

REPUBLIC OF YEMEN
MINISTRY OF AGRICULTURE AND IRRIGATION

IRRIGATION IMPROVEMENT PROJECT

(IDA Credit No. 3412 – YEM)

Main Technical Assistance Package for IIP

WORKING PAPER 10

Training Report 2 PIM Extensionists Tuban

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 **ARCADIS** EUROCONSULT

IN ASSOCIATION WITH





YEMENI ENGINEERING GROUP

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ABBREVIATIONS AND ACRONYMS

| | |
|--------|--|
| ACA | Agricultural Co-operatives Association |
| AE | Agricultural Extensionists (RAO) |
| APL | Adaptable Programme Lending (approach by IDA) |
| AREA | Agricultural Research and Extension Authority |
| CV | Curriculum Vitae (Bio-data, or summary of experience of proposed staff) |
| CWR | Crop Water Requirement |
| DIMSSA | Institutional assessment approach: Diagnosis-Mission-Strategy-Structure-Action |
| EC | Executive Council of WUA |
| EDI | Economic Development Institute of the World Bank |
| FAO | Food and Agricultural Organisation of the UN |
| FCA | Facilitator / Change Agent |
| GDI | General Directorate of Irrigation |
| GoY | Government of Yemen |
| IC | Irrigation Council |
| IDA | International Development Association |
| IE | Irrigation Extensionists (RAO) |
| IEI | Irrigation Engineering Institute |
| IIP | Irrigation Improvement Project |
| IMT | Irrigation management Transfer |
| ISF | Irrigation Service Fee |
| iSIS | Hydro-dynamic modelling software |
| IWMI | International Water Management Institute |
| LRAO | Lahej Regional Agricultural Office |
| LWCP | Land and Water Conservation Project |
| M&E | Monitoring and Evaluation |
| MAI | Ministry of Agriculture & Irrigation |
| MCM | Million Cubic Metres |
| MIS | Management Information System |
| NGO | Non-Governmental Organisation |
| NWRA | National Water Resources Authority |
| O&M | Operation and Maintenance |
| OED | Operations Evaluation Department of the World Bank |
| ogma | (traditional) earthen diversion weir |
| PIM | Participatory Irrigation Management |
| PIP | Project Implementation Plan |
| PIU | Project Implementation Unit |

| | |
|---------|---|
| PMU | Project Management Unit |
| PPR | Project Preparation Report |
| PPU | Project Preparation Unit |
| PY | Project Year |
| RAO | Regional Agricultural Office of MAI |
| RDA | Regional Development Authority of MAI |
| RIA | Regional Irrigation Agency |
| RID | Regional Irrigation Department |
| RoY | Republic of Yemen |
| SC | Steering Committee |
| SIIP | Spate Irrigation Improvement Project (original name for IIP) |
| SLHIDP | Saturation and Localised High Impact Demonstration Programme (agricultural extension) |
| SMC | Scheme Management Council/-> SWUF |
| SMM | Spate Management Model |
| SMU | Scheme Management Unit |
| SRADP | Southern Rural Agricultural Development Project |
| SSHARDA | Sana'a/Sadah/Hajja Development Authority |
| SWUF | Scheme Water User Federation |
| TA | Technical Assistance |
| TDA | Tihama Development Authority of MAI |
| ToR | Terms of Reference |
| UNDP | United Nations Development Programme |
| WBI | World Bank Institute |
| WIS | Water Institutions Specialist |
| WM | Water Master (appointed by RAO - paid?) |
| WSP | Water Service Provider |
| WUA | Water User Association |
| WUG | Water User Group |
| YR | Yemeni Rials |

WORKING PAPERS

- **WP 1 – Water Management in Wadi Tuban & Wadi Zabid**
Alan Clark
- **WP 2 – Concept Paper Management Information Systems**
Thomas R. E. Chidley
- **WP 3 – Training Report No.1 – Orientation Workshops**
Olaf Verheijen
- **WP-4 – Procedure Manual on Participatory Irrigation Management**
Olaf Verheijen
- **WP 5 – Concept Paper for Flood Warning System**
John Windebank
- **WP 6 – Hydrological Analysis**
David T. Plinston
- **WP 7 – Community Awareness Campaigns**
Darryl Kuhnle
- **WP 8 – Gates Assessment – Interim Report**
David A. R. Wood
- **WP 9 – Initial Roads Study**
Abbas A. Abu Taleb

1 INTRODUCTION

On 27 and 28 January 2003, a two-day Refresher Training for the PIM Extensionists in Wadi Tuban was conducted. The main reason for conducting this training session was to refresh the knowledge of the PIM Extensionists as well as their communication and presentation skills.

Prior to the implementation of the training activities, the PIM Training Specialist in collaboration with the PMU Institutional Specialist as well as the Training Expert and PIM Specialist of the PIU Office have undertaken the following activities:

- preparation of agenda for the two-day training session (see Annex A);
- preparation of Training Sheets with explanatory notes and guidelines (see Annex B);
- preparation of Overhead Sheets, including translation in Arabic (see Annex C);
- preparation of Flip Chart to be used during Awareness Meetings (see Annex D);
- preparation of IIP-PIM Brochure for distribution during awareness meetings (see Annex E);
- preparation of tentative time schedule for implementation of PIM approach for 6 pilot spate irrigation systems (see Annex F).

2 REFRESHER TRAINING FOR PIM EXTENSIONISTS

Details about the two-day Refresher Training for PIM Extensionists in Wadi Tuban are presented in the following table:

| | |
|-------------------------------|--|
| Name of Training Session: | Refresher Training for PIM Extensionists |
| Date(s) of Training Session: | 27 and 28 January 2003 |
| Location of Training Session: | PIU Office in Lahej |
| Duration of Training Session: | Two days |
| Number of Participants: | 12 PIM Extensionists, PIU Water Management Specialist, PIU Agronomist and PIU Institutional Development Specialist |
| Trainer(s)/Moderator(s): | Fathiyah Arshad – Training Expert (PIU) Kamel Ali Al-Rashahi – PIM Specialist PIU Ahmed Saeed Hobaishan – Water Management Specialist (PIU) Mohammed Barakat – Institutional Specialist (PMU) Olaf Verheijen – Training Specialist |
| Purposes of Training Session: | Introduction of main aspects of IIP Introduction and review of 21 steps of PIM approach as well as tentative time schedule for first 6 pilot spate irrigation systems Introduction and review of purposes, guidelines and structure of Community Awareness Campaign (PIM Step 2) Introduction of main purposes of utilisation of Flip Chart as well as practising the use of flip charts as extension tool Introduction and review of main aspects of WUG formation (PIM Step 6) Introduction and review of preparation of schematic layout of spate irrigation system, including demonstration and practising Introduction and review of main steps of the participatory planning and design of rehabilitation works (PIM Step 7) |
| Learning/Training Techniques: | Presentation Plenary and small group discussion Demonstration Practising |
| Training Equipment: | Overhead projector + screen Flip chart tripod |
| Training Materials: | Prepared and blank overhead sheets A-1 sheets + markers Handouts |

LIST OF APPENDICES

- A. AGENDA OF TWO DAY TRAINING**
- B. TRAINING SHEETS**
- C. OVERHEAD SHEETS**
- D. TEXT FOR FLIP CHART ON COMMUNITY AWARENESS CAMPAIGN**
- E. IIP – PIM BROCHURE**
- F. TENTATIVE TIME SCHEDULE FOR 6 PILOT SPATE IRRIGATION SYSTEMS**

A. AGENDA FOR TWO-DAY TRAINING

Monday (27 January 2003)

8.30 – 8.45 Introduction (Mrs Fathiyah)

8.45 – 9.45 Main Aspects of IIP (Mr Kamel)

- assessment of PIM Extensionists' knowledge (3 groups)
- presentation
- discussion

9.45 – 10.45 PIM Approach and Time Schedule (Mr Barakat)

- assessment of PIM Extensionists' knowledge (6 PIM Teams)
- presentation
- discussion

10.45 – 11.00 Tea break

11.00 – 11.30 ToR of PIM Extensionists (Mrs Fathiyah)

- assessment of PIM Extensionists' knowledge (plenary inventory)
- presentation
- discussion

11.30 – 12.30 Community Awareness Campaign (PIM Step 2) (Mr Kamel)

- assessment of PIM Extensionists' knowledge (3 groups)
- presentation
- discussion

12.30 – 13.30 Use of Flip Chart (Mrs Fathiyah)

- presentation
- demonstration
- practising

Tuesday (28 January 2003)

8.30 – 10.00 WUG Formation (PIM Step 6) (Mr Barakat)

- assessment of PIM Extensionists' knowledge (3 groups)
- presentation
- discussion

10.00 – 11.00 Preparation of Schematics (Mr Hobeisan)

- introduction
- demonstration
- practising

11.00 – 11.15 Tea break

11.15 – 12.30 Participatory Planning and Design of Rehabilitation Works (PIM Step 7) (Mr Kamel)

- presentation
- discussion

12.30 – 13.30 Preparation of Work Plans (Mrs Fathiyah)

B. TRAINING SHEETS

TRAINING MODULE: COMMUNITY AWARENESS CAMPAIGN (STEP 2)

TRAINING MODULE: FORMATION OF WATER USERS' GROUPS (STEP 6)

**TRAINING MODULE: PARTICIPATORY PLANNING AND DESIGN OF
REHABILITATION WORKS (STEP 7)**

TRAINING SHEET

TRAINING MODULE: COMMUNITY AWARENESS CAMPAIGN (STEP 2)

Objective(s):

- To enhance the skills of PIM Extensionists to prepare and conduct Community Awareness Campaign in the scheme villages

Expected Output(s):

- The trainees know how to plan and prepare the Community Awareness Campaign
- The trainees understand how to conduct a Community Awareness meeting, including a presentation for a large audience
- The trainees know how to prepare and use Flip Charts

Target Group(s):

- PIM Extensionists

Expected Number of Participants:

- 12-15

Timing:

- Just before the implementation of Step 2 of the PIM Programme

Estimated Time Required:

- half day

Location:

- PIU Office

Training/Learning Techniques:

- Presentation
- Plenary Discussion
- Demonstration and Trial
- Exercise

Preparations Required:

- Preparation of overhead sheets with main points/keywords of Community Awareness Campaign

Materials Required:

- Large (A-1 size) sheets and markers
- Copies of IIP Brochure

EXPLANATORY NOTES

1 Purposes of Community Awareness Campaign

Question: What are the purposes of the Community Awareness Campaign?

The purposes of the Community Awareness Campaign are:

- Introduction of PIU staff.
- Briefing the concerned farmers about the main aspects of the IIP and the PIM Programme as the implementation approach.
- Assessment of interest among concerned farmers to participate in development of PIM Programme.

The main purpose of the Community Awareness Campaign is to inform all villagers in general and the farmers, including landowners, tenants and sharecroppers, in particular about the major aspects of the PIM Programme, including its main principles, approach and components, and the expected role and responsibilities of the farmers during the different stages of the formation of WUGs and WUA, design and construction of the scheme and the management of the irrigation system, including the assessment and collection of water charges to pay for the O&M of the irrigation infrastructure.

The Community Awareness Meeting is also an opportunity to introduce the concerned PIU staff, who will work very closely with the farmers during all phases of the PIM Programme. In addition, staff of supporting agencies present during the meeting should be introduced to the attending farmers and other villagers as well.

☞ It is important to invite representatives from all agencies that will be directly and indirectly involved in the implementation of the PIM Programme, including the TDA and Lahej RAO.

2 Guidelines for Preparation and Implementation of Community Awareness Meetings

Basic Guidelines for Conducting Community Awareness Meeting:

- A Community Awareness Meeting should be conducted at least in each main village of the command area of the primary canal system.
- The PIM Extensionist should arrive at least 30 minutes before the agreed time at the agreed venue to prepare the Community Awareness Meeting and to check if the Village Sheikh/Local Council has informed the farmers in his village. If not, the PIM Extensionist should request the Village Sheikh/Local Council to do so.
- The duration of each Community Awareness Meeting should not be longer than 1½ hours. The presentation given by the PIM Extensionist should not last longer than 30 to 45 minutes giving the farmers sufficient time to ask questions following the presentation.
- To ensure that the attending farmers fully understand the information given during the presentation, it is crucial that the PIM Extensionist uses simple language. Furthermore, the PIM Extensionist should speak slowly, clearly and loudly enough so that all attending farmers can hear him/her.
- To ensure that the attending farmers fully understand the presentation, it is very important that the PIM Extensionist does not use too many technical terms that are not familiar to all farmers. The PIM Extensionist should avoid the use of English words or expressions that are difficult to understand for farmers. Use the terminology related to irrigation and agriculture, which are commonly used by the farmers.
- Before the start of the Community Awareness Meeting, all names of all attending farmers should be registered.
- It is not recommended to register the names of the attending farmers during the presentation and subsequent discussions as it would distract the attention of the attending farmers.
- At the end of the Community Awareness Meeting, a copy of the IIP Brochure should be handed out to the attending farmers and the staff of any supporting agencies invited for the meeting.
- About ten to fifteen copies of the IIP Brochure should also be given to the Village Sheikh/Local Council, which they should distribute among other farmers who could not attend the Community Awareness Meeting.

Basic Guidelines for Planning Community Awareness Meeting:

- At least one week before the planned Community Awareness Meeting, the PIM Extensionist shall visit the concerned village to contact the Village Sheikh/Local Council in order to plan and agree upon the date, time and venue of this village meeting that is most convenient for the concerned farmers.

- It is very crucial that a convenient place is selected where all the farmers from the village(s) can come easily and speak freely and where the meeting could be conducted quietly and undisturbed. Ideal places would be in the vicinity of village school, mosque or the village meeting room, if any.
- To ensure that the Community Awareness Meeting can be carried out quietly and undisturbed, places along busy roads with heavy traffic or at places with many passer-byes, such as shops and market place, should be avoided.
- The PIM Extensionist should contact the concerned Village Sheikh/Local Council one or two days before the planned Community Awareness Meeting to confirm if the villagers have been informed about the date, time and venue of the meeting, so that the planned meeting can be conducted.
- To inform as many farmers in the concerned village about the planned Community Awareness Meetings, it is recommended that PIM Extensionist should distribute a notice and/or use banners mentioning the date, time and venue of the planned Community Awareness Meetings.

3 Structure of Community Awareness Meeting

Question: How should the Community Awareness Meeting be structured to ensure that the meeting is effective?

To conduct the Community Awareness Meeting effectively, it is important that it is structured as follows:

Introduction: The Community Awareness Meeting should start with an introduction, during which the PIM Extensionist should welcome all farmers and other villagers who have come to the meeting and thank the Village Sheikh/Local Council for organising the meeting. Following the welcome, the other staff of the PIU and any other supporting agencies present at the meeting should be introduced briefly to the attending farmers and other villagers. Before starting with the presentation, the main purpose as well as major subjects and the expected duration of the meeting should be told to the participants.

Presentation: The presentation should be given by the responsible PIM Extensionist. However, the total length of the presentation should not exceed 40 minutes in order to keep the attention of the audience. The presentation should cover the following topics:

- Main objectives and activities of the IIP;
- Main actors involved in implementation of the IIP;
- Main conditions for implementation of the IIP;
- Main principles of the PIM approach, including active participation of farmers in all stages of the PIM Programme, principle of partnership between the farmers and the IIP during the implementation of the PIM Programme, formal approval of all major decisions by farmers;
- Village women will be informed and consulted throughout the entire PIM Programme;
- Formation and strengthening of WUOs at different levels to ensure effective O&M of irrigation infrastructure following transfer of the O&M responsibility;
- Expected farmers' participation during all steps of the PIM Programme;
- Expected farmers' contributions towards capital costs of rehabilitation works and the O&M of the irrigation structures following the transfer of the O&M responsibility;
- Provision of support and training to ensure that all WUOs have the necessary skills and knowledge to participate effectively in design, supervision and execution of rehabilitation works and to take over the O&M responsibility for the transferred irrigation infrastructure, including agricultural extension to assist farmers to improve their irrigated agriculture; and
- Expected benefits for the farmers.

Questions and Discussion: Following the presentation, the attending farmers and other villagers should have the opportunity to ask questions about the IIP and the PIM Programme.

☞ As the farmers are the main target group for the Community Awareness Campaign, they should ask the questions and participate in any discussions. If other persons than the farmers tend to dominate the discussions, the PIM Extensionist should intervene in order to allow the attending farmers to ask their questions.

☞ At the end of the questions and discussion, it would be useful if the PIM Extensionist could give a summary of the major issues discussed as well as any conclusions and decisions made during the session.

Assessment of Farmers' Interest: At the end of the Community Awareness Meeting, the PIM Extensionist should assess if the farmers, who have attended the meeting, are enthusiastic and willing to participate actively in the rehabilitation of their irrigation scheme, including contributions to the capital costs, and to take up the O&M responsibility for the transferred irrigation infrastructure, including the payment of the O&M costs.

Closure: The PIM Extensionist should wrap up the meeting by thanking all the attending farmers and staff of supporting agencies for their attention and participation.

3.1 Utilisation of Extension Materials

During the presentation of the main aspects of the IIP and PIM approach, it is recommended that the PIM Extensionist uses Flip Charts.

Flip Charts are large (A-1 size) sheets, on which the main topics of the training/extension session (i.e. all major aspects of the IIP and PIM approach) are summarised by using key words. As participants/trainees should be able to read the text on the Flip Chart, large letters (10cm high) must be used. Where possible, illustrations should also be used.

Question: What are the main advantages of using Flip Charts during a presentation?

The main advantages of using a Flip Chart are:

- to structure the presentation as the PIM Extensionist gives his/her presentation by following the key words written down on the Flip Chart;
- to present all the necessary information as the PIM Extensionist cannot miss any subject if he/she follows all the key words on the Flip Chart; and
- to attract and keep the attention of the participants/trainees by referring actively to the key words and illustrations on the Flip Chart.

For the preparation of the Flip Chart for the Community Awareness Campaign, the IIP Brochure should be used as it contains all important information about the IIP and the PIM approach.

4 Demonstration and Trial

4.1 Preparation of Flip Chart

As Flip Charts have to be used during different steps of the PIM Programme, the PIM Extensionists should be able to prepare their own set of Flip Charts by conducting the following activities:

- Before the trainees can try themselves to prepare a Flip Chart, they should be given a Demonstration, during which the basic rules for the preparation of a Flip Chart are explained.
- Following the Demonstration, each trainee should try him/herself to prepare one Flip Chart sheet. The results should be reviewed and discussed plenary in order to learn from each other.

4.2 Implementation of Presentation

The Community Awareness Meetings will probably be the first opportunity for the PIM Extensionists to conduct a presentation to a large audience. To ensure that their presentations during the Community Awareness Meetings and subsequent steps of the PIM Programme are effective, the PIM Extensionists shall acquire some basic skills by conducting the following activities:

- Brief explanation of the main guidelines for conducting a presentation, which are:
 - presentation should not be longer than 30 to 45 minutes;
 - speak slowly, clearly and loudly enough so that all attendants can hear the presenter;

- avoid the use of difficult technical and/or English terms by using simple language and terminology familiar to the attendants;
- use the Flip Chart actively in order to keep the attention of the audience;
- do not direct the presentation to one person or group but talk in all directions;
- walk slowly in front of the audience; and
- use proverbs and/or clear examples.
- Demonstration of a presentation by using either overhead sheets or an example of prepared Flip Chart;
- Each trainee should conduct a short presentation, which should be reviewed by the other trainees.

TRAINING SHEET

TRAINING MODULE: FORMATION OF WATER USERS' GROUPS (STEP 6)

Objective(s):

- To enhance the knowledge of the PIM Extensionists about the main purpose of the formation the Water Users' Group (WUG) as well as the main functions of the WUG with regard to the O&M of the tertiary unit
- To enhance the skills of the PIM Extensionists concerning the process of establishing WUGs at the level of tertiary units within the command area of the primary canal system

Expected Output(s):

- The trainees are able to identify the tertiary units and prepare lists with detailed information about each tertiary unit
- The trainees have good knowledge of the main purpose of forming WUGs and their main functions and the skills to explain the main purpose and functions of the WUG to the farmers
- The trainees have the necessary skills to mobilise farmers sharing the same tertiary unit for the formation of WUGs and to manage the process of WUG formation in collaboration with the concerned farmers

Target Group(s):

- PIM Extensionists

Expected Number of Participants:

- 12-15

Timing:

- Within two weeks after the Community Awareness Campaign (Step 2)

Estimated Time Required:

- half day

Location:

- PIU Office

Training/Learning Techniques:

- Presentation
- Plenary and Group Discussion
- Demonstration and Trial

Preparations Required:

- Preparation of overhead sheets with main points/keywords of WUG Formation

Materials Required:

- Large (A-1 size) sheets and markers

EXPLANATORY NOTES

IDENTIFICATION OF TERTIARY UNITS

Basic principles:

- participation shall begin at the very lowest level in order to offer opportunities for all individuals to be involved; and
- participation will be more predictable, productive and sustainable if it is channelled through appropriate organisations.

At the lowest level, farmers will be organised in WUGs on the basis of the smallest hydraulic units in spate irrigation systems:

- command area irrigated by a tertiary canal taking spate water from secondary canal or directly from primary/branch canal;
- group of fields sharing the same *ma'aqam* in the primary/branch canal.

Prior to formation of WUGs, the tertiary units must be identified by the PIM Extensionist in close collaboration with the local Canal Master(s), who are locally known as *Sheikh al Obar* or *Sheikh al Shareej*. The recommended procedure for the identification of the tertiary units is as follows:

- collect map(s) of the entire primary canal system and/or (high resolution) satellite images with the canal system indicated;
- If existing maps and/or satellite images of the canal system are not available, the PIM Extensionist shall prepare sketches (schematics), on which the alignment of all canals, outlet structures and/or *ma'aqem* as well as the command area of each outlet structure and/or *ma'aqam* are indicated.
- walk-through along all canals in order to:
 - check if the number and location of outlet structures and/or *ma'aqem* as indicated on the map(s) are correct;
 - indicate the location of (additional) outlet structures and/or *ma'aqem* on the maps if they are not indicated yet;
 - collect information on the number and size of all plots of land served by each outlet structure and/or *ma'aqam*;
 - collect the names of the owners of all plots of land served by each outlet structure and/or *ma'aqam*; and
 - collect the names of the sharecroppers and/or tenants for each plot of land that is not cultivated by the owner him-/herself.

Following walk-through along all canals, PIM Extensionist shall prepare lists for all identified tertiary Units, in which for each plot the following details are specified:

- name of farmer;
- name of village where farmer is resident;
- size of land within command area of tertiary unit;
- land tenure by indicating if farmer is owner-operator, sharecropper or tenant; and
- name of landowner of farmer is not owner of the land that he/she cultivates.

WUG MOBILISATION AND FORMATION MEETINGS

Following the Community Awareness Campaign (STEP 2), during which the concerned farmers have expressed their willingness to participate in the implementation of the PIM Programme, the PIM Extensionist shall start the WUG formation process by planning a series of Mobilisation Meetings in order to introduce and explain:

- Institutional framework
- Main purposes for the formation of WUGs
- Main functions of the WUG;
- Criteria for WUG membership;
- Minimum conditions for WUG formation;
- Presentation of main aspects of Water Users' Association (WUA); and

- Formation of WUG:
 - Preparation of WUG Membership List
 - Election of WUG Leader
- ➔ These Mobilisation Meetings should be planned in collaboration with the Village Sheikh/Local Council of Water Master.

Institutional Framework

Before the PIM Extensionist explains the main purposes and functions of the WUG and the WUA to the farmers sharing the same tertiary unit, it is important that the concerned farmers are correctly informed about which institutions will be formed at different levels of the entire Wadi system.

It is envisaged that the following institutions are formed:

- WUGs at the level of the tertiary canals or *ma'aqem*
- WUAs at the level of the primary canals
- Scheme Water Users' Federations (SWUFs) at the level of (sub-)Wadi
- Irrigation Council at the level of the entire Wadi system

MAIN ASPECTS OF WATER USERS' GROUP

Main Purposes of WUG Formation

Question: For which reason(s) is the WUG formed? (plenary discussion)

The formation of WUGs has the following two main purposes:

- to ensure the effective O&M of the tertiary unit; and
- to ensure effective participation of all farmers at all levels of their spate irrigation system, in particular with regard to the planning, design, supervision and execution of the rehabilitation works as well as the O&M of their irrigation system, including the allocation and distribution of spate water between primary canal systems at Wadi level and between individual farmers along the primary canal system.

➔ The tertiary unit can be defined as follows:

- the command area irrigated by a tertiary canal taking spate water from secondary canal or directly from the primary/branch canal;
- the group of fields sharing the same *uqma* in the primary/branch canal.

Main Reasons for WUG Formation:

- Management of the tertiary unit requires good coordination and cooperation among all farmers with land served by the same tertiary unit, so that the available spate water is shared equitably to meet the needs of all individual farmers;
- Operation of the tertiary unit needs detailed knowledge of the local layout of the distribution system and its characteristics, irrigation practices and the individual farmers, which could be best provided by groups of farmers that are organised at tertiary level; and
- Routine maintenance of the tertiary unit is relatively simple and within the capability of groups of farmers with appropriate training, which will use local labour and locally available equipment.

Main Functions of WUG

Question: What will be the main tasks of the WUG? (plenary or small group discussion)

In general, experiences elsewhere in the world have shown that the O&M of tertiary units are best carried out by groups of farmers, such as WUGs.

Main WUG Function:

The main function of the WUG is to distribute the received amount of irrigation water equitably and efficiently among all its members and non-members so as to maximise agricultural production and to ensure the economic well-being of its members and non-members.

Specific WUG Functions:

- to provide the WUA with all necessary information, including number of members and non-members, planned irrigated area;
- to receive bulk water supply from the WUA in accordance with the Primary Canal Water Management Plan;
- to distribute water equitably among all individual water users within the command of the tertiary unit;
- to set its own rules and regulations concerning the O&M of its tertiary unit, including sanctions for offences;
- to maintain the tertiary unit in operational condition;
- to have regular general meetings to consult and inform all its members about the management of the O&M of the tertiary unit, the O&M of the primary and secondary canal system by the WUA, issues to be discussed and decisions made by the WUA, including the setting of the annual Irrigation Service Fee (ISF);
- to undertake and pay for rehabilitation or improvements to the tertiary unit as required;
- to elect one or more representatives for the General Assembly of the WUA; and
- to provide any other service as required to its members in order to improve irrigated agriculture.

It is possible that the WUA would make the WUGs responsible for the collection of ISFs among its individual members and non-members for the O&M and other services provided by the WUA.

Criteria for WUG Membership

Question: Who should be members of the WUG? (plenary or small group discussion)

In principle, every landowner having land within the command area of the tertiary unit as well as tenant and sharecropper cultivating land within the command area of the tertiary unit are eligible to become member of the WUG. However, it is not possible that both the landowner and his/her tenant(s) and/or sharecroppers are members of the WUG at the same time.

As the WUG is mainly responsible for the O&M of its tertiary unit, including the equitable distribution of spate water among all water users within its command area, it is strongly recommended that only those who are cultivating and irrigating the fields become members of the WUG. This would mean that non-operating landowners shall not be members of the WUG, but that they are represented by their tenant(s) and/or sharecropper(s) in the WUG, who shall become members.

In principle, landowners, sharecroppers and tenants can become members of their WUG on a voluntary basis. The main advantages of WUG membership are:

- to participate and vote in meetings and elections of the WUG; and
- to stand for election.

In addition, the WUA may decide that members have to pay a lower ISF than non-members.

Condition for WUG Formation

As membership of the WUG is not compulsory, it is possible that all landowners, tenants and/or sharecroppers decide to become a member of the WUG. To ensure that the WUG is representative and has sufficient authority, it is required that at least 50% of all landowners, tenants and/or sharecroppers owning or cultivating land within the command area of the tertiary unit decide to become members of their WUG.

MAIN ASPECTS OF WATER USERS' ASSOCIATION

Although the WUG is established during this particular step of the PIM approach, it is required to inform the individual farmers in each tertiary unit briefly about the main aspects of the proposed WUA for the following two main reasons:

- the WUA will be responsible for the effective O&M of the primary canal system and the equitable supply of spate water to their respective tertiary units largely depends on the performance of the WUA; and
- most farmers will become automatic members of the WUA through their membership of the WUG and, therefore, they have the right to be informed about their (future) WUA.

WUA Goal:

The overall goal of the WUA shall be to safeguard and promote the common interests of the owners and users of land in the command area of the WUA with regard to irrigation and agriculture.

WUA Objectives:

- the WUA shall be responsible for the operation of the transferred spate irrigation system in an equitable manner so as to ensure that each member and non-member of the Association receives a fair supply of spate water;
- the WUA shall take all reasonable measures to maintain and protect the transferred spate irrigation system and prevent unauthorised encroachments on to the transferred spate irrigation system and any adjacent land that is included in that system.

Main Functions and Power of WUA:

- to manage, operate and maintain the spate irrigation system and associated infrastructure within its command area, including the preparation of (annual) Primary Canal Water Management Plan to ensure equitable distribution of spate water as well as annual maintenance inspections and preparation of Annual Maintenance Plan with corresponding budget
- to ensure the bulk supply of spate water from the diversion structure in accordance with its water use rights and the Wadi Water Management Plan;
- to ensure the equitable supply spate water to members and non-members of the Association, who own or cultivate land within its command area, in accordance with the Primary Canal Water Management Plan;
- to employ permanent, temporary and seasonal staff as required;
- to develop an appropriate and equitable basis for setting ISFs;
- to assess and collect or arrange the collection of ISFs and any other service charges;
- to improve water management practices, including conjunctive use of ground water with spate water for irrigation of crops, and other improved land and agricultural input practices;
- to provide other irrigation and agricultural support services to improve agricultural production and economic well-being of its members;
- to undertake development and construction activities necessary to achieve the purposes listed above; and
- to arbitrate and settle any internal dispute arising over the operation and maintenance among its members and non-members.
- to procure and/or lease equipment, machines, tools and other matters required for the operation and maintenance of all irrigation and associated infrastructure within its command area;
- to enforce discipline by imposing sanctions against any member or non-member of the WUA, who unlawfully violates the Articles of Association or Internal Rules & Regulations of the Association;
- to open and manage one or more bank accounts; and
- to join a Federation of WUAs to ensure the equitable distribution of spate water among all concerned WUAs.

Organisational Structure of WUA:

- General Assembly comprising WUG Leaders and representatives from non-operating landowners;
- Management Board, including Chairman, Secretary and Treasurer, who are elected among the members of the General Assembly; and
- Standing Committees, such as Audit Committee.

FORMATION OF WATER USERS' GROUP

Following the presentation and explanation of the main aspects of the WUG, including the membership criteria and conditions for WUG formation, the PIM Extensionist shall assess the interest among the attending farmers to establish a WUG for their tertiary unit and to become members.

Preparation and Signing of WUG Membership List:

If it is clear that the majority of landowners, tenants and/or sharecroppers, who are owning and/or cultivating land within the command area of the tertiary unit, are willing to form a WUG, the PIM Extensionist shall prepare the WUG Membership List, in which the following details shall be specified:

- name and address of each member;
- size in hectares of that member's landholding and, if different, the name of the owner of the plot of land; and
- location of the member's land by specifying the name/number of the tertiary canal or *uqma* by which the member's land is served.

Each new WUG member shall sign WUG Membership List and pay the membership fee of YR_____ (100), which is required to cover the costs related to the formation and registration of the WUA.

Preparation of WUG Non-Membership List

In addition to the WUG Membership List, the PIM Extensionist shall also prepare a WUG Non-Membership List with the same details as specified for the WUG Membership List for all landowners, tenants and/or sharecroppers owning and/or cultivating land within the command area of the newly formed WUG, who have not become members of the newly formed WUG.

Election of WUG Leader:

Each member of the WUG is also automatically member of the WUA, which will be established at the level of the Primary canal. As a WUA may have more than hundred members, it is not possible to organise meetings, in which all its members will participate. Therefore, each WUA will have a representative system, whereby each WUG will be represented by one elected representative.

Question: What should be the minimum qualifications of a WUG Leader? (plenary or small group discussion)

To ensure the effective management of the newly established WUG and the representation of the WUG in the General Assembly of the WUA, the WUG members shall elect the WUG Leader among themselves. Before the WUG members elect their leader, the PIM Extensionist shall explain that a suitable candidate should fulfill at least the following qualifications:

- literate
- good standing and respected
- permanently resident
- 18 year or older

Before the election of the WUG Leader, the PIM Extensionist shall also explain the main functions and duties of the WUG Leader:

- to represent the WUG in the General Assembly of the WUA;
- to call and preside meetings of WUG and ensure that all WUG members are informed in time about the exact date, time and venue of the meeting;
- to ensure the effective and efficient maintenance of all irrigation infrastructure within the tertiary unit, including the mobilisation of labour and/or cash among all members and non-members of the WUG as required for the execution of all necessary maintenance works;
- to ensure the equitable distribution of spate water among all members and non-members of the WUG;
- to ensure the enforcement of penalties and sanctions against any member or non-member of the WUG for any offence committed;
- To arbitrate in any dispute between individual WUG members;
- To ensure the execution of any other activity as approved by the WUG members or instructed by the WUA; and
- If the WUG has been made responsible for the collection of the due ISFs on behalf of the WUA, to ensure the collection of the ISFs and any other service charges among all members and non-members of the WUG.

Name of WUG:

Following the election of the WUG Leader, the WUG members shall agree upon a name for their WUG. However, the WUG shall never be named after the WUG Leader.

Formulation and Adoption of Internal Rules & Regulations:

At the level of the tertiary unit, a considerable degree of group autonomy is desirable, whereby the farmers' view and preferences on all aspects of water management and maintenance, including the mobilisation of resources among all farmers sharing the same tertiary unit, should be respected.

It is essential that each WUG develops a minimum set of Internal Rules & Regulations with regard to the O&M of the tertiary unit and the management of the WUG itself.

Question: Which internal rules regarding O&M of tertiary unit and functioning of WUG can be formulated by WUG members? (plenary or small group discussion)

It is recommended that each WUG shall formulate its own set of Internal Rules & Regulations that cover at least the following aspects:

- criteria for WUG membership, including payment of (annual) membership fee, and procedures for admission of new members as well as resignation and expulsion of existing members;
- rights and obligations of members;
- rights and obligations of non-members, including payment of higher ISF;
- frequency of meetings and procedures for calling meetings;
- procedures for (re-)election of WUG Leader, minimum qualifications and term of office;
- main functions and duties of the WUG Leader;
- procedures for assessment of maintenance needs as well as planning and execution of maintenance works;
- penalties and sanctions for any offences, including unauthorised irrigation as well as wilful and accidental damage of irrigation infrastructure, and procedures for appeal;
- sanctions for non-payment of maintenance charge and/or non-contribution of labour for the maintenance of the irrigation infrastructure within the tertiary unit;
- penalties and sanctions for late and non-payment of ISF if WUG has been made responsible for the collection of the due ISFs among all members and non-members on behalf of the WUA; and
- procedures for resolution of conflicts between farmers within the tertiary unit.

ELECTION OF REPRESENTATIVES FOR NON-OPERATING LANDOWNERS

Majority of WUGs could determine in its Internal Rules & Regulations that:

- only landowners, who are cultivating and irrigating their fields, can become members of the WUG; and
- non-operating landowners shall not be members of the WUG, but that they are represented by their tenant(s) and/or sharecropper(s) in the WUG.

To avoid the alienation of landowners, who are not operating their lands themselves, it is important that they are formally represented in the WUAs, so that they can be involved in the WUA affairs, including the participatory planning and design process.

If at least two-third of the WUGs have determined that non-operating landowners are not eligible to become members, the PIM Extensionist shall organise one or more meetings for non-operating landowners in collaboration with the PIM Specialist and PIU Institutional Specialist, during which they shall elect their representatives to the General Assembly of the WUA.

In order to safeguard the interests of the large number of (small) owner-operators, sharecroppers and tenants as the actual "water users", appropriate mechanisms should be developed to avoid that large and medium landowners will dominate/monopolise the decision-making and management of the WUAs. The following rules may be applied:

- the WUG representatives have a large majority (66% or 75%) in the General Assembly of the WUA by restricting the total number of representatives from the large and medium landowners, Government and *Waqf* Trusts to 25% or 33% of the total number of seats; and
- at least 66% or 75% of the seats in the Management Board of the WUA are reserved for WUG representatives.

☞ The total number of representatives to be elected by the non-operating landowners shall be one for every three or four WUGs formed within the command area of the primary canal system.

The same information as given to the farmers at tertiary unit level during the Mobilisation and Formation Meetings, shall also be presented during the meeting(s) with the non-operating landholders, before they elect one or more representatives to the General Assembly of the WUA.

TRAINING SHEET

TRAINING MODULE: PARTICIPATORY PLANNING AND DESIGN OF REHABILITATION WORKS

Objective(s):

- To enhance the understanding of the PIM Extensionists and Design staff of the importance to planning and designing the rehabilitation works in consultation with the farmers and their representatives
- To enhance the skills of the PIM Extensionists and Design staff to plan and conduct the participatory planning and design of the rehabilitation works effectively in collaboration with the farmers and their representatives

Expected Output(s):

- The trainees have a good understanding of the different steps of the participatory planning and design process.
- The trainees have the necessary skills to form and train the Farmers' Design Committee
- The trainees have the necessary skills to execute the participatory planning and design process in coordination with the Farmers' Design Committee
- The trainees are convinced of the importance to consult the farmers at all stage of the planning and design process and that the Final Rehabilitation Plan requires farmers' approval

Target Group(s):

- PIM Extensionists and Design Engineers

Expected Number of Participants:

- 12 + ?

Timing:

- Within a few weeks after the formation of (first) WUGs

Estimated Time Required:

- half day

Location:

- PIU Office

Training/Learning Techniques:

- Presentation
- Plenary and Group Discussion
- Demonstration

Preparations Required:

- Preparation of overhead sheets with main points/keywords of Participatory Planning and Design Process
- Model of enlarged map(s) of spate irrigation system.

Materials Required:

- Large (A-1 size) sheets and markers

EXPLANATORY NOTES

The way a design has been prepared is crucial for the sustainability of the rehabilitated irrigation infrastructure. Traditionally, rehabilitation of irrigation infrastructure have been designed by engineers without consulting the farmers as the main users of these structures. Consequently, the rehabilitated irrigation facilities were not satisfying (all) the needs and preferences of the users. The final result was that the users of the rehabilitated irrigation structures did not consider the O&M of the schemes as their responsibility, because they did not develop a sense of ownership. The farmers regarded the irrigation agency, which had designed and rehabilitated the irrigation infrastructure, to be responsible for O&M. But due to financial constraints and other reasons, these agencies were often not capable or willing to perform the required O&M tasks. Consequently, the performance of irrigation systems in many developing countries is poor and their sustainability is low.

To develop a sense of ownership and responsibility for O&M among the users of irrigation structures, it is required that the users are involved in all the stages of the rehabilitation of an irrigation system. Especially during the planning and design of the rehabilitation works, maximum farmer participation is a prerequisite for sustainable management of the rehabilitated infrastructure, because important decisions are made during this stage.

To enable the farmers to participate effectively in the planning and design of the rehabilitation of 'their' irrigation system, it is important to consider the elaboration of the planning and design as a step-by-step process during which farmers' priorities and preferences are matched with technical and financial possibilities.

FORMATION AND TRAINING OF FARMERS' DESIGN COMMITTEE

Farmers' Design Committee Formation Meeting

Before the PIU Design Team (PIU Resident Engineer and PIM Extensionist) could commence with the planning and design of the rehabilitation works in collaboration with the farmers, a Farmers' Design Committee should be formed in order to facilitate farmers' participation.

It is envisaged that the WUG Leaders shall become members of the Farmers' Design Committee as they are the formal (elected) representatives of all farmers sharing the same tertiary units, for which they have formed the WUGs.

Before the Farmers' Design Committee can be formed, the PIU Design Team shall introduce and explain the main principles of the participatory design process as well as the purpose and functions of the Farmers' Design Committee (FDC) to the WUG Leaders during the Farmers' Design Committee Formation Meeting.

Participatory Design Principles:

- Active participation of farmers, both men and women, in all stages of the planning and design process starting from the formation of Farmers' Design Committee and inventory of the farmers' preferences regarding the rehabilitation of their irrigation system to the approval of the agreed Rehabilitation Plan & Cost Estimates;
- Step-by-step approach of the participatory design process, including:
 - formation and training of Farmers' Design Committee;
 - inventory of farmers' preferences during WUG Meetings;
 - preparation of Preliminary Rehabilitation Plan & Cost Estimates by PIU Design Team;
 - review of Preliminary Rehabilitation Plan & Cost Estimates by Farmers' Design Committee;
 - review and approval of Final Rehabilitation Plan & Cost Estimates by Farmers' Design Committee;
 - presentation of Final Rehabilitation to all WUG members for review and approval during WUG Meeting(s);
 - signing of Final Rehabilitation Plan & Cost Estimates by Farmers' Design Committee/WUA and PIU Director;
 - preparation of Detailed Designs and O&M Manual by PIU Design Team;
 - review and approval of the O&M Manual by Farmers' Design Committee;
- Need for approval from both male and female farmers at crucial stages of planning and design process.

Purpose of Farmers' Design Committee:

- As it would not be possible and practical to consult all farmers continuously during the participatory planning and design process and a WUA has not been established yet at this stage of the PIM Programme, it is required to form a Farmers' Design Committee, which would have the authority to represent all the farmers during the Design Meetings with the PIU Design Team.

Question: What could be the functions and responsibilities of the Farmers' Design Committee (plenary or small group discussion)

Functions and Powers of the Farmers' Design Committee:

- to organise WUG Meetings to assess the farmers' and women's preferences regarding the rehabilitation of their irrigation system;
- to participate in Design Meetings with the PIU Design Team in order to present and discuss the different preferences regarding the rehabilitation of the irrigation infrastructure;
- to review, amend and approve the Preliminary Rehabilitation Plan & Cost Estimates;
- to review, amend and approve the Final Rehabilitation Plan & Cost Estimates;
- to present the Final Rehabilitation Plan & Cost Estimates as the outcome of the Design Meetings to all WUG members for review and approval during WUG Meetings;
- to sign the Final Rehabilitation Plan & Cost Estimates following the approval of the Final Rehabilitation Plan & Cost Estimates by the majority of WUG members; and
- to review, amend and approve the O&M Manual during Design Meetings with the PIU Design Team.

Composition of Farmers' Design Committee:

In principle, all WUG Leaders shall become members of the Farmers' Design Committee. However, if the total number of WUG is too large (i.e. more than 15), it is recommended to the WUG members elect 5 to 10 members of the Farmers' Design Committee among themselves.



If the Farmers' Design Committee consists of 5 to 10 elected members, it is required that the head, middle and tail reaches of the distribution system are properly represented.



As village women would also be involved in irrigated agriculture and related economic activities (i.e. livestock), it is recommended that at least one woman is elected or nominated as member of the Farmers' Design Committee, so that the views and preferences of village women are also incorporated in the Final Rehabilitation Plan & Cost Estimates.

Training of Farmers' Design Committee

Following the formation of the Farmers' Design Committee, its members should be briefed more in detail on the participatory planning and design approach, including its steps, and the main duties and authorities of the Farmers' Design Committee during the different steps of the participatory planning and design process. The Farmers' Design Committee members should also receive some training in technical and financial aspects of rehabilitation.

Selection of Chairperson and Secretary of Farmers' Design Committee:

At the end of the training course for the Farmers' Design Committee members or during the first meeting of the Farmers' Design Committee following the training course, the Farmers' Design Committee members should select a Chairperson and Secretary of the Farmers' Design Committee.

Main responsibilities of Farmers' Design Committee Chairperson:

- to call and inform all Farmers' Design Committee members in time about the exact date, time and venue of next meeting;
- to preside meetings of the Farmers' Design Committee; and
- to maintain contact with PIU Design Team.

Main responsibilities of the Farmers' Design Committee Secretary:

- to prepare minutes of the Farmers' Design Committee meetings; and
- to maintain records of the Farmers' Design Committee.

WUG PRE-DESIGN MEETINGS

The planning and design of the rehabilitation of the irrigation infrastructure has to incorporate the preferences of the (male and female) farmers as much as possible but within the technical and financial means available. Before the first Design Meetings between the Farmers' Design Committees and the PIU Design Team can be held, the farmers' preferences should be identified during WUG Pre-Design Meetings. The Farmers' Design Committee should carefully register the farmers' preferences, because it will need this information during the Design Meetings to check if Preliminary Rehabilitation Plan & Cost Estimates has incorporated these preferences as much as possible.

All proposals and suggestions raised by the WUG members should be considered as equally important and registered by the Farmers' Design Committee.

Presentation of Assessed Maintenance and Rehabilitation Requirements

At the start of the WUG Pre-Design Meetings, the PIU Design Team shall present the deferred maintenance and rehabilitation requirements as assessed during PIM Step 4 to the attending WUG members. In this way, the WUG members will have a clear idea of which deferred maintenance and rehabilitation have already been identified by the PIU Design Team before they present their views and preferences concerning the rehabilitation of their irrigation system.

Question: How could the PIU Design Team present the proposed deferred maintenance and rehabilitation works clearly to the WUG members? (plenary or small group discussion)



It is recommended that all assessed maintenance and rehabilitation requirements are presented from the head to the tail with the help of enlarged maps, on which the headworks and the primary and secondary canals are clearly indicated.

Technical and Economic Constraints

During the presentation of the assessed maintenance and rehabilitation requirements as well as during the assessment of farmers' views and preferences regarding the rehabilitation of the irrigation infrastructure, the PIU Design Team shall clearly explain that not all proposed rehabilitation works can be executed due to technical and/or economic constraints.

PREPARATION OF PRELIMINARY REHABILITATION PLAN & COST ESTIMATES

After the last WUG Pre-Design Meeting, the PIU Design Team should start with the preparation of a Preliminary Rehabilitation Plan & Cost Estimates, in which the assessed maintenance and rehabilitation requirements and the registered farmers' and women's views and preferences are included as long as they are technically and economically feasible.

DESIGN MEETINGS

Following the preparation of the Preliminary Rehabilitation Plan & Cost Estimates by the PIU Design Team, the first Design Meeting with the Farmers' Design Committee could be arranged.

Presentation of Preliminary Rehabilitation Plan & Cost Estimates

During the first Design Meeting, the PIU Design Team shall present the Preliminary Rehabilitation Plan & Cost Estimates to the Farmers' Design Committee members.



To present the Preliminary Rehabilitation Plan & Cost Estimates clearly to the Farmers' Design Committee, an enlarged map should be used, on which the proposed rehabilitation works are clearly indicated together with the site of the headworks and the alignment of the primary, secondary and tertiary canals.

To ensure that the Farmers' Design Committee members understand the Preliminary Rehabilitation Plan & Cost Estimates, it is important that the following issues are given due attention during the presentation and explanation:

- Before starting to introduce and explain the different elements of the Preliminary Rehabilitation Plan & Cost Estimates, the location of the main villages, rivers and major roads should be indicated clearly on the map to ensure that the Farmers' Design Committee members can understand the approximate locations of the different elements of the Preliminary Rehabilitation Plan & Cost Estimates.
- It is very important that a logical sequence is followed during the explanation of the Preliminary Rehabilitation Plan & Cost Estimates. The most appropriate sequence will be from head to tail by starting from the headworks and finishing at the tail of the main canal.

Question: In addition to the presentation of the Preliminary Rehabilitation Plan with the help of enlarged map(s), how can the PIU Design Team demonstrate the proposed rehabilitation works to the Farmers' Design Committee members? (plenary discussion)

Walkover

Following the introduction of the Preliminary Rehabilitation Plan & Cost Estimates during the first Design Meeting, it is strongly recommended that the PIU Design Team arranges a joint Walkover with the members of the Farmers' Design Committee along the entire distribution system. During the joint Walkover, the PIU Design Team will have the opportunity to explain the site and scope of the proposed rehabilitation works to the Farmers' Design Committee members.

☞ During the joint Walkover, important decisions regarding the rehabilitation works could be made by the Farmers' Design Committee members and/or PIU Design Team. However, important information could be lost if it is not recorded immediately during the joint Walkover. Therefore, the Secretary of the Farmers' Design Committee with the support of the PIU Design Team should make detailed notes of all the suggestions and decisions made during the Walkover, which should be reviewed during a subsequent Design Meeting.

Review of Preliminary Rehabilitation Plan & Cost Estimates

Following the presentation of the Preliminary Rehabilitation Plan & Cost Estimates and the Walkover, the Farmers' Design Committee and the PIU Design Team should review the Preliminary Rehabilitation Plan & Cost Estimates in detail. During the review, they should check if all farmers' and women's preferences concerning the Rehabilitation Plan & Cost Estimates have been incorporated within the technical and economic possibilities.

Every proposed change in the Preliminary Rehabilitation Plan & Cost Estimates should be discussed between the Farmers' Design Committee and the PIU Design Team to assess if it corresponds with the farmers' and women's preferences and if it is technically and economically feasible. If the Farmers' Design Committee proposes changes to the Preliminary Rehabilitation Plan & Cost Estimates that are totally unrealistic from a technical and/or economic perspective, the PIU Design Team should explain that clearly.

☞ Detailed minutes of each Design Meeting should be prepared by the Secretary of the Farmers' Design Committee. At the end of each Design Meeting, the draft minutes should be presented to all participants to ensure that the main findings, conclusions and decisions are properly recorded.

PREPARATION OF FINAL REHABILITATION PLAN & COST ESTIMATES

After the Farmers' Design Committee has completed the review of the Preliminary Rehabilitation Plan & Cost Estimates, the PIU Design Team should commence with the preparation of the Final Rehabilitation Plan & Cost Estimates, in which all alterations as agreed with the Farmers' Design Committee should be incorporated.

☞ If any alteration to the Preliminary Rehabilitation Plan & Cost Estimates as agreed during one of the Design Meetings cannot be included in the Final Rehabilitation Plan & Cost Estimates due to technical and/or economic reasons, the PIU Design Team should mention it explicitly and explain the reasons to the Farmers' Design Committee during the subsequent Design Meeting.

APPROVAL OF FINAL REHABILITATION PLAN & COST ESTIMATES BY FARMERS' DESIGN COMMITTEE

As soon as the PIU Design Team has prepared the Final Rehabilitation Plan & Cost Estimates, another Design Meeting should be held, during which the Farmers' Design Committee should review the Final Rehabilitation Plan & Cost Estimates before it has to take the decision to approve or reject it.

The Design Meeting should start with a detailed presentation of the Final Rehabilitation Plan & Cost Estimates by the PIU Design Committee. All alterations compared with the Preliminary Rehabilitation Plan & Cost Estimates should be clearly explained to the members of the Farmers' Design Committee. The reasons for the non-inclusion of any previously agreed alteration should also be explained and discussed.



To facilitate the presentation of the Final Rehabilitation Plan & Cost Estimates to the Farmers' Design Committee, an enlarged map should be used, on which the finally proposed rehabilitation works are clearly indicated together with the site of the headworks and the alignment of the primary, secondary and tertiary canals.

Following the presentation of the Final Rehabilitation Plan & Cost Estimates, the Farmers' Design Committee has to decide if it could approve the Final Rehabilitation Plan & Cost Estimates as prepared by the PIU Design Team.

Rejection of Final Rehabilitation Plan & Cost Estimates by Farmers' Design Committee

If the Farmers' Design Committee insists on the inclusion of one or more changes in the Rehabilitation Plan & Cost Estimates, which have been rejected by the PIU Design Team for technical and/or economic reasons, the PIU Design Team should study the Farmers' Design Committee's request(s) once more and formulate one or more possible alternatives. The organisation of an additional Walkover may also be useful to check and discuss the possibilities and impossibilities of any requested alteration at site.

During another Design Meeting, the PIU Design Team should present any alternative that may solve the pending issue(s). If the Farmers' Design Committee and the PIU Design Team could come to an agreement, the former should formally approve the Final Rehabilitation Plan & Cost Estimates with the agreed alteration(s).

It is, however, possible that the Farmers' Design Committee decides to reject the Final Rehabilitation Plan & Cost Estimates. During the subsequent WUG Design Meetings, the Farmers' Design Committee should explain its reasons for rejecting the Final Rehabilitation Plan & Cost Estimates to the WUG members.

WUG DESIGN MEETINGS

Before the Rehabilitation Plan & Cost Estimates Agreement can be signed, all WUG members have the right to be informed about the outcome the participatory planning and design process and to approve or reject the Final Rehabilitation Plan & Cost Estimates.

During WUG Design Meetings, the Farmers' Design Committee with the support of the PIU Design Team should present and explain its reasons for approving or rejecting the Final Rehabilitation Plan & Cost Estimates to all attending WUG members.

Presentation of Final Rehabilitation Plan & Cost Estimates to WUG Members

To illustrate that the design process has been participatory, the Farmers' Design Committee should clearly indicate which farmers' and women's preferences as well as all alterations proposed by the Farmers' Design Committee have been included in the Final Rehabilitation Plan & Cost Estimates. It should also explain why one or more preferences and/or proposed alterations could not be included.

Following the presentation of the Final Rehabilitation Plan & Cost Estimates, the attending WUG members should be given the opportunity to ask questions about the different components of the Final Rehabilitation Plan & Cost Estimates.

- ☞ To facilitate the presentation of the Final Rehabilitation Plan & Cost Estimates to all farmers, an enlarged map should be used, on which the finally proposed rehabilitation works are clearly indicated together with the site of the headworks and the alignment of the primary, secondary and tertiary canals.

Approval of Final Rehabilitation Plan & Cost Estimates by WUG Members

Following the presentation of the Final Rehabilitation Plan & Cost Estimates, the Farmers' Design Committee should formally request the attending WUG members to approve or reject the Final Rehabilitation Plan & Cost Estimated as presented to them.

- ☞ The approval of the Final Rehabilitation Plan & Cost Estimates is an important decision during the PIM Programme as it will be very difficult to propose any major alterations after the Rehabilitation Plan & Cost Estimates is signed. Therefore, the approval of the Final Rehabilitation Plan & Cost Estimates should be endorsed by a majority of WUG members attending the WUG Design Meeting. Therefore, at least 51% or 66% of all WUG members shall attend the WUG Design Meeting.

- ♀ To facilitate the active involvement of village women in the review and approval of the Final Rehabilitation Plan & Cost Estimates, it may be required to organise one or more special meetings for them. At the end of each meeting, the attending women should either approve or reject the Final Rehabilitation Plan & Cost Estimates as presented to them.

Rejection of Final Rehabilitation Plan & Cost Estimates by WUG Members

If the majority of WUG members has valid arguments for rejecting the Final Rehabilitation Plan & Cost Estimates, the Farmers' Design Committee and the PIU Design Team should have another Design Meeting to review these arguments carefully and to assess if any alterations to the Final Rehabilitation Plan & Cost Estimates are feasible that would alleviate the farmers' and/or women's concerns.

During other WUG Design Meetings, the Farmers' Design Committee should explain to the WUG members how the Final Rehabilitation Plan & Cost Estimates has been modified to address their earlier concern(s) as much as possible. If it is not possible to alter the Final Rehabilitation Plan & Cost Estimates to alleviate the farmers' and/or women concerns, the Farmers' Design Committee should clearly explain the reasons.

- ♀ During a number of meetings, the (female member of the) Farmers' Design Committee should also explain to the village women how their earlier concerns have been addressed by revising the Final Rehabilitation Plan & Cost Estimates as well as the reasons if that was not possible.
- ☞ If the majority of WUG members has decided to reject the Final Rehabilitation Plan & Cost Estimates, the PIU Director should inform the concerned Farmers' Design Committee/WUA about its decision to cancel the rehabilitation of the irrigation infrastructure.

SIGNING OF FINAL REHABILITATION PLAN & COST ESTIMATES

Only if the majority of WUG members has approved the Final Rehabilitation Plan & Cost Estimates, the WUA Chairperson and the PIU Director can proceed with the signing of the Rehabilitation Plan & Cost Estimates.

For this purpose, the PIU Design Team should have prepared a document, in which all details of the approved Final Rehabilitation Plan & Cost Estimates are systematically and clearly listed and described. All WUA Management Board members and the PIU Design Team members should sign at least three copies of the Rehabilitation Plan & Cost Estimates Agreement as witnesses.

PARTICIPATORY PLANNING AND EXECUTION OF DEFERRED MAINTENANCE OF TERTIARY UNITS

One of the main purposes of the formation of WUGs is to ensure the effective O&M of the tertiary units. However, the WUGs will only be able to operate their respective tertiary units effectively if all irrigation structures situated in the tertiary units are functional, so that spate water can be distributed efficiently to all fields located in the tertiary units. It is, however, possible that tertiary units are only partly functional or non-functional at all due to lack of sufficient maintenance for a number of years.

Assessment of WUG Members' Interest for Execution of Deferred Maintenance

To assess if the WUG members are interested to undertake any deferred maintenance works within their respective tertiary unit, the PIM Extensionist shall request the WUG Leader to invite all WUG members for a meeting, during which the following issues shall be presented and discussed:

- necessity for executing any deferred maintenance works; and
- procedures for the assessment, planning and execution of the deferred maintenance works.

☞ The PIM Extensionist shall only plan such WUG meetings for tertiary units that have received spate water on a regular basis during the last years.

⊙ The PIM Extensionist shall not plan WUG meetings to discuss the execution of deferred maintenance for tertiary units that have not received any spate water for a number of years as it may create expectations among the members and non-members of the WUGs that spate water would become available the upcoming irrigation season.

Assessment of Deferred Maintenance Requirements of Tertiary Unit

Only when the majority of WUG members have expressed their willingness to undertake any deferred maintenance works within their tertiary unit, the WUG shall carry out an inspection of all the irrigation structures within its tertiary unit in order to assess their deferred maintenance requirements.

Planning of Execution of Deferred Maintenance Works for Tertiary Unit

Based on the results of the assessment of the deferred maintenance requirements, the WUG shall prepare a work plan, in which the following issues concerning the execution of the deferred maintenance works are described:

- types and quantities of deferred maintenance works to be executed;
- estimates of labour input and equipment requirements;
- estimates of capital costs for procurement of materials, lease of equipment and/or recruitment of hired labour; and
- timing and time-schedule.

☞ As the WUG members would not have prepared a work plan for the execution of deferred maintenance works before, it may be expected that they will need support and technical advice during the first year in the form of a formal training course and/or on-the-job training, which shall be provided by the PIU Design Team.

Modalities for Execution of Deferred Maintenance Works for Tertiary Unit

Question: How could the deferred maintenance works at tertiary unit level be carried out? (plenary discussion)

Most if not all deferred maintenance works within the tertiary unit can be carried out by the members and non-members of the WUG as the envisaged works are technically simple and only require the input of unskilled labour, such as the desilting of the tertiary canals. With regard the execution of the technically simple, labour-intensive works, each WUG has to decide if:

- these works will be carried out by its members and non-members, who will provide (free) labour for one or more days; or
- these works will be executed by hired labourers.

If concrete structures, such as outlets and drop structures, need to be rehabilitated, it may be required that the WUG recruits a skilled mason.

Preparation and Execution of Deferred Maintenance Works within Tertiary Unit

Before the execution of the deferred maintenance works can commence, it may be required that the WUG has to procure materials (i.e. cement, sand, bricks), lease equipment and recruit skilled and/or unskilled labour in accordance with the agreed work plan.

The execution of the deferred maintenance works shall be coordinated and supervised by the WUG Leader, who may delegate this responsibility to one or more WUG members.

☞ It may be necessary that the WUG needs support and technical advice during the execution of the deferred maintenance works, which shall be provided by the PIU Resident Engineer with the support of the PIM Extensionist.

C. OVERHEAD SHEETS

MAIN ASPECTS OF IRRIGATION IMPROVEMENT PROJECT

COMMUNITY AWARENESS CAMPAIGN (STEP 2)

FORMATION OF WATER USERS' GROUPS (STEP 6)

PARTICIPATORY PLANNING AND DESIGN OF REHABILITATION WORKS (STEP 7)

PHASE I PROJECT OBJECTIVES

- **sustainable and efficient distribution and use of water in spate irrigation schemes of Wadi Tuban and Wadi Zabid through rehabilitation and improvement of irrigation infrastructure and implementation of Participatory Irrigation Management**
- **increase in agricultural productivity and smallholder income in both spate irrigation schemes through implementation of intensive agricultural extension and demonstration programme**

MAIN PROJECT ACTIVITIES

- **promotion of effective participation of all farmers in planning, design, rehabilitation and management of spate irrigation systems**
- **formation and strengthening of autonomous and financially self-sufficient water user's organisations at different levels within both spate irrigation systems**
- **gradual transfer of responsibility for management of spate irrigation schemes, including financing of O&M costs, to water users' organisations**
- **rehabilitation and improvement of headworks, canals and control structures as well as construction of flood protection works and rehabilitation of roads**
- **agricultural extension and demonstration programme in both spate irrigation schemes to introduce new varieties and improved agricultural and water management practices**
- **support to Government and its irrigation institutions to facilitate change of Government's role in management of spate irrigation schemes.**

MAIN IMPLEMENTATION PRINCIPLES

- **effective participation of all farmers in all stages of planning, design, rehabilitation and management of both spate irrigation schemes**
- **cost-sharing, whereby farmers shall contribute to capital costs of rehabilitation works either through cash payment or execution of direct labour contract**
- **execution of any rehabilitation works is conditional upon prior formation of WUAs at primary canal level**
- **farmers shall gradually become responsible for paying full costs for operating and maintaining all irrigation infrastructures, except diversion weirs**
- **implementation of Project shall be considered a partnership between all concerned farmers organised in WUAs and Ministry of Agriculture and Irrigation**

MAIN ACTORS IN PROJECT IMPLEMENTATION

- **landowners, sharecroppers and tenants owning and/or cultivating land in command areas of both spate irrigation systems**
- **Ministry of Agriculture and Irrigation through PMU in Sana'a and PIUs in Zabid and Lahej**
- **TDA in Wadi Zabid and Lahej Regional Agriculture Office in Wadi Tuban**
- **Main Technical Assistance Team comprising foreign and Yemeni consultants**

MAIN ROLE AND RESPONSIBILITIES OF GOVERNMENT AGENCIES AND CONSULTANTS

- **to ensure effective participation of all concerned farmers in planning, design and execution of rehabilitation works**
- **to assist farmers with formation and strengthening of their WUGs and WUAs**
- **to ensure design, tender and execution of main rehabilitation works**
- **to facilitate gradual transfer of responsibility for O&M of spate irrigation systems to farmers**

MAIN ROLE AND RESPONSIBILITIES OF FARMERS

- to participate directly or through elected representatives in all steps of planning, design and execution of rehabilitation works on their spate irrigation systems
- to participate in formation of WUGs and WUAs, including elections
- to contribute to capital costs of rehabilitation works either in labour or cash:
 - contribution of ___% of civil works costs or about YR_____ per *faddan/maad* during implementation of rehabilitation works, either in labour or cash
 - annual cash repayment of about YR_____ per *faddan/maad*, starting 5 years after completion of rehabilitation works over 20-year period
- to take over gradually the responsibility for O&M of entire irrigation canal network through their WUAs
- to pay annual Irrigation Service Fee to their WUAs to cover gradually the full costs for O&M of all irrigation canals estimated at YR_____ per *faddan/maad*

EXPECTED MAIN BENEFITS FOR FARMERS FROM IMPLEMENTATION OF REHABILITATION WORKS AND AGRICULTURAL EXTENSION ACTIVITIES:

- **improved availability, distribution and use of spate flows**
- **decreased risks of damage from flood events**
- **possible increase of groundwater recharge through deep percolation from spate irrigated fields**
- **savings in transportation cost after rehabilitation of rural roads**
- **increased incomes and improved food security due to improved production of various crops, including sorghum, cotton and vegetables**

EXPECTED BENEFITS FOR FARMERS FROM EFFECTIVE PARTICIPATION IN DESIGN AND EXECUTION OF REHABILITATION WORKS AND IRRIGATION MANAGEMENT TRANSFER:

- **control over quality of rehabilitation works, which reflect farmers' preferences**
- **full control over scope and quality of maintenance works**
- **control over allocation and distribution of spate water between primary canals along Wadi**
- **full control over distribution of spate water along primary canal system**
- **full control over own O&M staff**
- **full control over collection and utilisation of Irrigation Service Fees**
- **improved communication and less conflicts over water distribution**

PARTICIPATORY IRRIGATION MANAGEMENT

Main characteristics of dominant development approach for irrigation sector throughout the world for several decades:

- **governments have been considered as engine for development**
- **Government agencies were responsible for planning, construction and management of irrigation projects**
- **farming communities were only perceived as passive “beneficiaries” instead of active “partners”**

Main weaknesses of this development approach:

- **creation of large, over-staffed government bureaucracies with under-paid staff**
- **dramatic expansion of irrigated area without corresponding increase in funds required for O&M of irrigation systems**
- **rapid deterioration of irrigation infrastructure and declining productivity of irrigated agriculture due to increasing deficiencies in O&M of irrigation systems, including inequitable distribution of water**
- **poor economic and financial returns to irrigation investments due to decreasing agricultural productivity and gap between potential and actually irrigated areas**
- **weak civil society organisations, such as WUAs**

MAIN CHALLENGES FACING IRRIGATION SECTOR:

- **Between now and 2025, about 80% of additional food supply needed to feed growing world population must be produced on irrigated land by:**
 - **more productive and intensive agriculture**
 - **more productive and efficient water use**
- **industrialisation and urbanisation in developing countries will reduce share of accessible fresh water that is available for agriculture**

RATIONALE FOR FARMERS' PARTICIPATION IN IRRIGATION DEVELOPMENT AND MANAGEMENT

To avoid further deterioration of irrigation infrastructure and decreasing productivity of irrigated agriculture due to deficient O&M of irrigation systems, governments and financing institutions (i.e. ADB and WB) have agreed that:

- effective farmers' participation in development and management of irrigation systems is required**
- farmers shall contribute to the capital costs of construction and rehabilitation of irrigation infrastructure**
- farmers shall pay the O&M costs**

Apart from obvious fiscal advantage, farmers' contributions towards capital costs of new or rehabilitated scheme has following advantages:

- indication of demand and commitment as it is an investment in equity**
- development of sense of ownership**
- prospects for sustainability**

CONCEPT OF PARTICIPATORY IRRIGATION MANAGEMENT

To promote effective farmers' participation in development and management of irrigation systems, the concept of Participatory Irrigation Management has been introduced

Definitions

Participatory Irrigation Management (PIM) refers to effective involvement of water users in irrigation management along with government

Irrigation Management Transfer (IMT) refers to transfer of responsibilities and authority for O&M of irrigation infrastructure from government agencies to non-governmental organisations, such as WUAs, with following options:

- **full or partial transfer of irrigation management functions**
- **full or partial responsibility for payment of O&M costs**
- **transfer of ownership of irrigation infrastructure**
- **transfer of O&M responsibility at sub-system levels (i.e. distributary canals) or for entire irrigation systems, including diversion structures**

MAIN AIMS OF PARTICIPATORY IRRIGATION MANAGEMENT AND IRRIGATION MANAGEMENT TRANSFER

- **development or rehabilitation of sustainable irrigation systems as farmers participate in planning and design**
- **significant savings in capital costs as farmers undertake (significant) portion of construction works**
- **more efficient and equitable distribution of irrigation water as farmers have better control over irrigation supply and distribution**
- **decrease in maintenance costs as farmers undertake works at cheaper rates with own (financial) resources (cost awareness)**
- **increase in recovery of irrigation service fees as water users fully control collection and utilisation of these funds**
- **less dependency on government budget for O&M of irrigation systems as farmers pay (full) costs**

- **more transparent and accountable relations between farmers and the irrigation agency as rights and duties of both parties are specified in IMT agreements**
- **increase in irrigated area and improved agricultural production due to improved O&M of the irrigation systems and increased water use efficiency as farmers pay real costs for supply of irrigation water from source to their fields**
- **less corruption and favouritism with regard to the allocation and distribution of irrigation water.**

CONDITIONS FOR SUCCESSFUL IMPLEMENTATION OF PARTICIPATORY IRRIGATION MANAGEMENT

- **clear and strong legal status of WUOs**
- **clear water use rights vested in WUOs**
- **irrigation system is functional and compatible with water rights and management capacity of farmers**
- **full decision-making authority transferred to WUOs**
- **appropriate cost-sharing arrangements for O&M and system rehabilitation**
- **government adopts new role based on partnership and giving high priority to strengthen WUA capacity and providing adequate support during and after O&M transfer to farmers**
- **high-level political commitment is mobilised and communicated through consistent policies and legislation**
- **profitable irrigated agriculture and clear economic benefits for farmers**
- **strong parallel support programme to develop irrigated agriculture and marketing**

CONCEPT OF PARTICIPATION

Definitions:

World Bank defines participation as follows

“Participation is a process through which stakeholders influence and share control over development initiatives and the decisions and resources that affect them”.

“a process by which people, especially disadvantaged people, can exercise influence over policy formulation, design, alternatives, investment choices, management, and monitoring of development interventions in their communities”

MAIN PURPOSES OF PARTICIPATION

- enable people to define and choose their own objectives
- enable people to define and choose their own ways to achieve their own objectives
- enable people to have full control over benefits from activities undertaken by them in their own ways to achieve their own objectives
- enable people develop a *sense of ownership* as:
 - they have been involved in identification, planning and implementation of their own objectives
 - they have invested their own time, labour and/or cash to achieve their own objectives
 - they have control over the benefits
- enable *sustainability* as people feel responsible to operate and maintain the achievements, which are the result of their activities to achieve their own objectives, in order to get the benefits for as long as possible due to *sense of ownership*

MAIN PRINCIPLES OF PARTICIPATION

- **participation stems from people's decisions to devote portion of their time, thought and energy to dealing with problems through some form of collective action**
- **participation must begin at lowest level and must offer opportunities for all people, including poorer persons, to be involved in decision-making**
- **participation must take place at all stages of development process: planning, design and implementation to monitoring and evaluation**
- **participatory process must deal with allocation and control of goods and services**
- **participation will cause conflicts in some form, and suitable procedures to resolve them must be found**
- **participation will be more predictable, productive and sustainable if it is channelled through suitable organisations established for this particular task**
- **Leadership makes participation more coordinated and effective by providing direction, encouragement and discipline**

CONSTRAINTS FOR PARTICIPATION

- **limited experience with collective management of irrigation systems**
- **wide inequities in patterns of land ownership**
- **hierarchical social structure**
- **heterogeneity of many farming communities**
- **traditional rivalries between different groups within village or between villages**
- **political interference**
- **deep seated feeling of dependency on Government**
- **lack of interaction, cooperation, confidence and trust among farmers:**
 - **majority of farmers has never participated in decision-making processes**
 - **lack of confidence among farmers in their ability to manage irrigation systems themselves**
 - **mutual distrust among farmers regarding management of financial matters**
 - **farmers have limited experience in working as a group**

- **scepticism among farmers towards success of project due to previous experiences with unsuccessful, unsustainable Government projects in their communities**

LEVEL OF PARTICIPATION

Following (actual or potential) characteristics of community members should alert Project staff to possible imbalances or gaps in participation:

- location: upstream versus downstream water users
- gender: men versus women
- landholding: large versus small landowners
- land tenure: landholders versus tenants and sharecroppers
- ethnic: majority versus minority ethnic group(s)
- religion: majority versus minority religious group(s)
- age: old versus young

METHODS TO ENSURE PARTICIPATION

Effective participation of certain groups can be enhanced during different stages of scheme development and management by:

- selection of venue accessible to everybody, i.e. public places, such as schools**
- timing of meetings and training sessions when people have time to participate, i.e. avoiding seasonal and daily periods of peak labour demands**
- formation of separate focus groups by gender, socio-economic, age, ethnicity and/or religion**
- reservation of seats for separate focus groups in WUA committees**

COMMUNITY AWARENESS CAMPAIGN (STEP 2)

Purposes of the Community Awareness Campaign are:

- Introduction of PIU staff
- Briefing farmers on main aspects of IIP and PIM Programme
- Assessment of interest among farmers to participate IIP.

Basic Guidelines for Conducting Community Awareness Meeting:

- Community Awareness Meetings in all main village of command area of each primary canal system
- Community Awareness Meeting should not last longer than 1½ hours
- PIM Extensionist uses simple language as well as speak slowly, clearly and loudly enough
- PIM Extensionist does not use too many technical terms and he should avoid use of English words

Basic Guidelines for Planning Community Awareness Meeting:

- At least one week before planned Community Awareness Meeting, PIM Extensionist shall visit village to contact the Village Sheikh/Local Council to plan and agree upon the date, time and venue for meeting
- Convenient place is selected where all farmers can come easily and speak freely and where meeting could be conducted quietly and undisturbed
- PIM Extensionist should contact Village Sheikh/Local Council one or two days before planned Community Awareness Meeting to confirm date, time and venue
- PIM Extensionist should assist Village Sheikh/Local Council by promoting distribution of notices and use of banners mentioning the date, time and venue of planned Community Awareness Meeting.

Basic Guidelines for Implementation of Community Awareness Meeting:

- Before start of the Community Awareness Meeting, names of all attending farmers should be registered.
- At end of Community Awareness Meeting, copy of IIP Brochure be distributed among all farmers

Structure of Community Awareness Meeting:

Introduction:

- welcome all farmers and other villagers
- thank Village Sheikh/Local Council for organising meeting
- main purpose, major subjects and expected duration of the meeting

Presentation:

- Main objectives and activities of the IIP;
- Main actors involved in implementation of the IIP;
- Main conditions for implementation of the IIP;
- Main principles of the PIM approach
- Village women will be informed and consulted throughout entire PIM Programme;
- Formation and strengthening of WUOs at different levels to ensure effective O&M of irrigation infrastructure following transfer of the O&M responsibility;
- Expected farmers' participation during all steps of PIM Programme;
- Expected farmers' contributions towards capital costs of rehabilitation works and O&M of irrigation structures following transfer of O&M responsibility;
- Provision of support and training to all WUOs; and
- Expected benefits for farmers.

Questions and Discussion:

- Attending farmers have the opportunity to ask questions about IIP and PIM Programme.

Assessment of Farmers' Interest:

- PIM Extensionist should assess if farmers, who have attended the meeting, are enthusiastic and willing to participate actively in rehabilitation of their irrigation scheme, including contributions to the capital costs, and to take up O&M responsibility for transferred irrigation infrastructure, including the payment of the O&M costs.

Closure:

- PIM Extensionist should finish meeting by thanking all attending farmers and staff of supporting agencies for their attention and participation.

Utilisation of Extension Materials:

- Flip Charts are large (A-1 size) sheets, on which main topics of training/extension session are summarised by using key words.
- As participants/trainees should be able to read the text on the Flip Chart, large letters (10cm high) must be used

The main advantages of using Flip Charts are:

- to structure presentation as PIM Extensionist gives his/her presentation by following key words written down on the Flip Charts;
- to present all necessary information as PIM Extensionist cannot miss any subject if he/she follows all key words on the Flip Charts; and
- to attract and keep attention of participants/trainees by referring actively to key words and illustrations on Flip Charts.

FORMATION OF WATER USERS' GROUPS (STEP 6)

IDENTIFICATION OF TERTIARY UNITS

Basic principles:

- participation shall begin at lowest level to allow all individual farmers to be involved; and
- participation will be more predictable, productive and sustainable if channelled through appropriate organisations.

At lowest level, farmers will be organised in WUGs on the basis of the smallest hydraulic units (i.e. tertiary units):

- command area irrigated by tertiary canal taking water from secondary canal or directly from primary/branch canal;
- group of fields sharing same *ma'aqam* in primary/branch canal.

Prior to formation of WUGs, PIM Extensionist must identify tertiary units in close collaboration with local Canal Master (i.e. *Sheikh al Obar* or *Sheikh al Shareej*) by:

- collecting map(s) of canal system and/or (high resolution) satellite images with canal system indicated;
- if existing maps and/or satellite images are not available, preparing sketches (schematics) with location of canal system, outlet structures and/or *ma'aqem* as well as command area of each outlet structure and/or *ma'aqam*;
- walk-through along all canals in order to:
 - check number and location of outlet structures and/or *ma'aqem* as indicated on map(s) are correct;
 - indicate location of (additional) outlet structures and/or *ma'aqem* on maps if not indicated yet;
 - collect information on number and size of all plots of land served by each outlet structure and/or *ma'aqam*;
 - collect names of owners of all plots of land served by each outlet structure and/or *ma'aqam*; and
 - collect names of sharecroppers and/or tenants for each plot of land that is not cultivated by the owner him-/herself.

Following walk-through along all canals, PIM Extensionist shall prepare lists for all identified tertiary units with following details:

- name of farmer;
- name of village where farmer is resident;
- size of land within command area of tertiary unit;
- land tenure by indicating if farmer is owner-operator, sharecropper or tenant; and
- name of landowner if farmer is not owner of the land that he/she cultivates.

Water Users' Organisations

- WUGs at the level of the tertiary canals or *ma'aqem*
- WUAs at the level of the primary canals
- Scheme Water Users' Federations (SWUFs) at the level of (sub-)Wadi
- Irrigation Council at the level of the entire Wadi system

MAIN ASPECTS OF WATER USERS' GROUP

Main Purposes of WUG Formation

Formation of WUGs has following two main purposes:

- to ensure the effective O&M of the tertiary unit; and
- to ensure effective participation of all farmers at all levels of their spate irrigation system, in particular with regard to the planning, design, supervision and execution of rehabilitation works as well as O&M of their irrigation system, including the allocation and distribution of spate water between primary canal systems at Wadi level and between individual farmers along primary canal system.

Main Functions of WUG

Main Function:

Main function of WUG is to distribute received amount of irrigation water equitably and efficiently among all its members and non-members so as to maximise agricultural production and to ensure economic well-being of its members and non-members.

Specific Functions:

- to provide WUA with all necessary information;
- to receive bulk water supply from WUA;
- to distribute water equitably among all individual water users within command of the tertiary unit;
- to set its own rules and regulations concerning O&M of tertiary unit, including sanctions for offences;
- to maintain tertiary unit in operational condition;
- to have regular general meetings to consult and inform all members about O&M of tertiary unit, O&M of primary and secondary canal system by WUA, issues to be discussed and decisions made by WUA, including setting of annual Irrigation Service Fee (ISF);
- to elect one or more representatives for General Assembly of WUA.

It is possible that WUA would make WUGs responsible for collection of ISFs among members and non-members for O&M and other services provided by WUA.

Criteria for WUG Membership

In principle, every landowner having land within the command area of the tertiary unit as well as tenant and sharecropper cultivating land with the command area of the tertiary unit are eligible to become member of the WUG.

As WUG is mainly responsible for O&M of tertiary unit, it is strongly recommended that only farmers, who are cultivating and irrigating the fields, and tenant(s) and/or sharecropper(s) shall become members.

Membership is on voluntary basis. Main advantages of WUG membership are:

- to participate and vote in meetings and elections of the WUG; and
- to stand for election.

In addition, WUA may decide that members have to pay a lower ISF than non-members.

Condition for WUG Formation

It is required that at least 50% of all landowners, tenants and/or sharecroppers owning or cultivating land within the command area of the tertiary unit decide to become members of their WUG.

MAIN ASPECTS OF WATER USERS' ASSOCIATION

WUA Goal:

Overall goal of WUA shall be to safeguard and promote common interests of owners and users of land in command area of WUA with regard to irrigation and agriculture.

Main Functions and Power of WUA:

- to manage, operate and maintain spate irrigation system within its command area
- to ensure the bulk supply of spate water from diversion structure in accordance with water use rights;
- to ensure equitable supply spate water to members and non-members of WUA;
- to employ permanent, temporary and seasonal staff as required;
- to develop an appropriate and equitable basis for setting ISFs;
- to assess and collect or arrange collection of ISFs and any other service charges;
- to arbitrate and settle any internal dispute among its members and non-members.

- to enforce discipline by imposing sanctions against any member or non-member of the WUA, who unlawfully violates the Articles of Association or Internal Rules & Regulations of the Association;
- to open and manage one or more bank accounts; and

Organisational Structure of WUA:

- General Assembly comprising WUG Leaders and representatives from non-operating landowners;
- Management Board, including Chairman, Secretary and Treasurer, who are elected among members of General Assembly; and
- Standing Committees, such as Audit Committee.

FORMATION OF WATER USERS' GROUP

Preparation of WUG Membership List:

PIM Extensionist shall prepare WUG Membership List with following details:

- name and address of each member;
- size in hectares of that member's landholding and, if different, the name of the owner of the plot of land;
- location of member's land by specifying name/number of tertiary canal or *uqma* by which member's land is served.

Each new WUG member shall sign WUG Membership List and pay the membership fee of YR_____ (100), which is required to cover the costs related to the formation and registration of the WUA.

PIM Extensionist shall also prepare a WUG Non-Membership List with the same details.

Election of WUG Leader:

Each member of the WUG is also automatically member of the WUA, which will be established at the level of the Primary canal. As a WUA may have more than hundred members, it is not possible to organise meetings, in which all its members will participate. Therefore, each WUA will have a representative system, whereby each WUG will be represented by one elected representative.

Before WUG members elect their leader, PIM Extensionist shall explain that suitable candidate should fulfill at least following qualifications:

- literate
- good standing and respected
- permanently resident
- 18 year or older

Before election of WUG Leader, PIM Extensionist shall also explain main functions and duties of WUG Leader:

- to represent the WUG in General Assembly of WUA;
- to call and preside meetings of WUG and ensure that all WUG members are informed in time about the exact date, time and venue of the meeting;
- to ensure maintenance of irrigation infrastructure within tertiary unit, including mobilisation of labour and/or cash among all members and non-members of WUG;
- to ensure equitable distribution of spate water among all members and non-members of WUG;
- to ensure enforcement of penalties and sanctions against any member or non-member of WUG for any offence committed;
- To arbitrate in any dispute between individual members and non/or non-members of WUG;
- If WUG has been made responsible for collection of ISFs on behalf of WUA, to ensure collection of ISFs and any other service charges among all members and non-members of WUG.

Name of WUG:

Following election of WUG Leader, WUG members shall agree upon a name for their WUG. However, WUG shall never be named after WUG Leader.

Formulation and Adoption of Internal Rules & Regulations:

At tertiary unit level, considerable degree of group autonomy is desirable, whereby farmers' view and preferences on all aspects of water management and maintenance, including mobilisation of resources among farmers, should be respected.

Each WUG shall develop minimum set of Internal Rules & Regulations regarding O&M of tertiary unit and management of WUG itself, which cover at least following aspects:

- criteria for WUG membership, including payment of (annual) membership fee;
- rights and obligations of members;
- rights and obligations of non-members, including payment of higher ISF;
- frequency of meetings and procedures for calling meetings;
- procedures for (re-)election of WUG Leader, minimum qualifications and term of office;
- main functions and duties of WUG Leader;
- procedures for assessment of maintenance requirements as well as planning and execution of maintenance works;
- penalties and sanctions for any offences;
- sanctions for non-contribution of labour and/or cash for maintenance of irrigation infrastructure within tertiary unit;
- penalties and sanctions for late and non-payment of ISF if WUG has been made responsible for collection of due ISFs among all members and non-members on behalf of WUA; and
- procedures for resolution of conflicts between farmers within tertiary unit.

ELECTION OF REPRESENTATIVES FOR NON-OPERATING LANDOWNERS

Majority of WUGs could determine in its Internal Rules & Regulations that:

- only landowners, who are cultivating and irrigating their fields, can become members of the WUG; and
- non-operating landowners shall not be members of the WUG, but that they are represented by their tenant(s) and/or sharecropper(s) in the WUG.

To avoid the alienation of non-operating landowners, they must be formally represented in WUA and involved in WUA affairs, including participatory planning and design process.

If at least two-third of WUGs have determined that non-operating landowners cannot become members, meeting(s) for non-operating landowners shall be organised, during which they shall elect their representatives to General Assembly of WUA.

To avoid that large and medium landowners will dominate/monopolise decision-making and management of WUA, the following rules may be applied:

- WUG representatives have large majority (66% or 75%) in WUA General Assembly by restricting total number of representatives from large and medium landowners, Government and *Waqf* Trusts to 25% or 33% of total number of seats; and
- at least 66% or 75% of seats in WUA Management Board are reserved for WUG representatives.

☞ Total number of representatives to be elected by non-operating landowners shall be one for every three or four WUGs formed within command area of primary canal system.

PARTICIPATORY PLANNING AND DESIGN OF REHABILITATION WORKS

To develop a sense of ownership and responsibility for O&M among farmers as users of irrigation structures, it is required that farmers are involved in all stages of rehabilitation of irrigation system. Especially during planning and design of rehabilitation works, maximum farmer participation is precondition for sustainable management of rehabilitated infrastructure as important decisions are made during this stage.

To facilitate farmers to participate effectively in planning and design of rehabilitation works, the following steps should be followed:

WUG Pre-Design Meetings

- To present results of assessment of deferred maintenance and rehabilitation requirements by Project staff.
- To make inventory of farmers' preferences regarding rehabilitation of "their" spate irrigation system.

Formation and Training of Farmers' Design Committee

- Not possible and practical to consult all farmers during entire planning and design process.
- Farmers' Design Committee formed with authority to represent all farmers during Design Meetings with Project.
- All WUG Leaders or 5 to 10 elected/selected WUG Leaders shall be members of Farmers' Design Committee.
- Training of Farmers' Design Committee.

Preparation of Preliminary Rehabilitation Plan & Cost Estimates

- Based on information collected during WUG Pre-Design Meetings and inspections of all irrigation infrastructure, Project staff prepare Preliminary Rehabilitation Plan and calculates estimated costs.

Design Meeting(s)

- Project staff present Preliminary Rehabilitation Plan & Cost Estimates to Farmers' Design Committee members.
- Project staff and Farmers' Design Committee members walk together along all canals to explain the sites and size of proposed rehabilitation works.
- Review of Preliminary Rehabilitation Plan & Cost Estimates by Farmers' Design Committee

Preparation of Final Rehabilitation Plan & Cost Estimates

- Based on results of joint walkover along canals and review of Preliminary Rehabilitation Plan by Farmers' Design Committee, Project staff prepare Final Rehabilitation Plan & Cost Estimates

Approval of Final Rehabilitation Plan & Cost Estimates

- Farmers' Design Committee shall approve Final Rehabilitation Plan & Cost Estimates during Design Meeting.
- WUG members shall review and approve Final Rehabilitation Plan & Cost Estimates during WUG Design Meetings.

Signing of Final Rehabilitation Plan & Cost Estimates

- If majority of WUG members has approved Final Rehabilitation Plan & Cost Estimates, WUA Chairperson and PIU Director shall sign approved Final Rehabilitation Plan & Cost Estimates.

PARTICIPATORY PLANNING AND EXECUTION OF DEFERRED MAINTENANCE OF TERTIARY UNITS

- One of main purposes of WUGs is to ensure effective O&M of tertiary units.
- WUG can only operate its tertiary units effectively if all irrigation structures situated in tertiary unit are functional, so that spate water can be distributed efficiently to all fields located in tertiary unit.
- Tertiary units may be partly functioning or non-functional due to lack of (sufficient) maintenance for number of years.

One of first activities to be carried out by WUG could be maintenance of its tertiary unit. PIM Extensionist may facilitate such an initiative by:

- assessment of interest among WUG members to undertake maintenance works;
- supporting WUG with inspection to assess (deferred) maintenance requirements of tertiary unit;
- supporting WUG with planning of execution of (deferred) maintenance works; and
- supporting WUG with execution of (deferred) maintenance works within tertiary unit.

D. FLIP CHART ON COMMUNITY AWARENESS CAMPAIGN

PROPOSED TEXT FOR FLIP CHARTS ON COMMUNITY AWARENESS CAMPAIGN

Name of Project:

- Irrigation Improvement Project

Duration:

- 10 years
- Phase I: 5 years

Phase I Objectives:

- to ensure sustainable and efficient distribution of spate water
- to ensure an increase in agricultural productivity and farmers' income

Main Activities

- promotion of farmers' participation in planning, design, rehabilitation and management of spate irrigation systems
- formation and strengthening of WUOs at different levels of spate irrigation system
- rehabilitation of irrigation infrastructure and roads and construction of flood protection works
- transfer of O&M responsibility for spate irrigation systems to WUOs, including financing of O&M costs
- agricultural extension and demonstration programme

Financing:

- Government of Yemen
- World Bank
- Farmers

Main Actors in Phase I Implementation:

- Farmers through their WUGs and WUAs
- Ministry of Agriculture and Irrigation through its PMU and PIUs in cooperation with TDA and Lahej RAO
- Main Technical Assistance Team (National and International Consultants)

Implementation Conditions:

- effective farmers' participation in all stages of rehabilitation and management of spate irrigation system
- cost-sharing, whereby farmers contribute to capital costs of rehabilitation works
- formation of WUAs prior to start of rehabilitation works
- farmers shall gradually become responsible for paying full O&M costs, except for modern diversion weirs

Participatory Irrigation Management (PIM) Approach:

- implementation of the IIP is a partnership between concerned farmers and MAI
- all concerned farmers are involved in design, rehabilitation and management of spate irrigation system
- all decisions require approval of WUA
- women are informed and consulted during separate meetings throughout entire PIM approach
- following WUOs will be formed at different levels:
 - WUGs at level of tertiary canal or *ma'aqem*
 - WUAs at level of primary canals
 - SWUFs at level of (sub-)Wadi
 - Irrigation Council at level of Wadi

Main Steps of PIM Approach:

- Community Awareness Campaign
- Formation of WUGs
- Participatory Planning and Design of Rehabilitation Works
- Formation of WUA
- Signing of Works and Support Agreement between WUA and MAI
- Execution of Rehabilitation Works

- Formation of Federation of WUAs and Irrigation Council at Wadi level
- Training of WUGs, WUAs and Federation of WUAs
- Participatory Planning and Implementation of Agricultural Extension Programme
- Formulation of Water Management Plans at Wadi and primary canal levels
- Signing of Agreement for formal transfer of O&M responsibility for canals to WUA
- Support Programme for WUA and annual audits/inspections

Tentative Time Schedule:

- Formation of WUGs completed: April 2003
- Formation and Registration of WUA completed: June 2003
- Signing of Works and Support Agreement: July 2003 **OR** November 2003
- Start of Rehabilitation Works: October 2003 **OR** October 2004
- Completion of Rehabilitation Works: March 2004 **OR** March 2005
- Signing of Irrigation Management Transfer Agreement: April 2004 **OR** April 2005

Farmers' Contributions:

- contribution to capital costs of rehabilitation of canals and flood protection structures of:
 - 10% of total costs either in cash or labour (i.e. executing part of rehabilitation through direct contract against reduced price) during execution of rehabilitation works
 - an annual cash repayment of about 25% of the civil works expenditures, starting 5 years after completion of the civil works, over a 20-year period
- payment of Irrigation Service Fee to WUA that will gradually increase over 7-year period following completion of rehabilitation so that all O&M costs are fully recovered

IIP will entirely finance the rehabilitation of diversion weirs.

Training and Support:

- formation and management of WUAs and SWUF, including accounting and conflict resolution
- planning, design, supervision and execution of rehabilitation works
- preparation and execution of annual O&M plans, including water allocation and distribution plan
- development of irrigated agriculture through extension and demonstration activities

Expected Benefits for Farmers:

- scheme rehabilitation reflecting farmers' preferences
- control over quality of rehabilitation works
- full control over scope and quality of O&M of scheme, including water distribution
- full control over employment and dismissal of O&M staff
- full control over assessment, collection and utilisation of Irrigation Service Fees
- improved communication and less conflicts
- improved availability, distribution and use of spate water
- decreased risk of flood damage
- improved agricultural production and incomes

E. IIP – PIM BROCHURE

F. TENTATIVE TIME SCHEDULE FOR 6 PILOT SPATE IRRIGATION SYSTEMS

| PIM Step | Implementation period |
|---|---|
| 2 Community Awareness Campaign | January – February 2003 |
| 3 Agro-Economic, Environmental, Social and Gender Studies | January – April 2003 |
| 4 Assessment of Deferred Maintenance and Rehabilitation Requirements | January – April 2003 |
| 5 Assessment of Existing Water Management and O&M Practices | January – May 2003 |
| 6 Formation of WUGs | February – April 2003 |
| 7 Participatory Planning and Design of Rehabilitation Works | March – June 2003 |
| 8 Formation and Registration of WUAs | May – June 2003 |
| 9 Preparation and Signing of Works and Support Agreements | June – July 2003 |
| 10 Tender and Execution of Main Works | July 2003 – March 2004 or July 2004 – March 2005 |
| 11 Execution of WUA Works | October 2003 – March 2004 or October 2004 – March 2005 |
| 12 Formation and Registration of SWUF(s) | June – July 2004 |
| 13 Technical and Institutional Strengthening of WUGs and WUAs | July 2003 – March 2004 or August 2003 – September 2004 |
| 14 Participatory Planning and Execution of Agricultural Extension Programme | March 2003 – September 2004 |
| 15 Establishment of Irrigation Council | August – October 2004 |
| 16 Final Inspections of Main and WUA Works | March – April 2004 or March – April 2005 |
| 17 Formulation of Wadi Water Management Plan | November 2004 – February 2005 |
| 18 Formulation and Approval of Primary Canal Water Management Plans | October 2003 – January 2004 |
| 19 Preparation and Signing of Irrigation Management Transfer Agreement | March – April 2004 or March – April 2005 |
| 20 Monitoring and Supporting of System O&M and Management of WUAs and SWUF(s) | April 2004 – December 2005 or April 2005 – December 2005 |
| 21 Annual Financial, Technical and Institutional Audit of WUAs and SWUF(s) | April 2004 – December 2005 or April 2005 - December 2005 |