

**MINUTES OF MEETING  
BETWEEN  
THE JAPANESE EVALUATION TEAM AND THE MINISTRY OF WATER RESOURCES  
AND METEOROLOGY OF THE ROYAL GOVERNMENT OF CAMBODIA  
ON THE JAPANESE TECHNICAL COOPERATION FOR  
THE TECHNICAL SERVICE CENTER FOR IRRIGATION SYSTEM PROJECT PHASE-2  
IN THE KINGDOM OF CAMBODIA**

The Japanese Evaluation Team (hereinafter referred to as "the Japanese Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Dr. Ryuzo NISHIMAKI, Senior Advisor of JICA, visited the Kingdom of Cambodia from November 24, 2008 to December 4, 2008 in order to conduct the final evaluation on the Technical Service Center for Irrigation System Project Phase-2 in Cambodia (hereinafter referred to as "the Project").

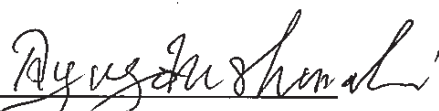
The Cambodian Evaluation Team (hereinafter referred to as "the Cambodian Team") was organized by the Ministry of Water Resources and Meteorology (MOWRAM) of the Royal Government of Cambodia and headed by Mr. EM Bun Thoeun, Director General of Technical Affairs, MOWRAM.


For the final evaluation of the Project, the Japanese Team and the Cambodian Team formed the Joint Evaluation Team (hereinafter referred to as "the Team"). After conducting study and analysis of the activities and achievements of the Project, the Team prepared the Joint Evaluation Report (hereinafter referred to as "the Report") and presented the evaluation results to the Joint Coordinating Committee of the Project.

The Joint Coordinating Committee accepted the Report and agreed to recommend to the respective governments the matters referred to the Report attached hereto.



Phnom Penh, December 3, 2008

  
Dr. Ryuzo NISHIMAKI  
Leader,  
Japanese Final Evaluation Team  
Japan International Cooperation Agency  
Japan

  
H.E. VENG Sakhon  
Secretary of State,  
Ministry of Water Resources and  
Meteorology  
The Kingdom of Cambodia

Attachment

1. The Joint Evaluation team presented the Evaluation report to the Joint Coordination Committee.
2. The Joint Coordination Committee accepted the Report and agreed to take necessary action which written bellow for replying to the recommendations of the Report.
  - 1) MOWRAM will allocate the budget for FY2009 for TSC activities.
  - 2) MOWRAM will continue to convince the Ministry of Economy and Finance (MEF) to take the necessary action for the smooth and quick disbursement of the remaining Counterpart Fund.
  - 3) The Joint Coordination Committee accepted the revise of the PO to ensure the output would be achieved within the Cooperation period.
  - 4) MOWRAM will continue to convince MEF to take the quick action for the usage of the counterpart fund of the Japanese Non Project Grant Aid for the construction of the terminal canals in the three pilot sites.

**JOINT EVALUATION REPORT**  
**ON**  
**THE TECHNICAL SERVICE CENTER**  
**FOR IRRIGATION SYSTEM PROJECT PHASE-2**  
**IN THE KINGDOM OF CAMBODIA**

Phnom Penh, December 3, 2008




Dr. Ryuzo NISHIMAKI

Leader

Japanese Evaluation Team

Japan International Cooperation Agency

Japan



H.E. EM Bun Thoeun

Leader

Cambodian Evaluation Team

Director General of Technical Affairs

Ministry of Water Resources and Meteorology

The Kingdom of Cambodia

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## List of Abbreviations

FWUC	Farmer Water User Community
FWUG	Farmer Water User Group
GOJ	The Government of Japan
JICA	Japan International Cooperation Agency
M/M	Minutes of the Meeting
MOWRAM	The Ministry of Water Resources and Meteorology
MS	The Model Site
OJT	On-the-Job Training
PDM	Project Design Matrix
PDWRAM	The Provincial Department of Water Resources and Meteorology
PO	Plan of Operations
PS	The Pilot Sites
R/D	Record of Discussions
RGC	The Royal Government of Cambodia
TSC	The Technical Service Center for Irrigation and Meteorology

## I. EVALUATION OF THE PROJECT

### 1. Objectives of Evaluation

- (1) To conduct a joint study and meeting with the concerned authorities of the Royal Government of Cambodia (hereinafter referred to as "RGC") in order 1) to gather necessary information to verify the outcome of the project inputs for the project period (include the expectancy after the project evaluation) and 2) to assess the level of achievement, overall effects and strategies by Five Evaluation Criteria (relevance, effectiveness, efficiency, impact and sustainability) based on the Record of Discussions (R/D), Project Design Matrix (PDM) and Plan of Operation (PO).
- (2) To identify remaining problems and recommend appropriate measures that need to be undertaken by the relevant government agencies after the completion of the Project, and
- (3) To consider the lessons obtained from the Project activities in order to reflect them on future projects in the interest of making them more effective and efficient.

### 2. Methodology

#### (1) Joint Evaluation

The Project was jointly evaluated by the Cambodian and Japanese evaluation teams (hereinafter referred to as "the Team") in accordance with the R/D, the PDM and the PO. The evaluation activities included report analysis, field survey, and interview with staff of the Ministry of Water Resources and Meteorology (hereinafter referred to as "MOWRAM"), Japanese experts and other concerned personnel in the Project were conducted based on the five Evaluation Criteria. The Joint Evaluation Team was composed of four members from the Cambodian side and four members from the Japanese side who were not involved in the project activities.

#### (2) Five Evaluation Criteria

##### 1) Relevance

Relevance refers to the validity of the Project Purpose and the Overall Goal in connection with the development policy of RGC as well as the needs of beneficiaries.

##### 2) Effectiveness

Effectiveness refers to the extent to which the expected benefits of the Project have been achieved as planned. It also examines whether these benefits have been brought about as a result of the Project.

##### 3) Efficiency

Efficiency refers to the productivity of the implementation process. It examines whether the inputs of the Project have been efficiently converted into outputs.

##### 4) Impact

Impact refers to direct and indirect, positive and negative impacts caused by the implementation of the Project, including the extent to which the overall goal has been attained.

##### 5) Sustainability

Sustainability refers to the extent to which the Project can be further developed by RGC, and the

extent to which the benefits generated by the Project can be sustained under national policies, technology, systems and financial state.

### 3. Members of the Joint Evaluation Team

#### (1) Japanese Evaluation Team

Position in the Team	Name	Title
Team Leader	Dr. Ryuzo NISHIMAKI	Senior Advisor, Rural Development Department, JICA
Irrigation Technology	Mr. Hiroaki KUNIHURO	Technical Official, Overseas Land Improvement Cooperation Office, Rural Development Bureau, Ministry of Agriculture, Forestry and Fisheries of Japan
Planning Management	Mr. Kunihiro NAKASONE	Advisor, Paddy Field Based Farming Area Division II, Paddy Field Based Area, Rural Development Department, JICA
Evaluation and Analysis	Ms. Keiko ITAGAKI	Researcher, Social Development Dept. Global Link Management, Inc.

#### (2) Cambodian Evaluation Team

Position in the Team	Name	Title
Team Leader	H.E. EM Bun Thoeun	Director General of Technical Affairs, MOWRAM
Member	Dr. THENG Tara	Deputy Director General of Technical Affairs, MOWRAM
Member	Mr. CHEA Chhunkeat	Director of Planning and International Cooperation Department, MOWRAM
Member	Mr. CHHEA Bunrith	Director of Administration & Human Resource Department, MOWRAM

### 4. Schedule of the Joint Evaluation

The schedule is attached as ANNEX 1.

## II. OUTLINE OF THE PROJECT

### 1. Background of the Project

Agriculture is the prime industry of the Kingdom of Cambodia. Agricultural production contributes to approximately 35% of the country's Gross Domestic Products (GDP), and approximately 75% of the national population relies on agriculture for their living in 2004. Despite abundant farmland and water resources, agricultural productivity of the country has rather been low mainly due to deficient irrigation systems, which is one of the essential development issues of the country.

RGC had requested the Government of Japan (GOJ) for a technical cooperation that aims at technical transfer on rehabilitation of existing irrigation systems such as survey, planning, design, construction, operation and maintenance. In response to the request, JICA conducted the 5-year project, namely Technical Service Center for Irrigation System, until January 9, 2006.

Based on the background above, RGC made new request to GOJ for the next phase of the project

that aims at strengthening of technical capacity of MOWRAM through establishing capacity development system in irrigation sector. In response to the request, JICA sent the preliminary study team to confirm the need for assistance and to discuss the details of the Project. The Record of Discussions on the Project was signed on January 4, 2006. This three and a half-year project started from January 10, 2006 and will be completed in July9, 2009.

## **2. Objectives of the Project**

The Project Purposes are 1) the technical capacity of MOWRAM and Provincial Department of Water Resources and Meteorology (herein after referred to as "PDWRAM") is improved, and 2) the farmers who have participated in the Project activities at the Pilot Sites (PS) are able to practice water management in terminal canals. The framework of the Project is shown in the PDM modified in February 2008 (See ANNEX 2). The organizational structure for the Project is shown in ANNEX 3.

## **III. ACHIEVEMENTS AND IMPLEMENTATION PROCESSES OF THE PROJECT**

The Team reviewed the performance of the Project including inputs and output indicators that could measure the achievement of the project purpose as well as the implementation process of the Project, the results of which are described in the following:

### **1. Inputs**

The Team confirmed that the Project has availed the following inputs along with the plan stated in the PDM and PO (the PO is attached as ANNEX 4).

#### **[Japanese side]**

##### **1) Dispatch of Experts to Cambodia**

Long-term experts in the three (3) fields and twelve (12) short-term experts were dispatched to the Project for technology transfer. And dispatch of two (2) more short-term experts is scheduled by the end of the Project period. The details of the Japanese Experts are found in ANNEX 5.

##### **2) Provision of Machinery and Equipment**

Machinery and equipment of the total value equivalent to 237,119.65 U.S. Dollars were provided for the Project activities. The details of the Machinery and Equipment are found in ANNEX 6.

##### **3) Training of Counterpart Personnel in Japan and the third countries**

Sixteen (16) counterpart personnel were dispatched to Japan and/or third countries, i.e. Thailand and Malaysia, for training on the subjects relevant to the scope of Project activities, such as "irrigation and drainage," "irrigation system and water management," "participatory irrigation management system for in paddies," and so forth. The details of the Training of Counterpart Personnel are found in ANNEX 7.

##### **4) Bearing of Local Costs**

A total amount of 456,017.76 US Dollars was provided to supplement a portion of local expenditure for JFY 2006 – 2007. It is planned by the end of the Project to allocate an additional amount of



265,000.00 US Dollars, thus the total allocation for the local cost bearing will be 721,017.76 US Dollars.

Table 3-1: Local Costs born by the Japanese Side

FY <sup>(*)</sup>	Running Costs	Activity Costs	Total
2006	65,375.49	137,714.01	203,089.50
2007	46,608.26	206,320.00	252,928.26
2008 <sup>(*)</sup>	48,000.00	162,000.00	210,000.00
2009 <sup>(*)</sup>	12,000.00	43,000.00	55,000.00
Total	171,983.75	549,034.01	721,017.76

(\*) Figures are based on the Japanese Fiscal Year (April – March).

(\*) Figures indicate the planned amounts

Source: Documents prepared by the Project

### [Cambodian side]

#### 1) Appointment of Counterpart Personnel and Other Staff

A total of fifty (50) counterpart personnel of relevant fields of the Project have been assigned to the Project from TSC and PDWRAM. The details of the Counterpart personnel are found in ANNEX 8.

#### 2) Allocation of the Operation Fund

A total amount equivalent to 144,777.98 U.S. Dollars had been allocated for FY 2006-2008, including the budget from MOWRAM and Counterpart Fund of RGC.

Table 3-2: Operational fund allocated by the Cambodian side

FY <sup>(*)</sup>	MOWRAM Budget	Counterpart Fund	Total
2006	15,053.49	1,000.00	16,053.49
2007	45,511.89	19,921.40	65,433.29
2008 <sup>(*)</sup>	54,212.60	9,078.60	63,290.20
Sub-Total	114,777.98	30,000.00	144,777.98
2009 <sup>(*)</sup>	75,000.00	47,060.00	122,060.00
Total	189,777.98	77,060.00	266,837.98

(\*) Figures are based on the Cambodian Fiscal Year (January – December).

(\*) Figures indicate the planned amounts.

Source: Documents prepared by the Project

#### 3) Provision of Facilities

The necessary office spaces with office equipment, water and electricity facilities have been provided. There has also been provision of fuel and some stationery, and the expenses of telephone bills are also covered.

## 2. Achievements of the Outputs

The Team confirmed that the Project has implemented the following activities as per the plan stipulated in the PDM and PO without notable delays or unprecedented difficulties, thus that the Project

would come up with most of its expected outputs by the end of the Project period, based on the following findings: (The detailed information on the output indicators and achievements is found in the ANNEX 9)

<p><b>Output 1:</b> The following outputs are expected to be achieved at TSC: 1-1. Establish the training system 1-2. Set up the technical manual 1-3. Manage the technical information</p>
<p><b>Indicators:</b> 1-1-1. TSC staff complete to make planned curricula of the 33 training courses. 1-1-2. TSC staff complete to produce 14 materials for the training courses. 1-2-1. TSC staff complete to make a list of planned technical manuals. 1-2-2. TSC staff complete to produce the 8 technical manuals. 1-3-1. A library of technical information in TSC is established. 1-3-2. A list of materials in the library is completed.</p>
<p><b>Achievements:</b> Based on the training needs assessment and review of the outcomes from the previous Japanese technical cooperation Project (hereinafter referred to as "the Phase 1 Project), the Project set the training courses and their targets. The training implementation capacity of TSC staff was assessed, based on the result of which the training curricula were developed. So far the 32 training curricula have been developed and modified with evaluation by the training participants. It is expected that 7 more curricula will be developed by the end of the Project period. (See ANNEX 10) Along with the training curricula, through the implementation of training, 14 training materials have been developed to cover the subjects of the training. As to the technical manuals, a list of 9 kinds of manuals has been made and agreed, and compilation work is in progress as to the 6 manuals, of which the Khmer translation is being done on 2 manuals. Activity schedule for compilation of all of the manuals and their Khmer translations are duly planned. Activities for the technical information management have been a bit behind the original schedule, however, the Project is trying to revise the PO to make sure the output would be achieved within the cooperation period.</p>

<p><b>Output 2:</b> The technical capacity of the engineers and technicians in MOWRAM and PDWRAM is well trained through the trainings at TSC and on-the-job-training (OJT) at Model Site (MS) and Pilot Sites (PS).</p>
<p><b>Indicators:</b> 2-1. 4,490 m length of the terminal canals in the Model Site are completed by the trained engineers and technicians in MOWRAM and PDWRAM. 2-2. More than 520 trainees in MOWRAM and PDWRAM complete the training courses in TSC. 2-3. More than 510 trainees in MOWRAM, PDWRAM and Farmers leaders complete OJT at the Model Site and Pilot Sites. 2-4. More than 21 staff in PDWRAM complete OJT at the Model and Pilot Sites.</p>
<p><b>Achievements:</b> By the time of the evaluation, the Project has conducted 32 training courses to which a total of 502 engineers and technicians of MOWRAM and PDWRAM have participated. Additional seven (7)</p>

training is scheduled by the end of the cooperation period, to which 113 more participants are expected to participate, thus the total number of training participants will be 615 persons.

OJT was conducted in the 18 among the 32 training courses mentioned above, and 365 trainees from MOWRAM and PDWRAM have completed the OJT<sup>1</sup>. A total of 98 trainees are to go through the four (4) OJT to be conducted from now on, thus the total number of OJT trainee will be 463. Aside from those OJT in the training courses, the Project has so far conducted eight (8) farmer-to-farmer OJT<sup>2</sup> for a total of 125 farmers in MS and PS. This OJT for farmers are scheduled to be conducted two more times with 28 farmer participants, thus a total of 153 farmers are expected to complete the OJT by the end of the Project. Therefore, the total number of the trainees who participate these OJT activities by the Project will be 616.

Necessary processes for the construction of the terminal canals in MS, such as the OJT on survey, design, meteorological and hydraulic observations, have been properly conducted, and contract work was implemented under the supervision of the counterpart personnel of the Project. As a result, six (6) terminal canals were completed with total length of 5,700m.

As is shown in the table below, the OJT activities for the terminal canal construction and rehabilitation in MS and PS were conducted for 34 times, to which all of the 30 PDWRAM counterpart personnel have participated.

Table: Number of OJT for terminal canal construction and rehabilitation at MS & PS

Subjects Sites	Survey	Meteorological observation	Crop water requirement	Design	Construction management	Total
Kandal Stung	4	-	1	-	4	9
Takeo	7	2	-	1	4	14
Pursat	5	-	-	1	5	11
Total	16	2	1	2	13	34

Source: Documents prepared by the Project

### Output 3:

With the technical assistance of TSC, the following outputs are expected to be achieved at the Pilot Sites.

- 3-1 The trained engineers and technicians in PDWRAM construct the terminal canals, which make it possible for farmers to easily access irrigation water.
- 3-2 Farmers start to conduct water management activities at the terminal canals in cooperation with PDWRAM.

### Indicators:

- 3-1-1. More than 5km length of the terminal canals with efficient water distribution capacity constructed or rehabilitated by the engineers and technicians in PDWRAM is extended.
- 3-1-2. Basic design documents for 3 Pilot Sites are made.
- 3-2. Activities concerned with the water management, such as moving the grass, dredging in canals and discussion, started with cooperation by PDWRAM at three Pilot Sites.

### Achievements:

Various OJT activities on route survey, topographic survey, drawing, and so forth were conducted in

<sup>1</sup> The participants took part in the training activities in the field as a part of the training course, which is called as "OJT" for this indicator.

<sup>2</sup> This activity is also called as "OJT" for this indicator.

all of PS through which the basic design documents were compiled and submitted to the relevant authorities for budget requests. The PDWRAM engineers and technicians have designed and supervise the construction of terminal canals, i.e. a 650m concrete canal in Takeo PS, and a 1,000m brick canal in Pursat PS. Also, in collaboration between the Project technical assistance and self-help initiatives of the farmers, a total length of 2,750m and 3,359m of the earthen terminal canals were rehabilitated in Takeo PS and Pursat PS, respectively. The total length of terminal canals constructed and rehabilitated has thus reached almost to 7.8km, exceeding the target figure of the indicator. (See ANNEX 11)

As to the water management activities, the Project has conducted the situation review, farmer-to-farmer OJT to explore the details of successful cases of farmer water user groups in other areas, as well as the workshops and meeting to promote the awareness and to formulate the water management activity plans by the farmers. As a result of these activities, the farmers in PS have already started their own activities on planning and implementing the water management in the terminal canals, such as canal cleaning and maintenance, in collaboration and consultation with the respective PDWRAM staff.

### 3. Prospects to Achieve the Project Purposes

Based on the confirmation on the following, the Team agreed that the Project purposes would successfully be achieved by the end of the Project.

#### Project Purpose:

1. The technical capacity of MOWRAM and PDWRAM is improved.
2. The farmers who have participated in the Project activities at the Pilot Sites (PS) are able to practice water management in terminal canals.

#### Indicators:

- 1-1 More than 60% of engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula.
- 1-2 More than 80% of trainees is satisfied with the training courses management system.
- 2-1 More than 9 water user groups are active in water management
- 2-2 More than 360 farmers start the water management works learned at the Project.

#### Achievements:

In evaluation of the 32 training courses so far conducted by the Project, an average of the 70% of the participants achieved the designated target in the curricula. Similarly, the ratio of the participants who are satisfied with the training course management system of TSC has reached to 94% among all trainees. (See ANNEX 10 for the details of the training evaluation.) It is therefore assumed that the Project purpose 1 would likely be achieved if the evaluation of the training courses to be conducted from now on would keep the similar level of achievement.

As to the water management in PS, ten (10) water user groups (FWUG) have been organized and currently in operation. The water management activities such as planning meeting and canal dredging were implemented in PS with a total number of 411 farmer participants, thus the figures of the indicators have already been met.

### 4. Prospects to Achieve the Overall Goal

#### Overall Goal:

Livelihoods of the farmers' households is improved by stabilizing their agricultural productivity through

efficient water resource management in the irrigation areas conducted by the trained engineers and technicians in MOWRAM and PDWRAM.

**Indicators:**

1. Irrigated area is increased to 810,300 ha. in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010.
2. Unit yield of rice is improved to 2.50 ton/ha. in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010.

It is reported that the unit yield of rice for the year 2007 was 2.62 ton/ha., and the total irrigated area in the country at the end of 2007 was 773,320 ha. As far as these data are concerned, the probability of achieving the overall goal seems to be high. However, it should be noted that, at the time of the evaluation, the targets of irrigated area and rice yield in the NSDP are being reviewed for possible revision, as the existing data indicated that the targets originally set for 2010 has already or almost been met by the end of 2007, which thus lead a question on the validity of the target figure of NSDP itself.

## **5. Implementation Processes**

### **(1) Decision making and monitoring mechanism**

The Joint Coordination Committee (JCC) has so far been held four times to review the progress of Project activities, to confirm the plans for the upcoming period, and to discuss other issues related to the Project implementation. Aside from the JCC, the Project has conducted quarterly Management Meetings, monthly Project Meetings, weekly or biweekly Counterpart Meetings for coordination and monitoring mechanism of the Project. (See Annex 3 for the chair of each meeting) The members of the Management Meetings include relevant personnel of MOWRAM such as finance department and administration and human resource department, who discuss important matters related to the financial, personnel and other important issues related to the Project management and operations. In the Project Meetings, the project personnel discuss the plan and progress of the detailed activity of the Project, particularly in the technical aspects, including the examination of training curriculum and materials, review of the technical manuals. In the Counterpart Meetings, project personnel discuss various issues at working level for information sharing and problem solving. This multi-layer mechanism for decision-making and monitoring seems to have considerably contributed to the effective communication among the relevant stakeholders and thus to the smooth implementation of the Project. Particularly, involvement of the officials of finance and other relevant departments of MOWRAM in the Management meeting was a vital factor for creating enabling environment for the Project implementation, in terms of allocation of the MOWRAM budget to the Project.

### **(2) Collaboration with the local authorities in the field activities**

Upon the implementation of the activities to enhance water management activities by farmers in PS, such as farmers' workshop and farmer-to-farmer OJT, the Project involves not only the farmer members of the Farmer Water User Groups (FWUG), but also the local authorities such as commune chiefs and village chiefs. Those local authorities in PS are cooperative to the Project activities and

some are actively taking initiatives in the activities conducted by the FWUG. The leadership of these local authorities has also contributed in some cases to the dissemination and expansion of water management activities by the farmers to the neighboring areas, thus the collaboration with the local authorities have contributed both to the smooth implementation and to spread out of the effects of the Project activities.

#### **IV. RESULTS OF THE EVALUATION**

Through the evaluation study, the Team jointly assessed the project's relevance, effectiveness, efficiency, impact and sustainability.

##### **1. Relevance**

The relevance of the Project is evaluated as high based on the following confirmation:

###### **(1) Relevance to the policies of RGC**

The Project is still consistent with the policies of RGC, as there has not been any major change in the Rectangular Strategy in 2004 and National Strategic Development Plan (2006-2010) which stresses the needs of irrigation development for improvement of agricultural productivity. Similarly, "the water resources management and development", together with "the administration, management and human resource development", are still envisaged as the targets of Action Plan in the current Strategic Development Plan (SDP) of MOWRAM (2006-2010).

###### **(2) Consistency with the ODA policies of the Japanese Government**

Sustainable economic growth and social security is one of the four priority areas of the Japanese ODA policy as has been stipulated in the country assistance policy for Cambodia, and "agricultural and rural development" as well as "improvement of agricultural productivity" are considered as vital cooperation strategy in the aid programs. Similarly, the Country Program of JICA for Cambodia also emphasizes the "Agriculture and Rural Development" as one of the priority issues. The Project is assumed to contribute to the cooperation program on "the improvement of irrigated agriculture," which is considered as one of the means to realize improvement of agricultural productivity. Thus the Project is considered to be quite consistent with the Japanese aid policies.

###### **(3) Relevance of the project design**

In Cambodia, a large number of the experienced human resource in irrigation engineering had been lost during the civil war, and there is no comprehensive program to train the irrigation engineers in the educational institutions in the country. Human resource development is the urgent needs in the irrigation sector, as insufficiency or inadequacy of irrigation facilities has long been one of the major inhibiting factors to the improvement of the rice productivity. With the limited number of technical staff of RGC in the field, participation of the beneficiary farmers in operation

and maintenance of the irrigation facilities, especially in the terminal level is deemed to be essential. The Project is aiming to enhance the technical capacity of the government officers in irrigation sector, such as engineers and technician of MOWRAM and PDWRAM, as well as of the farmers, through strengthening the function of TSC as the technical training institution in the sector. This approach is considered to be highly practical and an appropriate response to the needs of the technical capacity development in the irrigation sector in Cambodia.

(4) Relevance to the needs of target beneficiaries

In PS, the interviewed farmers pointed out that there had been the problems of water distribution, such that water was not available at needed time and that water was distributed only to the farmland adjacent to the main or secondary canals, prior to the commencement of intervention by the Project. Through the Project activities, however, the water distribution at terminal facilities has considerably been improved, and some positive effects on the yield, cropping, and expansion of irrigated area are now being realized. The leaders of FWUG are also actively engaged in the activities for water management, operation and maintenance of the irrigation facilities, to sustain these positive effects. The Project is considered to be quite relevant to the needs of the beneficiaries.

## 2. Effectiveness

The effectiveness of the Project is considered to be high.

(1) Achievement of Project purpose

The participants of the training courses conducted by the Project have rarely had training opportunities before the Project, thus highly appreciate the technical training by TSC. The both levels of achievement of the curriculum target and satisfaction are high on average, indicating the usefulness of the training for the participants. As to the water management activities at PS, leaders of FWUG have already started taking initiatives to operate and maintain the terminal canals of their respective irrigation system in an organized manner in close consultation with the PDWRAM and TSC counterpart personnel. As these activities are scheduled to continue, the Project purpose is likely to be achieved to a large extent by the end of the cooperation period.

(2) Contribution of outputs to project purpose achievement

The Project purpose of improving the technical capacity of MOWRAM and PDWRAM is to be achieved through attainment of the output 1, i.e. the enhancement of training capacity of TSC, as well as by the attainment of the output 2, i.e. technical transfer through the training to individual engineers and technicians of MOWRAM and PDWRAM. The water management ability of the farmers in PS is to be enhanced first by the output 3-1, where the trained PDWRAM staff work to adequately construct or rehabilitate the terminal canals in PS, through which the physical improvement of water distribution is to be realized. Then, the output 3-2, i.e. initiation of the activities by beneficiary farmers will contribute to the achievement of this purpose. Thus, the

logical sequence between the outputs and Project purpose is appropriate, and all of the three outputs have significantly contributed to achievement of the project purpose.

(3) Analysis of factors

1) Promoting factors

TSC has officially become a department of the MOWRAM in December 2006. The fact that TSC acquired an official position in the MOWRAM's organizational structure with assignment of its own director has greatly contributed to the proper implementation of the Project activities. It was also beneficial to improve the ownership of RGC, as exemplified in the allocation of the MOWRAM budget to TSC, even on a small scale. This establishment of TSC as the sole training wing of MOWRAM is considered as a promoting factor to the project achievement, as well as a positive implication to the organizational sustainability.

2) Hampering factors

In the training activities, the candidates were selected by the PDWRAM upon invitation from MOWRAM. TSC counterpart personnel who served as trainers reported that the participants were not always appropriate to the training subjects in some cases. In addition, the levels of knowledge and experiences of the participants varied to a considerable degree, which created some difficulties for effective teaching for the part of the trainers. As for PS activities, the delay in securing budget for canal construction by RGC has affected implementation schedule of the actual construction work as well as in the water management activities. In M\$ and PS in Kandal Stung, some farmers do not agree to provide the land for canal construction for free, as the price of land has been increasing due to the economic development in the area, resulting in the delay in scheduled construction work. Although the Project could so far manage to proceed with PS activities, by slightly modifying the original plan, these issues may need to be noted as potentially hampering factors that could cause any major problem for the implementation process of the Project.

(4) Important Assumptions

There has not been any notable influence caused by the changes of the important assumptions.

**3. Efficiency**

The efficiency of the Project is considered to be high.

(1) Appropriateness and Utilization of Inputs

Inputs by both Japanese and Cambodian sides were mostly adequate and sufficient in terms of the volume as well as of the quality to produce the intended outputs for the following reasons:

1) Japanese Experts

The timing, quality and quantity of the dispatch of Japanese experts were also considered



appropriate. As for the short-term experts, some counterpart commented that it is harder to catch up with highly technical contents in a short period of time in an intensive manner, compared to the continuous guidance by the long-term experts during the Phase I Project. Nevertheless, the roles of the short-term experts were clear and adequately integrated in the Project activities; therefore the experts could play their roles with maximum efficiency.

#### 2) Machinery and equipment

The machinery and equipment required for the Project activities and technical transfer have duly been provided. Counterpart and other relevant personnel both at TSC and PDWRAM have already become capable of handling these equipment and machineries by their own and most of the equipment provided is properly utilized in good conditions.

#### 3) Training of counterpart personnel

The timing, duration and subject of counterpart training in Japan and the third countries were adequate. Those who have participated in these training unanimously consider that their learning and experiences were very inspiring, though some aspects learned through the exposure to the advanced technology may not directly be applicable to the situation of Cambodia. Their participation to these training is evaluated as helpful in carrying out not only the activities of the Project but also their regular duties in the future. It is also to be noted that seven (7) counterpart personnel have enrolled in the academic degree courses in Cambodia with partial financial support from the Project.

#### 4) Inputs from the Cambodian side

A sufficient number of counterpart personnel both from MOWRAM and PDWRAM were assigned in each field of Project activities in accordance with the planned schedule. It is to be noted and appreciated that RGC has made considerable efforts to allocate its own budget to the Project, not only from MOWRAM budget, but also from the Counterpart Fund of RGC, despite of the delay in actual allocation of the fund. Provision of the office space with office equipment, water and electricity facilities, fuel, some stationery, and so forth is also contributed to the smooth implementation of the Project activities..

### 4. Impact

Impact of the Project is considered to be positive as the results of the following analysis:

#### (1) Impact on overall goal level

The overall goal of the Project is four-fold, i.e. firstly, the conduct of training of engineers and technicians of MOWRAM and PDWRAM; secondly, the realization of water resources management by those trained staff; thirdly, the stabilization of the agricultural production; and finally, the improvement of the livelihood of the farmers. As the training system would be established at TSC, the MOWRAM and PDWRAM staff would likely be provided with training opportunities as far

as RGC could continue the effort to conduct training activities. Since PDWRAM have already had their own plans of irrigation projects, the trained PDWRAM staff would automatically take initiatives in the irrigation development once the budget would be secured. Contribution of proper irrigation to the efficient water resource management as well as to the stabilization of agricultural production has partly been proven in PS activities of the Project, and if the relatively constant selling price of rice produce is taken into account, the probability of improvement of the farmers' livelihood seems to be high. Therefore, positive impacts of the Project are anticipated on the overall goal, yet under the condition if necessary inputs for training activities as well as for irrigation development by PDWRAM would continuously be provided through the efforts by RGC.

## (2) Positive Impacts

In MS in Kandal Stung, double cropping in the wet season with improved rice variety has been widely practiced since the improvement of the terminal canals. According to the interview by the Project, the area of double cropping has increased from 10% in 2002 to 60% in 2008. The interviewed farmers reported to the Team that the yield has also increased. These statements are consistent with the results of sample interview by the Project, as is shown in the Table 4-1 below. In the Takeo PS, double cropping in the dry season is being tried, and the double cropping in wet season with IR variety is on trial in the Pursat PS by the voluntary initiatives of the farmers. It is also pointed out by the farmers during the field interview that the construction of the access roads along the rehabilitated or newly constructed canals have contributed to the improved access to and from the farmland, benefiting the farmers in terms of daily mobility, transport of agro-inputs and produce.

Table 4-1: Comparison of the yield at farmlands of sample farmers in MS in Kandal Stung

	Yield in non-irrigated farmland (ton/ha.)	Yield in Irrigated farmland (ton/ha.)
Farmer A	3.0	4.0
Farmer B	No farmland	4.5
Farmer C	2.0	3.5
Farmer D	No farmland	5.0
Farmer E	1.5	3.0
Average	2.16	4.0

Source: Documents prepared by the Project (based on the interview in March 2008)

## (3) Negative Impacts

There has not been any negative impact reported or observed at the time of the evaluation study.

## 5. Sustainability

The sustainability of the Project is assessed as fair enough in some aspects, but there are some remaining concerns in other aspects as described in the following:

### (1) Policy and Institutional Sustainability

The necessity of irrigation development for the improvement of agricultural production as well as the consequence of the technical capacity development in water resources and irrigation sector are given high priority in the current policy of RGC; therefore the policy support from the government would continuously be secured for the coming years. Also, the institutional framework is being formulated with the recent enactment of the Law on Water Resources Management and on-going preparation of the Sub-Decrees on FWUC, on River Basin Management and on Water Licensing. Therefore, the policy and institutional sustainability of the Project is considered as high.

### (2) Organizational and Financial Sustainability

TSC has already become a department of MOWRAM, and MOWRAM has a long-term vision to upgrade TSC as a comprehensive institute in the water resources, irrigation and meteorology sector, in terms of training, education, and research. The Road Map for institutionalization of TSC has been prepared with concrete steps, targets, and budgetary and human resource requirements. With these initiatives by MOWRAM, the organizational sustainability is evaluated as high.

However, the allocation of TSC budget by RGC after the cooperation period will inevitably be of much smaller scale than the Project inputs, which would unavoidably lead to the scale down of the training activities. The limited budget for PDWRAM would also become an unfavorable factor in terms of actual implementation of any irrigation development project in the field, which is essential for the OJT activities, i.e. one of the most important parts of the training curriculum by TSC. Thus, the financial sustainability is not sufficiently secured at this time, although the continuity of some training activities is expected in a limited scale.

### (3) Technical Sustainability

It is assessed that the technical sustainability at this stage is secured only in terms of continuous training activities. In order to ensure regular technical update and upgrading, wider dissemination and practical application, further technical supports seem to be necessary. It is also to be noted in this regard that the technical aspects that TSC has dealt with were limited to the terminal irrigation facilities and structures in the entire irrigation system; however, considering the roles and functions expected to TSC in the future as the sole technical institute in water resources, irrigation and meteorology sector in the country, the scope of technical aspects to be covered by TSC may need to be broadened. Further discussion within the MOWRAM should be held on the future directions for TSC to pave, from medium- and long-term perspectives in line with the Road Map for institutionalization of TSC.

#### 1) TSC counterpart personnel

The training curriculum, materials and technical manuals are being compiled by the Project, and the counterpart personnel at TSC have become almost capable of conducting the training for participants from PDWRAM by themselves with some support from the Japanese experts. They

are generally confident in carrying out these already developed training courses by their own, however, they feel that more guidance, knowledge and experiences are needed for them to be able to revise or modify the existing training curriculum, let alone to develop new curriculum.

2) Counterpart personnel at 3 PDWRAM with PS activities

About 50% of the counterpart personnel of the PDWRAM where PS activities have been conducted are confident to continuously utilize the technical learning obtained from TSC training by themselves in the actual irrigation development activities, yet, all of them express the necessity of further technical training. It is also pointed out that there are more technical staff of PDWRAM who did not participate in the training and PS activities under the Project, thus that the technical capacity of PDWRAM as a whole still needs to be enhanced.

3) Training participants from other PDWRAM

Although the level of the capacity of the participants of the training activities from PDWRAM other than those with PS activities may be assessed satisfactory as indicated in the indicators, continuity of training activities and possibility of application of technical learning are still a challenge in the future direction, due to the aforementioned financial constraints of RGC.

4) Farmers in PS

As for the ability of the farmers in PS, the activities of FWUC are still in a very initial stage, thus need further guidance, supervision and consultation in terms of both water management technologies and organizational management. As the support to FWUC will be the responsibility of the new department on FWUC in MOWRAM, it is necessary to carefully examine the contents and methods of technical support to FWUC for water management at terminal level, in line with the stipulations of the Sub-Decree on FWUC that is currently being drafted. TSC needs to collaborate with the Department of FWUC in this regard.

## V. CONCLUSION

The Project has successfully been implemented without any major or critical problem and will mostly achieve its outputs by the end of the technical cooperation period. Prospect of achieving the Project purpose is evaluated high with continuous efforts that are quite likely to be made for the rest of the project period. Thus, it is to be concluded that the Project will be terminated as stipulated in the R/D.

## VI. RECOMMENDATIONS

### 1. Recommendations for the remaining period of the Project

(1) Prompt disbursement of the operational fund by RGC

For the implementation of the Project, RGC has allocated considerable amount of budget. However, the actual disbursement of the Counterpart Fund has tended to be delayed, which was repeatedly pointed out at various occasions to discuss managerial issues of the Project. There

will still be many activities for the remaining seven months of the Project period, such as conduct of training courses, continuous monitoring on PS activities, and so forth; therefore the delay in the fund disbursement may cause a serious inhabitation to the successful completion of those planned activities. It is thus strongly recommended to the relevant offices of RGC to make maximum efforts for prompt and smooth disbursement of the Counterpart Fund for the Project.

(2) Follow-up on the application of technical learning by the training participants from PDWRAM

In the 3 PDWRAM where PS activities were conducted, the counterpart personnel were assigned. Through the actual construction and rehabilitation of terminal canals and water management activities in PS, the application of the technical leanings by these counterpart personnel was confirmed. However, the application of technical learning by the training participants from other PDWRAM has not yet been confirmed, as the Project is yet to conduct comprehensive follow-up of the ex-participants of the training by TSC. It is therefore necessary by the end of the Project to organize any activity to grasp the degree of utilization of technical learning by the training participants. Such undertaking will also serve to let the PDWRAM realize on the roles and functions of TSC as the technical training wing of MOWRAM.

(3) Wrap-up workshop on the achievement of the Project

The Project has conducted the technical training for the engineers and technicians of MOWRAM and PDWRAM as well as the water management, operation and maintenance of terminal irrigation facilities in PS. The outputs with various experiences have been accumulated through the implementation of these activities both at TSC and PS. It is worthy for the Project to wrap up these activities through the review and discussion among the counterpart personnel and to organize a forum to present the Project achievements, at least internally among MOWRAM staff, and if possible to a wider range of audiences, including the relevant government officers and other donor agencies. The information management function of TSC can also be known to the audience at such an occasion, which would facilitate the collection and utilization of technical information managed by TSC in the future.

## 2. Recommendations for the future (after the completion of the Project)

(1) Efforts for realization of the Road Map for the institutionalization of TSC

According to the Road Map for the institutionalization of TSC that is formulated by MOWRAM, TSC is to bear broadly four functions, namely, a) to provide technical training to the technical staff of MOWRAM and PDWRAM, including the new recruits, b) to conduct experiments and researches in water resources, irrigation and meteorology sector, c) to award the academic education with degree programmes, and d) to provide technical assistance services to the irrigation development projects to be implemented by MOWRAM and PDWRAM. In order to realize the Road Map, considerable efforts to enhance various organizational and technical capacities of TSC is required in line with the comprehensive human resource development framework of MOWRAM as a whole. It is therefore strongly requested to not only to MOWRAM, but also to other relevant agencies of

RGC to take every possible measure to secure the human and financial resources to realize this long-term vision for TSC. It may also be worthy to consider the application of some support incentive systems such as Priority Mission Group (PMG) and Merit Based Payment Initiative (MBPI), for which the detailed coordination and early preparation for necessary procedures may be required.

(2) Human resource development of TSC personnel

In pursuit of any of the future roles and functions envisioned in the aforementioned Road Map, it is essential to further strengthen the technical capacity of TSC personnel. For TSC staff, it is important to acquire more academic knowledge and technical experiences through opportunities for advanced studies and training in Cambodia and/or overseas. Since the popularity of TSC as the technical training wing as well as technical service provider in water resources, irrigation and meteorology sector has gradually been increasing among the PDWRAM and donor agencies through the implementation of the Project, the human resource development of TSC should also be in line with this function at least for several coming years. It is thus recommended to both RGC and GOJ to continue efforts for human resource development of TSC personnel.

(3) Utilization on the experiences and outputs of the Project by MOWRAM

The Project will compile technical manuals on technologies related to water resources, irrigation and meteorology. Since these manuals would integrate not only the literature review but also the actual experiences of PS activities, it is thus expected that these outputs would serve as useful references for the relevant departments of MOWRAM. Particularly, in terms of the water management by the farmers, the essences derived from the first-hand experiences of FWUG in PS and learning from successful cases studies through the farmer-to-farmer OJT may have practical implications for the effective support to the farmers in the future by the newly-established Department of FWUC. It is therefore recommended to MOWRAM to ensure the thorough dissemination and maximum utilization of these Project outputs.

## VII. LESSONS LEARNED

(1) Continuity of the guidance by short-term experts

In the Project, the activities have been carried out and managed through the day-to-day guidance by a small number of the long-term experts who are stationed in TSC, together with the technical transfer in various fields by the larger number of short-term experts. As many counterpart personnel have experiences of the Phase I Project where long-term experts in the major technical fields were stationed at TSC, some felt difficulties to fully catch up with highly technical guidance in a short period of time in an intensive manner. It was even more difficult in cases where different short-term experts were dispatched to guide them in the similar field, than in cases where same persons were continuously engaged in the Project. Therefore, it may be drawn as a lesson for the technical cooperation project with similar expert allocation that the

continuity of the service of same short-term experts is effective and efficient when the dispatch of short-term experts in the similar field for more than 1 time is planned in the project design.

(2) Support to the efforts by implementing agencies in terms of the public relations

Throughout the period of its implementation, the Project has supported TSC in publicizing its roles and functions to other institutions through various donor meetings and by receiving many visitors such as students, journalists, NGOs and so forth. Such publicity could raise interests and expectations among the donor agencies on the services that TSC can render. Such support is considered to be an effective measure to broaden the possibility of additional support to the implementing agencies, thus to contribute to the organizational and financial sustainability of the cooperation projects.



## ANNEX 1: Schedule of the Joint Evaluation

Date	Time	Activities			Remarks
		Cambodian Team Members	Japanese Team Members		
			Team Leader, Irrigation Technology, Planning Management	Evaluation and Analysis	
Nov.16	Sun			Narita(1050 TG641)→Bangkok →Phnom Penh(1915 TG698)	Phnom Penh
Nov.17	Mon	9:00		60th Counterpart Meeting,	TSC
		14:00		Meeting with Japanese Experts	TSC
Nov.18	Tue	9:00		Meeting with TSC Director	TSC
		10:30		Interview with TSC counterparts	TSC
Nov.19	Wed	8:30		Interview with Pursat PDWRAM Counterparts	Pursat PDWRAM
		14:30		Interview with Pursat PS Group Leaders	Pursat PS
Nov.20	Thu	10:30		Interview with Takeo PDWRAM counterparts	Takeo PDWRAM
		14:00		Interview with Takeo PS Group Leaders	Takeo PS
Nov.21	Fri			Additional interview with TSC counterpart & Japanese Experts	TSC
Nov.22	Sat			data analysis	TSC
Nov.23	Sun			data analysis	TSC
Nov.24	Mon			Narita(1050 TG641)→Bangkok →Phnom Penh(1915 TG698) Meeting with Japanese Experts	TSC
Nov.25	Tue	8:30		Courtesy call to MOWRAM (H.E. Veng Sakhon, Secretary of State)	MOWRAM
		9:15		Courtesy call to MOWRAM (H.E Bun Hean, Secretary of State)	MOWRAM
		10:00		Meeting at JICA Office	JICA
		11:15		Courtesy call to the Embassy of Japan	Embassy
		14:00		Meeting with JICA Experts	TSC
Nov.26	Wed	9:00	First Joint Evaluation Team Meeting		MOWRAM
		14:00	same as above		TSC
Nov.27	Thu		Site survey (Kandal Stung model site and Takeo pilot site of the Project, interview with farmers and staff of the provincial office)		Kandal MS Takeo PS
Nov.28	Fri		Site survey (Pursat pilot site of the Project, interview with farmers and staff of the provincial office)		Pursat PDWRAM Pursat PS
Nov.29	Sat		Data analysis and preparation of evaluation report		TSC
Nov.30	Sun		Data analysis and preparation of evaluation report		TSC
Dec.1	Mon	9:00	Second Joint Evaluation Meeting (finalize evaluation report)		MOWRAM
Dec.2	Tue		Third Joint Evaluation Meeting (finalize evaluation report) Reporting to Project Director & Manager		MOWRAM
Dec.3	Wed	9:00	Joint Coordination Committee (sign the Final Eva Report & M/M)		MOWRAM
		PM		Report to JICA Office	JICA
Dec.4	Thu	11:00		Report to Embassy of Japan Leave Phnom Penh	Embassy of Japan
Dec.5	Fri			Arrive in Japan	



PDM (英文)

ANNEX 2: Project Design Matrix (PDM)

Name of the Project: The Technical Service Center for Irrigation System Project Phase-2  
 Implementation Organization of the Project: Ministry of Water Resources and Meteorology (MOWRAM) Supporting Organization: Japan International Cooperation Agency (JICA)  
 Term of the Cooperation: 3 years and 6 months (from January 10, 2006 to July 9, 2009)

Target Group: Full time counterparts in the TSC, the engineers & technicians in MOWRAM and PDWRAM and the farmers at Pilot Sites

Sites of the Project

Technical Service Center for Irrigation and Meteorology (TSC)

Model Site (MS): 260ha special field within the Kandal Stung Irrigation Area, Kandal Province

Pilot Site (PS): the Kandal Stung Irrigation Area, Kandal Province, Thleas Ma Orm Area, Pursat Province, Thom Vinev Area, Takeo Province Version: 3.0 (Revised on 5 February 2008)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p><b>Overall Goal</b></p> <p>Livelihood of the farmer's households is improved by stabilizing their agricultural productivity through efficient water resource management in the irrigation areas conducted by the trained engineers and technicians in MOWRAM and PDWRAM.</p>	<p>1. Irrigated area is increased to 810,300ha in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010.</p> <p>2. Unit yield of rice is improved to 2.50 ton/ha in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010.</p>	<p>1. Statistical Data of MOWRAM.</p> <p>2. Statistical Data of MAFF (Ministry of Agriculture, Forestry and Fisheries)</p>	
<p><b>Project Purpose</b></p>			
<p>1. The technical capacity of MOWRAM and PDWRAM is improved.</p>	<p>1-1. More than 60% engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula.</p> <p>1-2. More than 80% of trainee is satisfied with the training courses management system.</p>	<p>1-1. Documents about the evaluation of respective training courses of the Project through questionnaire and test to trainee.</p> <p>1-2. Documents about the evaluation of respective training courses of the Project through questionnaire.</p>	<p>1. Engineers and technicians who participated in the trainings remain at MOWRAM and PDWRAM and continue to assist farmers in Cambodia.</p>
<p>2. The farmers who have participated in the Project activities at the Pilot Sites (PS) are able to practice water management in terminal canals.</p>	<p>2-1. More than 9 water user groups are active in water management.</p> <p>2-2. More than 360 farmers start the water management works learned at the Project.</p>	<p>2-1. Record of the project activities</p> <p>2-2. Record of the project activities.</p>	<p>2. The circumstances of the agricultural product market don't get worse.</p> <p>3. Workers in each farmer's household is secured in the Target Area.</p> <p>4. Farmers in the national irrigation project are not against the activities of the water management.</p>

Outputs			
<p>1. The following outputs are expected to be achieved at TSC.</p> <p>1-1. Establish the training system</p> <p>1-2. Set up the technical manuals</p> <p>1-3. Manage the technical information</p>	<p>(Until the end of the Project)</p> <p>1-1-1. The TSC staff complete to make planned curricula of the 33 training courses.</p> <p>1-1-2. The TSC staff complete to produce 14 materials for the training courses.</p> <p>1-2-1. The TSC staff complete to make a list of planned technical manuals.</p> <p>1-2-2. The TSC staff complete to produce the 8 technical manuals.</p> <p>1-3-1. A library of technical information in TSC is established.</p> <p>1-3-2. A list of materials in the library is completed.</p>	<p>1-1-1. The numbers of planned and implemented curricula for the training courses.</p> <p>1-1-2. The numbers of planned and produced materials for the training courses.</p> <p>1-2-1. The list of planned technical manuals.</p> <p>1-2-2. The numbers of planned and produced technical manuals.</p> <p>1-3-1. Established technical library</p> <p>1-3-2. Completed list of materials in the library</p>	<p>1. Engineers and technicians who participated in the trainings remain at MOWRAM and PDWRAM.</p> <p>2. The financial resources for MOWRAM are secured.</p>
<p>2. The technical capacity of the engineers and technicians in MOWRAM and PDWRAM is well trained through the trainings at TSC and on-the-job-trainings (OJT) at MS and PS.</p>	<p>2-1. 4,490 m length of the terminal canals in the Model Site are completed by the trained engineers and technicians in MOWRAM and PDWRAM.</p> <p>2-2. More than 520 trainees in MOWRAM and PDWRAM complete the training courses in the TSC.</p> <p>2-3. More than 510 trainees in MOWRAM, PDWRAM and Farmers leaders complete OJT at the Model Site and Pilot Sites.</p> <p>2-4. More than 21 staff in PDWRAM complete OJT at the Model and Pilot Sites.</p>	<p>2-1. Documents about plan and implementation on the construction of the terminal canals on the Project.</p> <p>2-2. Documents about implementation of the training courses.</p> <p>2-3. Documents about implementation of OJT.</p> <p>2-4. Document about implementation of OJT.</p>	
<p>3. With the technical assistance of TSC, the following outputs are expected to be achieved at PS.</p> <p>3-1. The trained engineers and technicians in PDWRAM construct the terminal canals, which make it possible for farmers to easily access irrigation water.</p> <p>3-2. Farmers start to conduct water management activities at the terminal canals in cooperation with PDWRAM.</p>	<p>3-1-1. More than 5km length of the terminal canals with efficient water distribution capacity constructed or rehabilitated by the engineers and technicians in PDWRAM is extended.</p> <p>3-1-2. Basic design documents for 3 Pilot Sites are made.</p> <p>3-2. Activities concerned with the water management, such as mowing the grass, dredging in canals and discussion, started with cooperation by PDWRAM at three Pilot Sites.</p>	<p>3-1-1. Documents about construction and use of the terminal canals of the Project</p> <p>3-1-2. Basic design documents</p> <p>3-2. Record of the project activities</p>	

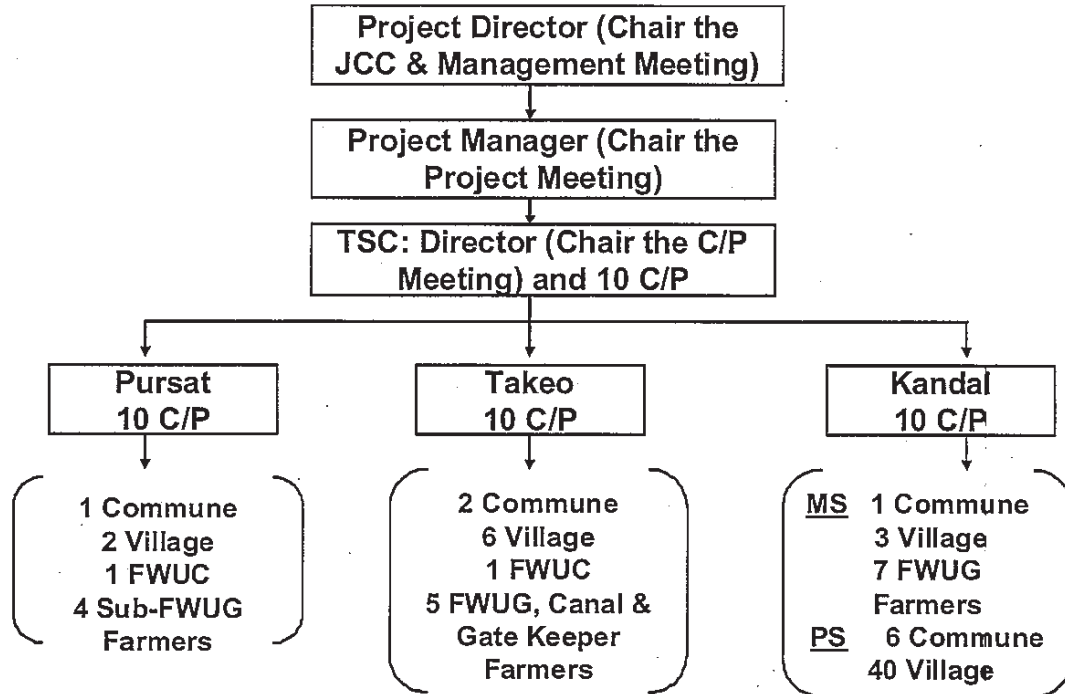
Activities	<Japanese Side>	Input	<Cambodian Side>
1	1-1-1 Make training curricula 1-1-2 Make systematized training materials	1. Dispatch of experts: (1) Long-term experts: several persons/year such as: - Chief advisor/ Irrigation - Project coordinator/ Training - Water Management (2) Short-term experts are sent according to necessity.	1. Assignment of counterpart personnel and other supporting staff members. (1) Project Director (2) Project Manager (3) Project Sub-Managers (4) Full-time counterpart personnel: 1) Director (when TSC is established, automatically to be Project Sub-Manager) 2) Deputy Director (when TSC is established) 3) Engineering Office Survey Section Planning and Design Section Construction Section 4) Water Management Office Facility Management Section Farmer Water Management Section Watershed Management Section 5) Administration and Finance Office Administration Section Planning and Accounting Section Training and Management Section Information Management Section
2	1-2-1 Make a technical manual list 1-2-2 Compile technical manuals 1-2-3 Translate technical manuals into Khmer	2. Provision of equipment 3. Training of Cambodian counterpart personnel in Japan and in other countries 4. Budget for local activity	2. Farmers are not against the Project. 3. The Pilot sites are selected by the Cambodian Government.
3	1-3-1 Collect and organize technical information in irrigation sector 1-3-2 Provide technical information 2-1 Conduct the trainings for the engineers and technicians in MOWRAM and PDWRAM at TSC 2-2 Conduct OJT for the engineers and technicians in MOWRAM and PDWRAM at MS and PS 3-1 Provide technical assistance on the construction of terminal canals at PS 3-2 Provide technical assistance on farmers' participatory water management at PS		2. Provision of land, buildings and facilities related to the Project. 3. Provision of machinery necessary for the Project. 4. Allocation of budget for: (1) Operation and maintenance of irrigation systems (2) Personnel expenses of counterparts and other supporting staff (3) Operating expenses necessary for the implementation of the Project.

Abbreviations:

- MOWRAM: Ministry of Water Resources and Meteorology
- PDWRAM: Provincial Department of Water Resources and Meteorology
- TSC: The Technical Service Center for Irrigation and Meteorology
- MS: Model Site
- PS: Pilot Sites
- OJT: On-the-Job Training

プロジェクト実施体制図

ANNEX 3: Organizational Structure of the Project



プロジェクト活動計画・実績表 (PO)

Ver.3 on 5 February 2008

Annex 4: Plan of Operations (PO)

Activities	Targets / Indicators	2006				2007				2008				Responsible persons in the project	Inputs	Remarks
		I	II	III	IV	I	II	III	IV	I	II	III	IV			
<b>1-1. Establish the training system</b>																
<b>1-1-1. Make training curricula</b>																
1-1-1a Follow-up survey of Phase 1 training															TSC & Training team	Short-term Expert (Project planning)
1-1-1b Need survey of training course in TSC															Training team	Short-term Expert (Irrigation project Management)
1-1-1c Need survey of training course in MOWRAM and PDWRAM															TSC & Training team	
1-1-1d Set up the training target and a training courses list	33 courses & 580 trainees (20 or 10 trainees / 1 course)														Training team & All CP	
1-1-1e Assessment of present technical capacity of survey, planning, Design,															TSC & Training Team	
1-1-1f Design of training curricula	14 curricula														All CP	
1-1-1g Assessment of training courses and MOWRAM & PDWRAM human resources needs															TSC & Training Team	
1-1-1h Review of the training target, training course list & curricula															TSC, Training team & All CP	
1-1-1i Set up a short and long term plan for TSC training course															TSC	
<b>1-2. Make systematized training materials</b>																
<b>1-2-1. Make a technical manual list</b>																
1-2-1a Collect and translate technical materials															All CP	
1-2-1b Assess and review of manuals and text of Phase 1 Project															All CP	
1-2-1c Make the training materials	14 materials														All CP	
1-2-1d Assess the training materials															TSC, Training team and appointed people by JCC	
1-2-1e Review the training materials															All CP	
<b>1-2.2. Compile technical manuals</b>																
1-2-2a Collection of technical manuals															All CP	Short-term Expert (Irrigation & drainage designing manual)
1-2-2b Assessment of existing manuals in MOWRAM															All CP	Short-term Expert (Irrigation & drainage structure design & drawing and tenderization of irrigation facilities)
1-2-2c Practice and inspect in TSC activities															All CP	Short-term Expert (Construction management)
1-2-2d Make draft technical manuals and distribute to MOWRAM & pilot PDWRAM	8 draft manuals														All CP	Short-term Expert (Quality control)
1-2-2e Review the draft technical manuals															All CP	Short-term Expert (Operation & maintenance)
1-2-2f Approve by MOWRAM and distribute to MOWRAM & PDWRAM	8 manuals														MOWRAM	Short-term Expert (Water management database)
1-2-2g Translate technical manuals into Khmer															MOWRAM	Short-term Expert (Technical manual coordination & justification)
1-2-3 Translate technical manuals in Khmer															All CP	
<b>1-3. Manage the technical information</b>																
<b>1-3-1. Collect and organize technical information in irrigation sector</b>																
1-3-1a Collection of technical information															All CP	Personal computer
1-3-1b Establish a technical library at TSC	1 technical library														MOWRAM	Photocopy machine
1-3-1c Make a technical information list	1 technical information list														All CP	
<b>1-3-2. Provide technical information</b>																
1-3-2a Operation of the technical library															TSC	
1-3-2b Build a web page and load the technical information list															TSC	
1-3-2c Request base distribution of draft technical manuals & training materials															TSC	
1-3-2d Distribution of technical manuals & training materials to MOWRAM & PDWRAM															MOWRAM	
<b>2-1. Conduct the trainings for the engineers and technicians in MOWRAM and PDWRAM at TSC</b>																
<b>2-1-1. Survey</b>																
2-1-1a Basic survey 1															Survey section	Short-term Expert (Soil and concrete test)
2-1-1b Basic survey 2															Survey section	Short-term Expert (Foundation design & application of FEM)
2-1-1c Total station and data processing															Survey section	Short-term Expert (Rural development & irrigation planning by GIS)
2-1-1d Discharge measurement															Survey section	Personal computer
2-1-2 Planning															Planning section	GIS software
2-1-2a Meteorology survey and crop water requirement															Planning section	Power Aviger
2-1-2b Irrigation planning															Planning section	Equipment for test
2-1-2c Irrigation & Water Management planning															Planning section	
<b>2-1-3. Design</b>																
2-1-3a Design Manual on Irrigation/Water Resources Development Project															Design section	
2-1-3b Design of irrigation canal & facilities															Design section	
2-1-3c Design of foundation of canal structure															Design section	
<b>2-1-4. Construction</b>																
2-1-4a Construction Management															Construction section	
2-1-4b Real practical training at the construction site															Construction section	
<b>2-1-5. Water management</b>																
2-1-5a Participation of farmers for sustainable irrigation system															Water management section	
2-1-5b Operation and maintenance of irrigation facilities															Water management section	
<b>2-2. Conduct OJT for the engineers and technicians in MOWRAM and PDWRAM at MS and PS</b>																
<b>2-2-1. OJT at MS</b>																
2-2-1a Survey & Planning	Construct 4,490m length of terminal														Survey and Planning	Short-term Expert (Topography Survey & Mapping)
2-2-1b Design															Design section	Short-term Expert (Meteorology & Hydrology Measurement)
2-2-1c Contract Management															Construction section	Total station
2-2-1d Construction Management															Construction section	GPS
2-2-1e Farmers Workshop															Water management section	
2-2-1f Water Management by Farmers Group															Water management section	
<b>2-2-2. OJT at PS</b>																
2-2-2a Survey & Planning															Survey and Planning	
2-2-2b Design															Design section	
2-2-2c Contract Management															Construction section	
2-2-2d Construction Management															Construction section	
2-2-2e Farmers Workshop															Water management section	
2-2-2f Water Management by Farmers Group															Water management section	
<b>3-1. Provide technical assistance on the construction of terminal canals at PS</b>																
<b>3-1-1. Kandal</b>																
3-1-1a Survey & Planning	More than 28,000m length of terminal canal														Survey and Planning	Short-term Expert (Irrigation, drainage & water management planning)
3-1-1b Design															Design section	Theodolite
3-1-2 Takeo															Design section	Auto level
3-1-2a Survey & Planning	Takeo province														Survey and Planning	Total station
3-1-2b Design															Design section	Personal computer
3-1-2c Contract Management															Design section	GIS software
3-1-2d Construction Management															Construction section	GPS portable
<b>3-1-3. Pursat</b>																
3-1-3a Survey & Planning	Pursat province														Survey and Planning	
3-1-3b Design															Design section	
3-1-3c Contract Management															Construction section	
3-1-3d Construction Management															Construction section	
<b>3-2. Provide technical assistance on farmers' participatory water management at PS</b>																
<b>3-2-1. Kandal</b>																
3-2-1a Assess farmers and water management	Kandal province, Kandal Slung district, Farmers														Water management section	
3-2-1b Farmers & Local Authorities workshop															Water management section	
<b>3-2-2. Takeo</b>																
3-2-2a Assess farmers and water management	Takeo province, Farmers														Water management section	
3-2-2b Farmers workshop															Water management section	
<b>3-2-3. Pursat</b>																
3-2-3a Assess farmers and water management	Pursat province, Farmers														Water management section	
3-2-3b Farmers workshop															Water management section	

## ANNEX 5: List of Japanese Experts

### (1) Long-term Experts

No.	Name	Field	Period of Assignment							
			From	To	Remarks	2005	2006	2007	2008	2009
1	Koji Kanemaru	Coordinator/Training	2008/4/22	2008/4/21						
2	Shigemitsu Tsukamoto	Chief Advisor/ Irrigation	2006/6/01	2009/7/09						
3	Kenji Washino	Water Management	2006/6/01	2009/7/09						
4	Goro Nishimoto	Coordinator	2008/6/16	2009/7/09						

### (2) Short-term Experts

No.	Name	Field	Period of Assignment							
			From	To	Remarks	2005	2006	2007	2008	2009
1	Kanezo Takeuchi	Preparation of Draft Work Plan	2006/3/06	2006/6/30						
2	Shinobu Sakai	Irrigation Project Management	2006/10/01	2007/3/31						
3	Norihumi Shimura	Topography Survey and Mapping	2006/12/06	2007/1/28						
4	Husanari Sato	Irrigation and Drainage Facilities Design	2007/1/07	2007/3/16						
5	Mitsunari Sadano	Construction Management and Supervision	2007/1/22	2007/3/16						
6	Takao Masumoto	Meteorology and Hydrology Measurement	2007/4/22	2007/5/13						
7	Youichi Hayashida	Soil and Concrete Test	2007/5/16	2007/6/24						
8	Husanari Sato	Design, Construction Management and Rural Development & Irrigation Planning	2007/7/15	2008/2/03						
9	Manabu Kawaguchi	Rural Development & Irrigation Planning	2007/9/16	2007/1/08						
10	Takao Masumoto	Hydrology and Meteorology Measurement	2008/6/08	2008/6/28						
11	Toshikatsu Imai	Operation and Maintenance	2008/6/22	2008/8/16						
12	Yuji Kogo	Structural Design and Culuculation	2008/8/10	2008/8/24						

## ANNEX 6: Provision of Equipment by Japanese Side

Note: Frequency of Use (A: Always - B: Often - C: Sometimes)  
Condition (A: Good - B: Fair - C: Bad)

Equipment Number	Date Received	Name of Equipment	Maker	Model	QTY	Price US\$		Place of Storage	Frequency of Use	Condition	Remarks
						Unit	Total				
2006 E 001	9-Jan-07	Automatic Generator Control Unit	MICK	MICK 125 KVA	1	2,500.00	2,500.00	TSC	A	A	
2006 E 002	17-Jan-07	Digital Camera	Canon	Power Shot A-530	1	300.00	300.00	Pursat	B	A	
2006 E 003	17-Jan-07	Digital Camera	Canon	Power Shot A-530	1	300.00	300.00	Takeo	B	A	
2006 E 004	18-Jan-07	Printer	Hewlett Packard	HP 1280 Desk Jet	1	235.00	235.00	TSC	B	A	
2006 E 005	18-Jan-07	Printer	Hewlett Packard	HP 1280 Desk Jet	1	235.00	235.00	Pursat	B	A	
2006 E 006	18-Jan-07	Printer	Hewlett Packard	HP 1280 Desk Jet	1	235.00	235.00	Takeo	B	A	
2006 E 007	18-Jan-07	Printer	Hewlett Packard	HP 2600N	1	365.00	365.00	TSC	A	A	
2006 E 008	18-Jan-07	Printer	Hewlett Packard	HP 1320 Laser Jet	1	285.00	285.00	TSC	B	A	
2006 E 009	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 010	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 011	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 012	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 013	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 014	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 015	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 016	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 017	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 018	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 019	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 020	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 021	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 022	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	

Equipment Number	Date Received	Name of Equipment	Maker	Model	QTY	Price US\$		Place of Storage	Frequency of Use	Condition	Remarks
						Unit	Total				
2006 E 023	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 024	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 025	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 026	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minitower	1	1,474.00	1,474.00	TSC	B	A	
2006 E 027	22-Jan-07	Notebook Computer	Dell	Optiplex 745 Minitower	1	1,750.00	1,750.00	TSC	B	A	
2006 E 028	1-Feb-07	Photocopy Machine	Fuji Xerox	Copier DC-550ICP	1	7,650.00	7,650.00	TSC	A	A	
2006 E 029	9-Feb-07	Level	Sokkia	Digital Level SDL 50	1	3,715.00	3,715.00	Pursat	C	A	
2006 E 030	9-Feb-07	Level	Sokkia	Digital Level SDL 50	1	3,715.00	3,715.00	Takeo	C	A	
2006 E 031	23-Feb-07	Current Meter	OTT	Small Current Meter C2	1	4,656.00	4,656.00	TSC	C	A	
2006 E 032	23-Feb-07	Current Meter	OTT	Small Current Meter C2	1	4,656.00	4,656.00	Pursat	C	A	
2006 E 033	23-Feb-07	Current Meter	OTT	Small Current Meter C2	1	4,656.00	4,656.00	Takeo	C	A	
2006 E 034	6-Mar-07	Dynamic Penetrometer	Humboldt	H-4218B	1	2,345.00	2,345.00	TSC	C	A	
2006 E 035	9-Mar-07	GPS	Leica	GPS set SR20 (2 receivers)	1	10,431.66	10,431.66	TSC	C	A	
2006 E 036	12-Mar-07	Large Format Color Printer	Hewlett Packard	HP Design jet 4000	1	9,000.00	9,000.00	TSC	A	A	
2006 E 037	23-Mar-07	Total Station	Topcon	Pulse Total Station GPT-7001	1	11,505.00	11,505.00	TSC	C	A	
2006 E 038	23-Mar-07	Total Station	Topcon	Pulse Total Station GPT-7001	1	11,505.00	11,505.00	TSC	C	A	
2006 E 039	23-Mar-07	Total Station	Topcon	Pulse Total Station GPT-7001	1	11,505.00	11,505.00	TSC	C	A	
2006 E 040	23-Mar-07	Total Station	Topcon	Electronic Total Station GTS-725	1	9,560.00	9,560.00	Pursat	C	A	
2006 E 041	23-Mar-07	Total Station	Topcon	Electronic Total Station GTS-725	1	9,560.00	9,560.00	Takeo	C	A	
2006 E 042	23-Mar-07	Theodolite	Topcon	Laser Digital Theodolite DT-205L	1	2,367.00	2,367.00	Pursat	C	A	
2006 E 043	23-Mar-07	Theodolite	Topcon	Laser Digital Theodolite DT-205L	1	2,367.00	2,367.00	Takeo	C	A	
2006 E 044	28-Mar-07	Core drilling machine	Controls	83-C0355	1	6,692.44	6,692.44	TSC	C	A	
2006 E 045	28-Mar-07	Light weight dynamic penetrometer	Controls	16-T0013	1	3,575.56	3,575.56	TSC	C	A	
2006 E 046	21-Mar-07	One box wagon car	Ford	Ford Transit Minibus 2007 model	1	28,800.00	28,800.00	TSC	B	A	



Equipment Number	Date Received	Name of Equipment	Maker	Model	QTY	Price US\$		Place of Storage	Frequency of Use	Condition	Remarks
						Unit	Total				
2007 E 001	12-Feb-08	Personal Computer (Desktop)	HP	DC7800cmt	1	970.00	970.00	Pursat	B	A	
2007 E 002	12-Feb-08	Personal Computer (Desktop)	HP	DC7800cmt	1	970.00	970.00	Pursat	B	A	
2007 E 003	12-Feb-08	Personal Computer (Desktop)	HP	DC7800cmt	1	970.00	970.00	Takeo	B	A	
2007 E 004	12-Feb-08	Personal Computer (Desktop)	HP	DC7800cmt	1	970.00	970.00	Takeo	B	A	
2007 E 005	12-Feb-08	Personal Computer (Desktop)	HP	DC7800cmt	1	970.00	970.00	TSC	B	A	
2007 E 006	12-Feb-08	Personal Computer (Desktop)	HP	DC7800cmt	1	970.00	970.00	TSC	B	A	
2007 E 007	12-Feb-08	Personal Computer (Desktop)	HP	DC7800cmt	1	970.00	970.00	TSC	B	A	
2007 E 008	12-Feb-08	Personal Computer (Laptop)	IBM Lenovo	3000 G400M	1	889.00	889.00	TSC	C	A	
2007 E 009	12-Feb-08	Personal Computer (Laptop)	IBM Lenovo	3000 G400M	1	889.00	889.00	TSC	C	A	
2007 E 010	12-Feb-08	Personal Computer (Laptop)	IBM Lenovo	3000 G400M	1	889.00	889.00	TSC	C	A	
2007 E 011	25-Feb-08	Printer	HP Officejet	K7100	1	235.00	235.00	TSC	C	A	
2007 E 012	25-Feb-08	Digital Camera	Canon	A700	1	270.00	270.00	TSC	B	A	
2007 E 013	4-Mar-08	Digital Theodolite	Topcon	DT-205L	1	3,085.00	3,085.00	TSC	C	A	
2007 E 014	26-Mar-08	Digital type Water Level Recorder	OTT	OTT Thalimedes	1	7,083.00	7,083.00	TSC	C	A	
2007 E 015	4-Mar-08	Circular Level	Topcon	-	1	30.00	30.00	TSC	C	A	
2007 E 016	4-Mar-08	Circular Level	Topcon	-	1	30.00	30.00	TSC	C	A	
2007 E 017	4-Mar-08	Aluminium Tripod	Topcon	-	1	115.00	115.00	TSC	C	A	
2007 E 018	17-Mar-08	Electronic Total station	Sokkia	Topcon Total Station GTS-725	1	9,100.00	9,100.00	TSC	C	A	
2007 E 019	17-Mar-08	Automatic Level	Sokkia	Sok-B20	1	1,149.50	1,149.50	TSC	C	A	
2007 E 020	17-Mar-08	Circular Level for Alg-55	SB-60	Alg-55	1	12.00	12.00	TSC	C	A	
2007 E 021	17-Mar-08	Circular Level for Alg-55	SB-60	Alg-55	1	12.00	12.00	TSC	C	A	
2007 E 022	17-Mar-08	Aluminium Tripod Model PFA1	Sok-PFA1	PFA1	1	138.22	138.22	TSC	C	A	
2007 E 023	17-Mar-08	Total Station	SOK-SET 510-CF	SET 510-CF	1	7,250.00	7,250.00	TSC	C	A	
2007 E 024	17-Mar-08	Wooden Tripod Model PRW1	SOK-PFW1	PFW1	1	180.00	180.00	TSC	C	A	

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Equipment Number	Date Received	Name of Equipment	Maker	Model	QTY	Price US\$		Place of Storage	Frequency of Use	Condition	Remarks	
						Unit	Total					
2007 E 025	17-Mar-08	Wooden Tripod Model PRW1	SOK-PFW1	PFW1	1	180.00	180.00	TSC	C	A		
2007 E 026	17-Mar-08	Wooden Tripod Model PRW1	SOK-PFW1	PFW1	1	180.00	180.00	TSC	C	A		
2007 E 027	17-Mar-08	PRISM SET	SOK-KPS12	KPS 12	1	655.00	655.00	TSC	C	A		
2007 E 028	17-Mar-08	PRISM SET	SOK-KPS12	KPS 12	1	655.00	655.00	TSC	C	A		
2007 E 029	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 030	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 031	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 032	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 033	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 034	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 035	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 036	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 037	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 038	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 039	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 040	17-Mar-08	Mini Tripod	SOK-AP71	AP71	1	115.25	115.25	TSC	C	A		
2007 E 041	26-Mar-08	Mechanical Extension Meter	Controls	70-C0953	1	2,701.00	2,701.30	TSC	C	A		
2008 E 001	22-May-08	Tension/Compression Testing Machine	Controls	70-C0019	1	12,219.97	12,219.97	TSC	C	A		
<b>Total</b>							237,119.65					

研修実施実績（本邦研修、第3国研修）

ANNEX 7: List of Counterpart Personnel Participated in the Training Overseas

Year	Name of Training Course	Duration		Name of the Counterpart Personnel	Present Position
Training in Japan					
2006	Irrigation System and Water Management (J-06-20339)	13 August - 22 October 2006	1	Mr. Uch Hing	Deputy Director, TSC
			2	Mr. Teng Tong Heng	Deputy Chief, Administration Office, TSC
			3	Mr. Keo Vey	Deirector, Provincial Department of Water Resources and Meteorology, Pursat
2006	Sustainable Agricultural Development from Perspective of a Basin Management (J-06-22518)	5 -31 March 2007	1	Mr. You La	Deputy Director, Provincial Department of Water Resources and Meteorology, Pursat
			2	Mr. Bun Huor	Deirector, Provincial Department of Water Resources and Meteorology, Takeo
2007	Irrigation and Drainage (J-07-22871)	18 August - 29 September 2006	1	Mr. Maen Seng	Deputy Chief, Construction Management and Technical Irrigation Office, TSC
			2	Mr. Sao Ena	Deputy Chief, Water Management, Research and Information Management Office, TSC
2007	Participatory Irrigation Management System for Paddies for Asian Countries	21 May - 21 July 2007	1	Mr. Prum Kanthel	Official, Water Management, Research and Information Management Office, TSC
2008	Participatory Irrigation Management System for Paddies	31 May - 05 July 2008	1	Mr. Sok Korn	Official, Water Management, Research and Information Management Office, TSC
			2	Mr. Leng Sasel	Official, Provincial Department of Water Resources and Meteorology, Kandal
			3	Mr. Lao Sokha	Official, Provincial Department of Water Resources and Meteorology, Pursat
			4	Mr. Suon Sopal	Official, Provincial Department of Water Resources and Meteorology, Takeo
Training in the Third Country					
2006	Irrigation System Management (in Malaysia)	13 November - 1 December 2006	1	Mr. Sok Korn	Official, Water Management, Research and Information Management Office, TSC
2007	Irrigation System Management (in Malaysia)	19 November - 7 December 2007	1	Mr. Noun Vannarith	Deputy Chief, Water Management, Research and Information Management Office, TSC
2008	Modernization of Irrigation Water Management (in Thailand by TICA)	21 January - 15 February 2008	1	Mr. Teng Tong Heng	Deputy Chief, Administration Office, TSC
			2	Mr. Sok Korn	Official, Water Management, Research and Information Management Office, TSC

## C/P リスト

## ANNEX 8: List of Counterpart Personnel

No.	Name of Counterpart	Field	Present Post in MOWRAM	Remarks	Period of Assignment				
					From	To	2006	2007	2008
<b>1. TSC</b>									
1	H.E. Veng Sakhon	Project Director	Secretary of State		January 2006	July 2009			
2	H.E. Bun Hean	Project Manager	Director General of Technical Affairs		January 2006	July 2009			
3	Mr. Pich Veasna	Project Sub-Manager	Deputy Director General of Administration Affairs / Director of Technical Service Center (TSC)		January 2006	July 2009			
4	Mr. Te Ouv Kim	Project Sub-Manager	Director, Department of Irrigated Agriculture		January 2006	July 2009			
5	Mr. Ngoun Pich	Project Sub-Manager	Deputy Director, Department of Engineering		January 2006	July 2009			
6	Mr. Uch Hing	Survey	Deputy Director, TSC		January 2006	July 2009			
7	Mr. Hay Bunthoeun	Design	Deputy Chief, Construction Management and Technical Irrigation Office, TSC		January 2006	July 2009			
8	Mr. Meas Savoeun	Planning	Deputy Chief, Construction Management and Technical Irrigation Office, TSC		January 2006	July 2009			
9	Mr. Maen Seng	Survey	Deputy Chief, Construction Management and Technical Irrigation Office, TSC		January 2006	July 2009			
10	Mr. Teav Vutha	Design	Official, Construction Management and Technical Irrigation Office, TSC		January 2006	July 2009			
11	Mr. You Sotha	Planning	Deputy Director, TSC	Resigned	January 2006	September 2006			
12	Mr. Sao Ena	Design	Deputy Chief, Water Management, Research and Information Management Office, TSC		January 2007	July 2009			
13	Mr. Noun Vannarith	Construction Management	Deputy Chief, Water Management, Research and Information Management Office, TSC		January 2006	July 2009			
14	Mr. Hout Thean	Construction Management	—	Resigned	May 2006	October 2006			
15	Mr. Teng Tong Heng	Water Management	Deputy Chief, Administration Office, TSC		January 2006	July 2009			
16	Mr. Sok Kom	Water Management	Official, Water Management, Research and Information Management Office, TSC		January 2006	July 2009			
17	Mr. Prum Kanthel	Water Management	Official, Water Management, Research and Information Management Office, TSC		January 2006	July 2009			
18	Mrs. Oung Chandara	Construction Management	Deputy Chief, Administration Office, Department of Engineering	Temporary	January 2007	December 2007			
19	Mr. Ket Chansovath	Construction Management	Chief, Soil Laboratory, Department of Engineering	Temporary	January 2007	December 2007			
20	Mr. Team Vulheary	Construction Management	Official, Construction office, Department of Engineering	Temporary	January 2007	December 2007			
<b>2. PDWRAM</b>									
1	Mr. Hong Chheang Lim	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	July 2009			
2	Mr. Prak Lak	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	July 2009			
3	Mr. Hem Sarom	Hydraulic Technician	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	July 2009			
4	Mr. Prak Sovannarith	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	July 2009			
5	Ms. Srang Leang Meng	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	July 2009			
6	Mr. Un Vuthy	Chief of DWRAM, Kandal Stung	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	July 2009			
7	Mr. Chea Chentrasmeay	Hydraulic Technician, DWRAM, Kandal Stung	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	July 2009			
8	Mr. Leng Sasel	Chief of Water Sanitation	Official, Provincial Department of Water Resources and Meteorology, Kandal		June 2008	July 2009			
9	Mr. Leng Som Bohk	Irrigation Staff	Official, Provincial Department of Water Resources and Meteorology, Kandal		June 2008	July 2009			
10	Mr. Oum Veasna	Irrigation Technician	Chief of DWRAM, Lenk Dark		June 2008	July 2009			
11	Mr. Keo Vey	Director, Irrigation Engineer	Deputy Director, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	July 2009			
12	Mr. You La	Irrigation Engineer	Deputy Director, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	July 2009			
13	Mr. Kit Phal	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	July 2009			
14	Mr. Chhim Samorn	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	July 2009			

No.	Name of Counterpart	Field	Present Post in MOWRAM	Remarks	Period of Assignment					
					From	To	2006	2007	2008	2009
15	Mr. Lao Sokha	Hydraulic Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	July 2009				
16	Mr. Tauch Soeurn	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	July 2009				
17	Mr. Meas Bunthoem	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	July 2009				
18	Mr. Suy Sovannareth	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		March 2007	July 2009				
19	Mr. Pa Sovannareth	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		March 2007	July 2009				
20	Ros Vanny	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		March 2007	July 2009				
21	Mr. Bun Huor	Director, Irrigation Engineer	Deirector, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	July 2009				
22	Mr. San No	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	July 2009				
23	Mr. Suon Sopal	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	July 2009				
24	Mr. Kea Saman	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	July 2009				
25	Mr. Yuk Narin	Mechanic Vocational	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	July 2009				
26	Mr. Heng Sodara	Meteorology Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	July 2009				
27	Mr. Ven Sovann	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	July 2009				
28	Mr. Sok Sokhom	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo		March 2007	July 2009				
29	Mr. Chea Phirun	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo		March 2007	July 2009				
30	Mr. Chin Chenda	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Takeo		March 2007	July 2009				

## ANNEX 9: Achievement of the PDM Indicators

Narrative Summary	Objectively Verifiable Indicators	Achievements
<p><b>Overall Goal</b> Livelihood of the farmer's households is improved by stabilizing their agricultural productivity through efficient water resource management in the irrigation areas conducted by the trained engineers and technicians in MOWRAM and PDWRAM.</p>	<p>1. Irrigated area is increased to <b>810,300ha</b> in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010. 2. Unit yield of rice is improved to <b>2.50 ton/ha</b> in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010.</p>	<p>1. The irrigated area at the end of 2007 reached to <b>773,320 ha</b>. 2. For the 2007-2008, the average yield is reported as <b>2.62 ton/ha</b>.</p>
<p><b>Project Purpose</b> 1. The technical capacity of MOWRAM and PDWRAM is improved. 2. The farmers who have participated in the Project activities at the Pilot Sites (PS) are able to practice water management in terminal canals.</p>	<p>1-1. More than 60% engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula. 1-2. More than 80% of trainee is satisfied with the training courses management system. 2-1. <b>More than 9 water user groups</b> are active in water management. 2-2. <b>More than 360 farmers</b> start the water management works learned at the Project.</p>	<p>1-1 The rate of training participants who achieved the target has reached to <b>70%</b> on average among 32 training courses so far conducted. 1-2 The rate of training participants who are satisfied with the training course management system has reached <b>94%</b> on average. 2-1 <b>Ten (10) water user groups</b> have conducted water management activities. 2-2 A total of <b>411 farmers</b> have participated in water management works at the pilot sites.</p>
<p><b>Outputs</b> 1. The following outputs are expected to be achieved at TSC. 1-1. Establish the training system 1-2. Set up the technical manuals 1-3. Manage the technical information</p>	<p>(Until the end of the Project) 1-1-1. The TSC staff complete to make planned curricula of the <b>33 training courses</b>. 1-1-2. The TSC staff complete to produce <b>14 materials</b> for the training courses. 1-2-1. The TSC staff complete to make a list of planned technical manuals. 1-2-2. The TSC staff complete to produce the <b>8 technical manuals</b>. 1-3-1. A library of technical information in TSC is established. 1-3-2. A list of materials in the library is completed.</p>	<p>1-1-1. So far, <b>32 curriculum</b> have been completed, and <b>7 more</b> to be developed by the end of the cooperation period. 1-1-2. <b>14 materials</b> have been produced.. 1-2-1. The list is completed. 1-2-2. A total of <b>9 manuals</b> are to be compiled and <b>6 are already</b> in the process of compilation. 1-3-1. Space of the technical library has been secured and being cleaned 1-3-2. Completion of the list is in progress.</p>

<p>2. The technical capacity of the engineers and technicians in MOWRAM and PDWRAM is well trained through the trainings at TSC and on-the-job-trainings (OJT) at MS and PS.</p>	<p>2-1. <b>4,490 m</b> length of the terminal canals in the Model Site are completed by the trained engineers and technicians in MOWRAM and PDWRAM.  2-2. More than <b>520</b> trainees in MOWRAM and PDWRAM complete the training courses in the TSC.  2-3. More than <b>510</b> trainees in MOWRAM, PDWRAM and Farmers leaders complete OJT at the Model Site and Pilot Sites.  2-4. More than <b>21</b> staff in PDWRAM complete OJT at the Model and Pilot Sites.</p>	<p>2-1. A total of <b>5,700m</b> of the terminal canals has been constructed at the Model Site.  2-2. Total number of trainees in 32 training courses by the end of November 2008 reached to <b>502</b>, and additional 7 training courses are to be conducted with <b>113</b> trainees to join..  2-3. A total of <b>616</b> MOWRAM/PDWRAM staff and farmers would complete the OJT at Model/Pilot sites  2-4. All of the <b>30</b> PDWRAM counterpart personnel took part in the total of 34 OJT at the Model/Pilot Sites..</p>
<p>3. With the technical assistance of TSC, the following outputs are expected to be achieved at PS.</p> <p>3-1. The trained engineers and technicians in PDWRAM construct the terminal canals, which make it possible for farmers to easily access irrigation water.</p> <p>3-2. Farmers start to conduct water management activities at the terminal canals in cooperation with PDWRAM.</p>	<p>3-1-1. More than <b>5km length</b> of the terminal canals with efficient water distribution capacity constructed or rehabilitated by the engineers and technicians in PDWRAM is extended.  3-1-2. <b>Basic design documents for 3 Pilot Sites</b> are made.  3-2. Activities concerned with the water management, such as mowing the grass, dredging in canals and discussion, started with cooperation by PDWRAM at three Pilot Sites.</p>	<p>3-1-1. A total of about <b>7.8 km</b> of the terminal canals have been constructed and/or rehabilitated in the Pilot Sites  3-1-2. <b>Basic design documents for 3</b> irrigation scheme, including the Pilot Sites are compiled and submitted for budget requests  3-2. FWUGs are organized and actively carrying out meetings, canal cleaning and other water management works in the Pursat and Takeo Pilot sites.</p>

実施済み研修コース一覧

ANNEX 10: List of Training Courses, Attendance and Evaluation

No	Date(Start)	Date(Finish)	Training course title	No. of Participants	No. of OJT Participants	No. of Participants cleared the Curriculum Target	%	% of Satisfied Participants
1	29-Jan-07	2-Feb-07	Discharge Measurement I	20	20	9	45	80%
2	2-Feb-07	9-Feb-07	Meteorology & Crop Water Requirement I	20	20	12	60	74%
3	13-Feb-07	27-Feb-07	Irrigation and Water Management Plan by GIS1	10	-	8	80	80%
4	5-Mar-07	16-Mar-07	Basic Survey I	19	19	17	89	100%
5	19-Mar-07	23-Mar-07	Supervision on Construction Site	19	19	13	68	95%
6	23-Apr-07	27-Apr-07	Participatory of farmers for sustainable irrigation system management	19	19	10	53	84%
7	16-Jul-07	27-Jul-07	Irrigation and Water Management Plan by GIS2	10	-	10	100	100%
8	30-Jul-07	10-Aug-07	Basic Survey II	20	20	20	100	100%
9	20-Aug-07	24-Aug-07	Training for Irrigation system design	20	-	8	40	83%
10	3-Sep-07	7-Sep-07	Discharge Measurement II	20	20	17	85	100%
11	10-Sep-07	14-Sep-07	Meteorology & Crop Water Requirement II	19	19	11	58	95%
12	17-Sep-07	21-Sep-07	Design & Drawing by Auto CAD	10	-	7	70	100%
13	22-Oct-07	26-Oct-07	Participatory of farmers for sustainable irrigation system management	14	14	8	57	92%
14	1-Nov-07	8-Nov-07	Construction Management	20	20	14	70	95%
15	13-Nov-07	16-Nov-07	Data Processing of Total Station	10	-	7	70	100%
16	3-Dec-07	7-Dec-07	Design & Drawing for Irrigation canal and canal Structure by Auto CAD	10	-	7	70	100%
17	14-Jan-08	18-Jan-08	Operation and maintenance irrigation facilities	8	8	7	88	88%
18	2-Feb-08	7-May-08	Topographic and Route survey	24	24	24	100	100%
19	7-Apr-08	9-Apr-08	Operation and maintenance irrigation facilities	9	9			
20	21-Apr-08	22-Apr-08	Operation and maintenance irrigation facilities	9	9			
21	5-May-08	9-May-08	Participatory of farmers for sustainable irrigation system management	19	19	14	74	100%
22	26-May-08	6-Jun-08	Design drawing & Cost estimation of Irrigation canal and Structure by Excel and Auto CAD	14	-	9	64	100%
23	23-Jun-08	27-Jun-08	Irrigation Planning	20	-	11	55	100%
24	7-Jul-08	11-Jul-08	Construction Management	20	20	15	75	100%
25	11-Aug-08	15-Aug-08	Operation and maintenance irrigation facilities	19	19	14	74	95%
26	18-Aug-08	22-Aug-08	Structural Design & Calculation for Irrigation Facilities	20	-	2	10	65%
27	25-Aug-08	19-Sep-08	Irrigation Planning by GIS	13	-	13	100	100%
28	6-Oct-08	24-Oct-08	Discharge Measurement, Meteorology, Crop Water Requirement & Irrigation Planning	57	57	33	58	100%
29	3-Nov-08	7-Nov-08	Participatory of farmers for sustainable irrigation system management	19	19	18	95	100%
30								
31								
32								



灌溉水路整備実績一覧 (OJT・技術移転対象)

**ANNEX 11: Canal Construction and Rehabilitation**

Canal	Length	Remark
<b>1.OJT</b>		
(1)Kandal stung model site		
a)Tertiary canal construction(Earth canal)		
T320S	1,200 m	Constructed by company(3 package)
T326	500 m	Constructed by company(1 package)
T327	500 m	Constructed by company(1 package)
TT1	1,500 m	Constructed by company(4 package)
T324	500 m	Constructed by company(1 package)
TT2	1,500 m	
Sub-total of Kandal Stung MS	5,700 m	
(2)Takeo pilot site		
a)Tertiary canal construction(Concrete canal)		
Canal No.5	650 m	Constructed by company(8 package)
(3)Pursat pilot site		
a)Tertiary canal construction(Brick canal)		
TC4	1,000 m	Constructed by company(6 package)
<b>2.Technical assistance</b>		
(1)Takeo pilot site		
a) Tertiary canal rehabilitation		
Canal under gate No.2	200 m	
Canal under gate No.2&3	930 m	Excavation by machinery & compaction by farmers
Canal under gate No.4	1,120 m	
North area of pilot site	500 m	
Sub-total of Takeo PS	2,750 m	
(2)Pursat pilot site		
a) Delivery canal construction		
Delivery canal A1	145 m	Excavation by machinery & compaction by farmers
Delivery canal A2	200 m	
Delivery canal B1	150 m	
Delivery canal C1	200 m	
Delivery canal C2	300 m	
Delivery canal C3	300 m	
Delivery canal D1	100 m	
Delivery canal D2	350 m	
Delivery canal D3	488 m	
Delivery canal D4	200 m	
Sub-total	2,433 m	
b)Tertiary canal rehabilitation		
TC3	926 m	Excavation by machinery & compaction by
Sub-total of Pursat PS	3,359 m	
Model Site Total	5,700 m	
Pilot Site Total	7,759 m	

