付　属　資　料

1. 協議議事録（ミニッツ、PDM、PO、R/D 案）
2. 要請書
3. 日程表
4. 主要面談者リスト
5. 問題分析・問題分析（PDM ワークショップ結果）
6. 末端水路詳細
7. 水路システム及び水維持管理体制模式図
8. 第４章　補足資料
9. PISIP に計上している新規技プロ連携経費
10. 協議録
11. タウンサ堰視察記録
12. 収集資料リスト
13. 農業局協議録

MINUTES OF MEETING
BETWEEN THE JAPANESE EX-ANTE EVALUATION SURVEY TEAM AND THE AUTHORITIES CONCERNED OF THE ISLAMIC REPUBLIC OF PAKISTAN ON TECHNICAL COOPERATION FOR STRENGTHENING IRRIGATED AGRICULTURE THROUGH PARTICIPATORY IRRIGATION MANAGEMENT IN THE PUNJAB PROVINCE

The Japanese Ex-ante Evaluation Survey Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") visited the Islamic Republic of Pakistan (hereinafter referred to as "Pakistan") from 1st to 28th of June 2008, for the purpose of preparatory study of the technical cooperation project concerning Strengthening Irrigated Agriculture Through Participatory Irrigation Management in the Punjab Province (hereinafter referred to as "the Project").

During its stay in Pakistan, the Team exchanged their views and had a series of discussions with the authorities concerned of the Government of Pakistan (hereinafter referred to as " the Pakistani Authorities").

As a result of the discussions, the both sides agreed upon the matters referred to in the document attached hereto. The Minutes of Meeting reflect discussions and initial agreements made between the Pakistani Authorities and the Team, which are subject to further consideration and approval of authorities of both parties.

Lahore, June 16, 2008

Dr. Hideyuki Kanamori
Leader
The Japanese Ex-ante Evaluation Survey Team
Japan International Cooperation Agency

Mr. Zafar Hassan Raza
Joint Secretary-ADB/Japan
Economic Affair Division
Ministry of Economic Affair and Statistics
Islamic Republic of Pakistan

Mr. Shahid Mahmood
Secretary
Planning & Development Department
Government of Punjab
Islamic Republic of Pakistan

Mr. Babar Hassan Bharwana
Secretary
Irrigation and Power Department,
Government of Punjab
Islamic Republic of Pakistan

Mr. Muhammad Javaid Iqbal Awan
Secretary
Agriculture Department,
Government of Punjab
Islamic Republic of Pakistan

ATTACHED DOCUMENT

The Pakistani Authorities and the Team agreed on the following articles.

I. Tentative Framework of the Project

1. The Title of the Project

"Strengthening Irrigated Agriculture through Participatory Irrigation Management in the Punjab Province"

2. Implementing Strategy and Agencies

In order to support the efforts on the Irrigation Sector Reform by the Government of Punjab, the Government of Japan has extended the assistance through the foregoing JICA Project, i.e. Capacity Building for Irrigation Management (hereinafter referred to as "the CBIM") which intends to enhance the operational functions of Area Water Boards (hereinafter referred to as "AWBs") and Farmer's Organizations (hereinafter referred to as "FOs"), as well as the Yen Loan Project i.e. Punjab Irrigation System Improvement Project (hereinafter referred to as "the PISIP") which aims to rehabilitate and upgrade the distributaries/minors with facilitation of FO formation. In line with these initiatives to support the Reform process, the Project is to be implemented in close coordination with the PISIP, and by continuously utilizing and further promoting the outcomes of the CBIM.

Implementing Agencies of the Project are Irrigation and Power Department, Punjab (IPD) and Punjab Irrigation and Drainage Authority (PIDA) in collaboration with Punjab Agriculture Department (PAD).

3. Target Area and Group

Target area of the Project covers Bahawalnagar Canal Circle in Bahawalpur Irrigation Zone, Lower Chenab Canal West (hereinafter referred to as the "LCC (W)") Circle in Faisalabad Irrigation Zone and Dera Jat Canal Circle in DG Khan Irrigation Zone in Punjab Province.

Target group of the Project consists of the AWBs, FOs and relevant staffs of government organizations in the target area.

4. Duration of the Project

The duration of the Project will be four (4) years. The date of the Project's commencement is to be stipulated in the Record of Discussions (hereinafter referred to as "R/D"), which is expected to be signed between JICA and the Government of Pakistan after further examination by each party.

5. Site of the Project

5-1. Pilot Areas

A pilot area covers the canal command area under the jurisdiction of one (1) distributary of the respective irrigation system. Project activities will be implemented in the two (2) main pilot areas, i.e. in LCC (W) Circle and Bahawalnagar Canal Circle, and one (1) sub pilot area, i.e. in Dera Jat Canal Circle. Classifications of the pilot areas are as follows;

Main pilot areas are the sites of the Project where the activities will be conducted with close collaboration and joint efforts by the counterpart personnel and Japanese experts, aiming at verification, demonstration and dissemination of the developed manuals/guidelines and technologies. The Project Design Matrix (PDM) evaluation indicators will be applied to the achievements in these areas.

Sub pilot area is the site of the Project where the activities will be conducted mainly by the counterpart personnel, under guidance and supervision of the Japanese experts. The Project activities in the sub pilot area generally aim at demonstration and dissemination of verified manuals/guidelines and technologies. Sub pilot area is considered as the site for the counterpart personnel to practice the transferred technology. The PDM evaluation indicators will not be applied to the sub pilot area.

5-2. The Names of the Pilot Areas

Main pilot areas

(1) Pabbarwala Distributary, LCC(W) Circle, Faisalabad Irrigation Zone

(2) Jalwala Distributary, Bahawalnagar Canal Circle, Bahawalpur Irrigation Zone

Sub pilot area

(1) Yaru Distributary, Dera Jat Canal Circle, DG Khan Irrigation Zone

5-3. Selection Criteria

Following criteria were applied for selection of the pilot areas.

a. Target areas of the PISIP: The pilot areas should be selected from the target areas of the PISIP.

b. Accessibility: The pilot areas should be at an accessible location, thus the distance and traveling time to and from the respective AWB office is to be considered.

c. Canal command area (CCA): The CCA of each pilot area should be in the average scale of CCAs of all distributaries in the respective Circle.

d. Ratio of the small farmers in the distributary area: In view of possible impact on poverty alleviation, the ratio of small farmers among the beneficiaries is taken into accounts.

In the selection process, considerations were also given to the aspects such as availability

of canal water, groundwater conditions and monitoring, willingness of the FOs and farmers, and so forth.

5-4. Model Areas

A model area is the canal command area under the jurisdiction of one (1) watercourse directly off-takes from the selected distributary of the pilot area. It is planned to select three (3) model areas in one pilot area, i.e. one each from the head, the middle and the tail reaches of the distributary. Verification and demonstration of water saving technologies will be implemented in these model areas.

The model areas will be selected through discussions between implementing agencies and JICA Pakistan Office, based on the selection criteria which include among others availability of canal water, accessibility to the area, ratio of small farmers in the watercourse area, in reference to the results of the additional site surveys.

6. Overall Goal

The established model of appropriate irrigation management system is disseminated in Bahawalnagar Canal Circle in Bahawalpur Irrigation Zone, LCC (W) Circle in Faisalabad Irrigation Zone and Dera Jat Canal Circle in DG Khan Irrigation Zone.

7. Project Purpose

The model of appropriate irrigation management system is established through verification activities in the pilot areas.

Definition: The model consists of holistic approaches that integrate strengthening of AWBs/FOs, water saving technologies, and improvement of extension and training methodologies.

8. Expected Outputs

8-1. Guidelines/manuals are improved to strengthen and sustain the efforts of the AWBs/FOs.

8-2. Appropriate water saving technologies established in the model areas are promoted in the pilot areas.

8-3. Capacity building methodologies are improved for relevant government staffs such as IPD, PIDA and PAD personnel as well as for the officials of the organizations at farmer's level such as AWBs/FOs.

Definition: The guidelines and manuals developed as the outputs of the CBIM are defined as follows.

a. "Manual" is defined as a book containing the principles, rules, regulations and directions in concise form needed for functioning of AWBs/FOs.

b. "Guidelines" are defined as instructions on the general principles needed for functioning of AWBs/FOs.

II. Measures to be Taken by Each Side

1. Japanese Side

1-1 Dispatch of long-term experts

① Chief Adviser / Strengthening of AWBs/FOs

② On-farm Water Management / Water Saving Irrigation

③ Project Coordination / Training

1-2 Dispatch of short-term experts in the relevant fields (if necessary)

1-3 Provision of machinery and equipments

1-4 Training of counterpart personnel overseas

1-5 Provision of local costs (if and when necessity arises)

2. Pakistani Side

2-1 Assignment of counterpart and administrative personnel

2-2 Provision of office space and equipments

2-3 Preparation of model areas and facilities in the pilot areas

2-4 Provision of local costs

2-5 Security arrangement

III. Administration of the Project

1. Steering Committee

The tentative organization chart is given in ANNEX I.

2. Project Management & Coordination Committee (PMCC)

The tentative organization chart is given in ANNEX II.

IV. Tentative Schedule of the PISIP, the CBIM and the Project

The tentative schedule is given in ANNEX III.

V. Coordination with the PISIP

Both sides agreed that manuals on specific issues should be compiled before commencement of the enforced training for FOs in the PISIP (see ANNEX III), although the schedule is yet a tentative one. It was also noted that the PISIP staff would be recruited by January 2009 or earlier.

VI. Consultation on the Equipments Procured under the PISIP

All vehicles, equipment and materials that will be utilized for the activities of the Project will be procured by the PISIP in consultation with JICA experts.

VII. Others

1. Groundwater Issue

Both sides agreed that the existing Pakistani experts of groundwater management will be included as the trainees in the training of trainers to be conducted by the Project.

2. Review of the Guidelines/Manuals Developed by the CBIM

The review of implementation of these guidelines/manuals would be conducted in the AWB/Lower Chenab Canal East (LCC (E)) Circle, as these guidelines/manuals are developed based on studies and other activities undertaken there. To secure the basis for comparison and/or applicability of the guidelines/manuals, it was agreed that the review of guidelines/manuals would be conducted in one (1) distributary selected from the six (6) areas under the AWB/LCC (E) Circle where both the FO survey and the distributary survey have been implemented by the CBIM.

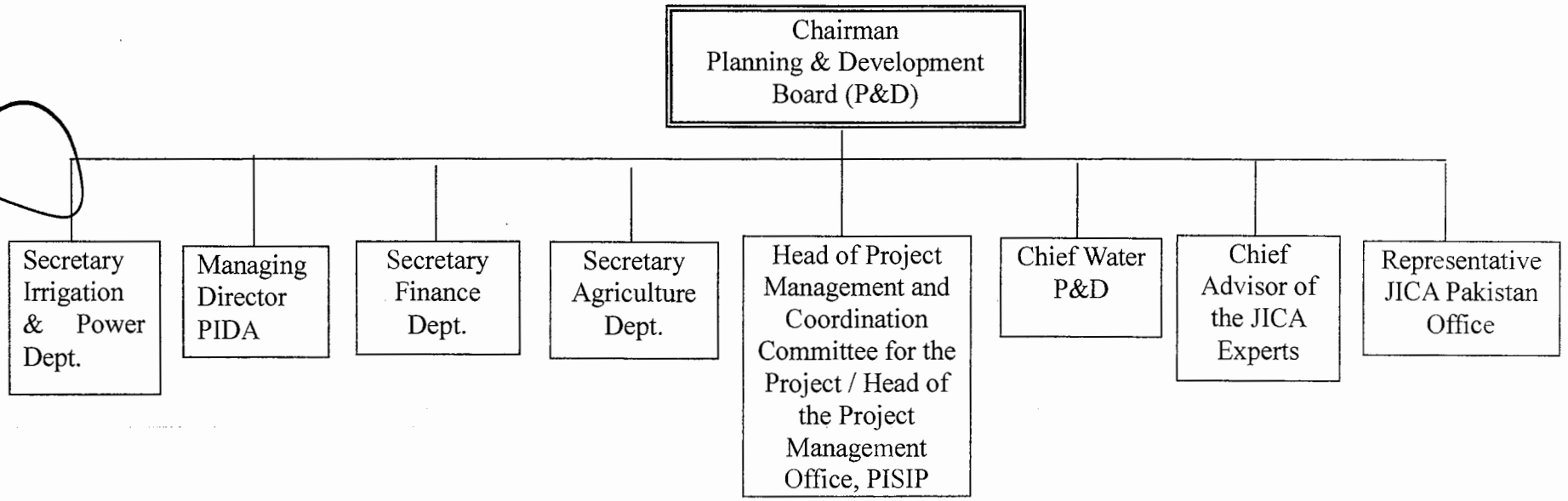
3. Equipment and Facilities of Water Saving Technologies

The PAD explained that it is currently promoting the demonstration of the water saving technologies in the entire province with its own initiative, and thus proposed that the Project equipment and facilities of water saving technologies in the model areas should be covered under the PAD's on-going / pipeline projects, not under the demonstration component of the PISIP. The Team accepted the proposal because the PAD committed that financing from the on-going / pipeline project is to be made available without any delay when it is required so that the outcome of the Project can fully be materialized as scheduled. Accordingly, both sides agreed that the amount originally planned for the said component of the PISIP may be allotted to other components as and when necessity arises. It was noted, however, that the change of the expenditure items financed by the Government of Japan under the PISIP is subject to the approval by the donor of the Yen Loan Project.

ANNEX I	**STEERING COMMITTEE**
ANNEX II	**PROJECT MANAGEMENT & COORDINATION COMMITTEE (PMCC)**
ANNEX III	**TENTATIVE IMPLEMENTATION SCHEDULE OF THE PISIP, THE CBIM AND THE PROJECT**
ANNEX IV	**PROJECT DESIGN MATRIX (PDM)**
ANNEX V	**PLAN OF OPERATIONS (PO)**
ANNEX VI	**DRAFT OF RECORD OF DISCUSSIONS (R/D)**

ANNEX I STEERING COMMITTEE

1. Functions
   (1) To review and oversee implementation of all the Project activities and the Yen Loan Project, i.e. Punjab Irrigation System Improvement Project (PISIP).
   (2) To decide on policy issues regarding managerial, technical and financial aspects.
   (3) To resolve the interdepartmental / interdisciplinary and other issues at the Federal Government and donor's level.
2. Frequency of the Meetings
   The meetings of the Steering Committee will be held on quarterly basis.
3. Organizational Set-up
   (1)The Chairman of the Steering Committee is the Chairman of the Planning and Development Board (P&D).
   (2)The Secretary of the Steering Committee is the Secretary of the Irrigation and Power Department.



ANNEX II PROJECT MANAGEMENT & COORDINATION COMMITTEE (PMCC)

1. Functions

(1) To review and implement all the Project activities.

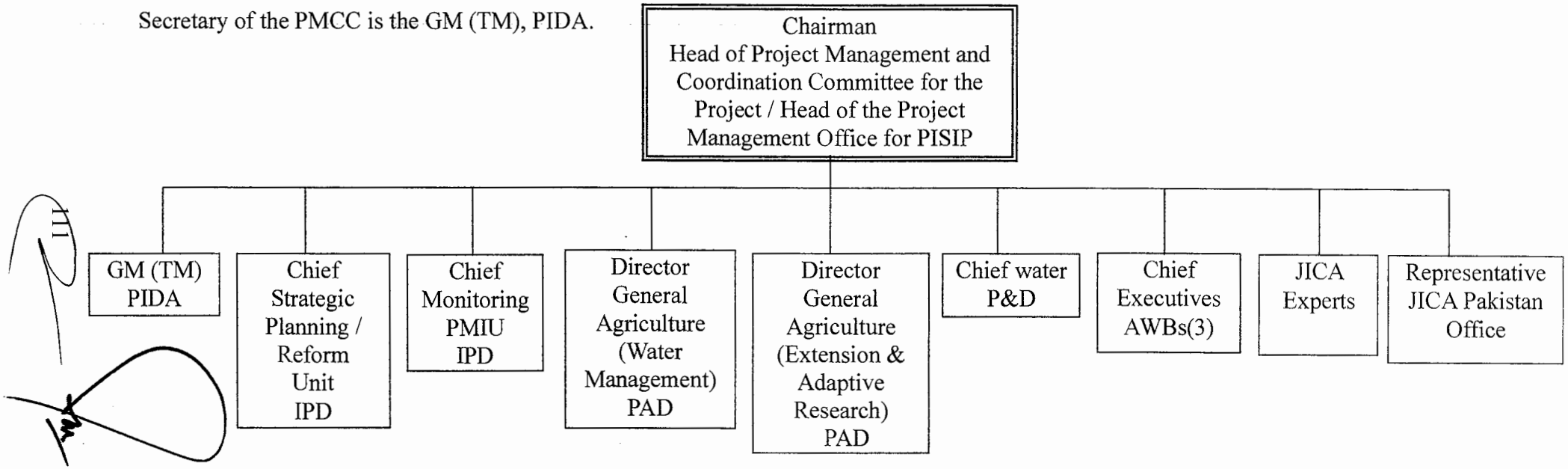
(2) To discuss issues and report them to the Steering Committee.

2. Frequency of the Meetings

The meetings of PMCC will be held on regular basis.

3. Organizational Set-up

Secretary of the PMCC is the GM (TM), PIDA.



Abbreviations
GM (TM): General Manager (Transition Management)
PMIU: Program Monitoring and Implementation Unit

ANNEX III TENTATIVE IMPLEMENTATION SCHEDULE OF THE PISIP, THE CBIM AND THE PROJECT

	2006	2007				2008				2009				2010				2011				2012				2013			
		1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12
the PISIP																													
Civil Work																													
Institutional Reform																													
IMT																													
Basic Training																													
Enfoced Training																													
Capacity Building																													
the CBIM																													
Guidelines/Manuals																													
Specific Issue Guidelines																													
The Project																													
Specific Manuals																													

ANNEX IV PROJECT DESIGN MATRIX (PDM)

June 16, 2008

Project Title: Strengthening Irrigated Agriculture through Participatory Irrigation Management in the Punjab Province

Implementing Agencies: of Irrigation and Power Department, Punjab (IPD) and Punjab Irrigation and Drainage Authority (PIDA) in collaboration with Punjab Agriculture Department (PAD)

Project Period: 4 years (June 2009 - June 2013)

Target Area: Bahawalnagar Canal Circle in Bahawalpur Irrigation Zone, Lower Chenab Canal West (LCC (W)) Circle in Faisalabad Irrigation Zone, and Dera Jat Canal Circle in DG Khan Irrigation Zone
Main pilot areas are in Bahawalnagar Canal Circle and LCC (W) Circle, while sub pilot area is in Dera Jat Canal Circle

Target Group: Area Water Boards (AWBs), Farmer's Organizations (FOs) and relevant staff of government organizations in the target area

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal The established model of appropriate irrigation management system is disseminated in Bahawalnagar Canal Circle in Bahawalpur Irrigation Zone, LCC (W) Circle in Faisalabad Irrigation Zone and Dera Jat Canal Circle in DG Khan Irrigation Zone.	1 The number of FOs which apply the established model of appropriate irrigation management exceeds 15% of all FOs in the target area by year 2018.	Activity records of AWBs/FOs in the target area	• Participatory irrigation management policy and functions of related agencies are maintained by the Government of Punjab. • The Government of Punjab secures necessary budget and personnel to continue the efforts.
Project Purpose The model of appropriate irrigation management system is established through verification activities in the pilot areas.	1 The manuals/guidelines for AWBs/FOs are compiled and applied in the main pilot areas. 2 Water productivity in the main pilot areas is increased by 5%. 3 More than 50% of the government staff of IPD, PIDA and extension related staff of PAD trained through TOT by the Project apply the obtained knowledge /methods / techniques to support farmers and members of AWBs/FOs in the main pilot areas.	Project records and activity records of AWBs/FOs Sample surveys in the field Project records and interviews	• The Yen Loan Project i.e. Punjab Irrigation System Improvement Project (PISIP) is implemented as scheduled in the target area. • Security situations in the target area do not become extremely unstable. • The knowledge and experiences acquired in the Project are incorporated in the training components under the PISIP. • There is no drastic change in climatic conditions.
Outputs 1 Guidelines/manuals are improved to strengthen and sustain the efforts of AWBs/FOs. 2 Appropriate water saving technologies established in the model areas are promoted in the pilot areas. 3 Capacity building methodologies are improved for relevant government staffs such as IPD, PIDA, and PAD personnel as well as for the officials of the organizations at farmers' level such as AWBs/FOs.	1-1 The improved manuals/guidelines are compiled and made available to AWBs/FOs. 2-1 Guidelines on the water saving technologies are compiled and made available to the farmers in the main pilot areas. 2-2 More than 10% of the farmers in the main pilot areas apply at least one of the water saving technologies recommended by the Project. 3-1 Training manuals, textbooks and information materials are compiled. 3-2 At least 25 staff of IPD and PIDA receive the TOT. 3-3 At least 20 extension related staff of PAD receive the TOT on extension methodology. 3-4 At least 15 officials of the organizations at farmers' level such as AWBs/FOs receive the TOT.	Project records and activity records of AWBs/FOs Project records Field surveys and interviews Project records Project records Project records Project records	• There is no drastic change in climatic conditions. • Price of the agricultural products/inputs do not become extremely unstable. • Security situations in pilot areas do not become extremely unstable. • Inputs by the PISIP are timely made in the pilot areas.
Activities **1 Strengthening of AWBs/FOs** 1-1 Review and re-examine the guidelines/manuals developed in the AWB / Lower Chenab Canal (East) Circle by the foregoing project, i.e. Capacity Building for Irrigation Management (CBIM). 1-2 Set up and prepare the pilot areas and the model areas. 1-3 Conduct the on-site verification of the guidelines/manuals for the AWBs/FOs. 1-4 Improve the guidelines/manuals based on the results of the verification. **2 Water Saving Technologies** 2-1 Provide guidelines of water saving technologies through verification in the model areas 2-2 Disseminate the technologies recommended in the guidelines. **3 Capacity Building Methodologies** 3-1 Improve the agricultural extension methods. 3-2 Improve the Training of Trainers (TOT) methods for government staffs who provide guidance to the AWBs/FOs and farmers. 3-3 Disseminate and share the outcomes and experiences of the Project.	**Inputs** Japanese Side 1. Japanese experts Long-term experts: - Chief Advisor / Strengthening of AWBs/FOs - On-farm Water Management / Water Saving Irrigation - Project Coordination / Training Short-term experts in the relevant fields (if necesary) 2. Machinery and equipments 3. Training of counterpart personnel overseas 4. Local costs (if and when necessity arises)	Pakistani Side 1. Counterpart and administrative personnel 2. Office space and equipments 3. Model area and facilities in the pilot areas 4. Local costs	• Necessary inputs from relevant organizations including research institutes are obtained. • No major dispute or conflict occur within the FOs and among the farmers in the pilot areas. **Preconditions** • Counterpart personnel are assigned continuously and actively engaged in the Project activities. • Collaborative coordination is made among the implementing agencies. • The AWBs/FOs and farmers in the target area are willing to participate in the Project activities.

Note: The model to be established as the Project Purpose consists of holistic approaches that integrate the strengthening of AWBs/FOs, water saving technologies, and improvement of extension and training methodologies.

ANNEX V
PLAN OF OPERATIONS (PO)

Enforced training under the PISIP will start at this point.

June 16, 2008

Activities	2009		2010				2011				2012				2013	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
0. Preparatory activities																
(1) Share the Project concept among the stakeholders.																
(2) Set up the management body of the Project and prepare the work plan.																
1-1 Review and re-examine the guidelines/manuals developed in the Area Water Board (AWB)/Lower Chenab Canal East (LCC (E)) Circle by the foregoing JICA Project, i.e. Capacity Building for Irrigation Management (CBIM).																
(1) Review the operations of the FOs in the AWB/LCC (E) in line with the guidelines/manuals.																
(2) Re-examine the applicability of the guidelines/manuals upon feedback from verification activities in the pilot areas.																
1-2 Set up and prepare the pilot areas and model areas.																
(1) Review the present situation and implement baseline survey on the pilot areas, taking into account the guidelines/manuals which the foregoing JICA Project has proposed.																
(2) Provide the pilot areas with required facilities																
1-3 Conduct on-site verification of the guidelines/manuals for the AWBs/FOs.																
(1) Strengthen the management, finance and accounting (water charge collection etc) of the FOs through on-the job-training in the pilot areas in line with the guidelines/manuals.																
(2) Implement operation and maintenance of distributaries as well as appropriate water management and monitoring in the pilot areas, taking the guidelines/manuals into account.																
(3) Instruct the AWBs to conduct monitoring activities of the FOs based on the guidelines/manuals.																
(4) Compile the results of monitoring and the verification processes.																
1-4 Improve the guidelines/manuals based on the results of verification.																
(1) Draw out the points to be improved and accordingly revise the guidelines/manuals.																
2-1 Provide guidelines of water saving technologies through verification in the model areas.																
(1) Conduct the baseline survey to grasp the current irrigation management practices by farmers.																
(2) Introduce and practice the water saving methods selected from laser land leveling, furrow irrigation, drip irrigation, sprinkler irrigation, etc. in the model areas.																
(3) Propose improvement of the conventional land leveling methods and conduct verification study.																
(4) Propose improved on-farm water management and conduct verification study.																
(5) Draw out the guidelines of the water saving technologies.																
2-2 Disseminate the water saving technologies recommended in the guidelines.																
(1) Apply the guidelines to the FOs in the areas other than the model areas through PAD.																

Enforced training under the PISIP will start at this point.

June 16, 2008

Activities	2009		2010				2011				2012				2013	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
3-1 Improve the agricultural extension methods.																
(1) Review and select appropriate extension methods utilizing FOs in the pilot areas in collaboration with IPD, PIDA, PAD, and related institutions, with application of methods of farmers field school and/or others.		—														
(2) Draw out extension plan and training textbooks/materials for trainers, and conduct training for the FOs in the pilot areas.			—	—	—	—	—	—	—	—						
(3) Extend the outcomes of various activities in the model areas to the farmers in other areas, taking into account the actual literacy level in rural areas.									—	—	—	—	—	—	—	—
3-2 Improve the Training of Trainers (TOT) methods for government staffs who provide guidance to AWBs/FOs and farmers.																
(1) Review the existing methods of TOT.		—														
(2) Modify the training materials for the trainers who train AWB/FO officials and farmers, as well as the documentaries to be disseminated through media, and conduct trial trainings.			—	—	—	—	—	—	—	—						
(3) Implement the TOT targeting to the relevant staffs and trainers of government organizations, as well as to the officials of the AWBs/FOs.						—	—	—	—	—	—	—	—	—	—	—
3-3 Disseminate and share the outcomes and experiences of the Project.																
(1) Conduct sharing activities among stakeholders.							—									
(2) Hold seminars, workshops, field visits etc. to extend outcomes of the activities 1, 2 and 3.											—		—			—

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RECORD OF DISCUSSIONS
BETWEEN
JAPANESE IMPLEMENTATION STUDY TEAM
AND
AUTHORITIES CONCERNED OF THE GOVERNMENT OF ISLAMIC REPUBLIC PAKISTAN
ON JAPANESE TECHNICAL COOPERATION
FOR
THE STRENGTHENING IRRIGATED AGRICULTURE THROUGH PARTICIPATORY IRRIGATION MANAGEMNET IN THE PUNJAB PROVINCE

The Japanese Implementation Study Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Dr.Hideyuki Kanamori, visited Islamic Republic of Pakistan (hereinafter referred to as "Pakistan") from 1st to 28 of June, 2008 for the purpose of working out the details of the technical cooperation project concerning the Strengthening Irrigated Agriculture through Participatory Irrigation Management in the Punjab Province of Pakistan.

During its stay in Pakistan the Team exchanged views and had a series of discussions with the Pakistani authorities concerned with respect to desirable measures to be taken by JICA and Pakistani Government for the successful implementation of the above-mentioned Project.

As a result of the discussions, and in accordance with the provisions of the Agreement on Technical Cooperation between the Government of Japan and the Government of Pakistan, signed in Lahore on 3rd April, 2008 (hereinafter referred to as "the Agreement"), the Team and Pakistani authorities concerned agreed on the matters referred to in the document attached hereto.

Lahore, Punjab, xx, xxxxx,2008

Mr. Takao Kaibara Resident Representative JICA Pakistan Office	Mr. Zafar Hassan Raza Joint Secretary Economic Affairs Division Ministry of economic Affairs and Statistics Islamic Republic of Pakistan

Mr. Shahid Mahmood
Secretary
Planning and Development Department
Government of Punjab
Islamic Republic of Pakistan

Mr. Babar Hassan Bhayana
Secretary
Irrigation and Power Department
Government of Punjab
Islamic Republic of Pakistan

Mr. Muhammad Javaid Iqbal Awan
Secretary
Agriculture Department
Government of Punjab
Islamic Republic of Pakistan

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN JICA AND PAKISTAN GOVERNMENT

1. The Government of Pakistan will implement a project entitled as "the Strengthening Irrigation Management System Including Agricultural Extension through Farmers' Participation in The Punjab Province" (hereinafter referred to as "the Project") in cooperation with JICA.

2. The Project will be implemented in accordance with the Master Plan which is given in Annex I.

II. MEASURES TO BE TAKEN BY JICA

In accordance with the laws and regulations in force in Japan and the provisions of Article III of the Agreement, JICA, as the executing agency for technical cooperation by the Government of JAPAN, will take, at its own expense, the following measures according to the normal procedures of its technical cooperation scheme.

1. DISPATCH OF JAPANESE EXPERTS
JICA will provide the services of the Japanese experts as listed in Annex II. The provision of Article V of the Agreement will be applied to the above-mentioned experts.

2. PROVISION OF MACHINERY AND EQUIPMENT
JICA will provide such machinery, equipment and other materials (hereinafter referred to as the Equipment) necessary for the implementation of the Project as listed in Annex III. The provision of Article VII of the Agreement will be applied to the Equipment.

3. TRAINING OF PAKISTANI PERSONNEL IN JAPAN
JICA will receive the Pakistani personnel connected with the Project for technical training in Japan.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF PAKISTAN

1. The Government of Pakistan will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through full and active involvement in the Project by all related authorities, beneficiary groups and institutions.

2. The Government of Pakistan will ensure that the technologies and knowledge acquired by the Pakistani nationals as a result of the Japanese technical cooperation will contribute to the economic and social development of Pakistan.

3. In accordance with the provisions of Article V of the Agreement, the Government of Pakistan will grant in Pakistan privileges, exemptions and benefits to the Japanese experts referred to in II-1 above and their families.

4. In accordance with the provisions of Article [illegible] of the Agreement, the Government of Pakistan will take the measures necessary to receive and [illegible] the Equipment provided by JICA under II-2 above and equipment, machinery and materials carried in by the Japanese experts referred to in II-1 above.

5. The Government of Pakistan will take neces[illegible]easures to ensure that the knowledge and experience acquired by [illegible]kistani personn[illegible]om technical training in Japan will be utilized effectively in the im[illegible]en[illegible]on of the Pro[illegible].

6. In accordance with the provi[illegible]n of [illegible]ticle [illegible] of the Agreement, the Government of Pakistan [illegible] pro[illegible] the servic[illegible] Pakistani counterpart personnel and administrative personn[illegible] listed in [illegible]nex IV.

7. In accordance [illegible] the p[illegible] of Article V of the Agreement, the Government of Pakista[illegible] provi[illegible]e buildings and facilities as listed in Annex V.

In accordance with the laws and regulations in force in Pakistan, the Government of Pakistan will take necessary measures to supply or replace at its own expense machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided by JICA under II-2 above.

9. In accordance with the laws and regulations in force in Pakistan, the Government of Pakistan will take necessary measures to meet the running expenses necessary for the implementation of the Project.

IV. ADMINISTRATION OF THE PROJECT

1. Secretary of Irrigation and Power Department, Government of Punjab, as the Project Director, will bear overall responsibility for the administration and implementation of the Project.

2. General Manager (Transitional Management, TM), PIDA, as the Project Manager, will be responsible for the managerial and technical matters of the Project.

3. The Japanese Chief Advisor will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.

4. The Japanese experts will give necessary technical guidance and advice to Pakistani counterpart personnel on technical matters pertaining to the implementation of the Project.

5. For the effective and successful implementation of technical cooperation for the Project, a Steering Committee will be established whose functions and composition are described in Annex VI.

V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by JICA and the Pakistani authorities concerned, in the middle and during the last six months of the cooperation term in order to examine the level of achievement.

VI. CLAIMS AGAINST JAPANESE EXPERTS

In accordance with the provision of Article VI of the Agreement, the Government of Pakistan undertakes to bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in Pakistan except for those arising from the willful misconduct or gross negligence of the Japanese experts.

VII. MUTUAL CONSULTATION

There will be mutual consultation between JICA and Government of Pakistan on any major issues arising from, or in connection with this Attached Document.

VIII. MESURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

For the purpose of promoting support for the Project among the people of Pakistan, the Government of Pakistan will take appropriate measures to make the Project widely known to the people of Pakistan.

IX. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be from _____.

ANNEX I MASTER PLAN
ANNEX II LIST OF JAPANESE EXPERTS
ANNEX III LIST OF MACHINERY AND EQUIPMENTS
ANNEX IV LIST OF COUNTERPART AND ADMINISTRATIVE PERSONNEL
ANNEX V LIST OF BUILDINGS AND FACILITIES
ANNEX VI STEERING COMMITTEE AND PROJECT MANAGEMENT & COORDINATION COMMITTEE (PMCC)

ANNEX I MASTER PLAN

1. Title of the Project

"Strengthening Irrigated Agriculture Through Participatory Irrigation Management in the Punjab Province"

2. Overall Goal

The established model of appropriate irrigation management system is disseminated in Bahawalnagar Canal Circle in Bahawalpur Irrigation Zone, Lower Chenab Canal West (LCC (W)) Circle in Faisalabad Irrigation Zone and Dera Jat Canal Circle in D.G Khan Irrigation Zone.

3. Project Purpose

The model of appropriate irrigation management system is established through verification activities in the pilot areas.

4. Outputs of the Project

(1) Guidelines/manuals are improved to strengthen and sustain the efforts of AWBs/FOs.

(2) Appropriate water saving technologies established in the model areas are promoted in the pilot areas.

(3) Capacity building methodologies are improved for relevant government staffs such as IPD, PIDA and P&D personnel as well as for the officials/leaders of the organization at farmer's level such as AWBs/FOs.

5. Activities

1 Strengthening of AWBs/FOs

1-1 Review and re-examine the guidelines/manuals developed in the AWB / Lower Chenab Canal (West) Circle by the foregoing project, i.e. Capacity Building for Irrigation Management (CBIM).

1-2 Set up and prepare the pilot areas and the model areas.

1-3 Conduct the on-site verification of the guidelines/manuals for the AWBs/FOs.

1-4 Improve the guidelines/manuals based on the results of the verification.

2 Water Saving Technologies

2-1 Provide guidelines of water saving technologies through verification in the model areas.

2-2 Disseminate the technologies recommended in the guidelines.

3 Capacity Building Methodologies

3-1 Improve the agricultural extension methods.

3-2 Improve the Training of Trainers (TOT) methods for government staffs who provide guidance to the AWBs/FOs and farmers.

3-3 Disseminate and share the outcomes and experiences of the Project.

ANNEX II LIST OF JAPANESE EXPERTS

1. Long-term Experts
(1)Chief Adviser / Strengthening AWBs/FOs
(2)On-farm Water Management / Water Saving Irrigation
(3)Project Coordination / Training

2. Short-term Experts in the relevant fields (If necessary)

ANNEX III LIST OF MACHINERY AND EQUIPMENTS

1. The equipments necessary for the transfer of technology by the Japanese experts will be provided by Japanese side.

2. Other materials and equipments mutually agreed upon will be provided if necessary.

ANNEX IV LIST OF COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Counterpart Agencies

The agency to bear primary responsibility for the Project is the Irrigation and Power Department, (IPD), while the Punjab Irrigation and Drainage Authority (PIDA) and Punjab Agriculture Department (PAD) also take part in the Project implementation as the counterpart agencies.

2. Counterpart Personnel

(1) Chief of the Steering Committee

(2) Chief of the Project Management & Coordination Committee

(3) Provincial Level Counterpart

GM (TM), PIDA

Chief Strategic Planning / Reform Unit, IPD

Chief Monitoring Programme Management and Implementation Unit, IPD

Director General Agriculture (Water Management), PAD

Director General Agriculture (Extension and Adaptive Research), PAD

Chief Water, P&D

(4) Field Level Counterpart

Chief Executive, AWB, LCC (W)

Chief Executive, AWB, DG Khan

Chief Executive, AWB, Bahawalnagar

Representatives of FOs in the pilot areas

District Officers of Agriculture (Water Management) in the target area

District Officers of Agriculture (Extension and Adaptive Research) in the target area

3. Assignment of counterpart personnel to the Project is to be mutually agreed upon as necessity arises.

ANNEX V LIST OF BUILDINGS AND FACILITIES

1. Sufficient facilities for the implementation of the Project

2. Offices and other necessary facilities for Japanese experts

3. Provision of services such as electricity, water supply, telephone and furniture necessary for the Project activities

4. Proper facilities and lands for on-farm activities

5. Other facilities are to be mutually agreed upon as necessity arises.

ANNEX VI STEERING COMMITTEE

1. Functions

(1) To review and oversee implementation of all the Project activities and the Yen Loan Project i.e. Punjab Irrigation System Improvement Project (PISIP).

(2) To decide on policy issues regarding managerial, technical and financial aspects.

(3) To resolve the interdepartmental / interdisciplinary and other issues at the Federal Government and donor's level.

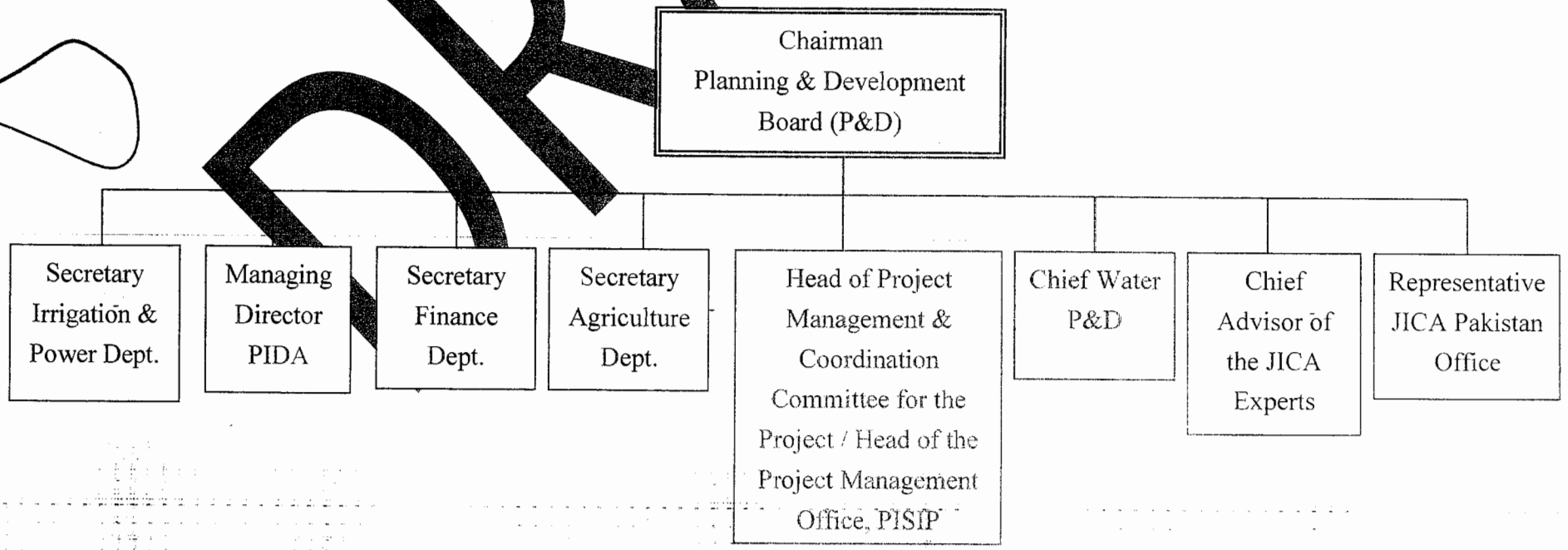
2. Frequency of the Meetings

The meetings of the Steering Committee will be held on quarterly basis.

3. Organizational Set-up

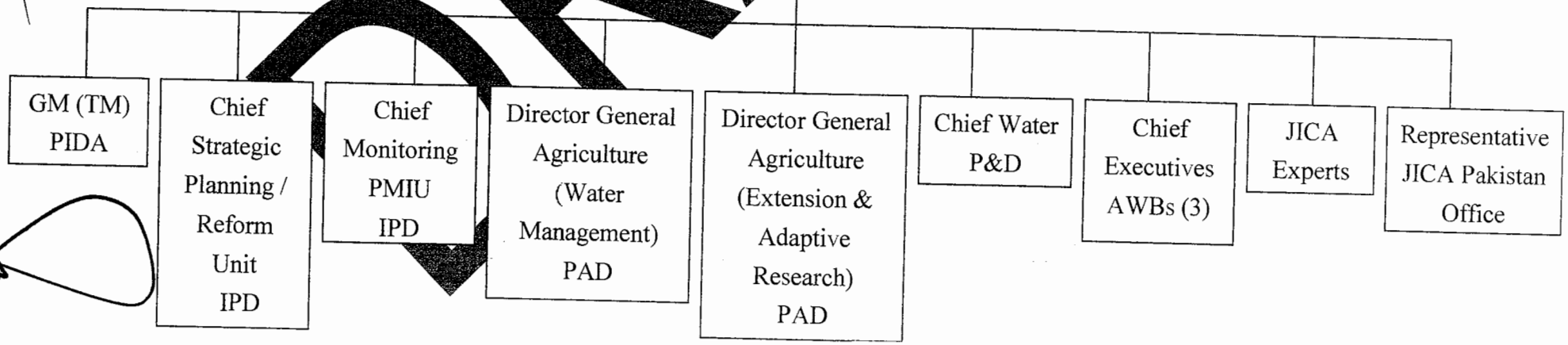
(1)The Chairman of the Steering Committee is the Chairman of the Planning and Development Board (P&D).

(2)The Secretary of the Steering Committee is the Secretary of the Irrigation and Power Department.



PROJECT MANAGEMENT & COORDINATION COMMITTEE (PMCC)

1. Functions
   (1) To review and implement all the Project activities.
   (2) To discuss issues and report them to the Steering Committee.
2. Frequency of Meetings
   The meetings of PMCC will be held on regular basis.
3. Organizational Set-up
   Secretary of the PMCC is the GM (TM), PIDA.



Abbreviations

GM (TM): General Manager (Transition Management)

PMIU: Program Monitoring and Implementation Unit

Sector Code :	Day Month Year
Applicant: Federal ■Ministry of Economic Affairs and Statistics, Economic Affairs Division Province □ Balochistan □ NWFP ■Punjab □ Sindh Department of Irrigation and Power in Punjab Government	
Implementing Agency: Department of Irrigation and Power in Punjab Government(IPD) and Punjab Irrigation and Drainage Authority(PIDA) in collaboration with Department of Agriculture Address: Old Anarkali Lahore, Pakistan Contact Person: Mr. M Aslam Qureshi General Manager(TM) PIDA Tel.No.: +92-42-9212882 E-Mail	

APPLICATION FORM

FOR JAPAN'S *"TECHNICAL COOPERATION", "DEVELOPMENT STUDY"*

AND *"GRANT AID GENERAL AND FISHERIES"*

1. Project Title

Strengthening Irrigated Agriculture through Participatory Irrigation Management in the Punjab Province

2. Procedural status in Pakistan Government

□ Approved (□ Concept Clearance Paper ■ PC-1 □ PC-II)

□ Under preparation of CCP

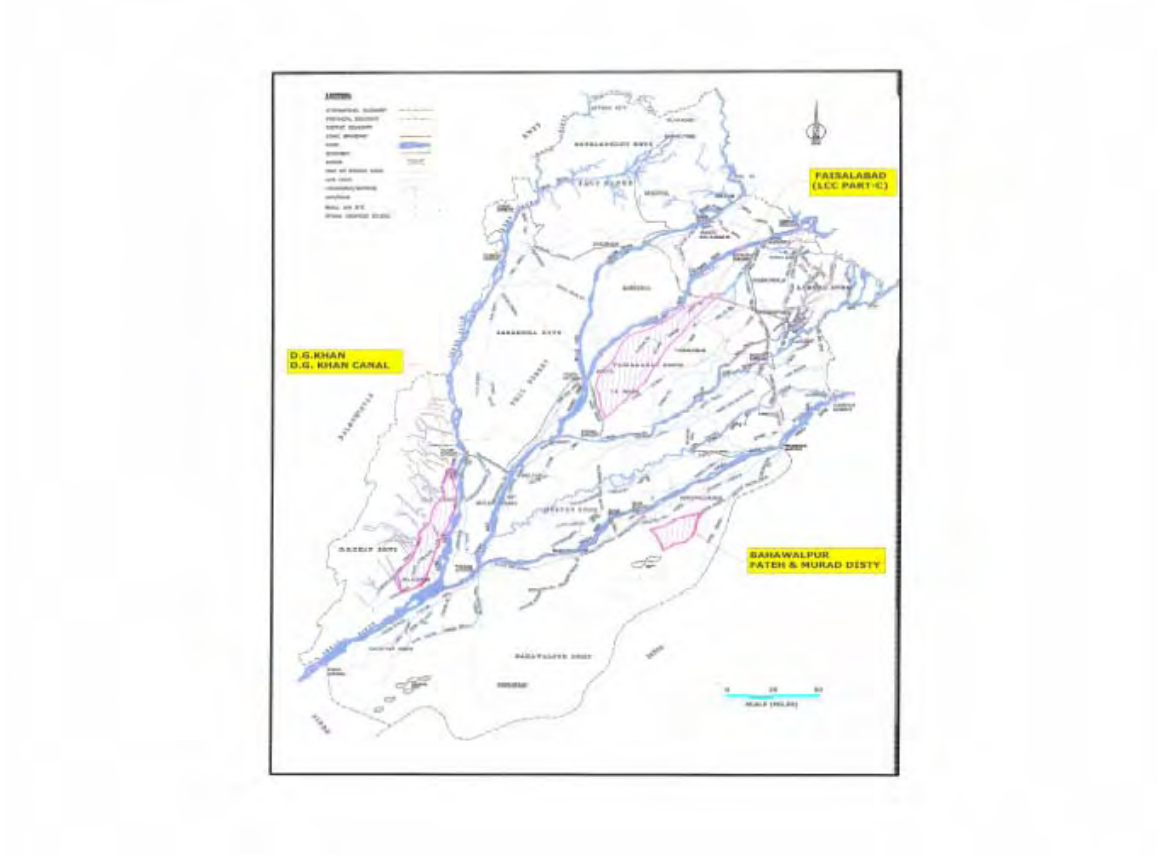
□ Part of the approved project (□ listed in PSDP or ■not listed in PSDP)

(Project name: Listed in ADP of Punjab 2007-08 "Punjab Irrigation System Improvement Project")

■ Part of the 5 / 10 Year Plan

□ Small and no need CCP/PC-I/PC-II process

Fig 1 Site Location of the Project



3. Background of the Project

1 Current condition of the agriculture and irrigation system in Pakistan as well as Punjab

1 Country Overview

Pakistan's total land area is 307,376 square miles (795100 km^2). About 50% of the land area includes mountainous terrain, narrow valleys and foothills and, as such, is of limited productivity. Pakistan is a country of over 148.72 million people, which is expected to grow to about 221 million by the year 2025. The most pressing need over the next quarter century in Pakistan will be the management of the rapidly increasing population in view of scarce water resource and land and provision of basic amenities. The increasing population will have a major impact on food, power and domestic water requirements.

Agriculture is the single largest sector of Pakistan's economy contributed 25persent to GNP. Rs. 7,864billion ($131.0Billion) (2005-06). About 70 percent of rural population depends on agriculture, which employs over 48 percent of the labor force and accounts for more than 60 percent of foreign exchanges. In addition, about 40 percent of the rural population is poor, while

incidence of poverty in urban areas is about 35 percent.

2 Overview of Punjab Province

(1)Area and Population

The Punjab land area is 79,653 sq. mils (206,300 km^2) lying in Indus river basin with the alluvial plain formed over geological time by alluvial deposits of the Indus, which accounts for 26percent of the Pakistan total area. The total population of Punjab is 73.6 million (1998), which is 55.6 percent of the population of Pakistan. The population of Punjab had risen to 82.32 million by 2003, out of which 68.7 percent was living in rural areas.

Out of total labor force of 13.4 millions in the province, about 68.7 percent falls in rural areas and 31.3 percent in urban areas. Proportion of female labor force comes to about 4 percent only, of which about 2 percent is rural and 2 percent urban. Unemployment rate is 19.4 percent, which is higher in urban area (20.1 percent) than rural areas (18.6 percent).

(2)Agriculture

Punjab, in many ways, is a microcosm of Pakistan. The role of agriculture in the overall economy is slightly higher in Punjab than that in Pakistan. Agriculture is the mainstay of the Punjab economy. In addition, agriculture has been largest contributor (24 percent) towards the economic growth of the province

There are about 3.9million farmers who cultivate 30.7million acres (12.3million hectares). Out of them, 85and 10 percent farmers are below 12.5acres (5hectaers) and 25acres (10hectares) respectively. There are two crop season i.e. summer of Kharif and winter of Rabi. The Kharif season starts in April and ends in September while the Rabi season starts in October and ends in March. Important Kharif crops include cotton, rice sugarcane, maize & Pulses. The Rabi crops comprise of wheat, barely, tobacco and mustard.

The farm areas, main crops, cropping intensity, and number of farms in proposed project areas s are shown in table 1, where JBIC Loan Project will be implemented

Table 1: Farm area, Main crops, Cropping intensity and Farmers in Project Areas

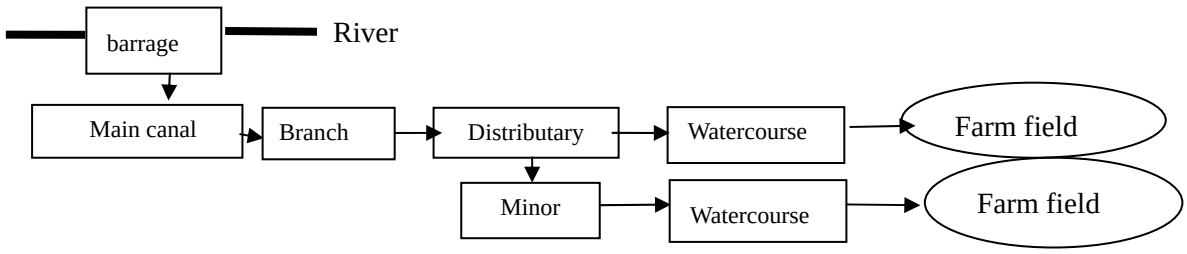
Area Water Board (AWB)	Farm area(ha)	Main Crops and cropping intensity at present (Note) number with ( ) is the percent of cropping intensity			Number of farms(farmers household)
		Kharif	Rabi.	perennial	
Bahawalpur zone(Bahawalnagar Circle)	117,149	Cotton(37) Sorghum/Millet(9) Rice (3)	Wheat(40) Oilseeds(9) Clover(4)	Sugarcane(5)	30,443
DG Khan Zone(Dera Jat Circle)	181,056	Cotton(32), Rice(7) Sorghum/Millet(4)	Wheat(36) Clover(4)	Sugarcane(1)-	55,670
Faisalabad Zone(LCC(W) Circle)	366,043	Maize(13) Sorghum/Millet(13) Rice(9),Cotton(6)	Wheat(44) Clover(11) Oilseeds(4)	Sugarcane(13)	130,506
total	664,248				216,619

(3) Irrigation System

Pakistan has one of the largest contiguous gravity flow irrigation systems in the world. It serves as a lifeline for sustainable the agriculture in this part of the world having an arid to semi-arid climate. Irrigation in the Indus basin has a long history dating back to the Indus civilization. Its development, however, was started about in the middle of 19th century.

Irrigation network of the Punjab is a part of Indus Basin Irrigation System of Pakistan was designed with the objective of bringing as much land under canal command as possible with initial cropping intensity ranging from 60% to 80%. The Punjab irrigation network comprises of irrigation canals, branches, minors distributaries and watercourses by which irrigation water is delivered to farm fields from rivers, with supplemental facilities of tube-wells, small dams and food protection infrastructure (shown in figure2)

Fig.2 Conceptual Picture of Irrigation System



2 issues to be solved

1 Punjab irrigation system

(1) Reforms in Irrigation Sector (Farmers Organizations (FOs))

The Punjab irrigation system has been operated by the Punjab Government: IPD (Irrigation and Power Department). The main operational issues of the Punjab Irrigation System include deferred maintenance of canals, inadequate funding, sub-optimal farmers' participation in evolving operational plans and their implementation. The Major problems/concerns of Punjab irrigation system in eyes of its management be identified as insufficient and varied canal water supplies to irrigate their lands in a crop season; unreliable and inequitable in distribution of irrigation water.; deterioration of the canal system and frequent breaches due to weak banks; increased cases of water theft and failure of management to check them; increase in water disputes and delay in actions and justice

To address the irrigated agriculture problems and sustainability of the irrigation system, Government of the Punjab has launched major institutional reforms in the Province with setup of PIDA in 1997 at provincial level, Pilot Area Water Board(AWB) at a Canal Command, and Farmers Organizations (FOs) at distributary levels. One of the conditions of Institutional Reforms Component is transferring the authority of irrigation management at distributary level from Government to farmers. Participatory Irrigation Management (PIM) of Farmers Organizations has been introduced through institutional reforms.
Main objective of institutional reforms is to improve the quality, equity, efficiency and accountability with which the irrigation services are delivered.
Formation of FOs has initially implemented in Lower Chenab canal circle (East) (LCC (E)) as the pilot area in which JBIC Yen loan has supported the setup of FOs as well as rehabilitation of canals.

JICA has been implementing and will implement the technical cooperation of "Capacity Building for Irrigation Management (the Present JICA Project)", from 24 June 2006 to 23 June 2008, based on the official request from government of Pakistan dated on 28, September 2004. The Minutes of Meeting singed on June 22 ,2006 shows that the purpose of the present JICA Project is to improve and strengthen the management system of public irrigation and drainage infrastructure with three outputs : evolvement of FOs & AWB performance ,formulation of Water Master Plan and proposal on renovating the current management information system. Regarding output of proposal on renovating the current management information system, however, the system has been developed well and will be renovated in the future by IPD.

Therefore modifying the part of contents of singed Minutes of Meeting, the present JICA project should focus on the activities regarding FOs & AWB performance as well as master plan(Business Plan) of distributaries managed by FOs: The present JICA project should be required to develop the functions of FOs in LCC (E) set up by the JBIC Yen Loan Project as well as function of AWB, taking into account the Land Improvement District institutional system in Japan (similar system of FOs in Pakistan), drawing up the Guideline to empower the activities of FOs such as:

- Enhancement of FOs managerial capacity and the delivery performance and operation ＆maintenance of distributaries
- Improvement of capacity building methodologies in Faisalabad training cell,etc
- Recommendation regarding FOs and AWB present institutional system in light of Japanese Land Improvement District institutional system
- Capacity building of IPD/PIDA personnels

PIDA will continue setting up FOs in the areas other than LCC(E), taking into account the outcome of pilot FOs in LCC(E). Therefore, it would be requested that further technical cooperation should be necessary to verify and materialize the Guidelines which the present JICA project will draw up in the appropriate selected FOs as well as that outcome of further technical cooperation should feed back FOs in LCC(E)

Table 2 shows the number of distributaries and minors in the proposed project zones where FOs are scheduled to be established respectively.

Table 2: Number of Distributaries & Minors and FOs

Area Water Board (AWB)	No of distys and minors	Farm area(ha)	Average area(ha) and farms per a disty	No of FOs
Bahawalpur(Bahawalnagar Circle)	567	117,149	1770(460)	66
DG Khan(Dera Jat Circle)	399	181,056	2920(900)	62
Faisalabad(LCC(W) Circle)	440	366,043	5460(1,950)	67
Total	1406	664,248		195

(Note) numbers with ( ) are average Farms (farmers household)
No of FOs will be established among No of Distys
Farm areas (ha) are linked to command areas of FOs, not to linked to Distys

(2) Irrigation Sector Reform Program

In addition to above mentioned issues, recently due to increase in actual cropping intensity up to 150% against a planned value of 70%, population increase and changes in the sociological, cultural, agricultural and economic practices, Punjab irrigation system lacks in meeting with the full demand. As a consequence, the design considerations and capacities, which might have been relevant at the time of the system's construction, are now no longer suitable.

On the other hand, the share of groundwater, which is generated as a result of percolation from rainfall, seepage from canals, watercourses and farm fields is also important. Governmental SCARP tube-wells as well as more then 5,50,000 private tube-wells are being operated which pump out a quantity of 30-35 MAF annually and have caused an increase in the cropping intensity averaging 122% with maximum up to 150% in some of the areas. However, supplementation of groundwater is depleting the existing reservoirs due to over exploitation and drastic lowering of water table, being observed in parts of the Punjab. The high cost of pumping and the low quality of groundwater is a threat, not only to the sustainability of fresh groundwater source but also to the agricultural productivity and fertility of lands.

To cope with these issues including setup of FOs, Punjab government decided to take holistic management for irrigation sector reform program (ISRP) supported by World Bank 2006 in pursuance of the objectives laid down in the medium - term strategy for the development and management of the water resources in accordance with the growing water demand in irrigation and other sectors. Punjab's long term vision for the sector is to provide adequate and reliable irrigation supplies to the cultivable lands of Punjab, aiming at enhanced agricultural productivity for the sustainable development. This vision is to be achieved by ensuring the integrity and sustainability of the irrigation infrastructure, improving water resources management, improving irrigation services delivery; and enhancing productivity. The components of the ISRP are shown in table 3

Table 3: Outline of Irrigation Sector Reform Program

ISRP – Objectives and Goals
Pillar I: Institutional and Policy Reforms to improve the management and maintenance of the irrigation system to ensure its long term physical and financial sustainability.
Pillar II: Water Resources Management Reforms to make intra-province water allocation and distributaries more transparent.
Pillar III: Irrigation Service Delivery Reforms to improve the quality, efficiency and accountability with which irrigation services are delivered.
Pillar IV: Reforms to improve water use efficiency and on-farm productivity.

Regarding pillar1and pillar4, in order to improve the irrigation efficiency of surface water, concrete lining of distributaries and watercourse is essential to mitigate seepage losses from canals and introducing the water saving technologies is likewise to provide the water effectively for crops in the farm field. Out of them, concrete lining of canals will be supported by JBIC Yen loan project, etc.

In addition to the water saving technology by laser land leveling, the conventional land leveling without using laser should be also important for small farmers because laser land leveling is expensive although laser land leveling is high in its leveling accuracy and Benefic Cost (B/C) ratio. The maximum cost of the laser land leveling is Rs1500 /acre and only 10% to 15% of farmers can accept to apply according to our sample survey of three villages in July 2007. Therefore it is proposed to introduce not only the state-of-art water saving technologies like laser land leveling, but also conventional land leveling as the supplemental technology which should be improved from viewpoints of acceptability of all farmers from small farmers to progressive farmers.

Moreover enlightenment to water saving consciousness among farmers is important factor for water saving of ground water intake. It is thus useful to conduct a diagnosis of real farmers' way of irrigation and advise improvement recipe. Applying a device to check whether water is applied in the rooting zone or over the rooting zone, we can make the diagnosis and suggest the practical improving measures if understanding the soil-water-crop relation and farmers' practice deeply. The device should be cheap and portable such as a tensiometer.

2. Improvement in Agriculture Sector (Agricultural Extension)

In order to disseminate the reformed institutional system and irrigation measures to farmers, agricultural extension system is applied. However, the fact that yields of various crops are less than those of the international standard despite a favorable climate, temperature etc indicates that the present extension system is not properly equipped to meet present issues. Some constraints are under:

- Further linkage between research institutes and Farmers at field level through agriculture extension.
- Inefficiency of extension service at field level due to the limitation of number of agriculture officer

For improving the present extension situation, Punjab Agriculture Department (PAD) has developed an extension system of the Farmers Field School (FFS) from 2005. This system is aiming at strengthening transferring the research institutes technologies to farmers through farmers' participatory approach. It would be desirable to apply FFS method to requested project. Meantime, in order to improve efficiency of extension service, utilization of FOs would be one of the effective options

More improvements will be possible by enforcing the capability of agricultural officers and field assistants through training of enriched extension methods/techniques. The following examples of enrichment can be suggested.

- Produce extension movies/videos for dissemination with TV.
- Make illustration-rich extension materials considering the low literacy rate among poor farmers.
- Conduct skill training of agricultural officers and field assistants in such way as they make extension materials by themselves based on the needs of farmers under their jurisdiction

3. Strengthening Collaboration with IPD/PIDA and PAD

Agriculture productivity generally depends on three major elements: technology, irrigation and farm land. Meantime IPD/PIDA is responsible for deliver of irrigation water and formation of FOs, on the other hand PAD is responsible for agriculture technology, extension service and on-farm-water-management. It will be essential to tighten further mutual collaboration for development of Punjab agriculture. In this sense, incorporation of FOs into present extension service would be an appropriate way.

4 . Related Government's policy

(National/Provincial Development Plan & Sector Development Plan)

1 Irrigation Sector Reform Program (ISRP)

Government of Punjab has prepared a Medium Term Strategy(MTS) for implementing the Irrigation Sector Reform Program supported by World Bank since 2006

Reforms are being carried out along the following four pillars;

Pillar I: Institutional and Policy Reforms to improve the management and maintenance of the irrigation system to ensure its long term physical and financial sustainability.

Pillar II: Water Resources Management Reforms to make intra-province water allocation

and distributaries more transparent.

Pillar III: Irrigation Service Delivery Reforms to improve the quality, efficiency and accountability with which irrigation services are delivered.

Pillar IV: Reforms to improve water use efficiency and on-farm productivity.

2 National Program for Improvement of Watercourses in Pakistan

Government of Pakistan has recently launched a mega activity titled "National Program for improvement of Watercourses in Pakistan (NPIW)" to improve all remaining 86,000 watercourses (54, 000 in Punjab) in the country in four years (2004-08) at a total cost Rs. 66.37 billion (about 1 billion US$).

3 Strengthening of LASER Land Leveling Services in the Punjab

Government of the Punjab has launched a scheme in July 2005 for provision of 2500 units to the small farmers at union council level for provision of land leveling services facility to the farmers of the same locality as service providers with budget of 860 million Rs) .

4 Water Conservation and Productivity Enhancement through High Efficiency Irrigation system

Government of Pakistan has recently approved the project titled "Water Conservation and Productivity Enhancement through High Efficiency Irrigation system**"** during 5 years (2007-2012) .The Main objectives of the project are to increase agricultural production by demonstration of drip and sprinkler irrigation as well as installation of drip irrigation system etc. This project is budgeted at 18 billion Rs

5 Farmer Field School

All villages of project district have Farmer Field School. Every Farmer Field School has 25 farmers, who are trained in integrated management Techniques through Participatory approach

(Other relevant projects or activities for solving said issues and problems)

1 JBIC Loan Project (2008-2013)

JBIC Loan Project will comprise following component.

- Lining/rehabilitation of distributaries and minors of Bahawalpur, DG Khan, and Faisalabad Irrigation Zones
- Conjunctive use of Groundwater and canal water
- Institutional Strengthening and Operation Modernization
- Water Measurement Devices for Irrigation Management Information System(IMIS)
- Capacity building for concerned agencies and organizations

2 JICA PROJECT (Capacity Building for Irrigation Management)(2006-2008)

Purpose of the Project

The management system of public irrigation and drainage infrastructure in Punjab is improved and strengthened.

Output

- Area Water Board (AWB) in Lower Chenab Canal (East) (LCC (E)) operates in supervisory mode and later to perform as autonomous entity in a phased manner.
- Water Management Master Plan for LCC(E) is formulated.
- Proposal on renovating the current management information system for irrigation and drainage in Punjab is prepared.

5. Outline of the Project of New JICA Project

(1) Overall Goal / Long-term objective

The irrigation management system is improved in Bahawalpur(Bahawalnagar Circle), Faisalabad(LCC(W) Circle) and DG Khan(Dera Jat Circle) Zones

(2) Project Purpose / Short-term objective

The model of improved irrigation management system is established through implementation/ verification of activities in pilot areas in Bahawalpur(Bahawalnagar Circle), Faisalabad(LCC(W) Circle) and DG Khan(Dera Jat Circle) Zones in collaboration with IPD, PIDA and PAD

(3) Output

1) Function of FOs which is responsible for appropriate operation and management of irrigation facilities as well as water management in the pilot areas-distributaries and function of AWB are enhanced and stabilized through implementation/verification of the guidelines which the present JICA project will propose based on the activities on FOs in LCC (E).
2) Improved water saving Irrigation technologies are established in the pilot areas with enriched extension methods/techniques.
3) Capacity of IPD, PIDA and PAD personnels and the concerned is improved through training programs applying the above outputs and others.

(4) Project Activities

(0 preparation ）

0-1 Share the Project concept among the stakeholders

0-2 Set up the management body of the Project and prepare the work plan

0-3 Select “pilot areas” in proposed zones respectively with “three models areas” extending in watercourse command areas

0-4Review the present situation and implement the baseline survey on selected pilot areas,

taking into account the guideline which the present JICA project will propose

: Training contents to Established FOs and training textbook, activities and issues of established FOs and AWB, feature of distributaries and watercourses, maintenance and water management of distributaries, groundwater, agriculture and farmers' technology regarding water saving technologies, extension system and issues, direction of PIDA to FOs and AWB

0-5 Provide pilot areas with required facilities

: Renovation of FOs office, laser land leveling, raised-bed on farm, installation of drip irrigation and sprinkler facilities, Flexible Gated Pipe(FGP) , conjunction facilities with groundwater, etc

(1 Function of FOs and AWB)

1-1 Strengthen the management, finance and accounting (water charge collection etc) of FOs through on-the job-training in selected pilot areas taking into account the Guideline

1-2 Implement operation and maintenance of distributaries as well as appropriate water management and monitoring in pilot areas, taking into account the Guideline.

1-3 Improve AWB activities, taking into the Guideline

1-4 Materialize operational methodologies of the Guideline as manuals

(2 Water Saving Technologies with enriched extension methods/techniques.)

2-1 Introduce and practice the laser land leveling, furrow irrigation, drip irrigation, sprinkler irrigation and FGP in terms of water saving irrigation in model areas

2-2 Improve the conventional land leveling methodologies in model areas

2-3 Improve the managerial irrigation methodologies, especially for vegetable crops in model areas

2-4 Verify appropriate water saving technologies as well as agriculture farming relating to water saving in model areas

2-5 apply enriched extension methods in order to extend the various outcomes of activities in the model area to the farmers in pilot areas by preparing appropriate extension materials, taking into account low literacy level in rural area.

2-6Draw out the manual of water saving irrigation with enriched extension and agriculture farming technologies relating to water saving method in pilot areas

(3. Enhancement of capacity building)

3-1 Prepare the training materials for trainers who are responsible for training FOs and farmers

3-2 Implement the training of governmental staff, trainers to farmers and FOs as well as leaders of FOs

3-3 Hold seminar, workshops etc to extend outcomes of various activities from item1 to item 3

(5) Beneficiaries ＃

Population for which positive change are intended directly and indirectly by implementing the project, and gender disaggregated date, if available.

Beneficiaries are shown as under table at average size

Items	Bahawalpur Area	DG Khan Area	Faisalabad Area	Total
No of FOs	1	1	1	3
No of KP	20	20	20	60
No of farmers	460	900	1950	3300

In addition to the table, the average size of farm families is 7. Therefore the total number of men and women is about 23000 with women making about50 % of the total where the total number of women is about 11500

(6) Input from the Pakistan side ＃

Counterpart personnel and support staff attached to the project

Management Unit at Head Office (Lahore)

Counterparts	**JICA Experts**	**Support Staff (JICA)**
• GM (TM) PIDA • Chief (Strategic Planning Reform Unit) • Chief Monitoring PMIU • Director General On Farm Water Management (PAD) • Director on extension (PAD) • Chief Water (P&D)	• Project Manager/FOs function • On-Farm-Water-Management/ Water saving irrigation • Project coordination /Agriculture Extension Improvement /Training	• Manager Admin & Accounts (1) • Computer(1) Operator(1) • Office Assistant(1) • Driver(2) • Naib Qasid(4) • Sweeper(1)
Supporting Staff for Management Unit • Senior Agr. Engineer I • Soil Scientist • Agronomist		

Supervise

Advise

Report

Implementation Units (3) at Field Office

Counterparts	**JICA Experts**
• Superintending Engineer (3) (Project Areas) • Agriculture officer(3) • District officer on farm water management (3)	• Project Manager/FOs function • On-Farm-Water-Management/ Water Saving Irrigation • Project Coordination /Agriculture Extension Improvement /Training
Supporting Staff for Execution of On-Farm Activities Agriculture Engineer(3) Agriculture Field assistant (3) • SubEngr.civil(3) • Computer Operator(3) • Office Assistant(3) • Field Assistant(3) • Tractor Operator(3) • Driver(6) • Lab Atentant(3) • Naib Qasid(6)	

(7) Input from the Japanese side (= request) ＃

Experts (Number, Field and qualification)

In case that the input is only expert(s), please attach the A1 form

1 long term experts

- Project Manager/FOs function
- On-Farm-Water-Management/Water saving irrigation
- Project coordination/ Agriculture Extension Improvement /Training

2 short term experts

- Administration of FOs
- O/M of Distributary
- Measurement of appropriate managerial Irrigation using tensiometer
- Agriculture Extension for guidance of understandable material to farmers

Training, seminars and workshops (Expected participants and numbers)

1) In-country

Training of trainers, Seminars, Workshops

2) In Japan or third countries

Counterparts training in Japan/third countries

Outline of equipment

1) Site address to be installed *(★This information is necessary.)*

Pilot areas

3) Name of main equipment *(★This information is necessary.)*

- Training materials and dissemination materials (laptop computers video cameras projectors)
- Computers
- GIS software
- tensiometer
- etc

6. Implementation Schedule

Four (4) years (January 2009 to January 2013)

7. Implementing Agency

Department of Irrigation and Power in Punjab Government (IPD) and Punjab Irrigation and Drainage Authority（PIDA）in collaboration with Department of Agriculture

8. Gender Consideration

Women in the rural area, accounting for half population, play an important role in agricultural development as engaged in weeding, rice sowing, caring of cattle, and harvesting. Their activities, however, remain economically and socially low due to lack of information, opportunities and access to various resources.

The extension of women's participation is important in various agri-social activities such as water delivery and on-farm agriculture activities. IPD/PIDA has been carrying out various supports to involve women in the awareness of Irrigation water management along with setting up FOs since initiation of reforms during the year 2000 in LCC (E). Main activities of IPD/PIDA to develop the involvement of women are social mobilization, formation of female groups, training & capacity building of female groups, and monitoring and evaluation of their activities to develop the social role of gender in the rural area. These continuous efforts of IPD/PIDA have created good awareness in the gender in the reforms areas and it would gradually expand.

IPD/PIDA will extend the gender activities to the proposed project zones other than LCC (E).

日　程　表

（官団ベース）

DATE	DAY	SHEDULE
1-Jun	Sun	*(Tokyo - Bangkok - Lahore)*
2-Jun	Mon	Courtesy call to IPD, P&D and PAD Meeting with working group member and the concerned of PAD, IPD and PIDA 1. Presentation on the outline of JBIC Yen loan Project by PIDA- Head PMO of PISIP 2. Discussion on Draft of M/M, PDM and PO by JICA mission
3-Jun	Tue	Hold workshop to make PDM with support of JICA Mission member as facilitator
4-Jun	Wed	*(Lahore - Faisalabad)* Visit a branch canal Meeting with Chief Executive and members of AWB(LCC(E)) and AWB(LCC(W)) 1. Presentation on the outline of AWB(LCC(E)) and AWB(LCC(W)) 2. Interview with Chief Executive, members of AWB(LCC(W)) 3. Interview with 2 FOs (Pabbarwala Disty and Gilotran Disty) in LCC(W) Visit 3 FOs (Pabbarwala Disty, Waghwala Disty and Mandwala Disty) in LCC(W) Visit several distributaries
5-Jun	Thu	Ayub Agricultural Institute to interview about Water saving technologies Visit International Network on Participatory Irrigation Management (NGO) Visit 1 FO (Balochwala Disty) in LCC(E) *(Faisalabad - Bahawalnagar)* Visit a local green market Visit a distributry
6-Jun	Fri	Meeting with Chief Executive of AWB(Bahawalnagar) 1.Presentation on the outline of AWB by Chief Engineer 2.Interview with Chief Executive and members of AWB Visit 3 FOs (Jalwala Disty, Gajiani Disty and Murad Disty (not established)) *(Bahawalnagar - Okara)* Visit to the water saving project site of District in Okara *(Okara - Lahore)*
7-Jun	Sat	Visit Government Engineering Academy Punjab Visit Water Management Training Institute (WMTI) Interview with Project Director of Fruit & Vegetable Development Project and other officials, PAD
8-Jun	Sun	Internal discussion on M/M, PDM and PO *(Lahore - Multan)*
9-Jun	Mon	Meeting with Chief Executive of AWB(DG Khan)　(not established) 1.Presentation on the outline of AWBs by Chief Engineer

		2.Interview with Chief Executive and members 3.Interview with FOs (Shadan Disty, Batil Disty and Yaru Disty) *(Multan - DG-Khan)* Visit the Taunsa Barrage and meeting with Japanese Consultants *(DG-Khan - Multan - Lahore)*
10-Jun	Tue	Meeting with Project Director of Fruit & Vegetable Development Project Visit FFS (Farmers Field School) in Mudhkay village Discussion on the framework of the Project with IPD, PIDA &PAD
11-Jun	Wed	Discussion on the framework of the Project including the draft of M/M, PDM & PO with IPD, PIDA and PAD
12-Jun	Thu	Discussion on the framework of the Project including the draft of M/M, PDM & PO with IPD, PIDA and PAD
13-Jun	Fri	Meeting with PAD for preparation of signing M/M
14-Jun	Sat	Meeting with PAD (Secretary) for preparation of signing M/M Collecting materials & report writing
15-Jun	Sun	Collecting materials & report writing
16-Jun	Mon	Signing M/M with IPD ***Official members****:* *(Lahore - Islamabad)* Report the result of discussion to the Embassy of Japan and JICA Pakistan Office (*Islamabad -Bangkok - Tokyo in the next evening)* ***One consultant member:*** Additional survey in Lahore

（コンサルタント追加調査）

Date	Day	Schedule	Accommoda-tion
June 17	(Tue)	Departure to Faisalabad Meeting with the District Officers (Water Management & Extension and AR), Faisalabad Meeting with the 1st group of KP members (Pabbarwala Disty)	Faisalabad
June 18	(Wed)	Leave the hotel for field Meeting with the 2nd group of KP members (Pabbarwala Disty) Move to Bahawalnagar	Bahawalnagar
June 19	(Thu)	Meeting with the District Officers (Water Management & Extension and AR), Bahawalnagar Meeting with the 1st group of KP members (Jalwala Disty) Meeting with the 2nd group of KP members (Jalwala Disty)	Bahawalnagar
June 20	(Fri).	Meeting with the 3rd group of KP members(Jalwala Disty) Meeting with the 4th group of KP members(Jalwala Disty) Return to Lahore	Lahore
June 21	(Sat)	Confirmation of arrangement and preparation for the survey in DG Khan Additional information gathering at PAD	Lahore
June 22	(Sun)	Compilation of survey data Departure to Multan (arrival at 7:25 p.m.)	Multan
June 23	(Mon)	Leave hotel for DG Khan Meeting with the District Officers (Water Management & Extension and AR), DG Khan Meeting with the KP members (Yaru Disty) Return to Multan Leave for Lahore via air (arrival at 8:55 p.m.)	Multan
June 24	(Tue)	Additional information gathering at PAD Compilation of the survey data	Lahore
June 25	(Wed)	Confirmation on the questionnaire for PIDA Compilation of the survey data	Lahore
June 26	(Thu)	Compilation of the survey data	Lahore
June 27	(Fri)	Report drafting & preparation for presentation	Lahore
June 28	(Sat)	Presentation of the survey results at PIDA Report drafting	On air
June 29	(Sun)	Departure to Bangkok Arrive Narita via Bangkok	

主要面談者リスト

1. Lahore

IPD (Irrigation and Power Department) / PIDA (Panjub Irrigation Development Authority)

Babar Hassam Bharwana	Secretary
Asrar-ul-Haq	Chief Strategic Planning / Reform Unit
Abdul Ali	Additional Secretary

PIDA (Panjub Irrigation and Drainage Authority)

Waqar Khan	General Manager™ PIDA
Shaiq Hussain Abidi	Deputy General Manager
Irshad-ul-Haq	Deputy General Manager

PAD (Punjab Agricultural Department)

Muhammad Javaid Iqbal Awan	Secretary
Chaudhary Mohammad Ashraff	Director General Agriculture (Water Management)
Muhammad Yasin	Director General Agriculture (Field)
Rafiq Akhtar	Director Agriculture
Munawar Ali	Director Agriculture (Extension)
Qarban Ahmed	Director Agriculture Mechanization Research Instruction
Javid Iqbal Anjum	Deputy Director of Agriculture and Horticulture
Massa	Additional Secretary, Evaluation Cell
Hassawar Abass Nagri	Additional Secretary, Planning
Muhammad Asif Khan	Project Director Fruit & Vegetable Development Project
Narif Hussam	Master Chief Planning & Evaluation Cell (Water Management)
Amrar Abrahum	Project Officer / Master Trainer
Shen Sherawat	District Officer of Agriculture (Extension)
Arif Siddique	Agricultural Officer (Extension)

P&D (Planning & Development Department)

Shahid Mahmood	Secretary
Muhammad Bazhil	Chief (W&P)
Najim Riaz	Deputy Chief (ECA)
Muhammad Abid Bodla	Member Engineering

Government Engineering Academy Punjab

Syed Qasim Ali Shah	Director of Studies

Water Management Training Institute

Mumtaz Ahmed	Director / Extension Specialist
Gulrez Albar	Rural Sociologist
Mohammad Akram Pasha	Agricultural Economist
Sher Afgan	Assistant Agriculture Engineer
Tariq Maqbool	Assistant Agriculture Engineer

2. Faisalabad

IPD/PIDA

Rama Rafigue Afwad	Chief Executive of LCC(E)
Qazi Anwari Ali	Chief Engineering of Faisalabad Zone

PAD

Rana Farman Ali Khan	Executive District Officer, Agriculture
Zahur Ahmed	District Officer, Water Management
Abdul Hamid	District Officer, Agricultuer (Extension)

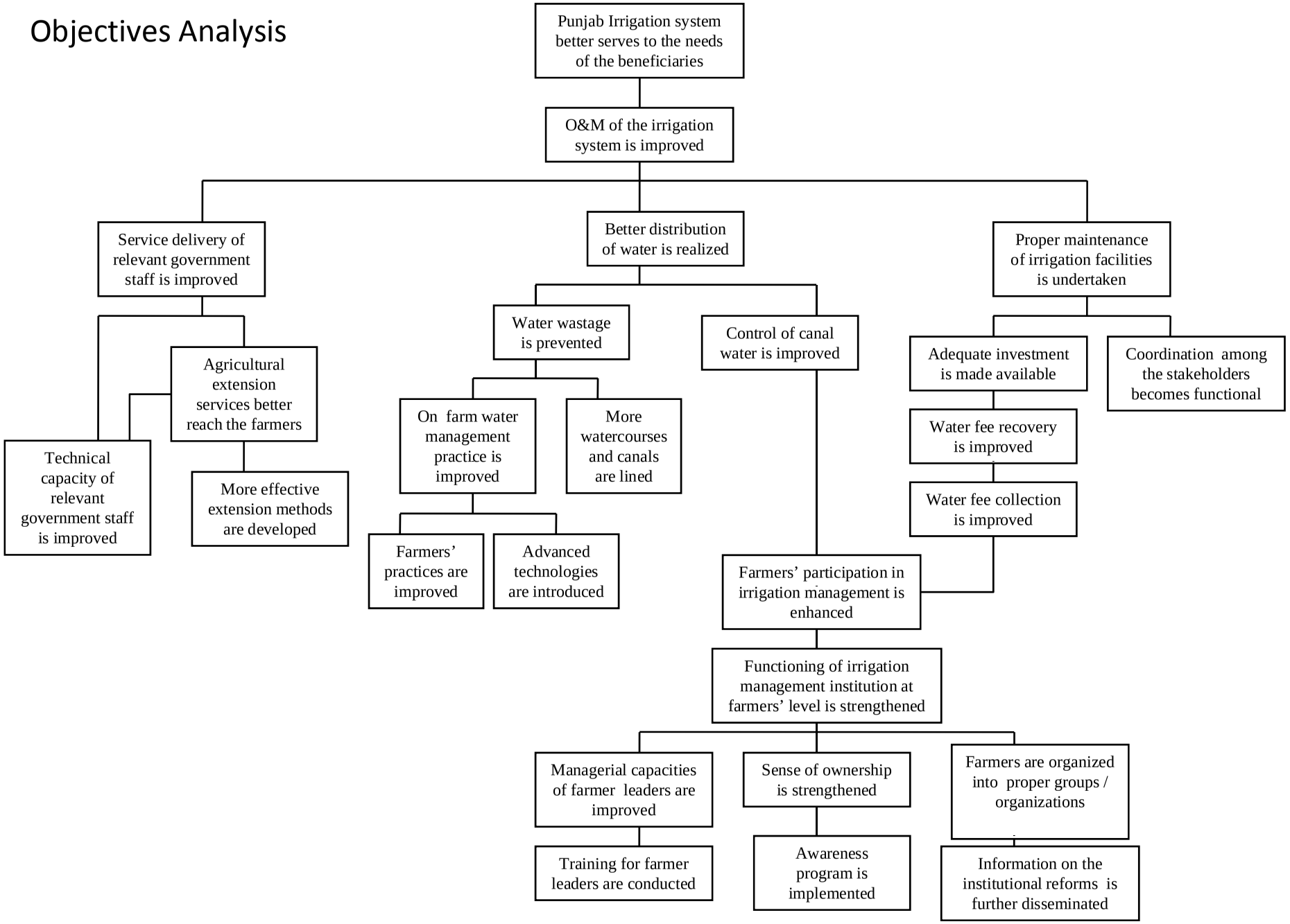
AWB(W)

Khaliq Dad	Manager (coordinator)
Zulfgan Ali	Manager (SM)
Malik Milsar Tiwana	member
Syed Shafqat Hussain	member
Muhammad Saddique	member
Iftikhan Hassain	member
Shamshar Khan	member
Farman Ali Bhatt	member
Tariq Mahmood	member

AWB(E)

Arif Zalid	vice Chairman
Inyaf Ullah Wlarruar	Chief Executive
Shariq Hussain Abidi	Deputy General Manager (SM)
Suhail Abbas Shamgi	Manager (operation)
Muhammad Saeed	Manager (coordinator)
Muhammad Aslam Rama	Training Coordinator
Sarwar Hassain	member
Raja Khalig-u-Zawau	member
Muhammad Youzef Tarar	member

Objectives Analysis



Ayub Agricultural Institute

Muhammad Rashid	Director General
Muhammad Aksan	Director, Chakwal
Abdul Hameed	Deputy Director
Muhammad Nadeem Iqbal	Soil & Water Conservation Research Institute, Chakwal
Noor Muhammad	Director, Vegetable Research Institute
Khalid Mahmood	Vegetable Botanist, Vegetable Research Institute
Abdus Sattar	Director, Agronomy Department

International Network on Participatory Irrigation Management

Intizar Hussain	Executive Director

FO

Bashir Tariq	President, Gilotran
Ikhtasar Ahmad Naeem	President, Balchwala
Nisar Ahmad	Vice President, Balchwala
Zulfiqar	Secretary, Balchwala
Naveed Ishaq	Treasurer, Balchwala
(Executive members)	Pabbarwala, Waghwala and Mandwala

3. Bahawarpur

IPD/PIDA

Khadim Hussain	Chief Executive
Syed Shafiq Abidi	Director General Management (SM)
Nassir Sultan	MSM

PAD

Muhammad Jamil	Deputy District Officer, Water Management
Manzoor Ahmed	Deputy District Officer, Agricultuer (Extension)

FO

Sajad Muhmood	President, Jalwala
Muhammad Iqbal	Vice President, Jalwala
Muhammad Ajmal Langah	Secretary, Jalwala
Syed Ibrar Hussain Shah	President, Gajiani
Qazi Ihtisham-ul-haq	Vice President, Gajiani
Zaheer-ul-Din	Secretary, Gajiani
Muhammad Ahmed	Treasurer, Gajiani
(KP Chairmans)	Murad

4. Okara

Ali Ahmad Ktor	District Officer, Water Management

5. DG Khan

IPD/PIDA

Muhammad Ghufrar	Superintendent Engineer
Muhammad Asghar Dogar	Executive Engineer
Rana Afmir Naseem	Assistant Executive Engineer
Safder Yar Sarf	Manager (SM)
Jarwed Iqbal	Field Officer
Rashrel Muhmood	Field Officer
Syed Zahid Ali	Superintending Engineer, IDP, Derajat Canal Circle

PAD

Manzool Ahmad Jatala	District Officer, On-farm Water Management
Malik Amjad Iqbal	District Officer, Agricultuer (Extension)

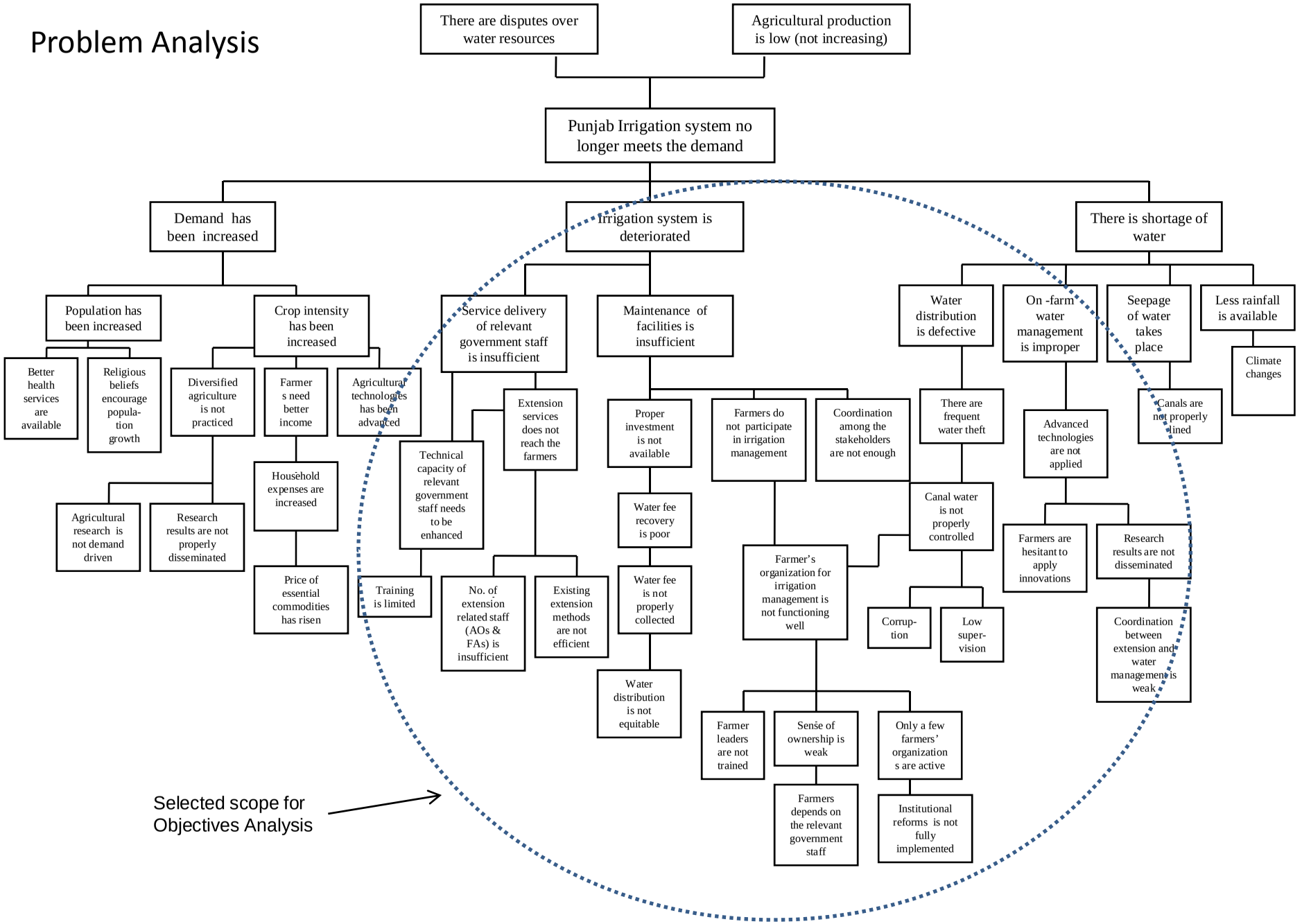
FO

Irees Ismail	President, Shudan Lund
Haider Nawaz	Vice President, Shudan Lund
Mabel Musa	Secretary, Shudan Lund
Nazil Ahmmed	Treasurer, Shudan Lund
Ghulam Noas	President, Batil
Manjar Hussain	Secretary, Batil
Haji Solobar Khan	Treasurer, Batil
Gulam Mustafa	President, Yaru
M. Yausir	Treasurer, Yaru
Khadir Hussain	Secretary, Yaru

タウンサ堰施設改修計画

成川　正則	三祐コンサルタンツ

Problem Analysis



付属資料6-1　Pabbarwala三次水路受益地末端水路詳細

Sl.	KP (Outlet No.)	三次水路内の位置	FO事務所からの距離	末端水路延長		ライニング延長		CCA (acre)	受益農家数	所有規模別の農家割合			最大土地所有面積 (acre)	最小土地所有面積 (acre)	用水量	地下水	地下水利用状況	受益地内行政村		受益地内集落		水利組合	
				miles	feet	feet	%			12.5 acre未満	12.5 acre以上25 acre未満	25 acre以上						数	名称	数	名称		ＫＰとの役員重複
1	56/L	上流	20 Km	3.0	15,840	480	3.0	746	250	100.0%	0.0%	0.0%			設計水量	利用可	約2/3の農家が用水と併用	1	No. 17	1	Chak No. 131 JB	有	無
2	1547/L	上流						235										1	No. 17	1	Chak No. 131 JB		
3	3285/R	上流						429										1	No. 17	1	Chak No. 131 JB		
4	3616/L	上流	19 Km	1.5	7,920	220	2.8	280	300	100.0%	0.0%	0.0%			設計水量	利用可	約2/3の農家が用水と併用	1	No. 17	1	Chak No. 131 JB	有	無
5	6561/R	中流	19 Km	2.0	10,560	1,700	16.1	886	250	89.6%	10.0%	0.4%			設計水量	利用可	約2/3の農家が用水と併用	1	No. 17	1	Chak No. 132 JB	有	無
6	10162/R	中流	19 Km	0.5	2,500	0	0.0	84	45	100.0%	0.0%	0.0%			設計水量	利用可	約2/3の農家が用水と併用	1	No. 17	1	Chak No. 132 JB	無	n.a.
7	10650/L	中流						307										1	No. 17	1	Chak No. 134 JB		
8	13536/R	中流	19 Km	1.3	6,600	240	3.6	251	250	100.0%	0.0%	0.0%			設計水量	利用可	約2/3の農家が用水と併用	1	No. 17	1	Chak No. 132 JB	有	無
9	13556/L	中流	19 Km	2.0	10,560	2,200	20.8	871	300	100.0%	0.0%	0.0%			設計水量	利用可	約2/3の農家が用水と併用	1	No. 17	1	Chak No. 134 JB	有	無
10	17006/R	中流	19 Km	5.0	26,500	1,000	3.8	649	30	46.7%	33.3%	20.0%	150	1	設計水量	利用可	約2/3の農家が用水と併用	1	No. 16	1	Pabbarwala	有	無
11	21342/L	中流	18 Km	1.7	9,000	2,400	26.7	396	150	98.0%	0.0%	2.0%	40	0.25	設計水量	利用可	約2/3の農家が用水と併用	1	No. 16	1	Pabbarwala	有	無
12	21594/R	中流	19 Km	0.9	4,800	2,400	50.0	235	24	87.5%	0.0%	12.5%	62	0.5	設計水量	利用可	約2/3の農家が用水と併用	1	No. 16	1	Pabbarwala	有	無
13	22825/R	下流	17 Km	7.2	38,000	1,000	2.6	101	25	100.0%	0.0%	0.0%	12.5	0.5	設計水量	利用可	約2/3の農家が用水と併用	1	No. 16	1	Pabbarwala	有	無
14	24573/L (*1)	下流	16 Km	1.5	7,920	1,800	22.7	554	125	96.8%	1.6%	1.6%	189	1	設計水量	利用可	約2/3の農家が用水と併用	1	No. 16	1	Pabbarwala	有	無
15	25600/L (*2)	下流	18 Km	1.0	5,280	1,200	22.7	124	4	50.0%	0.0%	50.0%	100	0.5	設計水量	利用可	約2/3の農家が用水と併用	1	No. 16	1	Pabbarwala	有	無
16	26395/R	下流	18 Km	2.1	11,000	2,880 (*3)	26.2	323	150	92.0%	6.7%	1.3%	36	1	設計水量	利用可	約2/3の農家が用水と併用	1	No. 16	2	Pabbarwala Makwala	有	無
17	27960/L	下流						660										1	No. 16	1	Pabbarwala		
18	27960/TF	下流F	17 Km	1.2	6,240	240	3.8	1077	250	80.0%	20.0%	0.0%			設計水量	利用可	約2/3の農家が用水と併用	1	No. 17	1	Chak No. 136 JB	有	無

(*1) FO理事長が所属するＫＰ。
(*2) FO理事長が本ＫＰの役職を兼務。
(*3) 現在ライニング工事中であり、完工時の予定延長。

付属資料6-2 Jalwala三次水路受益地末端水路詳細　1/3

Sl.	KP (Outlet No.)	三次水路内の位置	Bahawalnagarからの距離	末端水路延長		ライニング延長		CCA (acre)	受益農家数	所有規模別の農家割合			最大土地所有面積 (acre)	最小土地所有面積 (acre)	用水量	地下水	地下水利用(ポンプ設置)状況	受益地内行政村		受益地内集落		水利組合	
										12.5 acre未満	12.5 acre以上 25 acre未満	25 acre以上						数	名称	数	名称		ＫＰとの役員重複
				miles	feet	feet	%																
1	2/L	上流						342															
2	3/R	上流	15 Km	2.5	13,000	1,000	7.7	666	238	88.2%	10.5%	1.3%	26	0.125	設計水量	利用不可	1基	1	Muhammadpur	1	Darbjirka	有	無
3	4/L	上流	15 Km	2.3	12,000	1,200	10.0	286	200	97.5%	1.5%	0.0%	15	0.0625	設計水量	利用不可	1基	1	Muhammadpur	2	Darbjirka, Toba balocha	有	無
4	5/L	上流	15 Km	1.9	10,000	0	0	430	250	83.2%	16.0%	0.8%	35	0.25	設計水量	利用不可	1基	1	Muhammadpur	3	Darbjirka, Toba balocha, Jalwala	無	n.a.
5	6/L	上流	15 Km	2.8	15,000	0	0	863	275	77.5%	18.2%	4.3%	60	1	設計水量以下	利用不可	利用せず	1	Muhammadpur	2	Toba balocha, Jalwala	無	n.a.
6	7/R	上流	15 Km	1.5	8,000	1,000	12.5	285	165	95.8%	4.2%	0.0%	15	1	設計水量	利用不可	利用せず	1	Muhammadpur	1	Toba balocha	有	無
7	8/R	上流	15 Km	1.5	8,000	1,000	12.5	285	85	95.3%	0.0%	4.7%	30	0.25	設計水量	利用不可	利用せず	1	Muhammadpur	1	Toba balocha	有	無
8	8A/R	上流						419															
9	9/L (*2)	上流	15 Km	1.7	9,000	1,000	11.1	483	213	95.0%	15.0%	0.0%	22	0.5	設計水量以下	利用不可	利用せず	1	Muhammadpur	2	Toba balocha, Jalwala	有	無
10	10/L	上流						444															
11	11/R	上流	8 Km	2.8	15,000	5,000	33.3	689	120	75.0%	20.8%	4.2%	40	1	設計水量以下	大半が利用不可	15 基 (usable)	1	Muhammadpur	3	Toba balocha, Loharka, Attar singh	有	無
12	12/L	上流	10 Km	1.7	9,000	0	0.0	379	80	86.3%	12.5%	1.2%	50	2	設計水量以下	大半が利用不可	4 基 (usable)	1	Muhammadpur	2	Toba balocha, Jalwala	無	n.a.
13	13/L	上流						323															
14	14/L	上流						183															
15	15/R	上流	8 Km	1.9	10,000	2,200	22.0	258	78	93.6%	6.4%	0.0%	17	1	設計水量以下	大半が利用不可	6 基 (usable)	1	Muhammadpur	1	Toba balocha	有	無
16	16/L	上流						483															
17	17/R	上流	6.5 Km	1.9	10,000	1,400	14.0	368	50	82.0%	10.0%	8.0%	50	1	設計水量以下	大半が利用不可	6 基 (usable)	2	Muhammadpur, Malikpura	2	Attar singh, Ghulam kot	有	無
18	18/L	上流	6 Km	3.0	16,000	0	0.0	498	145	88.3%	6.9%	4.8%	60	3	設計水量以下	大半が利用不可	15 基 (usable)	1	Malikpura	4	Ghulam kot, Dharma, Tukra No.1, Dhuddhi	有	無
19	19/R	上流						617															
20	20/L	上流	5 Km	2.1	11,000	3,000	27.3	428	75	89.3%	8.0%	2.7%	50	0.25	設計水量以下	大半が利用不可	4 基 (usable)	1	Malikpura	3	Lakhwari, Dhuddhi, Ghulam kot	有	無

付属資料6-2 Jalwala三次水路受益地末端水路詳細　2/3

Sl.	KP (Outlet No.)	三次水路内の位置	Bahawalnagarからの距離	末端水路延長		ライニング延長		CCA (acre)	受益農家数	所有規模別の農家割合			最大土地所有面積 (acre)	最小土地所有面積 (acre)	用水量	地下水	地下水利用(ポンプ設置)状況	受益地内行政村		受益地内集落		水利組合	
										12.5 acre未満	12.5 acre以上 25 acre未満	25 acre以上						数	名称	数	名称		ＫＰとの役員重複
				miles	feet	feet	%																
21	21/R	上流						294															
22	22/L	上流	5 Km	1.9	10,000	5,000	50.0	633 (*6)	123	91.9%	8.1%	0.0%	12.5	1	設計水量以下	大半が利用不可	8 基 (usable)	1	Malikpura	3	Tukra No.1, Amir kot, Lakhwari	有	無
23	22A/L	中流	5 Km	2.1	11,000	5,000	45.5	505	104	96.2%	3.8%	0.0%	21	1	設計水量以下	大半が利用不可	6 基 (usable)	1	Malikpura	2	Tukra No.1, Amir kot	有	無
24	23/R	中流						181															
25	24/R	中流						247															
26	25/L	中流	5 Km	1.5	8,000	0	0.0	396	110	95.5%	1.8%	2.7%	65	0.5	設計水量以下	大半が利用不可	8基 (usable)	1	Islampura	1	Khwaza bakhish	無	n.a.
27	26/R	中流						594															
28	27/L	中流	4 Km	0.9	5,000	2,000	40.0	219	37	94.6%	5.4%	0.0%	21	1	設計水量以下	利用不可	8基 (brackish)	1	Islampura	2	Khwaza bakhish, Chugetta arain	有	3名
29	27A/L	中流	3 Km	1.1	6,000	1,600	26.7	410	200	94.5%	4.0%	1.5%	50	0.125	設計水量以下	利用不可	4 基 (brackish)	1	Islampura	2	Khwaza bakhish, Chugetta arain	有	1名
30	28/R	中流	2.5 Km	1.5	8,000	0	0.0	492	65	89.2%	6.2%	4.6%	60	0.5	設計水量	利用不可	5 基 (2 marginal, 3 brackish)	1	Islampura	1	Chugetta arain	無	n.a.
31	29/R	中流	2.5 Km	1.9	10,000	4,000	40.0	278	74	85.1%	10.8%	4.1%	35	0.5	設計水量	利用不可	8 基 (brackish)	1	Islampura	2	Chugetta arain, Islampura	有	2名
32	30/L	中流	2.5 Km	1.3	7,000	1,000	14.3	382	150	97.3%	2.7%	0.0%	25	1.5	設計水量	利用不可	10 基 (brackish)	1	Islampura	1	Khwaza bakhish	有	1名
33	31/L	中流	2.5 Km	1.3	7,000	1,200	17.1	233	120	94.2%	5.0%	0.8%	26	0.5	設計水量以下	大半が利用不可	14 基 (8 usable, 6 brackish)	1	Islampura	2	Tibba noor shah, Nazarkot	有	1名
34	32/R	中流	2 Km	1.4	7,600	2,400	31.6	363	100	99.0%	0.0%	1.0%	50	0.25	設計水量	大半が利用不可	5 基 (2 usable, 3 brackish)	1	Islampura	3	Khalil abad, Raza colony, Basti shah muhammad	無 (*7)	n.a.
35	32A/L	中流	2.5 Km	0.9	5,000	2,500	50.0	160	70	98.6%	1.4%	0.0%	24	0.5	設計水量	大半が利用不可	14 基 (7 usable, 7 brackish)	1	Islampura	2	Khalil abad, Tibba noor shah	有	1名
36	33/R	中流	2 Km	0.8	4,000	1,500	37.5	212	52	96.2%	1.9%	1.9%	31.5	0.5	設計水量以下	利用不可	8 基 (1 marginal, 7 brackish)	1	Islampura	2	Hafizwala, Islampura	有	3名
37	34/L (*3)	中流	5 Km	1.1	6,000	4,000	66.7	362	138	81.2%	15.9%	2.9%	40	0.25	設計水量	利用不可	利用せず	1	Islampura	1	Hafizwala	有	無
38	35/R	中流	3 Km	2.8	15,000	4,600	30.7	600	200	94.5%	4.0%	1.5%	75	0.125	設計水量以下	利用不可	9 基 (brackish)	2	Islampura, Dimpur	3	Hafizwala, Islampura, Muhammad nawazpura	有	2名
39	36/R	中流						934															

付属資料6-2 Jalwala三次水路受益地末端水路詳細　3/3

Sl.	KP (Outlet No.)	三次水路内の位置	Bahawalnagarからの距離	末端水路延長		ライニング延長		CCA (acre)	受益農家数	所有規模別の農家割合			最大土地所有面積 (acre)	最小土地所有面積 (acre)	用水量	地下水	地下水利用(ポンプ設置)状況	受益地内行政村		受益地内集落		水利組合	
				miles	feet	feet	%			12.5 acre未満	12.5 acre以上 25 acre未満	25 acre以上						数	名称	数	名称		KPとの役員重複
40	37/L	中流						631															
41	38/R (*4)	中流	5 Km	1.7	9,000	1,200	13.3	820	200	70.0%	25.0%	5.0%	75	0.03125	過去6か月間配水なし	大半が利用不可	10 基 (marginal)	1	Rabnawazpura	1	Karou mekanwala	有	1名
42	39/R	中流						655															
43	40/L	中流	6 Km	1.1	6,000	3,000	50.0	356	60	88.3%	11.7%	0.0%	17	1	過去6か月間配水なし	大半が利用不可	5 基 (2 marginal, 3 brackish)	2	Islampura, Rabnawazpura	3	Murli ghar, Basti balochanwali, Mehabub kot	有	無
44	41/R	中流						409															
45	42/L	中流	6 Km	1.3	7,000	2,800	40.0	497	300	97.7%	1.3%	1.0%	50	0.5	過去6か月間配水なし	利用不可	4 基 (brackish)	2	Islampura, Rabnawazpura	2	Murli ghar, Basti balochanwali	有	無
46	43/L	下流						342															
47	43A/L	下流	8 Km	1.3	7,000	5,000	71.4	311	35	100.0%	0.0%	0.0%	12	0.25	過去6か月間配水なし	大半が利用不可	10基 (6 marginal, 4 brackish)	1	Rabnawazpura	1	Murli ghar	有	1名
48	44/R	下流	8 Km	1.1	6,000	1,000	16.7	295	50	92.0%	6.0%	2.0%	26	0.25	過去6か月間配水なし	大半が利用不可	7 基 (marginal)	1	Rabnawazpura	1	Murli ghar	有	無
49	45/R	下流	9 Km	0.6	3,000	300	10.0	128	38	100.0%	0.0%	0.0%	12.5	0.09375	過去6か月間配水なし	大半が利用不可	10 基 (marginal)	1	Rabnawazpura	2	Murli ghar, Mehbub kot	有	無
50	46/R	下流						172															
51	47/L (*5)	下流	10 Km	1.7	9,000	0	0.0	286	60	75.0%	25.0%	0.0%	25	1	過去6か月間配水なし	利用不可	利用せず	3	Rabnawazpura, Pirsikandal, Maharwali	3	Khota arrain, Mehbub kot, Anwarkot	無	n.a.
52	48/L	下流	12 Km	1.5	8,000	0	0.0	220	70	91.4%	4.3%	4.3%	40	2	過去6か月間配水なし	利用不可	利用せず	1	Maharwali	2	Sakindarin abael, Khota arrain	無	n.a.
53	49/TF	下流	12 Km	1.5	8,000	2,000	25.0	280	30	100.0%	0.0%	0.0%	7	0.25	過去6か月間配水なし	利用不可	利用せず	1	Pirshikandal	1	Anwarkot	有	無

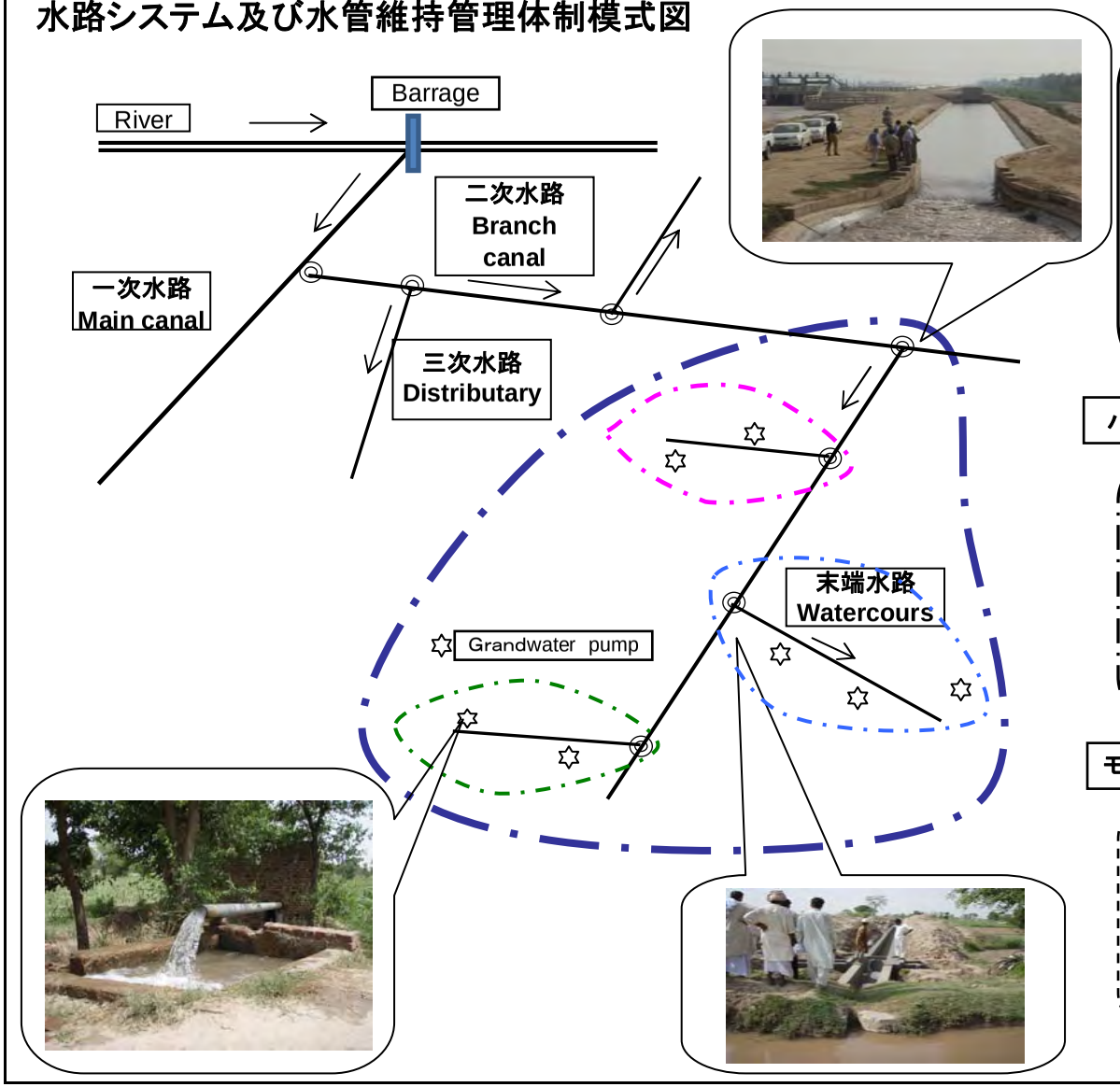
(*1) 上流部の3末端水路の土地が高く、RD9地点で堰上が行われているため中・下流で配水量減少が生じている。水路改修の詳細設計時に十分な現地調査が必要。
(*2) 本KP役員の一名が農業の学位を有しており、地域の先進農家として知られている。
(*3) FO理事長が所属するＫＰ。
(*4) 本KP理事長は農業普及員により展示農家に選定されている。
(*5) 本ＫＰ理事長はレーザーレベリング補助事業に申請を行った。
(*6) 実際の耕作地は登録ＣＣＡの約半分の面積。
(*7) 本末端水路のライニングは地元出身の国会議員支援によるものであるためＷＵＡは設立されていない。

付属資料6-3 Yaru三次水路受益地末端水路詳細

Sl.	KP (Outlet No.)	三次水路内の位置	FO事務所からの距離	末端水路延長		ライニング延長		CCA (acre)	受益農家数	所有規模別の農家割合			最大土地所有面積 (acre)	最小土地所有面積 (acre)	用水量	地下水	地下水利用（ポンプ設置）状況	受益地内行政村		受益地内集落		水利組合
				miles	feet	feet	%			12.5 acre未満	12.5 acre以上25 acre未満	25 acre以上						数	名称	数	名称	
1	2000/R	上流	2 Km	0.5	0.75	0	0	161	45	82.2%	13.3%	4.5%	45	1.5	設計水量以下（土地高度）	利用不可	利用せず	1	Yaru	4		無
2	2500/L	上流	1.5 Km	1.3	2	0	0	502	60	81.7%	16.6%	1.7%	40	0.125	設計水量	利用不可	10基（全てbrackish）	1	Yaru	10		
3	3000/R	上流	1.5 Km	1.9	3	0	0	407	43	100.0%	0.0%	0.0%	8	0.125	設計水量以下（取水口口径）	利用不可	利用せず	1	Yaru	10		無
4	4800/L	上流	1 Km	1.3	2	0	0	490	60	28.3%	58.3%	13.4%	40	0.125	設計水量	利用不可	10基(4 usable, 6 brackish)	1	Yaru	7		無
5	4850/L	上流	1 Km	1.6	2.5	0	0	290	140	95.0%	5.0%	0.0%	25	4	設計水量	利用不可	4基(brackish, Rabi期のみ利用)	1	Yaru	10		無
6	5000/R	上流	2 Km	2.0	3.25	0	0	371	110	100.0%	0.0%	0.0%	12	2.5	設計水量	利用不可	1基(brackish)	1	Yaru	7		無
7	9000/R	中流	1.5 Km	0.9	1.5	0	0	159	60	95.0%	3.3%	1.7%	25	0.5	設計水量	利用可	3基 (usable)	1	Yaru	8		無
8	10500/R	中流	0.5 Km	2.0	3.25	0	0	304	70	91.4%	8.6%	0.0%	25	0.125	配水なし（7-8年前に水路途上に建築）	利用可	8基 (usable)	2	Chabree Bala, Yaru	8		無
9	10500/L-I	中流	0.25 Km	1.6	2.5	0	0	230	40	100.0%	0.0%	0.0%	8	0.0125	設計水量以下（土地高度）	利用可	8基 (usable)	1	Yaru	6		無
10	10500/L-II	中流	0.2 Km	1.3	2	0	0	352	30	83.3%	16.7%	0.0%	13	0.25	設計水量以下（シルト堆積）	利用可	8基(usable)	1	Yaru	10		無
11	11585/L (*1)	中流	0.5 Km	1.6	2.5	0	0	169	60	90.0%	10.0%	0.0%	13	0.00625	設計水量	利用可	12基 (usable)	1	Yaru	5		無
12	11585/R	中流						169	44	100.0%	0.0%	0.0%				利用可						
13	12098/L	中流	0.5 Km	1.6	2.5	0	0	166	60	100.0%	0.0%	0.0%	10	0.125	設計水量以下（土地高度）	利用可	7基 (usable)	1	Yaru	7		無
14	13400/L	中流	0.5 Km	2.0	3.2	1	31.3	332	75	100.0%	0.0%	0.0%	11	1	設計水量	利用可	8基 (usable)	1	Yaru	9		無
15	14500/L	中流	2 Km	1.9	3	2.5	83.3	350	106	84.9%	14.2%	0.9%	30	2.5	設計水量以下（以前は設計水量以上に配水？）	利用可	13基(usable)	1	Chabree Bala	10		無
16	16000/R	下流	1.5 Km	1.9	3	0	0	160	80	96.3%	3.7%	0.0%	14	0.375	設計水量	利用可	9基 (usable)	1	Chabree Bala	8		無
17	17500/L	下流	2 Km	1.9	3	0	0	202	28	89.3%	3.6%	7.1%	30	1.5	設計水量	利用可	9期 (usable)	1	Yaru	10		無
18	20000/TL	下流	3 Km	2.2	3.5	0	0	377	60	93.3%	6.7%	0.0%	20	0.00625	設計水量以下（最末端部であるため？）	利用可	5基 (usable)	1	Chabree Bala	7		無
19	20000/TR	下流	3 Km	1.6	2.5	0	0	352	150	96.7%	1.3%	2.0%	26	0.5	設計水量	利用可	5基 (usable)	1	Chabree Bala	8		無

(*1) FO 理事長が所属するKP。

水路システム及び水管維持管理体制模式図



AWB（Area Water Board）
地域水管理委員会：頭首工から二次水路掛りまでの水管理維持管理組織

・管理対象施設：Barrage、Main canal、Branch canal
・水管理状況：各水路上流と下流水位観測
（時間：6:00,18:00）
H-Qカーブによる流量換算
・管理：計画分水量と現況流量の確認
・ホームページに計画流量と現況流量を公開
・苦情情報をメールで受け付けている
・三次水路への通水：ローテーションを実施

パイロットエリア（三次水路）

FO（Farmers Organization）
農民組織：三次水路掛りの水管理持管理組織

・管理対象施設：Branchcanalの分水工（Outlet）
・水管理状況：水位観測
Yロッド（水位観測用の目盛りがついた棒）
・末端圃場への通水：輪番灌漑を実施
・管井戸：モニタリングを実施予定

モデルエリア（末端水路）

KP(Khal Panchayat)
末端水路掛りの水管理維持管理組織

・管理対象施設： 末端水路
・水管理状況： 流量観測 未実施
・各圃場へのローテーションを実施