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MINUTES OF MEETING
 BETWEEN
 THE JAPANESE TERMINAL EVALUATION TEAM
 AND
 THE AUTHORITIES CONCERNED
 OF
 THE ROYAL GOVERNMENT OF CAMBODIA
 ON
 JAPANESE TECHNICAL COOPERATION
 FOR
 THE PROJECT
 ON
 CAPACITY BUILDING FOR WATER SUPPLY SYSTEM IN CAMBODIA

The Japanese Terminal Evaluation Team (hereinafter referred to as "the Japanese Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Juro Chikaraishi, visited the Kingdom of Cambodia from May 17 to June 1, 2006.

During its stay in the Kingdom of Cambodia, the Japanese Team had a series of discussions with the Cambodian authorities concerned and evaluated the present achievements of the Project on Capacity Building for Water Supply System in Cambodia (hereinafter referred to as "the Project") and exchanged views on the Project activities to fulfill the Record of Discussions signed on October 10, 2003.

As a result of the discussions, the Japanese Team and the Cambodian authorities concerned agreed to report to their respective Governments the matters referred to in the document attached hereto.

Phnom Penh, June 1, 2006

 	 	 
Mr. Juro Chikaraishi Leader, The Japanese Team Resident Representative, JICA Cambodia Office	H.E. EK Sonn Chan General Director, Phnom Penh Water Supply Authority	H.E. Phork Sovanrith Leader, The Cambodian Team Secretary of State, Ministry of Industry, Mines and Energy

ATTACHED DOCUMENT

**JOINT TERMINAL EVALUATION REPORT
ON
THE PROJECT
ON
CAPACITY BUILDING
FOR
WATER SUPPLY SYSTEM IN CAMBODIA**

June 1, 2006

ABBREVIATION

ADB	Asian Development Bank
AfD	Agence Francaise de Developpement
CDC	Council for Development of Cambodia
C/P	Counterpart
JCC	Joint Coordinating Committee
JICA	Japan International Cooperation Agency
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MEF	Ministry of Economy and Finance
MIME	Ministry of Industry, Mines and Energy
MIME/DPWS	Ministry of Industry, Mines and Energy/Department of Portable Water Supply
NRW	Non Revenue Water
NWTTI	National Waterworks Technology Training Institute (Thailand)
O&M	Operation and Maintenance
OJT	On the Job Training
PCM	Project Cycle Management
PDM	Project Design Matrix
PO	Plan of Operation
PPWSA	Phnom Penh Water Supply Authority
SOP	Standard Operation Procedures
SRWSS	Siem Reap Water Supply System
WB	World Bank
WTP	Water Treatment Plant

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1. INTRODUCTION

1-1 Preface

The Project was initiated in October 2003 and will be completed in October 2006. The Japanese Team was dispatched by JICA visited the Kingdom of Cambodia from May 17 to June 1, 2006 for the purpose of evaluating the achievements of the Project. The evaluation has been undertaken jointly by the Cambodian authorities concerned and the Japanese Team.

1-2 Objectives of Evaluation

Objectives of the evaluation are as follows:

- 1) To grasp the inputs of Cambodian and Japanese sides to the Project and summarize the Achievement of the Plan of Operation (hereinafter referred to as "PO") of the Project which is shown in Annex 2.
- 2) To execute a comprehensive evaluation on the achievements of the Project from the viewpoint of five components of evaluation (explained later in this document).
- 3) To make a recommendation to the future perspective of the Project and draw lessons from the Project for the same field of technical cooperation.

1-3 Schedule of the Japanese Team

No.	Date	Day	Time	Schedule
1	17-May-06	wed	11:00 19:25	Mr. FUJIKAWA Departing Narita → Arriving Bangkok Departing Bangkok → Arriving Phnom Penh
2	18-May-06	thu	AM 13:30 PM	Meeting with JICA Project members Interview with C/P members Collecting information & materials
3	19-May-06	fri	8:30 PM	Interview with C/P members Collecting information & materials
4	20-May-06	sat	16:55	Meeting with JICA Project members, Arranging collected information & materials Mr. HIRANO Departing Narita → Arriving Bangkok
5	21-May-06	sun	09:30	Arranging collected information & materials Mr. HIRANO Departing Bangkok → Arriving Phnom Penh
6	22-May-06	mon	8:30 10:00 11:00 14:00	Meeting at JICA Cambodia Office Courtesy Call to MIME/DPWS Courtesy Call to PPWSA First meeting of Evaluation Team at MIME (ground floor meeting room) Collecting information at MIME/DPWS & PPWSA
7	23-May-06	tue	10:30 13:00 10:00 19:25	Interview with C/P Interview with C/P Start drafting Minutes of Meeting (MM) Mr. HIOKI Departing Narita → Arriving Bangkok Departing Bangkok → Arriving Phnom Penh

8	24-May-06	wed	8:15 9:20 10:30 11:00 PM	Meeting with ADB WB AfD Meeting at JICA Cambodia Office Collecting additional information at MIME/DPWS & PPWSA
9	25-May-06	thu	9:00 14:00 15:00 17:50	Joint meeting with the directors of the 8 provincial water supply (Siem Reap, Sihanoukville, Kampong Cham, Kampong Thum, Battambang, Pursat, Kampot, Svay Rieng) Report on draft result of the five evaluation criteria to MIME (introducing Mr. HIOKI) Report on draft result of the five evaluation criteria to PPWSA (introducing Mr. HIOKI) Departing Phnom Penh → Arriving Siem Reap
10	26-May-06	fri	9:00 19:05	Collecting information at Siem Reap Water Supply System (SRWSS) (including sight survey) Departing Siem Reap → Arriving PP by flight (Ms. Yamamoto, Mr. Fujikawa)
11	27-May-06	sat	5:00	Departing Siem Reap to PP by Car via Battambang & Pursat (visiting water supply system)
12	28-May-06	sun		Drafting the MM, Arranging collected information & materials
13	29-May-06	mon	10:00	Holding the Evaluation Workshop with the Evaluation Team, MIME/DPWS & PPWSA counterpart members Collecting additional information
14	30-May-06	tue		Collecting additional information Drafting MM
15	31-May-06	wed	9:00 16:00	Meeting with MIME/DPWS & PPWSA on draft MM Pre-report to Japanese Embassy & JICA Cambodia Office Revising MM -Final confirmation of MM
16	1-Jun-06	thu	9:00 9:30 12:00	Signing the MM Joint Coordination Committee Lunch reception

1-4 Evaluators

1-4-1 The Cambodian side

H.E. Phork Sovanrith	Secretary of State, Ministry of Industry, Mines and Energy (MIME) / Leader
Mr. Por Yutha	Chief of Bilateral Cooperation Division, Department of Investment & Cooperation, Ministry of Economy and Finance (MEF)
Mr. Dim Kimhon	Staff, Asia Pacific Department, CRDB/Council for the Development of Cambodia (CDC)"
Mr. Huy Vatharo	Assistant for JICA expert, Council for the Development of Cambodia (CDC)"
Mr. An Bunhak	Deputy Director of Department of Potable Water Supply, Ministry of Industry, Mines and Energy (MIME)"
Mr. Samreth Sovithia,	Director, Planning and Technical Department, Phnom Penh Water Supply Authority (PPWSA)"

1-4-2 The Japanese side

Mr. Juro Chikaraishi	Leader
Mr. Junichi Hioki	Water Administration
Mr. Junichi Hirano	Evaluation Cooperation
Mr. Tomohiro Ono	Evaluation Planning (1)
Mr. Chanvibol Meng	Evaluation Planning (2)
Mr. Manabu Fujikawa	Evaluation Analysis / Training

1-5 Methodology of Evaluation

The evaluation study was conducted in accordance with the JICA Project Cycle Management method in the following steps:

- 1) The Project Design Matrix which is shown in Annex 1 (hereinafter referred to as "PDM") prepared in October 2003.
- 2) Achievement of the Project was studied by collecting data and other relevant information.
- 3) Analysis was made for five evaluation criteria described below.

(1) Relevance

Relevance of the Project is reviewed by the validity of the Project Purpose and the Overall Goal in connection with the development policy of the Government of Cambodia and Japanese aid policy.

(2) Effectiveness

Effectiveness is assessed by examining the extent to which the Project has achieved its purpose, and clarifying the relationship between that purpose and outputs.

(3) Efficiency

Efficiency of the Project implementation is analyzed with emphasis on the relationship between outputs and inputs in terms of timing, quality and quantity.

(4) Impact

Impact of the Project is assessed by either positive or negative influence caused by the Project.

(5) Sustainability

Sustainability of the Project is assessed in terms of organizational, financial and technical aspects by examining that to what extent the achievements of the Project be sustained or maintained after the Project's completion.

- 4) Finally, the evaluators reached an agreement on the conclusion of the evaluation and made recommendations.

For the evaluation, the materials used are the followings: the Record of Discussions of October 2003, PO in Annex 2, a series of minutes of discussions, the reports made by the Project and the results of meetings, interviews, questionnaire survey and observations made by the Japanese Team during its stay in kingdom of Cambodia.

2. BACKGROUND AND SUMMARY OF THE PROJECT

2-1 Background of the Project

The water supply system in Phnom Penh was demolished because of the civil war in kingdom of Cambodia until 1990s and the facilities had not been maintained. Consequently, the circumstances of water supply in the city have extremely worsened.

After the end of the civil war, Japanese government and other donors conducted the cooperation about rehabilitation on water supply system in PPWSA. The capacity on water supply system was expanded from 65,000 m³/ day in 1993 to 235,000m³/day in 2003. There was an urgent need of human resources development to cope with the rapidly expansion of the water supply facility in PPWSA.

On the other hand, MIME/DPWS which has responsibility to improve capacity of provincial waterworks, did not have enough experience to conduct the capacity building.

The existing condition of water supply was very limited in provincial waterworks. Regarding the major provincial waterworks, ADB, WB and JAPAN was starting to reconstruct the water supply facilities. The human resources development of these provincial waterworks became a matter of great urgency according to the improvement of facilities.

Therefore, the government of Cambodia requested government of Japan to implement the technical cooperation project on capacity building for water supply system in Kingdom of Cambodia. Responding to the request, government of Japan decided to implement technical cooperation through JICA aiming to improve (1) the capacity to operate and maintain water supply facilities in PPWSA and (2) the staff training system for the water supply system in the Kingdom of Cambodia.

Finally, both sides agreed to implement the Project and signed the Record of Discussion (R/D) between JICA and the Kingdom of Cambodia on October 10, 2003.

2-2 Summary of the Project

The master plan was prepared in the Minutes of Meetings (M/M) signed on October 10, 2003. The summary of the Project is shown below.

(1) Objective of the Project

1. Ultimate Development Goals
 - Access to safe water will increase in urban area.
2. Overall goal
 - Capacity to operate and maintain water supply facilities will be improved in urban area.
3. Project Purpose
 - 1) Capacity to operate and maintain water supply facilities will be improved in PPWSA.
 - 2) Staff training system for the water supply system will be improved in the Kingdom of Cambodia.

(2) Output of the Project

1. Capacity to control the distribution of treated water will be improved in PPWSA.
2. Appropriate operation and maintenance techniques in Phun Prek water treatment plant will be mastered.
3. Water quality monitoring system will be improved in PPWSA.
4. Training programme based on human resources development plan will start in PPWSA.
5. Training programme based on the needs of provincial waterworks will be conducted.

(3) Activities of the Project (Refer to the PDM: Annex1 for details)

2-3 Plan of Operation

The PO is shown in Annex 2 and it has been revised according to the progress of the Project every year, and is being implemented thereby.

3. ACHIEVEMENT OF THE PLAN

The details of the achievements are shown in Annex 3.

3-1 Input

Input from the Cambodian side is shown below.

(1) Counterpart personnel assigned for the Project

A total of fifty (50) personnel (MIME: 11 and PPWSA: 39) were assigned in the fields of project management/coordination, maintenance of electrical facility, water treatment process, water quality management, study of algae, distribution maintenance, human resources development, training management and provincial workshop/training.

(2) Provision of a project office

The offices for the Project are well equipped at the PPWSA compounds.

(3) Payment of transportation, accommodation and other costs of participants in training at PPWSA from provincial waterworks

Total amount of US\$ 7,416 was burdened by the Cambodian side.

(4) Payment for the training at NWTTI (Thailand)

Total amount of US\$ 2,098 was burdened by the Cambodian side.

(5) Payment of Training Centre in operation and management cost

Operation and management cost in Training Centre was paid by the Cambodian side. The cost amounted to US\$ 2,906.

Input from the Japanese side is shown below.

(1) Long-term experts

A total of three (3) long-term experts were dispatched in the fields of maintenance of electrical facilities, coordination/training management and management of water distribution system and analysis of data.

(2) Short-term experts

A total of thirty two (32) short-term experts have been dispatched.

(3) Counterpart training

Twenty nine (29) counterparts and twelve (12) counterparts were accepted for training in Japan and NWTTI (Thailand), respectively.

(4) Provision of Equipment

The equipment procured in Japan amounts to JPY 19,326,005. The equipment procured in Cambodia amounts to US\$ 82,283.

3-2 Activities

Activities consist of twenty three (23) fields as indicated in the PDM. The progress of the activities can be found in Annex 3.

3-3 Outputs

Output 1:

Capacity to control the distribution of treated water will be improved in PPWSA.

Verifiable indicators	Achievement
1-1 4 staff related to telemeter system will be able to collect and analysis the date from telemeter system.	1-1 4 counterparts are able to collect and analyze the flow data from telemeter system. They can compile the collected data in "Daily Report of Distributed Water" almost every day (95.8% in 2006) and "Monthly Report of Distributed Water" every month.
1-2 4 staff related to telemeter system will be able to formulate water distribution plan.	1-2 The collected data from the system was used to make the Master Plan of Greater Phnom Penh Water Supply (Phase 2) and expansion plans in the coverage area.
1-3 4 staff related to telemeter system will be able to formulate countermeasures against non-revenue water(NRW).	1-3 4 counterparts have already made the standard operation procedures (SOP) against non-revenue water and carried out the countermeasures to reduce the NRW.
1-4 Manuals for telemeter operation will be produced.	1-4 Manuals for telemeter operation were produced.
1-5 40 persons in PPWSA (include the member of board) and external institution will understand the role of water distribution control.	1-5 The seminar inviting more than 40 participants for understanding of the role of water distribution control, telemeter system in particular, is scheduled to be held in the final stage of the Project.

Output 2:

Appropriate operation and maintenance techniques in Phum Prek water treatment plant will be mastered.

Verifiable indicators	Achievement
2-1 Staff in charge of treatment process in Phum Prek WTP will be able to operate the plant in accordance with manuals.	2-1 Manuals were almost prepared and scheduled for completion in September 2006. Based on the manuals completed, it is expected that staff in charge of treatment process in Phum Prek WTP operate the plant with manuals on a routine basis.
2-2 Manuals for operation of WTPs will be produced.	2-2 Manuals for operation of WTPs were almost prepared and scheduled for completion in September 2006.
	2-3 7 Staff in charge of electricity has been trained. It is expected that they maintain the

<p>2-3 7 staff in charge of electricity in 3 WTPs will be able to maintain the facilities from power receiving to instrumentation equipment.</p> <p>2-4 Manuals for maintenance of electrical facilities will be produced.</p> <p>2-5 8 staff in charge of machinery in 3 WTPs will be able to maintain the facilities.</p> <p>2-6 Manuals for maintenance of mechanical facilities will be produced.</p>	<p>facilities from power receiving to instrumentation equipment on a routine basis using manuals.</p> <p>2-4 Manuals for maintenance of electrical facilities were almost produced and scheduled for completion in September 2006.</p> <p>2-5 Through OJT, it is expected that staff in charge of operation of Phum Prek WTP maintain mechanical facilities on a routine basis using manuals.</p> <p>2-6 Manuals for maintenance of mechanical facilities were almost produced and scheduled for completion in September 2006.</p>
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Output 3:

Water quality monitoring system will be improved in PPWSA.

Verifiable indicators	Achievement
<p>3-1 Monitoring plan for entire water supply facilities (point and term of monitoring, item of water quality analysis) will be made in 3 WTPs, and 5 staff in charge of water quality will be able to analyze water quality in accordance with the plan.</p>	<p>3-1 Water quality monitoring manuals from raw water to tap were completed. Based on the manuals, 5 staff analyzed water quality in 33 to 37 parameters including accurate analysis for 3 parameters such as color, free available chlorine and total coliform. It is expected that they analyze water quality in 12 of the main parameters in an accurate manner.</p>
<p>3-2 Result of water quality monitoring will be reflected in water treatment process.</p>	<p>3-2 Based on the result of water quality monitoring, which is the criteria on the dosing amount of chemicals, water treatment process is adjusted and controlled.</p>
<p>3-3 Result of water quality monitoring will be reflected in the maintenance and management of entire water supply facilities.</p>	<p>3-3 In addition to the achievement above, residual chlorine and other factors such as turbidity, temperature and conductivity at 20 points in the distributed area, are checked once a week. Based on the results, dosing of chlorine is adjusted.</p>

Output 4:

Training programme based on human resources development plan will start in PPWSA.

Verifiable indicators	Achievement
<p>4-1 Study report on human resources development will be formulated.</p>	<p>4-1 The long-term human resources development programme (draft) was already submitted in 2004. In response to the contents in the draft programme with additional support by the Japanese experts,</p>

<p>4-2 2 staff in personnel division and 2 staff in training division will start the training based on human resources development plan.</p>	<p>several training courses were newly developed by PPWSA. 4-2 2 Staff in administration and human resources department have clarified the training needs of the staff based on the training needs survey. The number of staff in the training center was increased from 1 to 4. The staff can make the training plans, implement the training courses and evaluate the training courses.</p>
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Output 5:

Training programme based on the needs of provincial waterworks will be conducted.

Verifiable indicators	Achievement
<p>5-1 Study report on human resources development in provincial waterworks and programmes of human resources development programmes for 2 to 3 provincial waterworks will be formulated. 5-2 Staff of provincial waterworks will get training on introduction to waterworks and fundamental operation and maintenance techniques. 5-3 5 staff of MIME will conduct workshops on laws and policies related to waterworks in provinces.</p>	<p>5-1 Needs survey report on capacity building for provincial waterworks in Cambodia was formulated in 2004. Training plans for 2 to 3 provincial waterworks were proposed in the report. 5-2 In 2005, 97 staff of 8 provincial waterworks participated in the training on introduction to waterworks and fundamental operation and maintenance techniques at PPWSA. 5-3 The task force (9 members) on workshops for provincial waterworks was established at MIME. The staff of the task force made a need survey, formulated the workshop programmes, coordinated among stakeholders, and implemented the workshop at five places.</p>

3-4 Project Purpose

Project Purpose 1:

Capacity to operate and maintain water supply facilities will be improved in PPWSA.

Verifiable indicators	Achievement
<p>1-1 Leakage ratio will decrease from the ratio before installation in the area where telemeter system is installed.</p>	<p>1-1 NRW (non revenue water) ratio, which is equivalent to leakage ratio, was decreased from 16% in 2003 to 11% in 2005 based on the telemeter system.</p>
<p>1-2 Water will be distributed in accordance with the demands in each area.</p>	<p>1-2 Water is controlled in water flow and water pressure and distributed for 24 hours mostly in accordance with the demands in each block.</p>
<p>1-3 Phum Prek Water Treatment</p>	<p>1-3 Manuals were almost prepared and scheduled</p>

<p>Plant (WTP) will be operated appropriately using manuals.</p>	<p>for completion in September 2006. Based on the manuals completed, it is expected that Phum Prek WTP is operated and maintained on a routine basis.</p>
<p>1-4 Treated water quality will satisfy the Cambodian National Drinking Water Quality Standards on a continuing basis in 3 WTPs.</p>	<p>1-4 At the laboratories, quality of treated water in 3 WTPs is checked in 33 to 37 parameters including accurate analysis for 3 parameters such as color, free available chlorine and total coliform. The result of analysis continuously satisfies the Cambodian National Drinking Water Quality Standards.</p>
<p>1-5 Electrical and mechanical facilities will be operated and maintained appropriately in 3 WTPs.</p>	<p>1-5 Manuals were almost prepared and scheduled for completion in September 2006. Based on the manuals completed, it is expected that electrical and mechanical facilities is operated and maintained at Phum Prek WTP on a routine basis.</p>
<p>1-6 Water quality of entire water supply facilities will be controlled appropriately in accordance with the result of water quality analysis.</p>	<p>1-6 Water quality of entire water supply facilities is controlled in accordance with the results of water quality analysis.</p>

Project Purpose 2

Staff training system for the water supply system will be improved in the Kingdom of Cambodia.

Verifiable indicators	Achievement
<p>2-1 Capacity building will be undertaken in accordance with the human resources development plan in PPWSA.</p>	<p>2-1 Capacity building was undertaken. The long-term human resources development programme (draft) was already submitted in 2004. In response to the contents in the draft programme with additional support by the Japanese experts, several training courses were newly developed by PPWSA.</p>
<p>2-2 Staff of provincial waterworks will get training.</p>	<p>2-2 Staff of 8 provincial waterworks were trained based on the needs survey in 2005. In 2006, training at PPWSA is scheduled for the staff of 13 provincial waterworks.</p>

3-5 Implementation Process

(1) Process of activities in terms of the Plan of Operation

The PO has been revised based on the discussions at the Joint Coordination Committee (hereinafter referred to as "JCC"). As for Output 1, the schedule for the seminar was postponed to the final stage of the Project. All the activities of the Project for 3 years will be presented at that time.

(2) Progress of "Proposed long - term human resources development programme"

Long-term human resources development programme (draft) was submitted to counterparts of the Project in 2004. After that, the study for the Master Plan of Greater Phnom Penh Water Supply (Phase 2) including human resources development plan by 2020 has started. Therefore, both the Cambodian and Japanese sides agreed to postpone the finalization of the long-term human resources development programme considering the Master Plan completed in March 2006. Now it is expected the programme is finalized referring the result of Master Plan, the experiences of the practical training implementation and the Business Plan of PPWSA by the end of the Project.

(3) Appropriateness in approach/method of technology transfer

Technology transfer through OJT is highly evaluated by the counterparts.

(4) Project Management

Important external conditions shown in the PDM were not changed.

The Project was monitored by JCC. The counterpart meeting among counterparts and the Japanese experts were held once a month. When the Japanese experts start their assignment, both sides discussed their work plans. Through discussion, both sides clarified the number and field of counterparts.

Also, the meeting between the Japanese experts and the staff of JICA Cambodia Office were held regularly.

(5) Ownership of MIME and PPWSA in terms of the Project

The management staff of MIME and PPWSA were positively involved in the Project. The number of counterparts assigned for the Project was much larger than the one shown in the PDM.

(6) Coordination among donor agencies in the fields of water supply

As for human resources development/training, the Project provided training courses for the staffs of 8 provincial waterworks where the facilities have been innovated or rehabilitated by ADB, WB and JICA.

4. RESULTS OF EVALUATION

The following is the summary of the results of the evaluation based upon the evaluation method described in 1-5. Through the surveys and interviews to those concerned, the both sides jointly assessed the project's relevance, effectiveness, efficiency, impact and sustainability. And the both sides evaluated the Project as written below.

Refer to the Result of the Evaluation (Annex 4).

4-1 Relevance

(1) Relevance to National Policies in Cambodia

The Ultimate Development Goals, Overall Goals and the Project Purpose are relevant to the national development policy and the water supply strategy of Cambodia as follows;

- (a) Wider provision of affordable potable water supply and sanitation is a priority issue according to "the Socio-economic Development Plan (2001-05)",
- (b) National Poverty Reduction Strategy (2003-05) focused on the supply of safe drinking water to the poor population in rural and urban areas,
- (c) National Strategic Development Plan (2006-10) stipulated the emphasis on ensuring of water in sufficient quantities and appropriate quality and needs of capacity building and human resources development as a whole.

(2) Relevance to Target Group Selection

It was appropriate for the Project implementation to select MIME and PPWSA as the counterpart, since they are responsible for development of water supply system. For realization of comfortable urban environment in terms of water supply, they need to foster their staff in capacity building. The Project is to address their need.

(3) Relevance to Japan's Assistance policy

One of the priorities of Japan's Assistance policy for Cambodia 2002 is set on water and sanitation improvement and provision of technical and financial assistance for policy planning and the training of engineers and technicians.

According to JICA Country Program for Cambodia 2005-2008, improvement and maintenance of water supply system is emphasized as the strategies for improving urban living condition in the social sector development.

4-2 Effectiveness

The Project proves to be highly effective, as an access to capacity building of human resources in water supply sector.

The capacity to operate and maintain water facilities were improved through activities of the Project.

NRW (non revenue water) ratio, which is equivalent to leakage ratio, was decreased from 16% in 2003 to 11% in 2005 based on the telemeter system.

Manuals were almost prepared and will be completed in September 2006. Based on the manuals completed, it is expected that Phum Prek Water Treatment Plant (WTP) is operated and maintained as a routine work.

At the laboratories, quality of treated water in 3 WTPs is checked in 33-37 parameters including accurate analysis for 3 parameters such as color, free available chlorine and total coliform. The result of analysis continuously satisfies the Cambodian National Drinking Water Quality Standards. Number of accurate analysis is expected to increase to 12 parameters at the end of the Project.

The staff training system for the water supply system has been improved at MIME and PPWSA.

The long-term human resources development programme (draft) was already submitted in 2004. In response to the contents in the draft programme with additional support by the Japanese experts, several training courses were newly developed by PPWSA.

Based on the Final Evaluation Report on Training Courses for PPWSA's staff in 2004 and the Evaluation Report on Training Courses in 2005 (Trainer's Training, Provincial and PPWSA Staff Training), the training courses at PPWSA are highly evaluated by the participants.

The staff of the task force for provincial workshops at MIME made a need survey, formulated the workshop programmes including selection of target groups, coordinated among stakeholders, and implemented the workshop at five places. The workshops are appreciated by the participants.

Outputs contributed to the achievement of the Project purpose in the following.

- (1) The counterparts acquired the knowledge of telemeter operation system. This system contributed an effective water distribution at PPWSA.
- (2) Counterpart staff are confident that they are able to operate and maintain the Phum Prek WTP by using manuals.
- (3) Highly improved water quality monitoring system promoted the effective operation of WTP and supply of the safe water to taps in the distribution area.
- (4) The training center management ability was strengthened. The training courses were launched based on the proposed long-term human resources development programme (draft) and the needs survey report on capacity building for provincial waterworks in Cambodia.

Also, the Project's effectiveness is attributed to the following factors.

- (1) Strong leadership of the management staff of MIME and PPWSA
- (2) Robust ties between the counterpart staff and the Japanese experts
- (3) Provision of the English training courses by PPWSA for the counterpart staff in order to strengthen their abilities on communication

4-3 Efficiency

In general, input from both the Cambodian and Japanese sides efficiently generated planned activities toward the Project purpose and the higher goals of capacity building in Cambodia.

3 long-term experts and a total of 32 short-term experts have been appropriately assigned in terms of qualification and timing. The technology transfer from the experts is highly appreciated by the counterpart staff. The experts have satisfactorily contributed to progress of all activities in the PDM.

The equipment provided by JICA to MIME and PPWSA was appropriate in quality and timing. Most of equipment was well maintained and utilized, although some pieces of equipment in one provincial waterworks out of three which the Japanese team visited were not fully utilized.

The counterpart training in Japan and NWTTI (Thailand) is highly appreciated. Sometimes the counterparts went back to Cambodia in the timing when the Japanese short-term experts started the assignment in Cambodia and then the counterparts had the training by the experts continuously.

The results of the training are disseminated through presentation, seminars, reports and training courses to other staffs.

The local cost support budgets by JICA were efficiently disbursed for the activities including workshops for provincial waterworks.

A total of 50 staff (MIME: 11 and PPWSA: 39) were assigned as counterparts, which is much larger than the number shown in the PDM. Also, 29 counterparts and 12 counterparts underwent training courses in Japan and NWTTI (Thailand), respectively.

The Cambodian side shouldered operational budget, payment of transportation, accommodation and other costs of participants in the training from provincial waterworks.

Joint Coordination Committee (JCC) meeting was held 6 times as of June 2006. JCC well monitored the progress of the Project.

4-4 Impact

(1) Achievement of Ultimate Development Goals and Overall Goals

In order to achieve the super goals, which is related to Millennium Development Goals (MDG), the Cambodian government continues to make possible efforts.

As for overall goals, the capacity to operate and maintain water supply facilities are already improved at 3 water treatment plants of PPWSA as the "top-runner". The appearance of the "second runner" and other runners are highly expected, although it may require own efforts by the Cambodian side and assistance among donor agencies. Support by the Project to Siem Reap Water Supply System (hereinafter referred to as "SRWSS") is one step to achieve the overall goals.

(2) Impact of the Project

Joint efforts of the Project contributed to the following impact.

Quite a few counterparts transferred the technologies they have learned from Japanese experts to colleagues or other personnel who are not involved in the Project activities.

According to the questionnaire, many counterparts answered that they have obtained capability such as "work with accuracy", "understanding of the responsibility of their work" and "positive attitudes toward work/assignment", which are not items on technology transfer.

MIME starts exchanges of the technical information on water supply system and human resources development among provincial waterworks and promotes to establish the Cambodian Waterworks Association.

SRWSS was newly innovated by the Japanese grant aid in the beginning of 2006. Both counterparts of PPWSA and the Japanese experts in the Project helped the operation of SRWSS in the fields of (1) training at PPWSA (outline of waterworks for

staff of SRWSS and workshop for leakage repairing work), (2) on-the-job training (OJT) about valve operating with pressure monitoring, construction of the bypass pipe and leakage and illegal connection survey and so on. The SRWSS are operated successfully since JICA's several schemes for training including activities by the Project complemented each other.

Relating to water quality analysis, one staff was newly assigned in the laboratory to analyze algae and trained in Japan. This is not depicted in the PDM.

The long term training scheme is utilized to foster a leader in terms of water supply technology in the future.

4-5 Sustainability

(1) Institutional Sustainability

The Cambodian Government continues to strengthen roles and functions of MIME and PPWSA in terms of social development and poverty alleviation.

PPWSA formulated its business plan for Year 2005-2009 in terms of water supply management. The high institutional capability of PPWSA and its performance is also confirmed through the annual report.

MIME is responsible for the coordination among donor agencies in the fields of water supply. MIME formulated the policies on water supply in the country such as National Policy on Water Supply and Sanitation (2003).

(2) Technical Sustainability

Through on-the-job training, training courses at PPWSA, training courses in Japan and NWTTI and other workshops/seminars, technical knowledge of counterpart staff in the fields of treated water distribution, operation and maintenance of water treatment plants/facilities, water quality control, training management and provincial workshop/training has been reinforced.

Performance indicators based on the consecutive monitoring system show the technical level of PPWSA.

The staff of the task force at MIME are capable of making a need survey, formulating the workshop programmes, coordinating among stakeholders and implementing the workshops.

Technology transferred by the Japanese experts is well disseminated from counterpart staffs to other staffs through daily activities, seminars and training courses.

(3) Financial Sustainability

According to the report titled Financial Sustainability of Water Supply Utilities (July 2005), financial situations of PPWSA seems to be sound. The Telemeter System plays an important role in the good financial performance.

At present financial sustainability of MIME and the provincial waterworks seems to be limited in terms of human resources development in water supply sector. It is highly expected that MIME and the provincial waterworks will strengthen the financial capability for sustainable implementation of the Project.