

Kingdom of Cambodia
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Module 6
On
Monitoring and Evaluation System
for PIMD

Prepared by: Ministry of water Resources and Meteorology

Dated: 22 / October / 2003

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

Module 6

**MONITORING AND EVALUATION SYSTEM
FOR PARTICIPATORY IRRIGATION
MANAGEMENT AND DEVELOPMENT**

Session 1: Classroom Training

1. *Review of Module 5*

1. Reporter presents brief summary of Module 5, Session 1. This is followed by questions and answers for clarification.
2. Someone presents results of a selected Working Group Assignment for Module 5, Session 2. This is followed by discussion.

2. *Overview of Module 6*

The purpose of Module 6 is to create awareness and understanding among participants about the appropriate monitoring and evaluation (M&E) system to support implementation and further development of the Participatory Irrigation Management and Development (PIMD) Policy in Cambodia. This module should enable participants to design and implement the M&E system.

The M&E system proposed for the PIMD program includes the following components:

1. Objectives of the M&E system,
2. M&E design principles,
3. PIMD information requirements,
4. Suggested indicators, data and information to be collected,
5. Methods for data collection and management (to be determined in a workshop and by the National Secretariat for PIMD),
6. Roles of different stakeholders in the M&E process,
7. Arrangement for utilizing results,
8. Schedule for implementation, and
9. Resource requirements for successful implementation.

The M&E system is based on the view that M&E should be:

1. simple,

2. concise,
3. support planning and decision-making requirements,
4. relevant to the interests of all key stakeholders and
5. well integrated into program implementation.

3. *Basic Principles for the Monitoring and Evaluation System*

3.1 Purposes of monitoring and evaluation

Monitoring and evaluation (M&E) will be designed and implemented nationwide, starting with the initial pilot provinces financed under the ADB Loan program, and eventually including all irrigation systems in the country. The M&E system will provide a data base on basic physical features of the irrigation scheme and its environment, condition of irrigation scheme infrastructure, the process and outcomes of organizing FWUC Support Teams and FWUC, process and outcomes of participatory infrastructure improvement, process and outcomes of agricultural extension and performance of irrigated agriculture.

The purposes of the M&E system are to provide a systematic database of all information necessary to enable the Royal Government of Cambodia to:

1. Plan and supervise implementation of PIMD,
2. Further revise and develop the PIMD policy and strategy and
3. Mobilize additional resources for further actions in support of PIMD.

Specific objectives of the M&E system are to obtain all pertinent data, create an appropriate database and issue timely reports on PIMD. This will include information on at least the following components:

1. Condition of irrigation schemes prior to intervention,
2. Progress and problems encountered in building capacity implement PIMD successfully and provide essential support services,
3. Progress and problems encountered in establishing and building capacity of FWUC,
4. Progress and problems encountered in participatory infrastructure improvement,
5. Outcomes of FWUC development, infrastructure improvement and provision of support services,
6. Impacts of FWUC development, infrastructure improvement and provision of support services.

3.2 Common weaknesses of M&E

Monitoring and evaluation is a regular part of development programs, but it is often poorly designed, implemented and used. The most common weaknesses of M&E are.

1. ***It produces excessive or inaccurate information.*** Enthusiastic consultants or technocrats often design overly elaborate and impractical M&E systems, without due regard to how the information will be collected and utilized.
2. ***Results are not utilized by decision makers.*** This can happen because of too much data, because it is not prepared in short, clear and simple ways, because it is not considered to be accurate or because it is not available on time to the right people. It can also happen because a proper forum for review of M&E findings and decision-making was not set up or does not function.
3. ***Data collected doesn't represent the information needs of all key stakeholders.*** This happens because a narrow group of planners does not include the full range of indicators for PIMD. Most often, M&E focuses on water users associations and performance of irrigated agriculture but ignores related aspects such as agency activities and capacity, agricultural development, marketing, and relations with local government.
4. ***Sampling frame doesn't enable valid generalizations.*** This happens because data isn't collected from head, middle and tail ends of canals, farmers are not selected randomly or sample sizes are too small.
5. ***Sampling frame doesn't enable valid comparisons*** “before and after the intervention” or “with and without the intervention.” This happens because no baseline data is available or is not collected before intervention or other similar systems where there is no intervention are not selected for M&E.

3.3 Guiding principles for M&E

These weaknesses can be avoided by adopting the following guiding principles.

1. ***Keep the information required as simple and concise as possible*** Planning an M&E system should start from an assessment of the needs of decision makers and stakeholders and an analysis of their limited capacity to assimilate information. There may be limited people, skills and budgets to collect, manage and analyze the data. Only the minimum amount of information required should be collected and no more. Unnecessary, unreliable or redundant information should be avoided. Information collected should be objective and easy to interpret. After special project funds are no longer available, the government should have a simple and inexpensive system that it can continue thereafter.
2. ***Plan simple and timely ways to summarize and convey results*** to busy stakeholders in workshops and planning meetings. Large reports are rarely read. Reports and presentations should focus on key findings using formats that are brief, clear and highlight the main points. Data collection and analysis should be planned so as to produce findings when they are needed by decision makers.
3. ***Involve key stakeholders in planning and implementing the M&E program*** and make sure that the indicators selected represent the information needs and interests of stakeholders. Also, make sure that all key stakeholders are represented in future forums to review results. If key stakeholders are involved, it will be more likely that they will respect and have to respond seriously to the results.

4. ***Design data collection to permit generalization and comparisons*** If there is only a small group of pilot sites for M&E, then all should be included. Baseline data should be collected before intervention, to permit comparison of the situation before and after implementation of PIMD. Similar schemes nearby pilot sites can be monitored to permit comparisons with and without PIMD.

5. ***Include participatory rural appraisals and key informant interviews*** to obtain sufficient qualitative information to enable validation of quantitative indicators and provide clear information about the implementation process, perspectives of stakeholders and practical lessons learned about how to implement PIMD. Planners should consider to what extent a potential indicator really measures the thing it is intended to measure. For example, is the fee collection rate a good indicator of farmer willingness to pay for irrigation, if water was not delivered to many farmers? Are non-functional structures more an indicator of poor maintenance or faulty design and construction? Qualitative information is needed to answer these questions.

4. Five steps in planning and implementing an M&E system

The National Secretariat for PIMD will be responsible to coordinate planning and implementation of the M&E system for the PIMD program. The M&E system should be planned and implemented in the following five steps:

Step 1: Identify information requirements

Step 2: Select and define indicators

Step 3: Collect and manage data

Step 4: Report and use M&E results

5. Step 1: Identify Information Requirements

5.1 Four types of M&E measures

There are four types of M&E measures, described below.

1. **Monitoring allocation of inputs** This answers the question, *What resources are being invested to implement PIMD?* This requires information on PIMD budgets, expenditures and assignment of staff, offices, equipment and other resources to implement PIMD.
2. **Monitoring implementation** This answers the following questions:
 - *Is PIMD being implemented according to the plan? (targets, time schedule, procedures)*
 - *What problems are arising during implementation?*
 - *What lessons are we learning from implementation?*
 - *How should the implementation strategy be modified?*

Monitoring implementation requires information about all key actions taken during the process of establishing FWUC Support Teams, developing FWUC, infrastructure improvements and provision of support services.

3. **Monitoring outcomes** Monitoring outcomes answers the following questions:

- *At what level of capacity are the FWUC Support Teams and FWUC?*
- *What are the direct and immediate effects of implementing PIMD on irrigation management and irrigated agriculture?*

Monitoring outcomes requires information on the immediate and direct outcomes of implementation, such as activities and investments by FWUC; FWUC performance in water delivery, maintenance and infrastructure improvements; fee collection rates and financial management of FWUC; democratic nature and accountability of FWUC procedures; satisfaction of FWUC members; and agricultural productivity. Monitoring outcomes provides essential information to enable planners to adjust the PIMD implementation strategy.

4. **Evaluating impacts** Evaluation aims to assess the ultimate impacts or effects of the PIMD strategy on key development objectives. Normally, this requires a few years after implementation to measure changes in basic development indicators. Evaluation answers the questions:

- *To what extent are the desired impacts of PIMD on rural people and development occurring?*
- *Is it PIMD that is causing the desired impacts or something else?*
- *Does the PIMD policy and basic strategy need to be revised and updated?*

After a few years, lessons are learned and conditions change. It may become necessary to modify the PIMD policy itself. This requires an analysis of the effects or impacts of PIMD. Normally, an evaluation makes comparisons of schemes where PIMD was implemented versus where it was not implemented. Or it may compare performance indicators in schemes before and after PIMD is implemented. Normally, a minimum of three years (and preferably five) are required after PIMD is implemented in a location, before impacts can be assessed.

Examples of potential effects or impacts of PIMD on development include:

1. Agricultural employment,
2. Farmer household income,
3. Health of rural population,
4. Sustainability of irrigated agriculture,
5. Conservation of natural resources,
6. Agricultural exports.

5.2 Conduct consultations to identify indicators

M&E indicators should reflect the objectives and interests of the different stakeholders, including the farmers, district and provincial government officers concerned with irrigated agriculture, NGO's, and national-level planners and policy makers. Three kinds of consultations should be done by the National Secretariat for PIMD in order to obtain information about the objectives and interests of key stakeholders about PIMD. This will be useful in selecting the M&E indicators. Table 1 below shows a format for a worksheet that could be used for planning the M&E system.

National-level consultation workshop

The National Secretariat for PIMD should hold a national-level discussion workshop with staff from MOWRAM, MAFF, MOP, MEF from the national and provincial levels (from the eleven pilot provinces) and from NGO's and technical assistance experts to identify key performance measures and indicators to be included in M&E for PIMD.

Small groups could identify indicators for each of the four categories of indicators (inputs, implementation process, outcomes and impacts). Indicators should include financial and personnel inputs; training and organizing activities; design and construction of repairs and improvements; physical, environmental and technical aspects; O&M; organizational aspects; agricultural and economic productivity of irrigated agriculture and socio-economic conditions. Participants should be careful not to select too many indicators, so that the M&E system becomes too difficult and impractical.

This workshop would require about two days could be divided into the following five sessions:

1. Session 1: Introduction and orientation to PIMD and M&E (1.5 hours),
2. Session 2: Information needs for PIMD (2 hours),
3. Session 3: Small groups discussions to identify indicators (divided into 4 groups for PIMD: inputs, implementation tasks, outcomes and impacts), (3 hours),
4. Session 4: General session to prioritize or revise indicators and propose a final set (2 hours),
5. Session 5: Arrangements for data collection, data management and data sharing between departments (1.5 hours).

A data management specialist should attend the workshop as a resource person.

Consultations with water users

The second kind of meeting for determining information requirements for the M&E system is consultations in meetings with approximately 20-30 selected farmer water users in at least three irrigation systems in different provinces. The schemes should

be rather typical of other schemes in the province and similar to (or including) the pilot scheme for that province.

In this consultation, farmers would be invited to speak freely about their concerns regarding PIMD, water management, agricultural development and socio-economic problems. Farmers should be asked to give suggestions about how they would like their irrigated agriculture to improve. National Secretariat staff, who are leading the meeting, should explain some key indicators about PIMD implementation, outcomes and impacts and ask farmers to comment on two things: 1) their suggestions about how they could participate in data collection and 2) their suggestions about any other information that should be monitored.

The following is a suggested agenda for water users consultations:

1. Open discussion about irrigated agriculture – problems and opportunities (officials stimulate farmers to share their perspectives),
2. Explanation about PIMD (mostly officials talking, but farmers commenting),
3. Discussion about what farmers would like to do to improve irrigation management and agriculture (officials stimulate farmers to do most of the talking),
4. Explanation about possible M&E indicators (officials explain and farmers comment),
5. Farmers comment on how they might participate in data recording or collection for M&E,
6. Farmers suggest any other information that should be monitored.

National Secretariat staff should make a careful record of comments and suggestions by farmers and prepare a short report of inputs obtained from the consultations. The outline for the report should follow the same order as the agenda of discussion topics. Only a limited number of government staff should attend this meeting and they should not speak much, so that the farmers are encouraged to express their own views.

Consultations with local officials

The third kind of meeting is with selected local government and NGO staff who are working on irrigated agriculture in the provinces. These should include staff of the provincial and district governments, MOWRAM, MAFF, MRD and MEF and relevant technical and NGO staff who might be working on irrigated agriculture in the province.

The following is a suggested agenda for the Local Government and NGOs Consultation Meetings:

1. Open discussion about irrigated agriculture – problems and opportunities,
2. Explanation about PIMD,

3. Discussion about what farmers would like to do to improve irrigation management and agriculture,
4. Explanation about what is M&E, why it's important and possible M&E indicators,
5. Participants discuss options for how to organize data recording, collection and computerized data entry and who should do what
6. Participants make suggestions about any other information that should also be included in the M&E system.

National Secretariat staff should make a careful record of comments and suggestions by the local officials and NGO staff and prepare a short report of inputs obtained from the consultations. The outline for the report should follow the same order as the agenda of discussion topics for the meeting. Inputs from the consultation meetings with farmers, local officials and NGO staff should be used by the National Secretariat for PIMD to revise the final list of indicators and finalize the guide for data collection, computer entry and use.

Table 2 below shows an example of a worksheet that can be used to summarize inputs from the consultations according to the framework we are using for organizing M&E into four components and, for each component, progressing from key issues or concerns to suggested indicators.

6. Step 2: Select and Define Indicators

After the consultation meetings have been held, the Sub-committee on M&E of the National Secretariat will have a list of information requirements and a partial list of indicators.

6.1 Baseline information

It is important for baseline information to be collected for irrigation systems before PIMD is implemented so that there is information about the situation before PIMD. Measurement of the same indicators after PIMD is implementing provides the basis for knowing whether PIMD has been successful or not, and why so.

In order to facilitate selection of appropriate indicators for baseline data, the following is a list of possible M&E information, for consideration by Module 6 participants (and others involved in formulating the PIMD M&D system). Again, it is important not to select too many indicators. The National Secretariat should not feel compelled to select all of those listed below.

Potential data on the irrigation scheme

1. Name and location of scheme
2. Water source and technology for extracting water
3. Type of headwork structure

4. Seasonal or monthly average water supply
5. Canal capacity for water delivery
6. Year scheme was originally constructed?
7. Year when scheme was last rehabilitated?
8. Main source of funds for last rehabilitation?
9. Water measurement capacity
10. Type and level of structural flexibility for water control
11. Type, number and functional condition of control structures
12. Percentage of total canal length (by type) which is dysfunctional and in need of repair (as observed during irrigation season)
13. Percentage of total canal length (by type) for which flow is restricted due to need for cleaning (as observed during irrigation season)
14. Irrigated area in wet and dry seasons for current and previous 2 years (ha)
15. Irrigation intensity (% irrigable area irrigated for wet plus dry season) for current and previous 2 years

Potential data on irrigation management

1. Is scheme primarily for irrigation, drainage or flood control?
2. Type and level of irrigation and drainage service provided
3. Existing arrangements for water distribution and delivery
4. Does a water users association exist in the scheme at the scheme level?
5. Does the water users association have leaders? rules? arrangement for mobilizing funds or labor for O&M?
6. Were WUA leaders elected by democratic election?
7. Percentage of all water users who are members of the association
8. Is the WUA or FWUC legally established through the provincial government?
9. If the WUA/FWUC collects an irrigation service fee, what is the charge and what is the collection rate? (amount/ha; % of water users who pay)
10. In which (and how many) of the following activities does the WUA/FWUC play a management role? (water delivery, infrastructure maintenance, fee collection, enforcement of rules, group provision of inputs, group credit, group marketing, group crop processing, group agri-business development)
11. Degree of sample farmer satisfaction with reliability of water delivery
12. Degree of sample farmer satisfaction with fairness (equity) of water distribution
13. Degree of sample farmer satisfaction with responsiveness (flexibility) of water delivery
14. On-farm water management practices (upper, middle and lower reaches)

Potential data on agriculture

1. Main irrigated crop(s) and second most important irrigated crop
2. Main cultivation season (rainy or dry)
3. Average crop yields in current and previous 2 years for main and secondary crop
4. Cropping intensity in scheme
5. Percentage of rice harvest sold

6. Does farmer plant a non-rice crop? If, yes % of harvest which is sold
7. Farm gate price for rice in current and previous 2 years
8. Farm gate price for secondary crop in current and previous 2 years
9. Percentage of dry season irrigated area in non-rice crops
10. Number of sample irrigator farmers who transplant rice seedlings (versus broadcast seed)
11. Approximate % of farmers who apply fertilizer

Potential socio-economic data

1. Number of sample irrigator farmers in scheme who are landowners versus tenants
2. Number of sample landowners who possess land titles
3. Average daily wage for agricultural labor in current and previous 2 years
4. Number of sample irrigator farmers in scheme whose household receives more than 50% of income outside of irrigated agriculture
5. Number of person days of hired labor used on farm of each sample irrigator farmer in scheme
6. Roles of females in irrigation, drainage and agriculture in sample farm households
7. Number of person days spent by sample irrigator farmer household on irrigation system maintenance in previous crop season

Baseline indicators selected should be collected prior to PIMD intervention and then for each year up to a minimum of 5 years after FWUC are organized and take over management of scheme in pilot PIMD schemes.

6.2 Potential indicators of resource inputs

The following are possible indicators for monitoring expenditures and other resources used for implementing PIMD.

1. Expenditures for PIMD Program by activity item at national level, monthly
1. Expenditures for PIMD Program by activity item at provincial and pilot scheme levels, monthly
3. Number of staff assigned to PIMD Program by function, level and organization

Financial information should be summarized in monthly statements of expenditures, but should be reported on a quarterly basis to the National Secretariat.

6.3 Potential indicators of implementation

The following is a list of 12 proposed steps in the process of organizing FWUC, building capacity of FWUC and transferring responsibility for irrigation management to FWUC. The step number and main activity is listed on the left side. Possible indicators are listed for each step on the right side (*in italics*). The list is intentionally too long, so as to provide abundant ideas for consideration. This should be discussed and revised as

needed. The National Secretariat should remember to apply the guiding principle of *not trying to collect and manage too much data.*

Implementation steps and indicators: Scheme level

Steps in implementation at scheme level

Possible Indicators

Step 1

(Preparatory meetings)

- *Orientation module*
- *PRA module on constraints & opportunities*
- *Module to plan next steps*

Step 2

(Determine hydraulic configuration of water users' organization)

- *Identify boundaries of each hydro-organizational unit at each level*
- *Identify names of prospective members of each unit*

Step 3

(MOA & formation of provisional FWUC Statute Drafting Comm.)

- *Module to discuss PIM assistance plan, identify repairs & improvements needed & farmer obligations in PIM process*
- *Module to prepare & sign MOA*
- *Election of FWUC Statute Drafting Committee*

Step 4

(Selection & training of Farmer Organizers)

- *Module to discuss role & desired characteristics of FO's*
- *FO's selected by Drafting Comm.*
- *Initial training of FO's & preparation of their work plans*

Step 5

(Preparation & adoption of FWUC Statute)

- *Orientation of Drafting Comm.*
- *Board completes draft Statute*
- *Draft Statute discussed & revised in general meeting of prospective members*
- *Draft Statute reviewed & approved by PIM Support Team*
- *Revised Statute approved & signed by all prospective FWUC members*
- *Registration of members*
- *% of water users who register*

Step 6

(Establishment of WUG's &

- *Election of WUG Reps.*
- *Election of Tertiary &*

FWUC)

- Secondary Canal Comm. Reps.
(if needed)*
- Election of FWUC Board of Directors*
- Were elections contested & were secret ballots used?*
- % of FWUC members who participated in election*

Step 7

(Legal registration of FWUC, including recognition of Statute & FWUC Board of Directors)

- Registration of FWUC with MOWRAM*
- Govt. acknowledgement of Statute and FWUC Board*

Step 8

(Repair & improvement of irrigation infrastructure)

- Feasibility study*
- Draft design prepared, discussed, revised and approved by FWUC & MOWRAM (via Support Team)*
- FWUC plans & implements its contribution*
- MOWRAM implements its role in construction (phased & contingent upon farmer contribution)*
- Repaired infrastructure is tested & FWUC Board signs approval of works*
- Cost of improvements per ha.*
- Share of total cost born by FWUC*

Step 9

(Joint preparation of O&M plan & budget)

- Appointment of irrig. mngt. staff*
- Training of staff & FWUC officers in irrigation management*
- Preparation of O&M plan & budget by FWUC Board & PIM Support Team*
- Calculation of irrig. service fee*

Step 10

(Approval of O&M plan, budget & fee)

- Discussion & approval of O&M plan, budget & fee in FWUC general assembly meeting*
- FWUC opens bank account*
- Collection of irrig. service fee*
- Implementation of seasonal O&M plan*

Step 11

(Transfer agreement)

- FWUC Board, other officers & PIM Support Team discuss model transfer agreement*

- *Draft transfer agreement is prepared, discussed, revised & approved by FWUC & PIM Support Team*
- *Transfer agreement signed by FWUC Board & MOWRAM*

Step 12

(Continuing capacity building & provision of support services)

- *Periodic training for FWUC*
- *Annual irrig. mngt. audits*
- *Service agreements (where jointly managed or is 3rd party)*
- *Phase out of govt. subsidy for O&M budget*
- *Establishment & functioning of Irrigation Repair & Improvement Fund*
- *Evaluation of farmer perceptions & suggestions about PIM process, FWUC leaders, O&M plan & fee, and others*

Implementation steps and indicators: National level

The above list of steps and indicators is for monitoring implementation at the scheme or province level. The following is a list of objectives and indicators for national-level implementation of PIMD.

National level implementation objectives

Optional indicators

1. Establish program structure

- *Formation of Secretariat for Participatory Irrig. Mgt. & Dev.*
- *Training of Secretariat staff*
- *National forum on PIM*
- *PIM orientation workshops (national and provincial levels)*

2. Reorientation & capacity of MOWRAM staff

- *Establishment of Provincial PIM building Support Teams*
- *Training of PIM Support Teams*
- *No. of staff at district & provincial levels assigned to PIM & FWUC support functions*

3. Establishment of M&E system for PIM

- % of staff assigned to PIM & support service provision who have required knowledge & skills (measured by test)
- Irrig. Mngt. Audits conducted
- Establishment of Provincial Irrig. Improvement Fund
- Workshop to finalize indicators, method of data collection, computerization & use
- M&E tasks done by FWUC
- Performance of M&E tasks by district staff & provincial PIM Support Team
- Provincial PIM Support Team and Secretariat review M&E data in planning meetings

6.4 Potential indicators of outcomes

Policy outcome
Objectives

Possible
Indicators

“Expansion of irrigated area”
(Policy, 1.1)

- Ha. irrigated, wet season
- Ha. irrigated, dry season
- Gross annual irrigated area

Operational performance and robustness of farmer management
(i.e., Policy, 1.4 & 2.3)

- No. of water disputes/yr
- Irrigation efficiency
- Delivery performance ratio (volume supplied/target)
- Ratio of actual area irrigated to irrigable area
- % of irrigable area with field channels built by farmers
- Sample farmer perceptions about reliability, adequacy and fairness of water delivery
- Tested knowledge & skills of FWUC officers in water acquisition and delivery
- % of essential operation tasks performed by FWUC (as per Irrigation Service Plan)

“Sustainable maintenance by farmers”
(Policy, 1.4 & 2.3)

- *Maintenance expenditure/ha/yr*
- *Maintenance expenditure/ha/yr as % of cost to eliminate deferred maintenance backlog*
- *Volume silt removed from canals*
- *% of total structures which are functional*
- *% of canal lengths needing repair and/or cleaning (during irrigation season)*
- *Tested knowledge & skills of FWUC officers in maintenance & incidental repairs*
- *% of essential maintenance tasks performed by FWUC (as per Irrigation Service Plan)*

“Farmer willingness to pay for O&M”

- *Fee collection rate (% of target amount collected)*
- *Amount of resources raised by WUA as % of total cost of O&M*
- *Ratio of target fee level to total cost of O&M*

Financial sustainability of irrigation systems
(Policy, 2.4)

- *Cost of irrigation as % of gross value of production in scheme*
- *% of irrigation expenditure on a scheme paid by water users*
- *Total expenditure on O&M as % of total cost of O&M*
- *Ratio of amount in FWUC capital reserve fund as % of annual O&M budget*
- *Completeness of financial bookkeeping by FWUC for each essential component*
- *Rating from irrigation management audit*

Decreased role of government in irrigation O&M
(Policy, 1.4 & 2.5)

- *Government expenditures on irrigation O&M per ha*
- *No. of government field operations staff assigned to irrigation system O&M*

Increased investment in irrigation sector by donors and

- *Annual amount of external loan funds and grants disbursed*

technical assistance agencies (Policy, 1.4 & 2.4)	<ul style="list-style-type: none"> - <i>Expenditures by NGO's on irrigation development</i> - <i>Private sector investment in irrigation development</i>
Uniformity within sector in applying PIM policy & strategy	<ul style="list-style-type: none"> - <i>% of assistance agencies that signed MOU with MOWRAM about PIM policy & strategy (Policy, 1.4 & 2.5)</i> - <i>% of PIM steps followed per project</i>
Cost efficiency of irrigation (Policy, 1.4)	<ul style="list-style-type: none"> - <i>Trend in annual government expenditures for irrigation O&M/ha</i> - <i>Trend in annual FWUC expenditures for O&M/ha</i> - <i>Trend in annual government plus FWUC expenditures for O&M/ha</i>
Added value (synergy) from joint irrigation & agricultural development interventions vis-à-vis PIM strategy (Policy, 2.5)	<ul style="list-style-type: none"> - <i>New agricultural practices adopted that were enabled by PIM</i>
Farmer understanding of PIM	<ul style="list-style-type: none"> - <i>Responses to key questions in group interviews</i>
Farmer acceptance of PIM	<ul style="list-style-type: none"> - <i>FWUC compliance with key PIM principles of democracy, transparency, accountability</i>
Understanding of PIM by MAFF & local government officers	<ul style="list-style-type: none"> - <i>Responses to key questions in MOWRAM, group interviews (in training sessions)</i>
Support for PIM by MOWRAM, MAFF & local government officers	<ul style="list-style-type: none"> - <i>Compliance of officers with PIM policy and strategy</i>

6.5 Potential indicators of impacts

Policy Impact Goals

Possible Indicators

<p>“Food security” (Policy, 1.1)</p>	<ul style="list-style-type: none"> - <i>Rice yield (kg/ha)</i> (Policy, 1.1) - <i>Cropping intensity (Is=100)</i> (Policy, 2.7)
<p>“Commercialization of agriculture” (Policy, 1.1)</p>	<ul style="list-style-type: none"> - <i>% crop sold</i>
<p>“Crop diversification” (Policy, 2.7)</p>	<ul style="list-style-type: none"> - <i>% dry season irrigated land in non-rice crops</i> - <i>No. crops grown in scheme</i>
<p>Environmentally “friendly” and “sustainable” irrigation systems (Policy, 1.4)</p>	<ul style="list-style-type: none"> - <i>Siltation rates in canals</i> - <i>Depth to groundwater table in dry season</i> - <i>Depth of fertile top soil</i> - <i>Pesticide residues in drainage water</i> - <i>% of irrigable area lost to production due to waterlogging or other resource degradation</i> - <i>Ratio of irrigated area to original irrigable area</i>
<p>Poverty Alleviation (Not stated in Policy)</p>	<ul style="list-style-type: none"> - <i>Ave. net farm income (\$/yr)</i> - <i>Agrl wage rates (\$/day)</i> - <i>% pop. below poverty line</i>
<p>Economic productivity of irrigation systems (Not stated in Policy)</p>	<ul style="list-style-type: none"> - <i>Gross value of prod./ha/yr</i> - <i>Agrl employment rate in irrigation system (person days/ha/season)</i> - <i>Trends in agrl wage rates</i>

7. Step 3: Data Collection and Management

7.1 Data collection plan

The first task is to identify the unit or level at which the indicator is to be measured. Then the source of data is specified. A Data Collection Worksheet is a useful planning tool for working through these two steps. An example of a Data Collection Worksheet is provided in Table 3 as a guide. This is only an example and should be examined and revised as needed. Data sources and data collection methods should be proposed by participants in the national workshop on M&E for PIMD, and be finalized by the National Secretariat.

7.2 Data entry and management plan

Data should be transferred from original questionnaires or worksheets onto computer disks as soon as possible after data collection. This will make it easier to find mistakes and make corrections while data collectors are still at or near the site and while the collector still remembers the circumstances of the interview or inspection. If possible, a data management staff who is attached to the Provincial FWUC Support Team should enter M&E data shortly after it is collected, if not in the field with a laptop computer, then in the district or province office where there is a desktop computer.

The National Secretariat should recruit a data management specialist to help set up the data entry templates and assign codes to indicators and their potential values. Microsoft Excel would serve adequately as the software for data entry, checking and simple descriptive statistics and charts. It has the advantage of being widely known and easy to use. Later, when many more irrigation schemes are included in PIMD activities and the data base expands and becomes more complex, it will probably be advisable to switch to a relational database program such as Microsoft Access.

For data entry onto a spreadsheet program like Excel, data files should be structured with each indicator (or variable) being given a unique column and the rows being used for different cases (farmers, structures or locations). The data management specialist should make sure that the provincial-level data managers for the M&E system (who belong to the Provincial FWUC Support Team) should make a clear distinction between a *missing value* (for which there is no data obtained) versus a *zero value* for something (such as 0 fees paid). The data management specialist should designate a symbol or number for 'missing value' versus a 0 for zero value.

Data entry errors are easy to make and several errors can render the data set useless. So it is important that the data management specialist institute a data checking arrangement whereby a second person examines at least random sample selections of spreadsheet entries, compared with the original data. An acceptable range of values should be specified in Excel so that the program will catch and alert the data entry person to data entry mistakes.

The data management staff at the provincial level should aggregate data from the farmer and block level to the scheme and province level. The data management specialist on the National Secretariat should develop a data base at the national level which aggregates all data from the province level to the national level.

7.3 Responsibility Matrix Worksheet: A plan for who does what

The Responsibility Matrix Worksheet is a planning tool to map out which of the different stakeholders involved with the M&E program have what roles and responsibilities. The worksheet can be used to facilitate discussion in a workshop or informal planning meeting. When complete, it should be distributed among all actors involved, so that all become clear about what their roles are in the process. Table 4 below

shows an example of what a Responsibility Matrix Worksheet might look like. In each of the cells there is either an “X” (for no role) or a short explanation of the task performed by the respective stakeholder.

8. Step 4: Report and Use of M&E Results

8.1 Organizing PIMD review meetings and presenting results

The following kinds of meetings are probably the most important means for presenting and discussing results of M&E. These are:

1. ***Monthly Inputs Review Meeting*** – where PIMD expenditures, personnel assignments (for PIMD) are presented and discussed and recommendations about revising expenditure patterns and procedures are issued,
2. ***Quarterly Implementation Review Meeting*** – where results from monitoring implementation are presented and discussed and recommendations about revising procedures are issued,
3. ***Annual Outcomes Review Meeting*** – where results from monitoring outcomes of PIMD are presented and discussed and recommendations about changes in strategy are issued,
4. ***Impact Evaluation Review Meeting*** (after 5 years) – where results from the original baseline survey, annual monitoring of outcomes and special data collected for the impact evaluation are presented. Before-and-after PIMD or with-and-without PIMD comparisons can be made. Charts and tables for presentation should be designed in such a way that these comparisons are emphasized.

However, in addition to these meetings, it will be necessary to have other meetings which are most suitable for special stakeholders. For senior politicians and officials, short personal presentations with a few charts and no more than one page of text may be the most effective way to communicate and discuss results of M&E. For middle-level functional experts and planners, discussion seminars may be the most effective and efficient means for discussing results. But in all cases, simplicity and directness is far more likely to be effective than more elaborate presentations.

8.2 Using M&E to support decision making

The four kinds of PIMD review meetings (inputs, implementation, outcomes and impacts) provide the basis for ensuring that M&E results are designed and presented so that they provide pertinent information at the time it is needed to make planning decisions about the PIMD Program. The National Secretariat should meet with Provincial FWUC Support Teams and FWUC regularly so that they become aware of issues and questions as they arise. At least three weeks prior to each M&E review meeting, the National Secretariat should give a list of key issues and questions that it can give to the Sub-committee on M&E so that the Sub-committee can prepare its presentations in the next meeting according to the important decision items that will be on the agenda.

The Executive Director of the National Secretariat should be chairman of the PIMD review meetings and emphasize the importance of comparing M&E results with the official policy, strategy and objectives. The Executive Director should also emphasize ending each topic with agreement on a clear action item for M&E or for improving the PIMD process.

9. Examples of planning worksheets for the M&E system

In the Annex below are examples of worksheets that could be used for planning the M&E System. It is important that the M&E System be based on the planning and decision-making needs of the FWUC Support Teams and the National Secretariat.

10. Suggested Group Exercises for Module 6, Session 1

Exercise 1: Reporting

The trainer assigns two participants to share the task of being reporters for Session 1 of Module 6. They will make a summary written report of the main points identified in the lectures and participatory exercises. They should prepare their report within one day after Session 1 is completed.

Exercise 2: Brainstorming about indicators

Step 1: Participants meet in small discussion groups to identify:

- 1) general socio-economic, physio-technical and agricultural context data,
- 2) indicators for program implementation,
- 3) objectives and indicators for initial outcomes, and
- 4) objectives and indicators of ultimate impacts.

Each group should have a mixture of disciplinary expertise (engineering, agriculture, socio-economic, etc.).

Step 2: Plenary session where a selected member from each discussion group presents the outcomes of the group discussion to all participants. Participants provide comments and suggestions on each presentation.

Step 3: Each presenter prepares a written summary of the groups recommendations about indicators, revised after the plenary discussion.

Exercise 3: Review

Step 1: At the end of Module 6 Session 1, the trainer asks participants to mention what they thought were the most important points learned in Module 6, Session 1.

Step 2: The reporters read their summary of Session 1.

Step 3: The trainer asks participants if any corrections or additions should be made to the report and suggestions are made, if any

Step 4: The reporters note the suggestions and revise the report for Session 1, as needed.

11. Summary of Module 6, Session 1

[Reporters present to participants their reports of key points raised in discussions and exercises. Participants make corrections or additions as needed.]

End of Module 6, Session 1

Session 2: Working Group Assignment

Task 1: Review and discuss Session 1 report

Task 2: Identify key future PIMD planning decisions, what kind of information will be needed and when

Task 3: Select specific M&E indicators

Task 4: Prepare plan for data collection, management and review, including assignment of responsibilities for M&E system

Task 5: Collect and analyze baseline data

Task 6: Prepare and present M&E plan and report of baseline data collection to National Secretariat (which provides comments) and then finalization of report

Task 7: Present results of baseline data collection and first year of field-level implementation of PIMD in national workshop

Annex

Examples of Worksheets for Planning Monitoring and Evaluation

Worksheet 1. M&E Review Meetings and Reports

M&E Component	Meeting	Report	When	Key Questions
Inputs	<ul style="list-style-type: none"> • Monthly Financial Review Meeting; • Quarterly Financial Review Meeting 	<ul style="list-style-type: none"> • Monthly Financial Statement on PIMD; • Quarterly Short Report on PIMD Finances 	<ul style="list-style-type: none"> • Monthly and • Quarterly, respectively 	<ul style="list-style-type: none"> • What level of resources is being spent? • Funds being spent properly?
Implementation	Implementation Review Meetings	Implementation Review Report	Quarterly (at end of quarter)	<ul style="list-style-type: none"> • Implemented according to plan? • Problems? • Lessons? • Changes needed in procedures?
Outcomes	Outcomes Review Meetings	Outcomes Review Report	Annually (at end of year)	<ul style="list-style-type: none"> • PIMD producing expected outcomes? • Changes needed in strategy?
Impacts	Evaluation Review Meeting	Evaluation Report	After 5 years of implementation	<ul style="list-style-type: none"> • Is PIMD producing desired impacts? • Changes needed in policy?

Worksheet 2. PIMD Issues and Indicators Worksheet

Component	Key Issues (examples only)	Indicators
Monitoring Inputs	1. How many personnel have been assigned to different PIMD tasks?	X, Y, Z
	2. How much budget is being spent on each PIMD activity?	“
	3. Etc.	“
Monitoring Implementation	1. Who should help the FWUC prepare the Transfer Agreement?	“
	2. How should a meeting be organized to discuss crop diversification?	“
	3. What is the best procedure for registering members of the FWUC?	“
	4. What should be done during a canal “walk through”?	“
	5. What’s the best method for organizing farmer labor contributions?	“
	6. What is the best procedure for FWUC & Support Team to prepare a proposal to the Irrigation Improvement Fund?	“
	7. Etc.	“
Monitoring Outcomes	1. What topics should be included in a Transfer Agreement?	“
	2. How can PIMD promote crop diversification?	“
	3. Should landowners or tenants become members of the FWUC?	“
	4. What roles should the FWUC play in rehabilitation?	“
	5. How should we determine what share of the cost of rehabilitation the FWUC should contribute?	“
	6. How should the Irrigation Improvement Fund be set up?	“
	7. Etc.....	“
Evaluating Impacts	1. Is PIMD resulting in higher farm income?	“
	2. Is PIMD resulting in more sustainable irrigation infrastructure?	“
	3. How is PIMD effecting the environment around irrigation systems?	“
	4. What kinds of support services to FWUC are needed?	“
	5. Etc.	“

Worksheet 3. Data Collection Worksheet

Indicator	Data Level	Data Source	Data Collection Method
Baseline Survey			
1. Scheme name	Scheme	(This column to be filled in during workshop)	(This column to be filled in during workshop)
2. Year constructed	“		
3. Year rehabilitated	“		
4. Rehab funds source	“		
5. Water extraction tech	“		
6. Type of headworks	“		
7. Scheme purpose	“		
8. Functl condition of control structures	Structures		
9. % canal needs repair	Canal lengths		
10.%canal need cleaning	Canal lengths		
11. Irrig. area (wet)	Scheme		
12. Irrig. area (dry)	“		
13. Irrig. intensity	“		
14. FWUC in scheme?	“		
15. FWUC – leaders, rules, water charge	“		
16.Democratic election of FWUC leaders?	“		
17. % users who are members	“		
18. FWUC legally establish?	“		
19. FWUC collects fee	“		
20. Amount of charge?	“		
21. Collection rate?	“		
22. FWUC roles	“		
23. Loc. Respondent	Farmer		
24. Respondent satisfied w/ reliability?	“		
25. Respondent satisfied w/fairness?	“		
26. Main crop	Scheme		
27. 2 nd crop	“		
28. Main cult. Season	“		
29. Main crop yield	Farmer		
30. 2 nd crop yield	Farmer		
31. Crop intensity	Scheme		
32. % rice crop sold	Farmer		
33. % 2 nd crop sold	Farmer		
34. Rice price	Scheme		
35. % dry season area in non-rice crop	Scheme		
36. Transplant or broadcast rice	Farmer		
37. % apply fertilizer	Farmer		

Worksheet 3. Data Collection Worksheet (continued)

Indicator	Data Level	Data Source	Data Collection Method
Baseline Survey (continued)			
38. No. owners vs. tenants	Scheme	(Column to be filled in during workshop)	(Column to be filled in during workshop)
39. No. owners w titles	Farmer		
40. Agrl labor wage	Scheme		
41. No. >50% income off farm	Farmer		
42. Person days hired labor	Farmer		
43. Roles of females	Scheme		
44. Days spent on maintenance works	Farmer		
Implementation Indicators			
1. Orientation module	National		
2. Module on constraints & opps.	National		
3. Module to plan steps	National		
4. Identify boundaries of each WUG/FWUC	Block & Scheme		
5. Members identified	Scheme		
6. PIMD assistance plan agreed	Scheme		
7. Election of drafting committee	Scheme		
8. Module – role of FWUC	Scheme		
9. FO's selected	Scheme		
10. FO training	“		
11. Draft statute done	“		
12. Draft statute discussed & revised	“		
13. Member registration	“		
14. % users register	“		
15. Election of WUG Representatives	Block		
16. Election of FWUC Board of Directors	Scheme		
17. Elections contested w/ ballots?	“		
18. % members vote	“		
19. Legal registration of FWUC	“		
20. Feasibility study for repairs	“		
21. Design of repairs	“		
22. FWUC contribution to repairs	“		

Worksheet 3. Data Collection Worksheet (continued)

Indicator	Data Level	Data Source	Data Collection Method
Implementation Indicators (continued)			
23. Construction done	Scheme	(Column to be filled in during workshop)	(Column to be filled in during workshop)
24. FWUC approves results of construction	“		
25. Cost of repairs	“		
26. Share paid by FWUC	“		
27. FWUC mgt. Staff appointed	“		
28. O&M training	“		
29. O&M plan & budget prepared?	“		
30. Irr. Fee set?	“		
31. FWUC approval of O&M plan & budget	“		
32. FWUC bank account	“		
32. Irr Fee collected?	“		
33. O&M plan implemented?	“		
34. Transfer Agreement prepared	“		
35. Transfer Agreement signed	“		
36. Service agreements signed	“		
37. Irr Mgt Audits conducted	“		
38. Govt. subsidy phases out	“		
39. Monitoring of inputs & implementation	“		
40. Irrigation Repair & Improvement Fund set up	Province		
41. Monitoring of outcomes	“		

Worksheet 3. Data Collection Worksheet (continued)

Indicator	Data Level	Data Source	Data Collection Method
National-level Implementation Indicators			
1. Secretariat formed	National	(Column to be filled in during workshop)	(Column to be filled in during workshop)
2. Sub-committees formed	National		
3. Secretariat staff trained	National		
4. PIMD orientation workshops	National/Province		
5. FWUC Support Teams formed	Province		
6. No. staff assigned to PIMD functions	National/Province		
7. FWUC Support Teams trained	Province		
8. Natl. Wkshp to finalize M&E system	National		
9. Monitoring of input & implementation	Scheme/Province		
10. 2 nd training of FWUC leaders	Province		
Outcome Indicators			
1. Area irrigated (wet)	Scheme		
2. Area irrigated (dry)	“		
3. Gross annual irr area	“		
4. No. disputes/yr	“		
5. Irrigated/irrigable area	“		
6. % area with field channels built by farmers	“		
7. Perceptions of water delivery service	Farmer		
8. FWUC officers knowledge & skills	Scheme		
9. Has FWUC implemented O&M plan?	“		
10. Maintenance expenditure/ha/yr	“		
11. Maint. expenditure as % of cost to eliminate deferred maintenance	“		
12. % of structures that are functional	“		
13. % canal lengths needing repair	“		

Worksheet 3. Data Collection Worksheet (continued)

Indicator	Data Level	Data Source	Data Collection Method
Outcome Indicators (continued)			
14. % of maintenance plan implemented	Scheme	(Column to be filled in during workshop)	(Column to be filled in during workshop)
15. Fee collection rate	“		
16. FWUC resources raised as % of totl cost	“		
17. Ratio of fee level to total cost of O&M	“		
18. Cost of irrig. as % of grs. value of prod.	“		
19. % irrig spending borne by FWUC	“		
20. Totl spending on O&M as % of total cost	“		
21. Amount in reserve fund as % of annual O&M	“		
22. Completeness of financial records	“		
23. Govt. spending on irrig. O&M/ha	“		
24. No. of govt. staff assigned to O&M	“		
25. Amount of external assistance provided	“		
26. Private sector investment in irrig.	Province/ National		
27. % of PIMD steps followed per project	Scheme/ Province		
28. % of NGO's and assistance agencies that signed MOA with MOWRAM	National		
29. Annual spending by farmers plus govt.	Scheme		
30. FWUC compliance with PIMD principles	Scheme		
31. FWUC leaders' awareness of key principles & procedures (tested)	Scheme		

Worksheet 3. Data Collection Worksheet (continued)

Indicator	Data Level	Data Source	Data Collection Method
Impact Indicators			
1. Rice yield (kg/ha)	Farmer/ Scheme	(Column to be filled in during workshop)	(Column to be filled in during workshop)
2. Secondary crop type and yield (kg/ha)	Farmer/ Scheme		
3. Cropping intensity	Farmer/ Scheme		
4. % crop sold	Farmer		
5. % dry season irrig land in non-rice crop	Scheme		
6. No. different crops grown in scheme	Scheme		
7. Depth to groundwater table	Block/ Scheme		
8. % of irrigable area lost to waterlogging or other resource degradation	Block/ Scheme		
9. Ratio of irrigated to original irrigable area	Scheme		
10. Net farm income	Farmer		
11. Agricl wage rate	Farmer/ Scheme		
12. % population below poverty line	Scheme		
13. Gross value of production/ha/yr	Farmer/ Scheme		
14. Agrl employment rate in scheme (person days/ha/yr)	Farmer/ Scheme		

Worksheet 4. Responsibility Matrix Worksheet for M&E

Role	FWUC Officers	Provl PIM Support Team	Local Govt officers	NGO & Techn Experts	Dept of Irrig Agric	PIMD Secretariat	Senior MOW-RAM officers
Select indicators							
Collect & record data							
Computerize data							
Prepare M&E Rpts							
Present results							
Review results on Implem.							
Review results on Outcome & Impacts							
Decisions about Implem.							
Decisions about Strategy or Policy							