

## 付 属 資 料

- 1 主要面談者一覧
- 2 ミニッツ・合同評価報告書
- 3 PDM 3（仮和訳）
- 4 PDM（オリジナル→Version2）改訂経緯
- 5 評価グリッド
- 6 質問票（回答集計）
- 7 州別研修参加者数
- 8 組織図（MOWRAM。TSC）
- 9 調査記録メモ

## 主要面談者一覧

### <日本側>

#### 1. 在カンボジア日本大使館

小林 賢一 二等書記官

#### 2. JICA カンボジア事務所

米田 一弘 所長

鵜飼 彦行 次長

田中 智子 所員

#### 3. 灌漑技術センター計画フェーズII

塚元 重光 チーフアドバイザー

金丸 晃治 業務調整員／研修

鷲野 健二 水管理専門家

#### 4. 水資源気象省

森山 信弘 個別専門家

#### 5. 経済財務省

鈴木 博 個別専門家（上級顧問エコノミスト）

### <カンボジア側>

#### 1. 水資源気象省 Ministry of Water Resources and Meteorology (MOWRAM)

H.E. Veng Sakhon	Secretary of State
H.E. Bun Hean	Director General of Technical Affairs
Mr. Prum Saoeun	Deputy General Inspector
Mr. Chea Chhunkeat	Director of Administration & Human Resources Department
Mr. Chhea Bunrith	Director of Planning and International Cooperation Department
Mr. Long Saravuth	Director of Meteorology Department

#### 2. 灌漑技術センター Technical Service Center, MOWRAM

Mr. Pich Veasna	Deputy Director General and Director of Technical Service Center for Irrigation and Meteorology (TSC)
Mr. Uch Hing	Chief, Construction Management and Irrigation Engineer Office, TSC
Ms. Pich Maly	Chief, Administration Office, TSC
Mr. Hay Bunthoeun	Deputy Chief, Construction Management and Irrigation Engineer Office, TSC
Mr. Meas Savoeun	- Ditto -
Mr. Meng Seng	Staff, -Ditto-
Mr. Teav Vutha	- Ditto

Mr. Noun Vannarith	Deputy Chief, Water Management, Research & Information Management Office, TSC
Mr. Sao Ena	- Ditto -
Mr. Prum Kanthel	Staff, - Ditto -

3. カンダル州水資源気象事務

Mr. Chun Peng Long	Director, Provincial Department of Water Resources and Meteorology, Kandal Province (Kandal PDWRAM)
Mr. Prak Lak	Official, - Ditto -
Mr. Prak Sovannarith	- Ditto -
Mr. Un Vuthy	

4. タケオ州水資源気象事務所

Mr. Bun Huor	Director, Provincial Department of Water Resources and Meteorology, Takeo Province (Takeo PDWRAM)
Mr. San No	Deputy Director, - Ditto -
Mr. Suon Sopal	Official, - Ditto -
Mr. Kea Saman	- Ditto -
Mr. Yuk Narin	- Ditto -
Mr. Heng Sodara	- Ditto -
Mr. Ven Sovann	- Ditto -
Mr. Sok Sokhon	- Ditto -
Mr. Chin Chenda	- Ditto -

5. プルサット州水資源気象事務所

Mr. Keo Vey	Director, Provincial Department of Water Resources and Meteorology, Pursat Province (Pursat PDWRAM)
Mr. You La	Deputy Director, - Ditto
Mr. kit Pkal	Official, - Ditto -
Mr. Chhim Samon	- Ditto -
Mr. Lao Sokha	- Ditto -
Mr. Tauch Soeurn	- Ditto -
Mr. Meas Bunthoeun	- Ditto -
Mr. Suy Sovannareth	- Ditto -
Mr. Ros Vanny	- Ditto -

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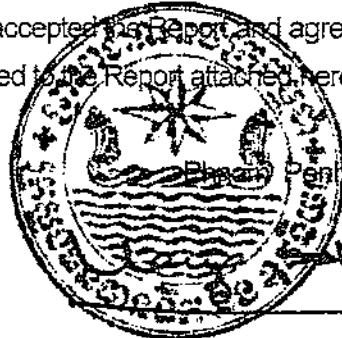
MINUTES OF MEETING  
BETWEEN  
THE JAPANESE EVALUATION TEAM AND THE MINISTRY OF WATER RESOURCES  
AND METEOROLOGY OF THE ROYAL GOVERNMENT OF CAMBODIA  
ON THE JAPANESE TECHNICAL COOPERATION FOR  
THE TECHNICAL SERVICE CENTER FOR IRRIGATION SYSTEM PROJECT PHASE-2

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 Mr. Terumi IWAYA, Executive Technical Advisor to the Director General, Rural Development Department of JICA, visited the Kingdom of Cambodia from January 22, 2008 to February 5, 2008 in order to conduct the mid-term 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 (hereinafter referred to as "MOWRAM") of the Royal Government of Cambodia and headed by Mr. Prum Saroeun, Deputy General Inspector of MOWRAM.

For the mid-term 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 in the Report attached hereto.



Phnom Penh, February 5, 2008

*Terumi Iwaya*

Mr. Terumi IWAYA  
Leader,  
Japanese Mid-term Evaluation Team,  
Japan International Cooperation Agency,  
Japan

*H.E. VENG Sakhon*

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

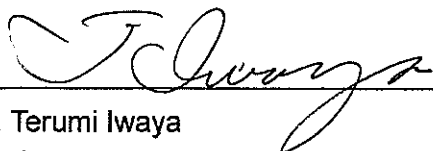
## Attachment

1. The Joint Evaluation team has presented the Evaluation report to the Joint Coordination Committee.
2. The Joint Coordination Committee has accepted the Report and it has agreed to take necessary action which written bellow for replying to the recommendations of the Report
  - 1) The Royal Government of Cambodia (RGC) will seek and allocate the necessary budget for TSC activities for FY2008 immediately.
  - 2) MOWRAM will allocate the budget for FY2009 for TSC activities.
  - 3) RGC will take the necessary action for the smooth and quick disbursement of the remaining Counterpart Fund to MOWRAM from the Ministry of Economy and Finance (MEF).
  - 4) MOWRAM will promote and disseminate TSC activities to the donors in order to provide technical services such as training courses and OJT in the field of water management.
  - 5) RGC will 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.
  - 6) The Project keep continuing support and strengthening of TSC officials through technical assistance.

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

Phnom Penh, February 5, 2008

Japan-Cambodia  
Joint Evaluation Team



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Mr. Terumi Iwaya  
Leader  
Japanese Evaluation Team  
Japan International Cooperation Agency  
Japan



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Mr. Prum Saroeun  
Leader  
Cambodian Evaluation Team  
Deputy General Inspector, Ministry of Water  
Resources and Meteorology  
The Kingdom of Cambodia

## CONTENTS

1. Evaluation of the Project
  - 1.1 Objectives of Evaluation
  - 1.2 Methodology
  - 1.3 Members of the Joint Evaluation Team
  - 1.4 Schedule of Evaluation
2. Outline of the Project
  - 2.1 Background of the Project
  - 2.2 Objective of the Project
3. Proposed revision of PDM
4. Achievement of the Project
  - 4.1 Inputs
  - 4.2 Outputs
  - 4.3 Prospect to achieve the Project Purpose
5. Results of the Evaluation
  - 5.1 Relevance
  - 5.2 Effectiveness
  - 5.3 Efficiency
  - 5.4 Impacts
  - 5.5 Sustainability
6. Conclusion
7. Recommendations

### List of Annexes

- Annex 1: Schedule of the Evaluation
- Annex 2: Project Design Matrix
- Annex 3: Dispatch of Japanese Experts
- Annex 4: Provision of Equipment by Japanese Side
- Annex 5: Counterpart Assignment and Training in Japan and other Asian countries
- Annex 6: Local Cost Allocated by Japanese Side
- Annex 7: Allocation of Budget by Cambodian Side
- Annex 8: List of the Produced Training Materials (textbooks) and Teaching Documents
- Annex 9: List and Contents of the Technical Manuals
- Annex 10: Evaluation Grid

## 1. Evaluation of the Project

### 1.1 Objectives of Evaluation

- (1) To evaluate the overall achievement of "The Technical Service Center for Irrigation System Project Phase-2" (hereafter referred to as "the Project") in term of five evaluation criteria (relevance, effectiveness, efficiency, impact and sustainability) based on the Record of Discussions (R/D), Project Design Matrix (PDM) and Plan of Operations (PO).
- (2) To review the project plan of the remaining period of the Project through discussion on the plan of operations and prospect of achievement of the Project at the end of the Project.
- (3) To identify and discuss necessary measures for solving problems on the project operation and assuring sustainability of the Project, and report and recommend the results of discussions to the relevant government agencies in Cambodia and Japan.

### 1.2 Methodology

#### (1) Joint Evaluation

The Project was evaluated by the Cambodian and Japanese evaluation teams (hereinafter referred to as "the Joint Evaluation 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, and the evaluation was conducted based on the five Evaluation Criteria. The Joint Evaluation Team was composed of 4 members from the Cambodian side and 4 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 the Royal Government of Cambodia (hereinafter referred to as "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.

## 1.3 Members of the Joint Evaluation Team

### (1) Japanese Evaluation Team

Mr. Terumi Iwaya	Team Leader	Executive Technical Advisor to the Director General, Rural Development Department, JICA
Mr. Akihiro Matsuoka	Irrigation Technology	Planning Director, Nishi-Ohu Land Improvement Investigation and management Office, Tohoku Agricultural Administration Bureau, Ministry of Agriculture, Forestry and Fisheries
Mr. Kojiro Fujino	Planning Management	Administration Team, Administration Group, Rural Development Department, JICA
Mr. Isao Dojun	Evaluation and Analysis	International Project Department Chuo Kaihatsu Corporation

### (2) Cambodian Evaluation Team

Mr. Prum Saroeun	Team Leader	Deputy General Inspector, MOWRAM
Mr. Chea Chhunkeat		Director of Administration and Human Resources Department, MOWRAM
Mr. Chhea Bunrith		Director of Planning and International Cooperation Department, MOWRAM
Mr. Long Saravuth		Director of Meteorology Department, MOWRAM

## 1.4 Schedule of the Evaluation

The schedule of the evaluation is attached as Annex 1.

## 2. Outline of the Project

### 2.1 Background of the Project

Agriculture is the prime industry of the Kingdom of Cambodia. Agricultural production contributes to approximately 35% of the country's 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 the Ministry of Water and Resources and Meteorology (hereinafter referred to as "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. The Project started in January 10, 2006 and will continue for three and a half-year period until July 9, 2009.

### 2.2 Objectives of the Project

The Project Purposes are 1) the technical capacity of MOWRAM and 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 revised PDM (proposed) which is modified during this mid-term evaluation (See Annex 2).

(Remark: PDWRAM means "Provincial Department of Water Resources and Meteorology")

### 3. Revision of PDM

Several numerical indicators in the PDM version 2.0 were not decided yet and also it becomes necessary to change some of indicators in the course of progress of the project activities for more appropriate ones. Therefore, the Joint Evaluation Team proposes revision of PDM version 2.0 and main part of revision is described in the following table. This mid-term evaluation has been done based on the revised PDM.

Table: Main part of the proposed revision of PDM version 2.0

Item	Version 2.0	Proposed revision	Reason of change
Indicator 1 of the Overall Goal	Irrigated area is increased at least X%.	<u>Irrigated area is increased to 810,300ha in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010.</u>	It is difficult to have data on irrigated area where the irrigation projects are conducted by the trained engineers and technicians in MOWRAM and PDWRAM. Hence, annual data on the total irrigated area in Cambodia is available at MOWRAM.  Engineers and technicians of PDWRAM from most of 24 provinces in Cambodia have participated in the training courses of TSC. Because these engineers and technician take part in irrigation projects to some extent, it is estimated that they will have some roles to contribute to increasing the irrigated area. Therefore, it is suitable as a second best to utilize the national target (indicator) about the irrigated area in Cambodia as an indicator for the Overall Goal of the Project.
Indicator 2 of the Overall Goal	Unit yield of rice is improved at least X%.	<u>Unit yield of rice is increased to 2.50 ton/ha in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010.</u>	Similar reason as mentioned above.  It is difficult to have data on rice yield in the areas where the irrigation projects are conducted by the trained engineers and technicians in MOWRAM and PDWRAM. Hence, annual data on the rice yield in the rice cultivated area in Cambodia is available at MAFF (Ministry of Agriculture, Forestry and Fisheries)
Indicator 3 of the Overall Goal	Livelihood of the farmer's households is improved at least X%.	(Delete this indicator)	Improvement of farmer's livelihood is very important issue as a final goal of the Project, however, this indicator will be achieved after achieving improvement agricultural productivity. In addition, the degree of influence of improvement of livelihood can not verify easily because available data on this regard is limited. Therefore, this indicator is deleted.
Indicator 1-1 of the Project Purpose	More than X% engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula.	More than <u>60%</u> engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula.	3 kinds of target (test, technical level up, and utilization of subjects learned at the training) were set up as the assigned target in the curricula. If participants achieve these all 3 kinds of target, it is considered that the assigned target in curricula is achieved.  Basically, for this project, It is considered that aim is achieved if more than 80% of the participants achieved the target. As for this indicator, considering hardness in achieving all 3 targets, 60% is appropriate as indicator.  (For reference: $0.80 \times 0.80 \times 0.80 = 0.512$ ).

Indicator 1-2 of the Project Purpose	More than X% of trainee is satisfied with the training courses management system.	More than <u>80%</u> of trainee is satisfied with the training courses management system.	As mentioned above, for this project, It is considered that aim is achieved if more than 80% the participants achieved the target.
Indicator 2-1 of the Project Purpose	More than 25 km length of the terminal canal with efficient water management is extended.	<u>More than 9 water user groups are active in water management.</u>	The length of the terminal canals will not be the first priority to evaluate the farmer's water management ability. In addition, indicator 3-1 is similar with this indicator. Therefore, it is better to change this indicator into other appropriate indicator.  9 is the estimated number of farmer's water user groups which covers the pilot sites in Takeo and Pursat provinces. It is important that these water user groups continue water management actively.
Indicator 2-2 of the Project Purpose	More than X farmers start the water management work learned at the Project.	More than <u>360</u> farmers start the water management works learned at the Project.	360 is the estimated number of farmers in the pilot sites in Takeo and Pursat provinces.
Indicator 2-2 of the Output 2	More than 580 trainees in MOWRAM and PDWRAM complete the training courses in the TSC.	More than <u>520</u> trainees in MOWRAM and PDWRAM complete the training courses in the TSC	It is planned to integrate 3 training courses related survey (Basic Survey I, Basic Survey II, and Data Processing of Total Station) into one training course, in order to operate the course more effectively. Number of participants for the training course, in which computers are utilized, is limited by the number of computers available. Therefore, the planned number of trainees is reduced.
Indicator 3-1 of the Output 3	More than 25km length of the terminal canals with efficient water distribution capacity constructed or rehabilitated by the engineers and technicians in PDWRAM is extended.	More than <u>5</u> km length of the terminal canals with efficient water distribution capacity constructed or rehabilitated by the engineers and technicians in PDWRAM is extended.	Although Cambodian side is making possible efforts to secure the budget for the pilot site of Kandal Stung province, due to the delay in assuring budget, the terminal canals (20 km) may not be constructed by the end of the Project.
Additional indicator for the Output 3 (indicator 3-1-2)	---	<u>Basic design documents for 3 pilot sites are made.</u>	Basic design documents are important outputs of the OJT to the technicians and engineers of the target PDWRAM.

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## **4. Achievement of the Project**

### 4.1 Inputs

#### 4.1.1 Inputs by Japanese side

##### (1) Dispatch of Japanese Expert

Long-term Japanese experts have been dispatched in the 3 fields, i.e. Chief Advisor/Irrigation, Coordinator/Training, and Water Management. 9 short-term Japanese experts have been dispatched in total as of end of January, 2008. Details see Annex 3.

##### (2) Equipment provision

Computers and computer related equipment, survey equipment, tools for meteorological station, etc. have been provided. Total cost for such equipment provision is 219,454 US dollars as of November 15, 2007. Details see Annex 4.

##### (3) Training in Japan and other Asian country

Eight (8) counterparts of MOWRAM and PDWRAM have been participated the trainings in Japan and 4 counterparts of MOWRAM have been participated in the trainings in Malaysia and Thailand as for the end of January 2008. Details see Annex 5.

##### (4) Local cost allocated by Japanese side

Local cost allocated by JICA for the implementation of the project activities in Japanese fiscal year 2006 and 2007 is 603,487 US dollars (including planned amount). Details see Annex 6.

#### 4.1.2 Inputs by Cambodian side

##### (1) Assignment of counterpart personnel

Currently, 18 persons of MOWRAM and 27 persons of PDWRAM assigned as counterpart personnel (including provincial staff who are nominated as counterpart for official authorization by MOWRAM). Details see Annex 5.

##### (2) Budget allocation by Cambodian side

Following budget has been allocated by Cambodian side in the years 2006 and 2007 for TSC building renovation, salary for TSC staff, expenditures for the training courses and fuel, etc. Details see Annex 7.

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(Unit: US dollar)	FY 2006	FY 2007	Total
MOWRAM budget	15,053.49	45,511.89	60,565.38
Counterpart fund	668.34	17,291.93	17,960.27
Total	15,721.83	62,803.82	78,525.65

## 4.2 Outputs

4.2.1 Output 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

The progress of the activities for the establishment of the training system, preparation of the technical manuals, and management of technical information is as planned. It is expected that the Output 1 will be achieved by the end of the Project as a satisfactory level.

Indicator 1-1-1: The TSC staff complete to make planned curricula of the 33 training courses.

By utilizing the results of the training needs survey, the target of the training and the kinds of training course were decided. And then, the curriculums for 17 training course have been produced as of end of the December 2007. At least 16 more curriculums will be produced by the end of the Project.

Indicator 1-1-2: The TSC staff complete to produce 14 materials for the training courses.

Training materials for 12 kinds of training courses, which were carried out already, have been produced as of January 2008. Training materials for 2 more kinds of training courses will be by the end of the Project. The list of the training materials (textbooks) and teaching documents (PowerPoint etc.), which are produced already, is attached as Annex 8.

Indicator 1-2-1: The TSC staff complete to make a list of planned technical manuals.

A list of the planned technical manuals is made.

Indicator 1-2-2: The TSC staff complete to produce the 8 technical manuals.

The following 9 kinds of technical manuals will be produced.

- 1) Topographic and Route Survey Manual
- 2) Meteorology & Hydrology Survey Manual
- 3) Irrigation Planning Manual
- 4) Design Manual for Small Scale Irrigation System
- 5) Construction Supervision and Management Manual for Small Scale Irrigation System
- 6) Quality Control Manual
- 7) Operation and Maintenance Manual
- 8) Water Management Manual
- 9) GIS Technical Manual

Preliminary draft of the manuals on 1) Topographic and Route Survey, 2) Meteorology & Hydrology Survey, 4) Design for Small Scale Irrigation System, 5) Construction Supervision and Management, 8) Water Management, and 9) GIS have been produced. By the end of the Project, 9 kinds of above mentioned manuals will be produced in Khmer language. For the planned contents of each technical manual see Annex 9.

Indicator 1-3-1: A library of technical information in TSC is established.

A room in the building of the TSC is going to utilize for the space for the library of technical information and renovation of the room was completed in November 2007. After the Installation of bookshelves etc. in the room, operation of the library will be started. The technical manuals collected and other technical information will be stored in the library.

Indicator 1-3-2: A list of materials in the library is completed.

After the commencement of operation of the library, a list of materials will be made. The list of materials will be published in the web site of the Project.

4.2.2 Output 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.

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The progress of the activities for enhancement of the technical capacity of the engineers and technicians in MOWRAM and PDWRAM is mostly as planned. It is expected that the Output 2 will be achieved by the end of the Project as a satisfactory level.

Indicator 2-1: 4,490 m length of the terminal canals in the Model Sites are completed by the trained engineers and technicians in MOWRAM and PDWRAM.

2,000 m length of the terminal canals in the Model Site is constructed by conducting OJT in the field of survey, planning, design, and construction management. At present, the procedures for construction of another 2,000 m of the terminal canals are progressing. 4,490 m length of the terminal canals will be completed by the end of the Project.

Indicator 2-2: More than 520 trainees in MOWRAM and PDWRAM complete the training courses in the TSC. (Revised indicator)

268 engineers and technicians of MOWRAM and PDWRAM completed the training courses as of January 2008. Details are as follows. At least 16 more training courses will be conducted by the end of the Project and at least 520 trainees in total will be complete the training courses.

No	Title of the training course	Period	Participants
1	Discharge Measurement	29 Jan. – 2 Feb. 2007	20
2	Meteorology Survey & Crop Water Requirement	5 Feb. – 9 Feb., 2007	20
3	Irrigation and Water Management Plan by GIS	13 Feb. – 27 Feb., 2007	10
4	Basic Survey I	5 Mar. – 16 Mar., 2007	19
5	Supervision on Construction Site	19 Mar. – 23 Mar., 2007	19
6	Participation of Farmers for Sustainable Irrigation System Management	23 Apr. – 27 Apr., 2007	19
7	Irrigation and Water Management Plan by GIS	16 Jul. – 27 Jul., 2007	10
8	Basic Survey II	30 Jul. – 10 Aug., 2007	20
9	Hydraulic Design for Irrigation Canal and Structure	20 Aug. – 24 Aug., 2007	20
10	Discharge Measurement	3 Sep. – 14 Sep., 2007	20
11	Meteorology Survey & Crop Water Requirement	10 Sep. – 14 Sep., 2007	19
12	Design, Drawing and Cost Estimation of Irrigation Canal and Canal Structure by GIS	17 Sep. – 21 Sep., 2007	10
13	Participation of Farmers for Sustainable Irrigation System Management	22 Oct. – 26 Oct., 2007	14
14	Construction Management	1 Nov. – 8 Nov., 2007	20
15	Total Station and Data Processing	13 Nov. – 16 Nov., 2007	10
16	Design, Drawing and Cost Estimation of Irrigation Canal and Canal Structure by GIS	3 Dec. – 7 Dec., 2007	10
17	Operation and Maintenance of Irrigation Facilities	14 Jan. – 18 Jan., 2008	8
TOTAL			268

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Indicator 2-3: More than 510 trainees in MOWRAM, PDWRAM and Farmers leaders complete OJT at the Model Sites and Pilot Sites.

199 trainees in MOWRAM and PDWRAM participated in OJT at the Model Site. In addition, 99 farmer leaders also participated in OJT at the Model Site and the Pilot Sites, in total 298 persons as of end of January 2008. By continuing the OJT activities, this indicator will be achieved by the end of the Project.

Indicator 2-4: More than 21 staff in PDWRAM complete OJT at the Model and Pilot Sites.

27 engineers and technicians of PDWRAM in Kandal, Pursat and Takeo provinces (including provincial staff who are nominated as counterpart for official authorization by MOWRAM) have participated OJT at the Model and Pilot Sites in the fields of topographic survey including route survey, setup and observation of meteorology station, crop water requirement, preparation of the basic design documents, contract management, preparation of GIS (Geographic Information System), etc.

4.2.3 Output 3: With the technical assistance of TSC, the following outputs are expected to be achieved at PS.

- 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.

The Output 3 will be achieved by the end of the Project.

Indicator 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. (Revised indicator)

As of 18 January 2008, around 0.8 km of terminals in the Pilot Site in Pursat province and around 1.5 km of terminal canals in the Pilot Site in Takeo province were newly constructed or rehabilitated (total 2.3km). By the end of the Project, more than 5 km of the terminal canals in total will be constructed or rehabilitated.

Indicator 3-1-2: Basic design documents for 3 Pilot Sites are made. (additional indicator)

A basic design document for the Kandal Stung Pilot Site was produced already by MOWRAM through technical assistance by the Project. Draft basic design documents for the Pilot Sites in Pursat and Takeo provinces were produced and are under the revision by the Project.

Indicator 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.

Activities concerned with the water management, such as moving the grass, dredging in canals and discussion were started with cooperation by PDWRAM at the Pilot Sites in Pursat and Takeo provinces. At the Pilot Site in Kandal province, a water distribution rule for the Pilot Site will be prepared by conducting meetings with participation of local authorities and the persons concerned.

#### 4.3 Prospect to achieve the Project Purpose

Project Purpose: There are two project purposes, i.e. 1) the technical capacity of MOWRAM and 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 technical capacity of engineers and technicians of MOWRAM and PDWRAM is progressing well and the farmers in the Pilot Sites started water management activities in the terminal canals. Further enhancement of engineers/technicians and farmers is going to be carried out under the Project, therefore, it is well expected that the Project Purpose will be achieved by the end of the Project.

##### 4.3.1 Prospect to achieve the Project Purpose No.1 "the technical capacity of MOWRAM and PDWRAM is improved".

The degree of achievement of the following two indicators are at very satisfactory level at present, therefore, the improvement of the technical capacity of engineers and

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technicians of MOWRAM and PDWRAM is progressing well. By keeping good progress like this, it is expected that the Project Purpose No.1 will be achieved at a satisfactory level at the time of completion of the Project.

Indicator 1-1: More than 60% engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula. (Revised indicator)

The following 3 kinds of target were set up for evaluating degree of capacity development through the training course.

(1) Improvement of technical level

If trainee feels his/her technical level is improved one level comparing before and after the training course (self evaluation system by classifying five-grades), it is considered that the technical improvement is achieved.

(2) Examination (test)

If trainee scores more than 60 points out of 100 points, it is considered that trainee passed examination.

(3) Possibility of utilization of the matters learned to irrigation project etc.

If trainee expresses that the matters learned at the training course will be utilized for his/her works for irrigation project etc., it is considered that this target is achieved.

When trainee achieves all 3 targets, it is considered that the trainee achieved the assigned target in the curricula.

17 training courses have been conducted with 268 trainees. Effective data has been obtained from 264 trainees and 185 trainees have achieved all 3 targets. The degree of achievement is 70.1% at present.

By keeping this performance, this indicator will be achieved as a satisfactory level at the time of the completion of the Project.

Indicator 1-2: More than 80% of trainee is satisfied with the training courses management system. (Revised indicator)

The following table shows the percentages of trainees who satisfied with the

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training course management.

	Title of the training course	Satisfaction degree
1	Discharge measurement	80%
2	Meteorology and crop water requirement	74%
3	Irrigation and water management plan	80%
4	Basic survey 1	100%
5	Supervision on construction site	95%
6	Participation of farmers for sustainable irrigation system	84%
7	Irrigation and water management plan by GIS	100%
8	Basic survey 2	100%
9	Design and Drawing of irrigation canal & canal structure	83%
10	Discharge measurement	100%
11	Meteorology and crop water requirement	95%
12	Irrigation design & drawing by AutoCAD	100%
13	Participation of farmers for sustainable irrigation system	92%
14	Construction management	95%
15	Total station and data processing in computation	100%
16	Irrigation design & drawing by AutoCAD	100%
17	Operation and maintenance	88%

Although, there is a training course that the satisfaction degree is less than 80% (74% for the meteorology and crop water requirement course), most of other training courses shows very high satisfaction degree. The meteorology and crop water requirement course was implemented twice and the satisfaction degree of the second course is 95%. There is good improvement in the satisfaction degree. Taking this improvement into consideration, the degree of this indicator is in a satisfactory level.

4.3.2 Prospect to achieve the Project Purpose No.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 degree of achievement of the following two indicators are at satisfactory level at present and it is expected that the Project Purpose No.2 will be achieved fully at the time of the completion of the Project.

Indicator 2-1: More than 9 water user groups are active in water management. (Revised indicator)

At the moment, 5 water user groups in the Pilot Site in Takeo province are reactivated and 4 water user groups in the Pilot Site in Pursat province are organized through the project activities, in total 9 water user groups were organized and enhanced

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water management activities. It is expected that these 9 groups will continue water management actively.

Indicator 2-2: More than 360 farmers start the water management works learned at the Project. (Revised indicator)

As of October 2007, as a result of implementation of the workshops with participation of farmers in the Pilot Sites in Pursat and Takeo provinces, around 360 farmers have started water management works including construction or rehabilitation of the terminal canals.

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## 5. Result of the Evaluation

### 5.1 Relevance

Relevance of the Project is high.

Agriculture is still important industry that employs around 75% of working population in Cambodia and rice is cultivated in 97% of the cropped land and majority of farmers engage in the rice production. Yield of rice per ha in recent years (2005 and 2006) is increased to around 2.5 ton/ha because RGC, especially MOWRAM made efforts on rehabilitation and construction of irrigation facilities. However, this figure is still lower than rice yields in the neighboring countries (4.50ton/ha in Vietnam, 3.19 ton/ha in Laos, 3.60ton/ha in Myanmar). For increasing yield of rice in Cambodia, improvement of rice production techniques and further progress of development of irrigated agriculture are necessary.

In Cambodia, number of engineers and technicians who had practical techniques and experiences on irrigation was reduced significantly due to the long-lasting civil war etc. Furthermore, there was no well established system to learn irrigation technologies comprehensively at the higher education institutes or working places in Cambodia. Lack of capable irrigation engineers and technicians is one of the factors of low rice productivity in Cambodia. Therefore, this project is in line with needs of engineers & technicians in MOWRAM and PDWRAM and also farmers in Cambodia.

One of the priority issues of the Rectangular Strategy of the RGC is enhancement of agricultural sector. Similarly, one of the major goals of the national Strategic Development Plan (2006-2010) is "development of agricultural sector and enhancement of agricultural production/ productivity. As for Strategy for Agriculture and Water 2006-2010 prepared jointly by the Ministry of Agriculture, Forestry and Fisheries and the Ministry of Water Resources and meteorology, the goal of the strategy is to contribute to poverty reduction, food security and economic growth through (a) enhancing agricultural productivity and diversification, and (b) improving water resources development and management. This project aims efficient water use and management, capacity improvement of irrigation engineers and technicians, and capacity improvement of farmers on water management. Therefore, this project is relevant to the National Development Plan and other related policies of RGC.

One of the priority areas of the Japan's assistance policy to Cambodia is "Realization of Sustainable Economic Growth and a Stable Society". Within this area, agriculture and rural development is one of important issues. And financial and technical

cooperation in the fields of development of irrigation facilities, improvement of water management system, capacity development of water users associations, etc. are considered as important. Therefore, this project is in conformity to priority assistance subjects of the Government of Japan.

As for selection of the target sites, the rice production in Cambodia can be classified into 2 types, i.e. the rice cultivation by using rainwater in rainy season and the rice cultivation in dry season by using stored flood water. The selected Pilot Sites in Kandal and Pursat provinces are for rehabilitation of Pol Pot canals for rice cultivation in rainy season, and the Pilot Site in Takeo province is for irrigation in dry season. Therefore, it seems that appropriate sites were selected for promoting irrigation improvement.

## 5.2 Effectiveness

Effectiveness of the Project will be high.

The progress of the project activities is as planned mostly and it is prospected that the Outputs of the Project will be achieved by the end of the Project. Further capacity enhancement of engineers/technicians and farmers is going to be carried out under the Project, therefore, it is well expected that the Project Purpose will be achieved by the end of the Project

## 5.3 Efficiency

Efficiency of the Project is at a satisfactory level.

Inputs of the Cambodian and Japanese sides were appropriate in general in terms of quantity, quality and timing, etc., and have been utilized well for the project activities.

Cost efficiency of this project is improved compared to the previous phase 1 project, because more number of training courses will be conducted in less project period, more farmers groups will be able to conduct better water management, and not only full-time counterparts of TSC but also PDWRAM staff in 3 provinces are receiving technical transfer.

## 5.4 Impacts

The Overall Goal will be achieved at the year 2010 and several impacts of the Project are observed.

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## (1) Prospect of achieving the Overall Goal

Indicator 1: Irrigated area is increased to 810,300ha in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010. (Revised indicator)

Irrigation development is a priority issue in the policy of RGC. Total irrigated area in Cambodia is increasing significantly in recent years (412,963 ha in 1999, and 596,300 ha in 2005), accordingly, RGC revised the target figure about the irrigated area in 2010 upward (from the 650,000 ha to 810,300 ha). Considering the past tendency about increase of the irrigated area and the policy of RGC, there is good possibility to achieve this target by the year 2010.

Indicator 2: Unit yield of rice is increased to 2.50 ton/ha in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010. (Revised indicator)

Unit yields of rice in the years of 2005 and 2006 are 2.48 ton/ha and 2.49 ton/ha respectively. Weather condition of these 2 year were very favorable for rice cultivation and rice yields were increased significantly compared to rice yields in the previous year (around 2.0 ton/ha). Considering the facts that the Improvement of agricultural productivity is a priority issue of RGC and irrigated area will be increased year by year, rice yield will be increased and it is very possible to achieve this target (2.50 ton/ha) at the year 2010.

## (2) Other Impacts

Following impacts of the Project are observed.

- 1) Three staff of PDWRAM of Takeo province, who participated in the training course on Irrigation and water management plan by GIS, has produced an irrigation inventory map by utilizing knowledge and skills learned. This outcome has been produced by providing a package of training, i.e. training at TSC and OJT for the Pilot Site including activities on farmer's participatory water management. It is confirmed that this approach is very effective for the capacity improvement of staff of PDWRAM.
- 2) AUSAID is interested in the training courses of the TSC and the process of the farmer participatory water management in order to apply to an AUSAID assisted project (CAVAC). TSC submitted a proposal for providing training course to staff of the



target provinces and implementing the farmer participatory water management. This will be a good opportunity to extend the outcomes of the Project.

- 3) Road access was improved where the farm roads were constructed along with the construction of the terminal canals in the project site.

## 5.5 Sustainability

Political sustainability of the Project will be secured. Although organizational, financial and technical sustainability of TSC has been significantly strengthened, there is room for further improvement.

### (1) Political aspect

As mentioned, "Further Rehabilitation and Construction of Physical Infrastructure" and "Enhancement of Agricultural Sector" are focused strategies of the Rectangular Strategy. The management of water resources and irrigation and the improvement of agricultural productivity are the important issues in this policy, and these issues well relevant to the aims of this project. As the National Strategic Development Plan (2006-2010) indicates numerical targets on the increase of irrigated area and the increase of unit yield of rice, the irrigated agriculture is considered one of the important issues by RGC. To achieve these policies, human resources development who engages in the irrigation projects is important, therefore, political sustainability of the Project will be secured in future also.

### (2) Organizational aspect

TSC was officially established as one of Department of MOWRAM in December 2006. As for the organizational structure, TSC is leaded by Director and there are 3 offices, i.e. 1) Administration Office, 2) Water Management, Research and Information Management Office, and 3) Technical Irrigation and Construction Management Office. In total, 15 persons are assigned to TSC including TSC Director at present. 10 persons out of 15 persons are regarded as the full-time counterparts for the Project. Capacity of these 10 full-time counterparts is strengthening further through preparing and conducting the training courses, and conducting OJT activities at the model site and the Pilot Sites in 3 provinces. Although there is difference in ability by person, the full-time counterparts are conducting and managing the training courses by cooperating and complementing each other, and they are strengthening individual capacity and capacity as group in order to conduct their activities in sustainable way.

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It is important for assuring sustainability of TSC to clarify further TSC's functions in the framework of the MOWRAM's mid-term and long-term human resources development vision and plan.

### (3) Financial aspect

Improvement of water management for irrigation has high priority in Cambodia. The fact that TSC was established officially, having a duty to strengthen irrigation engineers and technicians who can carry out irrigation project effectively and efficiently, shows that RGC recognizes importance of human resources development in this technical field.

For this project (phase 2 project), RGC approved the allocation of budget from the counterpart fund of the Government for the implementation of the training courses at TSC. It is highly appreciated this budgetary arrangement for assuring financial sustainability of TSC.

By becoming TSC as a department of MOWRAM officially, TSC becomes able to request the ordinary budget. This year, TSC is going to request the budget for the year 2009. Although RGC faces budgetary constraint, it is expected that MOWRAM and RGC assures further financial sustainability of TSC.

### (4) Technical aspect

Through preparation and production of the curriculums and teaching materials for the training course, implementation of the training courses as trainer, and implementation of OJT to the training course participants and the counterparts of PDWRAM in 3 target provinces, the counterparts of TSC have been strengthening further and acquiring necessary capacity as staff of organization for the human resources development. Also, a system or framework for conducting capacity development for engineers and technicians of MOWRAM and PDWRAM is under establishment. By implementing the project activities, it is expected that the counterparts of TSC will acquire capacity and experiences necessary for carrying out human resources development activities.

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## 6. Conclusion

Improvement of water management for irrigation is a high priority issue for farmers and also the RGC. One of important issues of the Japan's assistance policy to Cambodia is irrigation. Therefore, relevance of the Project is high. Capacity enhancement of engineers/technicians of MOWRAM/PDWRAM and also farmers in the Pilot Sites has been carried out well and further capacity enhancement is going to be carried out by the Project, therefore, it is well expected that the Project Purpose will be achieved by the end of the Project. Therefore, effectiveness of the Project will be high. Inputs of the Cambodian and Japanese sides were appropriate in general, and efficiency of the Project is at a satisfactory level. The Overall Goal is expected to be achieved and several impacts of the Project are observed. Political sustainability of the Project will be secured. Although organizational, financial and technical sustainability of TSC has been significantly strengthened, there is room for further improvement as mentioned in the section 5.5.

## 7. Recommendations

### (1) Maximization of Effectiveness

The project activities are making steady progress and it is well expected that the Project Purpose will be achieved by the end of the project. In this connection, expectations toward advance and comprehensive technical training and OJT by TSC are increasing among the concerned departments of MOWRAM and PWDRAM day by day.

Therefore, it is recommended that the Project and TSC will make efforts to improve the quality of training courses and OJT through introducing, upgrading and reviewing the advanced irrigation and drainage technology.

Also, to realize the above expectations, it is recommended that the Project and TSC will make effort to provide the advance and comprehensive techniques to TSC officials and key MOWRAM staff for their capacity development through the technical assistance from the experts, the Technical Advisory Team of the Project, and local resource persons or institutes.

### (2) Dissemination of the facilitation methods for farmer's participation

It is evaluated that the facilitation methods for farmer's participation in the field of water resources management and development which was introduced by the Project is simple, economical and appropriate methods for the enhancement of the participatory irrigation management and development (PIMD) in Cambodia.

Therefore, it is recommended that the Project will make efforts to disseminate and extend the above mentioned methods in Cambodia.

### (3) Enhancement of further sustainability of TSC

The Royal Government of Cambodia (RGC) works hard to secure the sustainability of TSC, and MOWRAM has a vision for the upgrading of TSC function from Technical Service Center (Department level) to Institute (General Directorate level) in the future. For the realization of MOWRAM's vision and effort, it is needed that RGC has to enhance the sustainability of TSC through the drafting of the road map for institute building of TSC including human resources and financial plan, and the securing of the essential operation budget for TSC activities.

Therefore, it is recommended that RGC has to take the necessary actions which mentioned in below immediately related to the Project activities.

- Securing the essential and sufficient operation cost of TSC activities for FY 2008 and FY 2009 for its sustainability
- Smooth and quick disbursement of the remaining Counterpart Fund to MOWRAM from Ministry of Economy and Finance for the smooth implementation of the Project
- Promotion and dissemination of TSC activities to the donors in order to provide technical services such as training courses and OJT in the field of water management.
- Assignment of appropriate personnel for the capacity development of TSC
- The Project keep continuing support and strengthening of TSC officials through technical assistance.

### (4) Budget for the canal construction of 3 pilot sites

Although it is agreed between Cambodian and Japanese sides that the cost for the construction of terminal canals of 3 pilot sites will be born by the Cambodian side, the budget allocation has not yet been done at this moment. Therefore, it is strongly recommended that RGC has to secure the budget from the Counterpart Fund of Japanese Non Project Grant Aid Scheme for the construction of the terminal canals in the three Pilot Sites by the end of the Project.

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## Annex 1 Schedule of the Evaluation

	Date		Schedule
1	Jan. 22	Tue	Arrival to Cambodia (a Japanese member)
2	Jan. 23	Wed	<ul style="list-style-type: none"> <li>• Meeting and interview with Japanese experts</li> <li>• Interview with Director of TSC</li> </ul>
3	Jan. 24	Thu	<ul style="list-style-type: none"> <li>• Interview with counterparts</li> </ul>
4	Jan. 25	Fri	<ul style="list-style-type: none"> <li>• Interview with Japanese experts and data collection</li> <li>• Interview with counterparts</li> </ul>
5	Jan. 26	Sat	Preparation of draft evaluation report
6	Jan. 27	Sun	Preparation of draft evaluation report Other Japanese members arrive to Cambodia
7	Jan. 28	Mon	<ul style="list-style-type: none"> <li>• Visit to JICA Cambodia office</li> <li>• Courtesy call to MOWRAM</li> <li>• Courtesy call to the Embassy of Japan</li> <li>• Visit to the TSC (Technical Service Center for Irrigation System)</li> </ul>
8	Jan. 29	Tue	First Joint Evaluation Meeting (including presentation of the progress of the project activities by C/Ps)
9	Jan. 30	Wed	Field survey to Kanda Stung and Takeo pilot sites
10	Jan. 31	Thu	Field survey to Pursat pilot site
11	Feb.1	Fri	<ul style="list-style-type: none"> <li>• Survey of TSC activities</li> <li>• Interview with counterpart personnel and Japanese experts</li> </ul>
12	Feb.2	Sat	Preparation of a draft joint evaluation report and a minutes of meeting
13	Feb.3	Sun	Preparation of a draft joint evaluation report and a minutes of meeting
14	Feb.4	Mon	<ul style="list-style-type: none"> <li>• Second Joint Evaluation Meeting (discussion on the contents of the draft joint evaluation report)</li> <li>• Meeting with Project Director and Project Manager</li> </ul>
15	Feb.5	Tue	<ul style="list-style-type: none"> <li>• Third Joint Evaluation Meeting</li> <li>• Joint Coordinating Committee Meeting</li> <li>• Signing ceremony for the Minutes of Meeting</li> <li>• Report to the Embassy of Japan</li> <li>• Report to the JICA Cambodia office</li> </ul> Leave from Cambodia
16	Feb.6	Wed	→ Arrival to Japan

Annex 2 Project Design Matrix  
(1) Original Version

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 starting from January 2006  
 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 System (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 Om Area, Pusat Province, Thom Vinev Area, Takeo Province

Version: 0.0 (January 4, 2006)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<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><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. Irrigated area is increased.            2. Unit yield of rice is improved.            3. Agricultural income in farm households is improved.</p> <p>1. Engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula.            2. Total length of the terminal canals with efficient water management is extended.            The number of farmers who practice the water management work learned at the Project is increased.</p>	<p>Profile data of respective areas in the project proposals.            Baseline indicators by the statistic data.            Social research on the Ex-post Evaluation</p> <p>1. Documents about the evaluation of respective training courses on the Project.            2. Ex-post investigation by the Project about implementation, operation and maintenance of terminal canals at the Pilot Sites.            Social research conducted by the Project at the Pilot Sites.</p>	<p>1. Engineers and technicians who participated in the trainings remain at MOWRAM and PDWRAM and continue to assist farmers in Cambodia.            2. The circumstances of the agricultural product market don't get worse.            3. Workers in each farmers' household is secured in the Target Area.            4. Farmers in the national irrigation project are not against the activities of the water management.</p>

Outputs	(Until the end of the Project)		1. Engineers and technicians who participated in the trainings remain at MOWRAM and PDWRAM. 2. The financial resources for MOWRAM are secured.
<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>1-1-1 The TSC staff complete to make planned curricula of the training courses.</p> <p>1-1-2 The TSC staff complete to produce planned 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 planned 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>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.</p>	<p>2-1 The terminal canals planned in the Model Sites are completed by the trained engineers and technicians in MOWRAM and PDWRAM.</p> <p>2-2 The assigned trainees in MOWRAM and PDWRAM complete the training courses in the TSC.</p> <p>2-3 The assigned trainees in MOWRAM and PDWRAM complete OJT at the Model 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>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 Total length of the terminal canals with efficient water distribution capacity constructed by the engineers and technicians in PDWRAM is extended.</p> <p>3-2 Activities concerned with the water management, such as moving the grass, dredging in canals and discussion, started with cooperation by PDWRAM.</p>	<p>3-1 Documents about construction and use of the terminal canals on the Project</p> <p>3-2 Social research conducted by the Project at the Pilot Sites.</p>	

<u>Activities</u>	<Japanese Side>	<u>Inputs</u>	<Cambodian Side>
1 1-1 1-1-1 Make training curricula 1-1-2 Make systematized training materials  1-2 1-2-1 Make a technical manual list 1-2-2 Compile technical manuals 1-2-3 Translate technical manuals into Khmer	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.  2. Provision of equipment  3. Training of Cambodian counterpart personnel in Japan and in other countries  4. Budget for local activity	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. 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.	The full-time counterparts continuously work with the Project.  <u>Pre-conditions</u> 1. Adequate number of qualified counterparts are assigned. 2. Farmers are not against the Project. 3. The Pilot sites are selected by the Cambodian Government
2 2-1 Conduct the trainings for the engineers and technicians in MOWVRAM and PDWRAM at TSC 2-2 Conduct OJT for the engineers and technicians in MOWVRAM and PDWRAM at MS			
3 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			

Remarks: Objectively Verifiable Indicators should be improved more concretely with numerical target value when the Annual Plan of Operation is established.

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



(2) Version 1.0

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 starting from January 2006  
 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 System (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 Viney Area, Takeo Province

Version: 1.0

Revised on 27 June 2006 by JCC

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><b>Project Purpose</b></p> <p>1) The technical capacity of MOWRAM and PDWRAM is improved.</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>1. Irrigated area is increased.</p> <p>2. Unit yield of rice is improved.</p> <p>3. Agricultural income in farm households is improved.</p>	<p>Profile data of respective areas in the project proposals.</p> <p>Baseline indicators by the statistic data.</p> <p>Social research on the Ex-post Evaluation</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 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>	
<p>1. Engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula.</p> <p>2. Total length of the terminal canals with efficient water management is extended.</p> <p>The number of farmers who practice the water management work learned at the Project is increased.</p>	<p>1. Documents about the evaluation of respective training courses on the Project.</p> <p>2. Ex-post investigation by the Project about implementation, operation and maintenance of terminal canals at the Pilot Sites.</p> <p>Social research conducted by the Project at the Pilot Sites.</p>			

<p><b>Outputs</b></p> <p>1. The following outputs are expected to be achieved at TSC.</p> <p>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)</p> <p>1 1-1 1-1-1 The TSC staff complete to make planned curricula of the training courses. 1-1-2 The TSC staff complete to produce planned materials for the training courses. 1-2 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 planned technical manuals. 1-3 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 1-1-1 The numbers of planned and implemented curricula for the training courses. 1-1-2 The numbers of planned and produced materials for the training courses. 1-2 1-2-1 The list of planned technical manuals. 1-2-2 The numbers of planned and produced technical manuals. 1-3 1-3-1 Established technical library 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. 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 2-1 The terminal canals planned in the Model Sites are completed by the trained engineers and technicians in MOWRAM and PDWRAM. 2-2 The assigned trainees in MOWRAM and PDWRAM complete the training courses in the TSC. 2-3 The assigned trainees in MOWRAM and PDWRAM complete OJT at the Model Sites and the Pilot Sites.</p>	<p>2 2-1 Documents about plan and implementation on the construction of the terminal canals on the Project. 2-2 Documents about implementation of the training courses. 2-3 Documents about implementation of OJT.</p>	
<p>With the technical assistance of TSC, the following outputs are expected to be achieved at PS.</p> <p>3. 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.</p>	<p>3 3-1 Total length of the terminal canals with efficient water distribution capacity constructed by the engineers and technicians in PDWRAM is extended. 3-2 Activities concerned with the water management, such as moving the grass, dredging in canals and discussion, started with cooperation by PDWRAM.</p>	<p>3-1 Documents about construction and use of the terminal canals on the Project 3-2 Social research conducted by the Project at the Pilot Sites.</p>	

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<u>Activities</u>	<u>Inputs</u>		
<p>1 1-1 1-1-1 Make training curricula 1-1-2 Make systematized training materials</p> <p>1-2 1-2-1 Make a technical manual list 1-2-2 Compile technical manuals 1-2-3 Translate technical manuals into Khmer</p> <p>1-3 1-3-1 Collect and organize technical information in irrigation sector 1-3-2 Provide technical information</p>	<p>&lt;Japanese Side&gt;</p> <p>1. Dispatch of experts: (1) Long-term experts: several persons/year such as: - Chief advisor/ Irrigation - Project coordinator/ Training - Water Management</p> <p>(2) Short-term experts are sent according to necessity.</p> <p>2. Provision of equipment</p> <p>3. Training of Cambodian counterpart personnel in Japan and in other countries</p> <p>4. Budget for local activity</p>	<p>&lt;Cambodian Side&gt;</p> <p>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</p> <p>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.</p>	<p>The full-time counterparts continuously work with the Project.</p> <p><u>Pre-conditions</u></p> <p>1. Adequate number of qualified counterparts are assigned. 2. Farmers are not against the Project. 3. The Pilot sites are selected by the Cambodian Government</p>
<p>2 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.</p> <p>3 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</p>			

Remarks: Objectively Verifiable Indicators should be improved more concretely with numerical target value when the Annual Plan of Operation is established.

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

23

(3) Version 2.0  
Project Design Matrix (PDM) Version 2.0 (revised on 24 October 2006)

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 starting from January 2006  
 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 System (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 Om Area, Pusat Province, Thom Vinev Area, Takeo Province  
 Version: 2.0  
 (Revised on 24 October 2006)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<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>	<ol style="list-style-type: none"> <li>1. Irrigated area is increased at least X%.</li> <li>2. Unit yield of rice is improved at least X%.</li> <li>3. Livelihood of the farmer's households is improved at least X%.</li> </ol>	<ol style="list-style-type: none"> <li>1. Questionnaire and profile data of irrigation project.</li> <li>2. Questionnaire to irrigated project by trained engineers and technicians.</li> <li>3. Questionnaire and census which is planning to conduct in 2008.</li> </ol>	
<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>	<ol style="list-style-type: none"> <li>1-1. More than X% engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula.</li> <li>1-2. More than X% of trainee is satisfied with the training courses management system.</li> <li>2-1. More than 25 km length of the terminal canal with efficient water management is extended.</li> <li>2-2. More than X farmers start the water management work learned at the Project.</li> </ol>	<ol style="list-style-type: none"> <li>1-1. Documents about the evaluation of respective training courses on the Project through questionnaire and test to trainee.</li> <li>1-2. Documents about the evaluation of respective training courses on the Project through questionnaire.</li> <li>2-1. Ex-post investigation by the Project about implementation, operation and maintenance of terminal canals at the Pilot Sites.</li> <li>2-2. Social research conducted by the Project at the Pilot Sites.</li> </ol>	<ol style="list-style-type: none"> <li>1. Engineers and technicians who participated in the trainings remain at MOWRAM and PDWRAM and continue to assist farmers in Cambodia.</li> <li>2. The circumstances of the agricultural product market don't get worse.</li> <li>3. Workers in each farmer's household is secured in the Target Area.</li> <li>4. Farmers in the national irrigation project are not against the activities of the water management.</li> </ol>

Outputs	(Until the end of the Project)		
<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>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 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 1-2-1 The list of planned technical manuals.</p> <p>1-2-2 The numbers of planned and produced technical manuals.</p> <p>1-3 1-3-1 Established technical 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 Sites are completed by the trained engineers and technicians in MOWRAM and PDWRAM.</p> <p>2-2 More than 580 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 Sites and Pilot Sites.</p> <p>2-4 More than 21 staff in PDWRAM complete OJT at the Model and Pilot Sites.</p>	<p>2 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>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 More than 25km length of the terminal canals with efficient water distribution capacity constructed or rehabilitated by the engineers and technicians in PDWRAM is extended.</p> <p>3-2 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.</p>	<p>3-1 Documents about construction and use of the terminal canals on the Project</p> <p>3-2 Social research conducted by the Project at the Pilot Sites.</p>	

<u>Activities</u>	<Japanese Side>	<u>Input</u> <Cambodian Side>	The full-time counterparts continuously work with the Project.
1 1-1 1-1-1 Make training curricula 1-1-2 Make systematized training materials 1-2 1-2-1 Make a technical manual list 1-2-2 Compile technical manuals 1-2-3 Translate technical manuals into Khmer	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. 2. Provision of equipment 3. Training of Cambodian counterpart personnel in Japan and in other countries 4. Budget for local activity	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	<b>Pre-conditions</b> 1. Adequate number of qualified counterparts are assigned. 2. Farmers are not against the Project. 3. The Pilot sites are selected by the Cambodian Government.
1-3 1-3-1 Collect and organize technical information in irrigation sector 1-3-2 Provide technical information			
2 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 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.	

Remarks: Objectively Verifiable Indicators should be improved more concretely with numerical target value when the Annual Plan of Operation is established.

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

### Annex 3 Dispatch of Japanese Experts

#### (1) Long-term Experts

No.	Name	Field	Period of Assignment						
			From	To	M/M	2006	2007	2008	2009
1	Shigemitsu Tsukamoto	Chief Advisor/ Irrigation	2006/6/1	2008/5/31	24.0				
2	Koji Kanemaru	Coordinator/Training	2006/1/10	2008/4/21	27.4				
3	Kenji Washino	Water Management	2006/6/1	2008/5/31	24.0				

#### (2) Short-term Experts

No.	Name	Field	Period of Assignment						
			From	To	M/M	2006	2007	2008	2009
1	Kanezo Takeuchi	Preparation of Draft Work Plan	2006/3/6	2006/6/30	3.9				
2	Shinobu Sakai	Irrigation Project Management	2006/10/1	2007/3/31	6.0				
3	Norihumi Shimura	Topography Survey and Mapping	2006/12/6	2007/1/28	1.8				
4	Husanari Sato	Irrigation and Drainage Facilities Designing	2007/1/7	2007/3/16	2.3				
5	Mitsunari Sadano	Construction Management and Supervise	2007/1/22	2007/3/16	1.8				
6	Takao Masumoto	Meteorology and Hydrology Measurement	2007/4/22	2007/5/13	0.7				
7	Yourichi Hayashida	Soil and Concrete Test	2007/5/16	2007/6/24	1.3				
8	Husanari Sato	Design, Construction Management and Quality Control	2007/7/15	2008/2/3	6.8				
9	Manabu Kawaguchi	Rural Development & Irrigation Planning by GIS	2007/9/16	2007/11/8	1.8				

## Annex 4 Provision of Technical Equipment

Note: R/P-Route of Procurement (J: from Japan, L: local purchase, E: for Expert)

Frequency of Use (A: Always - B: Often - C: Sometimes)

Condition (A: Good - B: Fair - C: Bad)

Equipment Number	Date of Arrival	Description			QTY	Price US\$		Place of Storage	Frequency of USE	Condition	Remarks
		Name of Equipment	Maker	Model		Unit	Total				
2006 E 001	9-Jan-07	Automatic Generator Control Unit	MICK	MICK 125 KVA	L	1	2,500.00	2,500.00	TSC	A	
2006 E 002	17-Jan-07	Digital Camera	Canon	Power Shot A-530	L	1	300.00	300.00	Pursat	A	
2006 E 003	17-Jan-07	Digital Camera	Canon	Power Shot A-530	L	1	300.00	300.00	Takeo	A	
2006 E 004	18-Jan-07	Printer	Hewlett Packard	HP 1280 Desk Jet	L	1	235.00	235.00	TSC	A	
2006 E 005	18-Jan-07	Printer	Hewlett Packard	HP 1280 Desk Jet	L	1	235.00	235.00	Pursat	A	
2006 E 006	18-Jan-07	Printer	Hewlett Packard	HP 1280 Desk Jet	L	1	235.00	235.00	Takeo	A	
2006 E 007	18-Jan-07	Printer	Hewlett Packard	HP 2600N	L	1	365.00	365.00	TSC	A	
2006 E 008	18-Jan-07	Printer	Hewlett Packard	HP 1320 Laser Jet	L	1	285.00	285.00	TSC	A	
2006 E 009	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 010	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 011	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 012	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 013	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 014	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 015	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 016	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 017	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 018	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 019	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 020	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 021	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 022	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	TSC	B	
2006 E 023	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	Takeo	B	
2006 E 024	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	Takeo	B	
2006 E 025	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	Pursat	B	
2006 E 026	22-Jan-07	Personal Computer (Desktop)	Dell	Optiplex 745 Minttower	L	1	1,474.00	1,474.00	Pursat	B	
2006 E 027	22-Jan-07	Notebook/Computer	Dell	Latitude D520	L	1	1,750.00	1,750.00	TSC	A	
2006 E 028	1-Feb-07	Photocopy Machine	Fuji Xerox	Copier DC-550(CP)	L	1	7,650.00	7,650.00	TSC	A	
2006 E 029	9-Feb-07	Level	Sokkia	Digital Level SDL 50	L	1	3,715.00	3,715.00	Pursat	C	
2006 E 030	9-Feb-07	Level	Sokkia	Digital Level SDL 50	L	1	3,715.00	3,715.00	Takeo	C	
2006 E 031	23-Feb-07	Current Meter	OTT	Small Current Meter C2	L	1	4,656.00	4,656.00	TSC	C	
2006 E 032	23-Feb-07	Current Meter	OTT	Small Current Meter C2	L	1	4,656.00	4,656.00	Pursat	C	



Equipment Number	Date of Arrival	Description				QTY	Price US\$		Place of Storage	Frequency of USE	Condition	Remarks
		Name of Equipment	Maker	Model	R/P		Unit	Total				
2006 E 033	23-Feb-07	Current Meter	OTT	Small Current Meter C2	L	1	4,656.00	4,656.00	Takeo	C	A	
2006 E 034	6-Mar-07	Dynamic Penetrometer	Humboldt	H-4218B	L	1	2,345.00	2,345.00	TSC	C	A	
2006 E 035	9-Mar-07	GPS	Leica	GPS set SR20 (2 receivers)	L	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	L	1	9,000.00	9,000.00	TSC	A	A	
2006 E 037	23-Mar-07	Total Station	Topcon	Pulse Total Station GPT-7001	L	1	11,505.00	11,505.00	TSC	C	A	
2006 E 038	23-Mar-07	Total Station	Topcon	Pulse Total Station GPT-7001	L	1	11,505.00	11,505.00	TSC	C	A	
2006 E 039	23-Mar-07	Total Station	Topcon	Pulse Total Station GPT-7001	L	1	11,505.00	11,505.00	TSC	C	A	
2006 E 040	23-Mar-07	Total Station	Topcon	Electronic Total Station GTS-725	L	1	9,560.00	9,560.00	Pursat	C	A	
2006 E 041	23-Mar-07	Total Station	Topcon	Electronic Total Station GTS-725	L	1	9,560.00	9,560.00	Takeo	C	A	
2006 E 042	23-Mar-07	Theodolite	Topcon	Laser Digital Theodolite DT-205L	L	1	2,367.00	2,367.00	Pursat	C	A	
2006 E 043	23-Mar-07	Theodolite	Topcon	Laser Digital Theodolite DT-205L	L	1	2,367.00	2,367.00	Takeo	C	A	
2006 E 044	28-Mar-07	Core drilling machine	Controls	83-C0355	L	1	6,692.44	6,692.44	TSC	C	A	
2006 E 045	28-Mar-07	Light weight dynamic penetrometer	Controls	16-T0013	L	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	L	1	28,800.00	28,800.00	TSC	A	A	
2006 J 001	11-Apr-06	PC Parts (HDD,DDR,CPU,VGA,LAN,Case,DVD)	Hitachi, Intel, ATX, Sony	ATA-133, PC2700, Celeron2.13, FSB800, AT X,DW-G120A	L	1	290.00	290.00	TSC	A	A	
2006 J 002	11-Apr-06	PC Parts (HDD,DDR,CPU,VGA,LAN,Case,DVD)	Hitachi, Intel, ATX, Sony	ATA-133, PC2700, Celeron2.13, FSB800, AT X,DW-G120A	L	1	290.00	290.00	TSC	A	A	
2006 J 003	11-Apr-06	PC Parts (HDD,DDR,CPU,VGA,LAN,Case,DVD)	Hitachi, Intel, ATX, Sony	ATA-133, PC2700, Celeron2.13, FSB800, AT X,DW-G120A	L	1	290.00	290.00	TSC	A	A	
2006 J 004	11-Apr-06	PC Parts (HDD,DDR,CPU,VGA,LAN,Case,DVD)	Hitachi, Intel, ATX, Sony	ATA-133, PC2700, Celeron2.13, FSB800, AT X,DW-G120A	L	1	290.00	290.00	TSC	A	A	
2006 J 005	11-Apr-06	PC Parts (HDD,DDR,CPU,VGA,LAN,Case,DVD)	Hitachi, Intel, ATX, Sony	ATA-133, PC2700, Celeron2.13, FSB800, AT X,DW-G120A	L	1	290.00	290.00	TSC	A	A	
2006 J 006	11-Apr-06	PC Parts (HDD,DDR,CPU,VGA,LAN,Case,DVD)	Hitachi, Intel, ATX, Sony	ATA-133, PC2700, Celeron2.13, FSB800, AT X,DW-G120A	L	1	290.00	290.00	TSC	A	A	
2006 J 007	11-Apr-06	PC Parts (HDD,DDR,CPU,VGA,LAN,Case,DVD)	Hitachi, Intel, ATX, Sony	ATA-133, PC2700, Celeron2.13, FSB800, AT X,DW-G120A	L	1	290.00	290.00	TSC	A	A	
2006 J 008	18-Apr-06	DVD Writer	Sony	DW-G120A	L	1	65.00	65.00	TSC	A	A	
2006 J 009	18-Apr-06	Memory	-	DDR333 Ram 512MB PC2700	L	1	45.00	45.00	TSC	A	A	
2006 J 010	18-Apr-06	Memory	-	DDR333 Ram 512MB PC2700	L	1	45.00	45.00	TSC	A	A	
2006 J 011	18-Apr-06	Memory	-	DDR333 Ram 512MB PC2700	L	1	45.00	45.00	TSC	A	A	
2006 J 012	18-Apr-06	Memory	-	DDR333 Ram 512MB PC2700	L	1	45.00	45.00	TSC	A	A	
2006 J 013	18-Apr-06	Memory	-	DDR333 Ram 512MB PC2700	L	1	45.00	45.00	TSC	A	A	
2006 J 014	18-Apr-06	Memory	-	DDR333 Ram 512MB PC2700	L	1	45.00	45.00	TSC	A	A	
2006 J 015	18-Apr-06	Memory	-	DDR333 Ram 512MB PC2700	L	1	45.00	45.00	TSC	A	A	
2006 J 016	29-May-06	Cabinet	Sure	F407	L	1	55.00	55.00	TSC	A	A	
2006 J 017	29-May-06	Safe	BIS	BS-T370	L	1	165.00	165.00	TSC	A	A	
2006 J 018	08-Jun-06	Locker	LEECO	CB	L	1	120.00	120.00	TSC	A	A	
2006 J 019	08-Jun-06	Locker	LEECO	CB	L	1	120.00	120.00	TSC	A	A	

Equipment Number	Date of Arrival	Description			QTY	Price US\$		Place of Storage	Frequency of USE	Condition	Remarks
		Name of Equipment	Maker	Model		Unit	Total				
2006 J 020	11-Jul-06	Mobile telephone	Nokia	N1100-LG	L	1	52.00	52.00	TSC	A	
2006 J 021	01-Aug-06	Evapotranspiration pan	Pearg Chanly	-	L	1	190.00	190.00	TSC	A	
2006 J 022	01-Aug-06	Evaporation pan	Pearg Chanly	-	L	1	50.00	50.00	TSC	A	
2006 J 023	31-Aug-06	UPS	Power tree	S650BX, 650VA	L	1	39.00	39.00	TSC	A	
2006 J 024	06-Sep-06	Autovoltage regulator	HAMSHIN	200S, 2KVA	L	1	50.00	50.00	TSC	A	
2006 J 025	06-Sep-06	Harddisk drive 3.5inch	-	80GB, USB2.0, 3.5inch	L	1	100.00	100.00	TSC	A	
2006 J 026	20-Sep-06	Desk	LEECO	DE45 with grass plate	L	1	125.00	125.00	TSC	A	
2006 J 027	20-Sep-06	Desk	LEECO	DE46 with grass plate	L	1	125.00	125.00	TSC	A	
2006 J 028	20-Sep-06	Desk	LEECO	DE47 with grass plate	L	1	125.00	125.00	TSC	A	
2006 J 029	20-Sep-06	Desk	LEECO	DE48 with grass plate	L	1	125.00	125.00	TSC	A	
2006 J 030	20-Sep-06	Chair	LEECO	LSC411 Blue	L	1	80.00	80.00	TSC	A	
2006 J 031	20-Sep-06	Chair	LEECO	LSC411 Blue	L	1	80.00	80.00	TSC	A	
2006 J 032	20-Sep-06	Chair	LEECO	LSC411 Blue	L	1	80.00	80.00	TSC	A	
2006 J 033	20-Sep-06	Chair	LEECO	LSC411 Blue	L	1	80.00	80.00	TSC	A	
2006 J 034	20-Sep-06	Chair	LEECO	LSC411 Blue	L	1	80.00	80.00	TSC	A	
2006 J 035	20-Dec-06	UPS	Power tree	S1250P	L	1	62.00	62.00	TSC	A	
2006 J 036	20-Dec-06	Portable GPS	Garmih	GPS Map60CSx	L	1	695.00	695.00	TSC	B	
2006 J 037	20-Dec-06	Portable GPS	Garmih	GPS Map60CSx	L	1	695.00	695.00	TSC	B	
2006 J 038	20-Dec-06	Portable GPS	Garmih	GPS Map60CSx	L	1	695.00	695.00	TSC	B	
2006 J 039	27-Dec-06	Portable GPS	Garmih	GPS 76	L	1	290.00	290.00	TSC	B	
2006 J 040	27-Dec-06	Portable GPS	Garmih	GPS 76	L	1	290.00	290.00	TSC	B	
2006 J 041	27-Dec-06	Portable GPS	Garmih	GPS 76	L	1	290.00	290.00	TSC	B	
2006 J 042	29-Dec-06	Harddisk drive 3.5inch	Maxtor	120GB, 7200rpm, USB2.0	L	1	90.00	90.00	TSC	B	
2006 J 043	29-Dec-06	Harddisk drive 3.5inch	Maxtor	120GB, 7200rpm, USB2.0	L	1	90.00	90.00	TSC	B	
2006 J 044	29-Dec-06	Harddisk drive 3.5inch	Maxtor	120GB, 7200rpm, USB2.0	L	1	90.00	90.00	TSC	B	
2006 J 045	29-Dec-06	Harddisk drive 3.5inch	Maxtor	120GB, 7200rpm, USB2.0	L	1	90.00	90.00	TSC	B	
2006 J 046	29-Dec-06	Harddisk drive 3.5inch	Maxtor	120GB, 7200rpm, USB2.0	L	1	90.00	90.00	TSC	B	
2006 J 047	10-Jan-07	Speech table	PSF Odam shop	-	L	1	280.00	280.00	TSC	B	
2006 J 048	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	
2006 J 049	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	
2006 J 050	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	
2006 J 051	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	
2006 J 052	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	
2006 J 053	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	
2006 J 054	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	
2006 J 055	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	
2006 J 056	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	

Equipment Number	Date of Arrival	Description				QTY	Price US\$		Place of Storage	Frequency of USE	Condition	Remarks
		Name of Equipment	Maker	Model	R/P		Unit	Total				
2006 J 057	10-Jan-07	Computer desk	UC	SD-08, grey	L	1	45.00	45.00	TSC	B	A	
2006 J 058	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 059	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 060	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 061	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 062	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 063	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 064	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 065	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 066	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 067	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	B	A	
2006 J 068	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	A	A	
2006 J 069	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	A	A	
2006 J 070	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	TSC	A	A	
2006 J 071	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	Pursat	A	A	
2006 J 072	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	Pursat	A	A	
2006 J 073	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	Takeo	A	A	
2006 J 074	10-Jan-07	Office chair	HOA PHAT	G-140H, blue	L	1	29.00	29.00	Takeo	A	A	
2006 J 075	11-Jan-07	Meeting table	MFC	TG-8686	L	1	77.00	77.00	TSC	A	A	
2006 J 076	11-Jan-07	Folding chair	Chitoss	CD-700	L	1	28.00	28.00	TSC	B	A	
2006 J 077	11-Jan-07	Folding chair	Chitoss	CD-700	L	1	28.00	28.00	TSC	B	A	
2006 J 078	11-Jan-07	Folding chair.	Chitoss	CD-700	L	1	28.00	28.00	TSC	B	A	
2006 J 079	11-Jan-07	Folding chair	Chitoss	CD-700	L	1	28.00	28.00	TSC	B	A	
2006 J 080	12-Jan-07	Computer Desk	LC	STE-300	L	1	68.00	68.00	TSC	B	A	
2006 J 081	12-Jan-07	Computer Desk	LC	STE-300	L	1	68.00	68.00	TSC	B	A	
2006 J 082	12-Jan-07	Computer Desk	LC	STE-300	L	1	68.00	68.00	TSC	B	A	
2006 J 083	12-Jan-07	Computer Desk	LC	STE-300	L	1	68.00	68.00	Pursat	B	A	
2006 J 084	12-Jan-07	Computer Desk	LC	STE-300	L	1	68.00	68.00	Pursat	B	A	
2006 J 085	12-Jan-07	Computer Desk	LC	STE-300	L	1	68.00	68.00	Takeo	B	A	
2006 J 086	12-Jan-07	Computer Desk	LC	STE-300	L	1	68.00	68.00	Takeo	B	A	
2006 J 087	12-Jan-07	Chair for meeting	LC	CV30AH	L	1	42.00	42.00	TSC	B	A	
2006 J 088	12-Jan-07	Chair for meeting	LC	CV30AH	L	1	42.00	42.00	TSC	B	A	
2006 J 089	12-Jan-07	Chair for meeting	LC	CV30AH	L	1	42.00	42.00	TSC	B	A	
2006 J 090	12-Jan-07	Chair for meeting	LC	CV30AH	L	1	42.00	42.00	TSC	B	A	
2006 J 091	12-Jan-07	Chair for meeting	LC	CV30AH	L	1	42.00	42.00	TSC	B	A	
2006 J 092	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A	
2006 J 093	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A	

Equipment Number	Date of Arrival	Name of Equipment			Description			QTY	Price US\$		Place of Storage	Frequency of USE	Condition	Remarks
		Maker	Model	R/P	Unit	Total								
2006 J 094	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 095	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 096	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 097	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 098	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 099	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 100	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 101	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 102	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 103	12-Jan-07	Chair for meeting	UC	C305	L	1	38.00	38.00	TSC	B	A			
2006 J 104	16-Jan-07	Scanner	Canon	LIDE 25	L	1	65.00	65.00	TSC	B	A			
2006 J 105	16-Jan-07	Scanner	Canon	LIDE 25	L	1	65.00	65.00	Pursat	B	A			
2006 J 106	16-Jan-07	Scanner	Canon	LIDE 25	L	1	65.00	65.00	Takeo	B	A			
2006 J 107	16-Jan-07	Multimedia Projector with screen	Sony	VPL-ES2 Projector	L	1	1,085.00	1,085.00	Pursat	A	A			
2006 J 108	16-Jan-07	Multimedia Projector with screen	Sony	VPL-ES2 Projector	L	1	1,085.00	1,085.00	Takeo	A	A			
2006 J 109	18-Jan-07	Speaker	DAS	DS-8	L	1	450.00	450.00	TSC	B	A			
2006 J 110	18-Jan-07	Speaker	DAS	DS-8	L	1	450.00	450.00	TSC	B	A			
2006 J 111	18-Jan-07	Stereo power amplifier	Bardl	SF-2600	L	1	1,150.00	1,150.00	TSC	B	A			
2006 J 112	18-Jan-07	Audio mixing console 8 channels	Behringer	UB-2442	L	1	550.00	550.00	TSC	B	A			
2006 J 113	18-Jan-07	Stereo graphic equalizer 1/3 octave	Behringer	FBQ-3102	L	1	500.00	500.00	TSC	B	A			
2006 J 114	18-Jan-07	Wireless microphone and receiver unit	Audio Technica	WAT-2100, ATW220	L	1	600.00	600.00	TSC	B	A			
2006 J 115	18-Jan-07	Wireless microphone and receiver unit	Audio Technica	WAT-2100, ATW220	L	1	600.00	600.00	TSC	B	A			
2006 J 116	18-Jan-07	Speaker stand	Speaker stand	S-stand	L	1	100.00	100.00	TSC	B	A			
2006 J 117	18-Jan-07	Speaker stand	Speaker stand	S-stand	L	1	100.00	100.00	TSC	B	A			
2006 J 118	18-Jan-07	Microphone stand	Microphone stand	Table stand	L	1	35.00	35.00	TSC	B	A			
2006 J 119	18-Jan-07	Microphone stand	Proel	Long microphone stand	L	1	60.00	60.00	TSC	B	A			
2006 J 120	18-Jan-07	Plastic rack	E rack	E rack	L	1	850.00	850.00	TSC	B	A			
2006 J 121	20-Jan-07	Projector Screen	Remaco	MAS-2121 84x84	L	1	180.00	180.00	TSC	B	A			
2006 J 122	22-Jan-07	Server case	ATX	P4	L	1	131.00	131.00	TSC	A	A			
2006 J 123	22-Jan-07	Network device	-	-	L	1	150.00	150.00	TSC	A	A			
2006 J 124	22-Jan-07	DVD/CD-RW Drive	-	-	L	1	35.00	35.00	TSC	A	A			
2006 J 125	22-Jan-07	CRT	Power Tree	MPT-15SB	L	1	70.00	70.00	TSC	A	A			
2006 J 126	22-Jan-07	Switch 16 port 10/100	D-Link	DES-1016D	L	1	62.00	62.00	TSC	A	A			
2006 J 127	25-Jan-07	Thermometer for Meteorological station	-	-	L	1	100.00	100.00	Takeo	A	Out of order			
2006 J 128	25-Jan-07	Thermometer for Meteorological station	-	-	L	1	100.00	100.00	Takeo	A	A			
2006 J 129	25-Jan-07	Thermometer for Meteorological station	-	-	L	1	100.00	100.00	Takeo	A	A			
2006 J 130	25-Jan-07	Thermometer for Meteorological station	-	-	L	1	100.00	100.00	Takeo	A	A			

Equipment Number	Date of Arrival	Description				QTY	Price US\$		Place of Storage	Frequency of USE	Condition	Remarks
		Name of Equipment	Maker	Model	R/P		Unit	Total				
2006 J 131	31-Jan-07	Shelter for Meteorological station	Sor Phear	Wooden Shelter	L	1	180.00	180.00	Takeo	A		
2006 J 132	31-Jan-07	Shelter for Meteorological station	Sor Phear	Wooden Shelter	L	1	180.00	180.00	Kandal	A		
2006 J 133	31-Jan-07	Key Box	JIELISI	No.8707	L	1	37.00	37.00	TSC	A		
2006 J 134	31-Jan-07	CD player	Panasonic	SL-MV65	L	1	120.00	120.00	TSC	C		
2006 J 135	31-Jan-07	Printer server	D-Link	DP-301P	L	1	68.00	68.00	TSC	A		
2006 J 136	06-Feb-07	Rain gauge for Meteorological station	Tang Cheng Hong	DOM MOVDRAM model	L	1	80.00	80.00	Takeo	A		
2006 J 137	07-Feb-07	Wind Speed/Direction pointer	Lay Mean Industry	DOM MOVDRAM model	L	1	280.00	280.00	Takeo	A		
2006 J 138	07-Feb-07	Wind Speed/Direction pointer	Lay Mean Industry	DOM MOVDRAM model	L	1	280.00	280.00	Takeo	A		
2006 J 139	08-Feb-07	Concrete mixer	HOL KORB	Small Mixer	L	1	500.00	500.00	TSC	C		
2006 J 140	09-Feb-07	Auto Level	Sokkia	B20	L	1	1,695.00	1,695.00	Pursat	C		
2006 J 141	09-Feb-07	Auto Level	Sokkia	B20	L	1	1,695.00	1,695.00	Takeo	C		
2006 J 142	23-Feb-07	Water Level Recorder	OTT	OTT Thalimedes	L	1	1,513.00	1,513.00	TSC	C		
2006 J 143	23-Feb-07	Water Level Recorder	OTT	OTT Thalimedes	L	1	1,513.00	1,513.00	TSC	C		
2006 J 144	23-Feb-07	Water Level Recorder	OTT	OTT Thalimedes	L	1	1,513.00	1,513.00	Pursat	C		
2006 J 145	23-Feb-07	Water Level Recorder	OTT	OTT Thalimedes	L	1	1,513.00	1,513.00	Pursat	C		
2006 J 146	23-Feb-07	Water Level Recorder	OTT	OTT Thalimedes	L	1	1,513.00	1,513.00	Takeo	C		
2006 J 147	23-Feb-07	Water Level Recorder	OTT	OTT Thalimedes	L	1	1,513.00	1,513.00	Takeo	C		
2006 J 148	23-Mar-07	Laser Level	Topcon	Rotating Kaser RL-H3A	L	1	1,908.00	1,908.00	TSC	C		
2006 J 149	23-Mar-07	Cylinder Mould (D150mm, H300mm)	Controls	Controls 55-C0118	L	1	341.83	341.83	TSC	C		
2006 J 150	23-Mar-07	Cylinder Mould (D150mm, H300mm)	Controls	Controls 55-C0118	L	1	341.83	341.83	TSC	C		
2006 J 151	23-Mar-07	Coring bit D 150mm, L400mm	Controls	Controls 83-C0323	L	1	797.20	797.20	TSC	C		
2006 J 152	23-Mar-07	Coring bit D 150mm, L400mm	Controls	Controls 83-C0323	L	1	797.20	797.20	TSC	C		
2006 J 153	23-Mar-07	Core extractor D 150mm	Controls	Controls 83-C0313/2	L	1	290.93	290.93	TSC	C		
2007 J 001	4-Oct-07	Hard Disk Drive (2.5 inch, 160 GB)	Maxtor	Maxtor one Touch III	L	1	135.00	135.00	TSC	A		
2007 J 002	4-Oct-07	Hard Disk Drive (2.5 inch, 160 GB)	Maxtor	Maxtor one Touch III	L	1	135.00	135.00	TSC	A		
2007 J 003	4-Oct-07	Hard Disk Drive (3.5 inch, 160 GB)	Maxtor	Maxtor Basics	L	1	105.00	105.00	TSC	A		
2007 J 004	4-Oct-07	Hard Disk Drive (3.5 inch, 160 GB)	Maxtor	Maxtor Basics	L	1	105.00	105.00	Pursat	A		
2007 J 005	4-Oct-07	Hard Disk Drive (3.5 inch, 160 GB)	Maxtor	Maxtor Basics	L	1	105.00	105.00	Takeo	A		
2007 J 006	15-Nov-07	USB Memory	Kingston	DT14GB	L	1	45.00	45.00	TSC	A		
2007 J 007	15-Nov-07	USB Memory	Kingston	DT14GB	L	1	45.00	45.00	TSC	A		
Total										219,454		

**Annex 5 Assignment of Counterpart/Training in Japan (draft)**

Note: In case a counterpart's employment is temporary, enter "N/A" in Remarks

No.	Name of Counterpart	Field	Present Post in MO/WRAM Post at assignment time	Remarks	Period of Assignment				Training in Japan and third countries			
					From	To	2006	2007	2008	2009	Year	Name of Training Course
1. TSC												
1	Mr. E. Veng Sakthou	Project Director	Secretary of State		2006	At present						
2	Mr. E. Bun Hean	Project Manager	Director General of Technical Affairs		2006	At present						
3	Mr. Pich Veasna	Project Sub-Manager	Deputy Director General of Administration Affairs / Director of Technical Service Center (TSC)		2006	At present						
4	Mr. Te Ou Kim	Project Sub-Manager	Director, Department of Irrigated Agriculture		2006	At present						
5	Mr. Ngoun Pich	Project Sub-Manager	Deputy Director, Department of Engineering		2006	At present						
6	Mr. Uch Hing	Survey	Chief, Construction Management and Technical Irrigation Office, TSC Official, Department of Engineering	Full-time C/P	2006	At present			2006	Irrigation System and Water Management (J-06-20339)		13 August - 22 October 2006
7	Mr. Hay Bunthoeun	Design	Deputy Chief, Construction Management and Technical Irrigation Office, TSC Official, Department of Engineering	Full-time C/P	2006	At present						
8	Mr. Meas Savoeun	Planning	Deputy Chief, Construction Management and Technical Irrigation Office, TSC Official, Department of Irrigated Agriculture	Full-time C/P	2006	At present						
9	Mr. Maen Seng	Survey	Official, Construction Management and Technical Irrigation Office, TSC Official, Department of Engineering	Full-time C/P	2006	At present			2007	Irrigation and Drainage (J-07- 22871)		18 August - 29 September 2006
10	Mr. Teav Vutha	Design	Official, Construction Management and Technical Irrigation Office, TSC Official, Department of Irrigated Agriculture	Full-time C/P	2006	At present						
11	Mr. You Solha	Planning	Deputy Chief, Construction Management and Technical Irrigation Office, TSC Official, Department of Engineering		2006	September						

No.	Name of Counterpart	Field	Present Post in MOWRAM Post at assignment time	Remarks	Period of Assignment		Training in Japan and third countries						
					From	To	Year	Name of Training Course	Duration	2006	2007	2008	2009
12	Mr. Sao Eha	Design	Deputy Chief, Water Management, Research and Information Management Office, TSC Official, Department of Engineering	Full-time C/P	January 2007	At present	2007	Irrigation and Drainage (J-07-22871)	18 August - 29 September 2006				
13	Mr. Noun Vannarith	Construction Management	Deputy Chief, Water Management, Research and Information Management Office, TSC Official, Department of Engineering	Full-time C/P	January 2006	At present	2007	Irrigation System Management (in Malaysia)	19 November - 7 December 2007				
14	Mr. Hout Thean	Construction Management	--- Official, Department of Engineering		May 2006	October 2006							
15	Mr. Teng Tong Heng	Water Management	Official, Administration Office, TSC Official, Department of Irrigated Agriculture	Full-time C/P	January 2006	At present	2006	Irrigation System and Water Management (J-06-20339)	13 August - 22 October 2006				
16	Mr. Sok Korn	Water Management	Official, Water Management, Research and Information Management Office, TSC Official, Department of Irrigated Agriculture	Full-time C/P	January 2006	At present	2006	Irrigation System Management (in Malaysia)	13 November - 1 December 2006				
17	Mr. Prum Kanthel	Water Management	Official, Water Management, Research and Information Management Office, TSC Official, Department of Irrigated Agriculture	Full-time C/P	January 2006	At present	2007	Participatory Irrigation Management System for Paddies for Asian Countries (in Japan)	21 May - 21 July 2007				
18	Mrs. Ung Chandara	Construction Management	Deputy Chief, Administration Office, Department of Engineering		January 2007	At present							
19	Mr. Kei Chansovath	Construction Management	Chief, Soil Laboratory, Department of Engineering		January 2007	At present							
20	Mr. Team Vuthary	Construction Management	Official, Construction office, Department of Engineering		January 2007	At present							
2. PDWRAM													
1	Mr. Hong Chheang Lim	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	At present							
2	Mr. Prak Lak	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	At present							
3	Mr. Hem Sarom	Hydraulic Technician	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	At present							
4	Mr. Prak Sovannarith	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	At present							

No.	Name of Counterpart	Field	Present Post in MOWRAM Post at assignment time	Remarks	Period of Assignment		Training in Japan and third countries				
					From	To	Year	Name of Training Course	Duration		
5	Ms. Siang Leang Meng	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	At present					
6	Mr. Un Vuthy	Chief of DWRAM, Kandal Stung	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	At present					
7	Mr. Chea Chanrasmey	Hydraulic Technician, DWRAM, Kandal Stung	Official, Provincial Department of Water Resources and Meteorology, Kandal		November 2006	At present					
8	Mr. Keo Vey	Director, Irrigation Engineer	Director, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	At present		2006	Irrigation System and Water Management (J-06-20339)	13 August - 9 September 2006	
9	Mr. You La	Irrigation Engineer	Deputy Director, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	At present		2006	Sustainable Agricultural Development from Perspective of a Basin Management (J-06-22518)	5 -31 March 2007	
10	Mr. Kit Phal	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	At present					
11	Mr. Chhim Samorn	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	At present					
12	Mr. Lao Sokha	Hydraulic Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	At present					
13	Mr. Tauch Soeur	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	At present					
14	Mr. Meas Bunthooun	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat		November 2006	At present					
15	Mr. Suy Sovannareth	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Pursat	* not yet approved by Minister	March 2007	At present					



No.	Name of Counterpart	Field	Present Post in MOWRAM	Remarks	Period of Assignment		Training in Japan and third countries			
					From	To	Year	Name of Training Course	Duration	
16	Mr. Pa Sovannareth	Qualification	Post at assignment time Official, Provincial Department of Water Resources and Meteorology, Pursat	* not yet approved by Minister	March 2007	At present				
17	Mr. Ros Yanny	Qualification	Official, Provincial Department of Water Resources and Meteorology, Pursat	* not yet approved by Minister	March 2007	At present				
18	Mr. Bun Huor	Director, Irrigation Engineer	Director, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	At present	2006	Sustainable Agricultural Development from Perspective of a Basin Management (J-06-22518)	5 -31 March 2007	
19	Mr. San No	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	At present				
20	Mr. Soun Sopal	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	At present				
21	Mr. Kea Saman	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	At present				
22	Mr. Yuk Narin	Mechanic Vocational	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	At present				
23	Mr. Heng Sodara	Meteorology Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	At present				
24	Mr. Ven Sovann	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo		November 2006	At present				
25	Mr. Sok Sokhom	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo	* not yet approved by Minister	March 2007	At present				
26	Mr. Chea Phirun	Irrigation Technician	Official, Provincial Department of Water Resources and Meteorology, Takeo	* not yet approved by Minister	March 2007	At present				
27	Mr. Chin Chenda	Irrigation Engineer	Official, Provincial Department of Water Resources and Meteorology, Takeo	* not yet approved by Minister	March 2007	At present				

**Annex 6 Local Cost allocated by Japanese side**

Unit: United States Dollar

No.	Category	Budgetary Year				Amount
		JFY.2006	JFY.2007 (Plan)	JFY.2008	JFY.2009	
1	General Budget (Running Expenses)	65,375.49	46,608.26			111,983.75
2	General Budget (Activities)	137,714.01	206,320.00			344,034.01
	Total	203,089.50	252,928.26			456,017.76

\*JFY.: Japanese Fiscal Year (from April to March)

## Annex 7 Budget allocated by Cambodian side

### (1) MOWRAM Budget

No.	Description		FY.2006	FY.2007	Total
1	Technical Equipment/stationery for Staff	Received Budget		1,600.00	1,600.00
		Expenditure		800.00	800.00
2	Custom Fee for Imported Equipme	Received Budget			
		Expenditure			
3	Building construction/renovation	Received Budget		19,000.00	19,000.00
		Expenditure		19,000.00	19,000.00
4	Water supply fee	Received Budget		1,918.20	1,918.20
		Expenditure		1,918.20	1,918.20
5	Electricity	Received Budget		8,412.30	8,412.30
		Expenditure		8,412.30	8,412.30
6	Fuel	Received Budget	5,463.36	4,097.00	9,560.36
		Expenditure	5,463.36	4,097.00	9,560.36
7	Telephone	Received Budget		1,123.39	1,123.39
		Expenditure		1,123.39	1,123.39
8	Salary for TSC staff	Received Budget	9,590.13	10,161.00	19,751.13
		Expenditure	9,590.13	10,161.00	19,751.13
9	Salary for Provincial Counteart	Received Budget			
		Expenditure			
10	Other	Received Budget			
		Expenditure			
<b>Total Budgetary Plan</b>					
<b>Total Received Budget</b>			15,053.49	46,311.89	61,365.38
<b>Total Expenditure</b>			15,053.49	45,511.89	60,565.38
<b>Balance of Fiscal Year</b>					

### (2) Counterpart Fund

No.	Description		FY.2006	FY.2007	Total
1	Training course	Received Budget	15,000.00	15,000.00	30,000.00
		Expenditure		15,991.78	15,991.78
2	OJT	Received Budget		415.99	415.99
		Expenditure		415.99	415.99
3	Others	Received Budget	668.34	429.16	1,097.50
		Expenditure	668.34	429.16	1,097.50
4		Received Budget		455.00	455.00
		Expenditure		455.00	455.00
5		Received Budget			
		Expenditure			
<b>Total Budgetary Plan</b>					
<b>Total Received Budget</b>			15,668.34	16,300.15	31,968.49
<b>Total Expenditure</b>			668.34	17,291.93	17,960.27
<b>Balance of Fiscal Year</b>					

Annex 8 List of the produced training materials (textbooks) and teaching documents

No.	Title of training course	Training materials (textbooks) and teaching documents (power point and others)	Language
1	Basic Survey I	(1) Materials (Textbooks) 1) Manual of Route Survey 2) Manual of Theodolite Survey  (2) Teaching documents 1) Traverse Survey 2) Topographic survey	English and Khmer English and Khmer  English and Khmer English and Khmer
2	Basic Survey II	(1) Materials (Textbooks) 1) Manual of Topographic Survey 2) Manual of Traverse Survey  (2) Teaching documents	English and Khmer English and Khmer
3	Data Processing of Total Station	(1) Materials (Textbooks) 1) Textbooks on how to use the Land development program  (2) Teaching documents 1) Text Book how to use land development program	English and Khmer  English
4	Discharge Measurement	(1) Materials (Textbooks) 1) Manual on Hydrological Observation, Explained in Pictures 2) Manual of Discharge Measurement 3) Manual of Discharge Measurement by Float and by Weirs  (2) Teaching documents 1) Lecture of Discharge Measurement 2) Measurement of water level 3) Procedure of Discharge and H <sub>Q</sub> curve 4) Measurement by current meter 5) Measurement by weirs 6) Curve	English and Khmer English and Khmer English and Khmer  English English English English English English
5	Meteorology & Crop Water Requirement	(1) Materials (Textbooks) 1) Manual of Calculation for Water Balance 2) Manual of Meteorological Observation  (2) Teaching documents 1) General Introduction of Crop Water Requirement 2) General Introduction of Crop Water Requirement measuring apparatus in paddy field ( Field	English and Khmer English and Khmer  English and Khmer English and Khmer

		Practices) 3) Calculated of crop water requirement 4) Summary of Meteorology station and Procedure data 5) Calculation of evapotranspiration by Penman method 6) Analysis of the hydrologic and meteorological data	English English English English
6	(Irrigation Planning)	(1) Materials (Textbooks) (Not yet produced) (2) Teaching documents (Not yet produced)	
7	Irrigation and Water Management Plan by GIS	(1) Materials (Textbooks) 1) Getting started with Arc GIS 2) Hand on GIS marking land title (Text book) (2) Teaching documents 1) Hand on GIS marking land title	English English English
8	Training for Irrigation System Design	(1) Materials (Textbooks) 1) Training for Irrigation system design (2) Teaching documents 1) Training for Irrigation system design	English English and Khmer
9	Design & Drawing by Auto CAD	(1) Materials (Textbooks) 1) Design & Drawing by Auto CAD (2) Teaching documents 1) Design & Drawing by Auto CAD	English English
10	(Basic Design of Irrigation Facilities)	(1) Materials (Textbooks) (Not yet produced) (2) Teaching documents (Not yet produced)	
11	Construction Management	(1) Materials (Textbooks) 1) Textbook for Construction Management (2) Teaching documents 1) Outline of Construction Management 2) Explanation documents about farmers problems, 3) Explanation documents to farmers about construction work confirmation of farmers, request & problems, get farmers cooperation and agreement for construction work. 4) Comparison of specification tolerance of dimension control 5) Work Process for Earth & Concrete Work	English and Khmer English and Khmer English and Khmer English and Khmer English and Khmer English and Khmer

		<p>6) Field Density Test , Time of compaction by Roller  7) Dynamic Cone Penetrometer  8) Slum test and Concrete Compression Test  9) Field Density &amp; Topographical Survey Test</p> <p>(1) Materials (Textbooks)  1) Manual on Setting Fixed Ruler  2) Manual on Role of Employment &amp; Contractor  3) Manual on Earth &amp; Concrete Work Process  4) Manual on Soil &amp; Concrete testing</p> <p>(2) Teaching documents  1) Direct construction (Contract with private company), planning &amp; management of construction schedule.  2) Check &amp; test of materials, stripping ,set of center line, land border, reference stakes, layer of soil  3) Check the specification of materials (soil cement, sand, aggregate, iron bar etc.)  4) Check layer of soil banking, dimension control, the shape and dimension of structure on drawing  5) Field density test  6) Concrete Test</p>	<p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p>
12	Supervision on Construction Site	<p>(1) Materials (Textbooks)  1) Manual on Basic of Irrigation System  2) Manual on Facilitators of Workshop Management  3) Manual on Operation and Maintenance of Irrigation Facilities  4) Manual on Problem and Solution on Farm Level Water Management  5) General Guidelines for Farmer's Survey  6) Textbook for participatory of farmers for sustainable irrigation system management</p> <p>(2) Teaching documents  1) Policy of PIMD  2) Irrigation water management  3) Leader ship  4) Activities of Prey nob FWUC</p> <p>(1) Materials (Textbooks)  1) Textbook for operation and maintenance  2) Flood gate and sluice gate in Kandal Stung irrigation system</p>	<p>English and Khmer  English and Khmer  English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p>
13	Participatory of Farmers for Sustainable Irrigation System Management	<p>(1) Materials (Textbooks)  1) Manual on Basic of Irrigation System  2) Manual on Facilitators of Workshop Management  3) Manual on Operation and Maintenance of Irrigation Facilities  4) Manual on Problem and Solution on Farm Level Water Management  5) General Guidelines for Farmer's Survey  6) Textbook for participatory of farmers for sustainable irrigation system management</p> <p>(2) Teaching documents  1) Policy of PIMD  2) Irrigation water management  3) Leader ship  4) Activities of Prey nob FWUC</p> <p>(1) Materials (Textbooks)  1) Textbook for operation and maintenance  2) Flood gate and sluice gate in Kandal Stung irrigation system</p>	<p>English and Khmer  English and Khmer  English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p>
14	(Operation and Maintenance)	<p>(1) Materials (Textbooks)  1) Textbook for operation and maintenance  2) Flood gate and sluice gate in Kandal Stung irrigation system</p>	<p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p> <p>English and Khmer  English and Khmer  English and Khmer  English and Khmer</p>

## Annex 9 List and Contents of the technical Manuals (Second Version)

### 1. Topographic and Route Survey Manual

- (1) Topographic Survey
  - 1) Review of geometry
  - 2) Ground control Point (GCP) Survey
  - 3) Traverse Survey
  - 4) Level Survey
- (2) Route Survey
  - 1) Longitudinal Survey (Profile)
  - 2) Cross Section Survey
  - 3) Plane Table Survey
  - 4) Detailed Survey
- (3) Hardware & Software Component
- (4) Aerial Photo (& Satellite Data) Prospecting
- (5) Drawing and Survey Result Management

### 2. Meteorology & Hydrology Survey Manual

- (1) Meteorology & Hydrology Measurement in Cambodia
- (2) Meteorology Survey
- (3) Hydrology Survey
- (4) Discharge Measurement
  - 1) Selection of Measuring Point & Method
  - 2) Water Depth Measurement
  - 3) Measurement by Float
  - 4) Measurement by Current Meter
  - 5) Measurement by Weirs
  - 6) Other Methods
  - 7) Make a H-Q Curve
  - 8) Data Processing, Management & Dissemination

### 3. Irrigation Planning Manual

- (1) Rice and Upland Crops in Cambodia
- (2) Basic Data and Investigation for Irrigation Planning
- (3) Crop Water Requirement
- (4) Calculation of Water Balance
- (5) Economical irrigation planning & target cost for investment

### 4. Design Manual for Small Scale Irrigation System

- (1) Hydraulic Design
- (2) Hydraulic and structural design on concrete structure
- (3) Example of Design Drawings for Irrigation Structure in MOWRAM
- (4) Drawing
- (5) Cost Estimation

#### **5. Construction Supervision and Management Manual for Small Scale Irrigation System**

- (1) Outline of Construction Supervision & Management
- (2) Collection and Comparison Technical Specifications use in the Construction Work under MOWRAM
- (3) Technical Specification for Construction Works
- (4) Construction Supervision and Process
  - 1) Construction Supervision and Process
  - 2) Dimension Control Criteria
  - 3) Construction Control by Photograph
- (5) Construction Report

#### **6. Quality Control Manual**

- (1) Construction Materials
- (2) Concrete Test
- (3) Soil Test
- (4) Methods of Quality Control in the field Construction Works
- (5) International Standards

#### **7. Operation and Maintenance Manual**

- (1) Irrigation System Management Policy in Cambodia
- (2) General of Operation and Maintenance
- (3) Case Study of Operation and Maintenance in Cambodia
  - 1) Operation and Maintenance by MOWRAM and PDWRAM
  - 2) Case Study of Operation and Maintenance by farmers, FWUG and FWUC
  - 3) Operation and Maintenance in Kandal Stung Irrigation Project

#### **8. Water Management Manual**

- (1) Outline of FWUC and FWUG
- (2) Collection and Analysis of FWUG and FWUC activities
- (3) Incentive and Good Example of Farmers Participation
- (4) Type of Water Resources Management plan
  - 1) Supply Oriented Management
  - 2) Demand Oriented Management
- (5) Water Management in Model & Pilot Site
- (6) Lesson and Learn from Model & Pilot Site

#### **9. GIS Technical Manual**

- (1) Map Projection
- (2) Handy GPS for ArcMap
- (3) Contour Line Map
- (4) Digital level Data Transfer
- (5) Google Earth Professional
- (6) Compeuim for GIS
- (7) Import of the Digital Mapping Data to Coverage
- (8) Line Generation by Semi Automatic Mapping
- (9) Digitizing
- (10) Ploting



Evaluation Grid: The Technical Service Center for Irrigation System Project Phase-2 Mid-term Evaluation

1. Evaluation Grid

Evaluation criterion	Evaluation Question		Information/ data required	Results
	Main Question	Sub Question		
Relevance	Necessity	Relevant to the needs of the target area and society? (Are needs of irrigated agriculture high?)	<ul style="list-style-type: none"> <li>Information about the needs of the target area and society</li> </ul>	<p>Although the share of agricultural sector in GDP reduced from 39.4% in 1997 to 31.4% in 2005 because of the development of industrial sector in recent years, agriculture is still important industry that employs around 75% of working population in Cambodia. Especially, rice is cultivated in 97% of the cropped land and majority of farmers engage in the rice production, and rice is most important crop in Cambodia's agriculture. Cambodia achieved and continues self-sufficiency in rice from 1995. Yield of rice per ha in recent years (2005 and 2006) is increased to around 2.5 ton/ha because of favorable whether conditions. However, this figure is still lower than rice yields in the neighboring countries (4.5ton/ha in Vietnam, 3.19 ton/ha in Laos, 3.60ton/ha in Myanmar). For increasing yield of rice in Cambodia, improvement of rice production techniques and further progress of development of irrigated agriculture are necessary.</p> <p>Development of appropriate irrigation facilities is very necessary because of destruction of agricultural infrastructure including irrigation facilities and irrigation development using inappropriate techniques in the period of the civil war etc. which continued around 20 years. Necessity of irrigation development can be confirmed by the results of questionnaire survey to farmers that carried out by Economic Institute of Cambodia. According to this survey, main limited factor for increasing agricultural production is water (water resources and construction of irrigation canal).</p> <p>Therefore, it is confirmed that needs of irrigated agriculture is high and this project is relevant to the needs of the target area and society.</p>
		Is the project in line with the needs of the target group? (Conformity with the needs of target groups, i.e. full time counterparts in the TSC, the engineers & technicians in MOWRAM and PDWRAM and the farmers at Pilot Sites)	<ul style="list-style-type: none"> <li>Information about the needs and opinions of persons concerned</li> </ul>	<p>In Cambodia, number of engineers and technicians who had practical techniques and experiences on irrigation was reduced significantly due to the long-lasting civil war etc. Furthermore, there was no well established system to learn irrigation technologies comprehensively at the higher education institutes or working places in Cambodia. MOWRAM was established in 1999 having responsibility as institution implementing irrigation projects. However, there was no appropriate human resources development system which aims technical improvement for engineers and technicians of MOWRAM. Lack of capable irrigation engineers and technicians is one of the factors of low rice productivity in Cambodia.</p> <p>This project aims to capacity development of irrigation engineers and technicians and then to bring stabilization of agricultural production through efficient use of water resources and poverty reduction through improvement of livelihood of poor farmers. Therefore, this project is in line with needs of engineers &amp; technicians in MOWRAM and PDWRAM and farmers in Cambodia.</p>
Priority		Are the aims of Project relevant to the National Development Plan of	<ul style="list-style-type: none"> <li>Political status or importance</li> </ul>	<p>One of the priority issues of the Rectangular Strategy of the Royal Government of Cambodia is enhancement of agricultural sector. Increase the yields in the existing land and development of irrigation</p>

	Cambodia? (Importance of irrigated agriculture or improvement of agricultural productivity within the National Development Plan of Cambodia)	<ul style="list-style-type: none"> <li>Opinions of persons concerned</li> </ul>	<p>facilities and water resource management are considered important for achieving improvement of agricultural productivity and diversification. Similarly, one of the major goals of the national Strategic Development Plan (2006-2010) is "development of agricultural sector and enhancement of agricultural production/ productivity indicating numerical targets for increase of irrigated area and rice yield.</p> <p>As for Strategy for Agriculture and Water 2006-2010 prepared jointly by the Ministry of Agriculture, Forestry and Fisheries and the Ministry of Water Resources and meteorology, the goal of this strategy is to contribute to poverty reduction, food security and economic growth through (a) enhancing agricultural productivity and diversification and (b) improving water resources development and management. This strategy describes that this goal can be achieved by more efficient use and management of water and land, institutional capacity building, and improved access to knowledge and technology.</p> <p>This project aims efficient water use and management, capacity improvement of irrigation engineers and technicians, and capacity improvement of farmers on water management. Therefore, this project is relevant to the National Development Plan and other related policies of the Government of Cambodia.</p>
Suitability as a means	Conformity of priority assistance subjects of Japanese Government and JICA	<ul style="list-style-type: none"> <li>Priority assistance subjects of Japanese Government for Cambodia</li> </ul>	<p>One of the priority areas of the Japan's assistance policy to Cambodia is "Realization of Sustainable Economic Growth and a Stable Society". Within this area, agriculture and rural development is one of important issues, and financial and technical cooperation in the fields of development of irrigation facilities, improvement of water management system, capacity development of water users associations, etc. are considered as important. According to the JICA country-wise cooperation plan to Cambodia (2005), this project is regarded a program within the "program on improvement of irrigated agriculture and farming". Therefore, this project is in conformity to priority assistance subjects of Japanese Government and JICA.</p>
	Were the project approach and the target areas adequately selected?	<ul style="list-style-type: none"> <li>Opinions of persons concerned</li> </ul>	<p>As mentioned already, lack of irrigation engineers and technicians is one of the factors of low rice productivity and unstable rice production in Cambodia and is a major obstacle for agricultural development. Therefore, the project approach, i.e. human resources development through training courses and OJT that contributes to realize stable and improved agricultural production through effective and efficient use of water resources in rural area and enables livelihood improvement of poor farmers, is adequate.</p> <p>Rice production in Cambodia can be classified into 2 types, i.e. rice cultivation by using rainwater in rainy season and rice cultivation in dry season using stored flood water. There is urgent necessity of reconstructing irrigation facilities which were destroyed in the period of the civil war or constructed with inappropriate technologies (for example Pol Pot canals).</p> <p>As for the selected pilot sites of the Project, the pilot sites in Kandal and Pursat provinces are for rehabilitation of Pol Pot canals for rice cultivation in rainy season, and the pilot site in Takeo province is for irrigation in dry season. Therefore, appropriate sites were selected for promoting irrigation improvement for rice in Cambodia.</p>
	Are the selection of the target group and its scale appropriate? (Full time counterparts in the TSC, the engineers & technicians in	<ul style="list-style-type: none"> <li>Opinions of persons concerned</li> </ul>	<p>TSC was established as department of MOWRAM for human resources development in irrigation and meteorological sector and there is no other organization in MOWRAM responsible for implementation of human resource development.</p> <p>Targets of training are engineers and technicians who belong to the engineering department and the</p>

MOWRAM and PDWRAM and the farmers at Pilot Sites)		<p>irrigation agriculture department of MOWRAM, and target number of persons is around 450. According to the project plan, 33 training courses will be held and around 580 engineers and technicians will participate in those training courses during the project period. This number of person accounts around 70% of engineers and technicians of MOWRAM and PDWRAM, and this seems quite appropriate size as target of training. In addition, capacity development of selected 21 engineers and technicians of 3 targeted PDWRAM (Kandal, Pursat and Takeo) is carrying out.</p> <p>As for the areas of the pilot sites, 100ha in Pursat province and 300 ha in Takeo province. The sizes of pilot areas are suitable for carrying out technical transfer to farmers on participatory water management. As for the pilot site on Kandal province, size of pilot site has 1,950ha including model site and is also suitable. However, due to delay of approval of the budget of development of irrigation facilities, it becomes necessary to review or reduce of the target area for development and the contents of OJT and technical transfer.</p>
Are there any ripple effects beyond the target group?	<ul style="list-style-type: none"> <li>• Opinions of persons concerned</li> </ul>	<p>Techniques transferred to the counterparts of TSC have been transferred to engineers and technicians of MOWRAM and PDWRAM through training courses and OJT.</p> <p>It is expected that the trained engineers and technicians at TSC will carry out technical transfer to other technicians of their PDWRAM.</p> <p>Not only the counterparts of PDWRAM in Pursat and Takeo, heads of local administration and heads of water users groups have also participated to the farmer participated workshops on water management and fields visits to the advanced places. As a result, heads of local administration and heads of water users groups are participating actively to the project activities in order to promote farmer's water management activities with more initiative of farmers. It is expected that this kind of participation of heads of local administration and heads of water users groups will bring ripple effect in neighboring areas.</p>
Are the benefits of the effect and the burden of the costs fairly distributed?	<ul style="list-style-type: none"> <li>• Opinions of persons concerned</li> </ul>	<p>In this project, together with development of tertiary canals and delivery canals, rules for fair water distribution are decided through discussions among persons concerned by formulating group of farmers concerned in order to improve unbalanced water distribution. This project focuses fair distribution of benefit and effect of development of irrigation facilities. Implementation of this project will contribute fair and effective utilization of valuable water resources in rural area.</p>
Does Japan have a technology advantage? (Does Japan have accumulated know-how on the target technology? Can Japan's experiences be applied?)	<ul style="list-style-type: none"> <li>• Opinions of persons concerned</li> </ul>	<p>Japan has accumulated technical knowhow on irrigated agriculture for rice and also has a lot of experiences of technical transfer on irrigation such as creation of a center for irrigation technology in Thailand and other Asian countries. Therefore, such knowhow and experiences can be applied to this project.</p>
Have there been any changes in the environment of the Project (politics, economy, society, etc.) since the start of the Project?	<ul style="list-style-type: none"> <li>•</li> </ul>	<p>By economical development in recent years in Cambodia, price of land is rising and speculation on land is observed. Especially purchase of agricultural land along the national roads is progressing and farmers have recognition that significant money can be gained by selling their land. Therefore, provision of agricultural land by farmers in free of charge for the construction of tertiary canals in the model site and pilot site in Kandal province becomes difficult year by year.</p>
Others		

				Available working forces for water management in the pilot sites in Kandal province and Takeo province are reducing year by year, because those pilot sites locate relatively near to Phnom Phen city and the national roads, and working forces of younger generation engage in the garment factories.
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Evaluation criterion	Evaluation Question		Information/ data required	Results
	Main Question	Sub Question		
Effectiveness	Degree of achievement of the Project Purpose	Will the Project Purpose be Achieved?	(Table of achievement)	(Table of achievement)
	The relation of cause and effect between the Outputs and the Project Purpose	Were the Outputs enough to achieve the Project Purpose? Were its no wonder in the logic that "the Project Purpose would be achieved if all the Outputs were achieved?"	<ul style="list-style-type: none"> <li>Opinions of persons concerned</li> </ul>	<p>The Project Purposes are 1) "the technical capacity of MOWRAM and 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."</p> <p>Output 1,2 and 3 are related to the enhancement of system for capacity development for engineers and technicians (strengthen of TSC's capacity on implementation of training) and implementation of training, in another wards, capacity of engineers and technicians on irrigation related techniques is enhanced by participating training courses at TSC and OJT at model site and pilot sites. It seems that the outputs of the Project is logically enough to achieve the Project Purpose 1. The output 3 is to realize water management by farmers' initiative through implementation of study and design of tertiary and delivery canals by engineers and technicians of PDWRAM with technical support and OJT by the counterparts of TSC, and support and training to farmers about appropriate water management at tertiary and delivery canals. Then, it seems that the output 3 is logically enough to achieve the Project Purpose 2.</p> <p>Overall, there is no wonder in the logic that "the Project Purpose would be achieved if all the Outputs were achieved"</p>
	Influence of Important Assumption	Influence of following aspects for achieving the Project Purpose 1) Engineers and technicians who participated in the trainings remain at MOWRAM and PDWRAM. 2) The financial resources for MOWRAM are secured.	<ul style="list-style-type: none"> <li>Opinions of persons concerned</li> </ul>	<p>it is expected that most of the engineers and the technicians, who participated to the training courses of the Project, are continuing to work in MOWRAM and PDWRAM.</p> <p>As for financial resources, delay of approval of budget for construction of canals in pilot site in Kandal province may reduce possibility to accomplish canal construction within the project period. There is possibility that this issue make negative influence for achieving the Project Purpose.</p>

Factors promoted and hampered to achieve the Project Purpose.	Factors promoted to achieve the Project Purpose.	Information of implementation process • Opinions of persons concerned	After the commencement of the Project, TSC was established officially in December 2006 as a department of MOWRAM. This effort made by MOWRAM for assuring organizational sustainability of TSC is a significant factor for promoting in achieving the Project Purpose.
	Factors hampered to achieve the Project Purpose.	• Opinions of persons concerned	Although budget for the construction of canals in pilot sites is planned to be provided by the Government of Cambodia, as mentioned already, approval of budget is delaying. This delay may produce no implementation of OJT about farmer's participatory water management activities utilizing developed irrigation canals. Furthermore, especially in the pilot site in Kandal province, agricultural land acquisition for the tertiary canals in free of charge is becoming difficult and this issue may become hampering factor.

Evaluation criterion	Evaluation Question		Information/ data required	Results
	Main Question	Sub Question		
Efficiency	Achievement of Outputs	Are the Outputs achieved?	(Table of achievement)	(Table of achievement)
	The relation of cause and effect between the project activities and the Outputs	Unnecessary activities	• Opinions of persons concerned	There is no unnecessary activity in the planned project activities.
	Quality, quantity and timing of Inputs	Activities that should have been involved in	• Opinions of persons concerned	There is no major activity that should have been included in the project activities.
		Appropriateness about number, specialty, capability, duration, timing of dispatch of Experts.	• Record of dispatch of Experts • Opinions of persons concerned	3 long-term Japanese experts have been dispatched in the fields of Chief Advisor/ irrigation, Coordinator/ training, and Water management. 9 short-term Japanese experts have been dispatched in the fields of Irrigation Project Management, Irrigation and Drainage Facilities Designing, Construction Management and Supervise, Meteorology and Hydrology Measurement, Soil and Concrete Test, Design, Construction Management and Quality Control, etc. It seems that dispatch of Japanese experts is appropriate in term of number, specialty, capability, timing of dispatch according to the results of questionnaire to the counterparts and interview to them.
	Appropriateness about kind, quantity and timing of provision of equipment.		• Record of procurement of equipment, Situation of use of equipment • Opinions of persons concerned	Topographic survey related equipment such as total station, theodolite, auto level, etc., computer and computer related equipment, water level gauge, meteorological survey tool such as thermometer, rain gauge, etc. have been provided. Expenditure for such equipment provision is 219,454 US dollars as of November 2007. It seems that necessary and appropriate equipment have been provided.
	Appropriateness of trainings in Japan and in other countries (number of	Appropriateness of trainings	• Record of trainings	8 counterparts have participated the training in Japan and 2 counterparts have participated training in Malaysia. According to the results of questionnaire to the counterparts, some of them pointed out that the duration of

	<p>persons, training contents, and timing etc.)</p>	<p>the training course is short for learning well because of a lot of training contents in limited time. However, it seems that the training in abroad is appropriate in general in term of number of persons participated, training contents and timing.</p>																
<p>Appropriateness about number, capability and timing of assignment of C/Ps.</p>	<p>Record of assignment of C/Ps  <ul style="list-style-type: none"> <li>• Opinions of persons concerned</li> </ul> </p>	<p>Currently, 18 staff of MOWRAM and 21 staff of PDWRAM in Kandal, Pursat and Takeo provinces are assigned as counterpart. 10 staff out of 18 MOWRAM staff are assigned as full time counterpart at TSC. In regard to the counterparts of PDWRAM, number will be increased to 30. It seems that number of counterparts, timing of assignment are appropriate and they have suitable capacity to conduct the project activities.</p>																
<p>Appropriateness about size and convenience of office space etc. utilized for the Project.</p>	<p>Situation of office space etc. utilized by the Project.  <ul style="list-style-type: none"> <li>• Opinions of persons concerned</li> </ul> </p>	<p>The office space for the Japanese experts is appropriate in term of size and convenience. Space of the training rooms and the room for technical information are also appropriate.</p>																
<p>Appropriateness about budget allocated by Cambodian side</p>	<p>Budget allocated by Cambodian side to the Project</p>	<p>Cambodia side allocated following budget for the years 2006 and 2007. Major items are renovation of the building facility of TSC, salary of TSC staff, expenses for the implementation of the training courses, fuel, water and electricity, photocopy papers etc.  In addition, it was planned to disburse 77,060 US dollars for the project activities from the counterpart fund of the Government of Cambodia. 30,000 US dollars out of 77,060 US dollars have been already allocated. Figures in the table below are amount disbursed.</p> <table border="1" data-bbox="885 1243 1013 1422"> <thead> <tr> <th>(Unit US dollar)</th> <th>FY 2006</th> <th>FY 2007</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>MOWRAM budget</td> <td>15,053.49</td> <td>45,511.89</td> <td>60,565.38</td> </tr> <tr> <td>Counterpart fund</td> <td>668.34</td> <td>17,291.93</td> <td>17,960.27</td> </tr> <tr> <td>Total</td> <td>15,721.83</td> <td>62,803.82</td> <td>78,525.65</td> </tr> </tbody> </table>	(Unit US dollar)	FY 2006	FY 2007	Total	MOWRAM budget	15,053.49	45,511.89	60,565.38	Counterpart fund	668.34	17,291.93	17,960.27	Total	15,721.83	62,803.82	78,525.65
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<p>Are there factors hampered that influenced on efficiency of the Project.</p>	<p>Utilization of equipment provided under the Project  Stability of C/Ps engaged in the Project  Other factors influenced.</p>	<p>Although there are delay in assuring the budget for construction of canals in pilot site, in general, allocation of budget by the Cambodian side has been made appropriately.  Equipment provided under the Project is utilizing effectively in general for daily project activities and  Most of counterparts have worked at TSC continuing and stability of Counter is good.  Due to the delay in assuring the budget for construction of the terminal canals in Kandal Stung pilot site, the planned OJT can not carried out as planned. In addition, in the case of the Kandal Stung pilot site, provision of the farmer's agricultural land without compensation for construction of terminal canals is becoming difficult, and this aspect may affect negatively for smooth progress of construction of the terminal canals, even if the above mentioned budget is allocated.</p>																

<p>Cost efficiency</p>	<p>Does the Project Purpose and the Outputs justify the cost to be invested compared to similar projects? Were there any alternative means to achieve the same achievement using less amount of cost?</p>	<p>• Opinions of persons concerned</p>	<p>Following table shows comparison of some outcomes of the phase 1 and the phase 2 projects. It might not very adequate to compare simply those outcomes because the project components are not same. However, following data helps us for easy understanding of improvement of cost efficiency in the phase 2 project.</p> <table border="1" data-bbox="391 141 566 934"> <thead> <tr> <th>Item</th> <th>Phase 1 (5 years)</th> <th>Phase 2 (3.5 years)</th> </tr> </thead> <tbody> <tr> <td>Number of training course implemented</td> <td>9</td> <td>17 at present (Planned number is 33)</td> </tr> <tr> <td>Establishment of farmers groups</td> <td>2</td> <td>10</td> </tr> <tr> <td>Target persons of PID/WRAM staff for OJT in 3 provinces</td> <td>None</td> <td>21 staff</td> </tr> </tbody> </table> <p>The outcomes of the phase 2 project increased significantly, and project period is reduced from 5 to 3 years, therefore, cost efficiency of the phase 2 project is improved very much.</p>	Item	Phase 1 (5 years)	Phase 2 (3.5 years)	Number of training course implemented	9	17 at present (Planned number is 33)	Establishment of farmers groups	2	10	Target persons of PID/WRAM staff for OJT in 3 provinces	None	21 staff
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<p>Evaluation criterion</p>	<p>Information/ data required</p>	<p>Results</p>
<p>Impact</p>	<p>Prospect of achievement of Overall Goal</p>	<p>(Table of achievement)</p>
<p>Information/ data required</p>	<p>Information/ data required</p>	<p>Results</p>
<p>Sub Question</p>	<p>Is there prospect that the overall goal will be achieved as an effect of the Project?</p>	<p>(Table of achievement)</p>

<p>Is the possibility high that the important assumptions from the Project Purpose to the Overall Goal are correct?</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) Rice is main crop in Cambodia and its price is stable, and the agricultural product market is not becoming worse.</p> <p>3) As for workforce of the farmer's household, with the development of garment industrial in and around Phnom Penh, the opportunity becoming wage worker has been increased and it is becoming difficult to secure workforces for agricultural activities in some places.</p> <p>4) As mentioned already, the provision of the farmer's agricultural land without compensation for construction of terminal canals is becoming difficult, however, it will not be happened the situation that farmers in the national irrigation project are against the activities of the water management.</p>	<p>• Opinions of persons concerned</p>	<p>1) There is no suitable information whether engineers and technicians who participated in the trainings remain at MOWRAM and PDWRAM and continue to assist farmers in Cambodia.</p> <p>2) Rice is main crop in Cambodia and its price is stable, and the agricultural product market is not becoming worse.</p> <p>3) As for workforce of the farmer's household, with the development of garment industrial in and around Phnom Penh, the opportunity becoming wage worker has been increased and it is becoming difficult to secure workforces for agricultural activities in some places.</p> <p>4) As mentioned already, the provision of the farmer's agricultural land without compensation for construction of terminal canals is becoming difficult, however, it will not be happened the situation that farmers in the national irrigation project are against the activities of the water management.</p>
<p>Are the overall goal and the project objective consistent? (Is there no wonder in the logic that "the Overall Goal would be achieved as an effect of the achievement of the Project Purpose?")</p>	<p>• Opinions of persons concerned</p>	<p>Through participation in the training courses of the TSC, technical capacity of engineers and technicians of MOWRAM and PDWRAM is enhanced. It is expected that the agricultural production will be stable and increased, and will contribute to improvement of livelihood of farmer's households through improvement of irrigation schemes by engaging those capacity enhanced staff in survey, study, design, construction management etc., and also by extending improvement of farmer's participatory water management and efficient use of water resources. Therefore, it seems that there is no wonder in the logic that the Overall Goal would be achieved as an effect of the achievement of the Project Purpose</p>
<p>Influence of the Project to C/Ps</p>	<p>• Opinions of persons concerned</p>	<p>As result of the questionnaire to the full time counterparts of TSC, all of them answered that their motivation for working and confidence are increased. They appreciate receiving useful knowledge and experiences through technical transfer from Japanese experts and the trainings in Japan and other Asian countries.</p>
<p>Ripple effect (Impact) (prospect)</p>	<p>• Opinions of persons concerned</p>	<p>(1) It is expected that the Project contribute to the achievement of one of important indicator in the agricultural sector, which is increase of rice yield, in the National Strategic Development Plan 2006-2010.  (2) Road access was improved where the farm roads were constructed along with the construction of the terminal canals in the project sites.  (3) One of the staff of PDWRAM in Takeo province, who participated in the training course on Irrigation and water management plan by GIS, has produced an irrigation inventory map by utilizing knowledge and skills learned. (It is expected that this kinds of utilization of the matters learned by ex-trainees will be increased.)</p>



Evaluation criterion	Evaluation Question		Information/ data required	Results
	Main Question	Sub Question		
Sustainability	Political aspect	Will the project components be regarded important politically by Cambodian government? (Importance of irrigated agriculture in the policies of Cambodian government)	<ul style="list-style-type: none"> <li>National Development Plan and other related policies</li> </ul>	<p>As mentioned, "Further Rehabilitation and Construction of Physical Infrastructure" and "Enhancement of Agricultural Sector" are focused strategies of the Rectangular Strategy. The management of water resources and irrigation and the improvement of agricultural productivity are the important issues in this policy, and these issues well relevant to the aims of this project. As the National Strategic Development Plan (2006-2010) indicates numerical targets on the increase of irrigated area and the increase of unit yield of rice, the irrigated agriculture is considered one of the important issues by the Cambodian government.</p> <p>To achieve these policies, human resources development who engages in the irrigation projects is important, therefore, political sustainability of the Project will be secured in future also.</p>
	Organizational and financial aspects	<p>Can TSC perform its roles appropriately after the completion of the Project?</p> <p>1) Organizationally (mission or responsibility and staff assignment, etc.)</p> <p>2) Financially (prospect of securing budget for activities of TSC)</p>	<ul style="list-style-type: none"> <li>Opinions of persons concerned</li> </ul>	<p>(1) Organizational aspect</p> <p>TSC was officially established as one of Department of MCWRAM through the approval by the Cabinet of the Royal Government of Cambodia in December 2006. As for the organizational structure, TSC is headed by Director and Deputy Director and there are 3 offices, i.e. 1) Administration Office, 2) Water Management, Research and Information Management Office, and 3) Technical Irrigation and Construction Management Office. In total, 15 persons are assigned to TSC including TSC Director at present. Deputy Director is vacant now. 10 persons out of 15 persons are regarded as full-time counterparts for the Project.</p> <p>Capacity of these 10 full-time counterparts is strengthening further through preparing and conducting the training courses for the engineers and technicians of MCWRAM and PDWRAM, and conducting OJT activities at the model site and the pilot sites in 3 provinces. Although there is difference in ability by person, the full-time counterparts are conducting and managing the training courses cooperating and complementing each other, and they are strengthening organizational capacity or capacity as group in order to conduct their activities in sustainable way.</p>

<p>(2) Financial aspect</p> <p>Irrigation development has high priority in Cambodia. The fact that TSC was established officially as a department, which has a duty to strengthen irrigation engineers and technicians who can carry out irrigation project effectively and efficiently, shows that the Royal Government of Cambodia recognizes well human resources development in this technical fields as important.</p> <p>For this project (phase 2 project), the Government of Cambodia approved the allocation of budget from the counterpart fund of the Government for utilizing implementation of the training courses of the Project. It is highly appreciated this budgetary arrangement for assuring financial sustainability of TSC. By becoming TSC as a department of MOWRAM officially, TSC becomes able to request the ordinary budget. This year, TSC is going to request the budget for the year 2009. If the TSC budget for the year 2009 is approved, after that, it becomes easy to obtain annual budget for TSC. Although the Royal Government of Cambodia faces budgetary constraint, in this way, the MOWRAM and the Government of Cambodia are making efforts for assuring financial sustainability of TSC.</p> <p>At present, there are 19 technical working groups (TWG) in order to coordinate the donor's assistances to Cambodia. This project is included in one of the projects in TWG for water and agriculture. Through coordination at TWG based on the Strategy or Agriculture and Water (2006-2010), each project will be implemented. Because TSC is only organization that provides human resources development in water (irrigation) sector, it is expected that other donor agencies request TSC to implement human resource development using the donor's budget. In this way, there is possibility to strengthen the financial sustainability of TSC in future.</p>			
<p>By conducting capacity development of TSC staff and training courses for engineers and technicians of PDWVRAM, this project becomes well known not only by the high class managerial officials of MOWVRAM and also staff of PDWVRAM.</p>	<p>Opinions of persons concerned</p>	<p>Importance and recognition of the Project at MOWVRAM</p>	
<p>Through preparation and production of the curriculums and teaching materials for the training course, implementation of the training courses as trainer, and implementation of OJT to the training course participants and the counterparts of PDWVRAM in 3 target provinces, the counterparts of TSC have been strengthening further and acquiring necessary capacity as staff of organization for the human resources development. Also, a system or framework for conducting capacity development for engineers and technicians of MOWVRAM and PDWVRAM is under the establishment. By implementing the project activities, it is expected that the counterparts of TSC will improve and acquire capacity and experiences necessary for carrying out human resources development activities.</p>	<p>Opinions of persons concerned</p>	<p>Do full-time C/Ps of TSC have necessary technical capacity?</p>	<p>Technical aspect</p>

<p>Through interview with the engineers and technicians of PDWRAM (Takeo and Pursat provinces) who participated in the training courses, it is confirmed that their technical capacity have improved and they are utilizing the matters learned.</p>	<p>As mentioned already, the pilot sites in Kandal province and Pursat province are for reconstruction of Pot canals for rice cultivation in rainy season, and the pilot site in Takeo province is for irrigation in dry season. These pilot sites have typical futures as irrigation area of Cambodia, therefore, the techniques transferred to the counterparts of PDWRAM can be extended to the irrigation area in their provinces and it is also possible to extend to other provinces.</p>	<p>The target of the training courses is engineers and technicians of PDWRAM in all 24 provinces in Cambodia. Although there is different with the number of participants to the training courses from each province, engineers and/or technicians from 23 provinces have participated in the implemented training courses. Therefore, there is mechanism that the techniques transferred extend to all provinces in Cambodia.</p>	<p>Construction and/or rehabilitation of terminal canals in the 2 Pilot Sites (Takeo and Pursat provinces) have started recently with participation of farmers. It is still early to judge whether farmers can conduct water management of terminal canals appropriately.</p>
<p>Following aspects of engineers and technicians of MOWRAM and PDWRAM who participated in the training courses of the Project.</p> <p>1) Technical capacity 2) Utilization of knowledge and skills learned at the training courses of the Project. Or opportunity of utilization of knowledge and skills learned.</p>	<p>Can techniques transferred to the project sites be extended to other areas?</p>	<p>Can farmers who participated in the project activities (workshops) at the Pilot Sites of the Project continue water management of terminal canals appropriately?</p>	<p>In generally, equipment provided under the project is maintained well and it is expected that good maintenance will be continued even after the completion of the Project.</p>
<p>Is there mechanism that the techniques transferred under the Project extend to other areas?</p>	<p>What are major factors that facilitated or hampered the sustainability, or could facilitate or hamper in future?</p>	<p>Facilitating and hampering factors</p>	<p>No specific aspect is identified.</p>
<p>Opinions of persons concerned</p>	<p>Opinions of persons concerned</p>	<p>Information and opinions of persons concerned</p>	<p>Opinions of persons concerned</p>
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## 2. Implementation Process

		Evaluation Question		Information source	Results
Main Question	Sub Question				
Were there any modification of project plan, implementation structure for accomplishing initial target of the Project?	Were there any problems on progress of implementation? How those problems solved?	1) Documents prepared by the Project 2) Japanese experts & C/Ps	<p>(1) Technical transfer For further capacity development of the counterparts of TSC as instructor (including awareness raising as person implementing technical transfer), it was judged that more OJT activities is necessary for them. Therefore, OJT activities not only in the model site but also in the pilot sites are included in the project activities additionally. And then, the engineers and technician of PDWRAM in 3 provinces, where the pilot sites exist, were selected as counterpart for receiving OJT, and the counterparts of TSC have started technical transfer to the PDWRAM counterparts. As a result, through OJT activities, the counterparts of TSC are taking good initiative in this activities and the technical transfer to PDWRAM counterparts is progressing smoothly.</p> <p>The project implemented side considers that this kinds of technical transfer at the pilot sites is a very important technical assistance activity for TSC from now on, because this kinds of technical transfer is providing in accordance with the needs of each PDWRAM and complementing practical techniques which is not covered by the training courses and OJT at the model site.</p> <p>(2) Project activities at the pilot sites As mentioned already, although the authorities concerned are making efforts to have the budget for construction of the terminal canals for the Kandal Slung pilot site, due to this delay, OJT activities can be done in limited scale. It is necessary to have budget for the terminal canal construction in order to implement the planned OJT activities at the pilot site.</p> <p>(On the other hand, the activities at the pilot sites in Pursat and Takeo provinces are progressing mostly as planned.)</p>		
Appropriateness of methodology of technical transfer	Were there any problems on methodology of technical transfer? If available, what kinds of problems. How those problems solved?	Japanese experts & C/Ps	It seems that there is no big problem on methodology of technical transfer.		

Ownership of Cambodian side	1) Appropriateness of allocation of C/Ps 2) Allocation of budget	Documents prepared by the Project	<p>1) Appropriateness of allocation of C/Ps As mentioned already, 18 MOWRAM staff and 21 PDWRAM staff are assigned as counterparts and persons. There is a plan to increase number of PDWRAM counterparts from 21 to 30. It seems that the assignment of counterparts is appropriate in term of number of person and capacity.</p> <p>2) Allocation of budget As mentioned already, Cambodia side made efforts and allocated the counterpart fund for the implementation of the training courses and also made efforts for allocating budget for the construction of the terminal canals in the pilot sites. And it is planned to make request for TSC annual budget for the year 2009.</p>
Project management system	Have JCC meetings been held at appropriate timing with appropriate themes.	1) Documents prepared by the Project 2) Japanese Experts 3) C/Ps	<p>Therefore, it is considered that the ownership on the Project by the Cambodian side has been improved.</p> <p>2 years have past from commencement of the Project and the JCC was held 3 times. Date and main subjects of JCC were as follows.</p> <p>(1) First JCC: June 2006. PDWRAM staff in the 3 provinces was selected as counterparts receiving technical transfer through OJT. (2) Second JCC: October 2006. Approval of PDM, PO (Plan of Operation), and APO (Annual Plan of Operation) for 2007. (3) Third JCC: August 2007. Approval of APO for 2008.</p> <p>It seems that JCC meetings have been held appropriately in terms of timing and themes.</p>

	<p>Periodical or regular meetings among Cambodian counterparts and Japanese experts functioned well?</p>	<p>1) Documents prepared by the Project 2) Japanese Experts &amp; C/Ps</p>	<p>The following periodical meetings have been held for enabling smooth progress of the project activities in order to assure budget of Cambodian side including the budget for terminal canals construction at pilot sites and the budget for the training courses with the participation of persons of the concerned departments, etc. of MOWRAM.</p> <table border="1" data-bbox="395 147 903 1178"> <thead> <tr> <th>Title of the Meeting</th> <th>Frequency</th> <th>Number of meetings held</th> <th>Participants, etc.</th> </tr> </thead> <tbody> <tr> <td>Management meeting</td> <td>Every 6 months</td> <td>6</td> <td>Chairman is Project Director (H.E. Veng Sakthorn), Directors or representatives of Finance Department and Human Resources Department, etc. For decision on the important issues on project operation such as budget allocation.</td> </tr> <tr> <td>Project meeting</td> <td>Every month</td> <td>14</td> <td>Chairman is Project Manager (H.E. Bun Hearn). For monitoring of the progress of the project activities and confirmation about the detailed implementation plan of the training courses, curriculums for the training courses, technical manuals, and teaching materials etc.</td> </tr> <tr> <td>Counterpart meeting</td> <td>Every 1 or 2 weeks</td> <td>36</td> <td>For sharing information on techniques among the counterparts and utilizing that for the project activities. Discussion on preparation of draft curriculums for the training courses and draft technical manuals etc., and its results are informed to the project meeting.</td> </tr> </tbody> </table>	Title of the Meeting	Frequency	Number of meetings held	Participants, etc.	Management meeting	Every 6 months	6	Chairman is Project Director (H.E. Veng Sakthorn), Directors or representatives of Finance Department and Human Resources Department, etc. For decision on the important issues on project operation such as budget allocation.	Project meeting	Every month	14	Chairman is Project Manager (H.E. Bun Hearn). For monitoring of the progress of the project activities and confirmation about the detailed implementation plan of the training courses, curriculums for the training courses, technical manuals, and teaching materials etc.	Counterpart meeting	Every 1 or 2 weeks	36	For sharing information on techniques among the counterparts and utilizing that for the project activities. Discussion on preparation of draft curriculums for the training courses and draft technical manuals etc., and its results are informed to the project meeting.
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	<p>Appropriateness of monitoring system</p>	<p>Japanese experts &amp; C/Ps</p>	<p>Monitoring of the progress of the project activities is carried out through conduction above mentioned various periodical meeting.</p>																
	<p>Appropriateness of communication between Japanese experts and C/Ps</p>	<p>1) Japanese experts 2) C/Ps</p>	<p>Compared to the phase 1 project, workload of the full-time counterparts of TSC is increased significantly, but allowance is not increased, therefore, the working condition might not so favorable for the counterparts. In spite of this circumstance, the counterparts of TSC have engaged in the project activities positively. The project activities have been progressing under the good cooperation between the counterparts and the Japanese experts.</p>																
	<p>Relationship among the Project, JICA Cambodia office and JICA headquarters</p>	<p>Japanese Experts</p>	<p>There is good communication among the Project, JICA Cambodia office and JICA headquarters.</p>																

3. Table of achievement (Achievement of the Overall Goal, Project Purpose and Outputs at the time of evaluation)

Achievement	Items		Information/ data required (Indicators)	Information source	Results
	Main items	Sub items			
Achievement	Prospect of achievement of the Overall Goal	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>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 increased to 2.50 ton/ha in 2010 as indicated as a target of the National Strategic Development Plan 2006-2010.</p> <p>3. Livelihood of the farmer's households is improved at least 5%.</p>	<p>1. Data of MOWRAM</p> <p>2. Statistical Data of MAFF.</p> <p>3. During the Project, results of questionnaire to the training course participants, and after the termination of the Project, questionnaire or interview to directors of all PDWRAM.</p>	<p>Irrigation development is a priority issue in the policy of the Royal Government of Cambodia (RGC). Total irrigated area in Cambodia is increasing significantly in recent years (412,963 ha in 1999, and 596,300 ha in 2005), accordingly, RGC revised the target figure about the irrigated area in 2010 upward (from the 650,000 ha to 810,300 ha). Considering the past tendency about increase of the irrigated area and the policy of the Cambodian government, there is good possibility to achieve this target by the year 2010.</p> <p>Unit yields of rice in the years of 2005 and 2006 are 2.48 ton/ha and 2.49 ton/ha respectively. Weather condition of these 2 year were very favorable for rice cultivation and rice yields were increased significantly compared to rice yields in the previous year (around 2.0 ton/ha). Considering the facts that the improvement of agricultural productivity is a priority issue of the Cambodian government and irrigated area will be increased year by year, rice yield will be increased and it is very possible to achieve this target (2.50 ton/ha) in the year 2010.</p> <p>By implementing irrigation projects and improving water management in the irrigation area, it is possible to increase rice yield and income of farmer's households. According to the results of the questionnaire survey to the trainees participated in 12 training courses which were implemented till September 2007, the estimated increase of farmer's households is 6.7%. Therefore, it seems possible to achieve this indicator.</p>

Items		Information/ data required (Indicators)	Information source	Results
Main items	Sub items			
Achievement of the Project Purpose 1) The technical capacity of MOWRAM and PDWRAM is improved.		1-1. More than 60% engineers and technicians who participated in the training and OJT achieve the assigned target in the curricula.	1-1. Documents about the evaluation of respective training courses on the Project through questionnaire and test to trainee.	<p>The following 3 kinds of target were set up for evaluating degree of capacity development through the training course.</p> <p>(1) Improvement of technical level If trainee feels his/her technical level is improved one level comparing before and after the training course (self evaluation system by classifying five-grades), it is considered that the technical improvement is achieved.</p> <p>(2) Examination (test) If trainee scores more than 60 points out of 100 points, it is considered that trainee passed examination.</p> <p>(3) Possibility of utilization of the matters learned to irrigation project etc. If trainee expresses that the matters learned at the training course will be utilized for his/her works for irrigation project etc., it is considered that this target is achieved.</p> <p>When trainee achieves all 3 targets, it is considered that this trainee achieved the assigned target in the curricula.</p> <p>17 training courses have been conducted with 268 trainees. Effective data has been obtained from 264 trainees and 185 trainees have achieved all 3 targets. The degree of achievement is 70.1% at present. By keeping this performance, this indicator will be achieved as a satisfactory level at the time of the completion of the Project.</p>



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		1-2 More than 80% of trainee is satisfied with the training courses management system.	1-2. Documents about the evaluation of respective training courses on the Project through questionnaire.	<p>The following table shows the percentages of trainees who satisfied with the training course management.</p> <table border="1"> <thead> <tr> <th></th> <th>Title of the training course</th> <th>Satisfaction degree</th> </tr> </thead> <tbody> <tr><td>1</td><td>Discharge measurement</td><td>80%</td></tr> <tr><td>2</td><td>Meteorology and crop water requirement</td><td>74%</td></tr> <tr><td>3</td><td>Irrigation and water management plan</td><td>80%</td></tr> <tr><td>4</td><td>Basic survey 1</td><td>100%</td></tr> <tr><td>5</td><td>Supervision on construction site</td><td>95%</td></tr> <tr><td>6</td><td>Participation of farmers for sustainable irrigation system</td><td>84%</td></tr> <tr><td>7</td><td>Irrigation and water management plan by GIS</td><td>100%</td></tr> <tr><td>8</td><td>Basic survey 2</td><td>100%</td></tr> <tr><td>9</td><td>Design and Drawing of irrigation canal &amp; canal structure</td><td>83%</td></tr> <tr><td>10</td><td>Discharge measurement</td><td>100%</td></tr> <tr><td>11</td><td>Meteorology and crop water requirement</td><td>95%</td></tr> <tr><td>12</td><td>Irrigation design &amp; drawing by AutoCAD</td><td>100%</td></tr> <tr><td>13</td><td>Participation of farmers for sustainable irrigation system</td><td>92%</td></tr> <tr><td>14</td><td>Construction management</td><td>95%</td></tr> <tr><td>15</td><td>Total station and data processing in computation</td><td>100%</td></tr> <tr><td>16</td><td>Irrigation design &amp; drawing by AutoCAD</td><td>100%</td></tr> <tr><td>17</td><td>Operation and maintenance</td><td>88%</td></tr> </tbody> </table> <p>Although, there is a training course that the satisfaction degree is less than 80% (74% for the meteorology and crop water requirement course), most of other training courses shows very high satisfaction degree. The meteorology and crop water requirement course was implemented twice and the satisfaction degree of the second course is 95%. There is good improvement in the satisfaction degree. Taking this improvement into consideration, the degree of this indicator is in a satisfactory level.</p> <p>At the moment, 5 water user groups in the pilot site in Takeo province are organized and 4 water user groups are reactivated through the project activities. It is expected that these 9 groups will continue water management actively.</p> <p>As of October 2007, as a result of implementation of the workshops with participation of farmers in the pilot sites in Pursat and Takeo provinces, around 360 farmers have started water management including construction or rehabilitation of the terminal canals.</p>		Title of the training course	Satisfaction degree	1	Discharge measurement	80%	2	Meteorology and crop water requirement	74%	3	Irrigation and water management plan	80%	4	Basic survey 1	100%	5	Supervision on construction site	95%	6	Participation of farmers for sustainable irrigation system	84%	7	Irrigation and water management plan by GIS	100%	8	Basic survey 2	100%	9	Design and Drawing of irrigation canal & canal structure	83%	10	Discharge measurement	100%	11	Meteorology and crop water requirement	95%	12	Irrigation design & drawing by AutoCAD	100%	13	Participation of farmers for sustainable irrigation system	92%	14	Construction management	95%	15	Total station and data processing in computation	100%	16	Irrigation design & drawing by AutoCAD	100%	17	Operation and maintenance	88%
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2) The farmers who have participated in the Project activities at the Pilot Sites (PS) are able to practice water management in terminal canals.		2-1. More than 9 water user groups, which can conduct efficient water management, are established. 2-2. More than 360 farmers start the water management work learned at the Project.	2-1. Record of the project activities  2-2. Social research conducted by the Project at the Pilot Sites.																																																							

Items		Information/ data required (Indicators)	Information source	Results
Main items	Sub items			
Are Outputs producing as planned?	1. The following outputs are expected to be achieved at TSC. 1-1 Establish the training system	1-1-1 The TSC staff complete to make planned curricula of the 33 training courses.	1-1-1 The numbers of planned and implemented curricula for the training courses.	By utilizing the results of the training needs survey, the target of the training and the kinds of training course were decided. And then, the curriculums for 17 training course have been produced as of end of the December 2007. At least 16 more curriculums will be produced by the end of the Project
		1-1-2 The TSC staff complete to produce 14 materials for the training courses.	1-1-2 The numbers of planned and produced materials for the training courses.	
	1-2 Set up the technical manuals	1-2-1 The TSC staff complete to make a list of planned technical manuals.	1-2-1 The list of planned technical manuals.	A list of the planned technical manuals is made.
		1-2-2 The TSC staff complete to produce the 8 technical manuals.	1-2-2 The numbers of planned and produced technical manuals.	The following 9 kinds of technical manuals will be produced. 1) Topographic and Route Survey Manual, 2) Meteorology & Hydrology Survey Manual, 3) Irrigation Planning Manual, 4) Design Manual for Small Scale Irrigation System, 5) Construction Supervision and Management Manual for Small Scale Irrigation System, 6) Quality Control Manual 7) Operation and Maintenance Manual 8) Water Management Manual 9) GIS Technical Manual
	1-3 Manage the technical information	1-3-1 A library of technical information in TSC is established.	1-3-1 Established technical library	Preliminary draft of the manuals on "Meteorology & Hydrology Survey", "Design for Small Scale Irrigation System", and "Water Management" have been produced. By the end of the Project, 9 kinds of above mentioned manuals will be produced in Khmer language.
		1-3-2 A list of materials in the library is completed.	1-3-2 Completed list of materials in the library	A room in the building of the TSC is going to utilize for the space for the library of technical information and the renovation of the room was completed in November 2007. After the Installation of bookshelves etc. in the room, will be done and then the operation of the library will be started. The technical manuals collected and other technical information will be stored in the library. After the commencement of operation of the library, a list of materials will be made. The list of materials will be published in the web site of the Project.

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	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.	2-1 4,490 m length of the terminal canals in the Model Sites 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 the TSC.	2-1 Documents about plan and implementation on the construction of the terminal canals on the Project. 2-2 Documents about implementation of the training courses.	<p>2,000 m length of the terminal canals in the Model Site is constructed by conducting OJT in the field of survey, planning, design, and construction management. At present, the procedures for construction of another 2,000 m of the terminal canals are progressing. 4,490 m length of the terminal canals will be completed by the end of the Project.</p> <p>268 engineers and technicians of MOWRAM and PDWRAM completed the training courses as of January 2008. Details are as follows. At least 16 more training courses will be conducted by the end of the Project and at least 520 trainees in total will be complete the training courses.</p> <table border="1"> <thead> <tr> <th>No</th> <th>Title of the training course</th> <th>Period</th> <th>Participants</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Discharge Measurement</td> <td>29 Jan. – 2 Feb. 2007</td> <td>20</td> </tr> <tr> <td>2</td> <td>Meteorology Survey &amp; Crop Water Requirement</td> <td>5 Feb. – 9 Feb., 2007</td> <td>20</td> </tr> <tr> <td>3</td> <td>Irrigation and Water Management Plan by GIS</td> <td>13 Feb. – 27 Feb., 2007</td> <td>10</td> </tr> <tr> <td>4</td> <td>Basic Survey I</td> <td>5 Mar. – 16 Mar., 2007</td> <td>19</td> </tr> <tr> <td>5</td> <td>Supervision on Construction Site</td> <td>19 Mar. – 23 Mar., 2007</td> <td>19</td> </tr> <tr> <td>6</td> <td>Participation of Farmers for Sustainable Irrigation System Management</td> <td>23 Apr. – 27 Apr., 2007</td> <td>19</td> </tr> <tr> <td>7</td> <td>Irrigation and Water Management Plan by GIS</td> <td>16 Jul. – 27 Jul., 2007</td> <td>10</td> </tr> <tr> <td>8</td> <td>Basic Survey II</td> <td>30 Jul. – 10 Aug., 2007</td> <td>20</td> </tr> <tr> <td>9</td> <td>Hydraulic Design for Irrigation Canal and Structure</td> <td>20 Aug. – 24 Aug., 2007</td> <td>20</td> </tr> <tr> <td>10</td> <td>Discharge Measurement</td> <td>3 Sep. – 14 Sep., 2007</td> <td>20</td> </tr> <tr> <td>11</td> <td>Meteorology Survey &amp; Crop Water Requirement</td> <td>10 Sep. – 14 Sep., 2007</td> <td>19</td> </tr> <tr> <td>12</td> <td>Design, Drawing and Cost Estimation of Irrigation Canal and Canal Structure by GIS</td> <td>17 Sep. – 21 Sep., 2007</td> <td>10</td> </tr> <tr> <td>13</td> <td>Participation of Farmers for Sustainable Irrigation System Management</td> <td>22 Oct. – 26 Oct., 2007</td> <td>14</td> </tr> <tr> <td>14</td> <td>Construction Management</td> <td>1 Nov. – 8 Nov., 2007</td> <td>20</td> </tr> <tr> <td>15</td> <td>Total Station and Data Processing</td> <td>13 Nov. – 16 Nov., 2007</td> <td>10</td> </tr> <tr> <td>16</td> <td>Design, Drawing and Cost Estimation of Irrigation Canal and Canal Structure by GIS</td> <td>3 Dec. – 7 Dec., 2007</td> <td>10</td> </tr> <tr> <td>17</td> <td>Operation and Maintenance of Irrigation Facilities</td> <td>14 Jan. – 18 Jan., 2008</td> <td>8</td> </tr> <tr> <td colspan="3">TOTAL</td> <td>268</td> </tr> </tbody> </table>	No	Title of the training course	Period	Participants	1	Discharge Measurement	29 Jan. – 2 Feb. 2007	20	2	Meteorology Survey & Crop Water Requirement	5 Feb. – 9 Feb., 2007	20	3	Irrigation and Water Management Plan by GIS	13 Feb. – 27 Feb., 2007	10	4	Basic Survey I	5 Mar. – 16 Mar., 2007	19	5	Supervision on Construction Site	19 Mar. – 23 Mar., 2007	19	6	Participation of Farmers for Sustainable Irrigation System Management	23 Apr. – 27 Apr., 2007	19	7	Irrigation and Water Management Plan by GIS	16 Jul. – 27 Jul., 2007	10	8	Basic Survey II	30 Jul. – 10 Aug., 2007	20	9	Hydraulic Design for Irrigation Canal and Structure	20 Aug. – 24 Aug., 2007	20	10	Discharge Measurement	3 Sep. – 14 Sep., 2007	20	11	Meteorology Survey & Crop Water Requirement	10 Sep. – 14 Sep., 2007	19	12	Design, Drawing and Cost Estimation of Irrigation Canal and Canal Structure by GIS	17 Sep. – 21 Sep., 2007	10	13	Participation of Farmers for Sustainable Irrigation System Management	22 Oct. – 26 Oct., 2007	14	14	Construction Management	1 Nov. – 8 Nov., 2007	20	15	Total Station and Data Processing	13 Nov. – 16 Nov., 2007	10	16	Design, Drawing and Cost Estimation of Irrigation Canal and Canal Structure by GIS	3 Dec. – 7 Dec., 2007	10	17	Operation and Maintenance of Irrigation Facilities	14 Jan. – 18 Jan., 2008	8	TOTAL			268
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		2-3 More than 510 trainees in MOWRAM, PDWGRAM and Farmers leaders complete OJT at the Model Sites and Pilot Sites.	2-3 Documents about implementation of OJT.	199 trainees in MOWRAM and PDWGRAM participated in OJT at the Model Site. In addition, 99 farmers' leaders also participated in OJT at the Model Site and the Pilot Sites. By continuing the OJT activities, this indicator will be achieved by the end of the Project.
		2-4 More than 21 staff in PDWGRAM complete OJT at the Model and Pilot Sites.	2-4 Document about implementation of OJT.	21 engineers and technicians of PDWGRAM in Kandal, Pursat and Takeo provinces have participated OJT at the model and pilot sites in the fields of topographic survey including route survey, setup and observation of meteorology station, crop water requirement, preparation of the basic design documents, contract management, preparation of GIS (Geographic Information System), etc.
3.	With the technical assistance of TSC, the following outputs are expected to be achieved at PS.  3-1 The trained engineers and technicians in PDWGRAM construct the terminal canals, which make it possible for farmers to easily access irrigation water.	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 PDWGRAM is extended.	3-1 Documents about construction and use of the terminal canals on the Project	As of 18 January 2008, around 0.8 km of terminals in the pilot site in Pursat province and around 1.5 km of terminal canals in the pilot site in Takeo province were newly constructed or rehabilitated (total 2.3km). By the end of the Project, more than 5 km of the terminal canals in total will be constructed or rehabilitated.
		3-2 3 basic design documents, which are necessary to request budget for terminal canal construction, are produced.	Data of the project activities	A basic design document for the Kandal Stung pilot site was produced already. A basic design document for the pilot site in Pursat province was produced and is under the revision at MOWRAM. A basic design document for the pilot site in Takeo province will be revised after the decision of the target area. At the pilot site in Kandal province, a water management rule for the pilot site will be prepared by conducting meetings with participation of the commune chiefs and the persons concerned.

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	3-2 Farmers start to conduct water management activities at the terminal canals in cooperation with PDWRAM.	3-2-1 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.	3-2 Data of the project activities	Activities concerned with the water management, such as moving the grass, dredging in canals and discussion were started with cooperation by PDWRAM at the pilot sites in Purast and Takeo provinces. A water management rule for the pilot site will be prepared by conducting meetings with participation of the commune chiefs and the persons concerned.