

**Kingdom of Cambodia**  
**Nation Religion King**



**Module 1**  
**On**  
**Introduction to Participatory**  
**Irrigation Management and**  
**Development (PIMD)**

**Prepared by: Ministry of water Resources and Meteorology**

**Dated: 22 / October / 2003**

**Kingdom of Cambodia**  
**Nation Religion King**



Appendix N°...01...of Prokash N°...157...  
Dated: 30 / 07 /2003

**Module 1**  
**On**  
**Introduction to Participatory**  
**Irrigation Management and**  
**Development (PIMD)**

**Prepared by: Ministry of water Resources and Meteorology**

**Dated: 22 / October / 2003**

## TABLE OF CONTENTS

Section	Title	Page
1	Overview of Module 1 .....	1
2	Orientation to the Training program .....	2
3	Overview to irrigated agriculture and reasons for adopting PIMD in Cambodia .....	4
4	Introduction to Participatory Irrigation Management and Development .....	7
5	International experiences with PIMD strategies and results .....	9
6	Summary of Session 1 of Module 1 .....	23

# **Training Manual for Participatory Irrigation Management and Development in Cambodia**

## **Module 1**

### **INTRODUCTION TO PARTICIPATORY IRRIGATION MANAGEMENT AND DEVELOPMENT**

#### ***1. Overview of Module 1***

The objectives of Module 1 are to give participants a clear understanding of the:

1. Purpose, philosophy, topics and organization of the Training Program on PIMD;
2. Nature of recent changes in irrigated agriculture and how they relate to PIMD;
3. Reasons for PIMD;
4. Meaning of key PIMD terms and concepts;
5. Different strategies for PIMD used internationally and key results and lessons learned.

The main outcomes expected are:

1. Participants will be able to explain to their colleagues or farmers, in clear and simple terms: What is PIMD? What are the core principles of PIMD? What are the different aspects of PIMD? Why is PIMD beneficial for Cambodia? Who are the different stakeholders in PIMD? What factors should be considered in order to ensure successful adoption?
2. Participants will know about the basic models for PIMD that have been adopted internationally and what have been their results. They will have a basic understanding of the interconnections between a social/technical context, a PIMD policy, institutional reform, the implementation process, direct outcomes and ultimate impacts.
3. Participants will be able to communicate to others what key elements of PIMD policies and programs are required in order for it to work. They will be able to distinguish between the core, essential principles of PIMD and more detailed aspects which are non-essential or which may be adjusted to suit local circumstances.
4. Participants will prepare a summary of module discussion and results of exercises.
5. Participants will complete the Group Assignment.

[The trainer should find out whether participants understand clearly the proposed objectives and expected outcomes. The trainer should ask whether they have any suggestions for modifying the objectives or outcomes.]

#### ***2. Orientation to the Training Program***

##### **2.1 Objectives of the Training Program for Participatory Irrigation Management and Development in Cambodia**

The title of this training manual is, “Training Manual for Participatory Irrigation Management and Development in Cambodia.” This manual should be used for the Training Program for the Participatory Irrigation Management and Development Program, which is

under the primary responsibility of the Ministry of Water Resources and Meteorology of the Royal Government of Cambodia.

The goal of this training program is to enable the people of Cambodia to achieve locally productive and sustainable management of the country's irrigation systems. The overall purpose of the training program is to improve the livelihood of poor people in rural areas and to conserve the country's precious land and water resources.

The five objectives of the training course are to:

1. Create a common vision among all stakeholders about the purpose, essential principles and strategy for PIMD in Cambodia;
2. Enable policy makers and planners at the national level to further develop and complete the policy, legal and institutional framework for PIMD;
3. Enable planners, government officers, consultants and other professionals at the national and provincial levels to plan, supervise, implement and monitor the PIMD Program;
4. Create capacity among Farmer Water Users Community (FWUC) representatives to establish and manage effective FWUC;
5. Enable government, NGO and private sector organizations to develop and implement an effective support system for FWUC.

## **2.2 Who should be involved in the training program?**

All government officers involved in planning and implementing PIMD, from the level of senior planners to field operations officers at the provincial and district levels, should participate in the training program. Consultants, researchers and trainers who are expected to be involved in the PIMD Program should also be invited to participate. Reporters from the national newspapers could be invited to attend some sessions, to promote public awareness about PIMD.

In general, all participants should attend all modules, regardless of whether they are staff from the national or provincial level. National level officers and professionals should understand clearly what is supposed to happen at the field operations levels so that they can plan and manage budgets and design and implement support services, monitoring and evaluation in ways that are appropriate for local needs. Province-level staff should understand clearly the policy, legislative and institutional framework of PIMD at the national level so that they can act confidently within national policy and laws and so that they will know how to obtain support from the national level.

However, it may not be necessary for all participants to be involved in the workshop assignments for each module. The Module Outline will indicate which participants should participate in the workshop assignments.

## **2.3 What is the philosophy behind the program?**

The philosophy of this training program can be summarized in the words of the ancient Chinese philosopher, Lao-Tse (circa 700 BC):

Go to the people,  
Live with them,

Learn from them,  
Love them,  
Start with what they know,  
Build with what they have,  
But with best leaders,  
When the work is done,  
The task accomplished,  
The people will say,  
“We have done this ourselves.”

The purpose of PIMD is to enable farmers to take over the management of their irrigation systems and achieve their socio-economic aspirations for irrigated agriculture. All training, all government assistance and support services should be provided with the intent to stimulate local investment and local capacity, not to create dependence on government. Within the PIMD Program, all support to the province or district from the National Secretariat for PIMD (or from any other government offices) should be done in such a way as to strengthen the capacity of organizations at the provincial or district level (such as the FWUC Support Team).

The following are six guiding principles for how this training program should be implemented:

1. With the active participation of all relevant stakeholders (because nobody knows everything and everybody has something to contribute);
2. With each participant lending a listening ear to the comments and perceptions of the other participants;
3. With common understanding about the basic principles of PIMD;
4. With tolerance for diversity and encouragement for local creativity in non-essential details;
5. With each participant helping to forge a common vision and consensus about how to move PIMD forward;
6. With the awareness that by helping to design and plan PIMD, participants gain a personal sense of ownership and commitment to it.

#### **2.4 How is the training program organized?**

The training program is organized into seven modules. These are:

1. Introduction to Participatory Irrigation Management and Development
2. Policy, Legal and Institutional Framework for PIMD
3. Implementing PIMD at the National Level
4. Implementing PIMD at the Provincial and Irrigation System Levels
5. Irrigation System Management by the Farmer Water Users Community
6. Support System for the Farmer Water Users Community
7. Monitoring and Evaluation System

Each module uses a combination of lectures by trainers with PowerPoint presentations, group discussions, participatory exercises and group assignments. Each module may take approximately two days, to complete the lectures, discussions and exercises. This does not include the group assignments.

Sometimes, it will be necessary to take a break for several days or weeks between modules to enable participants to return to their workstations and complete their group assignments before the next module. Instructions for this are contained in the section of this Manual entitled, Guide for Training Program.

### **3. *Overview of irrigated agriculture and reasons for adopting PIMD in Cambodia***

#### **3.1 Challenges facing irrigated agriculture in Southeast Asia**

In general, irrigated agriculture in Southeast Asia is dominated by rice and other cereal crops. The real price of rice and other staple crops has declined steadily over the past 15 years. As governments have reduced subsidies on fertilizers and pesticides, prices for these inputs have increased. In recent years, the level of profit for cultivating of rice and other food crops has been, in general, very low. Sometimes it is zero. The average size of farms is small, often less than 1 hectare. This often makes it impossible for farm families to produce enough food or income from farming to support their family. Often, farming becomes a part-time activity while families pursue income also from other non-farm activities. In many areas, farms are cultivated by renters or sharecroppers. Many of these people do not have strong commitments to invest in the long-term fertility of the land or the condition of irrigation facilities.

While it may be in the best interests of farm families to diversify their cropping patterns into higher value commercial crops, often there are constraints to doing this--such as shortage of labor, lack of reliable and timely water supply, uncertain markets, high cost of agricultural inputs, etc. Another challenge is the rising competition for water between farmers and between irrigation systems and other water users, such as municipal water users, hydro-power projects and manufacturing and industry. Competition for water is rising due to increases in population, increases in demands for water outside of agriculture and sometimes also because of less runoff throughout the year due to deforestation and perhaps global warming. In many areas, especially near cities, farmland is being converted into land for housing, factories and other buildings. In the future, the countries of Southeast Asia must learn to produce more food with less water and less farmland.

#### **3.2 Challenges facing irrigation system management in Southeast Asia**

In Southeast Asia, farmers have developed and managed irrigation systems for hundreds, even thousands, of years. There are many examples of highly effective and sophisticated traditional irrigation and irrigation organizations in Southeast Asia, including muang fai irrigation in northern Thailand, the Angkor civilization in northern Cambodia, the Balinese subak irrigation organizations in Indonesia and the zangheras in northern Luzon in the Philippines.

These examples are only a few of many cases where irrigation systems have been productive and sustainable for hundreds of years through management by local people. This demonstrates the intelligence and discipline of farmers, who, if given the right opportunities, right incentives and right kinds of support, have the potential to manage their own irrigation systems mainly with their own resources.

Over the past 50 years, the governments of Southeast Asian countries, and others around the world, have taken over the roles of developing and managing irrigation systems. This dramatically expanded the area under irrigated agriculture, but it led to some problems also. Design and construction of irrigation systems has often been of poor quality, partly due to corruption.

After construction, governments generally have not been able to allocate enough money to pay for proper management of their irrigation systems. So facilities are often in disrepair and water distribution is not as good as it could be. They have not been able, politically, to collect irrigation fees from farmers. So, government-built and managed irrigation systems tend to deteriorate rapidly.

Then governments seek loan programs from international donors to pay for major rehabilitation of dilapidated irrigation systems. After rehabilitation, again not enough funds are made available for maintenance and the facilities deteriorate rapidly again. The vicious cycle of, rehabilitation => inadequate maintenance => rapid deterioration => another rehabilitation project, is wasteful and creates heavy burdens of foreign debt for less developed countries.

Since governments built, managed and rehabilitated the irrigation systems, farmers think it is not their responsibility to manage or pay for them. Farmers have often become dependent upon the government for irrigation system management, but the government normally is not capable of managing the systems for them forever. So now, many governments around the world are working together with farmers, and other water users, to build capacity among water users to take over the management of irrigation systems. Governments are providing technical, financial and organizational assistance to water users associations to build their capacity to manage irrigation systems.

### **3.3 Special characteristics of irrigated agriculture in Cambodia**

The total cultivated area in Cambodia at present is about 2.7 million ha. The potential area that could be brought under cultivation is about 3.7 million ha (nearly all of which has been de-mined). About 1.2 million ha of the area with potential to be brought under cultivation has actually been farmed in the past but is currently not being used. This part of the uncultivated area has potential for relatively rapid development, especially if it can be brought under irrigation.

In Cambodia's irrigation systems, normally only one crop is grown per year. Well-drained areas cultivate during the rainy season. Lowland areas normally cultivate only during the dry season, due to flooding during rainy season. Irrigation is normally used to supplement rainfall. Only about 12% of the total area is cultivated during dry season. Hence, *there is a widespread need for increasing the area served by supplemental irrigation and only a small part of the cultivated area is irrigated at present.*

At present, the total area under irrigation is approximately 473,000 ha (in 1997). Although this is only about 16.6% of the total area cultivated, the irrigated area produces more than half of total agricultural production. Average rice yields in Cambodia are only about 2 tons/ha. Maize yields are about 1.6 tons/ha and soybean yields are about 1 ton/ha. However, in special project areas where water control and agricultural practices are enhanced, rice yields have risen to 3-3.5 tons/ha (such as in PRASAC project areas). Cambodia's relatively low

levels of agricultural productivity are mainly due to lack of good water control, highly variable rainfall, poor soil fertility and low levels of fertilizer use. ***Irrigation is the primary resource to make possible improvements in cropping intensification and higher yields.***

It is estimated that approximately 1 million ha of land could be irrigated from surface water, by low-lift pumps, small diversion weirs and “colmatage” canal systems. There are about 950 irrigation schemes in the country, most of which were developed by the government. An inventory conducted in 1997 found that only about 20% of the schemes were “fully functional” and 14% were not functional at all. ***There is considerable need and potential to improve the infrastructure and management of existing irrigation schemes and, unlike other countries in Southeast Asia, there is much potential to expand the irrigated area.***

Because of very insufficient budgets, most schemes are not being managed routinely by the government (MOWRAM). A general lack of farmer water users communities or village-level organization for irrigation means that ***much irrigation occurs with little, if any, group coordination.***

### **3.4 Reasons for adopting PIMD in Cambodia**

Participatory irrigation management and development is a practical way to encourage farmers to take over responsibility for managing their own irrigation systems and to better make use of limited government and donor resources. The logic is that farmers will invest more in irrigation management and development if they are in control of decision-making about the irrigation service and are able to increase agricultural productivity through making water delivery more responsive to their needs.

PIMD proposes a new partnership where the government regulates, facilitates and supports, but farmers take primary responsibility for irrigation management. Irrigation development will be a joint activity with investment shared by government, donors and farmers.

Why should the Government, donors, NGO’s and technical assistance agencies support PIMD?

1. PIMD is about good governance – achieving accountability between water users, FWUC and the government for effective use of water resources and financial management,
2. PIMD is about empowerment of the rural poor through transfer of authority for irrigation systems to local communities,
3. PIMD is a practical strategy to support poverty alleviation through more productive and profitable irrigated agriculture,
4. PIMD promotes crop diversification, agri-business development and an expanding role for the private sector in provision of support services to the irrigated agriculture sector,
5. PIMD aims to transform supply-driven government administration into responsive, demand-oriented management by water users,
6. PIMD can reduce the requirements for government staff and resources in the irrigation sector. It can even provide private sector jobs for government staff taking early retirement,
7. If effective, PIMD may improve irrigation system maintenance and reduce the need for loan-financed rehabilitation projects.

But why should farmers support PIMD?

1. PIMD empowers farmers to become the primary decision makers about their irrigation services,
2. PIMD will replace anarchy over water distribution with locally-agreed rules and arrangements for improved water delivery and drainage,
3. FWUC meetings, election of FWUC leaders, irrigation service plans and irrigation management audits will make management of irrigation systems accountable to the broad set of water users,
4. Through more reliable water delivery, PIMD can help raise the productivity of agriculture, through intensification and expansion of service areas,
5. PIMD facilitates cooperative action for bulk purchase of inputs, marketing and formation of agri-businesses (to increase the income of farmers),
6. PIMD provides a viable arrangement whereby farmers can obtain assistance from the government for rehabilitation, upgrading and extension of irrigation infrastructure,
7. PIMD motivates farmers to invest in maintenance of infrastructure through service agreements and agreements for cost sharing, and
8. PIMD normally reduces the frequency of water disputes.

#### ***4. Introduction to Participatory Irrigation Management and Development***

##### **4.1 What is “Participatory Irrigation Management and Development?”**

In Cambodia, Participatory Irrigation Management and Development (PIMD) means that Farmer Water Users Communities (FWUC) take over primary responsibility and authority:

- To manage, repair and improve existing irrigation systems and
- To develop new irrigation systems.

PIMD means that FWUC will take the lead role in managing and repairing their irrigation systems. It means that FWUC will take the lead role in promoting and guiding development of new irrigation systems. It does *NOT* mean that farmers will have to pay all the cost of irrigation management and development.

If FWUC need financial, technical or other assistance, the government or private sector will provide it, if possible. But in the future, PIMD requires that all assistance to irrigation systems will be provided in ways that encourage—not discourage—local investment by the FWUC. Assistance will be provided in ways that build the capacity of the FWUC to be self-reliant. Assistance will be restructured so that it will be provided in ways that avoid creating dependence of the FWUC on the government.

##### **4.2 Key definitions**

To be clear about what is meant by “Participatory Irrigation Management and Development,” it is necessary to adopt common definitions for the following terms:

- **Irrigated agriculture** is the set of human activities employed to raise crops, livestock or fish in order to provide socio-economic livelihoods for people.

- An **irrigation system** is the set of human-made facilities that divert water from its source, convey and distribute water to fields to support crop, livestock and fish production, and sometimes other human needs, and dispose of excess water.

Normally, crop production is the main purpose of an irrigation system. But often farmers also grow feed for livestock, supply water to fish ponds and obtain water for washing and bathing—all from an irrigation system.

- **Irrigation system management** is the set of human activities employed in order to use, maintain and improve irrigation systems.

Irrigation system management (or irrigation management) includes the following seven essential functions:

- 1) Defining what the water service should be,
- 2) Selecting and authorizing a service provider,
- 3) Developing an Irrigation Service Plan,
- 4) Delivering and disposing of water through the irrigation system,
- 5) Maintaining and repairing irrigation system facilities,
- 6) Mobilizing resources to pay for the costs of irrigation system management,
- 7) Enforcing rules and settling disputes.

- **Irrigation system development** is the set of human activities employed in order to identify a site for construction of a new irrigation system, organize prospective water users and have them identify future water service requirements, conduct a feasibility assessment, design and construct the physical facilities of an irrigation system and build capacity within the water users to take over management of the new irrigation system.

#### 4.3 What are the four essential principles of PIMD?

It is important to understand the difference between: 1) the essential aspects of PIMD that should always be present, and 2) non-essential details that should be permitted to vary from place to place depending on local circumstances. The following are the **four essential principles about PIMD** that should always be present. These are underlined. Examples of non-essential details that could vary according to local circumstances are given in brackets below the description of each principle.

1. Empowerment of FWUC -- This means that all water users served by a common irrigation system select FWUC leaders, establish the FWUC, agree on its constitution and rules and approve its basic policies. It means that the FWUC is established as an independent legal entity with the full decision-making authority to manage the irrigation system, based on the principles of ‘one irrigation system = one system of management.’

*[What varies? Structure of the organization, what rules it has, policies of the FWUC, size and boundaries of the FWUC, how it enforces its policies.]*

2. FWUC defines the water service and selects its service provider – FWUC leaders and members agree on what kinds of water services will be provided by the irrigation system and how they should be provided. The FWUC has the right to choose who will provide its

irrigation services and to negotiate the terms and conditions for service provision. It appoints and authorizes the service provider to perform its functions.

*[What varies? What kind of cropping pattern is desired by each FWUC? How does each FWUC want to schedule water deliveries? What is the schedule of activities for maintenance and repairs of irrigation facilities? Will the FWUC select its own members to provide the irrigation services or will it hire staff, make a contract with a contractor or request government staff to provide some services?]*

3. Partnership and mutual accountability between the service provider, FWUC leaders, members of the FWUC, government and other service organizations – The service provider serves the FWUC leaders, as authorized. If not, service providers can be removed from their position. The FWUC leaders follow the will of FWUC members, as authorized by them in elections and meetings. If not, FWUC leaders can be removed from their offices. The FWUC, government and other organizations interact with each other as partners, not masters and servants. Arrangements for services, training, etc. are formalized by agreements between the parties concerned.

*[What varies? The specific rules and arrangements that the FWUC uses to ensure that service providers are accountable to FWUC leaders and FWUC leaders are accountable to FWUC members; the specific kinds of support services that are provided to the FWUC (according to the local needs of the FWUC); the specific terms and conditions for service agreements between the FWUC and service provider.]*

4. Demand-driven support system based on cost sharing – The government withdraws from direct management of the irrigation system and focuses on regulating the water sector, providing assistance and support services to FWUC and building capacity in the FWUC. New arrangements are created to provide support services on basis of requests from FWUC and the principle of cost sharing.

*[What varies? Details about restructuring government departments, personnel redeployment, specific services that are provided to different FWUC.]*

## **5. *International experiences with PIMD strategies and results***

### **5.1 Why is PIMD being adopted in many places around the world?**

The most common reasons why governments adopt PIMD programs are:

1. To reduce the dependence of farmers on government and reduce the cost for the government of irrigation system management,
2. To improve the physical sustainability of irrigation systems and reduce the need for frequent rehabilitation projects,
3. To improve the efficiency and cost effectiveness of government expenditures,
4. To improve the productivity of irrigated agriculture,
5. To make it easier for the government to assist and regulate water users associations.

## 5.1 Types of strategies used internationally

Some countries adopt only pilot projects to organize water users associations. They don't bother to pass laws to give water users associations legal status. They don't restructure and re-train the government irrigation agency. The agency still controls the irrigation systems. Not enough capacity building for the water users associations was done.

In these cases, after the projects are over, the water users associations stop functioning. They never received the legal authority, never had enough training and didn't have the incentives to function very long.

In other cases, governments have high level commitment to adopt comprehensive irrigation sector reform programs that include clear policies, new legislation, restructuring of government agencies, formation of federated water users associations, new support services, etc. In these cases, more successful results are achieved.

We will review some case studies about PIMD programs in other countries. This will give us a better understanding of what are the essential principles of PIMD, what are the different strategies used in other countries and in general, what works and what doesn't work.

## 5.3 Case Study 1: Andhra Pradesh, India

(Taken from profile prepared by Raymond Peter for the International Email Conference on Irrigation Management Transfer, FAO, 2001)

### IMT Program

<b>Year IMT began:</b>	1997
<b>Target area to be transferred:</b>	4,840,000 ha
<b>Area transferred by 2000:</b>	4,840,000 ha
<b>IMT financed:</b>	State funds and foreign loan funds

### Irrigation and Agriculture

<b>Area irrigated:</b>	4,840,000 ha. (data from Min. of Irrigation and CAD)
<b>Surface irrigation:</b>	2,927,000 ha
<b>Lift irrigation:</b>	2,819,000 ha
<b>Main crops irrigated:</b>	Paddy, chilies, sugarcane groundnut, turmeric and tobacco
<b>Farmers:</b>	87% landowners, 13% tenants
<b>Farm sizes:</b>	97% <5 ha, 2.% =5-10ha, 0.4%=10-20ha, 0.04% >20ha

### IMT Policy

#### **Top factors that motivated IMT (listed by priority):**

1. Poor maintenance of irrigation systems
2. Poor operation of irrigation systems
3. Farmers requested to take over management
4. Shortage of government funds to allocate to irrigation O&M
5. A Chief Minister committed to people's involvement in management

**Main sources of support for IMT:**

- Highest level of government
- Parliament
- Media
- NGOs

**Type of policy issuance:** Policy statement in the legislature followed by legislation on the subject

**Irrigation systems included in IMT:** All irrigation systems under government control excluding projects located on tribal areas and small systems run by local government

**Hydraulic levels transferred:**

- All of scheme, including headworks in minor schemes (>2,000 ha)
- Up to main canal level in all medium schemes (2,000 - 10,000 ha)
- Up to main canal level in all major schemes (<10,000 ha),

**Full responsibility and authority devolved for:**

- Operation and maintenance
- Financing O&M
- Enforcing sanctions
- Resolving disputes
- Imposing service fees

**Partial responsibility and authority devolved for:**

- Financing rehabilitation and modernization

**Management transferred to:**

Water Users' Associations (at minor canal level) and Distributory Committees (at secondary canal level)

**Legal framework for IMT:**

- Water use right for WUAs
- WUAs have right to use and maintain irrigation infrastructure
- WUAs have right to enforce sanctions, obtain credit and make contracts
- WUAs have right to develop businesses and make profit
- Dispute settlement and appeal process
- Policy to redeploy agency staff displaced by IMT
- Technical support service for WUAs

**Implementation process**

- Farmer participation in planning / review
- Formation of WUAs
- Democratic selection of WUA leaders
- Training of WUA staff in finance & administration
- Training of WUA staff in O&M, repair/improvement of infrastructure

- Farmer participation in repairs/improvements
- Farmers paid part of cost of repairs/improvements
- Training for irrigation agency staff
- Redeployment of agency staff under WUA control
- Monitoring and evaluation program

### **Results of IMT**

<b>Cost of irrigation:</b>	Decreased for farmers and temporarily increased for government (during transition)
<b>Efficiency of fee collection:</b>	Increased
<b>Quality of maintenance:</b>	Increased
<b>Timeliness of water delivery:</b>	Increased
<b>Equity of water delivery:</b>	Increased
<b>Area irrigated:</b>	Increased
<b>Crop yields:</b>	Increased
<b>Farm income:</b>	Increased

### **Key Lessons Learned**

**Policy/legal framework:** Adequate economic incentives need to be built up for farmers to be willing to take part in participatory irrigation management (PIM) or IMT. Empowerment of farmers needs to be real. Clear water rights for WUAs and individual farmers need to be issued. A clear law defining the roles and responsibilities of the irrigation agency and the WUA is needed.

**Implementation process:** The IMT program started with wide consultation at all levels (farmers, irrigation agency, political parties, etc) and by different means (television, radio, public meetings, seminars and consultations). Consultation with other government officials was extensive. WUA areas were delineated, WUA officers were elected democratically in over 10,000 WUA throughout the state on the same day. Main issues and problems included cumbersome government procedures, irrigation agency indifference and late release of funds. Frequent meetings between WUA presidents and government officers sustained dialogue and facilitated adjustments. Good positioning of the young senior engineers who have the commitment and the incentive to support the reform program was very important.

**Support services:** There is need for a well-designed capacity building program. Enough financial support is required to undertake training based on participatory rural appraisal (PRA) techniques. WUAs need to keep in continual touch with the irrigation agency and the government. A well-conceived program of maintenance and rehabilitation with assured funds is a must. The irrigation agency should provide simplified procedures. Training is needed for O&M, budgeting and bookkeeping. A system of joint technical, financial and social audits of WUA should be set up.

**Reorientation of irrigation agency:** The irrigation agency no longer handles supervision of WUA budgets after IMT. WUAs receive funds directly from the government for maintenance and rehabilitation. The irrigation agency changed its role from implementer to facilitator. Assistant engineers were assigned as staff of federated WUAs. Irrigation and drainage agencies were merged and a plan for staff redeployment was adopted.

#### **5.4 Case Study 2: PIMD in Albania**

(Taken from profile prepared by Ylli Dede for International Email Conference on Irrigation Management Transfer, FAO, 2001)

##### **IMT Program**

**Year IMT began:** 1996  
**Target area to be transferred:** 180,000 ha  
**Area transferred by 2000:** 110,000 ha  
**IMT financed:** Mostly from foreign loan funds

##### **Irrigation and Agriculture**

**Area irrigated:** 180,000 ha (area currently irrigated)  
350,000 ha gross irrigated area (including non-functional infrastructure)  
**Surface irrigation:** 150,000 ha  
**Lift irrigation:** 30,000 ha  
**Main crops irrigated:** Maize, alfalfa, vegetables and watermelon  
**Farmers:** 90% landowners, 10% tenants  
**Farm sizes:** 100% = 1 - 1.5 ha (after redistribution in 1991)

##### **IMT Policy**

###### **Top factors that motivated IMT (listed by priority):**

- Shortage of government funds to allocate to irrigation O&M
- Poor maintenance of irrigation systems
- Insufficient government collection of water fees
- Farmers requested to take over management
- Poor operation of irrigation systems
- Pressure from central department
- Vandalism of irrigation systems during the transition period due to civil unrest

###### **Main sources of support for IMT:**

- High level government officials
- Parliament
- Irrigation agency
- Farmers
- World Bank

**Type of policy issuance:** Act of parliament and policy statement by the sectoral department

**Irrigation systems included in IMT:** All irrigation systems under government control

**Hydraulic levels transferred:** Headworks and all below

###### **Full responsibility and authority devolved for:**

- Operations & maintenance
- Financing O&M

**Partial responsibility and authority devolved for:**

- Financing rehabilitation and modernization
- Enforcing sanctions and resolving disputes
- Development of cooperative businesses

**Management transferred to:**

Water users' associations

**Policy/legal framework for IMT:**

- Water right for users
- WUAs right to use and maintain irrigation infrastructure
- WUAs right to enforce sanctions, obtain credit and make contracts

**Implementation process**

- Formation of WUAs with the help of promoters
- Democratic selection of WUA leaders
- Training of WUA staff in finance & administration
- Training of WUA staff in O&M, repair/improvement of infrastructure
- Farmer participation in repairs/improvements
- Farmers paid part of cost of repairs/improvements
- Training for irrigation agency staff
- Redeployment of agency staff
- Monitoring and evaluation program

**Results of IMT**

<b>Cost of irrigation:</b>	Decreased for farmers and government
<b>Efficiency of fee collection:</b>	Increased
<b>Quality of maintenance:</b>	Increased
<b>Timeliness of water delivery:</b>	Increased
<b>Equity of water delivery:</b>	Increased
<b>Area irrigated:</b>	Increased
<b>Crop yields:</b>	Increased
<b>Farm income:</b>	Increased

**Key Lessons Learned**

**Policy/legal framework:** Policy on water resources management at national level needs to be addressed. Laws on water rights for irrigation need further development. There is a need for further legislation on drainage service charges so that the users will finance it.

**Implementation process:** The IMT process was initially driven by the World Bank and encountered resistance by the public water service provider, which felt threatened by the process. Support for the IMT process was generated through seminars held locally and workshops and study tours abroad sponsored by the World Bank. WUAs were initially created based on villages, and one year later were converted into hydraulic-based WUAs supported by legislation. Main constraints to IMT are the highly deteriorated state of the irrigation systems

as well as the lack of sufficient financial resources of the WUAs to handle maintenance adequately. Drainage Boards created by new legislation still have to be implemented.

**Support services:** Coordinators and promoters were hired to help set up the WUAs. A WUA support unit was created within the Ministry of Agriculture. Training for the WUA members is currently being provided by an NGO specially created for this purpose, with the support of the World Bank.

**Reorientation of irrigation agency:** Reorientation includes the setting up of a WUA supervision unit within the ministry of agriculture and creation of Drainage boards that will replace the current water service provider.

### 5.5 Case 3: PIMD in Mexico

(Taken from profile on irrigation management transfer, IMT, by Carlos Garces-Restrepo for International Email Conference on Irrigation Management Transfer, FAO, 2001)

#### IMT Program

<b>Year IMT began:</b>	1989
<b>Target area to be transferred:</b>	3,400,000 ha
<b>Area transferred by 2000:</b>	3,236,000 ha (to Modulos or secondary canal level)
<b>IMT financed:</b>	Jointly financed from national funds and foreign loans

#### Irrigation and Agriculture

<b>Area irrigated:</b>	6,256,032 ha (1997)
<b>Surface irrigation:</b>	5,802,182 ha
<b>Lift irrigation:</b>	453,850 ha
<b>Main crops irrigated:</b>	Maize, wheat, sorghum, beans, soybean, alfalfa, sugar cane, rice
<b>Farmers:</b>	60% landowners, 40% tenants; with land tenure divided among <i>ejeditarios</i> <sup>1</sup> (55%) and private growers (45%)
<b>Irrigation categories:</b>	25% < 1 ha, 1 ha < 55% < 5 ha, 5 ha < 10% < 10 ha, 10 ha < 8% < 20 ha, 2% > 20 ha

#### IMT Policy

##### **Top factors that motivated IMT:**

- Shortage of government funds to allocate to irrigation O&M
- Pressure from central department
- Part of general liberalization policies of government
- Poor maintenance of irrigation systems
- Government could not collect enough fees from water users
- Poor operation of irrigation systems

##### **Main sources of support for IMT:**

- High government office
- Financial/planning department/ministry

---

<sup>1</sup> Farmers to whom government allocated land use rights.

**Type of policy issuance:** Policy statement by the government and by sectoral department

**Irrigation systems included in IMT:** All 82 irrigation districts that were managed by the National Water Commission.

**Hydraulic levels transferred:** The IMT program had two phases. During phase I the districts were turned over to WUAs below the main canal level. The second phase calls for the turnover of the main canal to a federation of associations known as SRLs (societies with limited liability). To the present, this has only been done in a very few cases. The dams and major headworks remain in the hands of the government.

**Full responsibility and authority devolved for:**

- Operation and maintenance
- Financing operation and maintenance

**Partial responsibility and authority devolved for:**

- Financing rehabilitation and modernization
- Enforcing sanctions and resolving disputes
- Development of cooperative business

**Management transferred to:**

- Water Users' Associations
- SRLs (societies with limited liability) (So far, only in a few cases)

**Policy/legal framework for IMT:**

- Water right for WUAs
- WUA right to use and maintain irrigation infrastructures
- WUA legal right to enforce sanctions, obtain credit and make contracts
- Dispute settlement and appeal process

### **Implementation Process**

- IMT steering committee
- Farmer participation in planning / review
- Formation of WUAs
- Democratic selection of WUA leaders
- Training for WUA staff in finance and administration
- Limited training for WUA staff in O&M
- Repair, rehabilitation and/or modernization of infrastructure
- Limited training for irrigation agency staff
- Limited redeployment of agency staff
- Monitoring and evaluation program

### **Results of IMT**

<b>Cost of irrigation:</b>	Increased for farmers and decreased for government
<b>Efficiency of fee collection:</b>	Increased in most districts (decreased in some cases)
<b>Quality of maintenance:</b>	Improved

<b>Timeliness of water delivery:</b>	Improved
<b>Equity of water delivery:</b>	Unchanged (it was not an issue prior to IMT)
<b>Area irrigated:</b>	Same (increased in modernized systems)
<b>Crop yields:</b>	Same (field-based research) / increased (GOM surveys)
<b>Farm income:</b>	Increased
<b>Salinity:</b>	Unchanged (not directly related to IMT)
<b>Waterlogging:</b>	Unchanged (not directly related to IMT)

### **Key Lessons Learned**

**Policy/legal framework:** The program was accompanied with a new water law that defined property rights over water and provided the new water users associations with clear rights, roles, functions and responsibilities. In addition, it was developed on already existing strong institutional and ideological basis for user representation in the new organizations. The water markets that are emerging as a result of changes in the Mexican Water Law will bring about a reshaping of the irrigated agriculture sub-sector in the country. A major legal issue that remains unanswered, stemming from IMT, is related to the ownership of the infrastructure. This will become an issue when the time comes some years down the road for the rehabilitation of the systems. Who will pay and under what conditions?

**Implementation process:** The IMT program in Mexico was part of an overall strategy of the GOM to modernize the country. It had clear objectives and goals and had political support at the highest levels in the government. Initially there was some reluctance from the irrigation agency to participate in the IMT program, but soon afterwards it became an active partner for the implementation process. The program also had some resistance at the beginning from farmers that were not well aware what the program was about and what benefits it represented. As the training and promotion of IMT moved forward, the process gained confidence and farmers accepted it.

The resistance faced by IMT in the districts was proportional to both technical and socio economic problems encountered in those districts. The more business-like districts in the northwest had almost no resistance, while those in the southfacing poverty and agricultural constraints underwent a much slower process. The IMT program had an specific component geared towards the creation of WUA, farmers were visited in the fields and at home and a well-developed plan to identify farmer leaders was put into place. The changes in the water law to help define better water rights and concessions at the “modulo” level (association level) was also a major incentive for farmers wanting to join the WUAs that were being proposed under IMT. The program was designed with very clear financial targets. Each step of the implementation process had specific funds allocated to it, most noticeable was the promotional, training, and rehabilitation and modernization components. Likewise, the cost recovery goals from the users were well spelled-out and explained. Financial autonomy for the service organizations to be established in both phases of the process was specified.

According to the IMT policy, the modulos’ (water users associations) are supposed to federate into Limited Responsibility Societies (SRL) at the main system level, but until the present, this has not been done in more than only a very few cases. It is not clear whether the government has opted to cancel the plan to form SRL’s universally or has only slowed the process.

**Support services:** With IMT implementation and the new institutional arrangements

derived from it, many support services that were previously provided by government agencies also became part of the WUA responsibilities. These dealt with agricultural extension services, technical assistance, legal matters and training programs. IMT has shown that in Mexico, the WUAs have been fairly successful in addressing these issues as well, on top of the O&M and administrative services they have taken over. There are still some legal and financial issues that do not allow the WUA to carry on with some of these services.

**Reorientation of irrigation agency:** Efforts are being made to reorient the agency's activities and provide other employment opportunities to their employees. Recently, the agency has taken a more supervisory and regulatory role and has found other areas of concentration, such as providing support to the irrigation "Unidades",<sup>2</sup> which until now had received little or no support from the agency. Likewise, the agency is becoming involved with the establishment of groundwater-based users organizations known as COTAS for their Spanish acronym, which follow the pattern of the surface water WUAs. This latter effort is also part of an integrated watershed management approach being implemented country-wide, within which the irrigation agency is playing an important role.

### **5.6 Case Study 4: PIMD in Nepal**

(Taken from Irrigation Management Transfer Profile prepared by Krishna C. Prasad and Rajendra L. Shilpakar for the Intl Email Conference on Irrigation Management Transfer, FAO, 2001)

#### **IMT Program**

**Year IMT began:** 1987  
**Target area to be transferred:** Not defined  
**Area transferred by 2000:** 21,500 ha  
**IMT financed:** Mainly from foreign loan funds

#### **Irrigation and Agriculture**

**Area irrigated:** 1,091,000 ha  
**Surface irrigation:** 900,000 ha  
**Lift irrigation:** 168,000 ha  
**Main crops irrigated:** Paddy, wheat and maize  
**Farmers:** 91% landowners, 9% tenants  
**Irrigation categories:** 26% <1ha, 27%=1-2 ha, 17%=2-3 ha, 24%=3-10 ha, 6% >10 ha

#### **IMT Policy**

##### **Top factors that motivated IMT (listed by priority):**

- Shortage of government funds to allocate to O&M
- In the absence of new projects, IMT offered some scope of work for agency staff
- Government could not collect enough fees from water users
- Poor maintenance of irrigation systems
- Poor operation of irrigation systems
- Previous successful local experiences

---

<sup>2</sup> Unidades are relatively small-scale farmer managed irrigation systems.

- Farmers requested to take over management of schemes
- Pressure from central department
- Part of general liberalization policies of government

**Main sources of support for IMT:**

- Legislature
- Irrigation agency
- International agencies (USAID, Asian Development Bank)

**Type of policy issuance:** Act of parliament, policy statements by planning department and by sectoral department, as well as general policy on decentralization.

**Irrigation systems included in IMT:** Full transfer for all schemes <500 ha in hills and <2,000 ha in plains. Gradual transfer in all other schemes.

**Hydraulic levels transferred:**

- Full transfer, including headworks, in schemes <500 ha in hills and <2,000 ha in plains
- Joint management but eventual transfer in larger schemes

**Full responsibility and authority devolved for:**

- Operation and Maintenance
- Financing operation and maintenance
- Financing rehabilitation and modernization

**Partial responsibility and authority devolved for:**

- Enforcing sanctions and resolving disputes
- Development of cooperative businesses

**Management transferred to:**

Water Users' Associations

**Policy/legal framework for IMT:**

- Water right for users
- Water right for WUAs
- WUA right to use and maintain irrigation infrastructure
- WUA legal right to enforce sanctions, obtain credit and make contracts
- WUAs have right to develop businesses and make profits
- Dispute settlement and appeal process
- Policy to redeploy agency staff displaced by IMT
- Technical support service for WUAs

**IMT Implementation Process**

- IMT steering committee
- Farmer participation in planning/review
- Formation of WUAs
- Democratic selection of WUA leaders

- Training of WUA staff in finance and administration
- Training of WUA staff in O&M, repairs/improvement of infrastructure
- Repair, rehabilitation or modernization of infrastructure
- Farmer participation in repairs/improvements
- Farmers paid part of cost of repairs/improvements
- Training for irrigation agency staff
- Redeployment of agency staff
- Monitoring and evaluation program

### **Results of IMT**

<b>Cost of irrigation:</b>	Increased for farmers and decreased for government
<b>Efficiency of fee collection:</b>	Increased
<b>Quality of maintenance:</b>	Improved
<b>Timeliness of water delivery:</b>	Improved
<b>Equity of water delivery:</b>	Improved
<b>Area irrigated:</b>	Increased
<b>Crop yields:</b>	Same
<b>Farm income:</b>	Same

### **Key Lessons Learned**

**Policy/legal framework:** Provisions should be made for empowering WUAs and making them accountable to farmers and the government to fulfil their responsibilities

**Implementation process:** The IMT process in Nepal was mainly driven by the government’s lack of funds to continue with irrigation management and by the expectation that farmer- managed irrigation systems would perform better than agency-managed systems. The IMT process has encountered some obstacles, such as “status conscious” agency staff who do not like the increased interaction with farmers and lack of funds for proper implementation of the transfer program. Negotiations with WUAs about the terms and conditions of transfer has presented some difficulties, as farmers want to receive their system in a favourable condition. Some WUAs have not been able to keep pace with required O&M activities, which has raised concerns about possible non-sustainability of transferred systems.

**Support services:** Post transfer support is needed to build up the institutional capacity of WUAs and to ensure sustainable operation and maintenance, adequate resource mobilization, improved agricultural practices and on-farm water management and effective monitoring, evaluation and feedback.

**Reorientation of irrigation agency:** No formal plans to reorient the irrigation agency have been prepared.

### **5.7 International lessons about PIMD: What works? What doesn’t?**

International experience suggests that the following partial approaches to PIMD do not produce desirable results.

1. PIMD does not have high-level political commitment and there is not a strong policy or legal basis for it. Water users associations (WUA) are not given clear LEGAL STATUS. WUA's have no clear WATER USE RIGHTS.
2. Full DECISION MAKING AUTHORITY is not transferred to WUA's. Government approval is still needed for the O&M plan, budget, water allocation, etc.
3. Water Users Associations do NOT FEDERATE up to the main system level, but are only established at the tertiary or minor canal level. They have not control over water allocation to the tertiary or minor canal levels.
4. The irrigation agency does not change how it RELATES TO FARMERS. It still relates to farmers in an authoritarian, top-down, father-to-child way.
5. The irrigation agency does not RESTRUCTURE itself to take on NEW ROLES, such as reducing its role in managing irrigation systems and focusing on new roles of providing technical support services, regulating water resources, environmental management, monitoring and evaluation, etc.
6. The irrigation agency resists PIMD because staff think that the agency will lose power and its budgets will shrink.
7. No change in how irrigation management is FINANCED. Cost sharing is still not required. Government subsidies are still designed in a way that makes farmers dependent on the government.
8. During the PIMD process, the irrigation agency FOCUSES ON REHABILITATION instead of building capacity in WUA's. There is no change in policy about REHABILITATION & MODERNIZATION. They are still financed by foreign loans or the government, without any local investment and with little participation, if any, by farmers.
9. There is no parallel program to develop agriculture, marketing and agri-business.

By contrast, international experience suggests that the following general practices for PIMD produce positive results.

1. PIMD is based on a strong and clear policy and legal framework, with strong political support from the highest levels of government. Water users associations (WUA) have clear LEGAL STATUS and clear WATER USE RIGHTS.
2. Full DECISION MAKING AUTHORITY for irrigation system management is transferred to WUA's.
3. Water Users Associations FEDERATE up to the main system level in a phased manner, consistent with the principle of 'one irrigation system = one system of management.'
4. The irrigation agency adopts a NEW PARTNERSHIP relationship with WUA's, which is based on requests from WUA's, mutual agreements and arrangements to ensure mutual accountability.
5. The irrigation agency undergoes a broader water sector strategic planning process which results in a RESTRUCTURING of the agency to take on NEW ROLES, such as reducing its role in managing irrigation systems and focusing on new roles of providing technical support services, regulating water resources, environmental management, monitoring and evaluation, etc.
6. Because of the restructuring and identification of new roles, the irrigation agency does not resist PIMD, because its staff know that the agency will have new, interesting roles to play in support services, regulation, etc.

7. PIMD includes restructuring of how the irrigation sector is financed. The principle of cost sharing is adopted. Government subsidies are re-designed in such a way they stimulate local matching investment.
8. During the PIMD process, the irrigation agency focuses primarily on building the capacity of WUA's. Rehabilitation and modernization of infrastructure, if needed, is organized according to the principles of cost sharing and empowerment of WUA's. The government adopts a new strategy for financing and implementing rehabilitation and modernization that is consistent with PIMD principles and financial restructuring.
9. The government adopts a revitalized program to develop agriculture, marketing and agri-business in a manner consistent with the principles and local institutional arrangements set up by PIMD.

The PIMD Program in Cambodia should be designed and implemented based on the lessons from international experience. But it should also be based on the specific needs and circumstances of Cambodia. It is the responsibility of the directors, trainers and participants of the Training Program on PIMD in Cambodia to work out the details for implementing PIMD in a way that uses the best lessons from international experience but also the best knowledge about the needs and circumstances in Cambodia.

## **5.8 Review of four essential principles of PIMD**

It is important that participants understand clearly what are the essential principles of PIMD. It is also important that participants remember the differences between essential aspects and non-essential details. So in conclusion, we review once more the four essential principles of PIMD. *[The trainer may wish to review this by asking participants to identify the four principles, after which they are written, one by one, on a board. The trainer may also ask participants to mention what kinds of non-essential details related to each principle, should be allowed to vary according to local circumstances.]*

2. Empowerment of FWUC -- This means that all water users served by a common irrigation system select FWUC leaders, establish the FWUC, agree on its constitution and rules and approve its basic policies. It means that the FWUC is established as an independent legal entity with the full decision-making authority to manage the irrigation system, based on the principles of 'one irrigation system = one system of management.'

*[What varies? Structure of the organization, what rules it has, policies of the FWUC, size and boundaries of the FWUC, how it enforces its policies.]*

2. FWUC defines the water service and selects its service provider – FWUC leaders and members agree on what kinds of water services will be provided by the irrigation system and how they should be provided. The FWUC has the right to choose who will provide its irrigation services and to negotiate the terms and conditions for service provision. It appoints and authorizes the service provider to perform its functions.

*[What varies? What kind of cropping pattern is desired by each FWUC? How does each FWUC want to schedule water deliveries? What is the schedule of activities for maintenance and repairs of irrigation facilities? Will the FWUC select its own members to provide the irrigation services or will it hire staff, make a contract with a contractor or request government staff to provide some services?]*

3. Partnership and mutual accountability between the service provider, FWUC leaders, members of the FWUC, government and other service organizations – The service provider serves the FWUC leaders, as authorized. If not, service providers can be removed from their position. The FWUC leaders follow the will of FWUC members, as authorized by them in elections and meetings. If not, FWUC leaders can be removed from their offices. The FWUC, government and other organizations interact with each other as partners, not masters and servants. Arrangements for services, training, etc. are formalized by agreements between the parties concerned.

*[What varies? The specific rules and arrangements that the FWUC uses to ensure that service providers are accountable to FWUC leaders and FWUC leaders are accountable to FWUC members; the specific kinds of support services that are provided to the FWUC (according to the local needs of the FWUC); the specific terms and conditions for service agreements between the FWUC and service provider.]*

4. Demand-driven support system based on cost sharing – The government withdraws from direct management of the irrigation system and focuses on regulating the water sector, providing assistance and support services to FWUC and building capacity in the FWUC. New arrangements are created to provide support services on basis of requests from FWUC and the principle of cost sharing.

*[What varies? Details about restructuring government departments, personnel redeployment, specific services that are provided to different FWUC.]*

## **6. Summary of Session 1 of Module 1**

Reporters present their summary of key points raised in Session 1 discussions and exercises.

**End of Session 1, Module 1**