Kingdom of Cambodia

Nation Religion King

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Ministry of Water Resources
And Meteorology

Japan International
Cooperation Agency

for

Improvement of Agricultural River Basin Management and Development Project (TSC3)






Prepared by

Technical Service Center for Irrigation and Meteorology

MOWRAM

Cooperated by

Improvement of Agricultural River Basin Management and Development Project (TSC3)

JICA

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I. Outline of the Project

1. Background of the Project

Agriculture is the prime industry of the Kingdom of Cambodia. Agricultural production contributes to approximately 27% of the country's Gross Domestic Products (GDP), and approximately 60% of the national population relies on agriculture for their living. 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 developments of the country.

The Royal Government of Cambodia (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 two projects, namely Technical Service Center for Irrigation System Phase-1 and Phase-2, from January 2001 until July 2009. In Phase-1, the technical capacity of the engineers and technicians of Ministry of Water Resources and Meteorology (MOWRAM) and Provincial Department of Water Resources and Meteorology (PDWRAM) was improved through supporting the establishment of Technical Service Center for Irrigation and Meteorology (TSC), setting up technical manuals and training module, and providing trainings to PDWRAM staffs. Trainings at TSC and assistance for constructing canals and related facilities (planning, survey, design, construction management, and operation/maintenance etc.) through on-the-job-trainings (OJT) at pilot sites were conducted in Phase-2.

Due to increasing supports from donors, several irrigation projects which supported by different donors have been implemented in the same river basin without water use coordination. Consequently, it is required to be improved technical capacity of MOWRAM and PDWRAM in an irrigation system as a whole, including planning and survey in river basin unit. In response to this, JICA decided to implement the project for promoting river basin management and development through (1) strengthening TSC capacity of implementing training and technical support related to the agricultural river basin management and development, (2) supporting OJT and technical assistance of irrigation systems for the engineers and technicians in MOWRAM and PDWRAM.

2. Summary of the Project

The Project of Target Area, Target Group, Overall Goal, Project Purpose and Outputs are shown in the following Table.

The framework of the Project ((Project Design Matrix (PDM)) was modified twice by Joint Coordinating Committee .

The framework of the Project is shown in the PDM modified in September 2011 (See ANNEX 1).

Target Area	6 Provinces, namely, Kandal, Takeo, Pursat, Kampong Chhnang, Kampong Speu, and Battambang
Target Group	Counterpart personnel in TSC, PDWRAM and Provincial Department of Agriculture (PDA) in the target area, the engineers and technicians in MOWRAM and other PDWRAM, and the farmers in the model project sites.
Overall Goal	Agricultural productivity in the target areas is stabilized through efficient water resource management realized by improved technical capacity of MOWRAM and PDWRAM in agricultural river basin management and development.
Project Purpose	Irrigation projects are properly planned, implemented and operated in the target area of the Project.
Output 1	TSC obtain capacities to implement training and provide technical support for MOWRAM and PDWRAM related to the agricultural river basin management and development.

Output 2	The engineers and technicians in MOWRAM and PDWRAM obtain knowledge on concepts and technologies related to the agricultural river basin management and development through training.
Output 3	The capacities of the engineers and technicians of MOWRAM and PDWRAM on planning, survey, design, construction management, operation and maintenance (O&M) of facilities and structures in an irrigation system as a whole are improved through training.
Output 4	The technical support system of TSC is established to promote implementation of irrigation projects by PDWRAM

3. Organizational structure for the Project

Project Manager holds Director of TSC. Deputy Director of TSC and three (3) Offices (Administration office, Construction Management & Technical Irrigation Office and Water Management, Research & Information Management Office) are organized as TSC counterpart under Deputy Project Manager.

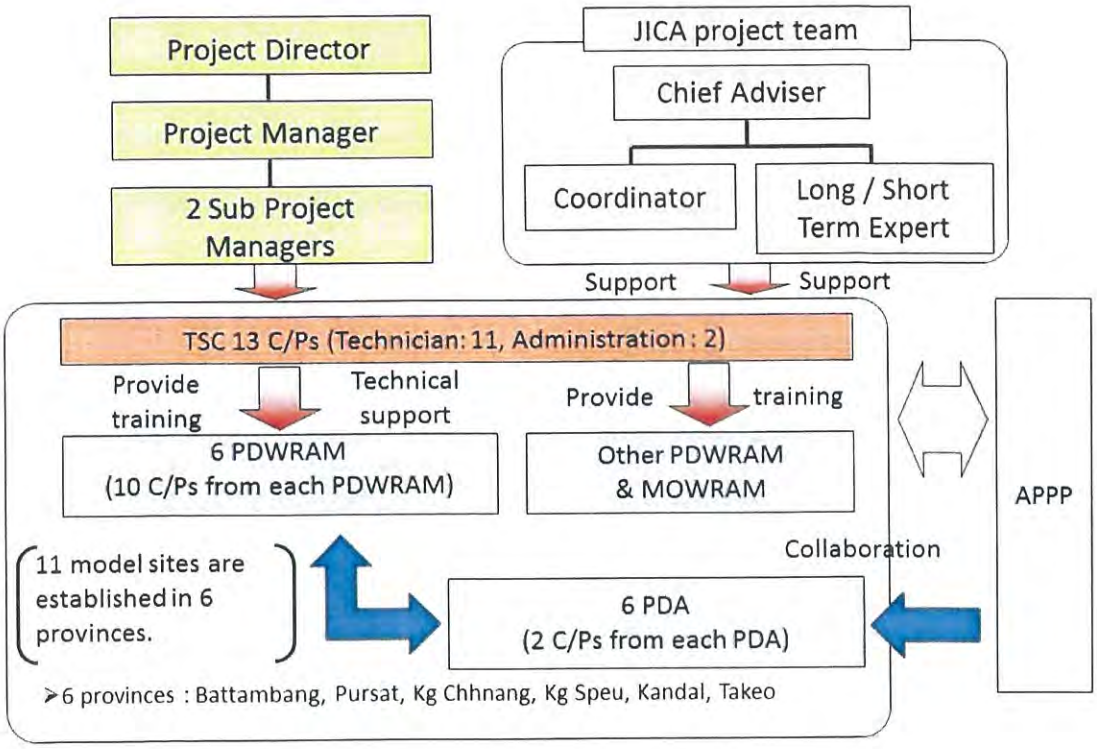
Ten (10) counterpart personnel from each PDWRAM in the target areas (In the model irrigation projects, three to eleven counterpart personnel from PDWRAMs were assigned for the construction of irrigation facilities and workshops.) were assigned.

Implementation system was reviewed for TSC to transfer management initiative to the targeted PDWRAMs in order to implement the activities smoothly such as survey, planning, design, establishment of FWUC, construction management, O&M of facilities and structures and strengthening of FWUC.

Moreover, Two (2) counterpart personnel from each PDA in the target areas were assigned. TSC project collaborated with Agricultural Productivity Promotion Project in West Tonle Sap (APPP) whose purpose is to ensure that "Productivity and income of farmers are improved" and conduct activities for farm management.

The organizational structure for the Project is shown in ANNEX 2. It was useful for implementation of the project smoothly.

Conceptual Diagram of Organizational Structure



II. Achievements and Implementation Processes of the Project

JICA Experts and Counterpart Personnel of TSC (hereinafter referred to as "TSC") have reviewed the performance of the Project including inputs and output indicators that could measure the achievement of the project purpose as well as the implementation process of the Project, the results of which are described in the following:

1. Inputs

JICA Experts and Counterpart Personnel of TSC confirmed that the Project has availed the following inputs along with the plan stated in the PDM and PO (the PO is attached as ANNEX 3).

1-1 Japanese Side

1) Dispatch of Experts to Cambodia

Six (6) Long-term experts in the three (3) fields and twenty-six (26) short-term experts were dispatched to the project for technology transfer. The details of the Experts are found in ANNEX 4.

2) Training of Counterpart Personnel in Japan and the third countries

Forty (40) counterpart personnel were dispatched to Japan and/or third countries, i.e. Indonesia, for training on the subjects relevant to the scope of Project activities, such as "Remote Sensing and GIS", "Satellite Remote Sensing Data Analysis Technology", "Participatory Irrigation Management System for Paddies", "Integrated Water Resources Management", "River Basin Management and Water Management of Paddy Field", and so forth. The details of the Training of Counterpart Personnel are found in ANNEX 5.

3) Provision of Machinery and Equipment

Machinery and equipment of the total value equivalent to 1,318,478 U.S. Dollars were provided for the Project activities. The details of the Machinery and Equipment are found in ANNEX 6.

4) Bearing of Local Costs

A total amount of 2,917,772.37 US Dollars was provided to supplement a portion of local expenditure for JFY 2009 – 2014. The details of the Local Operation Cost are found in ANNEX7.

1-2 Cambodian Side

1) Appointment of Counterpart Personnel and Other Staff

A total of sixteen (16) counterpart personnel of relevant fields of the Project have been assigned to the Project from TSC. The details of the Counterpart personnel are found in ANNEX 8.

2) Budget allocation

A total amount equivalent to 755,633.00 U.S. Dollars had been allocated for FY 2009-2014 including the budget from MOWRAM and Counterpart Fund of RGC. The details of the Budget Allocation are found in ANNEX9.

3) Allocation of the Rehabilitation Budget related to Model Sites

As a result of budgetary request of MOWRAM, the rehabilitation budget for Kandal Stung Irrigation System Rehabilitation Project, Thlear Maom Irrigation System Rehabilitation Project and Tomney Irrigation System Rehabilitation Project in FY 2009 and Thlear Maom Irrigation System Rehabilitation Project Phase II in FY 2012 has been provided by MEF. A total amount equivalent to 8,726,549 U.S. Dollars has been allocated

Non- Project counterpart fund related to Model site

Fiscal Year	Project Name	Amount	Items
2009	The Project for Kandal Stung Irrigation System Rehabilitation in Kandal Province	US$2,593,286	Rehabilitation of canal(secondly35km、tertiary26km)、construction of intake structure and Check Structure.
2009	The Project for Thlear Maom Irrigation System Rehabilitation in Pursat Province	US$2,779,102.27	Rehabilitation of canal(main6.6km、secondaly 10.1km)、construction of intake structure.
2009	Tormnei Irrigation Project in Takeo Province	US$423,260.58	Rehabilitation of canal(5.0km).
2012	The Project for Thlear Maom Irrigation System Rehabilitation Phase Ⅱ in Pursat Province	US$2,930,900	Rehabilitation of main canal, secondly canal, construction of check gate etc.
Total		US$8,726,548.85	

4) Provision of Land, Building, Office, and Facilities

The necessary office spaces with office equipment, water and electricity facilities have been provided. The details of Land, Building, Office and Facilities are found in ANNEX 10.

2. Achievements of the Outputs

JICA Experts and Counterpart Personnel of TSC confirmed that the Project has implemented the following activities as per the plan stipulated in the PDM and PO without notable delays or unprecedented difficulties and has achieved the all indicator by the end of the Project period. (The detailed information on the output indicators and achievements is found in the ANNEX 11)

(1) Output 1

TSC obtain capacities to implement training and provide technical supports for MOWRAM and PDWRAM related to the agricultural river basin management and development.		
OVI (derived from PDM ver. 2.0)		**Achievement Level**
1)	More than 90 % of TSC staff become competent in carrying out training and technical supports	Over 90% TSC staff get knowledge and skills of carrying out training and technical supports because the rate of training participants who are satisfied with the training and technical supports of TSC has reached approx. 96.0% as a whole.
2)	More than 80 % of PDWRAM are satisfied with training and technical supports of TSC	The rate of training participants who are satisfied with the training and technical supports of TSC has reached to 96.0 % in average (80.0%～100% among 20 courses).

Overall achievement for Output 1:

- It is reported that over 90 % of TSC staff become confident/competent in carrying out training and technical supports.
- In additions, it is reported that over 90 % (96.0 % in average) of PDWRAM participants are satisfied with training and technical supports of TSC.
- As the results on the above achievement, the self-evaluation of TSC staff as well as the satisfaction of the training participants, it is evident that TSC became to obtain sufficient capacities to implement training and provide technical supports for MOWRAM/PDWRAM related to the agricultural river basin management and development.

(2) Output 2

The engineers and technicians in MOWRAM and PDWRAM obtain knowledge on concepts and technologies related to the agricultural river basin management and development

through training.		
OVI (derived from PDM ver. 2.0)		**Achievement Level**
1)	More than 15 training courses on agricultural river basin management and development are conducted.	20 training courses have conducted.
2)	More than 60% of training participants achieve the curriculum targets of the training courses.	The rate of training participants who achieved the curriculum targets has reached to 88.7 % in average (63.6% ～ 100% among 20 training courses conducted). <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.>
Overall achievement for Output 2: • For the Output 2 which focuses on the technical level on agricultural river basin management and development, it is evaluated that the Project beneficiaries such as engineers and technicians in MOWRAM and PDWRAM became capable on the basic knowledge on concepts and practical technologies according to the achievement of 20 training courses conducted and also the achievement of the curriculum targets of the training courses (88.7 % in average).		

(3) Output 3

The capacities of the engineers and technicians of MOWRAM and PDWRAM on planning, survey, design, construction management, operation and maintenance (O&M) of facilities and structures in an irrigation system as a whole are improved through training.		
OVI (derived from PDM ver. 2.0)		**Achievement Level**
1)	More than 12 training courses are conducted on technologies related to the development and management of an irrigation system as a whole.	32 training courses have conducted.
2)	More than 60% of training participants achieve the curriculum targets of the training courses.	The rate of training participants who achieved the curriculum targets has reached to 91.4 % in average (70.0% ～ 100% among 32 training courses conducted). <same the above> Self-evaluation system by classifying five-grades
Overall achievement for Output 3: • For the Output 3 which focuses on the technical level on planning, survey, design, construction management, O&M of facilities and structures in an irrigation system as a whole, it is evaluated that the Project beneficiaries such as engineers and technicians in MOWRAM and PDWRAM became capable of their skills and experience because of the achievement of 32 training courses conducted and also the achievement of the curriculum targets of the training courses (91.4% in average). As indicated in the evaluation results through questionnaire and field interview results, the trained engineers and technicians in MOWRAM and PDWRAM is utilizing the skills and knowledge gained from training in their office and field.		

(4) Output 4

The technical support system of TSC is established to promote implementation of irrigation projects by PDWRAM.

OVI (derived from PDM ver 2.0)		Achievement Level
1)	More than 30 project plans are formulated with technical supports of TSC for budget requests.	31 project plans have been formulated and within the figure, 27 plans have been finally approved during the TSC Project period. (Including expecting final approval; 24=3+6+3+4+4+4 (4 project plans under processing) Grass Roots project as "Kusanone project" and 7=3+3+1 Counterpart fund project). The main component of the above rehabilitation project are secondly/tertiary canal rehabilitation, construction of check structures, drop structure, intake/outlet structure, culverts, embankment, concrete bridge, access road, turnout structures, and so on.
Overall achievement for Output 4: • 31 project plans have been formulated (Including 4 project plans under processing) during the TSC Project period. It is achieved the level of project indicators. Moreover, it is evaluated that the technical support system of TSC is functioning and being highly appreciated by PDWRAM. Through the strong technical support by TSC, PDWRAMs became to design map and make proper proposal on small scale irrigation projects, therefore, it is highly expected to continue to formulate and submit any irrigation projects for not only donors but also NGO and national government.		

3. Achievement of the Project Purpose

Based on the confirmation on the following, JICA Experts and Counterpart Personnel of TSC confirmed that the Project purposes have been successfully achieved by the Project.

Irrigation projects are properly planned, implemented and operated in the target area of the Project.		
OVI (derived from PDM ver 2.0)		**Achievement Level**
1)	1-1.Number of the newly formulated irrigation projects in the target area, which are planned and designed based on the water supply circulation.	1-1. The newly irrigation system are formulated at the following 8 model site on Por Canal, Damnak Ampil, Thlear Maom, Lum Hack, Roleang Chrey, Kandal Stung, Upper Slakou and Thomney.
	1-2.Total length of rehabilitated irrigation scheme of the project	1-2. At the time on the Project completion, total length of rehabilitated irrigation scheme/canal constructed by the Project became 144,535 m. Within the total length of irrigation scheme/canal, 96,633 m was constructed by farmer participation and incidental facilities number became 961. The figure of length is approx. 11 times in compared to TSC2 project constructed (at the time on TSC2 project; approx. 13,460 m).
2)	Number of PDWRAM technicians who obtained appropriate operation skills through TSC training, and Number of PDWRAM technicians who conducted any activities in the target area of the Project.	The number of PDWRAM technicians who obtained appropriate operation skills through TSC training is 1,305 persons, within the figure, it is reported as 622 PDWRAM technicians participated from the target 6 provinces. After participate training course, 39 PDWRAM technicians attend project activities such as construction, O&M WS, A&A/C WS, etc. as of Terminal evaluation time.
3)	Number of farmers group (water user committee and so on), are newly established, and	During the Project period, the newly farmers group (FWUG) are established at the model site on Por Canal (2011), Damnak Ampil (2011) and Lum Hach

	periodical O&M activities.	(2013). At the model site on Thlear Maom, Roleang Chrey, Kandal Stung, Upper Slakou and Thomney, FWUG have been already established. In 2012, the Project assisted to formulate annual plan and undertake O&M activities at 2 model site. Continuously in 2013 and 2014, the Project assisted to undertake O&M activities and also instructed about participatory/voluntary O&M activities at 3 model site. In the model sites where formulated farmers group already, and did supported by the Project, there are various activities carried out by themselves such as regular group meeting, O&M activities and water user fee collection.

Overall achievement :

- The newly irrigation system are formulated at the 8 model site in the target provinces as planned.
- Total length of rehabilitated irrigation scheme/canal constructed by the Project will be approx. 144,535 m. The figure of length is approx. 11 times in compared to TSC2 project constructed.
- The number of PDWRAM technicians who obtained appropriate operation skills through TSC training is reached more than one thousand three hundred (1,300) persons.
- The farmers group (water user committee and so on) are already established in the all the target model site, and do periodical O&M activities.
- On the above progress and accomplishment assisted by the Project, the OVIs of Project purpose and Outputs have been met in generally, and it is considered that the Project purpose have been successfully achieved by the Project.

4. Prospect to achieve the Overall Goal

The prospect for the achievement of the Overall Goal is summarized as below:

Agricultural productivity in the target area is stabilized through efficient water resource management realized by improved technical capacity of MOWRAM and PDWRAM in agricultural river basin management and development.		
OVI (derived from PDM ver 2.0)		**Achievement Level and Prospects**
1)	Unit yield of rice and other crops in the target area of the Project is improved to reach the national target.	The unit yield of rice differentiates on the target area. For 2012, the average yield of rice is reported as 1.8-4.4 ton/ha in the target area. And the paddy field with APPP project collaboration is reported as 4.5-7.1 ton/ha in 2013 and 3.45-6.0 ton/ha in 2014 (3 model sites by the end of the Project). (Target yield of rice in NSDP 2009-2013 update is currently 3.0 ton/ha.)
2)	Irrigated field area is increased due to the efficient water utilization and distribution in the target area of the Project. (Including 2 season or 3 season crop cultivation).	In the target area of the Project, total irrigated field area is increased to 3,307 ha due to the efficient water utilization and distribution, and within the area, it is reported approximately 361 ha as 2 or 3 season crop cultivation in 2013.

Overall achievement and prospect:

- Through the Project intervention, the unit yield of rice in the target area is increased in general and reached and/or beyond the national target.
- It is reported approximately 361 ha as 2 or 3 season crop cultivation in 2013.
- It means the irrigated field area has expanded for the sake of the efficient water

utilization and distribution through rehabilitation of canal and better O&M supported by the Project.

5. Implementation Process

5-1 Decision making and monitoring mechanism

The Joint Coordination Committee (JCC) has so far been held seven (7) times to review the progress of Project activities, to confirm the plans for the upcoming period, and to discuss other issues related to the Project implementation. Aside from the JCC, the Project has conducted Management Meetings, monthly Counterpart Meetings, Weekly Meetings for coordination and monitoring mechanism of the Project, as is shown in the table below.

Decision Making and Monitoring Mechanism of the Project

Project Management System
(Decision Making and Monitoring Mechanism)

The members of the Management Meetings include relevant personnel of MOWRAM such as finance department and administration and human resource department, who discuss important matters related to the financial, personnel and other important issues related to the Project management and operations. In the Counterpart Meetings by Project Manager as a chairperson, the project personnel discuss the plan and progress of the detailed activity of the Project such as planning, survey, design, construction management, O&M of facilities and structures, strengthening of FWUC/G, collaboration with APPP and technical support from short-term expert, particularly in the technical aspects, including the evaluation of training curriculum and materials, review of the technical manuals. In the Weekly Meetings every Monday, project personnel confirm the weekly and monthly activities and discuss various issues at working level for information sharing and problem solving based on the monthly work plan.

This multi-layer mechanism for decision-making and monitoring seems to have considerably contributed to the effective communication among the relevant stakeholders and thus to the smooth implementation of the Project. Particularly, the Project management has been smoothly carrying out and maintaining effectively by using work plan and plan of operation (PO) which aims to allocate C/Ps for target area and can manage efficiently. In spite of various kinds of activities of the Project as well as manpower limitation, the work plan was a vital factor for achieving all indicators by the end of the Project period.

5-2 Collaboration with the local authorities in the field activities

To do periodical O&M activities after establishment of Farmer Water User Community (FWUC) and Farmer Water User Groups (FWUG), it is desirable that FWUC and FWUG should build the good relationships with Local authorities in order to play their leadership enough to solve various problems such as conflict of water distribution among farmers, water

Upon the implementation of the activities to participate construction & maintenance work and to enhance water management activities by farmers in model site, such as farmers' workshop and farmer-to-farmer OJT about developed irrigation system, the Project involves not only the farmer members of FWUC and FWUG, but also the local authorities such as district governors, commune chiefs and village chiefs with PDWRAM C/Ps. Thus the collaboration with the local authorities has contributed the smooth implementation of water fee collection and maintenance works, etc.

5-3 Major Events organized by the Project

Date	Major events by the Project
- 2009.08.24	Signatory on Record of Discussion, PDM (ver.0) and PO (ver.0)
- 2009.09.01	Project started
- 2009.12.29	Project Director, Project Manager, Project Sub-manager and 13 number of Counterpart personnel was officially appointed by MOWRAM
- 2010.01.21	Holding 1st Project Management Meeting, proposed and approved by 6 PDWRAM Directors to allocate the counterpart personnel in each Province; Battambang, Pursat, Kampong Chhnang, Kampong Speu, Takeo and Kandal
- 2010.01-05	Each target province, 10 counterpart personnel was appointed in 6 target PDWRAM
-2010.03.12-14	TSC office moved to new building
- 2010.03.23	Holding 1st Joint Coordinating Committee, proposed and approved to modify PDM (ver.1) and PO (ver.1)
- 2010.03-05	Agriculture and socio-economic Baseline survey conducted at 11 model sites, and conducted irrigation facility inventory research for the newly selected 5 model sites (after this survey, continue to conduct Detail survey, Design, Formulation of FWUG, and Construction in the model sites)
-2010.04-	Conducted ALOS Research by TSC
-2010.07 09	2 counterpart personnel each from 6 Provincial Department of Agriculture (PDA) appointed from Ministry of Agriculture, Forestry and Fisheries (MAFF)
-2010.7.20-8.20	JICA internship student accepted for water user association
- 2010.10.15	Holding 2nd Joint Coordinating Committee, reported of the achievement of model site activity and training, and requested for more positive participation of PDWRAM staff
- 2010.11.30	Reported the Project Activities for TV and radio broadcasting for publicity work in Cambodia (through JICA Cambodia Office, TV/radio broadcasted on December)
- 2011.03-07	Canal construction and rehabilitation conducted in 3 model site at Por Canal, Battambang, Thlear Maorm, Pursat, and Thomney, Takeo
- 2011.06.14	Holding the discussion with 6 PDWRAM Directors to decentralize the management of model site activity
- 2011.06-	Conducted the discussion with local authority to confirm canal route and FWUG formulation, detailed survey, design for Damnak Ampil, Pursat, Roleang Chrey, Kampong Speu, and Upper Slokou, Takeo
-2011.08.30-9.14	Conducted the Mid-term Review, and reviewed of the Project activities including the plan on model irrigation projects and the TSC training courses.

- 2011.09.14	Holding 3rd Joint Coordinating Committee at the time on the Mid-term Review, reported of the project progress, project plan and the implementation system, then proposed and approved to modify PDM (ver.2)
- 2011.12～	Started Canal construction in Upper Slakou, Takeo province, but delayed the implementation because of discover UXO, and be obliged to discuss the matters among stakeholders, and then conducted survey, treated the bomb by the expense of the Project
- 2012.01～	Started Canal construction in Damnak Ampil, Pursat province and also Roleang Chrey, Kampong Speu province by the Project expenses
- 2012.03-06	Conducted the rehabilitation assistance toward flood damage caused by the previous year (provision of heavy equipment)
- 2012.04	Started the construction in Kandal Stung, Kandal province
- 2012.07～	Conducted the workshop on O&M at the model sites toward strengthening FWUC/FWUG
- 2012.07-11	Conducted the joint training with APPP/JICA Project for 12 PDA C/Ps and 2 Project C/Ps
- 2012.08.06	Holding 2nd Project Management Meeting, shared the achievement of the project activities and schedule among Project stakeholders
- 2012.08.28	Holding 4th Joint Coordinating Committee, reported of the achievement of project activities of the previous year and approved the next year activities
- 2012.10.03	Conducted the workshop on case introduction at advanced areas in Lum Hach, Kampong Chhnang province, and also undertook membership election of FWUC on 2, Nov
- 2013.01～	Conducted the joint training with APPP/JICA Project, and PDA C/Ps begun to execute the field practice to farmers at 5 model sites
- 2013.02	Started the construction in Lum Hach, Kampong Chhnang province
- 2013.04	Conducted the field survey in 3 model irrigation projects; Wat Luong and Wat Chre in Pursat province, Ream Kon in Battambang province, and specified the scope of the soft component activities according to the Mid-term review recommendation
- 2013.09.17	Holding 5th Joint Coordinating Committee, reported of the achievement of project activities of the previous year and approved the next year activities
-2013.09.17-09.20	Conducted the field visit in 3 model irrigation projects; Wat Luong and Wat Chre in Pursat province, Ream Kon in Battambang province, to Banteay Meanchhey and Siem Reap
-2013.11.06	Agriculture and socio-economic End-Line survey conducted at same sites where conducted Baseline Survey in March, 2010 for Final Evaluation Review.
-2013.11.21	Result of Yield/ha at Thlear Maom, Pursat Province was 5.36 ton/ha after conducted the field trial.
-2013.12.17	Result of Yield/ha at Lum Hach, Kampong Chhnang Province was 4.48 ton/ha after conducted the field trial.
-2014.01.13	Restarted the construction in Lum Hach, Kampong Chhnang Province

-2014.01.27-02.14	Conducted the Joint Final Evaluation Review. On February 13, The Result of Evaluation was reported at 6th JCC Meeting. M/M was signed.
-2014.02.03	Restarted the construction in Thlear Maom, Pursat Province
-2014.02.03	Restarted the construction in Kandal Stung, Kandal Province
-2014.02.13	Holding 6th Joint Coordinating Committee, reported of the Result of Final Evaluation Review and Achievement of Project Activities of the previous year and approved the next year activities
-2014.04.02	Restarted the construction in Lum Hach, Kampong Chhnang Province (finished on July 3)
-2014.04.21	Restarted the construction in Thlear Maom, Pursat Province (finished on July 12)
-2014.05.26	Restarted the construction in Thomney, Takeo Province (finished on July 19)
-2014.08.22	Holding 7th Joint Coordinating Committee, reported of the Achievement of Project Activities

III. Actual Implemented Schedule of Plan of Operation

Plan of Operation (PO) of the Project has modified 1 time mainly with consideration for progress of that time such as the delay of Yen loan project fund for the irrigation projects in the target area compared to its original schedule. (Exchange of Notes (E/N) of Yen loan project was signed in August 2011 and it will be planned to start construction from the end of 2014.)

The progress of the model irrigation projects was bit behind the schedule at the point of Joint Mid-Term Review in September 2011. There are several reasons of the project behind the schedule as follows:

- Constraints of input (human and financial resource constraints of Cambodian side, as well as human resource constraints of Japanese side)
- A larger number of model projects and its wideness of covered area in comparison to TSC2 (TSC3 covers 6 provinces, 11 model irrigation projects, but TSC2 covered only 1 model site, 3 pilot sites)
- Delay of project approval/implementation for the Yen loan project (West Tonle Sap Irrigation and Drainage Rehabilitation and Improvement Project)

However, the Project operation has been flexible in term of the situation surrounding of the project and the Project is trying to conduct the planned activities within the cooperation period. Consequently the Project has successfully achieved the all of activities by the end of the project.

The final progress for the implemented schedule of Plan of Operation is found in ANNEX 12.

Record of modification of Plan of Operation (PO)

PO	Approval Date	JCC	Note
Version 0	August 24, 2009	Record of Discussion	Original version of attached Plan of Operation
Version 1	March 23, 2010	1st JCC	With consideration for progress such as the delay of Yen loan project fund, review and revise of schedule so that activities related to the agricultural river basin management and development preceded the activities related to the irrigation

			facilities and structures in the main system

IV. Modification Record of Project Design Matrix (PDM)

1. Summary of modification of PDM

Project Design Matrix (PDM) of the Project was modified 2 times. Following table is record of modification of PDM and each detailed PDM are found in ANNEX 13.

Record of modification of Project Design Matrix (PDM)

PDM	Approval Date	Meeting	Summary of Modification
Version 0.0	August 24, 2009	Record of Discussion	Original version of attached Record of Discussion
Version 1.0	March 23, 2010	1st JCC	Seven (7) objectively verifiable indicators of project purpose and outputs were set with numerical target figure.
Version 2.0	September 14, 2011	3rd JCC	Some of indicators (1 indicator of Overall goal, 2 indicators of Project purpose) are changed or added and also the description of project activities is modified in the course of progress of the project implementation for more appropriate ones.

2. Detailed description for modification of PDM

1) Revision of PDM version 0.0

Seven (7) objectively verifiable indicators of outputs were set with numerical target value, based on the current situation and the human resources development plan considered.

Revision of PDM version 0.0

Item	Version 0.0	Revision	Reason of change
Indicator 1-1 of the Output 1	More than XX % of TSC staff becomes competent in carrying out training and technical supports.	More than 90 % of TSC staff becomes competent in carrying out training and technical supports.	This is the most important aim so that the indicator should be higher than that mentioned below
Indicator 1-2 of the Output 1	More than XX % of PDWRAM are satisfied with training and technical supports of TSC	More than 80 % of PDWRAM are satisfied with training and technical supports of TSC	Because of the same consideration as TSC2
Indicator 2-1 of the Output 2	More than XX training courses on agricultural river basin management and	More than 15 training courses on agricultural river basin management and	On basis of the human resources development plan considered in TSC2 (referred to next page)

	development are conducted.	development	
Indicator 2-2 of the Output 2	More than XX% of training participants achieve the curriculum targets (*2) of the training courses.	More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	Because of the same consideration as TSC2
Indicator 3-1 of the Output 3	More than XX training courses are conducted on technologies related to the development and management of an irrigation system as a whole.	More than 12 training courses are conducted on technologies related to the development and management of an irrigation system as a whole.	On basis of the human resources development plan considered in TSC2
Indicator 3-2 of the Output 3	More than XX% of training participants achieve the curriculum targets (*2) of the training courses.	More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	Because of the same consideration as TSC2
Indicator of the Output 4	More than XX project plans are formulated with technical supports of TSC for budget requests.	More than 30 project plans are formulated with technical supports of TSC for budget requests.	On basis of two cases calculated as follows; ➢ 90 thousand ha of irrigation area increased in NSDP divide 2 thousand ha/project is 45 ➢ At least one project in each province totals 24

2) Revision of PDM version 2.0

The Joint Mid-term Review Team looked out and assessed the project PDM version 1.0. then, it becomes necessary to change some indicators and also modify the description of the project activities in course of progress of the project implementation for more appropriate ones.

Therefore, the Team proposed revision of PDM Version 1.0 and the revised PDM (Version 2.0) was approved. Main part of revision is described in the following table.

Revision of PDM version 2.0

Item	Version 1.0	Revision	Reason of change
Additional Indicator of Overall goal	Nil	1-2. Irrigated field area is increased due to the efficient water utilization and distribution in the target area of the Project. (including 2 season or 3 season crop cultivation).	Currently, the indicator is only "unit yield of rice and other crops" in compared with the national target. Success with efficient water use as well as water utilization of irrigation project, the benefited farmers will be able to cultivate their land and contribute more crop production/harvest. Therefore, the expanded and/or incremental land area shall be measured.

Indicator 2 of Project purpose	2.Number of PDWRAM technicians who obtained appropriate operation skills.	2.Number of PDWRAM technicians who obtained appropriate operation skills through TSC training, and Number of PDWRAM technicians who conducted any activities in the target area of the Project.	Not only the number of staff trained, but also it is required to the trainees how to apply in practice after their training.
Additional Indicator of Project purpose	Nil	1-2.Total length of rehabilitated irrigation scheme of the project	Not only the number of the newly formulated irrigation projects, but also it is required to calculate the length of rehabilitated irrigation scheme of the project.
Activity 1-4	Provide support to MOWRAM to formulate the mid- / long-term human resource development plan on water and irrigation management.	Provide technical support to MOWRAM to formulate the mid- / long-term human resource development (HRD) plan on water and irrigation management based on Capacity building Roadmap of TSC.	Currently, to strengthening TSC for its sustainability, Long & Mid- term Capacity Building Plan/Roadmap is ready prepared, but not yet have tangible plan on it. Therefore, TSC will make the HRD plan of operation as well as its prioritizes as action plan, then the project will provide technical support on the HRD plan.
Activity 3-6	Formulate the training courses for the newly recruited staff of MOWRAM and PDWRAM based on the revised training courses above.	Provide technical support to formulate the training courses for the newly recruited staff of MOWRAM and PDWRAM based on the HRD plan as the above mentioned on Activity 1-4.	Based on the HRD plan above mentioned, the project will provide technical support to formulate the courses.

Activity 4-1	Select the sites for the model irrigation projects (*3) of in the target area of the Project.	*3: According to the agreement between RGC and JICA during the JCC on Sep, 2011, the model irrigation project sites and its activities will be modified.	Based on the discussion and consensus between RGC and JICA, the activities of the model irrigation projects are reviewed.

V. Result of Training Course and Support to formulate Training course for Newly Recruited Staffs

1. Result and evaluation of training course & Workshop

(1) Result and evaluation of training course

The Project classified the training courses into four categories such as New Comer, Basic course, Advance course, Agricultural River basin Management & Development course based on Capacity building Road Map which was drafted through the discussion with MOWRAM and PDWRAM on March 23, 2009.

Project has implemented 54 training course from November 16, 2009 to July 10, 2014 according to each Category. The details of the Training Courses and its Category are found in ANNEX 14 and ANNEX 15. More detailed information of training course output, please see "Result of 54 Training Courses on Implemented by TSC3, MOWRAM" and "Contents of Training Document according to classification of Training Courses by TSC3" which compiled separate volume.

Result of evaluation by TSC and Counterpart Meeting, it is evaluated that TSC conduct the training course with good management system, good technology transfer to engineers and technicians of MOWRAM and PDWRAM, and almost satisfied level for participant. The details of the Evaluation Result of Training Courses are found in ANNEX 16.

(2) Result of Workshop

Project has implemented 8 Workshops including Technical Exchange Program with Bangladesh, Lao and Japan and Evaluation Workshop for JICA- KOICA Joint Program. The details of the Workshop are found in ANNEX 14.

2. Technical support of the agricultural river basin planning and management

(1) Contents of technical support

Several development projects are currently under way in Cambodia to meet growing demand for water and energy. However, due to the availability of the fundamental hydrological and meteorological data (precipitation, stream flow etc.), some projects were conducted without rigorous check of water balance. In addition, the lack of those data has prevented a comprehensive understanding and coordination of how the flow regime will be changed after the projects are completed.

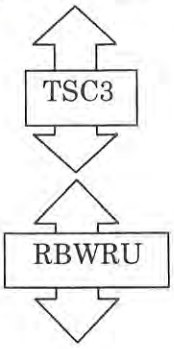
To cope with the above mentioned issues, we carried out technical support for checking (1) the water balance at each irrigation project, and (2) the potential changes in the flow regime likely to be induced by reservoirs, and their implications for irrigation projects. The core of the activities is introducing an analysis method using a distributed water circulation model, which corresponds to the first half of the roadmap for the implementation of river basin water resources planning and management proposed by MOWRAM (Table 1). The model was applied to our case study basin, the Pursat River Basin. The overall procedures were summarized as a manual for future application of this model to other river basins in Cambodia. See Annex17 for the detailed description of the model.

(2) Future prospects for the use of the technical support

The new technical corporation project 'River Basin Water Resources Utilization (RBWRU)' is going to deal with configuration mechanism for water resources allocation and coordination, which is presented in the latter half of the roadmap in Table 1. For conducting water resources allocation, water resources manager(s) should explain current and future situation on water demand and resource in the river basin. The main point for the explanation for stakeholders is not the precise 'prediction' of the future condition (for example 30 years later), but to show them what will happen if we continue to manage water resources based on several scenarios (facility operation, increasing of irrigation areas etc.) and to indicate what actions may be needed to prevent undesirable outcomes. The analysis method we introduced in this project will be a useful tool for such a purpose.

Table 1 Roadmap for river basin water resources planning and management proposed by MOWRAM

Process	Item
Process 1	Data Collection and development of a database
Process 2	Water balance calculations
Process 3	Proposals of a development plan
Process 4	Trial decision of water right volume
Process 5	Set-up Committee to hold meetings
Process 6	Modification of drafts based on recommendations by Committee
Process 7	Modification of operation rules
Process 8	Issuing & registering a water licensing



3. Support to formulate Training course for Newly Recruited Staffs

Japanese experts provided technical support so that TSC can take necessary actions to come up with details for the mid and long term human resource development plan, such as formulating the training courses for newly recruited staffs of MOWRAM/PDWRAMs.

Regarding the training courses for newly recruited staffs, the short-term expert conducted Needs survey in December, 2012. The short-term expert suggested the importance of recruiting staff, and assisted to make training course program and syllabus. The training course program (Draft) is found in ANNEX 18.

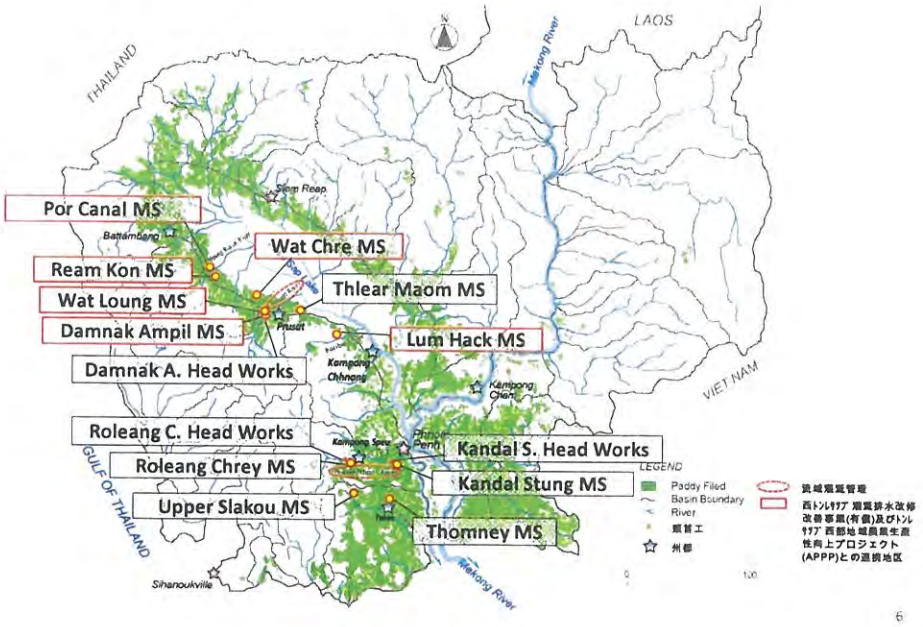
So far, it is not easy to access to technical training for the staff, though each department, in which the new staff are assigned, provides training to the new staff. As the result of making necessary arrangement so that TSC can provide technical training to new staff, some new staff as trainee (Total number of new staff: 28) joined the 6 technical training courses in fiscal 2014.

VI. Result of Model Site Activities and technical support to PDWRAM

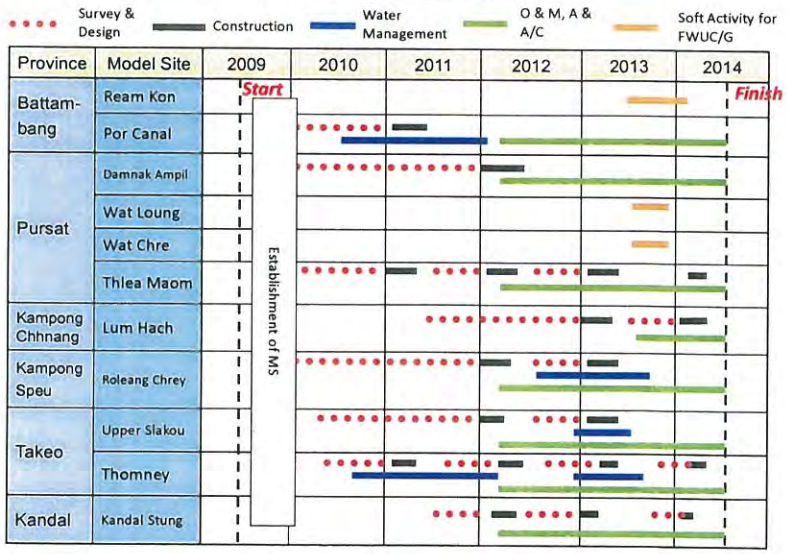
1. Summary of Model Site Activities

Project selected 11 model Sites and took some construction of irrigation facilities for sustainable development of agricultural area through the method of PIM (Participatory Irrigation Management) Location map of 11 model sites and Activity schedule as below.

Location Map of 11 Model Site



Schedule of Model Site Activity

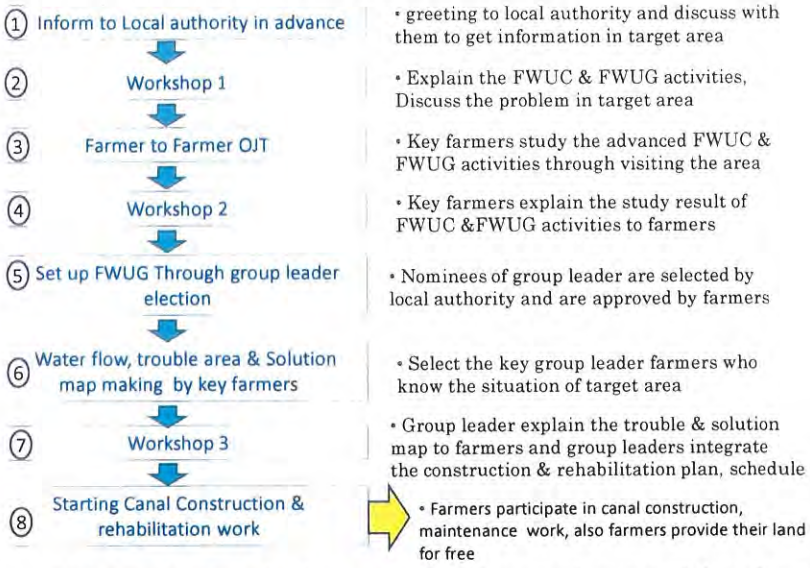


In 8 model sites (See Annex19), Project performed comprehensive development as establishment of FWUC/G (Farmer water user community/Farmer water user group), construction of irrigation facilities, intangible support for sustainable development of FWUC/G, dissemination of technology for promotion of rice productivity, and so on.

Other 3 model sites have a plan for construction of irrigation facilities by ODA loan. So, project provided Farmer to Farmer OJT which promote understanding for model sites farmers about operation & Maintenance of irrigation facilities by FWUC/G.

Project had workshop which are PIM method to take agreement for construction from model sites farmers as below.

Procedure of Participatory Irrigation Management (PIM)



Project conducted survey, design, construction and supervision for expert transfer skill to TSC CP by OJT (On the job training) method. Furthermore, project organizes dissemination system through TSC CP who got skill from expert taught PDWRAM CP by OJT method.

Project irrigated 3,307ha paddy field and constructed 144,535m canal, 29,868m road, as well as 961 number structure like check gate, distribution box and so on. (See Annex 20) Result of irrigation project, it get 3.42ton/ha rice yield as average which is increased 0.6ton/ha compare to before construction.

Irrigated Area by construction and Rice yield

Model Site	Irrigated Area by Construction(ha)			Rice yield (ton/ha)		
	One Season	Two Season	Three Season	2012year	2009year	Increase
Por Canal	125	17		3.85	2.90	0.95
Damnak Ampil	100	100		3.46	1.8	1.66
Thlear Maom	1,218	50		2.64	1.8	0.84
Lum Hack	161			1.76	3.1	-1.34
Roleang Chrey	210	17		4.17	3.4	0.77
Kandal Stung	1,006	111	12	3.87	3.1	0.77
Upper Slakou	120	34		3.24	2.7	0.54
Thomney	367	20		4.38	3.8	0.58
Total(Ave.)	3,307	349	12	(3.42)	(2.82)	(0.60)

Note1: Target yield of rice in NSDP2009-2013 update is 3.0ton/ha 25
2: Lum Hack model site start construction from 2013

2. Plan, Survey, Design and Construction at Model Site

(1)Plan

Project had "Base line and Inventory Survey" to select the Model Site and investigation by contract with private company. Project decided model area by result of survey which show existing irrigation system, rice productivity, rice variety, relating village and commune and so on.

(2)Survey and Design

TSC CP and PDWRAM CP took topographic and route survey for design of irrigation facilities. CP made a contour map of irrigation area by topographic survey and decided the canal route base on contour map. Then CP performed route survey and made existing drawings of longitudinal section and cross section.

After route survey, TSC CP calculated water flow and level for hydraulic design supported by Expert. CP designed and made drawings of secondary and tertiary canal accordance with hydraulic calculation. CP also designed other facilities like as check gate, distribution box, culvert, passing by concrete. They made drawing by Auto CAD.

(3)Construction

Project started to construct from 2011 in model sites. Construction is classified into construction by TSC participation with farmers and construction by private company through contract with company.

1) Construction by TSC

Project constructed 8 model site irrigation facilities using TSC machine(Excavator 7, Roller 3,Bulldozer 2) and rent equipment. Farmers participated as compaction of Delivery canal, making of concrete structure and so on.

Plan of construction was made by CP and Expert through discussion with farmers and plan avoided term of cultivation and heavy rain season which were difficult construction. CP took agreement for participating to construction from farmers through work shop which were held with local authority.

In construction, Expert transfered comprehensive construction supervision skill to CP like as spreading depth, compaction, ratio of concrete(or mortal), height of putting concrete, air vent, cure, steel bar arrangement and so on.

2) Construction by Company

Project took 4 construction (Por Canal, Damnak Ampil, Roleang Chrey (2012, 2013)) by contract with company. TSC CP prepared draft of tender document supported by expert and JICA took bidding and contracted. Expert made super vision checklist to facilitate CP skill and transfer knowledge about supervision of company construction.

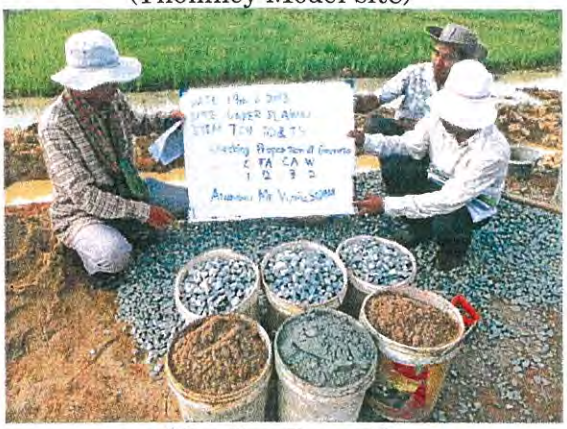
〔Construction participate Farmers〕
(Roleang Chrey Model site)

〔Completion of Construction〕
(Roleang Chrey Model site)

〔Construction participate Farmers〕
(Thomney Model site)

〔Completion of Construction〕
(Thomney Model site)

〔Dimension Check〕
(Thlear Maom Model site)



〔Quality Control〕
(Thomney Model site)

3. Establishment and strengthen FWUC/G

(1)Support of Establishment FWUG

Project supported establishment of FWUG by PIM method at 3 model sites as Por Canal, Damnak Ampil and Lum Hack which not yet had FWUG among the 8 construction model Site. (See Annex 21)

Model site farmer selected candidate of FWUG committee and took election participate all farmers in model site, then took result and decided FWUC Committee on the day of election supported by TSC CP and PDWRAM CP.

After election of FWUG committee, CP also support making FWUG statute and established FWUG.

(2) Strengthen FWUC/G

Project performed "Operation&Maintenance Work shop ; O&M WS" and "Annual Plan& Accounting Work shop ; A&A WS" for strengthen FWUC/G. (See Annex 22)

TSC CP and Expert made text book for O&M WS which includes water irrigation system in Model Site, turn of gate opening, attention of gate operation, inspection by FWUC/G for maintenance, check sheet for maintenance, method of maintenance by farmers. Before taking place WS, TSC CP transfered knowledge to PDWRAM CP and PDWRAM conducted O&M WS to make good collaboration between MOWRAM and PDWRAM. After in house Workshop, CP facilitated farmers to perform real activity like as canal cleaning, gate painting and gate greasing at model site.

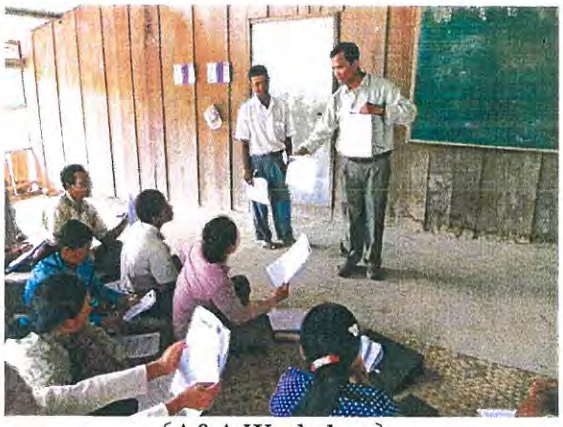
TSC CP and Expert made text book for A&A WS which includes how to make Annual Plan, Who should make Annual Plan, Budget plan of FWUC/G, Water fee collection, settlement and Audit. TSC CP transfered knowledge to PDWRAM CP before WS and project made a system

that PDWRAM CP conducts WS and transfers knowledge to farmers. Project facilitates development of farmer's ability to make real Annual Plan and Budget Plan accordance to Annual Plan.

Project had Water Distribution Workshop and facilitate efficient water supply supported by Expert in Por canal and Roleang Chrey model sites. CP transfered skill to farmer of FWUC/G about a water supply amount of canal and how to irrigate efficiently by rotation to paddy field by Workshop.

〔O&M Workshop〕
(Por Canal Model site)

〔O&M Workshop〕
(Damnak Ampil Model site)



〔A&A Workshop〕
(Lum Hach Model site)

〔A&A Workshop〕
(Kandal Stung Model site)

4. TSC Technical Support for PDWRAM Project

TSC CP had technical support for making plan of 24 Grass Roots-Human Security Project(2014;4, 2013;4, 2012;4, 2011;3, 2010;6, 2009;3) and 7 Non- Project counterpart fund(2012;1, 2010;3, 2009;3). TSC CP also supported PDWRAM CP about a supervision of construction and facilitated proper finalization of construction. (See Annex 23)

5. Dissemination of Rica Cultivation technology. (Collaboration with West Tonle sap rice productivity promotion Project)

(1) Collaboration of Training between TSC and APPP

Project had Rice cultivation technology training to 12 PDA CP who were assigned by TSC3 Project from July 2012. Training course which were supported by APPP Expert had 4 times term until Nov. 2012 and 3 TSC CPs join this training course too.
Training included seed selection and disinfection, line transplanting, growth observation, weeding and top dressing, seed variety study, harvest observation and so on.

(2) Dissemination at TSC Model Site.

Por canal and Damnak Ampil Model Site which irrigation systems were constructed in

2012 and 2013 had FFS supported by APPP. This FFS took result of rice yield from 4.2 to 7.1ton/ha, these results are beyond the NSDP national target 3.0ton/ha.

FFS Result in TSC3 Model Site conducted by APPP

Irrigation Scheme	Average Yield in2012 (ton/ha)				Average Yield in 2013(ton/ha)			
	Demo Farmer			PG	Demo Farmer			PG
	Demo ID #	Yield (ton/ha)	Variety		Demo ID #	Yield (ton/ha)	Variety	
D.Ampil		-		-	D86	7.1	Phka Rumdoul	
P.Canal	D20	4.2	Phka Rumdoul		D60	4.8	Chulsa	Establish
	D62	4.6	Phka Rumdoul	-	D63	4.6	Raing Chey	
Average	-	4.4	-		-	5.5	-	

FFS :Farmer Field School
PG: Pilot group

PDA CP and TSC CP collaborated and took place FFS in TSC3 model sites from 2013.TSC3 project classified FFS from farmer selection to harvest into 9 step, and conducted each step by workshop. Project selected 1 farmer in each model site and call about 20 farmers to disseminate APPP technology.

Project invited APPP chief advisor (APPP CA) to meeting among CP for discussion of FFS Activity, and APPP CA lectured some important skill for FFS on 29 and 30 April 2013.

〔Joint meeting between TSC & PDA〕

〔Lecture from APPP Chief Advisor〕

Farmers Field School in TSC3 model site

No.	Step	Workshop Activity
1	Step 1	One demo farmer selection
2	Step 2	Distribute the materials
3	Step 3	Seed selection / Disinfect the seeds
4	Step 4	Nursery bed preparation
5	Step 5	Land preparation
6	Step 6	Transplanting
7	Step 7	First top dressing
8	Step 8	Second top dressing
9	Step 9	Harvesting & Observation of rice productivity

Project had 11 times FFS as 6 demo paddy fields at 5 model Sites in 2013, and 5 demo paddy fields at 5 model sites in 2014. FFS result took between 3.45 to 5.36ton/ha which are

beyond the NSDP national target 3.0ton/ha. APPP provided "Rice Cultivation Calendar"," Rice Cultivation Technology" and" Durum Seeder manual", then TSC3 project distributed these materials for dissemination of Technique of APPP in Model Sites.

FFS Result in TSC3 Model Site conducted by TSC3 CP

	Por Canal	Damnak Ampil	Thlear Maom		Lum Hach	Roleang Chrey			Upper Slakou		Thomney
	①	①	①	②	①	①	②	③	①	②	①
Step 1	2014.04.03	2014.03.17	2013.01.30		2013.04.11	2013.01.29	2013.07.10		2013.02.21		2013.10.28
Step 2	2014.05.19	2014.04.04	2013.02.28	2014.04.25	2013.05.10	2013.02.19	2013.07.20		2013.02.22		2013.11.15
Step 3	2014.05.20	2014.04.29	2013.04.09	2014.05.29	2013.06.19	2013.03.12	2013.07.22	2014.03.12	2013.05.03	2014.04.09	2013.12.02
Step 4		2014.05.09	2013.06.20	2014.06.26	2013.06.22	2013.03.15	2013.07.24		2013.05.06	2014.04.12	
Step 5	2014.05.23	2014.06.03	2013.07.15	2014.06.27	2013.07.16	2013.04.03	2013.08.13		2013.05.22	2014.04.28	2013.12.04
Step 6	2014.05.23	2014.06.03	2013.07.16	2014.07.30	2013.07.16	2013.04.03	2013.08.14	2014.03.14	2013.06.23	2014.04.29	2013.12.04
Step 7	2014.06.20	2014.07.02	2013.08.16	2014.08.30	2013.08.13		2013.09.01	2014.04.21	2013.06.07	2014.05.12	2013.12.25
Step 8	2014.08.01	2014.07.17	2013.09.06	2014.09.15	2013.10.10	2013.05.02	2013.09.25	2014.05.05	2013.06.14	2014.05.27	2014.01.10
Step 9	2014.09.03	2014.09.13	2013.11.21	2014.11.15	2013.12.17	2013.07.04	2013.11.21	2014.07.08	2013.08.13	2014.07.21	2014.03.04
Variety	Phka Rumdoul	Somaly	Phka Rumdoul	Phka Rumdoul	Kha4	Sen Pidor	Sen Kraob	Cholsa	IR66	IR66	IR504
Yield ton/ha	Under way	Under way	5.36	Under way	4.48	4.59	5.5	3.45	5.0	5.0	6.0

〔Disinfect the Seeds〕
(Thlear Maom Model site)

〔Straight Transplanting〕
(Upper Slakou Model site)

〔Provide APPP material to Farmers〕
(Damnak Ampil Model site)

〔Harvest〕
(Roleang Chrey Model site)

6. Effect of Model Site Activity

Project constructed irrigation facilities in model site of 3,307ha which area became proper irrigated area. Among this area, 349ha became 2 time cropping and 12ha became 3 time cropping area.

Average Rice yield became 3.42ton/ha in 2012 from 2.82ton/ha in 2009 which increased 0.60ton/ha compared to before in 8 construction model sites. (Only Lum Hack model Site which had being construction decreased 1.34ton/ha of rice yield.) 6 Model site beyond the NSDP national target 3.0ton/ha among 8 model sites.

2 model sites are almost same yield in 3 model site which have no construction, and remaining 1 model site took 0.47ton/ha increase. But average yield of this model site is 2.63ton/ha, and this result is 0.79ton/ha lower than average of construction 8 model sites.

Average yield and irrigation area of model site

1) Construction model site

Model site	Irrigation Area(ha)			Yield(ton/ha)		
	1season crop	2 time crop	3 time crop	2012	2009	Increase
Por Canal	125	17	-	3.85	2.9	0.95
Damnak Ampil	100	100	-	3.46	1.8	1.66
Thlear Maom	1,218	50	-	2.64	1.8	0.84
Lum Hack	161	-	-	1.76	3.1	-1.34
Roleang Chrey	210	17	-	4.17	3.4	0.77
Kandal Stung	1,006	111	5～12	3.87	3.1	0.77
Upper Slakou	120	34	-	3.24	2.7	0.54
Thomney	367	20	-	4.38	3.8	0.58
sum<Ave.>	3,307	349	12	<3.42>	<2.82>	0.60

2) No Construction Model Site

Model Site	Irrigation Area(ha)			Yield(ton/ha)		
	1season crop	2 time crop	3 time crop	2012	2009	Increase
Ream Kun	115	0～35	-	3.3	3.4	-0.1
Wat Chrey	109	-	-	2.37	1.9	0.47
Wat Loung	126	-	-	2.22	2.2	0.02
sum<Ave.>	350	35		<2.63>	<2.5>	0.13

TSC CP got skill of irrigation project which includes survey, design, construction and supervision through project activity. And both PDWRAM CP skill of irrigation project and TSC CP skill of instruction are increased for result of transfer knowledge by OJT method.

Furthermore, Model site had good access road, improving of water utility and so on.

7. State of FWUC/G

Project took FWUC/G survey for getting state of FWUC/G in 2013 Feb. and 2014 Jul. TSC classified result of survey from 3 aspects as 'Organization', 'Accounting' and 'Operation and Maintenance'. Project judged state of FWUC/G from marks which were range from 0 to 11. Marks made from 11 itemizes point if FWUG/C activates well at each itemize.

Three types of FWUCs/FWUGs from the viewpoint of their " Strength"

- 2012 -

Name of model irrigation system	Name of FWUC/FWUG	Organizational structure					Accounting procedure			O & M				Strength Point (○:1 , △:0.5)
		Member's list	General or committee meeting (%)	Group meeting (%)	Reward for leaders/officials	Annual plan	Water fee collection (%)	Budget Plan	Financial report	Gate Keeper Activity	Illegal water drawing	maintenance work(%)	Attendance for	
5)Roleang Chrey	Ou Veang FWUC	○	○ 60	○ 60	○	○	○ 70	×	○	○	×	○	70	9
8) Thomney	Thomney FWUC	○	○ 80	○ 80	○	○	△ 40	×	○	○	×	○	70	8.5
3)Thlear Maom	Thlear Maom FWUC	○	○ 50	○ 60	-	○	× -	×	×	○	×	○	90	6
1)Por Canal	Brolay Thmey Beiphum Khum Talous FWUG	○	○ 50	○ 50	-	○	× -	×	×	×	×	○	80	5
7)Upper Slakou	Kpok Trabek FWUC	○	× -	○ 70	-	×	× -	×	×	○	×	○	70	4
2)Damnak Ampil	Kandeung Meas FWUG	×	× -	× -	-	×	× -	×	×	×	×	△	20	0.5
6)Kandal Stung	Kandal Stung FWUC	△	× -	○ 50	-	×	× -	×	×	×	×	○	50	2.5
4)Lum Hach	Lum Hach FWUG	×	× -	× -	-	×	× -	×	×	×	×	×	-	0

Sources from FWUG/C research in 2013 February &2014 July by TSC
Note1) ○ ; Yes, △ ;A part, × ;No
Note2) "Illegal Water Drawing" column. ○ ;No haven't × ; Yes have; △ ; A part
Note3) Specify of Strength Point. Good function; 7≦Point□ Some Good function; 4≦point <7 Not well function; point <4□

It had 2 "Good function(over 7 point)" FWUC/G, 3 "Some good function(between over 4 and less than 7 point)" FWUC/G and 3 "Not well function(or just established)(less than 4 point)" FWUC/G in TSC3 model site as of 2012. It had problem about some FWUC/G which didn't have meeting, water fee collection, budget plan, annual plan, gate operator(or no gate) and so on. Project took some workshop activity to strengthen FWUC/G base on this problem.

Three types of FWUCs from the viewpoint of their " Strength"

- 2014 -

Name of model irrigation system	Name of FWUC/FWUG	Organizational structure					Accounting procedure			O & M				Strength Point (○:1 , △:0.5)
		Member's list	General or committee meeting (%)	Group meeting (%)	Reward for leaders/officials	Annual plan	Water fee collection (%)	Budget plan	Financial report	Gate Keeper Activity	Illegal water drawing	maintenance work(%)	Attendance for	
5)Roleang Chrey	Ou Veang FWUC	○	○ 60	○ 80	○	○	△ 30	○	○	○	△	○	70	10
8) Thomney	Thomney FWUC	○	○ 80	○ 60	○	○	○ 70	○	○	○	○	○	70	11
3)Thlear Maom	Thlear Maom FWUC	○	○ 65	△ -	-	○	△ 3	○	×	△	△	○	90	7
1)Por Canal	Brolay Thmey Beiphum Khum Talous FWUC	○	○ 40	△ 30	-	○	× -	○	×	×	×	○	100	5.5
7)Upper Slakou	Kpok Trabek FWUC	○	× -	○ 100	-	○	○ 60	○	×	○	△	○	100	7.5
2)Damnak Ampil	Kandeung Meas FWUG	○	○ 60	○ 100	○	○	○ 70	○	×	○	×	○	60	9
6)Kandal Stung	Kandal Stung FWUC	△	○ 70	× -	-	○	× -	○	×	×	△	△	40	4.5
4)Lum Hach	Lum Hach FWUG	△	○ 50	○ 100	-	○	× -	○	×	○	×	○	100	6.5

Sources from FWUG/C research in 2013 February &2014 July by TSC
Note1) ○ ; Yes, △ ;A part, × ;No
Note2) "Illegal Water Drawing" column. ○ ;No haven't × ; Yes have; △ ; A part or Decrease after construction
Note3) Specify of Strength Point. Good function; 7≦Point□ Some Good function; 4≦point <7 Not well function; point <4□

2 year after, FWUC/G became better as 5 "Good function" FWUC/G, 3 "Some good function" FWUC/G and no "Not well function" FWUC/G in TSC3 model site as of 2012.

Especially, all became better about "Annual Plan" and "Budget Plan" which facilitate making themselves through Workshop. Furthermore, 3 model sites start collecting water fee. It is very efficient that TSC3 facilitated in workshop and gave receipt form to FWUC/G to start collect

water fee.

Especially, Damnak Ampil Model site which be able to sustainable 2 time cropping collected water fee 70% even first time to collect. It confirmed voluntary activity of maintenance irrigation facilities almost all model site.

VII. Technical Support of Mid and long term human resource development plan

1. The Mid and long term human resource development (HRD) plan based on Capacity building Road Map

MOWRAM and Technical Service Center for irrigation System Project Phase2 (TSC2 project) conducted the Workshop for mid and long term HRD plan in TSC on March 23, 2009.

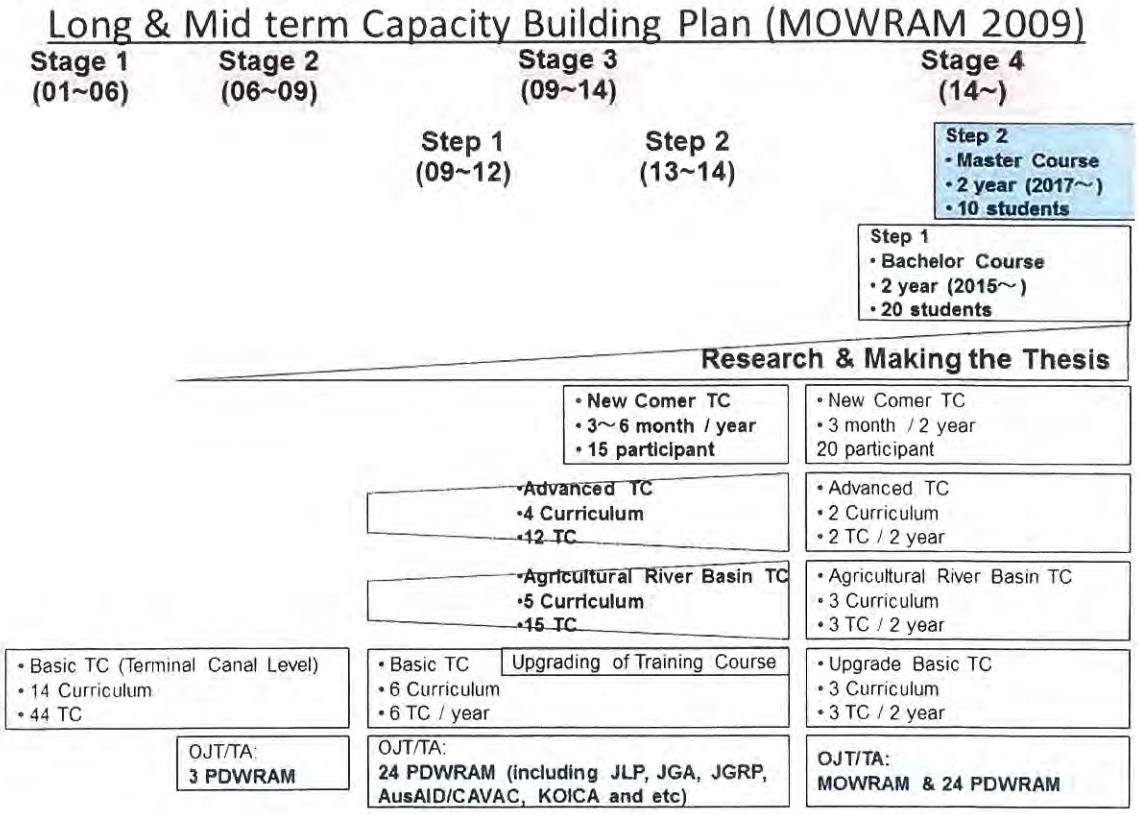
Capacity building Road Map of TSC was drafted through the discussion with MOWRAM and PDWRAM in this workshop. The Road Map is drawn up toward plan to take a step-by-step approach of enhancement of new comer training course and function of bachelor and Master course for strengthening the functions of the organization of TSC.

TSC is required to draw tangible HRD plan and action plan on water and irrigation management based on Road Map of TSC from mid and long term perspectives.

Japanese expert provided technical support to MOWRAM to formulate the mid and long term HRD plan on water and irrigation management based on Road Map.

Especially, the short-term expert simulated the yearly transition of age-distribution of staffs and suggested the importance of recruiting staff for foreseeing mid and long term vision in HRD. This suggestion was a vital factor to approach relief of imbalance in the age-distribution of MOWRAM staff.

The budgetary condition of Cambodian government has been limited so far and it will inevitably be hard to secure financial sustainability at this stage. In the progress situation of Road Map, the step-by-step approach of increasing staff, enhancement of budget and institutionalization of TSC do not proceed according to plan smoothly because of the unsubstantiated national budget plan of Road Map



2. Institutionalization of TSC

TSC was officially established as the department under Administration Affairs in 2006 and has acquired the independent budget since 2009 account year. MOWRAM had a long-term plan for institutionalization on water and irrigation management of TSC to restructure so as to hold educational function giving master degree. Now, MOWRAM has a plan of establishment of Institute of Crop and Water (ICW) which has been promoted under the assistance of Institut National Polytechnique (INP) de Toulouse, France, and China. The institute of ICW will be a main structure of high-educational function giving master-degree on the concerning subjects in Crop and Water, and TSC will belong under the new ICW.

Although detailed information on establishing "Institute of Crop and Water (ICW)" is not available, it seems that ICW will be launched in the near future. ICW might not only have training function (namely, a) to provide technical training to the technical staff of MOWRAM and PDWRAM, including the new recruits, b) to provide technical support to the irrigation development projects to be implemented by MOWRAM and PDWRAM) which is the TSC's current responsibility, but also the function of higher education and research. In this concept, TSC would become one of the major pillars of ICW.

3. Relief for an imbalance in the age-distribution of MOWRAM staff

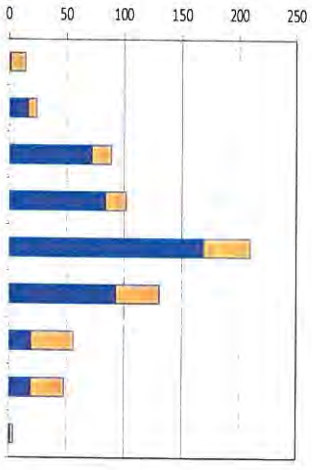
An excerpt from recommendation of the terminal evaluation report for TSC3 related to relief for an imbalance in the age-distribution of MOWRAM staff are described in the following.

As shown in the Table, which was prepared by the Project, number of young generation (21-35 years old) of MOWRAM is extremely small compared with the middle generation. Thus, ensuring sustainability, sound management of MOWRAM in the future recruiting young staff is essential. If MOWRAM continues to recruit less than 30 staff per year, sooner or later MOWRAM's ability to perform will deteriorate.

Table : General Features of the Age Structure of MOWRAM Staff (As of July 2012)

Class of Staff age	Cabinet	D.G. of Administration	D.G. of Technical	Others	Total
61 and above	11	1	1	1	14
56-60	3	3	16	2	24
51-55	7	8	72	2	89
46-50	3	11	84	4	102
41-45	5	27	168	10	210
36-40	2	21	93	15	131
31-35	0	32	19	5	56
26-30	2	26	19	1	48
21-25	2	1	1	0	4
Total	35	130	473	40	678

Source: Department of Administration and Human Resources, MOWRAM



Blue: D.G. Technical
Yellow: Others

Annex 24, which was prepared by the Project, shows the transition of MOWRAM's age distribution of under the condition which MOWRAM continues to recruit lower than 30 staff per year. According to the figures, most of experienced staff will retire after 2020, after which time the total number MOWRAM staff will be drastically decreased.

According to the analysis shown in Annex 25, it is needed that MOWRAM recruits about 90 staff per year constantly, to secure the necessary number of staff in the year of 2030.

VIII. List of Products

Annex 26 shows List of Product which are produced by project activity.

IX. Conclusion, Recommendations and Lessons Learned

1. Conclusion and recommendation

(1) Efforts for review of the Road Map based on establishment of institute of ICW

Now, MOWRAM has a plan of establishment of Institute of Crop and Water (ICW). The institute of ICW will be a main structure of high-educational function giving master-degree on the concerning subjects in Crop and Water, and TSC will belong under the new ICW.

Although detailed information on establishing "Institute of Crop and Water (ICW)" is not available, it seems that ICW will be launched in the near future. ICW might not only have training function which is the TSC's current responsibility, but also the function of higher education and research. In this concept, TSC would become one of the major pillars of ICW.

TSC's role which provides in-house training in RGC would be still very important in the ICW concept. TSC will be required to review the Capacity building Road Map of TSC and draw tangible HRD plan and action plan on water and irrigation management based on Road Map of TSC after getting detailed information on establishing ICW.

Furthermore, since human resource development of the private sector in the irrigation sector is also important, it could be considered to cover the private sector during discussion about the ICW concept.

(2) Continuous of the human resources development of TSC

The institute of ICW will have the function of higher education and research. In this concept, TSC would become one of the major pillars of ICW. Therefore, the engineers and technicians of TSC including new comer need to develop their capacities for the human resources development of TSC. For TSC staff, it is important to acquire more academic knowledge and innovation technology through opportunities for advanced studies and training in Cambodia, and/or overseas. It is thus recommended to RGC to continue efforts for human resource development of TSC personnel.

In the progress situation of Road Map, the step-by-step approach of increasing staff, enhancement of budget and institutionalization of TSC do not proceed according to plan smoothly. Therefore, the engineers and technicians of TSC may focus on developing their capacities to enhance training function of TSC, namely to provide technical training and technical support for a while.

(3) Continuous budget request for the human resources development of MOWRAM

For the effective and efficiency use of the RGC budget for irrigation and water resources development for poverty reduction of rural farmers, human resource development of engineers and technicians of MOWRAM and PDWRAM is essential. After the Project is completed, the TSC is going to continue all necessary activities, using its own staff and budget, without JICA's input. Therefore, it is strongly recommended that the RGC would secure the necessary budget for implementation of human resource development plan for irrigation and water resource engineers and technicians.

Regarding the budget for 2013, TSC requested the budget to MEF, based on the TSC's annual plan. The budget amount which was requested to MEF was approx. 1,372 million Riel (US$343 thousand: exchange rate, US$1=Riel 4,000); however MEF approved only 77 million Riel (US$19 thousand). For the budget for 2014, though TSC requested approx. 1,372 million Riel (US$343 thousand); however MEF approved only 66 million Riel (US$16.5 thousand), TSC remains not to receive full budget from MEF. Therefore, it is strongly recommended to the relevant agency of RGC to make maximum efforts for securing the TSC annual budget for the implementation of human resources development

plan of MOWRAM.

(4) Apply the Project's outputs to other irrigation projects

In the Project, many engineers and technicians have developed their capacities through the practical training provided by TSC C/Ps and JICA experts. After this Project, it is expected that these staff as core persons will implement any other projects related to the agricultural river basin management and development.

And also, MOWRAM/TSC/PDWRAM needs to apply the output of the Project to other irrigation projects implemented in the near future, such as national budget projects, Japanese ODA projects (the Grant Assistance for Grass Roots (Kusanone) projects, the Yen loan projects) and other donors' projects.

PDWRAM staff is expected to do planning, designing, construction management / supervision and water management by themselves for the projects. TSC is expected to provide training to PDWRAM staff and provide technical support. MOWRAM is expected to do administration role, such as securing budget, allocation of necessary staff, coordination among other Ministries and internal department and so on.

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

The Project compiled Text Books on technologies related to Agricultural River Basin Management and Development. Since these Text Books would integrate not only the literature review but also the actual experiences of model site activities, it is thus expected that these outputs would serve as useful references for the relevant departments of MOWRAM. It is recommended to MOWRAM to ensure the thorough dissemination and maximum utilization of these Project outputs.

(6) Qualification for the participated training

Guideline for applicants of TSC training course included the Qualification for the participated training. But, it was observed that some trainees, who do not match the qualification for the participated training.

The Project classified the training courses into four categories such as Basic course, Advance course, Agricultural River basin Management & Development course, etc. For the effective and efficient training, it is important to match between level of training course and trainees.

Therefore, in order to eliminate mismatch between level of training course and trainees, it is recommended to TSC to continue to consider the Qualification for the participated training according to level of training course. And also, it is recommended to each PDWRAM to continue to consider the necessary qualified staff for TSC training courses before selection.

(7) Providing training to newly recruited staff

MOWRAM recruited 31 new staff in 2012, 47 new staff in 2013, and will recruit about 100 new staff in 2014. So far, it is not easy to access to technical training for the staff, though each department, in which the new staff are assigned, provides training to the new staff.

Thus, the department of administration in MOWRAM is recommended to make necessary arrangement so that TSC can provide technical training. In addition, since the training program for newly recruited staff was developed in the Project, it is strongly recommended to TSC to utilize the training program developed by the Project when TSC implement the training to the new staff.

The budgetary condition of Cambodian government has been limited so far and it will inevitably be hard to secure financial sustainability at this stage. Therefore, TSC may provide technical training to some new staff by joining the technical training courses as part of trainee for a while.

(8) Change the role of FWUC/G in the model irrigation projects from "FWUG for promoting construction works" to "FWUG for promoting O&M works".

Since the construction works have been done, and farmers have started to use irrigation water in the model irrigation projects excluding Ream Korn, Wat Chre, and Wat Luoung, FWUC/G should start water fee collection as soon as possible. In the target model sites, Damnak Ampil, Thlear Maom, Roleang Chrey, Upper Slakou and Thomney have begun the collection of a water fee as of now.

The Project has supported the establishment of FWUC/G as one of the Project's key activities since the beginning. Consequently FWUGs have been established, and farmers have participated in the construction work in a participatory manner. This will provide evidence that changes in farmers' attitudes, through the Project activities, have occurred, and the evidence that FWUC/Gs function as organizations for promoting construction works.

After construction works done, the FWUC/Gs' role should be changed from promoting construction works to promoting O&M works including water fee collection. Therefore, the PDWRAMs provided the FWUC/Gs with the necessary knowledge and experiences, through workshops, especially on O&M issues, with technical support from TSC/JICA experts during the Project period. However, for FWUC/G member, water fee collection and other O&M activities are still challenging tasks, so they need technical support from the government side continuously.

After the Project terminated, PDWRAMs are also recommended to work for FWUC/Gs with support from MOWRAM like the department of irrigated agriculture and the department of FWUC with technical support from TSC.

Besides that, since FWUC/Gs can cover only O&M works for small scale facilities, PDWRAMs should cover O&M works for mid to large scale facilities in the sites.

Furthermore, it is obvious that maps, which show land owner, can help FWUC/G a lot in terms of water fee collection. Hence all PDWRAMs are recommended to prepare the maps as soon as possible with technical support from TSC.

(9) Relief for an imbalance in the age-distribution of MOWRAM staff

Number of young generation (21-35 years old) of MOWRAM is extremely small compared with the middle generation. Thus, ensuring sustainability, sound management of MOWRAM in the future recruiting young staff is essential.

Based on the analysis of the Project, it is recommended that MOWRAM should continue to recruit about 90 new staff per year, especially engineers and technicians, because MOWRAM/PDWRAM have to maintain and operate important infrastructure like dams and head works, and do proper water management of main river basins in the country.

In order to do this, the RGS's key actors like executive members of MOWRAM and the Ministry of Public Function, should understand that the purpose of this hiring policy. Hence it is also recommended that the department of administration in MOWRAM explains the current critical situation and requests to take necessary measures to the authority and the executives by using the outputs of the Project, to relieve MOWRAM's present age-distribution imbalance.

(10) Securing the salary incentive for personals of TSC

For the sustainable capacity and institutional development of TSC, it is important to consider the application of some support incentive systems.

Therefore, Project requests the Cambodian side to take the necessary measurement for securing some support incentive for the sustainability of TSC.

2. Lessons Learned

(1) Complementary relationship between Technical Cooperation project and the Yen loan project

The outputs by TSC3 can be good model for the Yen loan project, "West Tonle Sap Irrigation and Drainage Rehabilitation and Improvement Project". It is effective that implementing a technical cooperation project to strengthen capacity of implementation agency and to establish a model in the same target areas, before a Yen loan project starts.

In addition to that, if a Yen loan project, that can spread output of a technical cooperation, will be prepared in the same target area on the technical cooperation, the technical cooperation can focus more on capacity development rather than construction facilities.

(2) Effectiveness of combining hard and soft components

The Project aims to achieve the following goal, "Irrigation projects are properly planned, implemented and operated in the target area of the Project." The Project has covered theoretical as well as practical trainings. The Project experts have especially focused their efforts on OJT in the model irrigation projects. In the field, C/Ps of PDWRAM/TSC received practical training, which was previously lacking due to budget constraints. It is observed that technical training and OJT at model projects have complementary relationship in TSC3.

Consequently, C/Ps of PDWRAM/TSC acquired the confidence to manage construction works and supporting activities to FWUC/G by themselves.

In addition, farmers organized FWUC/Gs in each model site of the Project and participated in construction works.

We observed that it was not easy to motivate farmers after establishing farmers' groups in other projects. However, since irrigation facilities have been constructed in the model sites and farmers realized that they would soon get irrigation water, they were motivated to establish the FWUC/Gs. Furthermore, we observe that farmers' incomes have increased in these areas since the beginning of the Project.

On the other hand, from the project management view point, since the Project covers many model irrigation projects, TSC C/Ps and JICA experts have had difficulties managing the activities.

Based on the above information, the following the lessons can be learned.

1) The OJT model is effective in developing capacity among irrigation engineers and technicians. Technical cooperation be made by combining soft part and hard part is highly effective, and can be applied to any other projects
2) When an activity "strengthening water user groups" is included in a project, including construction works in the project is effective to motivate the target farmers.
3) Even though covering many pilot sites is crucial to expand the project outputs nationwide, too many pilot projects can make it difficult for C/Ps and JICA experts to properly manage the project activities. Thus, considering input by the recipient and donor countries, the project's contents and amount of activities should be decided.

(3) Collaboration among projects in the agriculture sector

The Project has had the opportunity to work with another JICA project, titled APPP whose purpose is to ensure that "Productivity and income of farmers are improved." The PDA/TSC staffs who are the C/P of the Project participated in several trainings sessions conducted by APPP. Thorough the APPP training, the PDA and TSC C/Ps learned about rice cultivation matters.

Through this collaborative work, PDA/TSC could learn how to teach O&M works to FWUC/Gs and farmers. Consequently, FWUC/Gs and farmers could learn how to manage irrigation water efficiently and produce higher yields. The collaboration among several complementary projects can be applied to projects in other countries. C/Ps in the recipient country can thus efficiently gain a wide spectrum of knowledge.

X Record of Joint Coordinating Committee

1. 1st JCC
   1) Date: March 23, 2010 (09:00～11:30)
   2) Venue: Meeting Room, MOWRAM
   3) Participants:

(Cambodia Side)

Dr. Teng Dara, Director, Dept. of Water Management & Conservation (Chairman)

Mr. Uch Hing, Deputy Director, TSC
Mr. You Sotha, Deputy Director, TSC
Ms. Pich Maly, TSC
Mr. Sok Korn, TSC
Mr. Sao Ena, TSC
Mr. Teav Vutha, TSC
Ms. Sans Chenda, TSC
Ms. Cheam Senny, TSC

<PDWRAM, MOWRAM>

Mr. Ea Piseth, Director, Kampong Speu
Mr. Eng Daravuth, Deputy Director, Kampong Chhnang
Mr. Huot Chandararith, Director, Battambang
Mr. San No, Deputy Director, Takeo

<Ministry of Agriculture, Forestry and Fisheries>

Mr. Prak Cheatlho, DDG of GDA

<Ministry of Economy and Finance>

Mr. Yos Sovanna, Officer

(Japanese Side)

Mr. Yukiharu Kobayashi, Senior Representative, JICA Cambodia Office
Ms. Ayako Osada, Program Assistant, JICA Cambodia Office
Mr. Akihiko Ihara, JICA Advisor to MOWRAM
Mr. Kaoru Nagai, Chief Advisor, TSC3
Mr. Masahiko Watanabe, Expert on Water Management, TSC3
Mr. Shigeo Watanabe, Project Coordinator, TSC3

4) Agenda:
   - Progress of Project Activities in 2009
   - Modification of Project Design Matrix (PDM)
   - Modification of Plan of Operation (PO)
   - Tentative Annual Plan of Project Activities in 2010

5) Summary of Meeting

Model Sites are established 11sites in 6 provinces; 8 new site and 3 former TSC2 sites. followed by TSC2 in 6 Provinces

Training Courses in GIS by irrigation planning has been conducted and GIS & GPS training was implemented in collaboration with AFD.

Other Donor Collaboration was accomplished with KOICA for Ream Thom Reservoir system in Kampong Cham.

Modification has been proposed to input the numeric notation in the Objectively Verifiable Indicators for Output in Project Design Matrix (PDM). The modified new PDM has been proposed to be version 1, and no objection has been raised.

Annual work plan for FY2010 in Training Course and Model Site Project was explained.

2. 2nd JCC

1) Date: October 15, 2010 (08:55～11:30)
2) Venue: Meeting Room, MOWRAM
3) Participants:

(Cambodia Side)

H. E. Bun Hean, Secretary of State / Project Director - Chairman
H.E. Pich Veasna, Deputy Director of General / Project Manager
Mr. Muy Monin, Director, Finance Department
Mr. Chhea Bunrith, Director, Human Resources Dept.
Dr. Teng Tara, Director, Water Management & Conservation Dept.
Mr. Sok Dalavy, Technical Affairs
Mr. Chim Kosal, Dept. of Hydrology & Water Works
Mr. Uch Hing, Deputy Director, TSC

Mr. You Sotha, Deputy Director, TSC
Ms. Pich Maly, TSC
Mr. Noun Vannarith, TSC
Mr. Hay Bunthoeun, TSC
Mr. Mean Seng, TSC
Mr. Sok Korn, TSC
Mr. Sao Ena, TSC
Mr. Teav Vutha, TSC
Mr. Meas Savoeun, TSC
Mr. Soeung Sotha, TSC
Ms. Sous Chenda, TSC
Ms. Cheam Senny, TSC
Mr. Chek Try, TSC

<PDWRAM, MOWRAM>

Mr. Dauk Binthou, Director, Kampong Chhnang
Mr. Hy Rithy, Deputy Director, Kampong Speu
Mr. Khay Soda,Deputy Director, Battambang
Mr. Ouk Vanna, Deputy Director, Kandal
Mr. Kit Phal, Chief of Irrigation Office, Pursat

<Ministry of Agriculture, Forestry and Fisheries>

Mr. Pech Sovanno, Deputy Director, GDA

<Ministry of Economy and Finance>

Mr. Sarim Sothoeun, Officer

<Japan International Cooperation Agency (JICA)>

Mr. Yasujiro Suzuki, Chief Representative, JICA Cambodia Office
Mr. Yukihiro Shibuya, Representative, JICA Cambodia Office
Ms. Siv Cheang, Program Officer, JICA Cambodia Office
Mr. Satoru Hagiwara, JICA Mission Leader, JICA HQ
Ms. Shoko Kanazawa, JICA Mission Member, JICA HQ
Mr. Akihiko Ihara, JICA Advisor to MOWRAM
Mr. Kaoru Nagai, Chief Advisor, TSC3
Mr. Masahiko Watanabe, Expert on Water Management, TSC3
Mr. Shigeo Watanabe, Project Coordinator, TSC3
Mr. Ryosuke Sakanashi, Short-term Expert, TSC3

4) Agenda
   - Progress of Project Activities in 2010
     Model Sites Activity
     Training Course
     Plan of River Basin Management

5) Summary of Meeting

The activity was briefed and the progresses of each site activity were explained.
5 training courses have been introduced in each outline and evaluation result.
The study for plan of ARBM&D was explained about 4 processes among the eight which TSC is going to follow in Pursat and Prek Thnot River Basin.

3. 3rd JCC

1) Date: September 14, 2011 (08:55～11:30)
2) Venue: Meeting Room, MOWRAM
3) Participants

(Cambodia Side)

H.E. Bun Hean, Secretary of State / Project Director – Chairman
H.E.Prum Saroeun,Team Leader,Cambodian Mid-Term Review Team
Mr. Mey Ly Huoth, Member of Cambodian Mid-Term Review Team, Deputy Director General of Administration
Mr. Chhea Bun Rith, Member of Cambodian Mid-Term Review Team

H.E. Pich Veasna, Deputy General Secretary of Tonle Sap Authority, Deputy Director General of Administration, Director of TSC / Project Manager
Mr. Chea Chhun Keat, Director of Planning and International Cooperation Department
Dr. Teng Dara, Director of Water Management & Conservation Dept.
Mr. Prey Sovann, Deputy Director of Administration and Human Resources Department
Mr. Uch Hing, Deputy Director, TSC
Mr. You Sotha, Deputy Director, TSC
Ms. Pich Maly, TSC
Mr. Noun Vannarith, TSC
Mr. Hay Bunthoeun, TSC
Mr. Mean Seng, TSC
Mr. Sok Korn, TSC
Mr. Sao Ena, TSC
Mr. Teav Vutha, TSC
Mr. Meas Savoeun, TSC
Mr. Soeung Sotha, TSC
Ms. Sous Chenda, TSC
Ms. Cheam Senny, TSC

<PDWRAM, MOWRAM>

Mr. Bun Huor, Director, Takeo
Mr. Ea Piseth, Director, Kampong Speu
Mr. Long Phal Kun, Director, Battangbang
Mr. Khay Soda,Deputy Director, Battambang
Mr. Chun Peng Long, Director, Kandal
Mr. Puth Sava, Chief Officer, Kampong Chhnang
Mr. Kit Phal, Chief Officer, Pursat

<Ministry of Agriculture, Forestry and Fisheries>

Mr. Prak Cheattho Deputy Director, GDA

<Ministry of Economy and Finance>

Mr. Dary Chetana, Chief, DIC
Mr. Chea Sengyi, Chief, DIC

<Japan International Cooperation Agency (JICA)>

Mr. Yasujiro Suzuki, Chief Representative, JICA Cambodia Office
Mr. Hiroshi Yokoi, Representative, JICA Cambodia Office
Ms. Aika Tomimatsu, Representative, JICA Cambodia Office
Ms. Chihiro Mano, Program Assistant, JICA Cambodia Office
Mr. Kenichiro Kobayashi, JICA Mission Leader, JICA HQ
Mr. Hiroshi Tanaka, JICA Mission Member, MAFF
Mr. Akira Matsumoto, JICA Mission Member, A & M Inc.
Mr. Masahiko Hiraiwa, JICA Advisor to MOWRAM
Mr. Kaoru Nagai, Chief Advisor, TSC3
Mr. Masahiko Watanabe, Expert on Water Management, TSC3
Mr. Shigeo Watanabe, Project Coordinator, TSC3
Mr. Masaru Imamura, Project Coordinator, TSC3
Mr. Eiji Takemori, Short-Term Expert, TSC3
Mr. Yoshinori Oyama, Short-Term Expert, TSC3

4) Agenda
   - Report of the Joint Mid-Term Review
   - Progress of Project Activities in 2011
     Model Sites Activity
     Training Course
     Plan of River Basin Management and development
     Working Style Reforming for Model Site Activity
5) Summary of Meeting

The Joint Team evaluated the Project in line with the five evaluation criteria based on the findings obtained from field observations and a series of discussions with those who are involved in the Project.

The Team concluded that the Project activities have been smoothly implemented, and the various publications like training manuals and survey documents have been compiled. Cambodian counterparts have been strengthened. However, it is still required to upgrade the knowledge and technical capacity related to the agricultural river basin management and development. And the Team mentioned that it is too early to evaluate the Project impact and sustainability at this stage, however, it is quite sure the Project is a right track and on the way of achievement of project purpose.

The activity was briefed and the progresses of each site activity were explained.

9 training courses have been introduced in each outline and evaluation result

1) Concept of River Basin Management, 2) Purpose of River Basin Management, 3) Water Use Issue in Cambodia, and 4) Activities in TSC 3 were explained.

1) Set up New Working System of Model Site Activity, 2) Proposal of Tentative Drafted Regulations on New Working System for Model Project which consist of a) Chapter I (General Provision), b) Chapter II (Model Project Sites and Activity, c) Chapter III (Formation of Working System, d) Chapter IV (Management of Model Projects, and e) Chapter V (Final Provision) were explained.

4. 4th JCC

1) Date: August 28, 2012 (08:30～11:30)
2) Venue: Meeting Room, MOWRAM
3) Participants

(Cambodia Side)

H.E. Bun Hean, Secretary of State / Project Director – Chairman
H.E. Pich Veasna, Deputy General Secretary of Tonle Sap Authority, Deputy Director General of Administration, Director of TSC / Project Manager
Dr. Teng Dara, Director of Water Management & Conservation Dept.
Mr. Prey Sovann, Deputy Director of Administration and Human Resources Department
Mr. Uch Hing, Deputy Director, TSC
Mr. You Sotha, Deputy Director, TSC
Ms. Pich Maly, TSC
Mr. Noun Vannarith, TSC
Mr. Hay Bunthoeun, TSC
Mr. Mean Seng, TSC
Mr. Sok Korn, TSC
Mr. Sao Ena, TSC
Mr. Teav Vutha, TSC
Mr. Meas Savoeun, TSC
Mr. Soeung Sotha, TSC
Ms. Sous Chenda, TSC
Ms. Cheam Senny, TSC

<PDWRAM, MOWRAM>

Mr. Bun Huor, Director, Takeo
Mr. Heng Sodara, Chief Officer, Takeo
Mr. Khay Soda,Deputy Director, Battambang
Mr. Huot Chandararith, Chief Officer, Battambang
Mr. Ea Piseth, Director, Kampong Speu
Mr. Roeung Chhorn, Vice Chief, Kampong Speu
Mr. Chun Peng Long, Director, Kandal
Mr. Leng Sasel, Chief Officer, Kandal
Mr. Dauk Bunthon, Diretor, Kampong Chhnang
Mr. Puth Sava, Chief Officer, Kampong Chhnang

Mr. Keo Vey, Director, Pursat
Mr. Kit Phal, Chief Officer, Pursat

<Ministry of Agriculture, Forestry and Fisheries>

Mr. Prak Cheattho Deputy Director, GDA
Mr. Sorn Uichet, Officer, GDA

<Ministry of Economy and Finance>

Mr. Ream Utdom, Deputy Chief, DIC

<Japan International Cooperation Agency (JICA)>

Mr. Yasujiro Suzuki, Chief Representative, JICA Cambodia Office
Mr. Kazuhiko Uzawa, Second Secretary, Japanese Embassy
Mr. Hiroshi Yokoi, Representative, JICA Cambodia Office
Mr. Wataru Ueda, Staff, JICA Cambodia Office
Mr. Masahiko Hiraiwa, JICA Advisor to MOWRAM
Mr. Kaoru Nagai, Chief Advisor, TSC3
Mr. Tokuyuki Atago, Expert on Water Management, TSC3
Mr. Masaru Imamura, Project Coordinator, TSC3
Mr. Yoshinori Oyama, Short-Term Expert, TSC3

4)Agenda

- Review of the discussion of the 2nd Project Management Meeting (PMM)
- Progress of Project Activities in 2011 to 2012
  Model Sites Activity
  Training Course

5)Summary of Meeting

Contents of the 2nd PMM which were Report of the whole activities in half project implementing periods and plans of next half periods was presented.

The activity was briefed and the progresses of each site activity were explained and plans of next year's activity were accepted.

5. 5th JCC

1) Date: September 17, 2013 (08:30～12:00)
2) Venue: Meeting Room, MOWRAM
3) Participants

(Cambodia Side)

H.E. Bun Hean, Secretary of State / Project Director – Chairman
H.E. Pich Veasna, Deputy General Secretary of Tonle Sap Authority, Deputy Director General of Administration, Director of TSC / Project Manager
Dr. Teng Dara, Director of Water Management & Conservation Dept.
Mr. Chhea Bunrith, Director of Administration
Mr. Uch Hing, Deputy Director, TSC
Mr. You Sotha, Deputy Director, TSC
Ms. Pich Maly, TSC
Mr. Noun Vannarith, TSC
Mr. Hay Bunthoeun, TSC
Mr. Mean Seng, TSC
Mr. Sok Korn, TSC
Mr. Sao Ena, TSC
Mr. Teav Vutha, TSC
Mr. Meas Savoeun, TSC
Mr. Soeung Sotha, TSC
Ms. Sous Chenda, TSC
Ms. Cheam Senny, TSC

<PDWRAM, MOWRAM>

Mr. Bun Huor, Director, Takeo

Mr. Kea Sam In, Chief Officer, Takeo
Mr. Khay Soda,Deputy Director, Battambang
Mr. Chen Sokhon, Vice Chief, Battambang
Mr. Ea Piseth, Director, Kampong Speu
Mr. Chea Bora, Chief Officer, Kampong Speu
Mr. Chun Peng Long, Director, Kandal
Mr. Prak Lak, Deputy Director, Kandal
Mr. Dauk Bunthon, Diretor, Kampong Chhnang
Mr. Wy Sorchea, Staff, Kampong Chhnang
Mr. Kit Phal, Deputy Director, Pursat
Mr. Sat Bun No, Staff, Pursat

<Ministry of Agriculture, Forestry and Fisheries>

Mr. Prak Cheattho Deputy Director, GDA

<Ministry of Economy and Finance>

Mr. Vorn Sovannara, Staff, DIC

<Japan International Cooperation Agency (JICA)>

Mr. Hiroshi Izaki, Chief Representative, JICA Cambodia Office
Mr. Kazuhiko Uzawa, Second Secretary, Japanese Embassy
Ms. Yoko Kinashi, Representative, JICA Cambodia Office
Mr. Wataru Ueda, Staff, JICA Cambodia Office
Mr. Masahiko Hiraiwa, JICA Advisor to MOWRAM
Mr. Masayuki Horiuchi, Chief Advisor, TSC3
Mr. Tokuyuki Atago, Expert on Water Management, TSC3
Mr. Masaru Imamura, Project Coordinator, TSC3

4) Agenda
- Progress of Project Activities in 2012 to 2013
  - Model Sites Activity
  - Training Course
  - River Basin Management
  - Strength of FWUC/G
  - Collaboration Activity with APPP

5) Summary of Meeting

The activity was briefed and the progresses of each site activity were explained and plans of next year's activity were accepted.

6. 6th JCC

1) Date: February 13, 2014 (08:00～12:00)
2) Venue: Meeting Room, MOWRAM
3) Participants

(Cambodia Side)

H.E. Bun Hean, Secretary of State / Project Director – Chairman
Mr. Mey Ly Huoth, Team Leader of Cambodian Terminal Evaluation Team, Deputy Director General of Administration
Mr. Bull Delly, Member of Cambodian Terminal Evaluation Team, Deputy Director General of Technical Affairs
Mr. Chhea Bun Rith, Member of Cambodian Mid-Term Review Team, Director of Administration and Human Resources
Mr. Chea Chhun Keat, Director of Planning and International Cooperation Department
Dr. Teng Dara, Director of Water Management & Conservation Dept.
Mr. Uch Hing, Deputy Director, TSC
Mr. You Sotha, Deputy Director, TSC
Ms. Pich Maly, TSC
Mr. Noun Vannarith, TSC
Mr. Hay Bunthoeun, TSC
Mr. Mean Seng, TSC

Mr. Sok Korn, TSC
Mr. Sao Ena, TSC
Mr. Teav Vutha, TSC
Mr. Meas Savoeun, TSC
Mr. Soeung Sotha, TSC
Ms. Sous Chenda, TSC
Ms. Cheam Senny, TSC

<PDWRAM, MOWRAM>

Mr. Bun Huor, Director, Takeo
Mr. Nou Ketputhrath, Vice Chief, Takeo
Mr. Long Phal Kun, Director, Battangbang
Mr. Huot Chandararith, Chief Officer, Battambang
Mr. Keo Vey, Director, Pursat
Mr. Kit Phal, Deputy Director, Pursat
Mr. Ea Piseth, Director, Kampong Speu
Mr. Chea Bora, Chief Officer, Kampong Speu
Mr. Chun Peng Long, Director, Kandal
Mr. Prak Lak, Deputy Director, Kandal

<Ministry of Agriculture, Forestry and Fisheries>

Mr. Seng Tuy Deputy Director, GDA

<Japan International Cooperation Agency (JICA)>

Mr. Takashi Ito, Senior Representative, JICA Cambodia Office
Mr. Shinichi Tamamitsu, first Secretary ,Embassy of Japan
Mr. Kenichiro Kobayashi, JICA Mission Leader, JICA HQ
Mr. Tetsuya Oishi, JICA Mission Member, MAFF
Mr. Naoki Yoshikawa, JICA Mission Member, JICA HQ
Mr. Akira Matsumoto, JICA Mission Member, A & M Inc.
Ms. Yoko Kinashi, Representative, JICA Cambodia Office
Ms. Haruko Toyama, Staff, JICA Cambodia Office
Mr. Masahiko Hiraiwa, JICA Advisor to MOWRAM
Mr. Masayuki Horiuchi, Chief Advisor, TSC3
Mr. Tokuyuki Atago, Expert on Water Management, TSC3
Mr. Masaru Imamura, Project Coordinator, TSC3
Mr. Satoru Hagiwara, Chief Advisor, APPP

4) Agenda
- Report of the Joint Terminal Evaluation Team
- Progress of Project Activities in 2013 to 2014

5) Summary of Meeting

The Joint Team evaluated the Project in line with the five evaluation criteria based on the findings obtained from field observations and a series of discussions with those who are involved in the Project.

The Joint Team concluded that the Project activities have been smoothly implemented, The activity was briefed and the progresses of each site activity were explained.

7. 7th JCC

1) Date: August 22, 2014 (08:30～11:00)
2) Venue: Meeting Room, MOWRAM
3) Participants

(Cambodia Side)

H.E. Bun Hean, Secretary of State / Project Director – Chairman
H.E. Pich Veasna, Deputy General Secretary of Tonle Sap Authority, Deputy Director General of Administration, Director of TSC / Project Manager
Mr. Chea Chhun Keat, Director of Planning and International Cooperation Department
Dr. Teng Dara, Director of Water Management & Conservation Dept.
Mr. Uch Hing, Deputy Director, TSC

Mr. You Sotha, Deputy Director, TSC
Ms. Pich Maly, TSC
Mr. Noun Vannarith, TSC
Mr. Hay Bunthoeun, TSC
Mr. Mean Seng, TSC
Mr. Sok Korn, TSC
Mr. Sao Ena, TSC
Mr. Teav Vutha, TSC
Mr. Meas Savoeun, TSC
Mr. Soeung Sotha, TSC
Ms. Sous Chenda, TSC
Ms. Cheam Senny, TSC

<PDWRAM, MOWRAM>

Mr. Nou Ketputhrath, Vice Chief, Takeo
Mr. Kay Soda, Deputy Director, Battangbang
Mr. Dim Sarom, Chief Officer, Battambang
Mr. Lao Sokha, Vice Chief, Pursat
Mr. Nhanh Cheashorng, Deputy Director, Kampong Speu
Mr. Chea Bora, Chief Officer, Kampong Speu
Mr. Prak Lak, Deputy Director, Kandal
Mr. Hong Cheanglim, Chief Officer, Kandal
Mr. Oeur Soroeun, Staff, Kampong Chhnang

<Ministry of Economy and Finance>

Mr. Nou Phyrith, Officer, DIC

<Japan International Cooperation Agency (JICA)>

Mr. Hiroshi Izaki, Resident Representative, JICA Cambodia Office
Mr. Kazuhiko Uzawa, Second Secretary, Embassy of Japan
Ms. Erika Inoue, Staff, Embassy of Japan
Ms. Yoko Kinashi, Representative, JICA Cambodia Office
Mr. Takeshi Sekijima, JICA Advisor to MOWRAM
Mr. Masahiko Hiraiwa, Chief Advisor, RBWRU
Mr. Ryoji Takahashi, Expert, RBWRU
Mr. Yasuo Uchida, Project Coordinator, RBWRU
Mr. Masayuki Horiuchi, Chief Advisor, TSC3
Mr. Tokuyuki Atago, Expert on Water Management, TSC3
Mr. Masaru Imamura, Project Coordinator, TSC3
Ms. Irie Kawauchi, Staff, TSC3

4) Agenda
   - Progress of Project Activities in 2014
   - Handover for Construction at Model Sites

5) Summary of Meeting

The activity was briefed and the progresses of each site activity were explained.
Officially Constructions at Model Sites were handover to MOWRAM.

XI Revision of the 2014 TSC Plan

After the Project is completed, the TSC is going to continue all necessary activities, using its own staff and budget, without JICA's input. Regarding the budget for 2014, TSC requested the budget to MEF, based on the TSC's annual plan. But, TSC was not able to receive full budget from MEF.

Thus, considering this situation, TSC revised the TSC annual plan for 2014 to set and achieve a more realistic goal based on the amount of budget approved by MEF.

Basic policy and Revision of the 2014 annual plan in TSC is shown in ANNEX 27.

For reference of Basic policy of the 2014 annual plan in TSC, Future Perspective and Expected Activities of TSC after TSC3 is shown in ANNEX 28.

Annex 1

Project Design Matrix (PDM) revised

Project Title: Improvement of Agricultural River Basin Management and Development Project (TSC 3)

Project Duration: September, 2009 to August , 2014

Version Number: Version 2.0

Target Area: Six (6) Provinces, namely, Kandal, Takeo, Pursat, Kampong Chhnang, Kampong Spue, and Battambang

Date: 14 September 2011

Target Group: Counterpart personnel in TSC, PDWRAM and PDA in the target area, the engineers and technicians in MOWRAM and other PDWRAM, and the farmers in the model project sites

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal: Agricultural productivity in the target area is stabilized through efficient water resources management realized by improved technical capacity of MOWRAM and PDWRAM in agricultural river basin management and development (*1).	1-1. Unit yield of rice and other crops in the target area of the Project is improved to reach the national target. 1-2. Irrigated field area is increased due to the efficient water utilization and distribution in the target area of the Project. (including 2 season or 3 season crop cultivation).	1-1. Statistical Data of MAFF and PDA in the target area, and Baseline study of the project 1-2. Sample survey in the model sites	
Project Purpose: Irrigation projects are properly planned, implemented and operated in the target area of the Project.	1-1.Number of the newly formulated irrigation projects in the target area, which are planned and designed based on the water supply circulation. 1-2.Total length of rehabilitated irrigation canal of the project 2.Number of PDWRAM technicians who obtained appropriate operation skills through TSC training, and Number of PDWRAM technicians who conducted any activities in the target areas of the Project. 3.Number of farmers group (water user committee and so on) are newly established, and periodical O&M activities	1-1 Project records and documents 1-2 Field survey and interviews	* There is no drastic climate change that affects the agricultural production.
Outputs: 1. TSC obtain capacities to implement training and provide technical supports for MOWRAM and PDWRAM related to the agricultural river basin management and development.	1. More than 90 % of TSC staff become competent in carrying out training and technical supports. 2. More than 80 % of PDWRAM are satisfied with training and technical supports of TSC	1-1 Evaluation by training participants 1-2 Self evaluation of TSC staff 2. Questionnaire survey with PDWRAM	* The funds are made available for the planned irrigation projects in the target area. * Security situations in the target area do not become extremely unstable. * There is no conflict among the farmers in the model project sites.
2. The engineers and technicians in MOWRAM and PDWRAM obtain knowledge on concepts and technologies related to the agricultural river basin management and development through training.	1. More than 15 training courses on agricultural river basin management and development are conducted. 2. More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	1. Project records and documents 2. Evaluation results of the training courses	
3. The capacities of the engineers and technicians of MOWRAM and PDWRAM on planning, survey, design, construction management, operation and maintenance (O&M) of facilities and structures in an irrigation system as a whole are improved through training.	1. More than 12 training courses are conducted on technologies related to the development and management of an irrigation system as a whole. 2. More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	1. Project records and documents 2. Evaluation results of the training courses	
4. The technical support system of TSC is established to promote implementation of irrigation projects nationwide by PDWRAM.	1. More than 30 project plans are formulated with technical supports of TSC for budget requests.	1-1. Records and documents of TSC and the Project 1-2. Application reports of irrigation projects to RGC and donors	
Activities: 1-1 Provide training to the TSC staff on the knowledge and technologies related to the agricultural river basin management and development.	**Inputs** **(Cambodia side)** **Personnel** (1)Project Director: Secretary of State, MOWRAM	**(Japanese side)** **Long-term Experts** (1) Chief Advisor / Agricultural River Basin	* Relevant authorities and stakeholders are supportive to promote the model projects. * Farmers are eager to participate the model

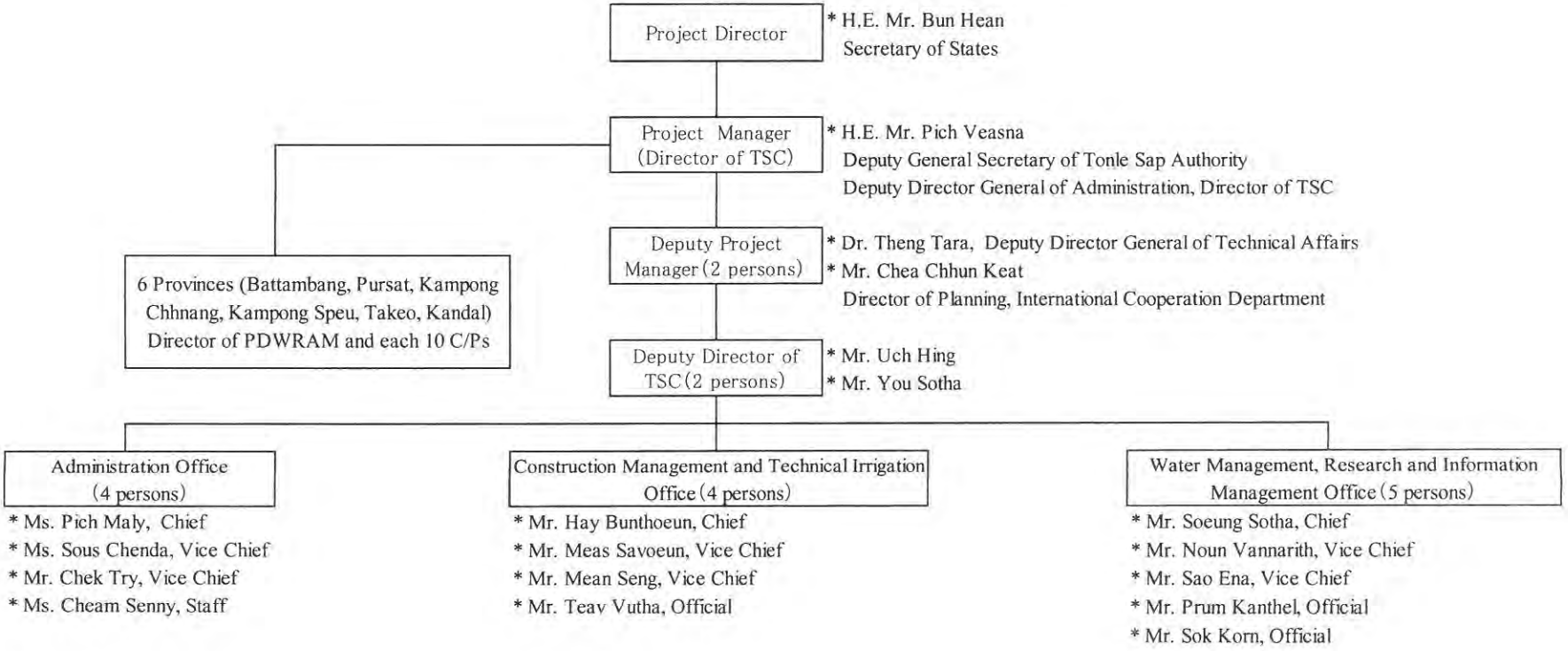
1-2 Provide training to the TSC staff on the knowledge and technologies related to the irrigation facilities and structures in the main system. 1-3 Reinforce the technical learning above of the TSC staff through actual conduct of the training courses for the engineers and technicians of MOWRAM and PDWRAM. 1-4 Provide technical support to MOWRAM to formulate the mid- / long-term human resource development (HRD) plan on water and irrigation management based on Capacity building Roadmap of TSC. 2-1 Formulate training courses on agricultural river basin management and development. 2-2 Conduct and evaluate the training courses on agricultural river basin management and development. 2-3 Review and revise the training courses on agricultural river basin management and development. 3-1 Formulate the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-2 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-3 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-4 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the tertiary system that have been developed through the foregoing TSC Phase 2 Project. 3-5 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the tertiary system. 3-6 Provide technical support to formulate the training courses for the newly recruited staff of MOWRAM and PDWRAM based on the HRD plan as the above mentioned on Activity 1-4. 4-1 Select the sites for the model irrigation projects (*3) of in the target area of the Project. 4-2 Provide technical support for the respective PDWRAM to plan, design, construct and conduct operation and maintenance (O&M) of the model irrigation projects. 4-3 Provide technical support for the respective PDWRAM to apply participatory irrigation management in close collaboration with beneficiary farmers, PDA and other relevant stakeholders in the area. 4-4 Based on the experiences of the technical supports above, formulate manuals for PDWRAM on planning of the irrigation projects.	(2)Project Manager: Director General of Technical Affairs, MOWRAM (3)Project Sub-Manager: - Deputy Director of the Department of Administration Affair and Director of TSC - Deputy Director General of Technical Affairs and Director of Water Conservation and management - Director of Planning and International Cooperation (4)Counterpart Personnel of TSC and PDWRAM **Land, Building and Facilities** (1)Office building and facilities necessary for the implementation of the Project (2)Office space and necessary facilities for the Japanese experts and related staff members (3)Land for the model project sites (4)Other facilities mutually agreed upon as necessary	Management (2) Participatory Irrigation Management (3) Training / Project Coordinator **Short-term Experts** (1) GIS (2) Meteo-Hydrological Analysis (3) Structural Design and Calculation for Reservoir and Main Dyke (4) Water Balance Calculation and Planning for Water Allocation (5) Soil and Concrete Analysis (6) Remote Sensing (7) Watershed Management (8) Other relevant fields **Training of counterpart personnel in Japan and/or the third countries**	irrigation projects. Pre-condition

*1: Agricultural river basin management and development is the holistic concept of water resource management to enable efficient water distribution among the irrigation systems at a river basin level, considering the needs of the other sectors.

*2: Curriculum target is set for each training course to evaluate the level of participants' understanding, based on the pre- and post-training tests, self evaluation of participants and so forth.

*3: Model irrigation projects are the interventions by the Project for improvement of water management, such as improvement of irrigation facilities, demonstration of participatory irrigation management as well as the operation and maintenance, enhancement of irrigated farming technologies and so forth.
According to the agreement between GOC and JICA, the model irrigation project sites and its activities will be modified.

ANNEX2 Organizational Structure of the Project

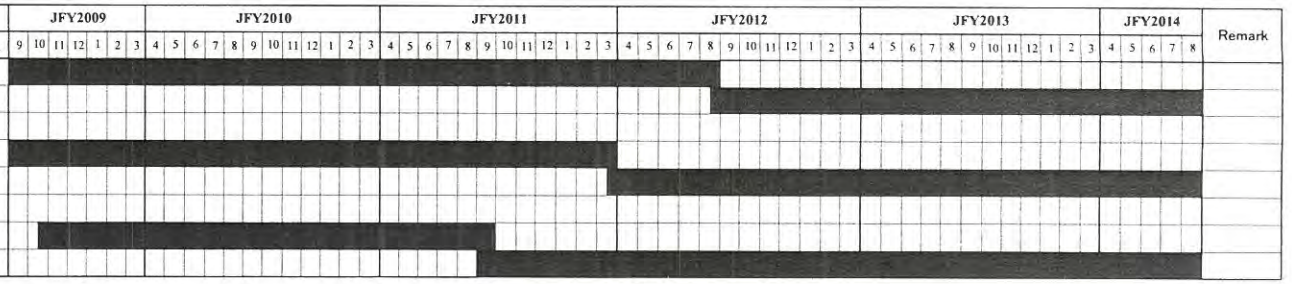


Activities		JFY2009			JFY2010				JFY2011				JFY2012				JFY2013				JFY2014	
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
0. Preparatory activities																						
(1) Gather technical references on the agricultural river basin management and development.	Plan																					
	Actual																					
(2) Gather basic information on the proposed model project sites.	Plan																					
	Actual																					
(3) Set up the management body of the Project and prepare the work plan.	Plan																					
	Actual																					
(4) Review and decide the indicators with target figures.	Plan																					
	Actual																					
1-1 Provide training to TSC staff on the knowledge and technologies related to the agricultural river basin management and development.	Plan																					
	Actual																					
(1) Prepare training course and materials for in-house training on the agricultural river basin management and development.	Plan																					
	Actual																					
(2) Organize the in-house training on the agricultural river basin management and development.	Plan																					
	Actual																					
1-2 Provide training to TSC staff on the knowledge and technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(1) Prepare training course and materials for in-house training on the knowledge and technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(2) Organize the in-house training on the knowledge and technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
1-3 Reinforce the technical learning above of TSC staff through actual conduct of the training courses for the engineers and technicians of MOWRAM and PDWRAM.	Plan																					
	Actual																					
(1) Organize preparatory meetings among TSC staff for formulation of training course on the agricultural river basin management and development.	Plan																					
	Actual																					
(2) Organize preparatory meetings among TSC staff for formulation of training course on the knowledge and technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(3) Organize the review meetings among TSC staff to evaluate their own understanding on the training subjects.	Plan																					
	Actual																					
1-4 Provide support to MOWRAM to formulate the mid- / long-term human resource development plan on water and irrigation management.	Plan																					
	Actual																					
(1) Analyze the results of training evaluations to be reflected in the human resource development program on water and irrigation management.	Plan																					
	Actual																					
(2) Provide suggestions for possible modification of the human resource development program on water and irrigation management.	Plan																					
	Actual																					
2-1 Formulate training courses on agricultural river basin management and development.	Plan																					
	Actual																					
(1) Review the technical references to select the contents to be covered in the training courses.	Plan																					
	Actual																					
(2) Formulate the detailed plan of the training courses and set curriculum targets for evaluation.	Plan																					
	Actual																					
(3) Prepare necessary textbook and/or training materials.	Plan																					
	Actual																					
2-2 Conduct and evaluate the training courses on agricultural river basin management and development.	Plan																					
	Actual																					
(1) Conduct training courses with field exercises.	Plan																					
	Actual																					
(2) Conduct evaluation of the training courses.	Plan																					
	Actual																					
2-3 Review and revise the training courses on agricultural river basin management and development.	Plan																					
	Actual																					
(1) Analyze the results of evaluation to identify any topic or method of training to be improved.	Plan																					
	Actual																					
(2) Revise the contents of the training course with appropriate modifications.	Plan																					
	Actual																					
3-1 Formulate the training courses on the technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(1) Review the technical references to select the contents to be covered in the training courses.	Plan																					
	Actual																					
(2) Formulate the detailed plan of the training courses and set curriculum targets for evaluation.	Plan																					
	Actual																					
(3) Prepare necessary textbook and/or training materials.	Plan																					
	Actual																					
3-2 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(1) Conduct training courses with field exercises.	Plan																					
	Actual																					
(2) Conduct evaluation of the training courses.	Plan																					
	Actual																					
3-3 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(1) Analyze the results of evaluation to identify any topic or method of training to be improved.	Plan																					
	Actual																					
(2) Revise the contents of the training course with appropriate modifications.	Plan																					
	Actual																					
3-4 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the tertiary system that have been developed through the foregoing TSC Phase 2 Project.	Plan																					
	Actual																					
(1) Conduct training courses with field exercises.	Plan																					
	Actual																					
(2) Conduct evaluation of the training courses.	Plan																					
	Actual																					
3-5 Review and revise the training courses on technologies related to the irrigation facilities and structures in the tertiary system.	Plan																					
	Actual																					
(1) Analyze the results of evaluation to identify any topic or method of training to be improved.	Plan																					
	Actual																					
(2) Revise the contents of the training courses with appropriate modifications.	Plan																					
	Actual																					
3-6 Formulate the training courses for the newly recruited staff of MOWRAM and PDWRAM based on the revised training courses above.	Plan																					
	Actual																					
(1) Select the appropriate contents from the revised training courses for newly recruited staff.	Plan																					
	Actual																					
(2) Formulate the detailed plan of the training courses and set curriculum targets for evaluation.	Plan																					
	Actual																					
4-1 Select the sites for the model irrigation projects of in the target areas of the Project.	Plan																					
	Actual																					
(1) Review the basic data and identify the contents of model irrigation projects for each proposed sites.	Plan																					
	Actual																					
(2) Discuss between PDWRAM and TSC to formulate the overall implementation plans of the model irrigation projects.	Plan																					
	Actual																					
(3) Conduct initial explanatory meetings for the relevant stakeholders in the model project sites.	Plan																					
	Actual																					
4-2 Provide technical support for the respective PDWRAM to plan, design, construct and conduct operation and maintenance (O&M) of the model irrigation projects.	Plan																					
	Actual																					
(1) Organize workshops with farmers and local government authorities in the model project sites for mapping and planning of the model irrigation projects.	Plan																					
	Actual																					
(2) Conduct survey and design the facilities and/or structures in consultation with the farmers.	Plan																					
	Actual																					
(3) Plan, conduct and supervise the construction activities with participation of the farmers.	Plan																					
	Actual																					
(4) Formulate the O&M plans in consultation with the farmer water user groups (FWUG) and facilitate the implementation of O&M activities.	Plan																					
	Actual																					
4-3 Provide technical support for the respective PDWRAM to apply participatory irrigation management in close collaboration with beneficiary farmers, PDA and other relevant stakeholders in the area.	Plan																					
	Actual																					
(1) Facilitate the farmers to organize the FWUG.	Plan																					
	Actual																					
(2) Conduct farmer-to-farmer training / study tours for the FWUG members.	Plan																					
	Actual																					
(3) Coordinate with PDA and other relevant stakeholders to disseminate improved farming technologies to the farmers in the model project sites.	Plan																					
	Actual																					
(4) Assist the local authorities and the FWUG to organize Farmer Water User Community (FWUC).	Plan																					
	Actual																					
4-4 Based on the experiences of the technical supports above, formulate manuals for PDWRAM on formulation on planning of irrigation projects	Plan																					
	Actual																					
(1) Review the implementation processes of the model irrigation projects.	Plan																					
	Actual																					
(2) Review the samples of irrigation project plans submitted for budget requests.	Plan																					
	Actual																					
(3) Formulate the manuals for PDWRAM on formulation of irrigation project plans.	Plan																					
	Actual																					

ANNEX 4 : List of Japanese Experts

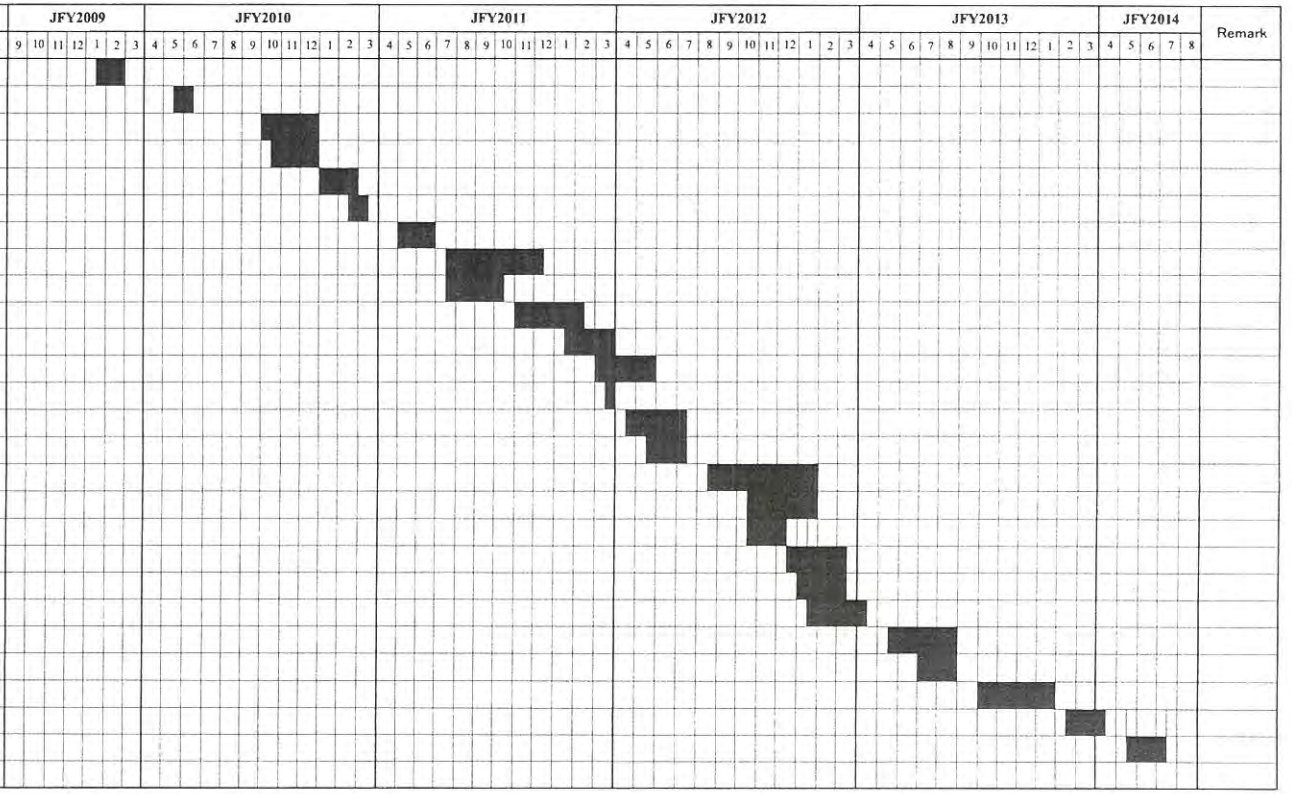
(long-term)

No	Name of Expert	Field of Expertise	Duration of Assignment	Remark
1	Mr. Kaoru NAGAI	Chief Advisor / River Basin Management	2009. 09. 01-2012. 08. 31	
2	Mr. Masayuki HORIUCHI	Chief Advisor / River Basin Management	2012. 08. 20-2014. 03. 31	
3	Mr. Masahiko WATANABE	Participatory Water Management	2009. 09. 01-2012. 03. 31	
4	Mr. Tokuyuki ATAGO	Participatory Water Management	2012. 03. 16-2014. 08. 31	
5	Mr. Shigeo WATANABE	Project Coordinator	2009. 10. 21-2011. 10. 03	
6	Mr. Masaru IMAMURA	Project Coordinator / Training	2011. 08. 29-2014. 08. 31	



(short-term)

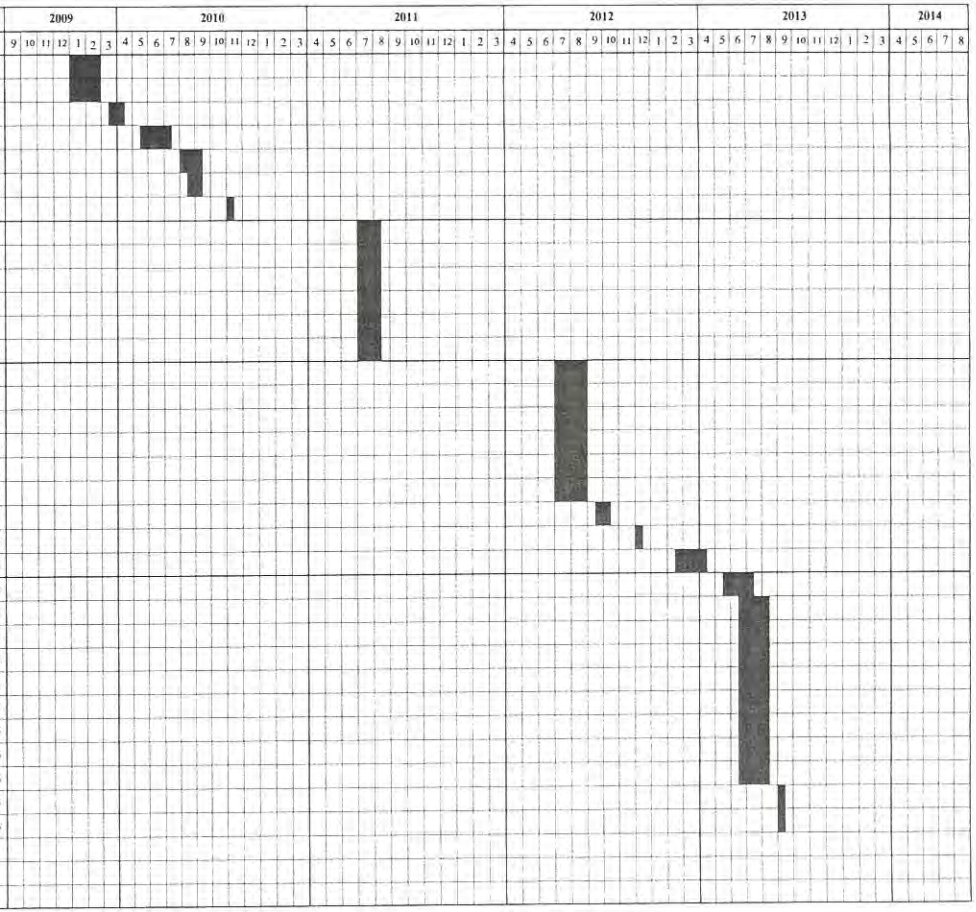
No	Name of Expert	Field of Expertise	Duration of Assignment	Remark
1	Mr. Manabu KAWAGUCHI	Irrigation Planning with GIS	2010. 01. 17-2010. 02. 27	
2	Dr. Takao MASUMOTO	River Basin Management	2010. 05. 16-2010. 06. 06	
3	Mr. Ryosuke SAKANASHI	Irrigation Planning & Construction Management	2010. 10. 05-2010. 12. 28	
4	Mr. Masanobu SAKURAI	Meteorology and Hydrology Analysis	2010. 10. 19-2010. 12. 24	
5	Mr. Manabu KAWAGUCHI	Remote Sensing	2011. 01. 04-2011. 02. 28	
6	Mr. Takeo YOSHIDA	River Basin Management	2011. 02. 23-2011. 03. 12	
7	Mr. Takeo YOSHIDA	Run-Off Analysis	2011. 05. 08-2011. 07. 09	
8	Mr. Yoshinori OYAMA	Canal Planning	2011. 07. 11-2011. 12. 08	
9	Mr. Eiji TAKEMORI	Irrigation Planning	2011. 07. 11-2011. 10. 12	
10	Mr. Shinwa HORI	Irrigation and Water Management	2011. 11. 06-2012. 02. 08	
11	Mr. Manabu KAWAGUCHI	Remote Sensing	2012. 01. 25-2012. 04. 28	
12	Mr. Yoshinori OYAMA	Construction Management (Disaster Recovery Work)	2012. 02. 28-2012. 05. 26	
13	Ms. Ieko KAKUTA	Farmers Participatory Irrigation Management	2012. 03. 16-2012. 03. 30	
14	Ms Yoko YAMAZAKI	Human Resource Development Planning	2012. 04. 23-2012. 07. 08	
15	Mr. Takeo YOSHIDA	Basin-Wide Irrigation Planning	2012. 05. 16-2012. 07. 20	
16	Mr. Yoshinori OYAMA	Guideline of Planning, Design and Construction Management of Small Scale Reservoir	2012. 08. 19-2013. 01. 25	
17	Mr. Shuichi MATSUSHIMA	Training Program for Newly Recruited Staffs	2012. 10. 11-2013. 01. 29	
18	Mr. Eiji TAKEMORI	River Basin Irrigation Water Management	2012. 10. 17-2012. 12. 08	
19	Mr. Manabu KAWAGUCHI	Remote Sensing	2012. 12. 23-2013. 03. 07	
20	Mr. Kenji TAMURA	Capacity Building of FNUC	2013. 01. 06-2013. 03. 21	
21	Mr. Nobuaki CHIBA	Soil / Cement Test and Analysis	2013. 01. 13-2013. 04. 12	
22	Mr. Eiji TAKEMORI	Irrigation Water Distribution Plan, Operation and Maintenance Management	2013. 05. 26-2013. 08. 23	
23	Mr. Takeo YOSHIDA	Hydrology and Water Resources Management	2013. 06. 30-2013. 08. 25	
24	Mr. Eiji TAKEMORI	River Basin Irrigation Water Management, Design and Construction Management	2013. 10. 07-2014. 02. 01	
25	Mr. Masayuki Kodama	Head Works' Planning, Design and Construction Management	2013. 12. 09-2014. 04. 04	
26	Dr. Takeo Yoshida	Basin-Wide Irrigation Planning	2014. 05. 18-2014. 07. 19	



ANNEX 5 : List of C/P Training in Japan and the third Contries

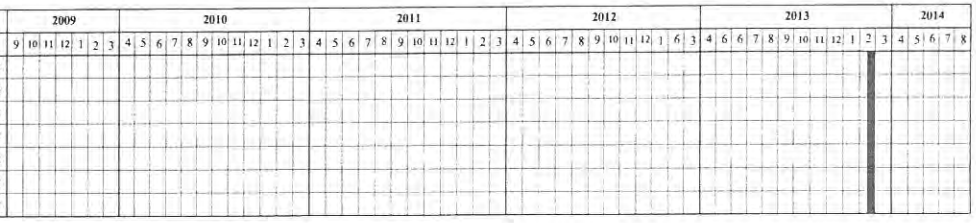
(1) Counterpart Personnel Training in Japan

No	Name of Counterpart Personnel	Field in Expertise	Name of Training Course	Duration of Training	
				From	To
1	Mr. Sao Ena	Vice Chief, Construction Office, TSC	JICA-Net Seminar on Remote Sensing and GIS at Cambodia (9 times)	2010.01.07	2010.03.03
2	Mr. Mean Seng	Vice Chief, Survey Office, TSC	JICA-Net Seminar on Remote Sensing and GIS at Cambodia (9 times)	2010.01.07	2010.03.03
3	Mr. Chea Bora	Chief, Irrigation Agriculture Office, Kampong Speu	Participatory Irrigation Facility Management (Group Training in Tsukuba Center)	2010.03.16	2010.04.16
4	Mr. Soueng Sotha	Chief, Water Management Office, TSC	Participatory Irrigation Management System for Paddies (Group Training in Sapporo Center)	2010.05.25	2010.07.23
5	Mr. Mean Seng	Vice Chief, Survey Office, TSC	Satellite Remote Sensing Data Analysis Technology for Disaster / Environment (Group Training, Tokyo Center)	2010.08.03	2010.09.11
6	Mr. Hay Bunthoeun	Chief, Design Office, TSC	Information Management Technology for Land Use and Natural Resource (Group Training, Chubu Center)	2010.08.16	2010.09.23
7	Mr. Pich Veasna	Director, TSC	4 th Joint Symposium of ALOS Observation of National Irrigation Project	2010.11.13	2010.11.20
8	Mr. Sao Ena	Vice Chief, Construction Office, TSC	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2011.07.05	2011.08.13
9	Mr. Ven Savann	Chief Office, Takeo	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2011.07.05	2011.08.13
10	Mr. Prak Lak	Chief Office, Kandal	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2011.07.05	2011.08.13
11	Mr. Earn Phalkun	Chief Office, Kartie	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2011.07.05	2011.08.13
12	Mr. Ros Rithy	Deputy Director, Prey Veng	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2011.07.05	2011.08.13
13	Mr. Tuy Peou	Deputy Director, Phnom Penh	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2011.07.05	2011.08.13
14	Mr. Noun Vannarith	Vice Chief, Construction Office, TSC	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2012.06.28	2012.08.03
15	Mr. Chhim Samorn	Deputy Director, Pursat	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2012.06.28	2012.08.03
16	Mr. Chea Bora	Chief, Kampong Speu	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2012.06.28	2012.08.03
17	Mr. Noun Boravoin	Vice Chief, Kampong Thom	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2012.06.28	2012.08.03
18	Mr. Uk Bossneath	Vice Chief, Udor Meanchey	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2012.06.28	2012.08.03
19	Mr. Im Veasna	Official, Phnom Penh	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2012.06.28	2012.08.03
20	Mr. Uch Hing	Deputy Director, TSC	Integrated Water Resources Management (Group Training in Tokyo Center)	2012.09.17	2012.10.06
21	Mr. Pich Veasna	Director, TSC	River Basin Management and Water Management of Paddy Field in Low Land Area	2012.12.03	2012.12.14
22	Mr. Sok Korn	Staff, Water Management Office, TSC	Improved Operation and Management for Agricultural and Rural Infrastructure in Japan (Group Training in Tsukuba Center)	2013.02.17	2013.04.20
23	Mr. Meas Savoeun	Vice Chief, Planning Office, TSC	Participatory Irrigation Management System for Paddies for Asia Country (A) (Group Training in Sapporo Center)	2013.05.22	2013.07.10
24	Mr. Teav Vutha	Official, Design Office, TSC	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2013.06.26	2013.08.06
25	Ms. Cheam Senny	Staff, Survey Office, TSC	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2013.06.26	2013.08.06
26	Mr. Puth Sava	Deputy Director, Kampong Chhnang	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2013.06.26	2013.08.06
27	Mr. Nhanh Cheabhorng	Deputy Director, Kampong Speu	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2013.06.26	2013.08.06
28	Mr. Som Doungkeo	Deputy Director, Kandal	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2013.06.26	2013.08.06
29	Mr. Kit Phal	Deputy Director, Pursat	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2013.06.26	2013.08.06
30	Mr. Yuk Narin	Vice Chief, Takeo	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2013.06.26	2013.08.06
31	Mr. Thong Phala	Vice Chief, Battambang	Participatory Irrigation Management System for Paddies for Asia (Cambodia) (Focused Training in Sapporo Center)	2013.06.26	2013.08.06
32	Mr. Sao Ena	Vice Chief, Construction Office, TSC	Focused Training on Land Improvement System in Japan for Cambodia, Laos, and Vietnam (Sapporo Center)	2013.09.08	2013.09.14
33	Mr. Noun Vannarith	Vice Chief, Construction Office, TSC	Focused Training on Land Improvement System in Japan for Cambodia, Laos, and Vietnam (Sapporo Center)	2013.09.08	2013.09.14



(2) Technical Exchange Program in Indonesia

No	Name of Participant	Field in Expertise	Name of Program	Duration of Program	
				From	To
1	Mr. Tokuyuki Atago	JICA Expert, Participatory Water Management	Technical Exchange Program on Integrated Water Resources Management and Participatory Irrigation Management	2013.02.17	2013.02.23
2	Mr. Theng Tara	Deputy Director General, MOWRAM		2013.02.17	2013.02.23
3	Mr. Chea Chhun Keat	Director, Planning and Cooperation, MOWRAM		2013.02.17	2013.02.23
4	Mr. Uch Hing	Deputy Director, TSC		2013.02.17	2013.02.23
5	Mr. Meas Savoeun	Vice Chief, Planning Office, TSC		2013.02.17	2013.02.23
6	Ms. Cheam Senny	Staff, Survey Office, TSC		2013.02.17	2013.02.23
7	Mr. Norng Keamny	Official, Water Resources Conservation and Manag		2013.02.17	2013.02.23



ANNEX 6 : Provision and Procurement of Machinery and Equipment

No.	Date of Arrival	Discription of Equipment			Amount	Unit Price		S-Total		Place of Storage	Frequency of Use	Condition of Equipment	Maintenace Mechanism	Remarks
		Item	Manufacture & Model Number	R/P		Currency		Currency						
JFY 2009														
001	2010.03.09	Color Copier	Konica Minolta Bizhab C253	L	1	US$	7,480.00	US$	7,480.00	TSC Office	A	a		
002	2010.03.09	Desktop Computer	DELL Optiplex 780 Mini Tower	L	19	US$	1,070.00	US$	20,330.00	TSC Office	A	a		
021	2010.03.09	Desktop Computer	DELL Optiplex 781 Mini Tower	L	1	US$	1,070.00	US$	1,070.00	Kampong Speu PDWRAM	A	a		
022	2010.03.09	Desktop Computer	DELL Optiplex 781 Mini Tower	L	1	US$	1,070.00	US$	1,070.00	Kampong Chhnang PDWRAM	A	a		
023	2010.03.09	Desktop Computer	DELL Optiplex 781 Mini Tower	L	1	US$	1,070.00	US$	1,070.00	Battambang PDWRAM	A	a		
024	2010.03.09	Laptop Computer	HP ProBook 451S	L	3	US$	1,190.00	US$	3,570.00	TSC Office	B	a		
027	2010.03.09	Monocrome Printer	HP LaserJet P2035	L	1	US$	300.00	US$	300.00	Kampong Speu PDWRAM	A	a		
028	2010.03.09	Monocrome Printer	HP LaserJet P2035	L	1	US$	300.00	US$	300.00	Kampong Chhnang PDWRAM	A	a		
029	2010.03.09	Monocrome Printer	HP LaserJet P2035	L	1	US$	300.00	US$	300.00	Battambang PDWRAM	A	a		
030	2010.03.09	Color Printer	CANON LaserShot LBP5970	L	1	US$	3,300.00	US$	3,300.00	TSC Office	D	d		
031	2010.09.17	Pickup Truck	TOYOTA Hilux 4WD	L	2	US$	25,000.00	US$	50,000.00	TSC Office	A	a		
033	2010.09.17	Station Wagon	TOYOTA Land Cruiser Prado	L	1	US$	40,500.00	US$	40,500.00	TSC Office	A	a		
034	2010.11.11	Tamping Rammer	SAKAI RS65	L	2	US$	2,640.00	US$	5,280.00	TSC Office (MOWRAM Garage)	C	a		
036	2010.11.11	Vibrating Roller	SAKAI TW502-1	L	1	US$	60,184.00	US$	60,184.00	TSC Office (MOWRAM Garage)	C	a		
037	2010.11.25	Total Station	TOPCON GPT-3002LN	L	1	US$	13,084.00	US$	13,084.00	TSC Office	C	a		
038	2010.11.25	Total Station	TOPCON GPT-3002LN	L	1	US$	13,084.00	US$	13,084.00	Kampong Speu PDWRAM	C	a		
039	2010.11.25	Total Station	TOPCON GPT-3002LN	L	1	US$	13,084.00	US$	13,084.00	Kampong Chhnang PDWRAM	C	a		
040	2010.11.25	Total Station	TOPCON GPT-3002LN	L	1	US$	13,084.00	US$	13,084.00	Battambang PDWRAM	C	a		
041	2010.11.25	Auto Level	TOPCON AT-B2	L	1	US$	968.00	US$	968.00	Kampong Speu PDWRAM	C	a		
042	2010.11.25	Auto Level	TOPCON AT-B2	L	1	US$	968.00	US$	968.00	Kampong Chhnang PDWRAM	C	a		
043	2010.11.25	Auto Level	TOPCON AT-B2	L	1	US$	968.00	US$	968.00	Battambang PDWRAM	C	a		
044	2011.11.17	Excavator	KOMATSU PC130	L	1	US$	95,850.00	US$	95,850.00	TSC Office (MOWRAM Garage)	C	a		
045	2011.11.17	Excavator	KOMATSU PC30 MR	L	1	US$	53,800.00	US$	53,800.00	TSC Office (MOWRAM Garage)	C	a		
JFY 2010														
001	2011.03.03	Tamping Rammer	SAKAI RS65	L	3	US$	2,696.00	US$	8,088.00	TSC Office	C	a		
004	2011.03.03	Vibrating Roller	SAKAI TW502-1	L	1	US$	61,442.00	US$	61,442.00	TSC Office (MOWRAM Garage)	C	a		
005	2011.03.17	Bulldoser	CATERPILLAR D5K XL	L	2	US$	125,000.00	US$	500,000.00	TSC Office (MOWRAM Garage)	C	a		
007	2011.04.09	Excavator	CATERPILLAR 303.5D CR	L	3	US$	52,000.00	US$	156,000.00	TSC Office (MOWRAM Garage)	C	a		
JFY 2011														
001	2012.03.05	Excavator	KOMATSU PC35MR-3	L	2	US$	55,525.00	US$	111,050.00	TSC Office (MOWRAM Garage)	C	a		
003	2012.03.05	Vibrating Compactor	SAKAI TW512D-E	L	1	US$	76,950.00	US$	76,950.00	TSC Office (MOWRAM Garage)	C	a		
JFY 2013														
001	2013.06.06	Color Printer	Konica Minolta Magicolor 7450 II	L	1	US$	2,899.00	US$	2,899.00	TSC Office	A	a		
002	2013.10.18	Water Level Meter, Pressure Type	UIZIN UIZ-WL500-LR	J	1	US$	1,304.00	US$	1,304.00	Charek Irrigation System, Pursat	A	a		
003	2013.10.18	Hand Driving Sampler	KANSAIKIKI KS-98B	J	1	US$	1,101.00	US$	1,101.00	TSC Office	C	a		

Note :

The listed Equipment should be the unit price of 20,000 yen or more and be usable for one year or more, according to manual for JICA Coordinator.

Conditionof Equipment : a : Good Condition, b : In moderate Condition, c : For repair, d : Unable to use

Frequency of Use : A : used frequntly, B : used well (1-3 times per week), C : used in specific season only, D : not so much used (3-11 times per year), E : not used by specific reason

ANNEX 7 : Local Operation Cost by Japanese Side

Unit:US$

Budget Item	2009	2010	2011	2012	2013	2014	Total Amount
Overseas Activities Cost	71,388.05	226,846.15	141,552.48	228,443.70	141,646.72	86,700.00	896,577.10
Model Site Construction Cost (including the Contruct through JICA Cambodia Office)		81,448.91	431,240.27	833,053.96	661,809.89	13,642.24	2,021,195.27
Total	71,388.05	308,295.06	572,792.75	1,061,497.66	803,456.61	100,342.24	2,917,772.37

ANNEX 8 : List of Counterpart Personnel

No	Name of Counterpart Personnel	Position / Organization	Field in Expertise	Duration of Assignment		2009						2010												2011												2012												2013												2014					
				From	To	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
1	Mr. Pich VEASNA	Director	Project Manager	2009.09.01	2014.08.31																																																												
2	Mr. Uch HING	Deputy Director	Survey	2009.09.01	2014.08.31																																																											
3	Mr. You SOTHA	Deputy Director	Planning	2009.09.01	2014.08.31																																																										
4	Mr. Meas SAVOEUN	Vice Chief	Planning	2009.09.01	2014.08.31																																																										
5	Mr. Mean SENG	Vice Chief	Survey	2009.09.01	2014.08.31																																																										
6	Ms. Cheam SENNY	Staff	Survey	2009.09.01	2014.08.31																																																									
7	Mr. Hay BUNTHOEUN	Chief	Design	2009.09.01	2014.08.31																																																									
8	Mr. Teav VUTHA	Staff	Design	2009.09.01	2014.08.31																																																									
9	Mr. Noun VANNARITH	Vice Chief	Construction	2009.09.01	2014.08.31																																																								
10	Mr. Sao ENA	Vice Chief	Construction	2009.09.01	2014.08.31																																																								
11	Mr. Soeung SOTHA	Chief	Water Management	2009.09.01	2014.08.31																																																								
12	Mr. Sok KORN	Staff	Water Management	2009.09.01	2014.08.31																																																								
13	Mr. Prum KANTHEL	Vice Chief	Water Management	2012.11.01	2014.08.31																																																								
14	Ms. Pich MALY	Chief	Administration	2009.09.01	2014.08.31																																																								
15	Ms. Sous CHENDA	Vice Chief	Administration	2009.09.01	2014.08.31																																																								
16	Mr. Chek TRY	Vice Chief	Administration	2011.10.01	2014.08.31																																																								

ANNEX 9 : Budget Allocation by Cambodia Side

MOWRAM Unit:US$

Budget Item	2009	2010	2011	2012	2013	2014	Total Amount
National Budget		70,500.00	48,375.00	0.00	19,250.00	16,500.00	154,625.00
General Operation Expenses	45,168.00	45,168.00	45,168.00	45,168.00	45,168.00	45,168.00	271,008.00
Total	45,168.00	115,668.00	93,543.00	45,168.00	64,418.00	61,668.00	425,633.00

TSC requested US$ 61,420 in 2012 for Training, but it was not granted.

Conversion rate of National Budget : US$ 1 = Riel 4,000

TSC Unit:US$

Budget Item	2009	2010	2011	2012	2013	2014	Total Amount
Counterpart Fund	30,000.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	330,000.00
Total	30,000.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	330,000.00

ANNEX 10 :Land, Building, Office and Facilities by Cambodia

Second Floor

CR (Male)	Stairs	Director's Room	C/Ps' and Experts Room	Library	Stairs	CR (Female)
Experts and C/Ps' Room			Meeting Room	Administration	Chief Advisor's Room	

Ground Floor

CR (Male)	Stairs	Storage Room	Computer Room		Stairs	CR (Female)
Training Room			Entrance			

TSC Property

Achievement of the PDM Indicators

Annex 11

Narrative Summary	Objectively Verifiable Indicators	Achievement/Results/Progress
Overall Goal: Agricultural productivity in the target area is stabilized through efficient water resource management realized by improved technical capacity of MOWRAM and PDWRAM in agricultural river basin management and development (*1).	1-1. Unit yield of rice and other crops in the target area of the Project is improved to reach the national target. 1-2. Irrigated field area is increased due to the efficient water utilization and distribution in the target area of the Project. (including 2 season or 3 season crop cultivation).	1-1. The unit yield of rice differentiates on the target area. For 2012, the average yield of rice is reported as 1.8-4.4 ton/ha in the target area. And the paddy field with APPP project collaboration is reported as 4.5-7.1 ton/ha in 2013 and 3.45-6.0 ton/ha in 2014 (3 model sites by the end of the Project). (Target yield of rice in NSDP 2009-2013 update is currently 3.0 ton/ha.) 1-2. In the target area of the Project, total irrigated field area will be increased to 3,307 ha due to the efficient water utilization and distribution at the time on the Project completion, and within the area, it is reported approximately 361 ha as double/triple crop cultivation (2013 harvest tme data).
Project Purpose: Irrigation projects are properly planned, implemented and operated in the target area of the Project.	1-1.Number of the newly formulated irrigation projects in the target area, which are planned and designed based on the water supply circulation. 1-2.Total length of rehabilitated irrigation scheme of the project 2.Number of PDWRAM technicians who obtained appropriate operation skills through TSC training, and Number of PDWRAM technicians who conducted any activities in the target area of the Project. 3.Number of farmers group (water user committee and so on), are newly established, and periodical O&M activities.	1-1. The newly irrigation system are formulated at the following 8 model site on Por Canal, Damnak Ampil, Thlear Maom, Lum Hack, Roleang Chrey, Kandal Stung, Upper Slakou and Thomney. 1-2. Total length of rehabilitated irrigation scheme/canal constructed by the Project became 144,535 m. Within the total length of irrigation scheme/canal, 96,633 m was constructed by farmer participation and incidental facilities number became 961 at the time on the Project completion. The figure of length is approx. 11 times in compared to TSC2 project constructed (at the time on TSC2 project; approx. 13,460 m). 2. The number of PDWRAM technicians who obtained appropriate operation skills through TSC training is 1,305 persons , within the figure, it is reported as 622 PDWRAM technicians participated from the target 6 provinces. After participate training course, 39 PDWRAM technicians attend project activities such as construction, O&M WS , A& A/C WS, etc. as of Terminal Evaluation time. "O& M of Irrigation Facilities","Construction Management and Supervision" and "GIS" training courses were most popular and be welcomed by the training participants because the courses were very practical and useful for their field works. 3. During the Project period, the newly farmers group (FWUG) are established at the model site on Por Canal (2011), Damnak Ampil (2011) and Lum Hack (2013). At the model site on Thlear Maom, Roleang Chrey, Kandal Stung, Upper Slakou and Thomney , FWUG have been already established. In 2012, the Project assisted to formulate annual plan and undertake O&M activities at 2 mode site. Continuously in 2013 and 2014, the Project assisted to undertake O&M activities and also instructed about participatory/voluntary O&M activities at 3 model sites. In the model sites where formulated farmers group already, and did supported by the Project, there are various activities carried out by themselves such as regular group meeting, O&M activities and water user fee collection.
Outputs: 1. TSC obtain capacities to implement training and provide technical supports for MOWRAM and PDWRAM related to the agricultural river basin management and development.	1. More than 90 % of TSC staff become competent in carrying out training and technical supports. 2. More than 80 % of PDWRAM are satisfied with training and technical supports of TSC	(At the time on Results of Terminal of Project) 1.Over 90% TSC staff get knowledge and skills of carrying out training and technical supports because the rate of training participants who are satisfied with the training and technical supports of TSC has reached approx. 96.0% as a whole. 2. The rate of training participants who are satisfied with the training and technical supports of TSC has reached to 96.0 % in average (80.0%～100% among 20 courses).
2. The engineers and technicians in MOWRAM and PDWRAM obtain knowledge on concepts and technologies related to the agricultural river basin management and development through training.	1. More than 15 training courses on agricultural river basin management and development are conducted. 2. More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	1. 20 training courses have conducted. 2. The rate of training participants who achieved the curriculum targets has reached to 88.7 % in average (63.6%～100% among 20 training courses conducted). <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.>
3. The capacities of the engineers and technicians of MOWRAM and PDWRAM on planning, survey, design, construction management, operation and maintenance (O&M) of facilities and structures in an irrigation system as a whole are improved through training.	1. More than 12 training courses are conducted on technologies related to the development and management of an irrigation system as a whole. 2. More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	1. 32 training courses have conducted. 2. The rate of training participants who achieved the curriculum targets has reached to 91.4 % in average (70.0%～100% among 32 training courses conducted). <same the above> Self evaluation system by classifying five-grades
4. The technical support system of TSC is established to promote implementation of irrigation projects by PDWRAM.	1. More than 30 project plans are formulated with technical supports of TSC for budget requests.	1. Until the time on Terminal evaluation, 31 project plans have been formulated and within the figure, 27 plans have been finally approved during the TSC Project period. (including expecting final approval; 24=3+6+3+4+4+4 (4 project plans under processing) Grass root project as "Kusanone project" and 7=3+3+1 Counterpart fund project) . The main component of the above rehabilitation project are secondly/tertiary canal rehabilitation, construction of check structures, drop structure, intake/outlet structure, culverts, embankment, concrete bridge, access road, turnout structures, and so on.

*1: ARBD is the holistic concept of water resource management to enable efficient water distribution among the irrigation systems at a river basin level, considering the needs of the other sectors.

*2: Curriculum target is set for each training course to evaluate the level of participants' understanding, based on the pre- and post-training tests, self evaluation of participants and so forth.

*3: Model irrigation projects are the interventions by the Project for improvement of water management, such as improvement of irrigation facilities, demonstration of participatory irrigation management as well as the operation and maintenance, enhancement of irrigated farming technologies and so forth..

Annex 12: Final progress of the implementation schedule of Plan of Operation (PO)

For Ver.1 on 23 March 2010

Activities		JFY2009			JFY2010				JFY2011				JFY2012				JFY2013				JFY2014	
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
0. Preparatory activities																						
(1) Gather technical references on the agricultural river basin management and development.	Plan																					
	Actual																					
(2) Gather basic information on the proposed model project sites.	Plan																					
	Actual																					
(3) Set up the management body of the Project and prepare the work plan.	Plan																					
	Actual																					
(4) Review and decide the indicators with target figures.	Plan																					
	Actual																					
1-1 Provide training to TSC staff on the knowledge and technologies related to the agricultural river basin management and development.	Plan																					
	Actual																					
(1) Prepare training course and materials for in-house training on the agricultural river basin management and development.	Plan																					
	Actual																					
(2) Organize the in-house training on the agricultural river basin management and development.	Plan																					
	Actual																					
1-2 Provide training to TSC staff on the knowledge and technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(1) Prepare training course and materials for in-house training on the knowledge and technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(2) Organize the in-house training on the knowledge and technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
1-3 Reinforce the technical learning above of TSC staff through actual conduct of the training courses for the engineers and technicians of MOWRAM and PDWRAM.	Plan																					
	Actual																					
(1) Organize preparatory meetings among TSC staff for formulation of training course on the agricultural river basin management and development.	Plan																					
	Actual																					
(2) Organize preparatory meetings among TSC staff for formulation of training course on the knowledge and technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(3) Organize the review meetings among TSC staff to evaluate their own understanding on the training subjects.	Plan																					
	Actual																					
1-4 Provide technical support to MOWRAM to formulate the mid- / long-term human resource development (HRD) plan on water and irrigation management based on Capacity building Roadmap of TSC.	Plan																					
	Actual																					
(1) Analyze the results of training evaluations to be reflected in the human resource development program on water and irrigation management.	Plan																					
	Actual																					
(2) Provide suggestions for possible modification of the human resource development program on water and irrigation management.	Plan																					
	Actual																					
2-1 Formulate training courses on agricultural river basin management and development.	Plan																					
	Actual																					
(1) Review the technical references to select the contents to be covered in the training courses.	Plan																					
	Actual																					
(2) Formulate the detailed plan of the training courses and set curriculum targets for evaluation.	Plan																					
	Actual																					
(3) Prepare necessary textbook and/or training materials.	Plan																					
	Actual																					
2-2 Conduct and evaluate the training courses on agricultural river basin management and development.	Plan																					
	Actual																					
(1) Conduct training courses with field exercises.	Plan																					
	Actual																					
(2) Conduct evaluation of the training courses.	Plan																					
	Actual																					
2-3 Review and revise the training courses on agricultural river basin management and development.	Plan																					
	Actual																					
(1) Analyze the results of evaluation to identify any topic or method of training to be improved.	Plan																					
	Actual																					
(2) Revise the contents of the training course with appropriate modifications.	Plan																					
	Actual																					
3-1 Formulate the training courses on the technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(1) Review the technical references to select the contents to be covered in the training courses.	Plan																					
	Actual																					
(2) Formulate the detailed plan of the training courses and set curriculum targets for evaluation.	Plan																					
	Actual																					
(3) Prepare necessary textbook and/or training materials.	Plan																					
	Actual																					
3-2 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(1) Conduct training courses with field exercises.	Plan																					
	Actual																					
(2) Conduct evaluation of the training courses.	Plan																					
	Actual																					
3-3 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the main system.	Plan																					
	Actual																					
(1) Analyze the results of evaluation to identify any topic or method of training to be improved.	Plan																					
	Actual																					
(2) Revise the contents of the training course with appropriate modifications.	Plan																					
	Actual																					
3-4 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the tertiary system that have been developed through the foregoing TSC Phase 2 Project.	Plan																					
	Actual																					
(1) Conduct training courses with field exercises.	Plan																					
	Actual																					
(2) Conduct evaluation of the training courses.	Plan																					
	Actual																					
3-5 Review and revise the training courses on technologies related to the irrigation facilities and structures in the tertiary system.	Plan																					
	Actual																					
(1) Analyze the results of evaluation to identify any topic or method of training to be improved.	Plan																					
	Actual																					
(2) Revise the contents of the training courses with appropriate modifications.	Plan																					
	Actual																					
3-6 Provide technical support to formulate the training courses for the newly recruited staff of MOWRAM and PDWRAM based on the HRD plan as the above mentioned on Activity 1-4.	Plan																					
	Actual																					
(1) Select the appropriate contents from the revised training courses for newly recruited staff.	Plan																					
	Actual																					
(2) Formulate the detailed plan of the training courses and set curriculum targets for evaluation.	Plan																					
	Actual																					
4-1 Select the sites for the model irrigation projects of in the target areas of the Project.	Plan																					
	Actual																					
(1) Review the basic data and identify the contents of model irrigation projects for each proposed sites.	Plan																					
	Actual																					
(2) Discuss between PDWRAM and TSC to formulate the overall implementation plans of the model irrigation projects.	Plan																					
	Actual																					
(3) Conduct initial explanatory meetings for the relevant stakeholders in the model project sites.	Plan																					
	Actual																					
4-2 Provide technical support for the respective PDWRAM to plan, design, construct and conduct operation and maintenance (O&M) of the model irrigation projects.	Plan																					
	Actual																					
(1) Organize workshops with farmers and local government authorities in the model project sites for mapping and planning of the model irrigation projects.	Plan																					
	Actual																					
(2) Conduct survey and design the facilities and/or structures in consultation with the farmers.	Plan																					
	Actual																					
(3) Plan, conduct and supervise the construction activities with participation of the farmers.	Plan																					
	Actual																					
(4) Formulate the O&M plans in consultation with the farmer water user groups (FWUG) and facilitate the implementation of O&M activities.	Plan																					
	Actual																					
4-3 Provide technical support for the respective PDWRAM to apply participatory irrigation management in close collaboration with beneficiary farmers, PDA and other relevant stakeholders in the area.	Plan																					
	Actual																					
(1) Facilitate the farmers to organize the FWUG.	Plan																					
	Actual																					
(2) Conduct farmer-to-farmer training / study tours for the FWUG members.	Plan																					
	Actual																					
(3) Coordinate with PDA and other relevant stakeholders to disseminate improved farming technologies to the farmers in the model project sites.	Plan																					
	Actual																					
(4) Assist the local authorities and the FWUG to organize Farmer Water User Community (FWUC).	Plan																					
	Actual																					
4-4 Based on the experiences of the technical supports above, formulate manuals for PDWRAM on formulation on planning of irrigation projects.	Plan																					
	Actual																					
(1) Review the implementation processes of the model irrigation projects.	Plan																					
	Actual																					
(2) Review the samples of irrigation project plans submitted for budget requests.	Plan																					
	Actual																					
(3) Formulate the manuals for PDWRAM on formulation of irrigation project plans.	Plan																					
	Actual																					

ANNEX 13 Record of the Modification of PDM

(1) Original Version

Project Design Matrix (PDM)

Project Title: Improvement of Agricultural River Basin Management and Development Project (TSC 3)

Project Duration: September, 2009 to August , 2014 (tentative)

Version Number: Version 0 (draft)

Target Area: Six (6) Provinces, namely, Kandal, Takeo, Pursat, Kampong Chhnang, Kampong Spue, and Battambang

Date: 29 May 2009

Target Group: Counterpart personnel in TSC, PDWRAM and PDA in the target area, the engineers and technicians in MOWRAM and other PDWRAM, and the farmers in the model project sites

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal: Agricultural productivity in the target area is stabilized through efficient water resource management realized by improved technical capacity of MOWRAM and PDWRAM in agricultural river basin management and development (*1).	1. Unit yield of rice and other crops in the target area of the Project is improved to reach the national target.	1. Statistical Data of MAFF and PDA in the target area.	* There is no drastic climate change that affects the agricultural production.
Project Purpose: Irrigation projects are properly planned, implemented and operated in the target area of the Project.	1.Number of the newly formulated irrigation projects in the target area, which are planed and designed based on the water supply circulation. 2.Number of PDWRAM technicians who obtained appropriate operation skills. 3.Number of farmers group (water user committee and so on), are newly established, and periodical O&M activates.	1-1 Project records and documents 1-2 Field survey and interviews	* The funds are made available for the planned irrigation projects in the target area. * Security situations in the target area do not become extremely unstable. * There is no conflict among the farmers in the model project sites.
Outputs: 1. TSC obtain capacities to implement training and provide technical supports for MOWRAM and PDWRAM related to the agricultural river basin management and development.	1. More than XX % of TSC staff become competent in carrying out training and technical supports. 2. More than XX PDWRAM are satisfied with training and technical supports of TSC	1-1 Evaluation by training participants 1-2 Self evaluation of TSC staff 2. Questionnaire survey with PDWRAM	* Relevant authorities and stakeholders are supportive to promote the model projects. * farmers are eager to participate the model irrigation projects.
2. The engineers and technicians in MOWRAM and PDWRAM obtain knowledge on concepts and technologies related to the agricultural river basin management and development through training.	1. More than XX training courses on agricultural river basin management and development are conducted. 2. More than XX% of training participants achieve the curriculum targets (*2) of the training courses.	1. Project records and documents 2. Evaluation results of the training courses	
3. The capacities of the engineers and technicians of MOWRAM and PDWRAM on planning, survey, design, construction management, operation and maintenance (O&M) of facilities and structures in an irrigation system as a whole are improved through training.	1. More than XX training courses are conducted on technologies related to the development and management of an irrigation system as a whole. 2. More than XX% of training participants achieve the curriculum targets (*2) of the training courses.	1. Project records and documents 2. Evaluation results of the training courses	
4. The technical support system of TSC is established to promote implementation of irrigation projects by PDWRAM.	1. More than XX project plans are formulated with technical supports of TSC for budget requests.	1. Records and documents of TSC and the Project	
Activities: 1-1 Provide training to the TSC staff on the knowledge and technologies related to the agricultural river basin management and development. 1-2 Provide training to the TSC staff on the knowledge and technologies related to the irrigation facilities and structures in the main system.	**Inputs** **(Cambodia side)** **Personnel** (1)Project Director: Secretary of State, MOWRAM (2)Project Manager: Director General of Technical Affairs, MOWRAM	**(Japanese side)** **Long-term Experts** (1) Chief Advisor / Agricultural River Basin Management (2) Participatory Irrigation Management (3) Training / Project Coordinator	

1-3 Reinforce the technical learning above of the TSC staff through actual conduct of the training courses for the engineers and technicians of MOWRAM and PDWRAM. 1-4 Provide support to MOWRAM to formulate the mid- / long-term human resource development plan on water and irrigation management.	(3)Project Sub-Manager: - Deputy Director of the Department of Administration Affair and Director of TSC - Deputy Director General of Technical Affairs and Director of Water Conservation and management - Director of Planning and International Cooperation (4)Counterpart Personnel of TSC and PDWRAM	**Short-term Experts** (1) GIS (2) Meteo-Hydrological Analysis (3) Structural Design and Calculation for Reservoir and Main Dyke (4) Water Balance Calculation and Planning for Water Allocation (5) Soil and Concrete Analysis (6) Remote Sensing (7) Watershed Management (8) Other relevant fields	
2-1 Formulate training courses on agricultural river basin management and development. 2-2 Conduct and evaluate the training courses on agricultural river basin management and development. 2-3 Review and revise the training courses on agricultural river basin management and development.	**Land, Building and Facilities** (1)Office building and facilities necessary for the implementation of the Project (2)Office space and necessary facilities for the Japanese experts and related staff members (3)Land for the model project sites (4)Other facilities mutually agreed upon as necessary	**Training of counterpart personnel in Japan and/or the third countries**	
3-1 Formulate the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-2 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-3 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-4 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the tertiary system that have been developed through the foregoing TSC Phase 2 Project. 3-5 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the tertiary system. 3-6 Formulate the training courses for the newly recruited staff of MOWRAM and PDWRAM based on the revised training courses			
4-1 Select the sites for the model irrigation projects (*2) of in the target area of the Project. 4-2 Provide technical support for the respective PDWRAM to plan, design, construct and conduct operation and maintenance (O&M) of the model irrigation projects. 4-3 Provide technical support for the respective PDWRAM to apply participatory irrigation management in close collaboration with beneficiary farmers, PDA and other relevant stakeholders in the area. 4-4 Based on the experiences of the technical supports above, formulate manuals for PDWRAM on planning of the irrigation projects.			

*1: Agricultural river basin management and development is the holistic concept of water resource management to enable efficient water distribution among the irrigation systems at a river basin level, considering the needs of the other sectors.

*2: Curriculum target is set for each training course to evaluate the level of participants' understanding, based on the pre- and post-training tests, self evaluation of participants and so forth.

*3: Model irrigation projects are the interventions by the Project for improvement of water management, such as improvement of irrigation facilities, demonstration of participatory irrigation management as well as the operation and maintenance, enhancemen of irrigated farming technologies and so forth..

(2) Version 1.0

Project Design Matrix (PDM)

Project Title: Improvement of Agricultural River Basin Management and Development Project (TSC 3)

Project Duration: September, 2009 to August , 2014 (tentative)

Version Number: Version 1.0

Target Area: Six (6) Provinces, namely, Kandal, Takeo, Pursat, Kampong Chhnang, Kampong Spue, and Battambang

Date: 23 March 2010

Target Group: Counterpart personnel in TSC, PDWRAM and PDA in the target area, the engineers and technicians in MOWRAM and other PDWRAM, and the farmers in the model project sites

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal: Agricultural productivity in the target area is stabilized through efficient water resource management realized by improved technical capacity of MOWRAM and PDWRAM in agricultural river basin management and development (*1).	1. Unit yield of rice and other crops in the target area of the Project is improved to reach the national target.	1. Statistical Data of MAFF and PDA in the target area.	* There is no drastic climate change that affects the agricultural production.
Project Purpose: Irrigation projects are properly planned, implemented and operated in the target area of the Project.	1.Number of the newly formulated irrigation projects in the target area, which are planed and designed based on the water supply circulation. 2.Number of PDWRAM technicians who obtained appropriate operation skills. 3.Number of farmers group (water user committee and so on), are newly established, and periodical O&M activates.	1-1 Project records and documents 1-2 Field survey and interviews	* The funds are made available for the planned irrigation projects in the target area. * Security situations in the target area do not become extremely unstable. * There is no conflict among the farmers in the model project sites.
Outputs: 1. TSC obtain capacities to implement training and provide technical supports for MOWRAM and PDWRAM related to the agricultural river basin management and development.	1. More than 90 % of TSC staff become competent in carrying out training and technical supports. 2. More than 80 PDWRAM are satisfied with training and technical supports of TSC	1-1 Evaluation by training participants 1-2 Self evaluation of TSC staff 2. Questionnaire survey with PDWRAM	* Relevant authorities and stakeholders are supportive to promote the model projects. * Farmers are eager to participate the model irrigation projects.
2. The engineers and technicians in MOWRAM and PDWRAM obtain knowledge on concepts and technologies related to the agricultural river basin management and development through training.	1. More than 15 training courses on agricultural river basin management and development are conducted. 2. More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	1. Project records and documents 2. Evaluation results of the training courses	
3. The capacities of the engineers and technicians of MOWRAM and PDWRAM on planning, survey, design, construction management, operation and maintenance (O&M) of facilities and structures in an irrigation system as a whole are improved through training.	1. More than 12 training courses are conducted on technologies related to the development and management of an irrigation system as a whole. 2. More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	1. Project records and documents 2. Evaluation results of the training courses	
4. The technical support system of TSC is established to promote implementation of irrigation projects by PDWRAM.	1. More than 30 project plans are formulated with technical supports of TSC for budget requests.	1. Records and documents of TSC and the Project	

Activities:	Inputs		
1-1 Provide training to the TSC staff on the knowledge and technologies related to the agricultural river basin management and development. 1-2 Provide training to the TSC staff on the knowledge and technologies related to the irrigation facilities and structures in the main system. 1-3 Reinforce the technical learning above of the TSC staff through actual conduct of the training courses for the engineers and technicians of MOWRAM and PDWRAM. 1-4 Provide support to MOWRAM to formulate the mid- / long-term human resource development plan on water and irrigation management.	**(Cambodia side)** **Personnel** (1)Project Director: Secretary of State, MOWRAM (2)Project Manager: Director General of Technical Affairs, MOWRAM (3)Project Sub-Manager: - Deputy Director of the Department of Administration Affair and Director of TSC - Deputy Director General of Technical Affairs and Director of Water Conservation and management - Director of Planning and International Cooperation (4)Counterpart Personnel of TSC and PDWRAM **Land, Building and Facilities** (1)Office building and facilities necessary for the implementation of the Project (2)Office space and necessary facilities for the Japanese experts and related staff members (3)Land for the model project sites (4)Other facilities mutually agreed upon as necessary	**(Japanese side)** **Long-term Experts** (1) Chief Advisor / Agricultural River Basin Management (2) Participatory Irrigation Management (3) Training / Project Coordinator **Short-term Experts** (1) GIS (2) Meteo-Hydrological Analysis (3) Structural Design and Calculation for Reservoir and Main Dyke (4) Water Balance Calculation and Planning for Water Allocation (5) Soil and Concrete Analysis (6) Remote Sensing (7) Watershed Management (8) Other relevant fields **Training of counterpart personnel in Japan and/or the third countries**	
2-1 Formulate training courses on agricultural river basin management and development. 2-2 Conduct and evaluate the training courses on agricultural river basin management and development. 2-3 Review and revise the training courses on agricultural river basin management and development.			
3-1 Formulate the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-2 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-3 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-4 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the tertiary system that have been developed through the foregoing TSC Phase 2 Project. 3-5 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the tertiary system. 3-6 Formulate the training courses for the newly recruited staff of MOWRAM and PDWRAM based on the revised training courses			
4-1 Select the sites for the model irrigation projects (*2) of in the target area of the Project. 4-2 Provide technical support for the respective PDWRAM to plan, design, construct and conduct operation and maintenance (O&M) of the model irrigation projects. 4-3 Provide technical support for the respective PDWRAM to apply participatory irrigation management in close collaboration with beneficiary farmers, PDA and other relevant stakeholders in the area. 4-4 Based on the experiences of the technical supports above, formulate manuals for PDWRAM on planning of the irrigation projects.			

*1: Agricultural river basin management and development is the holistic concept of water resource management to enable efficient water distribution among the irrigation systems at a river basin level, considering the needs of the other sectors.

*2: Curriculum target is set for each training course to evaluate the level of participants' understanding, based on the pre- and post-training tests, self evaluation of participants and so forth.

*3: Model irrigation projects are the interventions by the Project for improvement of water management, such as improvement of irrigation facilities, demonstration of participatory irrigation management as well as the operation and maintenance, enhancement of irrigated farming technologies and so forth.

(3) Version 2.0

Project Design Matrix (PDM)

Project Title: Improvement of Agricultural River Basin Management and Development Project (TSC 3)

Project Duration: September, 2009 to August , 2014

Version Number: Version 2.0

Target Area: Six (6) Provinces, namely, Kandal, Takeo, Pursat, Kampong Chhnang, Kampong Spue, and Battambang

Date: 14 September 2011

Target Group: Counterpart personnel in TSC, PDWRAM and PDA in the target area, the engineers and technicians in MOWRAM and other PDWRAM, and the farmers in the model project sites

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal: Agricultural productivity in the target area is stabilized through efficient water resources management realized by improved technical capacity of MOWRAM and PDWRAM in agricultural river basin management and development (*1).	1-1. Unit yield of rice and other crops in the target area of the Project is improved to reach the national target. 1-2. Irrigated field area is increased due to the efficient water utilization and distribution in the target area of the Project. (including 2 season or 3 season crop cultivation).	1-1. Statistical Data of MAFF and PDA in the target area, and Baseline study of the project 1-2. Sample survey in the model sites	
Project Purpose: Irrigation projects are properly planned, implemented and operated in the target area of the Project.	1-1.Number of the newly formulated irrigation projects in the target area, which are planned and designed based on the water supply circulation. 1-2.Total length of rehabilitated irrigation canal of the project 2.Number of PDWRAM technicians who obtained appropriate operation skills through TSC training, and Number of PDWRAM technicians who conducted any activities in the target areas of the Project. 3.Number of farmers group (water user committee and so on) are newly established, and periodical O&M activities	1-1 Project records and documents 1-2 Field survey and interviews	* There is no drastic climate change that affects the agricultural production.
Outputs: 1. TSC obtain capacities to implement training and provide technical supports for MOWRAM and PDWRAM related to the agricultural river basin management and development.	1. More than 90 % of TSC staff become competent in carrying out training and technical supports. 2. More than 80 % of PDWRAM are satisfied with training and technical supports of TSC	1-1 Evaluation by training participants 1-2 Self evaluation of TSC staff 2. Questionnaire survey with PDWRAM	* The funds are made available for the planned irrigation projects in the target area. * Security situations in the target area do not become extremely unstable. * There is no conflict among the farmers in the model project sites.
2. The engineers and technicians in MOWRAM and PDWRAM obtain knowledge on concepts and technologies related to the agricultural river basin management and development through training.	1. More than 15 training courses on agricultural river basin management and development are conducted. 2. More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	1. Project records and documents 2. Evaluation results of the training courses	
3. The capacities of the engineers and technicians of MOWRAM and PDWRAM on planning, survey, design, construction management, operation and maintenance (O&M) of facilities and structures in an irrigation system as a whole are improved through training.	1. More than 12 training courses are conducted on technologies related to the development and management of an irrigation system as a whole. 2. More than 60% of training participants achieve the curriculum targets (*2) of the training courses.	1. Project records and documents 2. Evaluation results of the training courses	
4. The technical support system of TSC is established to promote implementation of irrigation projects nationwide by PDWRAM.	1. More than 30 project plans are formulated with technical supports of TSC for budget requests.	1-1. Records and documents of TSC and the Project 1-2. Application reports of irrigation projects to RGC and donors	
Activities: 1-1 Provide training to the TSC staff on the knowledge and technologies related to the agricultural river basin management and development. 1-2 Provide training to the TSC staff on the knowledge and technologies related to the irrigation facilities and structures in the main system.	**Inputs** **(Cambodia side)** **Personnel** (1)Project Director: Secretary of State, MOWRAM (2)Project Manager: Director General of Technical Affairs, MOWRAM	**(Japanese side)** **Long-term Experts** (1) Chief Advisor / Agricultural River Basin Management (2) Participatory Irrigation Management (3) Training / Project Coordinator	* Relevant authorities and stakeholders are supportive to promote the model projects. * Farmers are eager to participate the model irrigation projects.

1-3 Reinforce the technical learning above of the TSC staff through actual conduct of the training courses for the engineers and technicians of MOWRAM and PDWRAM. 1-4 Provide technical support to MOWRAM to formulate the mid- / long-term human resource development (HRD) plan on water and irrigation management based on Capacity building Roadmap of TSC.	(3)Project Sub-Manager: - Deputy Director of the Department of Administration Affair and Director of TSC - Deputy Director General of Technical Affairs and Director of Water Conservation and management - Director of Planning and International Cooperation (4)Counterpart Personnel of TSC and PDWRAM **Land, Building and Facilities** (1)Office building and facilities necessary for the implementation of the Project (2)Office space and necessary facilities for the Japanese experts and related staff members (3)Land for the model project sites (4)Other facilities mutually agreed upon as necessary	**Short-term Experts** (1) GIS (2) Meteo-Hydrological Analysis (3) Structural Design and Calculation for Reservoir and Main Dyke (4) Water Balance Calculation and Planning for Water Allocation (5) Soil and Concrete Analysis (6) Remote Sensing (7) Watershed Management (8) Other relevant fields **Training of counterpart personnel in Japan and/or the third countries**	
2-1 Formulate training courses on agricultural river basin management and development. 2-2 Conduct and evaluate the training courses on agricultural river basin management and development. 2-3 Review and revise the training courses on agricultural river basin management and development.			
3-1 Formulate the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-2 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-3 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the main system. 3-4 Conduct and evaluate the training courses on the technologies related to the irrigation facilities and structures in the tertiary system that have been developed through the foregoing TSC Phase 2 Project. 3-5 Review and revise the training courses on the technologies related to the irrigation facilities and structures in the tertiary system. 3-6 Provide technical support to formulate the training courses for the newly recruited staff of MOWRAM and PDWRAM based on the HRD plan as the above mentioned on Activity 1-4.			Pre-condition
4-1 Select the sites for the model irrigation projects (*3) of in the target area of the Project. 4-2 Provide technical support for the respective PDWRAM to plan, design, construct and conduct operation and maintenance (O&M) of the model irrigation projects. 4-3 Provide technical support for the respective PDWRAM to apply participatory irrigation management in close collaboration with beneficiary farmers, PDA and other relevant stakeholders in the area. 4-4 Based on the experiences of the technical supports above, formulate manuals for PDWRAM on planning of the irrigation projects.			

*1: Agricultural river basin management and development is the holistic concept of water resource management to enable efficient water distribution among the irrigation systems at a river basin level, considering the needs of the other sectors.

*2: Curriculum target is set for each training course to evaluate the level of participants' understanding, based on the pre- and post-training tests, self evaluation of participants and so forth.

*3: Model irrigation projects are the interventions by the Project for improvement of water management, such as improvement of irrigation facilities, demonstration of participatory irrigation management as well as the operation and maintenance, enhancement of irrigated farming technologies and so forth.
According to the agreement between GOC and JICA, the model irrigation project sites and its activities will be modified.

ANNEX 14 : List of Training Courses and Workshops

<Training>

No.	Title	Date	Number of Participant	Contents	Remarks
JFY 2009 (Total 6 times for 63 days, 121 participants)					
1	Methodology of Accurate Data Collection on Survey with GIS and GPS Technology for ARBM&D	2009.11.16~2009.11.27	32	Acquisition of Technique of Accurate Data Collection and Data Processing for Agricultural River Basin Management and CISIS by using GIS, GPS and Remote Sensing Technology	Support by AFD
2	Irrigation Planning by GIS	2010.02.08~2010.02.19	17	Making of a Irrigation Planning by using GIS, GPS and Remote Sensing Technology	
3	Topographic and Route Survey	2010.03.01~2010.03.26	12	Topographic Survey, Route Survey, Traverse Survey, Establishment of Bench Mark etc.	
4	Operation and Maintenance of Irrigation Facilities	2010.02.22~2010.03.05	20	Operation and Maintenance of Irrigation Facilities by PDWRAM and Farmers etc.	National Budget
5	Design, Drawing & Cost Estimation of Irrigation Canal & Canal Structure by Excel & AutoCAD	2010.03.09~2010.03.12	20	Design, Drawing and Cost Estimation by using Excel and Auto CAD	National Budget
6	Irrigation Planning	2010.03.15~2010.03.26	20	Methodology for making a Irrigation Planning	National Budget
JFY 2010 (Total 10 times for 71 days, 195 participants)					
1	Hydraulic Design for Irrigation Canal and Canal structure	2010.06.21~2010.06.25	20	Hydraulic Design for Small Scale Irrigation Canal and Facilities	
2	Participation of Farmers for Sustainable Irrigation System Management	2010.07.19~2010.07.23	20	Construction and Management of Irrigation Facilities, and Establishment and Management of Farmer Water Users Community (FWUC) etc. by Farmer's Participatory	
3	Hydrology, Meteorology & Crop Water Requirement Survey and Irrigation Planning	2010.09.27~2010.10.05	21	Measurement and Data Collection of Hydrology, Meteorology and Water Requirement etc., and making of a Irrigation Planning by using these data	
4	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (I)	2010.11.02~2010.11.12	22	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (In-house training)	
5	Cost Estimation of Irrigation Canal and Canal Structure	2010.11.15~2010.11.19	20	Cost Estimation of Irrigation Canal and Canal Structure	
6	Construction Management	2010.11.29~2010.12.03	20	Construction Management of Construction Site	
7	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (II)	2010.12.06~2010.12.24	12	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (Practical site training)	
8	Construction Management	2010.04.05~2010.04.09	20	Construction Management of Construction Site	National Budget
9	Crop Water Requirement and Calculation	2010.04.19~2010.04.30	20	Calculation of Crop Water Requirement	National Budget
10	Participation of Farmers for Sustainable Irrigation System Management	2010.05.24~2010.05.28	20	Construction and Management of Irrigation Facilities, and Establishment and Management of Farmer Water Users Community (FWUC) etc. by Farmer's Participatory	National Budget
JFY 2011 (Total 15 times for 95 days, 271 participants)					
1	Supervision on Construction Site	2011.04.27~2011.04.29	20	Construction Supervision of Construction Site	
2	Basin-wide Irrigation Planning	2011.06.27~2011.06.30	12	Introduction of Basin-wide Irrigation Planning to C/Ps in Cambodia	
3	Participation of Farmers for Sustainable Irrigation System Management	2011.07.25~2011.07.29	20	Construction and Management of Irrigation Facilities, and Establishment and Management of Farmer Water Users Community (FWUC) etc. by Farmer's Participatory	
4	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (I)	2011.08.15~2011.08.19	20	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (In-house training)	
5	Hydrology, Meteorology & Crop Water Requirement Survey and Irrigation Planning	2011.08.29~2011.09.09	20	Measurement and Data Collection of Hydrology, Meteorology and Water Requirement etc., and making of a Irrigation Planning by using these data	
6	Operation and Maintenance of Irrigation Facilities	2011.10.10~2011.10.21	20	Operation and Maintenance of Irrigation Facilities by PDWRAM and Farmers etc.	
7	Advanced Design for Irrigation Canal and Related Structure	2011.11.14~2011.11.25	20	Advanced Design, Drawing, Cost Estimation and Calculation Method	
8	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (II)	2011.11.28~2011.12.16	12	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (Practical site training)	
9	Topographic Survey for Drawing of Plane	2012.02.27~2012.03.02	10	Topographic Survey for Drawing by GPS Documents	
10	Supervision on Construction Site	2012.03.19~2012.03.23	18	Construction Supervision of Construction Site	
11	Methodology of Remote Sensing for Agricultural River Basin Planning	2012.03.26~2012.03.30	19	Methodology for ARB Planning by Remote Sensing and GIS (In-house training)	
12	Construction Management and Supervision	2011.11.21~2011.11.25	20	Construction Management and Supervision of Construction Site	National Budget
13	Participation of Farmers for Sustainable Irrigation System Management	2011.11.28~2011.12.02	20	Construction and Management of Irrigation Facilities, and Establishment and Management of Farmer Water Users Community (FWUC) etc. by Farmer's Participatory	National Budget
14	Operation and Maintenance of Irrigation Facilities	2011.12.01~2011.12.16	20	Operation and Maintenance of Irrigation Facilities by PDWRAM and Farmers etc.	National Budget
15	Crop Water Requirement and Calculation	2011.12.19~2011.12.23	20	Calculation of Crop Water Requirement	National Budget

No.	Title	Date	Number of Participant	Contents	Remarks
JFY 2012 (Total 13 times for 101 days, 263 participants)					
1	Accurate Data Collection Methodology for ARB Planning by using Remote Sensing and GIS Technology	2012.09.25～2012.10.05	20	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (in House training)	
2	Basin-wide Irrigation Planning	2012.10.08～2012.10.12	20	Introduction of Basin-wide Irrigation Planning	
3	Discharge Measurement	2012.10.22～2012.10.26	20	Making HQ Curve using Discharge Measurement and Calculation	
4	Hydrology, Meteorology & Crop Water Requirement Survey and Irrigation Planning	2012.11.05～2012.11.16	26	Measurement and Data Collection of Hydrology, Meteorology and Water Requirement etc., and making of a Irrigation Planning by using these data	
5	Participation of Farmers for Sustainable Irrigation System Management	2012.12.03～2012.12.07	20	Construction and Management of Irrigation Facilities, and Establishment and Management of Farmer Water Users Community (FWUC) etc. by Farmer's Participatory	
6	Advanced Design of Reservoir	2012.12.11～2012.12.21	20	Advanced Design, Drawing, Cost Estimation and Calculation Method	
7	Construction Management and Supervision	2012.12.24～2012.12.28	19	Construction Management and Supervision of Construction Site	
8	Enhancement of Agricultural Extension Service with Rice Cultivation Technology	2012.12.31～2013.01.04	20	Improvement of Vital Program on Agricultural Productivities	
9	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (II)	2013.01.08～2013.01.25	20	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (Practical site training)	
10	Advanced Design for Irrigation Canal and Related Facilities	2013.01.28～2013.02.08	20	Improvement of Designing for Irrigation	
11	Topographic and Route Survey	2013.02.11～2013.03.01	20	Topographic and Route Survey using Total Station, Auto Level and Drawing by AutoCAD	
12	Operation and Maintenance of Irrigation System	2013.03.04～2013.03.07	20	Operation and Maintenance of Irrigation System	
13	Soil and Concrete Test and Analysis	2013.03.11～2013.03.21	18	Soil and Concrete Test at Laboratory and Field	
JFY 2013 (Total 16 times for 117 days, 307 participants)					
1	Water Balance Calculation	2013.04.22～2013.04.25	13	River Water Balance Calculation	
2	Accurate Data Collection Methodology for ARB Planning by using Remote Sensing and GIS Technology	2013.06.04～2013.06.14	19	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS (in House training)	
3	Enhancement of Agricultural Extension Service with Rice Cultivation Technology	2013.06.24～2013.06.28	20	Improvement of Vital Program on Agricultural Productivities	
4	Discharge Measurement	2013.07.08～2013.07.12	20	Making HQ Curve using Discharge Measurement and Calculation	
5	River Basin Water Balance Analysis	2013.07.15～2013.07.18	17	River Water Balance Calculation	
6	Operation and Maintenance of Irrigation Facilities	2013.08.05～2013.08.09	19	Operation and Maintenance of Irrigation Facilities by Farmers	
7	Basin-wide Irrigation Planning	2013.08.12～2013.08.16	19	Introduction of Basin-wide Irrigation Planning	
8	Accurate Data Collection Methodology for ARB Planning by using Remote Sensing and GIS Technology	2013.09.02～2013.09.13	20	Accurate Data Collection Methodology for ARB Planning by Remote Sensing and GIS	
9	Participation of Farmers for Sustainable Irrigation System Management	2013.10.08～2013.10.11	20	Construction and Management of Irrigation Facilities, and Establishment and Management of Farmer Water Users Community (FWUC) etc. by Farmer's Participatory	
10	Hydraulic Design for Irrigation Canal and Canal structure	2013.11.04～2013.11.08	20	Hydraulic Design for Small Scale Irrigation Canal and Facilities	
11	Construction Management and Supervision	2013.11.25～2013.11.29	20	Construction Management and Supervision of Construction Site	
12	Basin-wide Irrigation Planning	2013.12.16～2013.12.27	20	Introduction of Basin-wide Irrigation Planning	
13	Irrigation Planning by GIS	2013.06.04～2013.06.20	20	Making of a Irrigation Planning by using GIS, GPS and Remote Sensing Technology	National Budget
14	Participation of Farmers for Sustainable Irrigation System	2013.07.15～2013.07.30	20	Operation and Maintenance of Irrigation Facilities by PDWRAM and Farmers etc.	National Budget
15	Soil and Concrete Test and Analysis	2014.01.20～2014.01.24	20	Soil and Concrete Test at Laboratory and Field	
16	Advanced Design for Head Works	2014.03.03～2014.03.21	20	Advanced Design, Drawing, Cost Estimation and Calculation Method	
JFY 2014 (Total 6 times for 44 days, 148 participants)					
1	Construction Management and Supervision	2014.04.21～2014.04.25	19	Construction Management and Supervision of Construction Site	
2	Agricultural Extension Service with Rice Cultivation Technology	2014.05.05～2014.05.09	20	Improvement of Vital Program on Agricultural Productivities	
3	Irrigation Planning by GIS	2014.05.19～2014.05.30	20	Making of a Irrigation Planning by using GIS, GPS and Remote Sensing Technology	
4	Soil and Concrete Test and Analysis	2014.06.02～2014.06.13	30	Soil and Concrete Test at Laboratory and Field	18 PDWRAM
5	Participation of Farmers for Sustainable Irrigation System	2014.06.23～2014.06.27	29	Operation and Maintenance of Irrigation Facilities by PDWRAM and Farmers etc.	18 PDWRAM
6	River Basin Water Balance Analysis	2014.06.30～2014.07.10	30	River Water Balance Calculation	14 PDWRAM

No.	Title	Date	Number of Participant	Contents	Remarks
<Workshop>					
1	Technical Exchange Program with Rural Development Engineering Center Project (phase II) from Bangladesh	2009.12.07～2009.12.10	21	Introduction of each Project Activities and Discussion for the Sustainability of the Project	
2	Evaluation Workshop for JICA-KOICA Joint Program for the Rehabilitation of Irrigation System and Rural Community Development in Cambodia (2009.06.23～2009.12.31)	2009.12.23	30	Evaluation Report on each Project Activities and Discussion	
3	Seminar on River Basin Management and Development	2011.02.23	80	Education of the Knowledge of River Basin Management and Development Technique	
4	Technical Exchange Program with Participatory Irrigated Agriculture Development Project from Lao	2011.12.13～2011.12.19	21	Introduction of each Project Activities and Discussion for the Sustainability of the Project	
5	Joint Dissemination Workshop on River Basin Water Management in Cambodia	2012.07.10	43	Dissemination of some Achievement and Progress of the Project	
6	Technical Exchange Program between Cambodia and Japan	2013.01.22	80	Community-Based Natural Disaster Prevention	
7	Technical Exchange Program with Capacity Development Project for Participatory Water Resources Management Through Integrated Rural Development from Bangladesh	2013.09.25～2013.09.29	24	Introduction of each Project Activities and Discussion for the Sustainability of the Project	
8	Technical Exchange Program with Participatory Irrigated Agriculture Development Project from Lao	2014.04.22～2014.04.25	14	Introduction of each Project Activities and Discussion for the Sustainability of the Project	