visit:

- Depleted Range Rehabilitation Project (Drought Relief Program, Tor Ragha State Forest District, Quetta, commenced on 04-01-2001 (Spinkerez area)
- Karak Area Water Shed Planning and Management Project Quetta, 1996-1997.
- Earthen bunds, hillside ditches with shrub plantation are observed. A dam was constructed in Karak area. The design and quality of the dam is questionable though dam height is not high
- In addition to those project above, a water shed management project was performed in Berwery water shed area in 1987. Since then no major flood occurred in the area.
- .==End of Document==

Answer Sheet for Questionnaire on Preparatory Study on the Project for Development of Flood Outflow Water in Balochistan Province in the Islamic Republic of Pakistan

Date: **22-Oct-2003 (Sat)**
Time: **09:45**

Interviewer:
Name; TAKAHASHI Shinya
Position; Hydro-Geologist
JICA Preparatory Study Team

Interviewee:
Organization: **Water Resources Planning, Development and Monitoring (WRPD&M) Directorate, I&P Dept.**
Address: **Quetta**
Telephone: **081 9211190**
Fax: **E-mail:**
Answered by: **Mr. Amjad Ali Shal, Deputy Director (Monitoring)**
Mr. Habibi, Field officer
Position: **(see above)**
Office: **office (WRPD&M Directorate) and QA-4 site**
Subject: **Discussion on the Behavior of QA-4**

The Monitoring hole MNW-QA-04 was visited.

- 30-11.518 N, 67-02.074 E
- The QA-04 is located in a middle part of cantonment daily farm that used to be used for maize cropping for cow producing milk for military supply.
- No vital orchard field was seen around.
- About 100 m away from the QA-4, Habibi nullah (river), a seasonal river, was observed.
- Sewage water from Nureeabad was flowing along the Habibi nullha for a year in addition to flood water in wet seasons.
- A pumping facility was observed at the Habibi River near the QA-4 (some 100m apart); the pumping facility was used for irrigation purpose for the Cantonment daily field till 7 – 10 years ago.
- The sewage water was diverted from the Habibi River to ponds close to QA-4 (78-80 m apart). Presently no water is visible along the river.
- Nureeabad used only flood water before. The start used tube wells for about 30-35 years, explained by an inhabitant. Nureeabad expanded towards the hillside as it developed and water was pressure-sent to the higher area accordingly.
- In the inventory prepared by WRPD&M Directorate, twelve wells are recorded as constructed in; (1) 2001, (2)2001, (3) 1970(dry). (4)2000, (5)1970(dry), (6)1975, (7)1989, (8)1974, (9)2001, (10)2002, (11)1968, (12) 1961.
- It was confirmed by the inhabitant that there are 4 DAD near the area. Habibi Dara I (1977), Habibi Dara II (1992), Shaghai I (1996), Shaghai II (1994).
- *From the information above, it is difficult to conclude that the groundwater rising was due to the effects of any of those 4 dams. Construction timings do not match the groundwater rising*
- *No decisive conclusions are reached at this moment*

Automatic Water Level Gauging Station - Screen Position in Wells
The information below was provided.

	No.	Screen Position			
	QTA-01	110–130		QTA-11	389–429
	QTA-02	110–135		MST-01	85–95
	QTA-03	120–130, 138–148		MST-02	78-88,128-138
	QTA-04	114–130		MST-03	200-210, 297-307
	QTA-05	N/A		MST-04	231-255
	QTA-06	131–147		MGR-01	212-236
	QTA-07	168–184		MGR-02	197-213, 265-281
	QTA-08	85–101			
	QTA-09	241–257			
	QTA-10	381–421			

- .==the end of the document==

#26

Nippon Koei
Shinya TAKAHASHI
18-Oct-03

MNW-QA-4

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: **24-Oct-2003(Fri)**
Time:

Interviewer:
Name; TAKAHASHI Shinya
Position; Hydro-Geologist, JICA Preparatory Study Team

Interviewee:
Organization: **I&P Dept.,**
Address: **Civil Secretariats, Sariab Road, Quetta**
Telephone **081**
E-mail:
Answered by: **Mr. Mubawar Khan Mandokhail**
Position: **Secretary, I & P, Dept**
Office: **Civil Secretariat.**

Subject: **Courtesy visit – Flood Dispersion**

Answer:

- K Noda, S Takahashi and K Koga made a courtesy visit to the Secretary to appreciate his cooperation for the survey made by the Team.
- On the occasion of the final meeting with the Secretary, a confirmation of opinion of the department was made on 'flood dispersion method' for recharging purpose.
- The answers were:
  - ✧ The department is always ready to apply any types of improved measures for recharging groundwater.
  - ✧ The mentioned 'Flood dispersion method for recharging purpose' has not been adopted because flood water has to be spread over on the wide area of a piedmont. Due to high evaporation potential in Balochistan the loss of water will be higher than DAD.
  - ✧ In response to the question on whether this type of method was implemented, the answer was 'Not yet'.
- The Team expressed their thankfulness for his cooperation again to the Secretary.

==End of Document==

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: **27-Oct-2003 (Mon)**
Time:

Interviewer:
Name; TAKAHASHI Shinya
Position; Hydro-Geologist, JICA Preparatory Study Team

Interviewee:
Organization: **World Bank, Islamabad, Pakistan,**
Address: **Islamabad**
Telephone **9090103**
E-mail:
Answered by: **Mr. Addul Salam**
Position: **Chief, Library**
Office: **World Bank**

Subject: **Collection of Documents and Information**

Answer:

- K Noda and S Takahashi visited the WB office in Islamabad.
- Information and documents on the future plan and strategy of WB to be implemented in Pakistan and Balochistan were collected.==End of Document==

Answer Sheet for Questionnaire
on
Preparatory Study on the Project for Development of Flood Outflow Water in Balochistan Province in the Islamic Republic of Pakistan

Date: **27-Oct-2003 j(Mon)**
Time:

Interviewer:
Name; TAKAHASHI Shinya
Position; Hydro-Geologist, JICA Preparatory Study Team

Interviewee:
Organization: **Asian Development Bank, Islamabad, Pakistan,**
Address: **Islamabad**
Telephone **092-51-2825011-16**
E-mail: **rfarrukh@adb.org**
Answered by: **Mr. Raza M. Farrukh**
Position: **Project Implementaion Officer**
Office: **ADB, Islamabad**

Subject: **Collection of Documents and Information**

Answer:

- K Noda and S Takahashi visited the ADB office in Islamabad.
- Information and documents on the future plan and strategy of WB to be implemented in Pakistan and Balochistan were collected.
- In addition to the information, A TA report on 'Balochistan Groundwater Resource Reassessment' was requested to locate. In the following day, it was reported that the report was not available in the office, the report might be available from the web==End of Document==

(2) 質問票・回答 － 利 水 計 画

番号	訪問先	質問事項
#01_N	Honorary Consulate General of Japan, Quetta	Organization of Provincial Government of Balochistan, etc
#02_N	Agriculture, Cooperatives and Flood Department, Balochistan	Important Items of Development Strategy in Agriculture, Cooperatives and Food Development, etc
#03_N	Agriculture Extension Directorate General	Prices on Agro-economy, etc
#04_N	Agriculture Economics and Marketing Directrate	Cropping Pattern, etc
#05_N	Agriculture, Cooperatives and Food Department, Balochistan Province	Present Irrigation Method and Gross Irrigation Water Requirement
#06_N	Babu & Company, Mir Afzal Khan & Co. (Private Shops)	Procurement Possibility of Trickle Irrigation Facilities, Material and Parts
#07_N	On farm Water Management / Trickle Irrigation Directorate Rani Bagh, Sariab Road, Quetta	Definition and Naming of “Directorate General” and “Directorate” in Organization of Agriculture, Cooperatives and Food Department
#08_N	Trickle Irrigation Scheme / Agriculture Model Farm Sariab Road, Quetta	Crop Water Requirements
#09_N	Agriculture Extension Directorate	Future Plan of On-farm Water Management Projects
#10_N	UNDP, Quetta	Concept of UNDP’s Future Activities in Balochistan
#11_N	Water Resources Research Centre (WRRC)	Irrigation Related Major Activities of WRRC, etc
#12_N	Arid Zone Research Centre (AZRC), Federal Government	Agricultural Land Owner, etc
#13_N	World Bank in Pakistan	Future Strategy and Projects for Aid in Balochistan for Water Sector
#14_N	Asia Development Bank in Pakistan	Future Strategy and Projects for Aid in Balochistan for Water Sector

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 10-Oct.-2003 (Fri.)
Time: 16: 20

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Honorary Consulate General of Japan, Quetta
Address; 53-A, Jinnah Town, Samungli Road, Quetta

Telephone; 081-829478
E-mail; knadeem@ultra.net.pk

Answered by; Mr. Syed Nadeem Shah (Name of Interviewee)
Position; Honorary Consul General
Office;
(Section, Department)

Subject:
1. Organization of Provincial Government of Balochistan
2. Organization of District Government in Balochistan

Answer:

1. Organization of Provincial Government of Balochistan

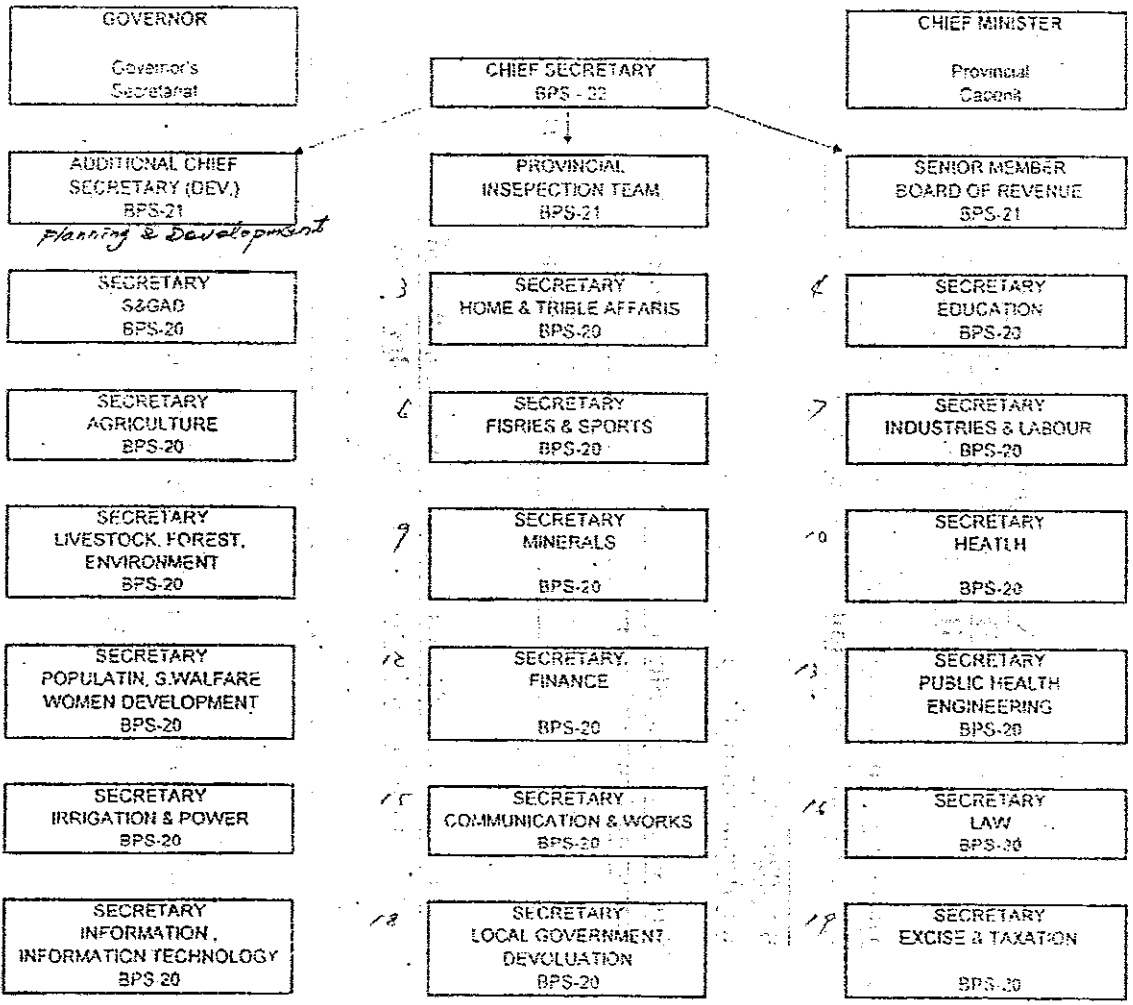
See two (2) sheets of (1/3) and (2/3) of organization charts attached.

2. Organization of District Government in Balochistan

See one (1) sheets of (3/3) of organization chart attached.

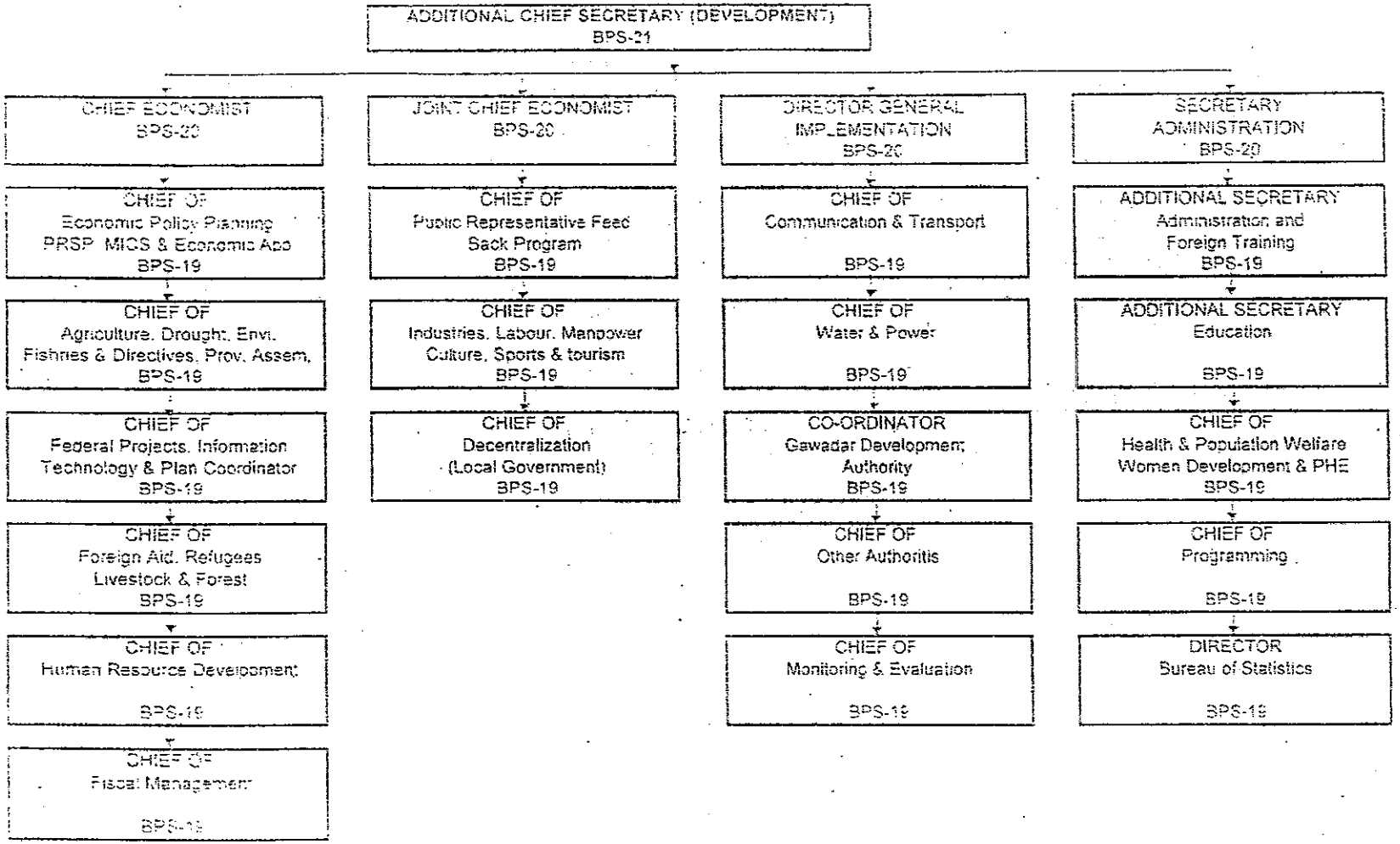
Attachment: Three (3) sheets of organization charts.

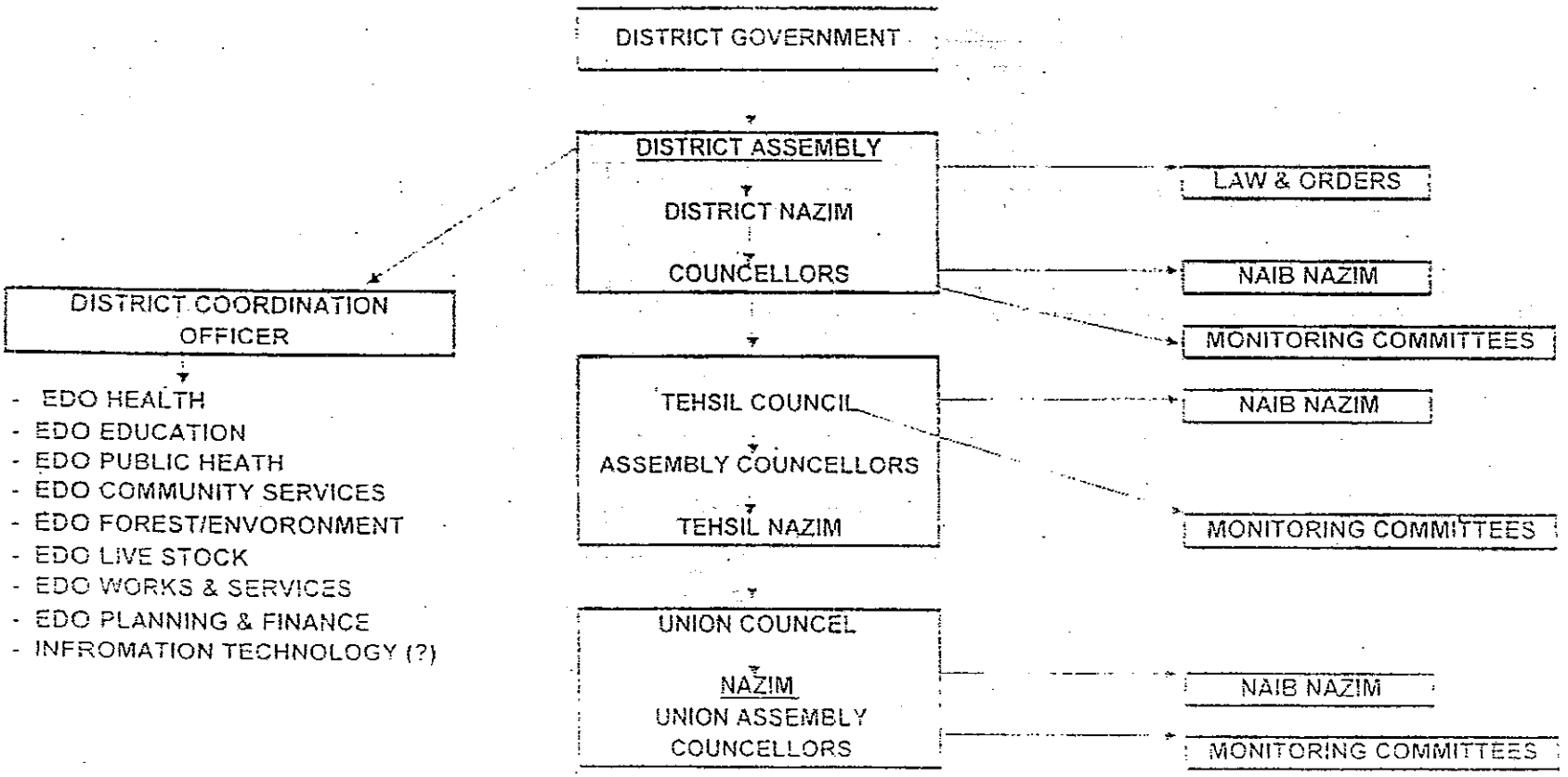
PROVINCIAL GOVERNMENT



NOTE:

1 Governor is the constitutional head of the Province
2 Chief Minister is the head of the Government and Chairman Cabinet
3 Chief Secretary is the head of Administration and Provincial Advisor to the Governor & Chief Minister
4 Additional Chief Secretary (Dev.) is the head of th devlopment in the province
5 Chariman Provincial Inspection Team is the Chief Moniter for development projects
6 Senior Member Board of Revenue is the head of land transaction in the Province
7 Secretaries are the head of administration of their respective departments
8 Each Secretary is the head of his subordinate directorates


ADDITIONAL CHIEF SECRETARY (DEVELOPMENT)
BPS-21
CHIEF ECONOMIST
BPS-20
CHIEF OF
Economic Policy Planning
PRSP MICS & Economic Adv
BPS-19
CHIEF OF
Agriculture, Drought, Envt.
Fisheries & Directives, Prov. Assem,
BPS-19
CHIEF OF
Federal Projects, Information
Technology & Plan Coordinator
BPS-19
CHIEF OF
Foreign Aid, Refugees
Livestock & Forest
BPS-19
CHIEF OF
Human Resource Development
BPS-19
CHIEF OF
Fiscal Management
BPS-19
JOINT CHIEF ECONOMIST
BPS-20
CHIEF OF
Public Representative Feed
Sack Program
BPS-19
CHIEF OF
Industries, Labour, Manpower
Culture, Sports & tourism
BPS-19
CHIEF OF
Decentralization
(Local Government)
BPS-19
DIRECTOR GENERAL
IMPLEMENTATION
BPS-20
CHIEF OF
Communication & Transport
BPS-19
CHIEF OF
Water & Power
BPS-19
CO-ORDINATOR
Gawadar Development
Authority
BPS-19
CHIEF OF
Other Authoritis
BPS-19
CHIEF OF
Monitoring & Evaluation
BPS-19
SECRETARY
ADMINISTRATION
BPS-20
ADDITIONAL SECRETARY
Administration and
Foreign Training
BPS-19
ADDITIONAL SECRETARY
Education
BPS-19
CHIEF OF
Health & Population Welfare
Women Development & PHE
BPS-19
CHIEF OF
Programming
BPS-19
DIRECTOR
Bureau of Statistics
BPS-19


DISTRICT GOVERNMENT
DISTRICT ASSEMBLY
DISTRICT NAZIM
COUNCELLORS
LAW & ORDERS
NAIB NAZIM
MONITORING COMMITTEES
DISTRICT COORDINATION OFFICER
- EDO HEALTH
- EDO EDUCATION
- EDO PUBLIC HEATH
- EDO COMMUNITY SERVICES
- EDO FOREST/ENVORONMENT
- EDO LIVE STOCK
- EDO WORKS & SERVICES
- EDO PLANNING & FINANCE
- INFROMATION TECHNOLOGY (?)
TEHSIL COUNCIL
ASSEMBLY COUNCELLORS
TEHSIL NAZIM
NAIB NAZIM
MONITORING COMMITTEES
UNION COUNCEL
NAZIM
UNION ASSEMBLY
COUNCELLORS
NAIB NAZIM
MONITORING COMMITTEES

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 13-Oct.-2003 (Mon.)
Time: 11: 30

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Agriculture, Cooperatives and Food Department, Balochistan Province
Address; Civil Secretariat Block-2, Quetta

Telephone; 081-9201261 & 9201179
E-mail;

Answered by; Mr. Abdul Salam Baloch (Name of Interviewee)
Position; Secretary
Office; Agriculture, Cooperatives and Food Department (Section, Department)

Subject:
1. Important Items of Development Strategy in Agriculture, Cooperatives and Food Development
2. Persons in Charge of Important Items
3. Organization Chart of Department

Answer:

1. Important Items of Development Strategy in Agriculture, Cooperatives and Food Development

   - On-farm water management
   - High efficiency irrigation system (Trickle, Bubbler, Sprinkler)
   - Ganda (earthen dike weir in Bolan and Jhalmagsi) and Bandat (earthen dike fields in other parts of Province, namely fields of Sailaba system)
   - Agriculture and construction machinery

   As for the on-farm water management, there was a project of OECF of 1997 for five (5) districts. Facilities constructed and the systems established by the project are not well functioning due to shortage of the budget and the technology. Follow-up project is necessary.

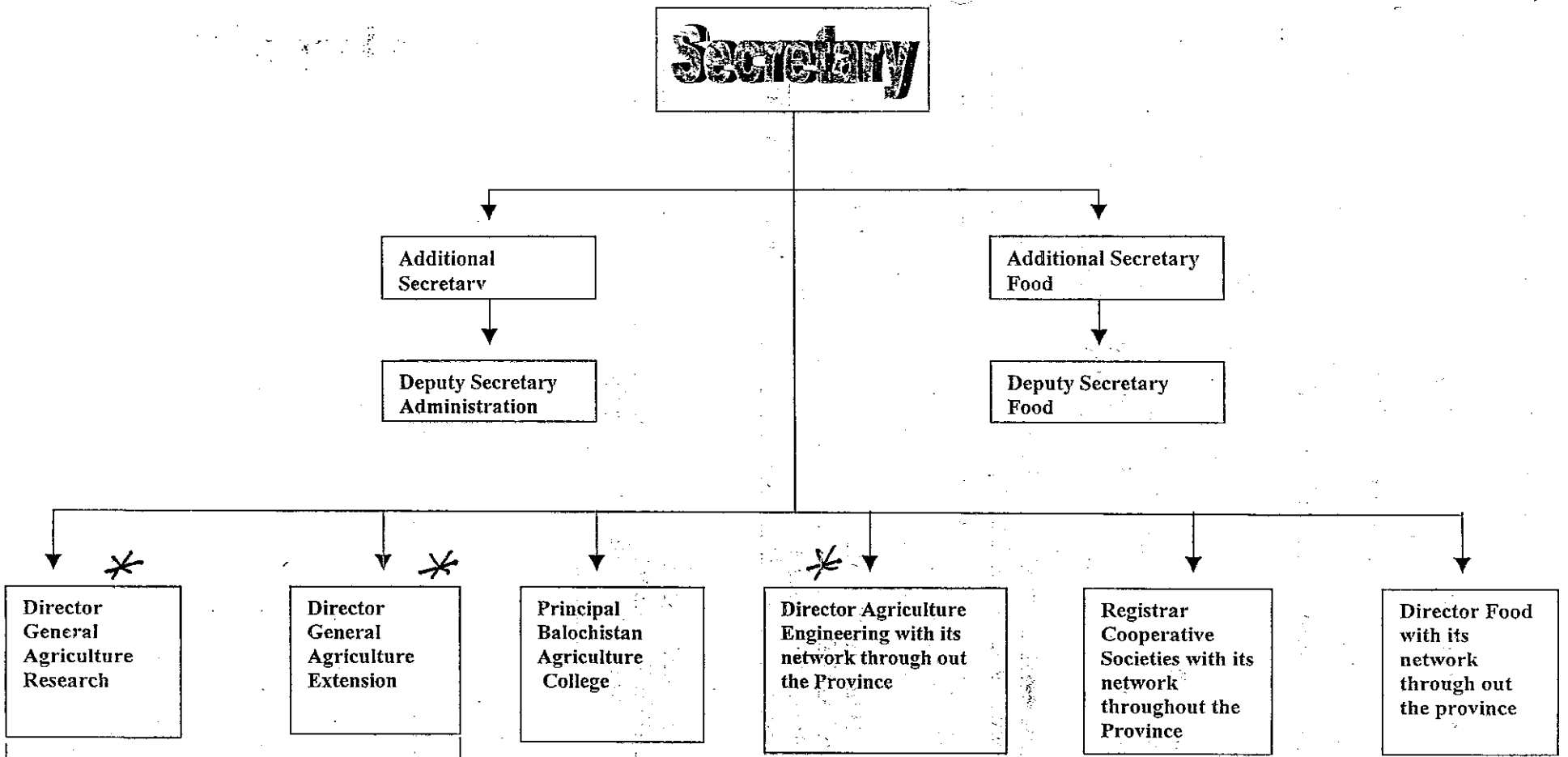
2. Persons in Charge of Important Items

- Director of On-farm water management and Trickle Irrigation under Director General of Agriculture Extension
  - On-farm water management
  - High efficiency irrigation system (Trickle, Bubbler, Sprinkler)

- Director of Agriculture Engineering
  - Ganda (earthen dike weir in Bolan and Jhalmagsi) and Bandat (earthen dike fields in other parts of Province, namely fields of Sailaba system)
  - Agriculture and construction machinery

3. Organization Chart of Department

See one (1) sheet of attachment.


Secretary
Additional Secretary
Deputy Secretary Administration
Additional Secretary Food
Deputy Secretary Food
Director General Agriculture Research
Director General Agriculture Extension
Principal Balochistan Agriculture College
Director Agriculture Engineering with its network through out the Province
Registrar Cooperative Societies with its network throughout the Province
Director Food with its network through out the province
Dir. Agri: (Research)
Dir: Vegetable Seeds
Dir: Planning
Dir: Coordination
Dir: I.P.M
Dir: Horticulture
Dir: Tropical fruits
Member – I (Agriculture)
Member – II (Natural Resources)
Res: Officers in various Sections
Director Agriculture Extension
Director Agriculture Planning
Director On Farm Water Management & Trickle Irrigation
Director Agriculture (Economics & Marketing)
Director Agriculture Development Institute Khanpur Usta Muhammad
Director Agriculture Adaptive Research
Deputy Director Agriculture Information
Deputy Director Agriculture (Procurement and Supplies)
Deputy Director Floriculture
Deputy Director Agriculture Statistics
Extension network up to Division, District, Tehsil & Village level

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 15-Oct.-2003 (Wed.)
Time: 9: 30

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Agriculture Extension Directorate General
Address; Rani Bagh, Sariab Road, Quetta

Telephone; 081-9211500
E-mail;

Answered by; Mr. Pir Muhammad Achakzai (Name of Interviewee)
Position; Director General
Office; Agriculture Extension Directorate General in Agriculture, Cooperatives and Food Department (Section, Department)

Subject:
1. Prices on Agro-economy
2. Agricultural Statistics of Balochistan
3. Price Trend of Agricultural Commodities

Answer:

1. Prices on Agro-economy

   Director of Agriculture Economics and Marketing was introduced for the data collection concerned.

2. Agricultural Statistics of Balochistan

   The book named "Agricultural Statistics Balochistan 2001-02, Statistical Wing, Directorate General Agriculture (Extension) Balochistan Quetta" was given.

   See a sheet (1/1) of copy of the cover attached.

3. Price Trend of Agricultural Commodities

   Director of Agriculture Economics and Marketing was introduced for the data collection concerned.

#03 N (1/1)

Agricultural Statistics Balochistan

2001-02

STATISTICAL WING

Directorate General Agriculture
(Extension) Balochistan
Quetta.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 15-Oct.-2003 (Wed.)
Time: 10: 30

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Agriculture Economics and Marketing Directorate
Address; Rani Bagh, Sariab Road, Quetta

Telephone; 081-9211504
E-mail;

Answered by; Mr. Abdullah Baloch (Name of Interviewee)
Position; Director
Office; Agriculture Economics and Marketing Directorate in Agriculture Extension Directorate General (Section, Department)

Subject:
1. Cropping Pattern
2. Prices on Agro-economy
3. Price Trend of Agricultural Commodities

Answer:

1. Cropping Pattern

   JICA F/S of 1997 can basically be used. As for the detailed cropping area, "Agricultural Statistics Balochistan 2001-02" can be referred to.

2. Prices on Agro-economy

   See the collected data of "I. Cost of Production per Acre" (1/6) ~ (6/6).

3. Price Trend of Agricultural Commodities

   See the collected data of :

   "II. Monthly Comparison of Wholesale Prices of Onion (dry) of Different Markets in Pakistan for the Year 2002" (1/1), and

   "III. Monthly Wholesale Prices of Agriculture Commodities and Livestock Products, 1990 ~ 2003" (1/14) ~ (14/14)

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 15-Oct.-2003 (Wed.)
Time: 11: 30

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Agriculture, Cooperatives and Food Department, Balochistan Province
Address; Rani Bagh, Sariab Road, Quetta
Telephone; 081-9211519
E-mail;

Answered by; Mr. Muhammad Ishaq Baloch (Name of Interviewee)
Position; Director
Office; On-farm Water Management and Trickle Irrigation Directorate in Agriculture Extension Directorate General (Section, Department)

Subject:
1. Present Irrigation Method and Gross Irrigation Water Requirement
2. High Efficiency Irrigation Method and Gross Water Requirement
3. Investment and O/M Costs of High Efficiency Irrigation

Answer:

1. Present Irrigation Method and Gross Water Requirement

Karez, Spring, Well, Canal, Rain, Flood

(Mr. Muhammad Riaz Khan Kasi in charge of irrigation water requirement may answer the question of water requirement.)

2. High Efficiency Irrigation Method and Gross Water Requirement

High efficiency irrigation such as trickle and bubbler has been promoted for such areas as Quetta, Pishin, Killa Saifullah, Mastung and Bolan since 2000.

(Mr. Muhammad Riaz Khan Kasi may answer the question of water requirement.)

Irrigation efficiency of trickle irrigation would reach 90%.

Additional merits are no weed, no requirement of leveling work and no salinity.

3. Investment and O/M Costs of High Efficiency Irrigation

Direct cost of facilities and materials: Rs. 90,000.-/ha in 2001-02

Rs. 125,000.- ~ 140,000.-/ha in 2003

excluding water source facilities such as the pump.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 18-Oct.-2003 (Sat.)
Time: 17: 00

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Babu & Company, Mir Afzal Khan & Co. (Private Shops)
Address; Suraj Gang Bazar, Quetta

Telephone; 081-820174, 081-822645
E-mail; knadeem@ultra.net.pk

Answered by; _____ (Name of Interviewee)
Position; Shopkeeper
Office; _____
_____ (Section, Department)

Subject: Procurement Possibility of Trickle Irrigation Facilities, Materials and Parts

Answer:

Procurement Possibility of Trickle Irrigation Facilities, Materials and Parts

1. No stock of the Trickle irrigation facilities, materials and parts is available in Quetta.
2. Those should be ordered and transported from Karachi.

Note.

According to information of the Trickle Irrigation Scheme / Agricultural Model Farm Sariab Road Quetta, only PVC pipes made in Pakistan is used, and polyethylene pipes and emitters are imported from Dubai, Saudi Arabia and UK.

Attachment: One (1) sheet of shops' addresses.

#06N (1/1)

Babu & Company

G.I. Pipes, P.V.C. Pipes, Sanitary & Gas Fittings, & Ceramics are Available

Suraj Gang Bazar, Quetta. Phone : 620174

بابو اینڈ کمپنی

جی آئی، پی وی سی پائپس، سینٹری اور گیس فٹنگ اور سرامکس کا سامان دستیاب ہے۔

سورج گنج بازار کوئٹہ۔ فون : 620174

MIR AFZAL KHAN & Co.
Suraj Ganj Road.
Phone - 822645.
Fax - 885565.
Email - Zeeshank@hotm.

MIR AFZAL KHAN & CO.
Sanitary Dealer,
Suraj Ganj Bazar
QUETTA.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 21-Oct.-2003 (Tue.)
Time: 9: 30

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; On-farm Water Management / Trickle Irrigation Directorate
Address; Rani Bagh, Sariab Road, Quetta

Telephone; 081-9211519
E-mail;

Answered by; Mr. Mamsoor Ahmed Bajwa (Name of Interviewee)
Position; Assitant Director
Office; On-farm Water Management / Trickle Irrigation Directorate, Agriculture, Cooperatives & Food Dept. (Section, Department)

Subject: Definition and Naming of "Directorate General" and "Directorate" in Organization of Agriculture, Cooperatives and Food Department

Answer:

Definition and Naming of "Directorate General" and "Directorate" in Organization of Agriculture, Cooperatives and Food Department

1. Present definition and naming have been succeeded.
2. There is no clear definition of "Directorate General" and "Directorate". Both names are sometimes used at the same level of the hierarchy of the organization. Examples are (i) Agriculture Research Directorate General, (ii) Agricultural Extension Directorate General, (iii) Agriculture Engineering Directorate, Food Directorate at the same level.
3. Some persons feel need of improvement but in actual no action has been taken.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 21-Oct.-2003 (Tue.)
Time: 11: 00

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Trickle Irrigation Scheme / Agriculture Model Farm Sariab Road
Address; Sariab Road, Quetta

Telephone; 081-892323
E-mail;

Answered by; Mr. Muhammad Riaz Khan Kasi (Name of Interviewee)
Position; Assistant Engineer
Office; On-farm Water Management and Trickle Irrigation Directorate in Agriculture Extension Directorate General (Section, Department)

Subject:
1. Crop Water Requirements
2. High Efficiency Irrigation Method
3. Extension Plan of High Efficiency Irrigation Method

Answer:

1. Crop Water Requirement

Mr. Muhammad Riaz Khan Kasi estimates the crop water requirements with use of the CROPWAT (computer program) introduced in FAO Irrigation and Drainage Paper 33.

2. High Efficiency Irrigation Method

Concept of the high efficiency irrigation development of the On-farm Water Management and Trickle Irrigation Directorate is mentioned in the attached paper named “Trickle Irrigation Scheme Department of Agriculture Extension Balochistan, Quetta”.

Programme for Farm Demonstration Centres (FDCs) is mentioned in the collected paper named “On-farm Water Management Demonstration Centres - Handbook and Records”.

3. Extension Plan of High Efficiency Irrigation Method

Mr. Muhammad Riaz Khan Kasi explained that the On-farm Water Management and Trickle Irrigation Directorate has a plan to extend the high efficiency irrigation method for the following areas:

- Quetta
- Pishin
- Killa Abdullah
- Killa Saifullah (incl. Muslimbagh)
- Zhob
- Loralai
- Ziarat
- Mastung
- Kalat
- Khuzdar
- Lasbela

27 Oct. '03
#08 N (1/3)

TRICKLE IRRIGATION SCHEME DEPARTMENT OF AGRICULTURE EXTENSION BALOCHISTAN, QUETTA

DRIP IRRIGATION

Drip irrigation (sometime called Trickle Irrigation) works by applying water slowly, directly to the soil using a low-pressure distribution system and special flow control outlet. This system deliver water to individual plant or row of plants through small diameter plastic lateral lines with devices called "Emitters" or "Drippers" at select spacing. The high efficiency of drip irrigation results from two primary factors. The first is that the water soaks into the soil before it can evaporate or runoff. The second is that the water is only applied where it is needed, (at the plant roots) rather than sprayed everywhere.

Drip irrigation is the most efficient method of irrigation. While Sprinkler system are around 75-85% efficient, drip system typically are 90% or higher. What that mean is much less wasted water. It is easy to install, easy to design, can be very inexpensive, and can reduce disease problems associated with high level of moisture on some plants.

COMPONENT OF THE SYSTEM

A drip irrigation system consist essentially of a pump, filter, control valves, water meter, fertilizer tank, pressure gauge, main line (PVC), sub main line, lateral line to which emitters are attached and flushing valve. The main, sub main and lateral lines are usually made of black PVC (polyvinyl Chloride) tubing's. The emitters are usually made of PVC material of varying discharge and types. Lateral lines are generally ranges from 10-32mm in diameter.

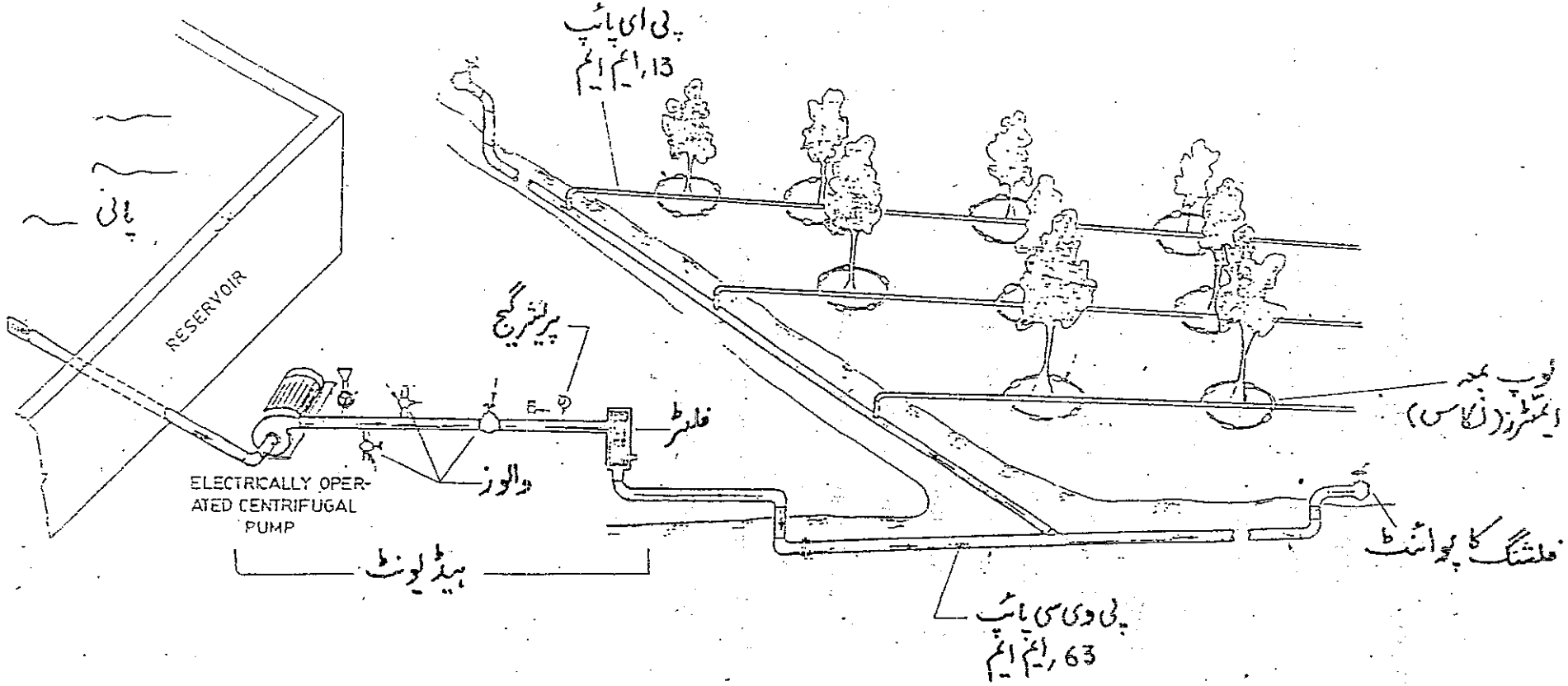
Drip irrigation has been accepted mostly for watering high value crops, such as fruit and nuts trees, grapes, sugar cane, tomato, papaya, banana, guava, pineapples, straw barries, flowers and vegetables.

BENEFITS OF TRICKLE IRRIGATION

- With drip irrigation system only the root zone of the plant is supplied with water and with proper system management deep percolation and soil evaporation losses are minimal.
- Weeds are more easily controlled, especially for the soil area that is not irrigated.
- Fertilizer, insecticides and pesticides may be injected into the system and applied in small quantities, as needed with the water.
- Low rates of water application at lower pressure are possible so as to eliminate runoff.
- Fewer weeds, less soil crusting, reduced cultivation, and thus less soil compaction and less interference with harvesting are benefits of trickle irrigation.
- Trickle irrigation is not practical or economical for closely planted crops such as cereal, grains and alfalfa.

BALOCHISTAN TRICKLE IRRIGATION PROJECT

منصوبۂ قطراتی طرز آبپاشی ۔ بلوچستان



BASIC COMPONENTS OF TRICKLE IRRIGATION SYSTEMS

نظام قطراتی طرز آبپاشی کے بنیادی حصہ جات

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 22-Oct.-2003 (Wed.)
Time: 9: 30

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Agriculture Extension Directorate
Address; Rani Bagh, Sariab Road, Quetta

Telephone;
E-mail;

Answered by; Mr. Inam-ul-Haq (Name of Interviewee)
Position; Assitant Director
Office; Agriculture Extension Directorate in Agriculture Extension Directorate General (Section, Department)

Subject: Future Plan of On-farm Water Management Projects

Answer:

Future Plan of On-farm Water Management Project

Mr. Inam-ul-Haq, Assistant Director, expressed his idea of a future plan of on-farm water management projects. He emphasized that it is not the official plan of the Agricultural Extension Directorate but his own private idea.

Future Plan

On-farm Water Management Balochistan was the OECF assisted project. Five (5) training and demonstration centers, which include training of the high efficiency irrigation, were completed in 2000. However, they are not being operated due to budget shortage. The restoration of those is expected to be realized with the foreign aid.

Locations are (i) Musa Khel Distri, (ii) Killa Saifulla District, (iii) Kalat District, (iv) Lasbela District and (v) Nasilabad.

PC-1 (1991) of the Project has been presented for reference.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 22-Oct.-2003 (Wed.)
Time: 12: 00

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; UNDP, Quetta
Address; Sariab Road, Quetta

Telephone; 081-9211638, 4499690, 445981
E-mail; adpbundp@qta.paknet.com.pk

Answered by; Dr. Rashid Javid (Name of Interviewee)
Position; Programme Coordinator
Office; Area Development Programme Balochistan, UNDP
(Section, Department)

Subject: Concept of UNDP's Future Activities in Balochistan

Answer:

Concept of UNDP's Activities in Balochistan

As mentioned in the attachement, activities would be taken in line with the Millenium Fevelopment Goals (MDGs) keeping linkage with the Area Development Program Balochistan (ADPB) to be completed in 2003.

UNDP is now preparing Initial Papers to find donors for programs of MDGs.

See the following attached:

"Millenium Development Goals of UNDP", and

"Linkage of ADPB with Millenium Development Goals (MDGs) of UNDP"

Millennium Development Goals

All goals are measured against baseline year, 1990

By 2015 all 189 United Nations Member States have pledged to:

1. Eradicate extreme poverty and hunger

- Reduce by half the proportion of people living on less than a dollar a day
- Reduce by half the proportion of people who suffer from hunger

2. Achieve universal primary education

- Ensure that all boys and girls complete a full course of primary schooling

3. Promote gender equality and empower women

- Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015

4. Reduce child mortality

- Reduce by two thirds the mortality rate among children under five

5. Improve maternal health

- Reduce by three quarters the maternal mortality ratio

6. Combat HIV/AIDS, malaria and other diseases

- Halt and begin to reverse the spread of HIV/AIDS
- Halt and begin to reverse the incidence of malaria and other major diseases

7. Ensure environmental sustainability

- Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources
- Reduce by half the proportion of people without sustainable access to safe drinking water
- Achieve significant improvement in lives of at least 100 million slum-dwellers by 2020

8. Develop a global partnership for development

- Develop further an open trading and financial system that is rule-based, predictable and non-discriminatory. Includes a commitment to good governance, development and poverty reduction — nationally and internationally
- Address the least developed countries' special needs. This includes tariff- and quota-free access for their exports; enhanced debt relief for heavily indebted poor countries; cancellation of official bilateral debt; and more generous official development assistance for countries committed to poverty reduction
- Address the special needs of landlocked and small island developing States
- Deal comprehensively with developing countries' debt problems through national and international measures to make debt sustainable in the long term
- In cooperation with the developing countries, develop decent and productive work for youth
- In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries
- In cooperation with the private sector, make available the benefits of new technologies — especially information and communications technologies

For more information on the Millennium Development Goals, see the following Web sites:

- www.un.org/millenniumgoals
- www.undg.org/login.cfm
- www.undp.org/mdg/

Printed by
United Nations Development Programme
One United Nations Plaza
New York, NY 10017
Tel: (212) 906 5295

#10M (2/4)

LINKAGE OF ADPB WITH MILLENNIUM DEVELOPMENT GOALS (MDGs) OF UNDP

The goal of Area Development Program Balochistan is 'Poverty Alleviation'. For achieving this complex and multi-facetted aim, all the program objectives, targets and interventions carried out so far, have close co-relation to the Millennium Development Goals (MDGs) of UNDP generally. The linkage of each MDG to ADPB interventions are as follows:

1. **ERADICATE EXTREME POVERTY:** The basic core of the program is to organize, build capacities and facilitate the communities to harness their own potential and generate local resources in order to come out of poverty. Nearly 509 COs comprise of 8,832 members, who have raised an amount of Rs. 38,09,748/- as cumulative saving in all regions. Capacity building of members in leadership, different sector related techniques and business/credit management has developed the human resource. Various micro-enterprises have developed through credit and due recovery rate is about 42%. **Agriculture and Integrated Pest Management (IPM):** In order to increase productivity, improve quality of agricultural output in the project area, a number of activities are being carried out. To promote good quality improved varieties of crops and fruits, 478 plots were established. To support women and to generate income at household level, ample quantity of vegetable seeds for kitchen gardening were provided to the members of WCOs. Since water scarcity is becoming a serious threat for agriculture in Balochistan attempts have been made to introduce short duration cash crops with minimum water requirement for instant pulses. To provide technical assistance and guidance to farmers, two soil and water testing laboratories and one biological laboratory have been established. To cope with pests problems 9 power spray machines were provided to community organizations on 50% cost sharing basis (and 30 knap sack sprayers free of cost) and 362 community members were given training in IPM approaches, orchard management and efficient use of irrigation water. About 1500 farmers have received training in different aspects of agriculture. Mechanized farming resulted in higher yield and income. Adoption of IPM techniques led to a reduction of production losses. Adoption of pruning practices resulted in an improvement in quality and yield of fruits. **Livestock & Fodder:** Animal health care was maximized through vaccination, parasitic control and treatment of 5,40,199 animals. Farmers' know how was upgraded on scientific lines in livestock health care, management, feeding, nutrition and marketing through training of 3,872 male and female farmers. Livestock health care services and veterinary of input delivery system at valley level was strengthened through training of 32 village livestock activists and opening of five veterinary centres through micro-credit. For drought mitigation improved cost effective feeding techniques was disseminated through fabrication and feeding of 3,63,000 Urea Molasses Blocks. Livestock fodder production base was strengthened by demonstrating improved multi-cut fodder production on 1051 acres. Breeding efficiency in ewes through flushing techniques in 4,359 ewes was improved. For income generation in female COs introduced high producing 216 teddy goats and 7,881 rural poultry chicken were introduced. Early withdrawal of male young stock from range through demonstrating commercial lamb and calf fattening of 5296 animals was encouraged. For long term dairy cattle development introduced cross breeding of local non descript cows with H/F germ plasm covering 265 cows was introduced.

2. **ACHIEVE UNIVERSAL PRIMARY EDUCATION:** Lack of educational facilities in most of the project areas compelled ADPB to choose innovative and informal mechanisms of increasing amenities for primary education for children and basic literacy for adults. These included 'home schools teacher training' for girls from WCOs, establishment of home schools independently as well as through linkages with NGOs and provision of basic school material for improvement of existing schools. This has resulted in enrollment of about 1000 children, most of whom are girls. In some villages, literacy/tuition centers are established, where

women from communities are receiving non-formal education. Support is also provided to two institutions for improving their delivery for education of 'special children'.

3. PROMOTE GENDER EQUALITY AND EMPOWER WOMEN: For the purpose of gender mainstreaming, ADPB involves women in the process of development as WCOs, right from need identification, planning, implementation to monitoring. Some strategic actions in this regard include gender sensitization of stakeholders, liaison with all important GAD forums, gender review of new provincial policies and write-ups on women rights & development. Moreover in the communities, along with men, women's economic empowerment is supported by capacity building of WCOs for decision making, income generation, business management, vocational skills and other sectoral interventions. Women's access to credit, micro-enterprise and service delivery is facilitated. As an impact of these activities, there is involvement of almost equal number of women & men in development process, all components of ADPB are gender balanced, GAD & human rights have become a regular part of public sector training courses in Balochistan, women's work load for fetching water and fire wood has reduced, they have emerged as bread winners in villages and have collectively earned around Rs. 5,50,000/- in the last two years period.

4, 5, 6. REDUCE CHILD MORTALITY, IMPROVE MATERNAL HEALTH & COMBAT HIV/AIDS, MALARIA AND OTHER DISEASES: For better health and hygiene of communities, the activities performed in ADPB field areas include 'Traditional Birth Attendant Training' (TBA) training to women from communities, due to which the TBAs/ health activists can handle maternal & child health cases correctly and more hygienically, with better information on nutrition, vaccination, family planning, first aid and minor general ailments. Hygiene orientation is also provided to men and women, which includes general diseases, including STDs and HIV/AIDS. Health relief camps providing medical advice and treatment to nearly 200 - 400 patients in each camp are conducted throughout the length of project. These camps also serve the purpose of a quick survey of prevalent diseases. For clean drinking water and diarrhea control, hand pumps are installed in all regions and sanitation habits promoted by demonstrating PIT latrines in villages either at communal places, such as school or in the homes of the poorest community members. Smokeless stove making was demonstrated to women in different field areas. Malaria control program and EPI program of Health Department is facilitated in field areas.

7. ENSURE ENVIRONMENTAL SUSTAINABILITY: **Range Management & Watershed Management:** Activities of the sector have mainly focused on creating awareness among communities about natural resources, rehabilitation of depleted rangelands, improvement of range areas and introduction of grazing management. The activities included: training of 608 livestock farmers in grazing management plus 96 farmers in range plant species plantation and management; establishment of 12 community range reserves; planting of palatable trees and shrubs over 3,044 acres; and production of 3,33,000 range plants in nurseries. The watershed management sector on the other hand aims at improving the recharge rate of aquifers, increasing production of agriculture and fodder crops through water harvesting, and protection of valuable farmlands from erosion. Activities conducted for achievements of these objectives include: training of 127 farmers in nursery raising; planting of catchments area over 2,366 acres by planting shrubs and trees of suitable species; construction of 15 water recharge ponds; 37 small water ponds; 2 fish ponds; 1.160 million cft. valley dikes; and 44,623 cft check dams; planting of 42,000 trees on farmlands, construction of water harvesting and spreading structures over 1,275 acres; 72,670 cft. flood protection gabion structures; and production of 1.400 million plants in watershed management nurseries. **Irrigation & Water:** The main activities include: demonstration of nine high efficiency irrigation systems (HEIS) comprising five trickle, two Bubbler and two sprinkler guns at Quetta, Mastung, Muslim Bagh and Sanjavi. Three training sessions were imparted in O&M of high efficiency irrigation systems, irrigation scheduling and fertigation techniques; 140 farmers and agriculture staff took part in the orientation training of community farmers to the

high efficiency irrigation was arranged which was attended by 20 farmers. Three brochures were prepared for farmers' training, which covered fertigation, irrigation scheduling through high efficiency irrigation systems for surface irrigation methods. Also 24 demonstration plots of improved irrigation practices were established and field training was imparted to the farmers. 190 farmers from various communities participated. Rehabilitation of 20 karezes at Pishin, Muslim Bagh, Loralai, Kalat and Khuzdar was completed. seven lined water reservoirs for irrigation were constructed, while construction of two inverted siphons was undertaken. Additionally two lined irrigation channels were constructed, and 15 community drinking water supply schemes were completed. A green house was constructed for tissue culture laboratory at Agriculture Research Institute Sariab. Technical support provided to trickle irrigation project of agriculture department. Also water quality testing equipments was provided for laboratory of Irrigation and Power department. **Productive and Social Infrastructure:** Rehabilitation of eight karezes and six water supply schemes were completed. Channel construction of one siphon / conduit was completed. Constructions of four water storage reservoir for irrigation were completed. Also a 'date packaging factory' and a cutting /training stitching unit were established at Burshore/Pishin and one at Loralai.

8. DEVELOP A GLOBAL PARTNERSHIP FOR DEVELOPMENT:

Linkage has been developed with Export Promotion Bureau, for exploring avenues of international marketing of local products, such as agricultural products and handicraft.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 23-Oct.-2003 (Thu.)
Time: 10: 00

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Water Resources Research Centre (WRRC)
Address; 47 - Gul Town, Quetta

Telephone; 081-9202418
E-mail;

Answered by; Dr. Jalal-ud-Din Qureshi (Name of Interviewee)
Position; Deputy Director
Office; Water Resources Research Centre (WRRC) in Pakistan Council of Research in Water Resources (PCRWR) (Section, Department)

Subject:
1. Irrigation Related Major Activities of WRRC
2. Establishment of Supply Company of Trickle Irrigation Facilities (Materials and Parts)

Answer:

1. Irrigation Related Major Activities of WRRC

The following are the irrigation related major activities:
See the attached sheet (1/2).

- Promotion of development and fabrication of trickle irrigation system on orchards
  See the attached sheet (2/2).
- Determination of water requirement of orchards in Balochistan through Lysimetric and other advanced techniques.
- Survey of Trickle irrigation system in Balochistan

2. Establishment of Supply Company Trickle Irrigation Facilities (Materials and Parts)

The following are the irrigation related major activities:

WATER RESOURCES RESEARCH CENTRE, QUETTA

LIST OF PROJECTS

1. Establishment of Water Resources Research Centre in Balochistan;
2. Survey and Evaluation of Delay Action Dam in Balochistan;
3. Assessment and Improvement of Traditional Karez Irrigation System in Balochistan;
4. Conjunctive Use of Flood & Groundwater in Loralai, Balochistan;
5. Development & Fabrication of Trickle Irrigation System on Orchards in Pakistan;
6. Appraisal of Groundwater Resources of Ziarat Valley Using Isotopic & Chemical Techniques;
7. Development of Water Resources Management Model for Chapper Valley, Balochistan;
8. Determination of Water Requirement of Orchards in Balochistan Through Lysimetric and other advanced techniques;
9. Groundwater Exploitation Through 250 Windmills in Drought Stricken Areas of Balochistan;
10. Upgradation of WRRC, Quetta to undertake rejuvenation of depleting aquifers and propagation of high efficiency irrigation systems in Balochistan;
11. Survey of Trickle Irrigation System in Balochistan;
12. National Water Quality Monitoring Programme; and
13. Research and Demonstration of Water Harvesting Practices in Balochistan, Pakistan under MOU with ICIMOD.

#11 N (7/2)

WATER IS A FOUNTAIN OF LIFE, IT IS ECONOMICAL GOOD, SAVE IT (FROM WASTAGE AND POLUTION

CLEAN ENVIRONMENT & PURE WATER ARE ESSENTIAL FOR LIFE, 80% DISEASES ARE CAUSED BY POLLUTED WATER (WHO)

SAVE WATER FOR YOUR NEXT GENERATION

WATER SAVER

ENVIRONMENTAL SERVICES

(WATER SENSE / WELFARE)

Kansi Building Adjacent to Children Hospital, Patel Bagh, Quetta, Balochistan
E-mail: watsees@yahoo.com Ph # 081 - 828858 Mob # 0320 - 4793568

زیر زمین پانی کی تلاش

SENIOR PRINCIPAL HUDROGEOLOGIST
Geophysicist / Engineers / Scientist / Doctors

WATER SAVER ENVIRONMENTAL SERVICES (WATER SENSE / WELFARE)

Hydrogeologist, Hydrologist, Civil Engineers, Agriculture Engineer, Geophysist , Soil Scientist M.B.B.S., & DVM Doctors.

WATER STUDIES SPECIALIST **5 PhDs, 5 Masters & Number of Diploma Holders Engineer & Scientist in various fields**

Water is the most essential component of all living thing and it supports the life process. Without water it would not have been possible to sustain life on this Planet. Balochistan is the largest province of Pakistan but population wise, it is the smallest. Agriculture is the mainstay of its economy. But due to sever drought and declination of Ground water level number of Karezs and Tubewells were completely driedup. Farmers are facing acute shortage of water for irrigation and Agriculture purpose. Our Senior Staff member having more than 20 years practical Experience are ready to provide the following technical services,

1. **Geological Investigation**
2. **Geophysical Surveys**
3. **Ground Water & Surface water investigations**
4. **Water quality analysis**
5. **Environmental issues**
6. **Research & development programs**
7. **Computer Modeling**
8. **Dam Designing**
9. **Organizing Training, Workshop Etc.**

for the better development of Balochsitan.

Clean Environment and Pure Water are Essential for Life

Projects in Hand

Dealing with multi purpose projects of water resources management, engineering works, geological, geophysical survey, drilling groundwater, surface water (flood control), water purification plant & water filter snow estimation development, research, computer modeling, municipal water supply, water pollution, irrigation and agriculture projects, forest development, soil and water quality testing analysis, Karez irrigation systems, dam weir & other channel designing, socio economic survey, environmental projects, salinity & sediment control, training & workshops, field surveys, recharge of groundwater projects, windmill project, Trickle, Bubbler & Sprinkler Irrigation System & etc.

WATER IS A FOUNTAIN OF LIFE, IT IS ECONOMICAL GOOD, SAVE IT (FROM WASTAGE AND POLUTION

29

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 23-Oct.-2003 (Thu.)
Time: 11: 15

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Arid Zone Research Centre (AZRC), Federal Government
Address; P.O. Box 63, Brewery Road, Quetta

Telephone; 081-853620
E-mail; aridzone@agric.qta.sdnpk.org

Answered by; Dr. Mohammad Afzal (Name of Interviewee)
Position; Chief Scientific Officer
Office; Animal Sciences Division, Pakistan Agricultural Research Council
(Section, Department)

Subject:
1. Agricultural Land Owner
2. Agricultural Economics of Khushkaba and Sailaba
3. Trickle Irrigation Experiments

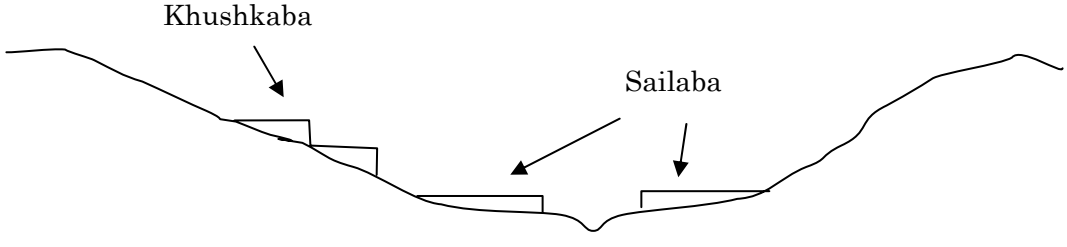
Answer:

1. Agricultural Land Owner

   a. Government Land
   Legal land could be transferred to the tribe head and the farmer.

   b. Tribe Head's Land
   Tribe head's land would never be transferred to the farmer.

2. Agricultural Economics of Khushkaba and Sailaba



a. Khushkaba

Khushkaba is the rainfed field with Bandat (bench terrace with earth dikes), which is located in the upper slope area of a valley.

The yield is 50% of it with the tube well irrigation,

b. Sailaba

Sailaba is the flood irrigation field with Bandat (bench terrace with earth dikes), which is located along the seasonal river.

The yield is 70%~80% of it with the tube well irrigation.

3. Trickle Irrigation Experiments

AZRC does not conduct the trickle irrigation experiments.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 27-Oct.-2003 (Mon.)
Time: 9: 30

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; World Bank in Pakistan
Address; 20-A, Shahrah-e-Jamhuriat, Ramna 5, (G - 5/1), Islamabad

Telephone; 051-9090103
E-mail; asyed@worldbank.org

Answered by; Mr. Abdul Salam (Name of Interviewee)
Position; Chief of Library
Office; Library of World Bank in Pakistan
(Section, Department)

Subject: Future Strategy and Projects for Aid in Balochistan for Water Sector

Answer:

Future Strategy and Projects for Aid in Balochistan for Water Sector

There is an overall strategy that is the Pakistan's Poverty Reduction Strategy.
See "Pakistan Country Assistance Strategy FY03-05, World Bank, June 24, 2002".

1. **Projects**

   After the Balochistan Community Irrigation and Agriculture Project, there are no planned projects to be implemented during coming three (3) years from 2004 to 2006.

2. **Fund**

   Fund allocation to Balochistan Province will be made until the end of 2004 for the ongoing project such as Drought Emergency Recovery Assistance Programme (DERA). There is no plan of fund allocation from 2005.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 27-Oct.-2003 (Mon.)
Time: 9: 30

Interviewer:
Name; NODA Kuninobu
Position; Water Utilization Expert
JICA Preparatory Study Team

Interviewee:
Organization; Asian Development Bank in Pakistan
Address; OPF Building, Shahrah-e-Jamhuriyat, Sector G - 5/2, Islamabad

Telephone; 051-2825011-16
E-mail; adbprm@adb.org

Answered by; Mr. Raza M. Farrukh (Name of Interviewee)
Position; Project Implementation Officer
Office; Project Implementation Office
(Section, Department)

Subject: Future Strategy and Projects for Aid in Balochistan for Water Sector

Answer:

Future Strategy and Projects for Aid in Balochistan for Water Sector

There is an overall strategy that is the Bank's Country Strategy and Program (CPS) for Pakistan for the period 2002-2006.
See "ADB Pakistan Sector Assessment Review, Asian Development Bank, October 2003".

Ongoing project such as Drought Impact Mitigation & Recovery Component (DIMRC) would finish in 2004/

There is the planned project "2nd Flood Protection Sector Project" to be implemented during coming three (3) years from 2004 to 2006. There is no other planned project.

It is noted that the ADB Programming Mission to be dispatched to Balochistan in December 2003 might formulate other projects in the water sector.

(3) 質問票・回答 － 建設機械計画

番号	訪問先	質問事項
#01_K	Agriculture, Cooperative and Food Dept., Balochistan	Present Conditions of the Equipment Supplied by Past Japan's Grant Aid Programs, etc.
#02_K	Agriculture, Cooperative and Food Dept., Balochistan	List of All the Construction Equipment, Rental Charge, Organization Chart, Annual Budget, etc.
#03_K	Agriculture, Cooperative and Food Dept., Balochistan	Future Plan Proposed by Directorate of Agricultural Engineering, etc.
#04_K	Communication and Works, Balochistan	Present Conditions of the Equipment and Repair Workshop
#05_K	Communication and Works, Balochistan	List of All the Construction Equipment, Rental Charge, Organization Chart, Annual Budget, etc.
#06_K	Haji Musa Jan (Contractor)	Availability of Labor, Construction Materials and Equipment, etc.
#07_K	Irrigation and Power Dept., Balochistan	List of All the Construction Equipment, Rental Charge, Organization Chart, Annual Budget, etc.
#08_K	Irrigation and Power Dept., Balochistan	Present Conditions of the Equipment/ Repair Workshop
#09_K	Irrigation and Power Dept., Balochistan	Rental Charge of Bulldozer/ Drilling Machine
#10_K	Irrigation and Power Dept., Balochistan	Bidding Procedure, Contact Document, Cost Data, Norm of Cost Estimate, etc.
#11_K	Irrigation and Power Dept., Balochistan	Contract Document, Bidding Procedure, Local Contractor
#12_K	Public Health Engineering Dept.	List of the Machinery, Present Conditions of the Machinery

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 8-Oct.-2003 (Wed.)
Time: 16: 00

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Agriculture, Cooperative and Food Department, Balochistan Province
Address; Link Sariab Road, Quetta

Telephone; 081-9211318
E-mail;

Answered by; Mr. Jamil Rind (Name of Interviewee)
Position; Deputy Director
Office; Directorate of Agricultural Engineering
(Section, Department)

Subject:
1. Present Conditions of the Equipment Supplied by Past Japan's Grand Aid Programs
2. Present Conditions of the Repair Workshop Owned by Directorate of Agricultural Engineering

Answer:

1. Present Conditions of the Equipment Supplied by Past Japan's Grand Aid Programs

①農業技術部が所有する全ての施設、機材は、全て標準使用年数を超えて運営している。これは、バロチスタン州内の各地区に配置された施設、職員が、維持管理マニュアルに従って所有する機材をうまく管理・運営していることに起因する（実際、20 年前に供与されたブルドーザは現在においても稼働可能な状態にある）。

②同部が所有する機材は、農業用あるいは洪水防御用として農民に貸出されている。また、農業目的以外としては、灌漑発電局が実施している地下水涵養ダム（DAD）建設用として建設業者へ貸出されている

2. Present Conditions of the Repair Workshop Owned by Directorate of Agricultural Engineering

① 同部はクエッタにある修理工場と同規模の施設を計 6 箇所所有している。各修理工場の所在地は以下のとおりである。

1) Quetta
2) Khuzdar
3) Sibi
4) Turbat
5) Lorelai
6) Nasirabad

また、上記修理工場の管理下にある地区事務所にはそれぞれ簡易な補修施設を備えている。

②クエッタの修理工場は 1957 年に設立された。工場内に設置されている機械類は既に 46 年経過しているが、維持管理状況も良く、現在でも支障なく機能している。

3. その他

①農業技術部は、現在各部局で目的に応じた機材を所有している機材を一括管理する組織設立構想を持っている。現在、この提案は州政府計画開発局を議長に審議中である。

②農業技術部は、1994 年に設立した農業機械技術訓練センターを有する。ここでは、同部職員並びに一般市民も対象に技術訓練を実施している。

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 10-Oct.-2003 (Fri.)
Time: 10: 00

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Agriculture, Cooperative and Food Department, Balochistan Province
Address; Link Sariab Road, Quetta

Telephone; 081-9211318
E-mail;

Answered by; Mr. Syed Saadat Hussain Naqvi (Name of Interviewee)
Position; Director
Office; Directorate of Agricultural Engineering
(Section, Department)

Subject: 1. Refer to Detailed Questionnaire Attached Herewith

Answer:

1. Detailed Questionnaire Attached Herewith

各質問項目に対する答えは、後日紙面で回答する。

2. その他

① 農業組合食糧局は圃場内整備及び農地開発を担当し、灌漑発電局は圃場外のインフラ整備（Delay Action Dam、灌漑水路等）を担当する。

② 農業組合食糧局が担当する事業は、機材（ブルドーザ、トラクター等）を補助金による有利なレートで農民へ貸出す方式で実施している。

③ 灌漑発電局が担当する事業では、建設業者が工事を請け負い、一部機材を建設業者へ貸出す方式で実施している。

Questionnaire

I. The following equipment were supplied on the Basic Design Study on the Project for Agricultural Land Development & Reclamation in the Province of Balochistan, 1994.

1）	Bulldozers, 140HP class	: 77 units
2）	Spare parts for Bulldozer	: For 3 years
3）	Transporter, 6 x 6 Max. loading 20 t	: 6 units
4）	Spare parts for Transporter	: For 3 years
5）	Fuel Tanker, 6 x 4 Tank capacity 7,000 l	: 6 units
6）	Pick-up car, 4 x4 Double cabin type	: 6 units
7）	Jeep, 4 x 4	: 5 units

In addition, the following bulldozers were supplied by Japan's grand aid KR-II programs.

A) **1982－1983**：Bulldozer 140HP, 117 units

B) **1987－1988**：Bulldozer 120HP, 86 units

C) **1990－1991**：Bulldozer 140HP, 10 units

II. Detailed Items to be confirmed are as follows:

1. List of the bulldozers owned by Agriculture Engineering Department, which was classified into 3 category that is 1) Number of workable, 2)Number of none-workable (under repairing), and 3)Number of scrap
2. List of all the construction equipment owned by Agriculture Engineering Department, including quantity, past year, and conditions (workable, none-workable, or scrap) of each equipment
3. Respective rental charge of the bulldozer for the following cases.
   ① Agriculture purpose：250 Rp/hour（If the charge will be paid by cash）
   ② Agriculture purpose：300 Rp/hour (If the charge will be paid by a special fund), Poor farmer only can be applied. 30 Rp (10%) of 300 Rp is required to be paid by poor farmer、the remains is paid by some funds）
   ③ The work except agriculture purpose：700 Rp/hour
4. Organization chart of the Agriculture Engineering Department, and Number of engineer, operator, mechanic, officer etc.
5. Annual budget of the Agriculture Engineering Department, which was classified into each items
6. Organization chart of district/ regional repair workshops
7. Number of each facilities/ equipment installed and number of the working staffs in each district/ regional repair workshops
8. Method of daily/ regular basis for each construction equipment
9. Method of management for spare parts of the construction equipment
10. Technical training center for agricultural machine, which was opened in 1994 (Training course, Number of trainer, Number of instructor and officer, Annual budget, etc.), Available of the Brochure on the said Technical training center

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: **09-Oct-2003(Thu)**
Time:

Interviewer:
Name; **TAKAHASHI Shinya**
Position; **HYdro-**
JICA Preparatory Study Team

Interviewee:
Organization: **Techno-Consult International under WASA project.**
Address: **2nd Floor WASA, office, ZArghoon Road Quetta**
Telephone: **+081 450485**
E-mail:

Answered by:
- Dr. Muhammad Bashir Lakhani, Team Leader, Investigation Phase – Technical Support Team
- Mr. Muhammad Jahazeb Maik, GIS-expert, Investigation Phase – Technical Support Team
- Mr. Anwer Jhah Khan, GIS Specialist / Cartographer, Ministry of Petroleum and Natural Resources, Geological Survey of Pakistan, Quetta

Position: **(see above)**
Office: **WASA office**

Subject: **1) Request for Information**

- Groundwater resources in Pishin-Lore groundwater basin are being assessed for a further development for water supply to Quetta City.
- GIS presentation is being prepared for WASA by the consultant
- Groundwater monitoring data is being supplied on monthly basis form the Water Resources Planning Development and Monitoring (WRPD&M) Directorate, Irrigation and Power Department, GoB, Quetta.
- The assessment will be completed by the end of December this year.

A satellite imagery showing groundwater monitoring stations in Pishin-Lora groundwater basin and a GIS presentation was given as a sample information.

=== end of document===

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 20-Oct.-2003 (Mon.)
Time: 9: 30

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Communication and Works Department
Address; Whyite Road, Quetta

Telephone; 081-9202867
E-mail;

Answered by; Mr. Qazi Amanullah (Name of Interviewee)
Position; Chief Engineer-I
Office; Communication and Works Department
(Section, Department)

Subject: 1. Present Conditions of the Equipment and Repair Workshop

Answer:

1. Present Conditions of the Equipment and Repair Workshop

① C&W Dept.が所有する修理工場並びに道路建設用機材に関する資料は、修理工場の Executive Engineer と面談して入手する。

2. その他

機材に関する予算申請の手順について下記の通り確認した。

① Budget for Development

予算書（PC-I 見積り）を P&D Dept.へ提出、承認後 Finance Dept.へ提出され、予算がリリースされる。

② Budget for Non-Development (従業員の給料及び施設維持費等)

予算書を直接 Finance Dept.へ提出、予算がリリースされる。

また、参考までに水電力公団（WAPDA）の現在の担当分野について下記の通り確認した。

水電力公団は、全ての州の送電網工事と大規模の貯水ダム・灌漑水路の工事を担当している。したがって、クエッタにあった地下水開発部門（Drilling機材と地下水調査部門）は灌漑発電局へ移管された。

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 20-Oct.-2003 (Mon.)
Time: 11: 00

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Communication and Works Department
Address; Eastern By-pass Road, Quetta

Telephone; 081-892487
E-mail;

Answered by; Mr. Noor Ahmed (Name of Interviewee)
Position; Executive Engineer
Office; E&M Workshop Division
(Section, Department)

Subject: Refer to the Detailed Questionnaire attached

Answer:

1. Detailed Questionnaire

各質問の内、可能な限り資料を入手した。

2. その他

修理工場及び待機している下記建設機械を視察した。

① 砕石生産設備（現在修理中）

② モーターグレーダ

③ 振動ローラ

④ タイヤローラ

⑤ トラック＆トレーラ

⑥ アスファルト生産設備（1991 年中国からの無償供与）

Questionnaire

Detailed Items to be confirmed are as follows:

1. List of the bulldozers owned by Irrigation and Power Department, which was classified into 3 category that is 1) Number of workable, 2)Number of none-workable (under repairing), and 3)Number of scrap
2. List of all the construction equipment owned by C & W Department, including quantity, past year, and conditions (workable, none-workable, or scrap) of each equipment
3. In case that your owned construction equipment rent to the Contractor, How much a rental charge of each construction equipment per hour
4. Organization chart of the Machinery and Equipment Section, and Number of engineer, administrator, operator, mechanic, electrician, officer etc. of the repair workshop
5. Annual budget of the Machinery and Equipment Section, which was classified into each items
6. Organization chart of repair workshop
7. Number of each facilities/ equipment installed and number of the working staffs in repair workshop
8. Method of daily/ regular basis for each construction equipment
9. Method of management for spare parts of each construction equipment

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 15-Oct.-2003 (Wed.)
Time: 12: 00

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Contractor; Haji Musa Jan
Address; 162 Sumungli Town, Quetta

Telephone; 081-828029
E-mail;

Answered by; Mr. Haji Musa Jan (Name of Interviewee)
Position; President
Office; Quetta
(Section, Department)

Subject: 1. Brochure of the Contractor (Capability of local contractor)
2. Availability of Labor, Construction Materials and Equipment

Answer:

1. Brochure of the Contractor

当コントラクターの説明書を入手した。

2. Availability of Labor, Construction Materials and Equipment

①Labor は Skilled Labor から Common Labor までパキスタン国内で雇用可能。

②建設材料は全てパキスタン国内で調達可能。

③建設機械は、当コントラクターの場合、主要な機械は所有しており、またレンタル会社とリース契約して所有している機械もある。これら機械リストは、上記 Brochure にリース契約書と共に添付されている。

④参考までに 2003 年現在の主要な Material Price 及び Labor wage は次の通り。

- Steel : Rp. 31,000/ton, Cement : Rp. 245/bag(50kg), Diesel oil : Rp. 21/liter
- Skilled Mason wage : Rp. 500/day, Common labor wage : Rp. 150/day

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 11-Oct.-2003 (Sat.)
Time: 10: 00

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Irrigation and Power Department, Balochistan Province
Address; Saryab Road, Quetta

Telephone; 081-9211113
E-mail;

Answered by; Mr. Arbab Yousaf (Name of Interviewee)
Position; Director General
Office; Water Resources Planning, Development & Monitoring Directorate
(Section, Department)

Subject: 1. Refer to Detailed Questionnaire Attached Herewith

Answer:

1. Detailed Questionnaire Attached Herewith

各質問項目に対する答えは、Deputy Director である Mr. Nadir Ali が回答を準備する。

2. その他

① 灌漑発電局はクエッタに一箇所修理工場を所有する。

② 灌漑発電局の組織図は後日に渡す。

③ 日本政府の一般無償案件で WAPDA へ供与された 5 台の井戸掘り用リグ機材は、1998 年に灌漑発電局へ移管された。

Questionnaire

Detailed Items to be confirmed are as follows:

1. List of the bulldozers owned by Irrigation and Power Department, which was classified into 3 category that is 1) Number of workable, 2)Number of none-workable (under repairing), and 3)Number of scrap
2. List of all the construction equipment owned by Irrigation and Power Department, including quantity, past year, and conditions (workable, none-workable, or scrap) of each equipment
3. In case that your owned construction equipment rent to the Contractor, How much a rental charge of each construction equipment per hour
4. Organization chart of the Machinery and Equipment Section, and Number of engineer, administrator, operator, mechanic, electrician, officer etc. of the repair workshop
5. Annual budget of the Machinery and Equipment Section, which was classified into each items
6. Organization chart of repair workshop
7. Number of each facilities/ equipment installed and number of the working staffs in repair workshop
8. Method of daily/ regular basis for each construction equipment
9. Method of management for spare parts of each construction equipment

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 11-Oct.-2003 (Sat.)
Time: 11: 00

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Irrigation and Power Department, Balochistan Province
Address; Saryab Road, Quetta

Telephone; 081-921120
E-mail;

Answered by; Mr. Nadir Ali (Name of Interviewee)
Position; Deputy Director, Workshop & Store
Office; Water Resources Planning, Development & Monitoring Directorate
(Section, Department)

Subject:
1. Present Conditions of the Equipment Owned by Irrigation and Power Department
2. Present Conditions of the Repair Workshop Owned by Irrigation and Power Department

Answer:

1. Present Conditions of the Equipment Owned by Irrigation and Power Department

①全ての機材は、バロチスタン州の各地区事務所の Executive Engineer の管理下で稼働中である。通常の点検・修理は近くの民間修理工場で実施している。クエッタの修理工場では、オーバーホール（大修理）等が必要な時にのみ各地区事務所から搬送され、修理を実施する。

②井戸掘り用リグ機材は全て稼働可能な状態にある。尚、現在リグ機材のスペアパーツ、特に消耗品であるビッドが不足している。不足しているビットの仕様及び数は以下の通りである。

1）ビット 12”1/4 diameter :100 nos.

2）ビット 17”1/2 diameter :100 nos.

尚、ビットの消耗は、参考値として深さ約 1,000 フィートで全損となる。

2. Present Conditions of the Repair Workshop Owned by Irrigation and Power Department

① 修理工場内に設置された機械類は、1986 年に USAID によって供与された。

② 年間予算では、2001－2002 年は、14 台のブルドーザと 1 台のバックホーの修理用として Rp. 10 million、2002－2003 年も同額の Rp. 10 million が配分された。2003－2004 年については、ブルドーザ（D6D）のスペアパーツ調達用として Rp. 10 million 予算化されており、まもなく配分される予定。

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 21-Oct.-2003 (Tue.)
Time: 12: 00

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Irrigation and Power Department, Balochistan Province
Address; Saryab Road, Quetta

Telephone; 081-921120
E-mail;

Answered by; Mr. Nadir Ali (Name of Interviewee)
Position; Deputy Director, Workshop & Store
Office; Water Resources Planning, Development & Monitoring Directorate
(Section, Department)

Subject:
1. Rental Charge of Bulldozer D6D
2. Rental Charge of Drilling Machine

Answer:

1. Rental Charge of Bulldozer D6D

建設業者へ貸出すブルドーザの賃貸価格は下記の通り。

① Rp. 870 per hour without P.O.L.(Petrol, Oil and Lubricant)

② Rp. 1,320 per hour with P.O.L

2. Rental Charge of Drilling Machine

建設業者へ貸出す井戸掘削用機材の賃貸価格は以下の通り。

①Tube Well 掘削費（深さ 500 feet） : Rp. 24,000

②維持修理費（深さ 500 feet） : Rp. 23,700

③注入器による循環用オイルの Supply 費 : Rp. 36,300

以上①～③の合計は Rp. 84,000 (深さ 500 feet)

したがって、1 feet 当りの価格は Rp. 168 と算出される。

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 13-Oct.-2003 (Mon.)
Time: 12: 30

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Irrigation and Power Department
Address; Sariab Road, Quetta

Telephone; 081-9211155
E-mail;

Answered by; Mr. Qutab Khan (Name of Interviewee)
Position; Sub-Divisional Officer
Office; Sub Divisional Office, Irrigation
(Section, Department)

Subject:
1. Bidding Procedure
2. Contract Document
3. Cost Data (Labor wage, material price and equipment cost)
4. Norm of Cost Estimate (Authorized Norm)
5. Contractor (Major local contractor in Quetta)

Answer:

1. Bidding Procedure

Bidding Procedure に関して記載されている資料を収集して渡す。

2. Contract Document

州政府資金と ADB 資金の 2 種類の Contract Document を準備する。

3. Cost Data (Labor wage, material price and equipment cost)

州政府計画開発局（Planning and Development Dept.）がまとめた、Engineer's Estimate時に適用する各単価が記載されたDocument、"Composite Schedule of Rate 1998"のコピーを渡す。

4. Norm of Cost Estimate (Authorized Norm)

先に渡した"PC-I/ Estimate, Construction of Wali DAD Delay Action Dam"の報告書の中に、Detailed Estimate が含まれている。この中で参照している各工事項目の単価は、全て上記 3 の Document で設定された単価である。

5. Contractor (Major local contractor in Quetta)

Quetta 周辺に事務所を持ち、DAD 建設の経験豊富な建設業者を紹介する。

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 14-Oct.-2003 (Tue.)
Time: 12: 00

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Irrigation and Power Department
Address; Sariab Road, Quetta

Telephone; 081-9211155
E-mail;

Answered by; Mr. Qutab Khan (Name of Interviewee)
Position; Sub-Divisional Officer
Office; Sub Divisional Office, Irrigation
(Section, Department)

Subject: 1. Contract Document
2. Bidding Procedure
3. Local Contractor

Answer:

1. Contract Document

州政府資金の場合、建設業者は Total Amount のみを記載して応札する。一方、WB あるいは ADB 資金の場合は、各 Pay Item に単価を記載した上で Total Amount を集計、記載して応札する。州政府資金の Contract Document と ADB 資金の Tender Document を入手した。

2. Bidding Procedure

入札及び評価手続きが記載された資料を入手した。

3. Local Contractor

DAD 建設の経験豊富な Local Contractor との面談日を設定した。

州政府の公共工事に応札できる Contractor は、州政府各局で以下のカテゴリー別（応札可能なプロジェクトの予算別）に登録されている。

カテゴリーA：100～10 million Rp.

カテゴリーB：10～2.5 million Rp.

カテゴリーC：2.5～0.1 million Rp.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 20-Oct.-2003 (Mon.)
Time: 13: 00

Interviewer:
Name; Koji KOGA
Position; Construction Equipment Planner
JICA Preparatory Study Team

Interviewee:
Organization; Public Health Engineering Department
Address; Eastern By-pass Road, Quetta

Telephone; 081-892215
E-mail;

Answered by; Mr. Thaikh Nawax Ahmed (Name of Interviewee)
Position; Executive Engineer
Office;
(Section, Department)

Subject: 1. List of the Machinery Owned by PHE Dept.
2. Present Conditions of Each Machinery

Answer:

1. List of the Machinery Owned by PHE Dept.

Public Health Engineering Dept.が現在所有している井戸掘り用リグ機材は下記の 4 台であることを確認した。

①1987 年モデル : 1 台

②1985 年モデル : 3 台

したがって、1996 年に日本政府の一般無償案件で供与されたリグ機材は含まれていないことを確認した。

尚、詳細な機材リストを別途入手した。

2. その他

井戸掘削工事は、灌漑及び飲料水の両方を目的とする場合は灌漑発電局が担当、リグ機材を建設業者へ貸出し工事を行う。一方、Rural Area で飲料水を目的とする場合（地方給水）は、Public Health Engineering Dept.が担当し、所有するリグ機材を使用して直営方式で工事を行う。

尚、Public Health Engineering Dept.は現在水質等検査する試験所は所有していない

(4)　質問票・回答 － 社会条件調査／住民参加調査

番号	訪問先	質問事項
#01_S	Irrigation Division Quetta, Balochistan Province	BCIA Project of Irrigtion Department, etc
#02_S	Forest and Wildlife Department, Balochistan Province	List of Natural conservation and Cultural ruins in Balochistan, etc
#03_S	SPO (Strengthening Participatory Organization) NGO	SPO organization structure, etc

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 23-Oct.-2003
Time: 14: 30

Interviewer:
Name; N. Shimmura
Position; Social Condition Specialist
JICA Preparatory Study Team

Interviewee:
Organization; Irrigation Division Quetta, Balochistan Province
Address; Office of the Irrigation Division, Sariab Road, Quetta

Telephone; 081-9211005
E-mail;

Answered by; Mr. Saleem Khal (Name of Interviewee)
Position; BCIA (Balochistan Community Irrigation and Agriculture) Project officer
Office; BCIA Project office in Irrigation division

Subject: We (JICA Study Team) would like to know
1. BCIA Project of Irrigation department
2. Model districts of farmer participatory Project

Answer:

1. **BCIA Project of Irrigation department**

   Refer to our department's BCIA Project reports.

2. **Model districts of farmer participatory Project**

   Refer to our department's List of BCIA Project districts

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 24-Oct.-2003
Time: 9: 30

Interviewer:
Name; N. Shimmura
Position; Social Condition Specialist
JICA Preparatory Study Team

Interviewee:
Organization; Forest and Wildlife Department, Balochistan Province
Address; Office of the Forest and Wildlife Department, Spinny Road, Quetta

Telephone; 081-9201137
E-mail;

Answered by; Mr. Syed Ali Imran (Name of Interviewee)
Position; Forests Coordinator
Office; Forest and Wildlife Department

Subject: We (JICA Study Team) would like to know
1. List of Natural conservation and Cultural ruins in Balochistan
2. Balochistan conservation strategy of Natural and cultural ruins

Answer:

1. List of Natural conservation and Cultural ruins in Balochistan

Refer to our organization's List of Natural conservation and Cultural ruins.

2. Balochistan conservation strategy of Natural and cultural ruins

Refer to book of「Balochistan Conservation strategy」IUCN published.

Answer Sheet for Questionnaire
on
Preparatory Study on the Project
for Development of Flood Outflow Water in Balochistan Province
in the Islamic Republic of Pakistan

Date: 10-Oct.-2003
Time: 10: 00

Interviewer:
Name; N. Shimmura
Position; Social Condition Specialist
JICA Preparatory Study Team

Interviewee:
Organization; SPO (Strengthening Participatory Organization) NGO
Address; H, 430-D, Smungli, Housing Scheme Smungli Road, Quetta

Telephone; 081-833801
E-mail;

Answered by; Mr. Zafar Zeeshan (Name of Interviewee)
Position; Regional Director
Office; SPO office in Quetta

Subject: We (JICA Study Team) would like to know
1. SPO organization structure
2. Contents of SPO activity

Answer:

1. **SPO organization structure**

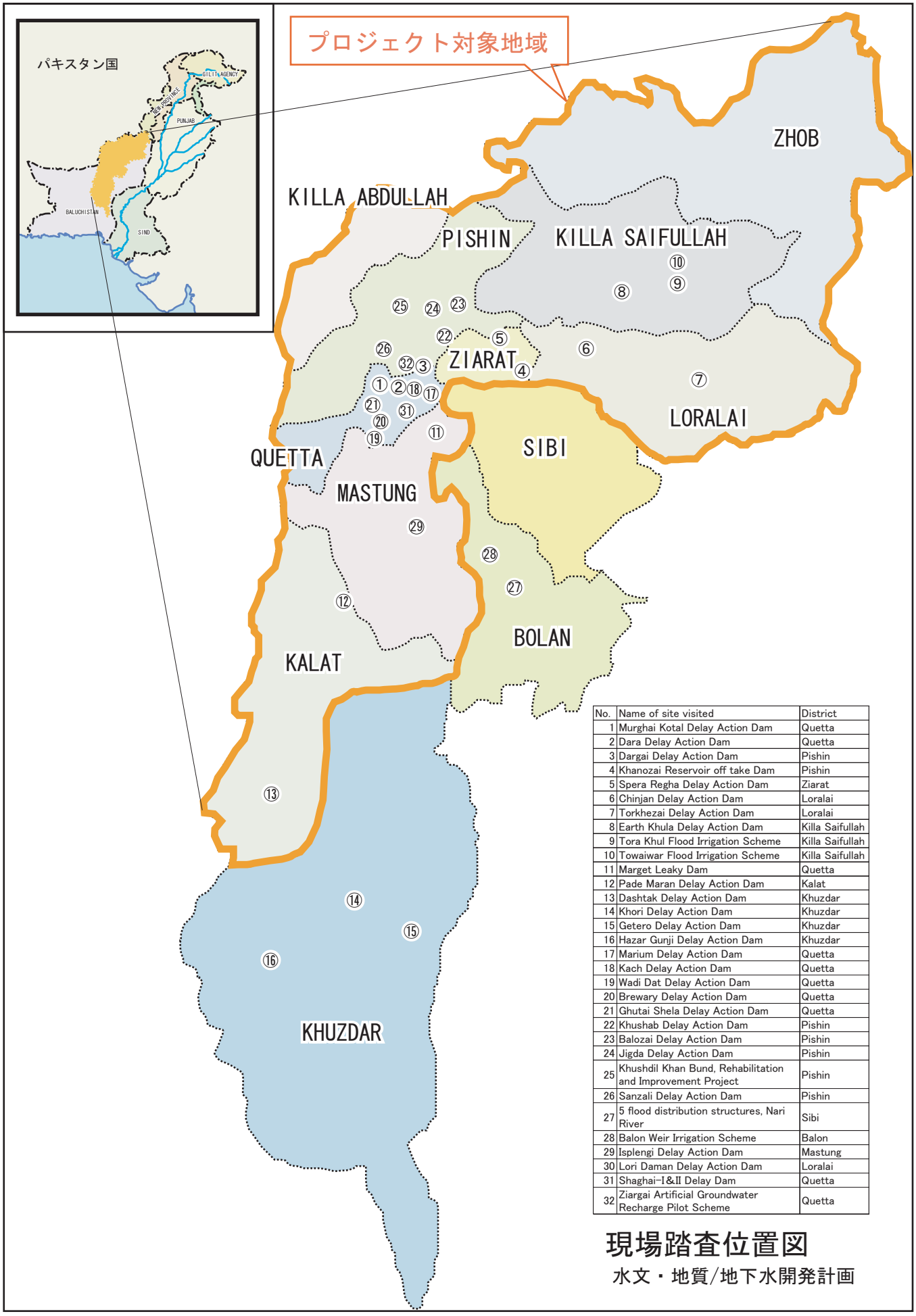
   Refer to our SPO organization's Pamphlet.

2. Contents of SPO activity

   Refer to SPO Project reports.

添付資料 － ５　　現場踏査記録

水文・地質／地下水開発計画



No.	Name of site visited	District
1	Murghai Kotal Delay Action Dam	Quetta
2	Dara Delay Action Dam	Quetta
3	Dargai Delay Action Dam	Pishin
4	Khanozai Reservoir off take Dam	Pishin
5	Spera Regha Delay Action Dam	Ziarat
6	Chinjan Delay Action Dam	Loralai
7	Torkhezai Delay Action Dam	Loralai
8	Earth Khula Delay Action Dam	Killa Saifullah
9	Tora Khul Flood Irrigation Scheme	Killa Saifullah
10	Towaiwar Flood Irrigation Scheme	Killa Saifullah
11	Marget Leaky Dam	Quetta
12	Pade Maran Delay Action Dam	Kalat
13	Dashtak Delay Action Dam	Khuzdar
14	Khori Delay Action Dam	Khuzdar
15	Getero Delay Action Dam	Khuzdar
16	Hazar Gunji Delay Action Dam	Khuzdar
17	Marium Delay Action Dam	Quetta
18	Kach Delay Action Dam	Quetta
19	Wadi Dat Delay Action Dam	Quetta
20	Brewary Delay Action Dam	Quetta
21	Ghutai Shela Delay Action Dam	Quetta
22	Khushab Delay Action Dam	Pishin
23	Balozai Delay Action Dam	Pishin
24	Jigda Delay Action Dam	Pishin
25	Khushdil Khan Bund, Rehabilitation and Improvement Project	Pishin
26	Sanzali Delay Action Dam	Pishin
27	5 flood distribution structures, Nari River	Sibi
28	Balon Weir Irrigation Scheme	Balon
29	Isplengi Delay Action Dam	Mastung
30	Lori Daman Delay Action Dam	Loralai
31	Shaghai-I&II Delay Dam	Quetta
32	Ziargai Artificial Groundwater Recharge Pilot Scheme	Quetta

現場踏査位置図

水文・地質/地下水開発計画

Record of Field Visit (#01)

Date visited:

20-Sep-2003

Name of site visited:

Murghai Kotal Delay Action Dam (#120)、proposed by JICA F/S(1997) for stage II construction

District:

Quetta

Coordinates (by handy GIS):

30-19.083N: 66-56.643E

Persons met:

Ahsan Hidayat Khan, Executive Engineer

Descriptions:

Cost incurred: Rp. 4.5 million

Date of Completion:30- June 1979

Restoration: 30-June-1979, Restored in June 2003

Catchment and Reservoir

- Catchment's Area: 19.7 sq.km
- River Discharge: 56.64 cumec
- Storage Capacity: 80 AF (104,000 m3)
- Storage Depth: 44 ft (13.4 m)

Components of DAD

- Dam type: Homogeneous earth fill type
- Crest length: 323 ft (9.8 m)
- Height: 57 ft (17.3 m)
- Crest Width: 6.1 m
- Bottom Width: 103.66 m
- Side Slope D/S (upper): 3:1
- Side Slope D/S Berm (Lower): 4.57
- Side Slope U/S: 2:1
- Stone Pitching on U/S Slope: 0.457
- Shingle: 0.565
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 67.378 m
- Width: 12.196 m
- Crest Level: 44 ft (13.4 m)
- Side slope: nil
- Stone pitching on bed and slopes: rocky bed
- Gabion barrier walls :RCC wall 4 nos.
- Design discharge (return period): 2200 cusec, (50 year)

Outlet structure:

- Discharge: 13 cusec
- Length of 12 inch dia, 131.09, MS pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: 107 nos
- Spring: nil nos
- Kareze: 3 nos
- Tube well:35 nos
- Additional cultivation: ** acres
- Farm families: **

Observations

- One of the stage II DAD proposed by JICA F/S Study (1997)
- Flood in Feb. 2003: 165 AF (203,000 m^3) spilled out, 80 AF (96,000 m^3) was stored and percolated (disappeared) within 6 days
- Karezes downstream dried up after the last draught, was not yet restored by the DAD

- Contractor arranged machinery for construction.
- Tube well records: constructed in1993 to the depth 600 ft, with groundwater level 95 ft, draw-down 195 ft. In 2003 groundwater level was 400 ft. Record of screen position is available on the tube well site.
- It was told the DAD was breached by flood during construction. The breached part was re-constructed with a few days.

Record of Field Visit (#02)

Date visited:

20-Sep-2003

Name of site visited:

Dara Delay Action Dam, proposed by JICA F/F (1997) for Stage 1 construction (#115 in Briefing paper)

District:

Quetta

Coordinates (by handy GIS):

30-19.314 N: 60-00.962 E

Persons met:

Ahsan Hidayat Khan, Executive Engineer

Descriptions:

Cost incurred:

Date of Completion: 2001

Catchment and Reservoir

- Catchment's Area: 6.70 sqm
- River Discharge: 3875 cusec
- Storage Capacity: 218 AF (283,400 m^3)
- Storage Depth: 40 ft (12.2 m)

Components of DAD

- Dam type: Homogeneous earth fill type
- Crest length: 362 m
- Height: 50 ft (15.2 m)
- Crest Width: 6.09 m
- Bottom Width: 82.31m
- Side Slope D/S (upper): 3:1
- Side Slope D/S Berm (Lower): 3:1
- Side Slope U/S: 2:1
- Stone Pitching on U/S Slope: 0.65 ft
- Shingle: 0.33 ft
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 44.81 m
- Width: 22.86 m
- Crest Level: 40 ft (12.2 m)
- Side slope: 0.2511
- Stone pitching on bed and slopes: nil
- Gabion barrier walls :nil
- Design discharge (return period): 3875 cusec (** year)

Outlet structure:

- Discharge: 12 cusec
- Length of 6 inch dia, 420 MS pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: ** nos
- Spring: ** nos
- Kareze: ** nos
- Tube well:** nos
- Additional cultivation: ** acres
- Farm families: **

Observations

- Assisted by Federal Government
- One of the stage I DAD of JICA Study of 1997
- No flood has yet to come after construction

Record of Field Visit (#03)

Date visited:

21-Sep-2003

Name of site visited:

Dargai Delay Action Dam (#174 in Briefing paper)

District:

Pishin

Coordinates (by handy GIS):

30-29.622 N: 67-08.587E

Persons met:

Descriptions:

Constructed under Draught Emergency Relief Assistance (DERA), ADB/WB

Cost incurred: Rp. 25.25 million

Date of Completion: under construction (scheduled by *****mm/yy)

Catchment and Reservoir

- Catchment's Area: 50 sq.mile (47.4 km^2)
- River Discharge: 7,000 cusec (198 m^3/sec) from Daragai river, 6,500 cusec (175.5 m^3) from Garki river
- Storage Capacity: 850 AF (1,105,000 m^3)
- Storage Depth: 44 ft (13.4 m)

Components of DAD

- Dam type: Homogeneous earth fill type
- Crest length: 3,365 ft, using low undulating area (1,025.7 m)
- Height: 38.5 ft (11.7 m)
- Crest Width: 20 ft (6.1 m)
- Bottom Width: 323.6 ft (98.6 m)
- Side Slope D/S (upper): 3.0 : 1
- Side Slope D/S Berm (Lower): no berm constructed
- Side Slope U/S: 2.0 : 1
- Stone Pitching on U/S Slope: 1.5 ft (0.46 m)
- Shingle: non
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 225 ft (68.6 m)
- Width: 225 ft
- Crest Level: 44 ft
- Side slope: 2:1
- Stone pitching on bed and slopes: 1.5 thick in gabion wall
- Gabion barrier walls :nil
- Design discharge (return period): 7,000 cusec, 30 year (198 m^3/sec)

Outlet structure:

- Discharge: ?
- Length of 6 inch dia, GI pipe with 'strainer' facility in the reservoir:

Benefits

- Surface Well: nil
- Spring: nil
- Kareze: 7 nos
- Tube well:5 nos
- Additional cultivation: 6,314 acres (757.7 Ha)
- Farm families: **

Observations

- Constructed on Dargai river bed, with water to be diverted from Gharki river flowing pallarell to Dargai river
- A piezometer to be installed
- Construction equipment on site: 2 loaders, 4 dump trucks, 1 compactor, 3 water

bowsers, 4 tractors, 1 bulldozers

Record of Field Visit (#04)

Date visited:

21-Sep-2003

Name of site visited:

Khanozai Reservoir off take Dam (#146 in Briefing paper)

District:

Pishin

Coordinates (by handy GIS):

30-37.417 N: 67-20.938E

Persons met:

Descriptions:

Cost incurred: Rp 1.2 million

Date of Completion: 1940

Date of Rehabilitation: 1960

Catchment and Reservoir

- Catchment's Area: (3.89 sq.km)
- River Discharge: (87.79 cumec)
- Storage Capacity: 3,207,100 cb.m
- Storage Depth: 30 ft

Components of DAD

- Dam type: Homogeneous earth fill type
- Crest length: ? (670.6 m)
- Height: ? (11.6 m)
- Crest Width: 20 ft
- Bottom Width: 210 ft (64.10m)
- Side Slope D/S (upper): 3:1
- Side Slope D/S Berm (Lower): no berm constructed
- Side Slope U/S: 2:1
- Stone Pitching on U/S Slope: 1.5 ft thick
- Shingle: ?
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 50 ft
- Width: 25 ft
- Crest Level: rl.492.10 ft
- Side slope: 2:1
- Stone pitching on bed and slopes: 1.5 ft thick in gabion wall
- Gabion barrier walls :2 nos.
- Design discharge (return period): 30 year

Outlet structure:

- Pipe under the DAD was *NOT Equipped*
- Intake tower observed

Benefits

- Surface Well: nil
- Spring: nil
- Kareze: 3 nos
- Tube well:70 nos
- Additional cultivation: 400 acres
- Farm families: 700

Observations

- Old storage type dam constructed in 1940, rehabilitated in1960.
- In the year of 2000, the DAD was de-silted.
- Detail structure not known
- 4 – 6 floods arrested in 2003; Water being stored for 2 month
- Kareze (approx 100 feet deep) just downstream abandoned

- Groundwater being pumped up from approx 400 ft deep in tube wells (approx 100 tube wells downstream of the dam)
- Water percolating from the reservoir, according to an officer accompanied

Record of Field Visit (#05)

Date visited:

21-Sep-2003

Name of site visited:

Spera Regha Delay Action Dam (#60 in Briefing paper)

District:

Ziarat

Coordinates (by handy GIS):

30-32.962 N: 67-41.887 E

Persons met:

Descriptions:

Cost: Rp. 10.12 million (Date of Contract: 11-July-2002)

Date of Completion: under construction - 85% completed (to be completed in 2003?)

Catchment and Reservoir

- Catchment's Area:6.12 sq. mile (15.7 km^2)
- River Discharge: 3,600 cusec (97.2 m^3/sec)
- Storage Capacity: 222 AF (288.600 m^3)
- Storage Depth:40 ft (12.2 m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 600 ft (182.9m)
- Height: 50 ft (15.2 m)
- Crest Width: 20 ft (6.1m)
- Bottom Width: 290 ft (88.4m)
- Side Slope D/S (upper): 3.0: 1
- Side Slope D/S Berm (Lower): 3.0 : 1
- Side Slope U/S: 2.0 :1
- Stone Pitching on U/S Slope: ?
- Shingle: shingle 60 %, Washed soil 40 %
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 218 ft (66.4 m)
- Width: 60 ft (18.3 m)
- Crest Level: 40 ft (12.2 m)
- Side slope: vertical
- Stone pitching on bed and slopes: gabion
- Gabion barrier walls :nil
- Design discharge (return period): 30 years

Outlet structure:

- Discharge: varies with the head of water up to 2.75 cusec
- Length of 10 inch dia, 340 ft long PVC pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: 30 nos
- Spring: 3 nos
- Kareze: 5 nos
- Tube well: 2
- Additional cultivation: 70 acres
- Farm families: 80

Observations

- Used to be snow falls in winter, water was available everywhere
- No snow falls last 5 years after the draught; groundwater level fell down
- During construction of the DAD, 2-3 small floods were arrested, and the last flood on 23-July-2003 resulting in reservoir water level to the spill level
- Purposes of the DAD, according to an officer accompanied:

- ✧ To capture flood water
- ✧ To regulate water discharge to downstream along river
- ✧ To recharge groundwater

- At present 4-5 l/sec of water being released from the discharging pipe.
- Discharged water running about 4 - 5 km long along the river, being expected to recharge groundwater
- Silt deposited in the reservoir is taken out by farmers, explained.

Record of Field Visit (#06)

Date visited:

21-Sep-2003

Name of site visited:

Chinjan Delay Action Dam (not listed in Briefing paper)

District:

Loralai

Coordinates (by handy GIS):

30-34.738 N: 67-57.681 E

Persons met:

Habib-Ullah Khan Superintending Engineer Irrigation Circle Loralai,
Surat Khan Executive Engineer Irrigation Division Loralai

Descriptions:

Cost: Rp. 16.93 million

Date of Completion: under construction - 85% completed (24th Nov. 2002 – Feb. 2004)

Catchment and Reservoir

- Catchment's Area:24.39 sq. mile (62.44 km^2)
- River Discharge: 5700 cusec
- Storage Capacity: 1,314 AF (1,576,800 m^3)
- Storage Depth:35 ft

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 490 ft (149.4 m)
- Height: 55 ft (16.8 m)
- Crest Width: 20 ft (6.1 m)
- Bottom Width: 342.5 ft (104.4 m)
- Side Slope D/S (upper): 3.0: 1
- Side Slope D/S Berm (Lower): 3.0 : 1
- Side Slope U/S: 2.5 :1
- Stone Pitching on U/S Slope: 1.5 ft (0.45 m)
- D/S Shingle: 0.5 ft (0.15 m)
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 417 ft (127.1 m)
- Width: 62.5 ft (19.1 m)
- Free Board: 5 ft (1.5 m)
- Crest Level: RL 540 ft
- Side slope: -
- Stone pitching on bed and slopes: Rock formation
- Gabion barrier walls :not provided due to rock
- Design discharge (return period): 5,716 cusec (161.9 cumec)

Outlet structure:

- Discharge: 20
- Length of 12 inch dia, 450 ft long PVC pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: 70 nos
- Spring: nil nos
- Kareze: 6 nos
- Tube well: 50
- Additional cultivation: 1,500 acres (607.1 ha)
- Farm families: 60

Observations

- Constructed on a narrow valley, shallow rock foundation
- Dam is not founded on rock foundation, according to an officer
- Recharging effect seems to be small due to thin and narrow alluvial deposit below the DAD
- Floods were arrested before construction of 'strainer' facility around the intake MS pipe

Record of Field Visit (#07)

Date visited:

21-Sep-2003

Name of site visited:

Torkhezai Delay Action Dam (#73 in Briefing paper)

District:

Loralai

Coordinates (by handy GIS):

30-27.378 N, 68-38.232 E

Persons met:

Descriptions:

Cost: Rp. 20 million

Date of Completion: 2001

Catchment and Reservoir

- Catchment's Area: 55 sq. mile (140.8 km^2)
- River Discharge: 16,500 cusec, 50 years (467 cu.mec))
- Storage Capacity: 887 AF (1,064,400 m^3)
- Storage Depth:35 ft (10.7 m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length:530 ft (161.5 m)
- Height: 50 ft (15.2 m)
- Crest Width: 20 ft (6.1 m)
- Bottom Width: 315 ft (96.0 m)
- Side Slope D/S (upper):3.0 : 1
- Side Slope D/S Berm (Lower): 2.5: 1
- Side Slope U/S: 2.5 :1
- Stone Pitching on U/S Slope: 1.5 ft (0.45 m)
- D/S Shingle: 0.75 ft (0.23 m)
- Steps seen on the downstream slope of the dam
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 1,175 ft (358.1 m)
- Width: 200 ft
- Free Board: 2 feet (0.61 m)
- Crest Level: 35 ft (10.7 m)
- Side slope: 1:1
- Stone pitching on bed and slopes: 1.5 ft
- Gabion barrier walls :-
- Design discharge (return period):16,500 cusec (50 years)

Outlet structure:

- Discharge: 20 cusec
- Length of 12 inch dia, 615 ft long MS pipe with 'strainer' facility in the reservoir
- Sluice valve equipped at the downstream end in design (not seen at site)

Benefits

- Surface Well: 50 nos
- Spring: nil
- Kareze: 10 nos
- Tube well: 100 nos
- Additional cultivation: 600 acres
- Farm families: 1500 families

Observations

- Assisted by WB
- Protection band was observed in the reservoir for an existing grave yard

- Flood to the MWL, spilling over 2 month ago. Water was still seen in the reservoir.
- Water being released from the MS pipe installed, flowing as a small river. The river disappears somewhere downstream according to an officer
- The DAD was meant to benefit to villages, Dirgi Shabozai and Oriagai & Zangiwal (38-23.727N, 68-37.546E). At Oriagai and Zangiwal, groundwater level in tube wells increased by 50-60 ft around 25-30 days after flood into the Torkazai DAD reservoir, but the increment is not sufficient to revitalize the existing Karezes.
- Dirigi Shabozai was proved not to be benefited.
- Instead, spring emerged in a village (Maratangi) 30 km away (have to be confirmed), explained.

- ***** Beneficiary area 30 km away – Maratangi village (30-30.530N, 68-56.693E)
- Water to the Maratangi village is being taken from a perennial flow originating from a adjacent water shed to the one of Torkazai river.
- After the completion of the Torkazai DAD, the water shed area of both Torkazai river and Maratangi river received a fairly amount of water, which gave the villagers impression that the DAD has increased the water volume to the village Maratangi.

Record of Field Visit (#08)

Date visited:

22-Sep-2003

Name of site visited:

Earth Khula Delay Action Dam (#87 in Briefing paper)

District:

Killa Saifullah

Coordinates (by handy GIS):

30-40.601 N, 68-21.684 E

Persons met:

Mr. Sher Affgan Khan, Assistant Engineer

Descriptions:

Cost: Rp. 14.45 million

Date of Construction: Feb 2001 – Jun 2002

Catchment and Reservoir

- Catchment's Area:20.5 sq. mile (52.5 km^2)
- River (Flood) Discharge: 7000 cusec (cumec)
- Storage Capacity:594 AF (712,800 m^3)
- Storage Depth:32 ft (9.8 m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 825 ft (251.5 m)
- Height: 42 ft (12.8 m)
- Crest Width:20 ft (6.1 m)
- Bottom Width:250 ft
- Side Slope D/S (upper): 3.0: 1
- Side Slope D/S Berm (Lower): 3.0: 1
- Side Slope U/S: 2.5:1
- Stone Pitching on U/S Slope: 1.5 ft (0.46 m)
- D/S Shingle: 0.3 ft (0.09 m)
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 150 ft (m)
- Width: 170 ft (51.8 m)
- Free Board: 7 feet
- Crest Level: 129.85 ft
- Side slope: vertical
- Stone pitching on bed and slopes: nil
- Gabion barrier walls :nil
- Design discharge & return period: 7,000 cusec, 50 year (cumec)

Outlet structure:

- Discharge: 4 cusec
- Length of 12 inch dia, 333 ft long MS pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: 10 nos
- Spring: 1 nos
- Kareze: 5 nos
- Tube well: 250 nos
- Additional cultivation: 200 acres (80.9 ha)
- Farm families: 200

Observations

- Funded by the Government of Balochistan and federal government for draught program
- Rainfall 11-12 feet/year
- Groundwater level in wells 2 km downstream not fluctuated after the DAD
- Piezometer to be installed in area downstream

- Marginal band constructed: 1100 ft long, 15 feet crest-wide, 14-19 ft high, with slope of 2.0:1
- Water seen in the reservoir (indication not smooth percolation from the reservoir bed)

Record of Field Visit (#09)

Date visited:

22-Sep-2003

Name of site visited:

Tora Khul Flood Irrigation Scheme (not listed in Briefing paper)

District:

(Killa Saifullah)

Coordinates (by handy GIS):

30-50.448 N, 68-43.935 E

Persons met:

Descriptions:

Cost: Rp.16.4 million

Funded by: the Government of Balochistan

Date of Completion: 29-March-2003 to June 2004; under construction (35%)

Components:

- Diversion weir: 175 ft long
- Off take flood regulator:2# R/L side
- Marginal Bunds
- Left side=830 ft
- Right Side =85 ft
- Out let 12#
- Flood channel right side = 3000 ft
- Flood channel left side = 3000 ft
- Drop structure 3# on left side
- Drop structure 1 # on right side

Benefits

- 200 cusec (5.7 cumec) for left bank,200 cusec (5.7 cumec) for right bank to be irrigated
- Command area: 4,000 acres (1,618.8 ha)
- 250 house hold to be benefited

Observations

- An intake weir across the river with intake gates on both bank
- An intake gate is equipped with 'barrier board' above, making opening between the barrier board above and weir below.
- The limited opening is provided to limit excessive water flow in to the channel or to release a certain volume of flood water to downstream
- Main channel is provided on both side of the river.
- The structures are under construction.

Record of Field Visit (#10)

Date visited:

22-Sep-2003

Name of site visited:

Toiwar Flood Irrigation Schem (not listed in Briefing paper)

District:

(Killa Saifullah)

Coordinates (by handy GIS):

30-54.331 N, 68-44/.780 E

Persons met:

Descriptions:

Cost: Rp. 81.73 million

Date of Completion:9-Nov-2001

Catchment and Reservoir

- Catchment's Area: 900 sq. mile (2304 km^2)
- River Discharge: 72,000 cusec (cumec)
- Length of Flood Channel: 36,427 ft (11,102.9m)
- Discharge of Channel: 500 cusec (14.16 cumec)

Benefits

- Command area: 5,000 acres (2023.5 ha)

Observations

- An intake barrage across the river with intake gate on the right bank
- The intake gate consists of 2 sand releasing gate and 3 water intake gates.
- The water intake gates are equipped with 'barrier board' on the above to regulate volume of water intake
- Water taken through the gates is led to downstream along a some 300 m long – concrete walled channel constructed on the right bank side of the river, thereafter lead to an excavated channel on the right bank downstream

- Detail information was provided on request on 22 Oct 2003, as attached.

TOIWAR FLOOD IRRIGATION SCHEME

Toiwar Flood Irrigation Scheme is one of the four flood irrigation schemes and is the largest of 34 irrigation schemes constructed under BCIA Project, in terms of cost, beneficiaries and the area benefitted. The scheme has been constructed on the Toi Rud which a tributary of the Zhob river near Tang, some 10 Km East of Shinkai with maximum flood discharge of 72000 cusec.

2. **Location:** The scheme is located in Killa Saifullah District some 35 Km East of Shinkai Railway Station on Quetta - Zhob road. The altitude of the Scheme is 4,900ft above mean sea level.

3. **Total Cost of Civil Works:**

Main Contract	Rs 78.79 million
Farmers' Organisation Contract	Rs 2.94 million
Total Cost	Rs 81.73 million

3.1 **Contribution of Farmers Organisation**

Farmers' Contribution in scheme construction	Rs 735,000
FO's deposit in Works Account	Rs 546,000

4. **Main Components of the Scheme**

Description of Works	Quantities	Description of Works	Quantities
Plum Concrete Class C Weir	230 ft	Syphon for Surbahao Channel	One
Channel Separation Wall	1479 ft	Nullah/Rain water Inlets	2 Nos
Earthen Trapezoidal Channel	27,128 ft	Outlets	4 Nos
Escape Structure	2 Nos	Road Bridges	5 Nos
Flow Division Structures	6 Nos	Tail Str'ture on main and br: channel	1 each
Drop Structures	34 Nos	Drop Structure on Branch Channel	1 No
Earthen Trapezoidal Br: Channel	3,100 ft	Outlet on Branch Channel	1 No.
Restoration of Potable Water Supply to Spinkai village near the scheme conveying 9 gallons per minute of drinking water through 2.5 inch dia pipe.			

5. **Cropping Pattern:** About 530 cusec of flood water will be made available to irrigate 5300 acres of land as per the cropping pattern hereunder:

Existing Cropping Pattern	Proposed Cropping Pattern
Wheat 1146 acres Barley 361 acres Maize 111 acres Mash 12 acres	Wheat 250 acres Barley 50 acres Cumin 1000 acres Mash 2750 acres Maize 250 acres Melons 200 acres Fodder 800 acres
Total 1630 acres	Total 5300 acres

6. **Scheme Benefits:** The total number of landowning households benefitting from the Scheme is 535 and the total number of beneficiaries is estimated at 4,050 souls. The scheme will generate employment opportunities in the rural area due to more than three times increase in the cropped area and will have major economic impact in the area. The Economic Internal Rate of Return for the Scheme is calculated at 16.0%. The population will receive assured drinking water to the extent of 9 gallons per minute.

BALOCHISTAN COMMUNITY IRRIGATION AND AGRICULTURE PROJECT
SUMMARY DATA SHEET

Scheme: Toiwar FIS	District: Killa Saifullah	Number: F 05	UNDER CONSTRUCTION
Location: 35km east of Shinkai railway station on Quetta-Zhob road			Altitude: 4,900ft
1:50,000 Maps: 38B/9 and 38B/13		Grid Reference:	30° 50' N 68° 53' E
Villages: Scattered population with few large clusters		Population:	3,779
Tribes: Mankezai, Anaizai, Baizai and Sarki Alizai sub-clans of Batozai clan of Sanzer Khel Pashtoon tribe			

Village Amenities	Wealth Indicators
8 Boys Primary Schools 1 Basic Health Unit 24 Shops Telephone Potable Water Supply in two villages	Housing: adobe housing with an average of 3.9 rooms Appliances: 52% own a radio Transport: 1% own a pick-up or car, 11% a motorbike, 59% a bicycle and 4% a tractor Livestock: an average of 63 sheep and goats, 2 cows, 12 camels, 1 horse and 9 chickens

Water Source:	Toiwar Rud		
Irrigation Cycle:	n/a	EC_w of Irrigation Water:	n/a
Number of Water Shareholders:	398	Number of Beneficiaries:	4,050

Land and Water Rights Distribution	Land Share Distribution	
Land rights are permanently distributed among the shareholders. Water distribution between the offtakes is theoretically riparian. Within the offtakes, water is distributed according to fixed flow-division and the mechanism for annual water distribution is proportionate to the effort invested in annual maintenance.	Lowest Quartile Second quartile Third Quartile Upper Quartile	6% 13% 25% 56%
Existing Water Supply (at CA): (unreliable)	With Project Water Supply (at CA)	530 cusecs (max)

Existing Cropping Pattern		Proposed Cropping Pattern	
Wheat	1146 acres	Wheat	250 acres
Barley	361 acres	Barley	50 acres
Maize	111 acres	Cumin	1000 acres
Mash	12 acres	Mash	2750 acres
		Maize	250 acres
		Melons	200 acres
		Fodder	800 acres
Without Project Cropped Area:	1630 acres	With Project Cropped Area:	5300 acres

Average Gross Financial Returns per Cropped Acre [per Water Shareholder]

Without Project (existing):	Rs 3,375 [Rs 13,825]	With Project (PY 20):	Rs 7,725 [Rs 97,683]

Proposed Works: Construction of headworks comprising concrete weir, stilling basin, sluice channel and canal head regulator. Intake channel, 1500ft long, with pitched stone protection divide bund. Provision of flow rejection structure and escape channel, and sediment settling basin. 21,325ft long trapezoidal, unlined main canal with design capacity of 530 cusecs, rehabilitating existing canal where appropriate. Construction of associated concrete/masonry flow division, drop, aqueduct and cross-drainage structures. Provision of river diversion spurs.

Financial Costs

Base Cost:	Rs 66,818,506	Physical Contingency:	Rs 7,854,869
Capital Cost:	Rs 74,673,375	Development Cost:	Rs 100,064,407
Capital Cost per Beneficiary	Rs 18,438	Capital Cost per Cropped Acre:	Rs 18,880

Farmer's Contribution and Payment Schedule

Farmer's Contribution Scale:	FLOOD SCHEME	Total Contribution:	Rs 1,492,000
Pre-Detailed Design (0.25%):	Rs 186,500	During Construction (1%):	Rs 746,000
Pre-Tender (0.25%):	Rs 186,500	After Completion (0.5%):	Rs 373,000

Social Infrastructure: Rehabilitation of an existing potable water supply system is requested and will be considered during detailed design.

FIRR	17.5%	EIRR	16.0%

BALOCHISTAN COMMUNITY IRRIGATION AND AGRICULTURE PROJECT
ENGINEERING DATA SHEET

Scheme:	Toiwar FIS	District: Killa Saifullah	Number: F 5
Engineering Status:	Under construction	System Nominal Design Capacity:	530 cusecs

Scope of Main Works:

- 230ft long reinforced concrete weir, reinforced concrete scour sluice, skimming weir, 27ft wide hydro-mechanical galed offtake and reinforced concrete abutment on right side of the weir.
- 1479ft long reinforced concretedivide wall between intake channel and river.
- rehabilitation and widening of 30228ft long unlined trapezoidal canal.
- 6no main flow division structures.
- associated structures including 35no drop structures, 5no outlets, 5no road bridges, 3no rain inlet structures, 1no escape structure and 1no syphon.

Scope of FO Works:

- rehabilitation and widening of 7600ft long unlined trapezoidal canal.

Summary of Cost (Main Works)

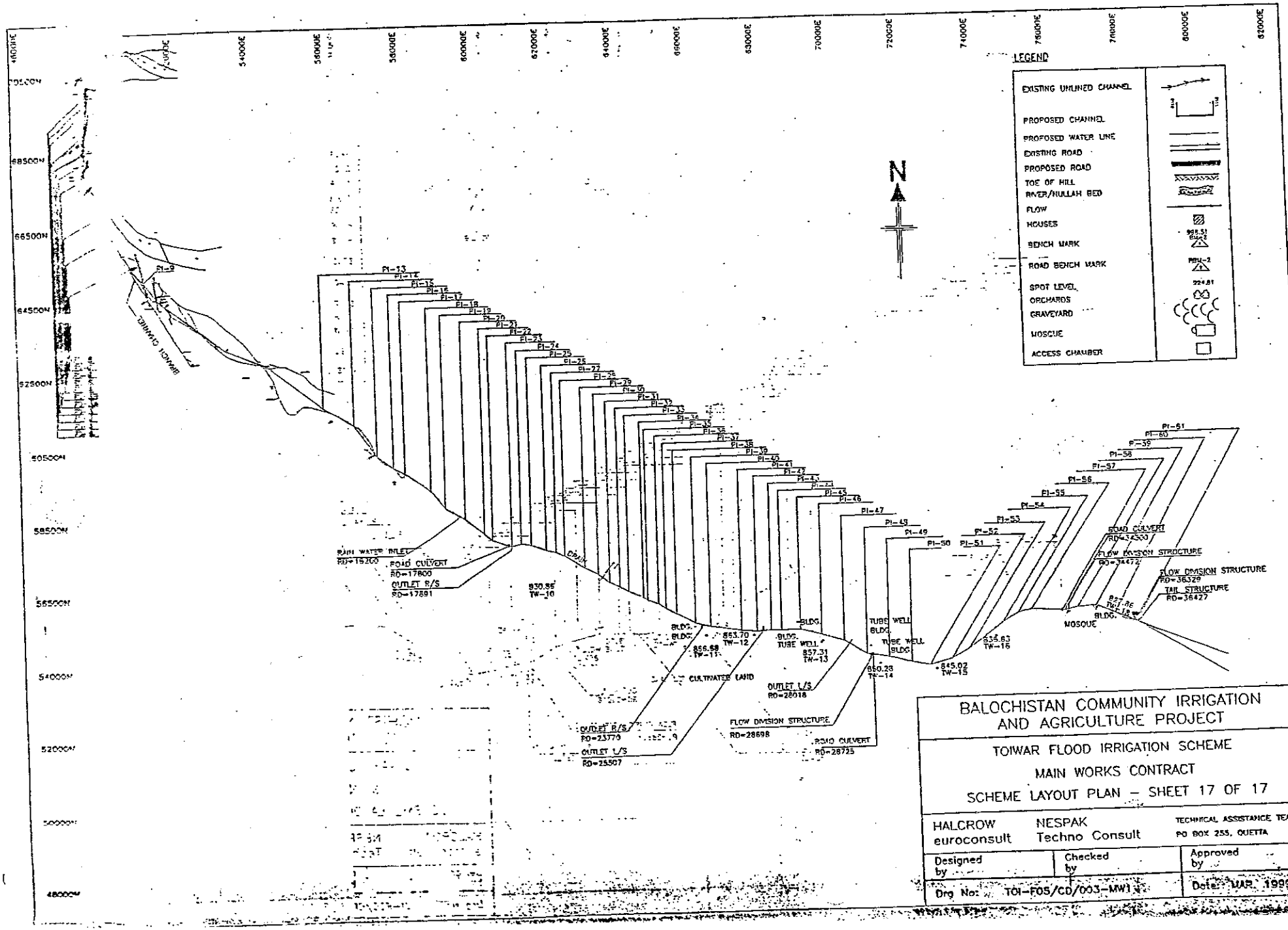
Bill No.	Description	Tendered Cost (Rs)
A	General Items	2,079,600
B	Head Works	39,297,394
C	Main and Branch Channel	11,755,998
D	Flow Division Structure & Tail Structure	4,041,322
E	Outlets	315,845
F	Drop Structures	11,667,072
G	Road bridges	2,356,613
H	Rain Water Inlet	77,995
J	Syphon for Existing Surbaho Channel	473,476
K	Escape Structure	302,633
	Total	72,367,948

Summary of Cost (Farmer Organisation Works)

Bill No.	Description	Tendered Cost (Rs)
A	Main Canal Earth Works	3,324,193
	Total	3,324,193

Summary of Costs (Whole Works)

S.No	Description	Main Works(Rs)	FO Works(Rs)	Whole Works(Rs)
1	Tendered Cost	72,367,948	3,324,193	75,692,141
2	Variations to Date	7,021,865	xxxxxxxxx	7,021,865
3	Construction Cost to Date	79,389,813	3,324,193	82,714,006
4	Project Overheads (38% of Scheme Construction Cost)			31,431,322
5	Scheme Development Cost (Construction Cost + Overheads)			114,145,328
6	Annual Maintenance Cost (1.4% of the Scheme Construction Cost)			1,157,996



BALOCHISTAN COMMUNITY IRRIGATION AND AGRICULTURE PROJECT

TOIWAR FLOOD IRRIGATION SCHEME

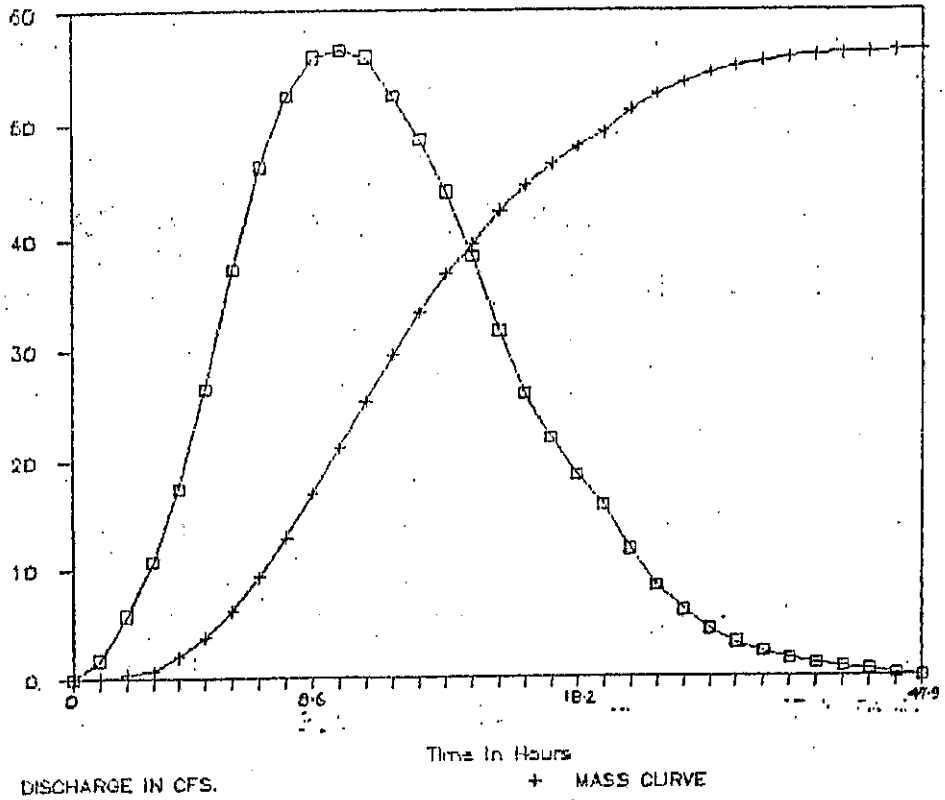
MAIN WORKS CONTRACT

SCHEME LAYOUT PLAN – SHEET 17 OF 17

HALCROW euroconsult	NESPAK Techno Consult	TECHNICAL ASSISTANCE TEAM PO BOX 255, QUETTA
Designed by	Checked by	Approved by
Drg No: TOI-FOS/CD/003-MW1		Date: MAR. 1999

TOIWAR FLOOD IRRIGATION SCHEME

FLOOD HYDROGRAPH – 50-YRS RETURN PERIOD



Record of Field Visit (#11)

Date visited:

23-Sep-2003

Name of site visited:

Marget Leaky Dam (not listed in Briefing paper)

District:

Quetta

Coordinates (by handy GIS):

30-08.257 N, 67-15.989 E

Persons met:

Dr. Abdul Majeed (IUCN), Mr. Jalal-ud-Din Qureshi (PCRWR)

Descriptions:

Date of Completion: 22-October-2002

Executed by: Pakistan Council of Research of Water Resources**(PCRWR)**, Ministry of Science and Technology

<Upstream site>

Cost: Rp.1.2 million

Catchment and Reservoir

- Catchment's Area: 1.79 sq. km^2
- River Discharge: 450 cusec (12.7 cumec)
- Storage Capacity: 9 AF (10,800 m^3)
- Total excavation of Foundation and Dam section: 15,000 c.ft (139.4 m^3)
- No. of steps: 4

<Downstream site>

Cost: Rp.1.27 million

Catchment and Reservoir

- Catchment's Area: 1.79 sq. km
- River Discharge: 1,225 cusec (34.7 cumec)
- Storage Capacity: 5.11 AF (6,132 m^3)
- Total excavation of Foundation and Dam section: 74,361 cft (2,105.7 m^3)
- No. of steps: 3

Observations

- The LEAKY DAM was constructed on researching basis.
- The LEAKY DAM was made with gabions (boulders and stream stone packed in steal-wired-cage) along with provision of outlet pipes at intervals throughout the embankment height.
- No structural preparation is prepared for water spilling out.
- The LEAKY DAM was meant to be designed to abate water flow energy by the dam so that silt settle down behind the dam, resulting in relatively silt free water flowing out through the dam body itself to downstream. At the second leaky dam, the same process takes place so that more silt-free water is released. Eventually, water can percolate in to the ground through the riverbed downstream without causing serious siltation problem.
- The LEAKY DAM is proposed by PCRWR because PCRWR believes that DAD will soon be not effective in recharging groundwater though DAD can recharge groundwater for an initial few years.
- Trial on watershed management is demonstrated; such as forestation, putting up of check dams made up with locally available cobble and bolder.
- Two local persons are employed to secure the project site from livestock that may destroy afforested small trees.
- Seven (7) piezometer boreholes and a rain fall gauge are installed. Due to no trained person who lives there and can take readings form the observation facility, data are collected by Engineer from Quetta city once flood or rainfall event takes place.

- It is said that the water level downstream came up after the construction of the Leaky dam
- After the completion of the dam a few flood event occurred during the last wet season. The Maximum rainfall was 72 mm; Water level in the reservoir came up to some 1.5 m at the dam, releasing flood water through the dam body. The structure successfully retarded duration of flood water flow, an officer explained.

ANNEXURE-A: A VIEW OF MARGAT LEAKY DAM NO.I AND II, CHECK DAMS AND PIEZOMETERS

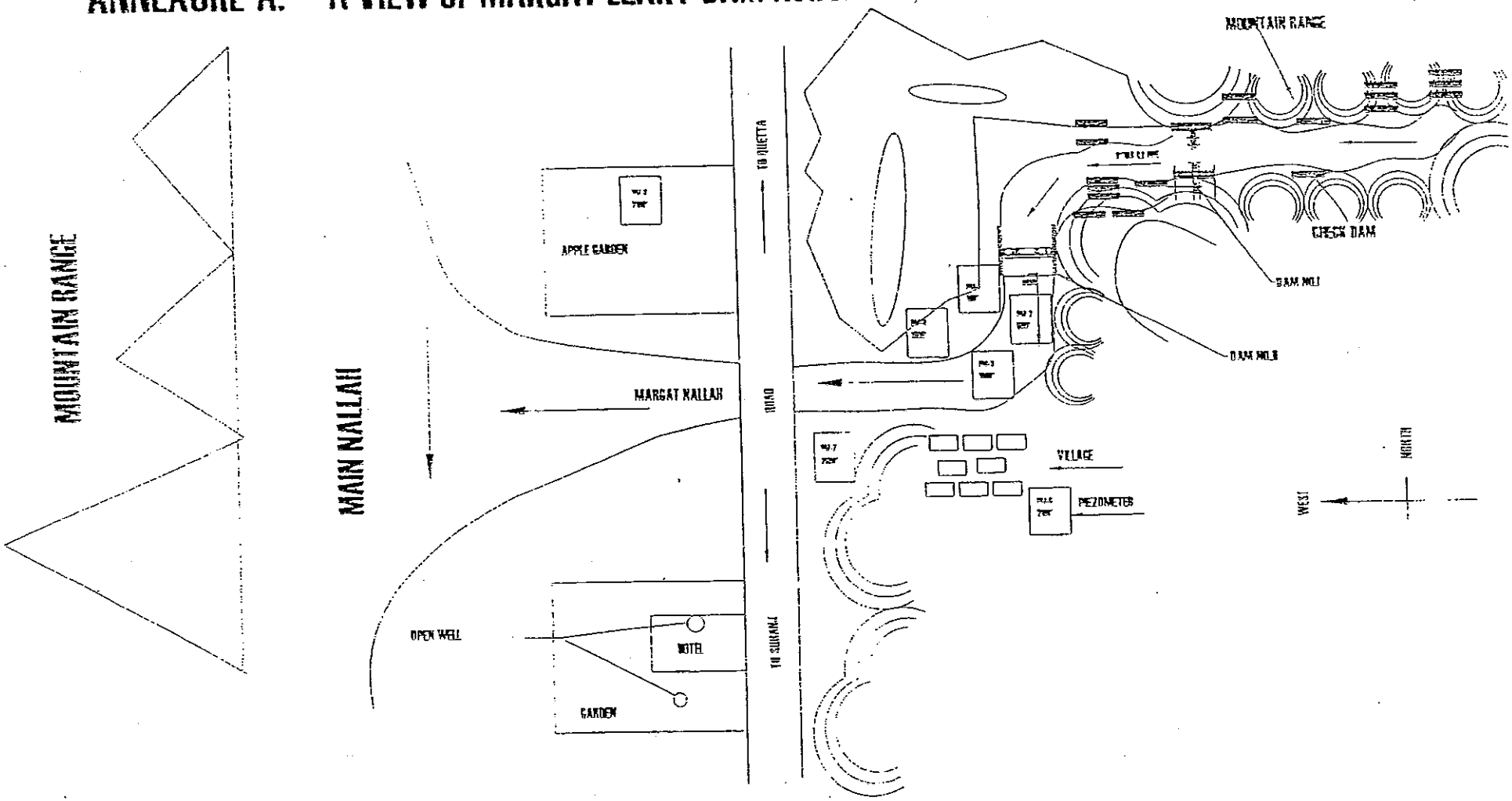


Fig.2: Section of Leaky Dam Margat, Quetta (U/S – Site I)
Wire Crated Boulder/P.C.C. Structure

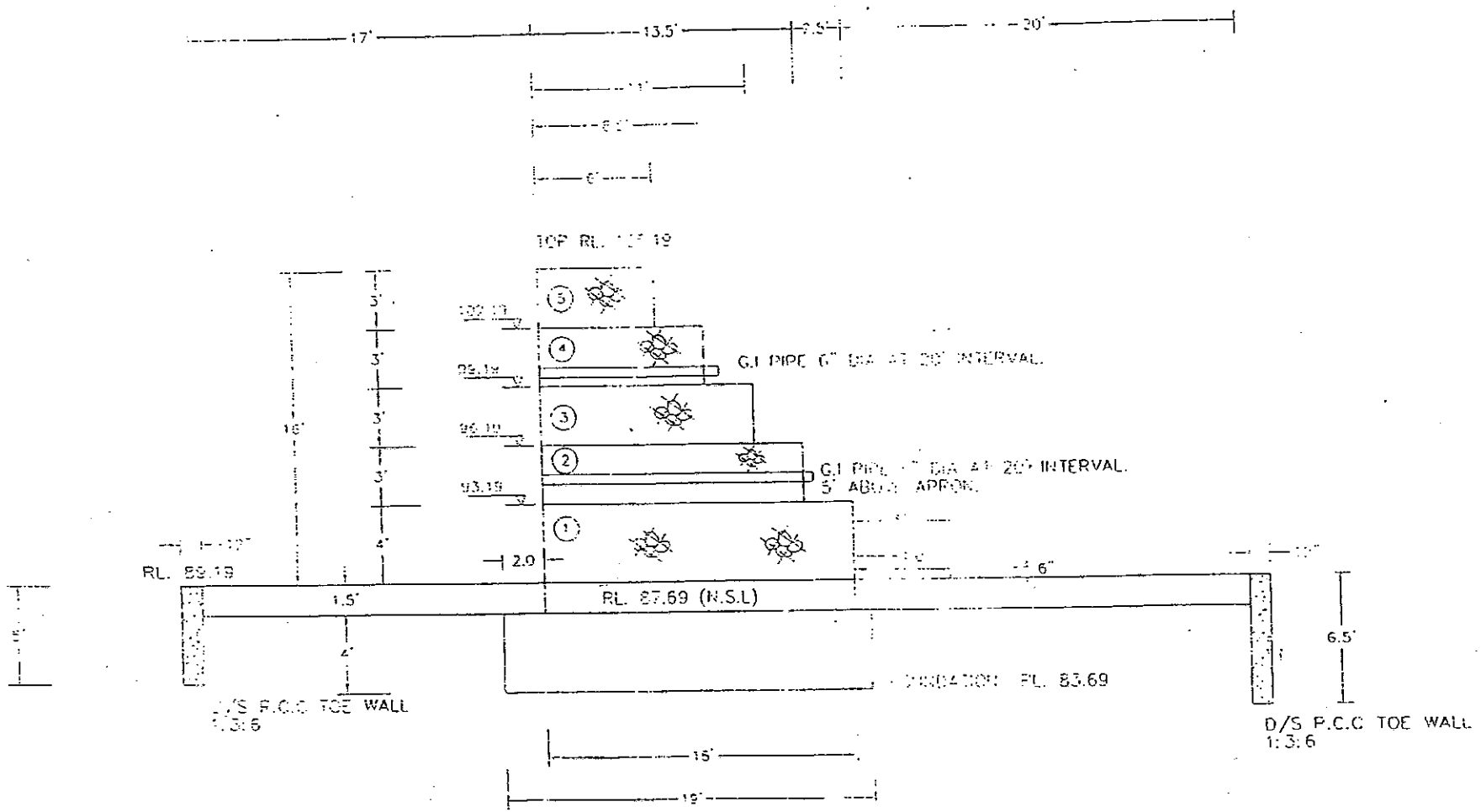


Fig.1: X-Section of Leaky Dam Margat, Quetta (U/S – Site I)

Fig.4: Section of Leaky Dam Margat, Quetta (D/S – Site II)
Wire Crated Boulder/P.C.C. Structure

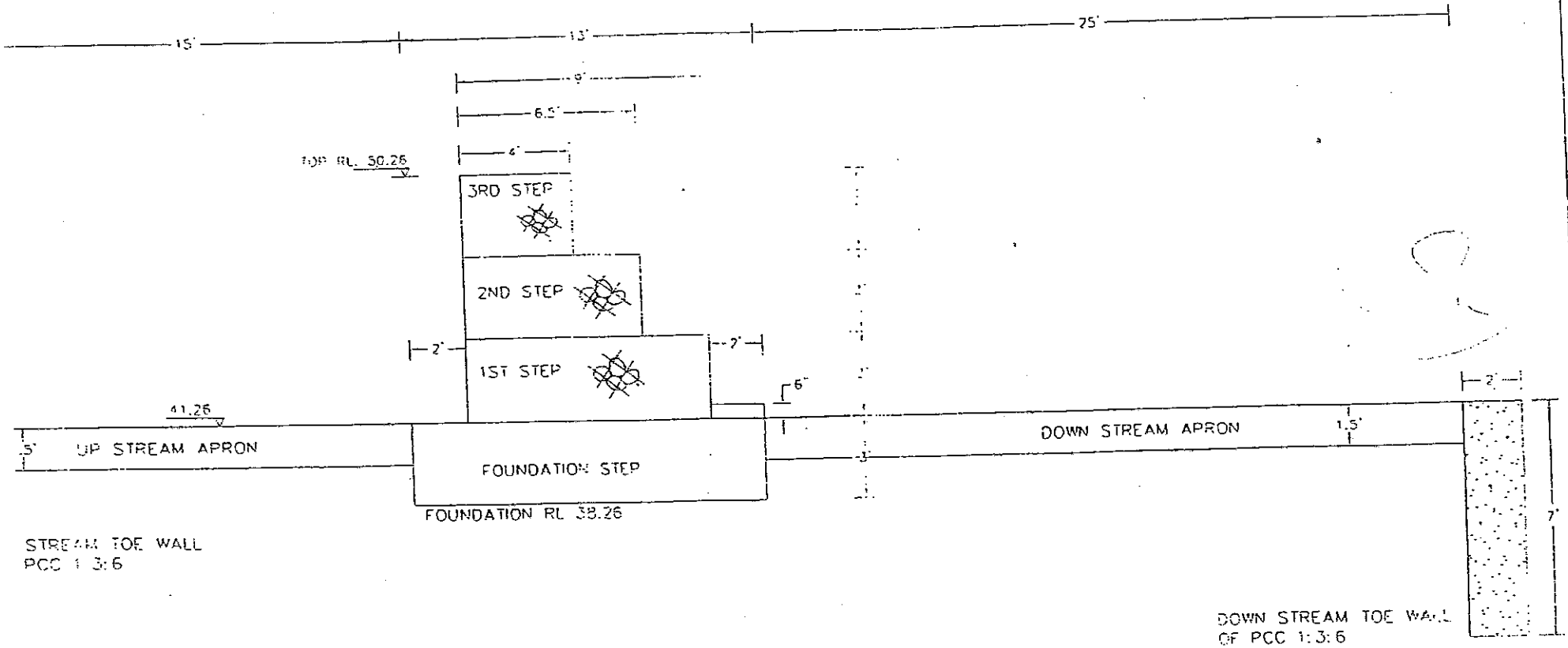
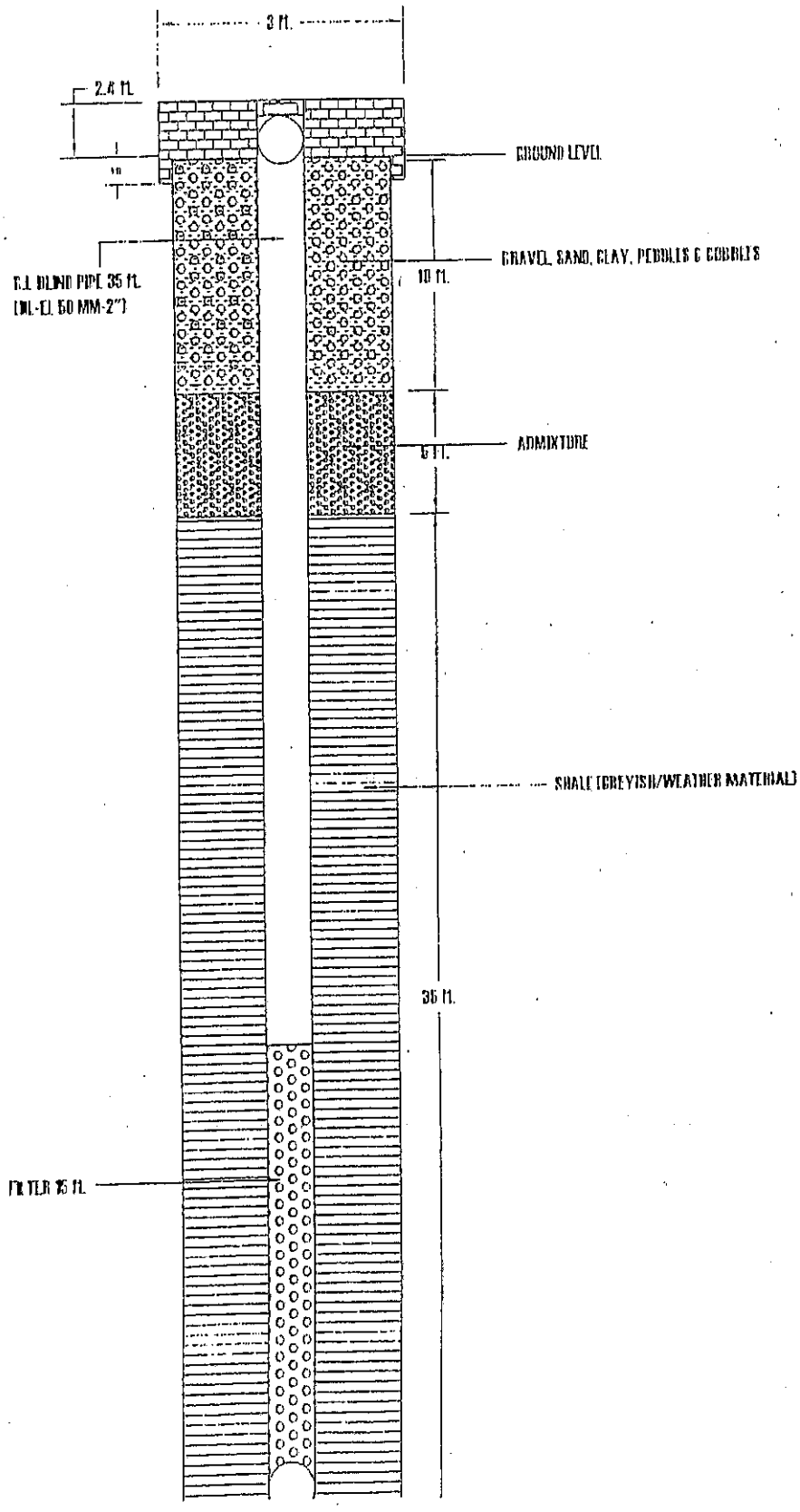


FIG.5: PROFILE OF PIEZOMETER NO.2 INSTALLED AT THE DISTANCE OF 500 ft. (LHS) FROM THE D/S LEAKY DAM-II AND AT DEPTH OF 50 ft. FROM THE GROUND LEVEL



Record of Field Visit (#12)

Date visited:

24-Sep-2003

Name of site visited:

Pade Maran Delay Action Dam (#06 in Briefing paper)

District:

Kalat

Coordinates (by handy GIS):

29-21.325 N, 66-42.429

Persons met:

Mr. Abdul Hayee Langove, Agriculturist, Mngocher, Kalat
Mr. Anwar-Ul-Hab, Executive Engineer, Irrigation Division, Mastung

Descriptions:

Cost: Rp. 7.5253 million

Date of Completion: July 2003

Catchment and Reservoir

- Catchment's Area: 16 sq. mile (40.96 km^2)
- River Discharge: 38,000 cusec, 30 years (1,076 cumec)
- Storage Capacity: 205 AF (252.800 m^3)
- Storage Depth:35 ft (10.7 m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 900 ft (274.3 m)
- Height: 45 ft (13.7m)
- Free Board: 4.0 ft (1.2 m)
- Crest Width: 20 ft (6.1 m)
- Bottom Width: 242.5 ft (73.9 m)
- Side Slope D/S (upper):2.0: 1
- Side Slope D/S Berm (Lower): 2.5 : 1
- Side Slope U/S: ** :1
- Stone Pitching on U/S Slope:1.0 ft thick
- D/S Shingle: ** ft
- H.G. Line (Assumed Saturation line):1: #

Spillway

- Length: 1,400ft (426.7 m)
- Width: 80 ft (24.4 m)
- Free Board: ? feet
- Crest Level: 35 ft (10.7 m)
- Side slope: 0.5 : 1
- Stone pitching on bed and slopes: only on slop
- Gabion barrier walls :6 nos. size 3 x 3.5 ft
- Design discharge, return period: 38,000 cusec, 30 years (1,076 cumec)

Outlet structure:

- Discharge: 3.5 cusec
- Length of 12 inch dia, 290 ft long MS pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: 6 nos
- Spring: nil
- Kareze: nil
- Tube well: 65 nos
- Additional cultivation: 115 acres
- Farm families: 24

Observations

- Both slopes of upstream and downstream seem to too steep (1.5 – 1.25: 1 ?); Crest width approx 4 m; Longitudinal cracks observed on the crest, and traverse crack on left

abutment side.

- ✧ The above was explained such that; the spillway was not excavated to a designed depth. Being feared from water overtopping the dam crest, contractor rushed embanking improperly on top of the designed height of the constructed dam. The top 5 feet therefore is in poor quality, to be removed due to the completion of excavation of the spillway to the designed depth.
- ✧ Other explanation on slope gradient was that the embankment to a designed height was urged without completing a designed width due to an impending wet season. The slope is yet to be completed to the design, which will be completed.

- It was observed that seepage appears on the slope downstream making the embanked material muddy. Toe drain is supposed not effective, which reduces the stability of the dam.
- The fist flood came on 6th August to 35 feet deep, 1.5 – 2 ft deep water was impounded when visited.
- In the downstream, open surface wells were used about 30 years ago; in 1981 electricity came, thereafter tube wells increased; resulting in depletion of groundwater.
- Groundwater level of 700 feet tube well was 300 ft deep ten (10) years ago, 250ft after the DAD; has risen up by 50 ft (15m)
- Released water from the MS pipe irrigated the downstream

Record of Field Visit (#13)

Date visited:

24D-Sep-2003

Name of site visited:

Dashtak Delay Action Dam (not listed in Briefing paper)

District:

Khuzdar

Coordinates (by handy GIS):

28-21.663 N, 66-21.811 E

Persons met:

Mr. Noor Rahmed Baloch, Supperintending Engineer, Irrigation Circle, Kalat/Mekran, Khuzdar

Descriptions:

Cost: Rp. 36.20 million

Date of Completion: under construction (39 % progress), to be completed on 30-Jul-2005

Catchment and Reservoir

- Catchment's Area: 62.16 sq. mile (169.1 km^2)
- River Discharge: 1828.80 cum/s (flood discharge)
- Storage Capacity: 200.42 Ha/m (2,004,000 m^3)
- Storage Depth:11.58 m

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 304.87 m
- Height: 14.63 m
- Crest Width: 6.09 m
- Bottom Width: 102.44 m
- Side Slope D/S (upper): 3.0 : 1
- Side Slope D/S Berm (Lower): 5.0 : 1
- Side Slope U/S: 2.0 :1
- Stone Pitching on U/S Slope: 0.3 m
- D/S Shingle: 0.15 m
- H.G. Line (Assumed Saturation line):1: 5

Auxiliary Bund

- Length: 1,051.82 m
- Height at RD 3200: 17.68 m
- Height at RD 3450 to 6300: 7.62 m
- Top width: 6.09 m
- Side Slopes (RD 2850-3450 U/S): 2.0:1
- Side Slopes (RD 2850-3450 D/S): 5.0 :1 & 3.0 :1
- Side Slopes (Both side)RD 3450-6300: 2.0:1 & 2.0:1
- Stone Pitching on U/S Slope: 0.22 m

Spillway

- Length: 152.43 m
- Width: 48.78 m
- Free Board: 1.5 m^2
- Crest Level: R.L 488.0 m
- Side slope: 1:1 both
- Stone pitching on bed and slopes: 0.22 m.
- Cut-off wall PCCl:1 no.
- Gabion barrier walls @ 100' interval: 6 No.
- Design discharge, return period: 1,828 cumec, 50 year

Outlet structure:

- Discharge: 0.0056 cmec
- Length of 2 nos. x 10 inch dia, 121.95m long, 6.09 m high in the reservoir, ** pipe with

'strainer (Filter media in circular shape around the strainer pipe; dia:top=2.44, bottom=11.58)' facility in the reservoir

Benefits

* 350 farm families will be benefited. The yield of springs and karezes of the area will be increased.
* The groundwater table will be raised & tube wells.
* The source of irrigation in the area will be recharged.
:*Are area under cultivation: 400 Ha
(As described in the sheet shown to the team)

Observations

- Under construction: a water bowser was spreading water onto the embankment material. 1 foot lay placing -> water spreading -> compaction
- Two dozers and a tractor were operated on the embankment site.
- Quality control of the compacted material was not performed (virtually difficult to station an Engineer or technician on site due to a remote location).
- Three key trenches (5 ft wide 5 ft deep, approx) were provided in the foundation ground.
- Two intake MS pipes without (before) gravel filter around them were seen in the reservoir that was half impounded.
- At a beneficiary area (28-19.274 N, 66-21.397 E), a tube well equipped with 50 HP electric submersible pump was producing 15-20 l/sec of water to an irrigation channel.
- Near the area a test tube well was left open, in which GWL was some 10 m deep.
- A worker for construction is paid Rp 150 per day with three meals

Record of Field Visit (#14)

Date visited:

24-Sep-2003

Name of site visited:

Khori Delay Action Dam (#21 listed in Briefing paper)

District:

Khuzdar

Coordinates (by handy GIS):

27-45.330 N, 66-55.960 N

Persons met:

Mr. Noor Ahmed Baloch, Superintending Engineer, Kalat/Mekran Irrigation Circle, Khuzdar

Descriptions:

Cost: Rp. 16.412 million

Date of Completion: under construction (progress 71 %) to be completed on 30-Jun-2004

Catchment and Reservoir

- Catchment's Area:31.50 sq. km
- River Discharge: 500.37 cum/s
- Storage Capacity: 206.10 Ha/m (2,061,000 m^3)
- Storage Depth:12.19 m

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length:176.83 m
- Height:15.25 m
- Crest Width: 6.09 m
- Bottom Width: 106 70 m
- Side Slope D/S (upper): 3.0 : 1
- Side Slope D/S Berm (Lower): 5.0 : 1
- Side Slope U/S: 2.0 :1
- Stone Pitching on U/S Slope: 0.45 m
- D/S Shingle: 0.22 m
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 457.32 m
- Width: 30.48 m
- Free Board: 1.52 m
- Crest Level: 532.0
- Side slope: 1 : 1 both side
- Stone pitching on bed and slopes: 0.45 m
- Gabion barrier walls :7 nos.
- Design discharge, return period: 500.37 cumec, 50 yera

Outlet structure:

- Discharge: 0.0056 cum/se
- Length of 12 inch dia, 121.95 m long MS pipe strainer (Filter media in circular shape around the strainer pipe)

Benefits

- Surface Well: 5 nos
- Spring: 2 nos
- Kareze: 1 nos
- Tube well: 0
- Additional cultivation: 100 acres
- Farm families:350 families, 4,500 heads
- Existing 7 nos irrigation schemes of Karakh valley will be benefited.
-1,619 ha area under cultivation

Observations

- The reservoir was half impounded. Intake structure (10 ft high strainer intake) was not visible.
- Both slopes of up/down stream looked steeper than designed and felt unstable (too steep). On the both slope of up/down, proper lip-rap material (stone pitching) were yet to be placed.
  - ✧ It was explained that the embankment was urged to the crest level due to the impending flood season. The dam slopes were not completely embanked to the design shape (gradient).
- Thirty (30) years life time is considered as the life time of the dam.
- The spillway was under construction, while the embankment was reached to the crest.
  - ✧ It was observed that seepage appeared on the slope downstream making the embanked material muddy. Toe drain is supposed not effective, which reduces the stability of the dam. Additional embankment was intended to stabilize the dam. It was suggested by the team that the additional embankment must be pervious or toe drain material shall be replaced with pervious material immediately.
- It was explained that investigation before construction was not performed as a matter of the usual course of action.

Record of Field Visit (#15)

Date visited:

25-Sep-2003

Name of site visited:

Gatero Delay Action Dam (#22 listed in Briefing paper)

District:

Khuzdar

Coordinates (by handy GIS):

27-35.710 N, 66-68.558 E

Persons met:

Mr. Noor Ahmed Baloch, Superintending Engineer, Kalat/Mekran Irrigation Circle, Khuzdar

Descriptions:

Cost: Rp. 15.533 million

Date of Completion: Under Construction, 83% Progress(02-Nov-2002 – 30-Jun-2004)

Catchment and Reservoir

- Catchment's Area: 77.67 sq. km
- River Discharge: 283 Cum/s
- Storage Capacity: 180.95 Ha/m (1,809,500 m^3)
- Storage Depth: 10.67 m

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 259.14 m
- Height:13.72 m
- Crest Width: 6.09 m
- Bottom Width: 96.03 m
- Side Slope D/S (upper): 3.0 : 1
- Side Slope D/S Berm (Lower): 5.0: 1
- Side Slope U/S: 2.0 :1
- Stone Pitching on U/S Slope: 0.45 m
- D/S Shingle: not provided
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 182.92 m
- Width: 74.69 m
- Free Board: 1.52 m
- Crest Level: 13.7 m
- Side slope: 1 :1 both side
- Stone pitching on bed and slopes: 0.45 m
- Gabion barrier walls :1.83 x 0.91 m
- Flexible apron: 6.09 x 0.91 m
- Design discharge, return period: 283 cumec, 50 year

Outlet structure:

- Discharge: 2 Cs
- Length of 12 inch dia, 121.95 m long M.S pipe strainer (filter media in circle shape around the strainer pipe)

Benefits

- Surface Well: 5 nos
- Spring: 2 nos
- Kareze: 7 nos
- Tube well: 40 nos
- Additional cultivation: 450 acres
- Farm families: 412 families, 4,450 head
- Area under cultivation : 3,705 ha

Observations

- Due possibly to the reason of under construction, both slopes U/S and D/S looked too steep.
- It was explained the some more embankment would be done (present crest width=some 8 m as against 6 m of designed crest with).
- No heavy equipment was visible within the site.
- The reservoir was partially impounded to such a level that the intake strainer facility was not visible.
- Water being released from the MS pipe was not so clean, not suitable for recharging to the ground due to turbidity.
- Seepage from the downstream slope would have occurred.
- **
- Area irrigated by surface flow was visited (27-36.664 N, 66-09.950 E)
- Water appeared after the DAD construction from a kareze that was dry before the DAD, explained.
- Tube wells were used before the DAD. Due to surface water being available, farmers do not want use tube wells any more.
- The dug wells for observation purpose (?) were visited. A dug well just beside the surface run-off was dry. Geological succession was: 3 m sand and gravel; 4-5 m silt with gravel in it to the bottom of the dug well. It is considered superficial thin layer of the ground is impervious.
- In the second dug well, water was there some 10 m below the ground. Geology of the well was: some 3 m thick of sand and grave, some 2 m thick of clayey layer below and again sand and gravel to the bottom of the well.
- It was explained that water table in tube wells have risen up after the dam was impounded by flood.

[illegible] CHART WERO DELAY ACTION DAM

S.No	Name of Source	[illegible]	Increase	Decrease %	Water level Depth Dam	
		([illegible] -03)				
1	Karez Ala Dumb	[illegible]		—	—	
2	Karez Naseeb Abad	0.67		—	—	
3	Kareze Mazaki	1.13	—	—	—	
4	Karez Mazaki chota	0.17		—	—	
5	Karez Khandai	0.20		—	—	
6	Karez Asiabi	20		—	—	
7	Well Imam Buksh	[illegible]			—	
8	Well Mohd Ishaq	2.0		—	—	Junior WO
		[illegible]				
1	Karez Ala Dumb	0.31		0.04		
2	Karez Naseeb Abad	0.62		[illegible]		
3	Karez Mazaki	1.03	—	0.10		
4	Karez Mazaki chota	0.18	—	0.01		
5	Karez Khandai	0.16	—	0.04		
6	Karez Asiabi	0.18	—	0.02		
7	Well Imam Buksh	4.0	—	1		
8	Well Mohd Ishaq	5.5		0.5		3/E
		6-[illegible]-03			35	Rain fall in area of 30-5-03
1	Karez Ala Dumb	0.76		0.05		
2	Karez Naseeb Abad	0.57		0.05		
3	Karez Mazaki	0.98		0.05		
4	Karez Mazaki Chota	0.13		[illegible]		
5	Karez ~~Mazaki~~ Khandai	0.12		0.02		
6	Karez Asiabi	0.14		0.04		
Total	Well Imam Buksh	3.0		1		

S/No	Name of Source	Discharge	Increase	Decrease	%	Water level /Depth Down
		([illegible])				
1	Karez Ala Dumb	[illegible]	[illegible]			
2	Karez Naseeb Abad	0.6[illegible]	[illegible]	—		
3	Karez Mazaki	1.46	[illegible]	—		
4	Karez Mazaki chota	0.25	[illegible]	—		
5	Karez Khandri	0.20	[illegible]	—		
6	Karez Asiaki	0.61	[illegible]	—		
7	Well Imam Baksh	[illegible]		—		
8	Well Mohd Ishaq	[illegible]		—		
		([illegible])				
1	Karez Ala Dumb	[illegible]				
2	Karez Naseeb Abad	[illegible]				
3	Karez Mazaki	1.5[illegible]				
4	Karez Mazaki chota	0.[illegible]	[illegible]	—		
5	Karez Khandri	0.22	0.02	—		
6	Karez Asiaki	0.63	0.02	—		
7	Well Imam Baksh	6	1	—		
8	Well Mohd Ishaq	8.9	1.9	—		
	(1-7-03)					
1	Karez Ala Dumb	0.87	0.03	—		
2	Karez Naseeb Abad	0.79	0.07	—		3.5
3	Karez Mazaki	1.61	0.04	—		
4	Karez Mazaki chota	0.30	0.02	—		
5	Karez Khandri	0.25	0.03	—		
6	Karez Asiaki	0.55	0.02	—		
7	Well Imam Baksh	8	2	—		
8	Well Mohd Ishaq	15	1.1			

Rain Fall on 5-7-03 [illegible]

[signature]

[signature] S/E

5

S.No	Name of Source	Discharge	Increase	Decrease	%	Water level / Depth Dug
1	Karez Ala Dand					
2	Karez Naseeb Ahad					
3	Karez Mazaki					
4	Karez Mazaki chota					
5	Karez Khandai					
6	Karez Asiaki					
7	Well Imam Bakhsh					
8	Well Mohd Ishaq					
1	Karez Ala Dand					
2	Karez Naseeb Ahad					
3	Karez Mazaki					
4	Karez Mazaki Chota	0.34	0.02			
5	Karez Khandai	0.29	0.03			
6	Karez Asiaki	0.72	0.03			
7	Well Imam Bakhsh	11.6	1.6			
8	Well Mohd Ishaq	11	2			
		1-8=03				
1	Karez Ala Dand	0.93	0.01			
2	Karez Naseeb Ahad	0.83	0.02			
3	Karez Mazaki	1.79	.06			
4	Karez Mazaki chota	0.35	0.01			
5	Karez Khandai	0.30	0.01			
6	Karez Asiaki	0.75	0.03			
7	Well Imam Bakhsh	.12	1			

SE.

SE.

7

S.No	Name of Source	Discharge	[illegible]	[illegible]	%	Water level /Depth in Dam
	(10 — 8 — 9 [illegible])					
1	Karez Alu Dande	[illegible]				
2	Karez Naseeb Abad	[illegible]				
3	Karez Mazaki	[illegible]				
4	Karez Mazaki che	[illegible]				
5	Karez Khandai	[illegible]				
6	Karez Asiabi	[illegible]				
7	Well Imam Baks	[illegible]				
8	Well Mohd Umar	[illegible]				
	(2 — 8 — [illegible])					
	Same As 10 — 8 —					
	1 — 4 — [illegible]					
	Same As 26 — 3 —					
	10 — 1 — 0					
	Same As 7 — 9 — 3					

[illegible] 5/E
[illegible] 5/E
[illegible] 5/E
[illegible] 5/E

(4)

Record of Field Visit (#16)

Date visited:

25-Sep-2003

Name of site visited:

Hazar Gunji Delay Action Dam (#20 listed in Briefing paper)

District:

Kuzdar

Coordinates (by handy GOS):

27-30.478 N, 66-08.845 E

Persons met:

Mr. Noor Ahmed Baloch, Superintending Engineer, Kalat/Mekran Irrigation Circle, Khuzdar

Descriptions:

Cost: Rp. 0.52 million

Date of Completion: 31-12-1981

Catchment and Reservoir

- Catchment's Area: 18.13 km^2
- River Discharge: 36.81 cumes
- Storage Capacity: 121.49 Ha/m (1,214,900 m^3)
- Storage Depth: 7.82 m

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 288.60 m
- Height: 10.97 m
- Crest Width: 6.09 m
- Bottom Width: 64.02 ft
- Side Slope D/S (upper): 3.0 : 1
- Side Slope D/S Berm (Lower): 3.0 : 1
- Side Slope U/S: 3.0 :1
- Stone Pitching on U/S Slope: 0.45 m
- D/S Shingle: not provided
- H.G. Line (Assumed Saturation line):1: 4

Spillway

- Length: 30.48 m
- Width: 10.0 m
- Free Board: 1.52 m
- Crest Level: 7.62 m
- Side slope: 1:1 both side
- Stone pitching on bed and slopes: not provided
- Gabion barrier walls : not provided
- Design discharge, return period: 36.81 cumec, 50 year

Outlet structure:

Not equipped

Benefits

- Surface Well: 15 nos
- Spring: 3 nos
- Kareze: 2 nos
- Tube well: 14 nos
- Additional cultivation: 154 Ha
- Farm families: 275 family, 2000 heads

Observations

- The reservoir was impounded to a half depth.
- Outlet pipe was not equipped.

- Seepage water of about 1 – 2 l/sec was flowing from the dam toe area. The seeping water was being led by a straight-aligned canal to downstream.
- From the observation of green grasses near the dam toe, the area were wetted with the seepage from the dam.
- The upstream slope and the dam crest were nicely lined with pebble (shingle).
- The downstream slope was not lined. Gullies are observed on the slope.
- On the berm of 20 ft wide, sink (?) holes were observed.

Record of Field Visit (#17)

Date visited:

30-Sep-2003

Name of site visited:

Marium Delay Action Dam (#118 listed in Briefing paper)

District:

Quetta

Coordinates (by handy GIS):

30-16.081 N, 87-11.483 E

Persons met:

Mr. Qutob Khan, subdivision officer, I&P department, Quetta

Descriptions:

Cost: Rp. 3.0 million

Date of Completion: 1993

Catchment and Reservoir

- Catchment's Area: 1.5 sq. mile (3.84 km^2)
- River Discharge: 1,861 Cusec (52.7 cumec)
- Storage Capacity: 43 AF (53,000 m^3)
- Storage Depth: 35 ft (10.7m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 298 ft (90.8 m)
- Height: 46.5 ft (14.2 m)
- Crest Width: 20 ft (6.1 m)
- Bottom Width: 365 ft (111.3 m)
- Side Slope D/S (upper): 3.5 : 1
- Side Slope D/S Berm (Lower): 3.5 : 1
- Side Slope U/S: 2.0 :1
- Stone Pitching on U/S Slope: 1.5 ft
- D/S Shingle: 0.5 ft
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 125 ft
- Width: 41 ft (12.5 m)
- Free Board: 3 feet
- Crest Level: 35 ft (10.7 m)
- Side slope: 1.5:1
- Stone pitching on bed and slopes: 0.75
- Gabion barrier walls :3 nos
- Design discharge (return period): 1,861cusec (30 years)

Outlet structure:

Outlet structure was not equipped.

Benefits

(not identified in the village close-by, might be identified in orchard field downstream)

- Surface Well: ** nos
- Spring: ** nos
- Kareze: ** nos
- Tube well:** nos
- Additional cultivation: ** acres
- Farm families: **

Observations

- The dam was seen on a narrow and steep valley.
- Muddy water was visible. The water level was close to the bottom of the reservoir.

- Last flood came in August this year to a level unknown.
- Since the construction in 1993, water did not spill out. For the last 7 years, no flood was available to the reservoir.
- Sand and gravel was not seen on the floor of the valley. The dam looked to be founded on weathered rock foundation. No appreciably thick riverbed material was seen on the river bed downstream of the dam.
- No significant seepage from the foundation was expected.
- Seepage from the toe of the dam was observed. The seepage might recharge aquifer downstream where orchard fields were visible.
- Upstream slope of the dam was nicely lined with flatly crashed rock material while the downstream be nicely lined with shingle layer.
- Reservoir level monitoring gauge (poles) was installed in 2003.

****

- Water transmission canal and bridge were seen. The water from a perennial stream was used to be sent to a army camp and for public use in Quetta. Not functional at the moment.

Record of Field Visit (#18)

Date visited:

30-Sep-2003

Name of site visited:

Kach Delay Action Dam, proposed by JICA F/S (1997), PC-I yet to be prepared

District:

Quetta

Coordinates (by handy GIS):

30-18.903 N, 67-05.277 E (the breached existing dam)

Persons met:

Mr. Qutobe Khan, subdivision officer

Descriptions:

PC-I is yet to be prepared.

- The DAD dam was proposed by JICA F/S report (1997) to be constructed in 2nd stage.
- The DAD is proposed to be constructed by using the existing breached dam as an upstream part of the dam body, and is meant to be rehabilitation of the existing dam; according to F/S report.
- At a downstream of the dam, an intake structure was observed. The water off-take by the intake (Sra Ghurgi) was led to an area downstream of Dara DAD which was also proposed by the F/S.
- Water release from outlet devices has to be met for Sra Ghurgi irrigation intake as well as recharging purposes, according to the F/S.

Observations

- The breached existing dam was constructed in 1962 by the army and was breached in 1987-88.
- The existing dam was filled with sediment to the maximum level, indicating high sediment load from the water shed.

Record of Field Visit (#19)

Date visited:

01-Oct-2003

Name of site visited:

Wadi Dat Delay Action Dam, proposed by JICA F/S (1997), Construction just started.

District:

Quetta

Coordinates (by handy GIS):

30-06.204 N, 66-55.298 E

Persons met:

Mr. Qutob Khan, subdivision officer, Quetta

Descriptions:

Cost: Rp. 10.422 Million

Date of Completion: Under construction, to be completed in July 2004

Catchment and Reservoir

- Catchment's Area: 2.5 sq. mile (km^2)
- River (flood) Discharge: 2,500 cusec (50 year)
- Storage Capacity: 203.0 AF (m^3) – 30 years
- Storage Depth: 32 ft

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length:660 ft
- Height: 42 ft
- Crest Width: 6.0 ft
- Bottom Width: 239 ft
- Side Slope D/S (upper): 2.0 : 1
- Side Slope D/S Berm (Lower): **not provided**
- Side Slope U/S: 2.5 :1
- Stone Pitching on U/S Slope: 1.5 ft
- D/S Shingle: 0.5 ft
- H.G. Line (Assumed Saturation line):**varies**
- Toe-Drain: 5 ft deep filled with shingle
- D/S horizontal drain: 3.0 ft thick, width equivalent to 1/3 of dam height

Spillway

- Length: 500 ft
- Width: 95 ft
- Free Board: feet
- Crest Level: 4 ft high
- Side slope: stone masonry wall in two steps
- Stone pitching on bed: 4 nos PCC Cut off wall filled with stone pitching & gabion apron.
- Gabion barrier walls :?
- Design discharge, return period: 2500 cusec, 30 year

Outlet structure:

- Discharge: ?
- Length of 12 inch dia, 365 ft long MS pipe with 'strainer' facility in the reservoir

Construction of Check dam

- One No. gabion check/detention dam in proposed to help to some extent trapping silt from entering into the reservoir.

Provision and installation of Piezometer

- to upkeep & check groundwater recharging. This activity will be monitored & groundwater recharge quantification will be done by the staff of WRPD&M Directorate, I&P Dept.

Water shed management

- Equivalent to 1.0 % of total cost of the project has also been planned for implementation. This includes execution of contour trenches / check / silt traps ant very small creekd on the upstream contours of the catchment area. This activity will be carried out in close

consultation with field officers of the Forest Department.

Benefits

- Surface Well: 38 nos
- Spring: nil
- Kareze: nil
- Tube well: 30 nos
- Additional cultivation:
- Farm families:
- Infrastructure of new vegetable market, Bus & Truck terminal, a large No. of public & provate property will also be saved from flood havoc.

Observations

- The DAD was proposed by JICA F/S (1997) to be constructed in 3 stage III.
- The proposed DAD by JICA was located at the location where old DAD that was washed out was located.
- The DAD presently being constructed is located at the pivot of the alluvial fan; the location of the DAD is approx 500 m downstream of the old DAD.
- PC-I for the DAD was prepared in May 2003, under Provincial Sector Development Program (PSDP).
- The DAD was proposed for recharging purposes and flood protection only.
- The contract was awarded in August 2003. Construction period is for a year.
- Down the DAD on the alluvial fan, the Quetta Development Authority has developed lands as residential area (houses yet to be constructed).

Record of Field Visit (#20)

Date visited:

20-Oct-2003

Name of site visited:

Brewary Delay Action Dam, proposed by JICA F/S (1997) as Stage I project. Tendering on progress, to be awarded sonly.

District:

Quetta

Coordinates (by handy GIS):

30-10.647 N, 66-56.048 N

Persons met:

Mr. Qutob Khan, subdivision officer, Quetta

Descriptions:

Cost: Rp.24.225million

Date of Completion:

Catchment and Reservoir

- Catchment's Area: 10.9 sq. mile (27.9 km^2)
- River Discharge: 5,600 cusec, 1000 years !!!! (158.6 cumec)
- Storage Capacity: 662 AF (816,000 m^3)
- Storage Depth: 47 ft (14.3 m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 779 ft (237.4 m)
- Height: 57 ft (17.4 m)
- Free board: 5.0 ft (1.5 m)
- Crest Width:325 ft(?)
- Top width: 20 ft (6.1 m)
- Bottom Width: 325 ft (99.1 m)
- Side Slope D/S (upper): 3.0 : 1
- Side Slope D/S Berm (Lower): 3.0 : 1
- Side Slope U/S: 2.0 :1
- **D/S horizontal filter between the dam and foundation, 3.0 ft thick, width equivalent to 1.5 times of dam height from the toe toward the dam axis.**
- Toe Drain: 5 ft deep filled with shingle
- Stone Pitching on U/S Slope: 1.5 ft
- D/S Shingle: 0.5 ft
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 517 ft (157.6 m)
- Width: 150 ft (45.7 m)
- Free Board: 3 feet
- Crest Level: 533.75 ft
- Side slope: 0.5 : 1
- Stone pitching on bed and slopes: 1.5 ft thick
- Gabion barrier walls :5 nos.
- Design discharge (return period): 5,600 cusec, 1000 year (158.6 cumec)

Outlet structure:

- Discharge: 13 cusec
- 2 nos length of 12 inch dia, 420 ft long MS pipe with 'strainer' facility in the reservoir. The strainer facility consists of 'SPWAL filling' and Shingle filling in rabble masonry cylinder of 11 ft dia with PVC weep holes in the masonry.

Diversion bund and leading cut/feeding channel

- Crest length: 370 ft (112.8 m)

- Height; 27 ft (8.2 m)
- Upstream slope 2:1
-Downstream slope 2:1
- Downstream shingle 0.5 ft thick

Benefits

- Surface Well: 26 nos
- Spring: 1 nos
- Kareze: 1 nos
- Tube well: 10 nos
- Additional cultivation: 80 acres
- Farm families: 50

Water Shed management

- water shed management equivalent to 1 % of total cost of the project has also been planned for implementation. This includes execution of contour trenches/check / silt traps at very samll creeks on the upstream contours of the catchments area. This activity will be carried out in close consultation with field officers of the Forest Department.

Observations

- JICA proposed DAD site was located near the very narrow gouge downstream the present site proposed by I & P dept.
- The right bank of the DAD consists of steep rock slope (limestone) while the left consisted of terrace deposit abutting on the right bank hill.
- The reservoir and the catchment area elongates NW – SE.
- The groundwater in the area emerges at the gouge.
- A recreation field exists on the left bank just upstream of the gouge.
- Two wells were being drilled downstream of the DAD site.
- Behind the ridge of the left bank, limestone is being mined.

Record of Field Visit (#21)

Date visited:

01-Oct-2003

Name of site visited:

Ghutai Shela Delay Action Dam, proposed by JICA for Stage III construction

District:

Quetta

Coordinates (by handy GIS):

30-12.844 N, 66-56.816 E

Persons met:

Mr. Qutob Khan

Descriptions:

Cost: Rp. 5.16 million

Date of Completion: 2002

Catchment and Reservoir

- Catchment's Area: 0.48 sq. mile (1.2 km^2)
- River Discharge: 547Cusec,30 years (15.5 cumec)
- Storage Capacity: ? AF (m^3)
- Storage Depth: ft (12.19 m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 430 ft (131.1 m)
- Height: 50 ft (15.2 m)
- Crest Width: 20 ft (6.1 m)
- Bottom Width: 380 ft (115.8 m)
- Side Slope D/S (upper):3.0 : 1
- Side Slope D/S Berm (Lower): 3.0 : 1
- Side Slope U/S: 2.0 :1
- Stone Pitching on U/S Slope: 1.5 ft (0.46 m)
- D/S Shingle: 0.5 ft (0.15 m)
- H.G. Line (Line of Saturation) : 1: 5

Spillway

- Length: ? ft (91.15 m)
- Width: ? ft (13.71 m)
- Free Board: ? ft (m)
- Crest Level: ? ft (378.5m)
- Side slope: ?
- Stone pitching on bed and slopes: 0.15 ft
- Gabion barrier walls :3 nos.
- Design discharge, return period: 547 cusec, 30 year (15.5 cumec)

Outlet structure:

- Discharge: 10 cumec
- Length of 8 inch dia, 290 ft long MS pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: ? nos
- Spring: ? nos
- Kareze: ? nos
- Tube well: ? nos
- Additional cultivation: ? acres
- Farm families: ?

Observations

- After the completion of the DAD, a flood water was arrested to a depth approx 15 ft.
- About 1.5 month was needed to release the water from the reservoir, through the outlet pipe, reservoir bed itself and evaporation.

- No water was seen in the reservoir when visited.
- Approx 2-3 m thick of sedimentation was observed. The upper part of the sedimentation was virtually clay that looked impervious.
- Upper part of inlet pipe of some 1 m was exposed; children removed the filter rock material around the pipe, explained.
- Similarly, parts of rip rap rock material at the crest level were removed and found on the upstream slope or at the bottom of the reservoir; children did, explained.
- The toe of the dam was beautifully protected with rock material.
- Recharging pit at the downstream was found buried with soil. Outlet pipe was not visible. The pipe could be choked due to no flow in the pipe. Needs to be rehabilitated.

Record of Field Visit (#22)

Date visited:

02-Oct-2003

Name of site visited:

Khushab Delay Action Dam (#147 listed in Briefing paper)

District:

Pishin

Coordinates (by handy GIS):

30-33.260 N, 67-19.545 E

Persons met:

Mr, Jam Mohammad, Pishin

Descriptions:

Cost: Rp. Million

Date of Completion: 30-June-1986

Catchment and Reservoir

- Catchment's Area: sq. mile (15.20 km^2)
- River Discharge,: cusec (75.12 cumec)
- Storage Capacity: 240 AF (392,900 m3)
- Storage Depth: 40 ft (12.2 m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: ft (164.0 m)
- Height: ft (15.4 m)
- Crest Width: ft (m)
- Bottom Width: ft (m)
- Side Slope D/S (upper): ** : 1
- Side Slope D/S Berm (Lower): ** : 1
- Side Slope U/S: ** :1
- Stone Pitching on U/S Slope: 1.5 ft (m)
- D/S Shingle: Nil
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 300 ft (m)
- Width: 50 ft (m)
- Free Board: 5 ft (m)
- Crest Level: ft (m)
- Side slope: 1:**
- Stone pitching on bed and slopes: Nil
- Gabion barrier walls :1 nos. concrete wall with rcc apron
- Design discharge, return period: cusec, year (cumec)

Outlet structure:

- Discharge: ? cusec
- Length of inch dia, ft long pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: nil
- Spring: nil
- Kareze: 2 nos.
- Tube well: 40 nos
- Additional cultivation: 150 acres
- Farm families: 150

Observations

- Although the DAD was constructed in 1980th, outlet pipe was seen in the reservoir. The outlet part of the pipe was though not seen possibly due to buried under the soil.

- Presently the water was said to be 10-12 ft deep, whereas silt to be 30 ft deep.
- About 30 – 40 days ago, a flood reached in to the reservoir to the spillway level. The present water level was seen just below the spill level.
- It is said the reservoir was totally silt up. No seepage even was seen from the toe. Water was completely held in the reservoir.
- De-siltation has been proposed, explained.
- As against the other DADs observed, U/S slope looked gentler that that of D/S.
- U/S slope was nicely lined with gravel and D/S with shingle. No remarkable erosions were seen on the D/S slope.

Record of Field Visit (#23)

Date visited:

02-Oct-2003

Name of site visited:

Balozai Delay Action Dam (#133 listed in Briefing paper)

District:

Pishin

Coordinates (by handy GIS):

30-38.461 N, 57-22.486 E

Persons met:

Descriptions:

Cost: Rp. million

Date of Completion: 30-June-1983

Catchment and Reservoir

- Catchment's Area: sq. mile (6.48 km^2)
- River Discharge: cusec (79.30 cumec)
- Storage Capacity: 400 AF (3,022,100 m3)
- Storage Depth: 25 ft (7.6 m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: ft (853.4 m)
- Height: ft (12.2 m)
- Crest Width: ft (6.10 m)
- Bottom Width: ft (67.10 m)
- Side Slope D/S (upper): 3: 1
- Side Slope D/S Berm (Lower): nil
- Side Slope U/S: 2:1
- Stone Pitching on U/S Slope: 1.5 ft (m) thick
- D/S Shingle: nil
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 50 ft (m)
- Width: 20 ft (m)
- Free Board: 4 ft (m)
- Crest Level: rl 493.16 ft (m)
- Side slope: 1: 2
- Stone pitching on bed and slopes: 1.5 in gabion
- Gabion barrier walls :2 nos gabion
- Design discharge, return period:250 cusec,30 year (cumec)

Outlet structure:

- not provided

Benefits

- Surface Well: nil nos
- Spring: nil nos
- Kareze: 5 no
- Tube well: 50 nos
- Additional cultivation: 100 acres
- Farm families: 500

Observations

- The DAD was constructed in 1960th by a public sector, taken over in 1981 by Irrigation and Power department.

- In 2002, Desilting works were carried out where some 11 million cu ft of silt was removed from the reservoir.
- After the 7 yeas long lasting draught, and after the de-siltation works in 2002, floods came in August 2003.
- The reservoir was filled up to three quarters or the full supply level when observed.
- No water release pipe was equipped. No seepage was visible at the dam toe.
- 250 Tube wells and 7 karazes are benefited from the DAD, explained.
- ******
- The removed silt was dumped on the downstream slop of the dam. Due to impervious nature of the removed silt, smooth drain function of the downstream slope might be malfunctioned. Some part of the dumped silt was about to slip down though the collapse was thought not to damage the dam body itself.

Record of Field Visit (#24)

Date visited:
02-Oct-2003

Name of site visited:
Jigda Delay Action Dam proposed by JICA F/S for Stage-I construction

District:
Pishin

Coordinates (by handy GIS):
30-39.528 N, 67-13.392

Persons met:

Descriptions:

Proposed Dam: component was yet to be decided.

Cost: *Rp. 10 million*

Date of Completion:

Catchment and Reservoir

- Catchment's Area: 6.84 sq. mile (km²)
- River Discharge: 3500 cusec (cumec)
- Storage Capacity: 168 AF (m³)
- Storage Depth: 40 ft (m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 475.10 ft (m)
- Height: 50 ft (m)
- Crest Width: 20 ft (6.1 m)
- Bottom Width: 290 ft (88.41m)
- Side Slope D/S (upper): 3: 1
- Side Slope D/S Berm (Lower): 3: 1
- Side Slope U/S: 2:1
- Stone Pitching on U/S Slope: 1.5 ft (m) thick
- D/S Shingle: 0.5 ft (m) thick
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 350 ft (m)
- Width: 100 ft (m)
- Free Board: ft (m)
- Crest Level: 465.10 ft (m)
- Side slope: vertical wall
- Stone pitching on bed and slopes:1.5 in gabion
- Gabion barrier walls :5 nos
- Design discharge, return period: 3500 cusec, 30 year (cumec)

Outlet structure:

- Discharge: ?
- Length of 12 inch dia, 340 ft long MS pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: nil
- Spring: nil
- Kareze: 2 nos
- Tube well: 100 nos
- Additional cultivation: 350 acres
- Farm families: 750

Observations

- PC-I for the DAD was yet to be prepared. A topo-survey for design purposes was completed.
- River deposit consisted of sand and silt with breccia/fragment of shale stone. The deposit looked less pervious.
- Thickness of the deposit was inferred to be less than 10 m. Much percolation to the river deposit was doubtful.
- ****
- The DAD was meant to recharge the existing Sharan Karage (30-39.915 N, 67-12.389 E) some 1.5 km downstream. The Karage was excavated in less consolidated silt stone and sandy silt stone. Water was collected from the sandy part of the soft rock layer.
- Down the Karage, beautiful orchard fields were observed.

Record of Field Visit (#25)

Date visited:

02-Oct-2003

Name of site visited:

Khushdil Khan Bund, Rehabilitation and Improvement Project
(not listed in Briefing paper)

District:

Pishin

Coordinates (by handy GIS):

30-40.269 N, 67-03.455 N

Persons met:

Descriptions:

Original Component:

- Year of Completion: 1890
- Original Storage Capacity: 23,800 AF (29,345,000 m^3)
- (Present Storage Capacity: 6,031 AF (7,436,000 m^3)
- Earth Embankment
  - Length = 3,500 ft (1,066.8 m)
  - Height = 38 ft (11.6 m)
  - Pond Height = 31 ft (9.4 m)
- Conveyance System
  - Main Canal: Length=6,800 ft(2.1km), Discharge Capacity=45 Cusecs(1.3cumec)
  - Sarala Canal: Length =30,250 ft(9.2km), Discharge Capacity=25 Cusecs(0.7cumec)
  - Shebo Canal: Length = 70,635 ft(2.2km), Discharge Capacity=20 Cusecs (0.7cumec)

Rehabilitation works undertaken (Removal of Silt from the reservoir)

- A part of sediment in the reservoir was removed in 2002 for resume the reservoir capacity to some extent.
- Further de-siltation is in consideration.

Proposed Component:

- **Cost:** Rp.1,008 million
- Construction of a new earth fill dam:
  - Location: some 2,500 ft downstream of the existing bund
  - Dimensions: yet to be detailed
  - Additional storage capacity: 14,500 – 15,000 AF
- Construction of New outlet/draw-off tower
- Construction of an RCC conduit and off-take channel
- Construction of a new spillway
- Relocation of existing main road from the existing dam crest to the new dam crest downstream
- Raising, remodeling, rehabilitation and improvement of the intake structure
- Provision of flood protection bunds around the proposed reservoir rim
- Rehabilitation of the Tor Murgha Feeder Canal embankments
- Training works of the Timrak Nullah
- Partial demolition of the existing bund
- Development of tube wells and conveyance structures
- Remodeling of 100,000ft of primary and secondary channels.
- Development of on-farm channels for a total length of about 400,000ft
- Provision of agricultural extension services
- Watershed Management through forestation of 100 km2 and range management through fuel and forage generation over 10 km2 with in the catchments area if 1,100 km2

Benefits:

- Storage capacity will be increased enough to meet irrigation water requirement of about 6,500 Acre

Record of Field Visit (#26)

Date visited:

02-Oct-2003

Name of site visited:

Sanzali Delay Action Dam, Proposed by JICA F/S (1997) for Stage III construction

District:

Pishin

Coordinates (by handy GIS):

30-31.312 N, 67-03.708 E

Persons met:

Descriptions:

PC-I is yet to be prepared

Cost: *Rp.12 million*

Date of Completion:

Catchment and Reservoir (JICA F/S)

- Catchment's Area: 10.4 km²
- River Discharge: 142 m3/sec, 1/100 year
- Storage Capacity: 508,000 m³
- Storage Depth: 36 ft

Components of DAD (JICA F/S)

- Dam type: Homogeneous Earth Fill
- Crest length: 210.0 m
- Height: 14.0 m
- Crest Width: 6.1 m
- Bottom Width: 270 ft (m)
- Side Slope D/S (upper): 3 : 1
- Side Slope D/S Berm (Lower): 3 : 1
- Side Slope U/S: 2 :1
- Stone Pitching on U/S Slope: 1.5 ft
- D/S Shingle: 0.5 ft
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 200 ft
- Width: 50 ft
- Free Board: 5 feet
- Crest Level: rl. 226.10 ft
- Side slope: vertical gabion wall
- Stone pitching on bed and slopes: 1.5 ft thick in gabion wall
- Gabion barrier walls :2 nos.
- Design discharge, return period: 142m³/sec, 100 year

Outlet structure:

- Discharge: 12 cusec
- Length of 12 inch dia, 300 ft long MS pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: 5 nos
- Spring: 2 nos
- Kareze: 5 nos
- Tube well: 20 nos
- Additional cultivation: 50 acres
- Farm families: 300

Observations

- The river bed was composed of silty sand with gravel. The permeability of the

unconsolidated material was inferred to be a lower rang of 1x 10^{-3}cm/sec

- The rock formation was composed of silt stone and conglomerate. The silt stone seemed less pervious in a order of 10^{-4}cm/sec, whereas the conglomerate was considered pervious.
- Due to the nature of less consolidated rock formation, fine material such as silt and clay will be accumulated in the reservoir.

Record of Field Visit (#27)

Date visited:

03-Oct-2003

Name of site visited:

5 flood distribution structures, Nari River (Proposed Mega Project #4 in Briefing paper)

District:

Sibi

Coordinates (by handy GIS):

See below

Persons met:

Descriptions:

Observations

- Sibi is the second biggest city in Balochistan.
- The Nari river is the largest river in Balochistan, the catchment area of the river: 9296 sq. moles, a maximum discharge: 180,000 cusec during 1982-83.
- Traditionally, earth-filled embankments (Ganda) are constructed across the Nari river before each flood season, to capture flood water into field for irrigation purposes (**Flood distribution**).
- Such constructed earth embankments are intentionally breached once the targeted lands have obtained enough water for cultivation, or left to be breached by natural flood.
- Funds for embankment works are incurred by community itself that is benefited by the embankment, or work itself is done by the community.
- Such communities are requesting the Government to construct permanent structures across the river to capture flood water.
- ***Visits***
- Four (4) sites out of the existing five (5) sites were visited (described in the order from upstream).
- **Erri Ganda** (29-18.289N, 67-46.849 E): A new embankment was under construction for the second flood season in winter. MPA funded on the work from his own development fund, not from the Government. MPA provided funds in shape of Dozer Hours, which in not enough to meet with requirement, hence the same is included in PC-I to construct the required size if ganda.
- **Haji Shaher Ganda** (29-15.722N, 67-49.022E): A breached embankment was observed. Flood came this year before new Ganda was constructed, explained.
- **Tool Ganda** (29-13.059 N, 67-51.092 E): A newly constructed but breached embankment was observed. Flood water was successfully captured and distributed to the irrigated area, explained.
- **Ghazi Ganda (**29-11.256 N, 67-50.092 E)**:** A concrete intake structure was constructed about 20 years ago. Due to a curving location of the river, river water runs into the forefront side bank, leaving much sand sedimentation in the other bank of the river. Farmers on the other side construct an embankment across the river, just downstream of the concrete intake structure to obtain flood water.
-

Record of Field Visit (#28)

Date visited:

04-Oct-2003

Name of site visited:

Balon Weir Irrigation Scheme(not listed in Briefing paper)

District:

Coordinates (by handy GIS):

Weir: 29-29.880 N, 67-34.116 E

A distribution weir along Dadar canal: 29-29.020 N, 67-36.167 E

Persons met:

Descriptions:

Original scheme was constructed in 1963-64 which was badly damaged by the flood of 1986 and then get remodeled in the year of 1990-91

##	Item	Original Scheme	Remodeled Schem
1	• Estimated Cost	• Rp. 1.1 mill	• Rp. 14.24 mill
2	• Date of Start	• 17-5-1960	• 31-1-1988
3	• Date of Completion	• 28-2-1963	• 30-6-1991
4	• Length of Pacca weir	• 350ft concrete	• 350 ft
5	• Length of Rock fill weir	• Nil	• 1,250 ft
6	• Length of Marginal Bund	• 1,600 ft	• 1,00 ft
7	• Maximum Designed Discharge	• 63,000 cusec	• 63,000 cusec
8	• Discharge of Dhadar Canal	• 50 cusec	• 50 cusec
9	• Discharge of Inami Canal	• 31 cusec	• 31 cusec
10	• Length of Inami Main Canal	• 13,000 ft	• 13,400 ft
11	• Length of Dhadar Main canal	• 12,300 ft	• 12,500 ft
12	• C.C.A (Acres	• 16,000 acres	• 16,000 acres
13	• Area under irrigation (Acres)	• 8,000 acres	• 8,000 acres
14	• Catchment area of Bolan river	• 800 sq. miles	• 800 sq. miles

The Maximum flood recorded in August 1986 was 250,000 cusec.

Observations

- Balon River is a perennial river.

Record of Field Visit (#29)

Date visited:

04-Oct-2003

Name of site visited:

Isplengi DAD (not listed in Briefing paper)

District:

Mastung

Coordinates (by handy GIS):

29-37.458 N, 67-00.895 E

Persons met:

Descriptions:

Cost: Rp. 5.56 Million

Date of Completion: under construction to be completed in August 2004

Catchment and Reservoir

- Catchment's Area: 31.64 sq. mile (81.0 km^2)
- River Discharge: 6,350 cusec, 30 years (179.8 cumec)
- Storage Capacity: 197 AF (242,900 m^3)
- Storage Depth:30 ft (9.1m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 490 ft (149.4 m)
- Height: 40 ft (12.2 m)
- Crest Width: 20 ft (6.1m)
- Bottom Width: 220 ft (m)
- Side Slope D/S (upper): 2.0 : 1
- Side Slope D/S Berm (Lower): 3.0 : 1
- Side Slope U/S: 2.0 :1
- Stone Pitching on U/S Slope: 1.5 ft (0.45m) thick
- D/S Shingle: only on level portion top of counter Berm and top 0.5 thick
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- Length: 400 ft (m)
- Width: 80 ft (m)
- Free Board: 50 ft (m)
- Crest Level: 10 ft (m) below from top of Bund
- Side slope: 1.5 : 1
- Stone pitching on bed and slopes: ?
- Gabion barrier walls : 5 nos. size 3' x 5'
- Design discharge , return period: 6,500 cusec, 30 year (179.8 cusmec)

Outlet structure:

- Discharge: 3.5 cusec
- Length of 10 inch dia, 280 ft long MS pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: 5 nos
- Spring: nil
- Kareze: nil
- Tube well: 95 nos
- Additional cultivation under flood water cultivation: 150 acres (60.7 ha)
- Farm families:

Observations

- The construction was commenced in September 2003.
- The less pervious key trench material on the river bed was just placed.

- On the steep right bank, concrete key walls are to be provided instead of impervious soil material (due to difficult compaction of soil on a steep slope).
- A longitudinal trench along the river bed was seen excavated for installation of outlet MS pipe. The gradient of the MS pipe to be installed is designed to be 1.35/100. Outlet portion of the MS pipe was in a lower elevation that the riverbed.
- In the trench for the MS pipe, a geological section of the river bed was observed, indicating a permeability of a lower side of 10^{-3} cm/sec.
- It was explained a layer of 1 foot is compacted 8 times with a roller of 18 tons.
- It was told that karezes downstream dried up about 15 year back.

Record of Field Visit (#30) – Notes on Discussion

Date visited:

05-Oct-2003

Name of site visited:

Lori Daman DAD (not listed in Briefing paper)

District:

Loralai

Coordinates (by handy GIS):

-

Persons met:

Mr. Basgir Tareen Subdivision officer, Irrigation, Loralai
(who participated in a training program on 'Irrigation System Management' hosted by JICA, held in Bangkok, Year 2000)

Descriptions:

Cost: Rp. 6.271 million

Date of Completion: under construction

Catchment and Reservoir

- Catchment's Area: 5.9 sq. mile (15.1 km^2)
- River Discharge: 2700 cusec (cumec)
- Storage Capacity: 152 AF (187,000 m^3)
- Storage Depth: 10 ft (m)

Components of DAD

- Dam type: Homogeneous Earth Fill
- Crest length: 2,500 ft (722m)
- Height: 17.50 ft (5.3 m)
- Crest Width: 15 ft (4.5 m)
- Bottom Width: 93.75 ft (28.6 m)
- Side Slope D/S (upper): 2.5 : 1
- Side Slope D/S Berm (Lower): 2.5 : 1
- Side Slope U/S: 2.0 :1
- Stone Pitching on U/S Slope: 9 inch
- D/S Shingle: 4 inch
- H.G. Line (Assumed Saturation line):1: 5

Spillway

- **Left side**

- Length: 100 ft (30.5m)
- Width: 100 ft (30.5m)

- Right side

- Length: 100 ft (30.5m)
- width: 40 ft (30.5m)

- Free Board: 5 ft (m)
- Crest Level: 503 ft (m)
- Side slope: 1: 2
- Stone pitching on bed and slopes: 1.5 ft
- Gabion barrier walls :2" x 5"
- Design discharge, return period: 2,700 cusec, 30 year (76.5 cumec)

Outlet structure:

- Discharge: 15 cusec
- Length of 9 inch dia, 150 ft long NS pipe with 'strainer' facility in the reservoir

Benefits

- Surface Well: 15 nos
- Spring: nil
- Kareze: 02 nos
- Tube well: - nos

- Additional cultivation: - acres
- Farm families: -

Observations (hearing)

It was explained that:

- Less pervious top layer in the reservoir area is to be removed to attain smooth recharge.
- An infiltration pond (100 ft x 30 ft, 50 ft deep) is to be provided downstream of the dam.
- Groundwater level is to be monitored in an 'injection well' to be provided at the downstream.

It was also explained about a village Muslimbad, Quilla Saifullah where;

- The community (20,000 heads) has not allow tube wells to be installed within the area.
- The last prolonged draught has only affected the village to minimal level.
- (location: 75 miles from Loralai to Quetta).

Record of Field Visit (#31)

Date visited:

10-Oct-2003

Name of site visited:

Shaghai-I & II DAD (#109 ans #110 listed in Briefing paper)

District:

Quetta

Coordinates (by handy GIS):

Shaghai I: 30-12.710 N, 67-04.212 E

Shaghi II: 30-12.870 N, 67-04.266 E

Persons met:

Mr. Qotobu Khar, subdivional offier, I&P dep., Quetta
Mr. Abdul Jabbar, Sub. Engineer, I&P, Quetta
Mr. Jalal-ud-Din Qureshi, Hydrogiologisy/Dty Director, PCRWR

Descriptions:

	Shaghai-I	Shaghai II
Cost: Rp. million	6.41	4.08
Date of Completion:	1995-96	1995-96
Catchment and Reservoir		
- Catchment's Area:	2.89sq.mile(7.4 sq.km)	1.40sq.mile(3.6 sq.km)
- River Discharge:	2100 cusec(59.5cumec)	1200 cusec (34.0 cusec)
- Storage Capacity:	309 AF (380,000 c.m)	168 AF (207,000 c. m)
- Storage Depth:	40ft (12.2 m)	30 ft (9.1 m)
Components of DAD		
- Dam type:	Homogeneous Earth Fill	Homogeneous Earth Fill
- Crest length:	800ft (242.2 m)	450ft (45.4 m)
- Height:	50ft (15.1 m)	40ft (12.1 m)
- Crest Width:	20ft (6.1 m)	20ft (6.1 m)
- Bottom Width:	315ft (95.4 m)	220ft (66.6 m)
- Side Slope D/S (upper):	3.5:1	3.0:1
- Side Slope D/S Berm (Lower):	3.5:1	-
- Side Slope U/S:	2:1	2:1
- Stone Pitching on U/S Slope:	1.5ft (0.45 m)	1.5ft (0.45 m)
- D/S Shingle:	0.5ft (0.15 m)	0.5ft (0.15 m)
Spillway		
- Length:	100ft (30.3m)	439ft(132.9 m)
- Width:	100ft (30.3 m)	30ft (9.1m)
- Free Board:	-	-
- Crest Level:	464.5ft (141.0 m)	470.2ft (142.4 m)
- Side slope:	0.5:1	1:1
- Stone pitching on bed	non	gabion
- Gabion barrier walls	non	-
- Design discharge (return period):	2100cusec	1200cusec
Outlet structure:		
- Discharge:	-	-
- Length of inch dia, ft long pipe with 'strainer' facility in the reservoir	6 inch dia; 370ft long; GI pipe	6 inch dia; 360ft lomg GI pipe
Benefits	for the Cantonment area	for the Cantonment area
Observations:	• The reservoir was almost empty. • A small pond was observed at the bottom of	• The dam is located just adjacent to Shaghai I DAD; some 300 m apart.

- It is said both Shagai I and II was recharging the area of observation hole

MNW-QA-4; Groundwater level of which rose from Nov-89, claiming due to dam construction.

- MNW-QA-4 is located near Habib nallha (river). Habib Dara I & II DAD were constructed 1972 and 93 respectively.
- No DAD constructed in or around '89 has been identified.

the reservoir.

- The bottom of the reservoir was covered with clayey material due to siltation.
- Outlet pipe and the surrounding protection/filter stone were exposed in the reservoir. NO serious damage was seen.
- It was judged sediment load was not so high.
- Discharging pipe at the downstream was protected /covered by stone.
- Both slopes of the dam body were nicely lined with stone pitching on U/S and shingle on D/S.
- Reservoir water monitoring poles were observed.
- The reservoir was almost empty too.
- No 'berm' on the D/S slope was observed due to low dam height, explained.
- Both slopes of the dam body were nicely lined.
- At the toe of the dam, small gravel mound for toe drain was observed.
- At the discharging pipe outlet, were observed a sedimentation pit (2x4.5 ft, 4.5 ft deep, a leading canal (1x0.75ft, 20ft long and infiltration pond (15x15ft) filled with pebble/bolder.
- The infiltration facility was partially broken and was not properly cleaned.
- Down the infiltration pit, several trench for recharging were observed.

Record of Field Visit (#32)

Date visited:

10-Oct-2003

Name of site visited:

Ziargai Artificial Groundwater Recharge Pilot Scheme(not listed in Briefing paper)

District:

Quetta

Coordinates (by handy GIS):

30-27.874 N, 67-07.677 E

Persons met:

Mr. Abdul Jabbar, Sub. Engineer, I&P, Quetta

Mr. Jalal-ud-Din Qureshi, Hydrogiologisy/Dty Director, PCRWR

Descriptions:

- Balochistan Minor Irrigation and Agricultural Development
- Funded by: WB, KfW, GoPakistan; Dutch Government for TA
- Component (from the Final report prepared in 1990):

A. RECHARGE WORKS (construction undertake in 1986)

- The diversion structure, a sluice and off-take weir for 2-year flood, whole structure for 25-year flood, with a free board for 100-year flood.
- The guide bund and chute
- The storage reservoir (72,000qu.m) with outlet pipe of 305 mm dia discharging 0.23 cumes that was meant to empty the reservoir within 24 hours.
- The recharge area (Zigzag channels of about 5200 m)

B. MONITORING WORKS (undertaken from 1984 to 1987)

- Rainfall monitoring gauge (1986- 1987)
- Flow and water level (1986 – 1987)
- Soil moisture status (1986 – 1987)
- Groundwater
- Dug Well (1984 – 1987)

- Preliminary Results ((from the Final report prepared in 1990)

A. RAINFALL ANDRUNOFF

- Quote, “One interesting feature of rainfall events is the importance of antecedent wetness conditions. The third event produced the largest amount of runoff despite arising from a rainfall event of significantly lower quantity and intensity. This s because it was preceded by a considerable period of wet weather which left the surface soil moisture conditions closer to saturation than the other events. This can be indexed by an antecedent precipitation index (API) which is designed to reflect the rainfall over the previous several days”, unquote.

B. SOIL MOUSTURE STATUS

- Quote,”The from seems to have reached 2-3 metre depth after 1 month, 5-6 metre after 3-months, and 6-8 metre after 4 months. This would seem to indicate a rate of movement of the front of the order of 1.5-2 metre per month or 20 metre per year. If this is an indication of the percolation rate, then we may be talking in terms of recharged water taking 4 years to reach the ground table. Hydraulic conductivity increased with moisture content, so that this time may reduce considerably over a long period encompassing several recharge events”, unquote.

C. GROUNDWATER

- Quote, “the groundwater table in this part of the Quetta valley is falling due to excessive abstraction. The fall appears to be of the order of 3 metre per year, although the further development of wells should increase this rate,” unquote.

Observations

- The pilot project was totally abandoned.
- Reservoir capacity was felt too small (72,000 qu.m).
- Bottom out let was felt too small (0.302 m dia).
- It was thought on the site that: major part of 2-year flood went through sluice weir to

downstream. Only the maximum of 72,000 qu.m was stored in the reservoir, only a part of the stored water contribute recharging the groundwater, it seemed to be.

- At the bottom of the zigzag channel, thin silty –clayey sediment layer was seen, which might have reduced the infiltration rate.
- It was felt on site major part of flood water ran in to the downstream side, not contributing in recharging groundwater.
- It was felt on site, a delay action dam with a properly designed discharging pipe, and facility for recharging such as zigzag channel or infiltration pond would have been useful.

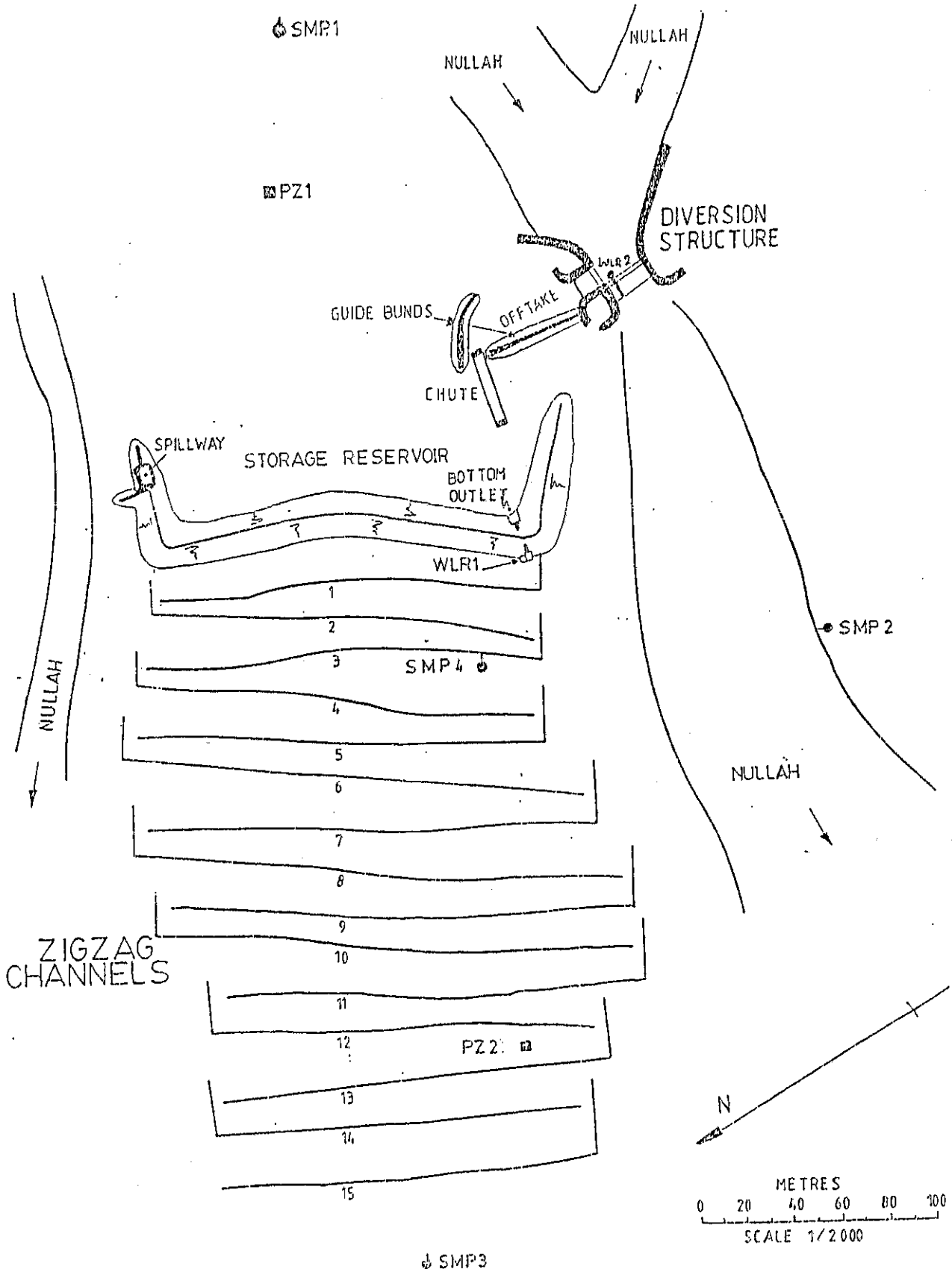


FIGURE 2.1: ZIARGAT RECHARGE WORKS (AS BUILT AT MARCH 1987)

Record of Field Visit (#33)

Date visited:

10-Oct-2003

Name of site visited:

On farm Management, QTA
Pilot Farm for trickle irrigation, Mastung
Bandat irrigation Site in Mastung

District:

Quetta, Mastung

Coordinates (by handy GIS):

Persons met:

Mr. Abdul Salam Baloch, Secretary to Agriculture, Cooperative, Food Department

Descriptions:

- Detail record on the site visit will be prepared by a team member for water utilization

Observation as a member in charge of water resources is as follows.

- "Bandat" is a series of 1m-high-earth-embankment meant for lands being inundated within 'Bandat'. Water is diverted from small nullah (rivers) in to a land squire where a Bandat obstructs water flow resulting in inundation of the land squire and moistur-ing the land for forming; then the water breaches a part of Bandat of the land squire, flows into a land squire downstream side. This process continues till flood water finally reaches the lowest part, or water exhausted itself.
- Since the Bandat is made of earth material, parts of Bandat are inevitably breached every year, requiring every year repair.
- Band is constructed across a river to divert water to lands, whereas Bandat is constructed on land to obstruct entered water in land from rapidly flowing down. Contour band may be a similar function to Bandat.
- * * *
- In addition, trickle irrigation seems to be laborious system to unskilled farmers.

The end of Record

添付資料 － 6　　収集資料リスト

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
			Policy and Statistics at National Level					
JST-PN-01	Ten Year Perspective Development Plan 2001-11 and Three Year Development Programme 2001-04, Islamabad,	421 pages	Long and medium term development plan of Pakistan	2001	Planning Commissio	English	-	Noda
JST-PN-02	Annual Plan 2003-04, Islamabad June, 2003, Government of Pakistan	120 pages	Annual Plan of economic framework and public sector development programme	2003	Planning Commissio	English	-	Noda
JST-PN-03	Public Sector Development Programme, 2002-2003, June 2002, Government of Pakistan	61 pages	Annual plan of public sector development programme	2002	Planning Commissio	English	-	Noda
JST-PN-04	Public Sector Development Programme, 2003-04, June, 2003, Government of Pakistan	85 pages	Annual plan of public sector development programme	2003	Planning Commissio	English	-	Noda
JST-PN-05	Estimates of Foreign Assistance 2003-2004, Government of Pakistan	42 pages	List of projects under Foreign assistance		Finance Division	English	-	Noda
JST-PN-06	Pakistan Statistical Year Book 2002, Federal Bureau of Statistics, Government of Pakistan	712 pages and notes	National statistics of Pakistan	2002	Statistics Division	English	-	Noda
JST-PN-07	Economic Survey 2001-2002, Government of Pakistan	179 pages	National statistics on economics of Pakistan	2002	Finance Division	English	-	Noda
			Policy and Statistics at Provincial Level					
	Government							
PBL-PP-01	9th Five Year Plan 1998-99 to 2002-03, Province of Balochistan, Planning and Development Department,	122 pages	Development policy and strategy of Balochistan Province	1998	P&D Dept.	English	-	Shinmura
PBL-PP-01'	GOVERNMENT OF BALOCHISTAN White Peper Budjet 2003-2004	35 pages	White paper budget	2003		English	-	Noda
PBL-PP-02	Public Sector Development Program 2003-04, June 2003, Government of Balochistan	101 pages and annexes	List of projects for public sector development programme	2003	P&D Dept.	English	-	Shinmura
PBL-PP-03	Development Statistics of Balochistan 2000-01, Bureau of Statistics, Planning & Development Department		Development Statistics of Balochistan	2002	P&D Dept.	English	-	Shinmura
PBL-PP-04	Agricultural Statistics Balochistan 2001-02, Statistical Wing, Directorate General Agriculture (Extension)	172 pages	Agricultural statistics in Balochistan Province	2002	Extension Directorate	English	-	Noda
PBL-PP-05	Killa Abdullah, A District Profile, Bureau of Statistics, Government of Balochistan	88 pages and annexes	Statistics on distict profile	1997	P&D Dept.	English	-	Study team
PBL-PP-06	Pishin, A District Profile, Bureau of Statistics, Government of Balochistan	82 pages and annexes	Statistics on distict profile	1997	P&D Dept.	English	-	Study team
PBL-PP-07	Quetta, A District Profile, Bureau of Statistics, Government of Balochistan	107 pages and annexes	Statistics on distict profile	1997	P&D Dept.	English	-	Study team

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
PBL-PP-08	Mastung, A District Profile, Bureau of Statistics, Government of Balochistan	60 pages and annexes	Statistics on distict profile	1997	P&D Dept.	English	-	Study team
PBL-PP-09	Kalat, A District Profile, Bureau of Statistics, Government of Balochistan	66 pages and annexes	Statistics on distict profile	1997	P&D Dept.	English	-	Study team
PBL-PP-10	Khuzdar, A District Profile, Bureau of Statistics, Government of Balochistan	52 pages and annexes	Statistics on distict profile	1997	P&D Dept.	English	-	Study team
PBL-PP-11	Kech, A District Profile, Bureau of Statistics, Government of Balochistan	83 pages and annexes	Statistics on distict profile	1997	P&D Dept.	English	-	Study team
	Donor							
PBL-PP-12	Pakistan Country Assistance Strategy Fy03-05, World Bank	38 pages and annexes	Assistance strategy for Pakistan	2002	WB Islamabad	English	-	Noda
PBL-PP-13	Pakistan Poverty Assessment, World Bank	169 pages	Poverty in Pakistan: Vulnerability, Social Gaps, and Dynamics	2002	WB Islamabad	English	-	Noda
PBL-PP-14	ADB Pakistan Sector Assessment Review, Asian Development Bank, October 2003	81 pages	Assistance strategy for Pakistan	2003	ADB Islamabad	English	-	Noda
PBL-PP-15	ADB Pakistan Economic Update (July 2002 - June 2003), Asian Development Bank, August 2003	33 pages	Statistics on economics	2003	ADB Islamabad	English	-	Noda
			Water Resources & Facilities					
	National Water Resources							
PBL-NW-01	Ministry of Water and Power, Government of Pakistan	46 pages	Guidebook of Ministry of Water and Power	-	Ministry of W&P	English	-	Takahasi
PBL-NW-02	Water Conservation: A Guide to Promoting Public Awareness, Water Resources Series No.81, Economic and Social Commission for Asia and the Pacific, United Nations	96 pages	Guidebook on water conservation	2001	United Nations	English	-	Takahasi
PBL-NW-03	Pakistan Council of Research in Water Resources Islamabad, August 1993	24 pages	Brochure of Pakistan Council of Research in Water Resources (PCRWR)	1993	PCRWR	English	-	Takahasi
PBL-NW-04	Publication Catalogue of Geological Survey of Pakistan (1985 to 1994), Geological Survey of Pakistan, 1994, Ministry of Petroleum and Natural Resources	34 pages	Publication catalogue	1994	GSP	English	-	Takahasi
PBL-NW-05	Water Supply and Sunitation in Pakistan, Current Status, Issues, and Future Strategies, Multi-donor Support Unit (MSU), October 2001	23 pages	Paper on current status, issues and future strategies in Pakistan					

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
	Provincial Water Resources, Balochistan							
PBL-PW-01	Monitoring and Evaluation Report on Pilot Phases of Groundwater Exploitation through 250 Windmills in Drought Stricken Areas of Balochistan, Water Resources Research Centre, Quetta, November, 2001	25 pages and tables	Monitoring and Evaluation Report on Groundwater Exploitation inBalochistan	2001	I&P Dept. and PCRWR	English	-	Takahasi
PBL-PW-02	PC-II; Impact Evaluation Study of Mauhsar Delay Action Dam in Conserving Water Resources of Balochistan, June 2000, Bureau of Water Resources	7 pages	Study Plan of Impact Evaluation on Mauhsar Delay Action Dam	2000	I&P Dept.	English	-	Takahasi
PBL-PW-03	PC-1 Proforma for Enhancement and Management of Groudwater Resources in Balochistan, Pakistan Coubcil of Research in Water Resources Islamabad, May 2003	27 pages	Study Plan of Enhancement and Management of Groudwater Resources in Balochistan	2003	PCRWR	English	-	Takahasi
PBL-PW-04	Report on Leaky Dam for Groundwater Recharge Watershed Management, Monitoring Program at Margat Area, District Quetta, Balochistan, September 2003, Water Resources	15 pages	Program on Groundwater Recharge Watershed Management, Monitoring at Margat Area with the Leaky Dam	2003	WRRC in PCRWR	English	-	Takahasi
PBL-PW-05	Balochistan Minor Irrigation and Agricultual Development Project: ARTIFICIAL GROUNDWATER RECHARGE Final Report Part-B, Vol:3 and Vol:4, Halcrow-ULG	48 pages and tables	Study report on artificial groundwater recharge	1990	Halcrow, Euroconsult	English	-	Takahasi
PBL-PW-06	Balochistan Minor Irrigation and Agricultual Development Project: ARTIFICIAL GROUNDWATER RECHARGE: A preliminary examination of economic viability; INTERNAL	33 pages and tables	INTERNAL REPORT, not for outside distribution, on preliminary examination of economic viability of artificial groundwater	-	-	English	-	Takahasi
PBL-PW-07	PC-I for Construction of Dargai Delay Action Dam, Drought Emergency Relief Assistance Programme (DERA), January 2002, Irrigation Division, Pishin	-	Project implementation plan and cost estimate for Dargai DAD	2002	I&P Dept.	English	-	Takahasi
PBL-PW-08	PC-I for Construction of Torkhezai Delay Action Dam, February 2000, Loralai Irrigation Division	-	Project implementation plan and cost estimate for Torkhezai DAD	2000	I&P Dept.	English	-	Takahasi
PBL-PW-09	Study on Hydraulic Relationship between Pechi Dam Reservoir and the Adjacent Karezes using Isotopic and Chemical Techniques, 1995, Water Resources Research	46 pages	Report on survey and evaluation on hydraulic relationship between dam and karezes	1995	WRRC in PCRWR	English	-	Takahasi
PBL-PW-10	Balochistan Groundwater Availability and Future Planning of Quetta Valley (Southern Part) - Inventory of Watering Points - Basic Data Series-1(Volume-I), Water Resources Planning Development & Monitoring Directorate,	19 pages and tables & figures	Report on investigation of groundwater	2002	WRPD&M Directorate in I&P Dept.	English	-	Takahasi
PBL-PW-11	Balochistan Groundwater Availability and Future Planning of Quetta Valley (Northern Part) - Inventory of watering Points - Basic Data Series-1(Volume-II), Water Resources Planning Development & Monitoring Directorate, March,	20 pages and tables	Report on investigation of groundwater	2002	WRPD&M Directorate in I&P Dept.	English	-	Takahasi

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
PBL-PW-12	Balochistan Groundwater Resource Reassessment, Final Report Volume 1 Main Report, January 1996, Halcrow Rural Management, Asian Development Bank	122 pages	Report on groundwater resources availability estimation	1996	Halcrow	English	-	Takahasi
PBL-PW-13	Ziargai Groundwater Recharge Pilot Scheme, Detailed Design Report, Baluchistan Minor Irrigation and Agricultural Development Project, Quetta, November, 1985	-	Design Report on groundwater monitoring programme	1985	Gov. of Balochistan	English	-	Takahasi
PBL-PW-14	Proposal for Project Concept Clearance, Water Resources Planning Development & Monitoring Directorate, Dec.	12 pages	Proposal for strengthening & modernization of groundwater network in Balochistan	2002	I&P Dept.	English	-	Takahasi
PBL-PW-15	Hydrological Yearbook 2001, River and Climatological Data of Balochistan, Water Resources Planning Development & Monitoring Directorate	538 pages	Statistics of river and climatological data of Balochistan	-	I&P Dept.	English	-	Takahasi
PBL-PW-16	Water Resources and Hydropower Development Vision - 2005, Pakistan Water and Power Development Authority,	99 pages	Data of projects and programme for development	2002	Water Wing WAPDA	English	-	Takahasi
PBL-PW-17	Master Feasibility Studies for Flood Management of Hill Torrents of Pakistan Umbrella PC-I, November 1998, National Engineering Services Pakistan (PVT) Ltd., Ministry	62 pages and figures	Study on flood management of hill torrents in Pakistan	1998	Federal Flood Commissio	English	-	Takahasi
PBL-PW-18	Spatial Analysis of Selected Watershed Areas Using RS and GIS Techniques, Water Resources Research Institute in Collaboration with JICA	60 pages	Remote sensing application for landcover / Landuse analysis	2003	NARC/PARC Islamabad	English	-	Takahasi
PBL-PW-19	Briefing Paper for JICA Preparatory Study Team on Flood Water Utilization Development in Balochistan Province Delay Action Dams, September, 2003, Irrigation & Power	main text and annexes	Present condition and situation in relation to Delay Action Dams in Balochistan	2003	I&P Dept.	English	-	All members
PBL-PW-20	PC-I / Estimate (Revised), Construction of Wali Dad Delay Action Dam in Hazar Ganji Area District Quetta, Irrigation	86 pages	Wali Dad Delay Action Dam Plan under Ground Water Recharge of Pishin, Quetta, Mastung and	2003	I&P Dept.	English	-	Takahasi
PBL-PW-21	1997 Annual Report, River and Climatological Data of Balochistan, Bureau of Water Resources	478 pages	Data of rivers and climate in Balochistan	1997	P&D Dept	English	-	Takahasi

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
			Irrigation					
PBL-IR-01	写真集 パキスタンの農業・農村と水、2001年3月	69頁	パキスタンの農業・農村と水に関係する写真と解説	2001	JICA清水専門家	日本語	-	野田
PBL-IR-02	PAKISTAN 国情・農業・灌漑、2003年6月	63頁と図表	パキスタンの国情・農業・灌漑に関する解説とデータ	2003	JICA清水専門家	日本語	-	野田
PBL-IR-03	On-farm Water Management Demonstration Centres - Handbook and Records, Federal Management Cell, Provincial Directorates of OFWM, FATA, FANA & ICTA, Ministry of Food, Agriculture and Cooperatives	14 pages and 14 forms	National guideline for establishment of on-farm water management demonstration centres	-	Ministry of Food, Agri. and Cooperative	English	-	Noda
PBL-IR-04	PC-1 for On-farm Water Management Balochistan (Japan Assisted), Agriculture Department, September 1991	20 pages and annexes	Project implementation plan and cost estimate for on-farm water management in Balochistan	1991	Agriculture Dept.	English	-	Noda
PBL-IR-05	Balochistan Community Irrigation and agriculture Project, Implementation Completion Report, Volume II, Appendices, June 2002, Halcrow - Euroconsult	-	Key information of schemes	2002	I&P Dept.	English	-	Noda
			Agriculture					
PBL-AG-01	Agriculture Statistics of Pakistan 2000-01, Ministry of Food, Agriculture and Livestock, Government of Pakistan	289 pages	National statistics on agriculture of Pakistan	2001	Economic Wing	English	-	Noda
PBL-AG-02	I. Cost of Product per Acre, II. Monthly Comparison of Wholesale Prices of Onion (dry) of Different Markets in Pakistan for the Year 2002, III. Monthly Wholesale Prices of Agriculture Commodities and Livestock Products, 1990~2003	I: 6 pages, II: 1page, III: 14 pages	Data of statistics on agro-economy	2003	Agriculture Economics and Marketing Directorate	English	-	Noda
PBL-AG-01	Research and Development Achievements of PARC 2000-2001, Directorate of Planning, Pakistan Agricultural	25 pages	Explanation of gricultural research and development projects by PARC	2002	PARC	English	-	Noda
PBL-AG-03	Area Development Programme Balochistan (ADPB), Achievements of the Project for the year 2002, UNDP	18 pages	Briefing paper on projects overseen by UNDP and Government of Balochistan	-	UNDP	English	-	Noda
PBL-AG-04	Area Development Programme Balochistan (ADPB), Targets of the Project for the year 2003, UNDP	8 pages	Briefing paper on projects to be overseen by UNDP and Government of Balochistan	-	UNDP	English	-	Noda
PBL-AG-05	Area Development Programme Balochistan (ADPB), Achievements of the Project up to May 2003, UNDP	18 pages	Briefing paper on projects overseen by UNDP and Government of Balochistan	-	UNDP	English	-	Noda
PBL-AG-06	Area Development Programme Balochistan (ADPB), A Working Paper Outlining Achievements of the Project (for	10 pages	Briefing paper on projects overseen by UNDP and Government of Balochistan	-	UNDP	English	-	Noda

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
			Consulting Company					
PBL-CC-01	Introduction to Services Rendered by SAMPAK Material Testing Laboratory	13 pages	Company brochure	-	SAMPAK	English	-	Takahashi
PBL-CC-02	Highway Engineering, Bridges, Material & Soil Testing, Survey and Mapping Work	-	Company brochure		SAMPAK	English	-	Takahashi
PBL-CC-03	National Engineering Corporation Pakistan	-	Company brochure		NEC	English	-	Takahashi
PBL-CC-04	Profile of the Firm, Cameos Consulting Engineers, Architects and Planners	55 pages	Company brochure		CAMEOS	English	-	Takahashi
			Construction & Machinery					
PBL-CM-01	District Wise Distribution of Bulldozers	1 page	List of number of bulldozer in each district, owned by Agricultural Engineering Dept.	2003	Agricultural Engineering Dept.	English	-	Koga
PBL-CM-02	All the data prepared by Agricultural Engineering Dept., in accordance with the detailed questionnaire	12 pages	1) List of equipment supplied by Japan's grand aid including KR2, 2) List of number of bulldozer classified into workable, non-workable, and scrap, 3) List of all the construction equipment, 4) Rental charge of the bulldozer in each purpose, 5) Organization chart of Agricultural Engineering Dept., 6) Annual budget, 7) Organization chart of each repair workshop, 8) Number of facilities installed and staffs in repair workshop, 9) Method of daily basis of each equipment, 10) Information on the technical training center	2003	Agricultural Engineering Dept.	English	-	Koga
PBL-CM-03	Subject: Procurement of Graders and Bulldozers under Japanese Grand and their Distribution, dated the 29th March, 1983	3 pages	List of number of each equipment which was distributed to each department	1983	Agricultural Engineering Dept.	English	-	Koga
PBL-CM-04	10th Five Year Plan 2003-2008	2 pages	Each proposed scheme and proposed budget, which were proposed to P&D Dept. by Agricultural Dept.	2003	Agricultural Engineering Dept.	English	-	Koga

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
PBL-CM-05	Each brief List proposed by 10th Five Year Plan 2003-2008	14 pages	-	2003	Agricultural Engineering Dept.	English	-	Koga
PBL-CM-06	Lubrication & Maintenance Guide, D&D Tractors	39 pages	Safety, Maintenance recommendations, Walk-Around inspection, Fuel and lubricant specifications, Lubrication and maintenance chart, Every 10 service hours or daily, Every 50 service hours or weekly, Every 100 service hours or 2 weeks, Every 250 service hours or monthly, Every 500 service hours or 3 months, Every 1000 service hours or 6 months, Every 2000 service hours or 1 year, When required, Refill capacities, G.E.T. bolt torques, Serial number locations	1982	Agricultural Engineering Dept.	English	-	Koga
PBL-CM-07	Minutes of the Meeting of the Committee Held on 15th July 2002 at 9:00 A.M. in the Office of the ACS (Dev.) to Consider Creation of Engineering Authority Balochistan	2 pages	-	2002	Agricultural Engineering Dept.	English	-	Koga
PBL-CM-08	Organogramme Balochistan Agricultural Engineering Authority	3 pages	-	-	Agricultural Engineering Dept.	English	-	Koga
PBL-CM-09	Detail of Machinery Available with Department	2 pages	List of all the machineries owned by I & P Dept.	2003	I & P Dept.	English	-	Koga
PBL-CM-10	List of Dozer Catter Piller D6D will be got repair under PSDP 2002-2003	1 page	List of bulldozer D6D, which will be got repair during 2002-2003	2003	I & P Dept.	English	-	Koga
PBL-CM-11	List of Machinery Installed in Irrigation Workshop Quetta	3 pages	List of all the machineries installed in repair workshop, which were installed by USAID in 1986	2003	I & P Dept.	English	-	Koga
PBL-CM-12	Seniority List of Staff in respect of Deputy Director W/S G.W.D.DIR: QTA.	4 pages	List of working staffs in repair workshop	2003	I & P Dept.	English	-	Koga
PBL-CM-13	List of Machinery in Respect of Deputy Director Drilling	1 page	List of drilling rigs and crane owned by I & P Dept.	2003	I & P Dept.	English	-	Koga

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
PBL-CM-14	Annexure=B (General abstract of cost) and C (Detailed estimate), PC-I/Estimate Construction of Wali DAD Delay Action Dam in Hazar Ganji Area District Quetta	32 pages	Annexure=B: Summary of Cost Estimate, Annexure=C: Detailed Cost Estimate including quantity calculation	2003	I & P Dept.	English	-	Koga
PBL-CM-15	Data of Bidding Procedure	5 pages	-	2003	I & P Dept.	English	-	Koga
PBL-CM-16	Contract Documents for Construction of Wali DAD Delay Action Dam financed by Pakistan Government Fund	29 pages	1.Notice invitation tender, 2.Tender form, 3.Notice invitation tenders issued vide this office inviting tenders, 4.Letter of approval of tender documents, 5.Comparative statement, 6.Letter of approval of rates, 7.General rules and directions for the guidance of contractors	2003	I & P Dept.	English	-	Koga
PBL-CM-17	Tender Documents for Construction of Munjro Check Cum Diversion Dam District Chagai financed by ADB fund	Approx. 50 pages	1.Notice invitation tender, 2.Instruction to tenders, 3.Tender, 4.Forms, 5.Conditions of contract, 6.Specifications and technical provisions	2003	I & P Dept.	English	-	Koga
PBL-CM-18	Organization Chart of Water Resources Planning, Development and Monitoring Directorate	1 page	-	2003	I & P Dept.	English	-	Koga
PBL-CM-19	Detail of Dozer Catter Piller Owned by Irrigation and Power Department Balochistan	1 page	-	2003	I & P Dept.	English	-	Koga

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
PBL-CM-20	Composite Schedule of Rates 1998 Volume-I, July 1998	Approx. 300 pages	1.Carriage, 2.Loading, Un-loading and stacking, 3.Earth work, 4.Dismantling(Demolition), 5.Plain and reinforced concrete, 6.Prestressed concrete, 7.Pile foundation concrete, 8.Damp proof course and water proofing, 9.Cement concrete block masonry, 10.Cement concrete hollow block masonry, 11.Brick work, 12.Stone masonry, 13.Roofing, 14.Floring, 15.Finishing, 16. Wood work, 17.Painting and varnishing, 18.Lining of canals, 19.Protection and diversion works, 20.Outlets, 21.Road and road structures, 22.Sheet piling, 23.Plumbing, sanitary installations and gas fittings, 24.Surface drainage, 25.Sewerage, 26.Sinking of wells, 27.Tubewell and water supply, 28.Iron steel and aluminum work, 29.Horticuture, 30.Miscellaneous, 31.Electrical installations, and Basic Data comprising material price, labor wage and rental charge of equipment	1998	Government of Baluchistan	English	-	Koga
PBL-CM-21	Composite Schedule of Rates 1986, Specifications, Part I, Construction Materials	Approx. 200 pages	Chapter I :Definitions and terminology, Chapter II :Water, Chapter III :Cementing materials, Chapter IV :Clay bricks and tiles, Chapter V :Special tiles, Concrete tiles, Glazed titles, Slate tiles, Chapter VI :Aggregate and inert materials, Chapter VII :Stone, Chapter VIII :Timber, Chapter IX :Paints, distempers and varnish, Chapter X :Metals and alloys, Chapter XI :Coal, Chapter XII :Bitumen and tar, Chapter XIII :Sanitary appliances and fittings, Chapter XIV :Pipes, Chapter XV :Miscellaneous	1986	Government of Baluchistan	English	-	Koga
PBL-CM-22	Composite Schedule of Rates 1987, Specifications, Part II, Execution of Works	Approx. 560 pages	Chapter 16. Carriage and materials, Chapter 17. Earthwork, Chapter 18. Dismantling and preparation of site, Chapter 19. Mortars, Chapter 20. Concrete, Chapter 21. Brickwork, Chapter 22. Stone masonry, Chapter 23. Roofing, Chapter 24. Flooring, Chapter 25. Surface renderings, Chapter 26. Woodwork, Chapter 27. Painting and varnishing, Chapter 28. Lining of canals, Chapter 29. Piles and pile driving, Chapter 30. River	1986	Government of Baluchistan	English	-	Koga

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
PBL-CM-23	Profile - MOOSA JAN - Government Contractor	Approx. 100 pages	A.Affidavits, B.Renewal, C.Pakistan Engineering Council, D.Income tax certificate, E.Bank statements, F.List of technical staffs and other personal managerial staffs, G.List of machinery, H.Work orders, I.List of work completed, J.Performance of work certificates, K.Pre-qualification	-	HAJI MOOSA JAN (Contractor)	English	-	Koga
PBL-CM-24	Abstract of Machinery Received for Communication and Works Department	1 page	List of machinery owned by C&W dept.	2003	Communication and Works	English	-	Koga
PBL-CM-25	List of Machinery and Equipment	4 pages	List of machinery and equipment with present status, owned by C&W dept.	2003	Communication and Works	English	-	Koga
PBL-CM-26	Hire Charge of each Equipment	1 page	Rental charge list of each equipment	2003	Communication and Works	English	-	Koga
PBL-CM-27	Machinery (Rig Dozers and Heavy Machinery)	1 page	List of machinery owned by Public Health Engineering Dept.	2003	Public Health Engineering	English	-	Koga
PBL-CM-28	PC-I for Procurement of Rigs, Spare Parts, Tools, Accessories	17 pages	-	2003	Public Health Engineering	English	-	Koga
PBL-CM-29	PC-I for Procurement of Spare Parts of Rigs and Stainless Steel Screen Pipes for Tubewells	17 pages	-	2003	Public Health Engineering	English	-	Koga
			References Supplied by JICA Tokyo					
PBL-JI-01	「地下水涵養ダム計画調査」主報告書、平成9年6月、国際協力事業団	235 頁と添付資料	地下水涵養ダム計画に係る開発調査	1997	JICA	日本語	-	調査団
PBL-JI-02	Survey and Evaluation of Delay Action Dams in Balochistan Water Resources Research Centre Quetta	28 pages and figires	Report on survey and evaluation of delay action dams	1989	WRRC in PCRWR	English	-	Study team
PBL-JI-03	Research Study on Survey and Evaluation of Delay Action Dams in Balochistan, Water Resources Research Centre Quetta	47 pages and tables & figures	Report of reseach study on survey and evaluation of delay action dams	47 pages and tables & figures	WRRC in PCRWR	English	-	Study team

Preparatory Study on Flood Utilization Development in Balochistan
Collected Report & Data

Ref No. (PBL-**-01)	TITLE OF REPORT / DATA	VOLUME	CONTENTS	YEAR	AGENCY/ SOURCE	Language	Translation to English	Name of Collector
PBL-JI-04	Report on Delay Action Dams as Means for Artificial Recharge in Balochistan, Pakistan Council of Research in Water Resources	7 pages and tables	Brief paper on groundwater recharge with Delay Action Dams	2002	PCRWR	English	-	Study team
PBL-JI-05	Concise Profile Water Resources Research Centre (WRRC) Quetta (1987 to 2003)	29 pages and figures	Explanation of concise profile Water Resources Research Centr (WRRC) Quetta	2003	WRRC in PCRWR	English	-	Study team
PBL-JI-06	Proceedings of Regional Workshop on Artificial Groundwater Recharge, Quetta, Pakistan. 10-14 June 1996, Pakistan Council of Research in Water Resources,	272 pages	Proceedings of workshop	1996	PCRWR, UNESCO, WRRC	English	-	Study team
PBL-JI-07	Area Development Programme Balochistan, Annual Progress Report 1999, United Nations Development Programme, World Food Programme, Planning & Development Department Government of Balochistan,	28 pages and annexes	Briefing paper on projects overseen by UNDP and Government of Balochistan	1999	UNDP, WFP, P&D Dept.	English	-	Study team
PBL-JI-08	Area Development Programme Balochistan, Annual Progress Report 2000, United Nations Development Programme, World Food Programme, Planning & Development Department Government of Balochistan,	40 pages and annexes	Briefing paper on projects overseen by UNDP and Government of Balochistan	2000	UNDP, WFP, P&D Dept.	English	-	Study team
PBL-JI-09	Area Development Programme Balochistan, Annual Progress Report 2001, United Nations Development Programme, World Food Programme, Planning & Development Department Government of Balochistan,	40 pages and annexes	Briefing paper on projects overseen by UNDP and Government of Balochistan	2002	UNDP, WFP, P&D Dept.	English	-	Study team
PBL-JI-10	Area Development Programme Balochistan, Annual Progress Report 2002, United Nations Development Programme(UNDP), World Food Programme(WFP), Government of Balochistan(GoB)	64 pages and annexes	Briefing paper on projects overseen by UNDP and Government of Balochistan	2002	UNDP, WFP, P&D Dept.	English	-	Study team
PBL-JI-11	Poverty and Vulnerability in South Asaia	70 pages	Paper on poverty and vulnerability	2002	WB	English	-	Study team
PBL-JI-12	Bridging Troubled Waters Assessing World Bank Water Resources Strategy	116 pages	Paper on water resources strategy	2002	WB	English	-	Study team