

## *Attachments*

*Attachment-1*  
*Scope of Work*

SCOPE OF WORK

FOR

THE BASIN-WIDE BASIC IRRIGATION AND DRAINAGE  
MASTER PLAN STUDY  
IN  
THE KINGDOM OF CAMBODIA

AGREED UPON BETWEEN

MINISTRY OF WATER RESOURCES AND METEOROLOGY,  
THE ROYAL GOVERNMENT OF CAMBODIA

AND

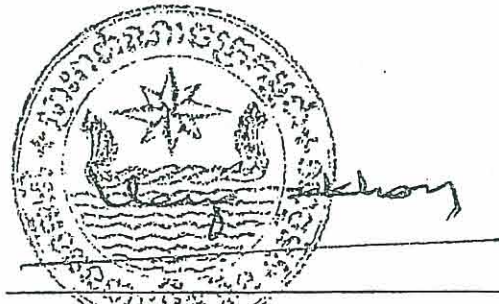
JAPAN INTERNATIONAL COOPERATION AGENCY

Phnom Penh  
October 26, 2006



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Mr. Kazuhiro YONEDA  
Resident Representative  
Cambodia Office  
Japan International Cooperation Agency



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H.E. Veng SAKHON  
Secretary of State  
Ministry of Water Resources and Meteorology  
The Royal Government of Cambodia

## I. INTRODUCTION

In response to the request of the Royal Government of Cambodia (hereinafter referred to as "RGC"), the Government of Japan (hereinafter referred to as "GOJ") decided to conduct the Basin-wide Basic Irrigation and Drainage Master Plan Study in the Kingdom of Cambodia (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation program of GOJ, will undertake the Study in close cooperation with the authorities concerned of RGC.

The present document sets forth the Scope of Work with regard to the Study.

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. To formulate a Master Plan on Irrigation and Drainage (hereinafter referred to as "M/P") in order to improve the water management and the agricultural productivity in four (4) target river basins, and to formulate Detailed Plan for selected priority areas in each river basin, and
2. To transfer technologies to the counterpart personnel through on-the-job training in the course of the Study.

## III. STUDY AREA

The Study Area covers the Battambang River Basin, the Moung Russey River Basin, the Pursat River Basin and the Boribo River Basin, as referred to the location map attached as Annex 1.

## IV. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Scope of Work for the Study shall cover the following activities:

[Phase 1] Formulation of a Draft M/P

1. To carry out basic study
  - Review of the existing reports and relevant information on the Study Area
  - Additional survey to the existing studies
2. To implement hydro-meteorological observation
  - Development of hydro-meteorological observation system

- Hydro-meteorological observation throughout the study period
3. To formulate a basin-wide Draft M/P composed of the following items:
- (1) Agricultural water availability/ irrigation and drainage
    - Establishment of the appropriate irrigation and drainage system taking full consideration of rehabilitation of the existing irrigation systems and of the Farmer Water User Community (FWUC)
    - Efficient utilization of the agricultural water
  - (2) Farming/ Cultivation
    - Appropriate farming/ cultivation plan/ agricultural land use plan/ marketing
  - (3) Environmental and Social Considerations
    - Execution of Initial Environmental Examination (IEE) as shown in Annex 3
4. To select priority area(s) in each basin
- Selection of priority area(s) in each basin for Detailed Plan

[Phase 2] Formulation of Detailed Plan in the Priority Areas and Finalization of the M/P

1. To formulate Detailed Plan composed of the following items in the priority area(s):
- (1) To implement hydro-meteorological observation in the priority area(s)
    - Development of supplementary hydro-meteorological observation system if necessary
    - Continuous hydro-meteorological observation from Phase 1 and supplementary observation in the priority area(s)
  - (2) Irrigation and drainage/ management of the agricultural water
  - (3) Farming/ Cultivation/ Agricultural land use plan/ Marketing
  - (4) Environmental and Social Considerations
2. To finalize the M/P.
- Finalization of the M/P as results of phase 1 and phase 2 studies

V. WORK SCHEDULE

The Study will be carried out in accordance with the tentative schedule as attached in the Annex 2.





## VI. REPORTS

JICA shall prepare and submit the following reports in English to RGC.

1. Inception Report:  
Thirty (30) copies at the commencement of Phase 1 in Cambodia.
2. Progress Report 1:  
Thirty (30) copies at the end of the Phase 1 in Cambodia.
3. Interim Report:  
Thirty (30) copies at the commencement of the Phase 2 in Cambodia.
4. Progress Report 2:  
Thirty (30) copies in the middle of the Phase 2 in Cambodia.
5. Progress Report 3:  
Thirty (30) copies at the end of the Phase 2 in Cambodia.
6. Draft Final Report:  
Thirty (30) copies after the Phase 2 in Japan. RGC shall submit its comments to JICA Cambodia Office within one (1) month after the receipt of the Draft Final Report.
7. Final Report:  
Fifty (50) copies will be submitted within one (1) month after the receipt of the comments on the Draft Final Report.

## VII. UNDERTAKINGS OF THE RGC

1. RGC shall accord privileges, exemptions and other benefits to the Japanese Study Team in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Royal Government of Cambodia signed on 17 June, 2003.
2. RGC shall bear claims, if any arises, against the members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the Japanese study team.
3. Ministry of Water Resources and Meteorology (hereinafter referred to as "MOWRAM") and Ministry of Agriculture, Forestry and Fisheries (hereinafter referred to as "MAFF") act as counterpart agencies to the Japanese study team and also as a coordinating body in relation with other

governmental and non-governmental organizations concerned for the smooth implementation of the Study, on behalf of RGC.

4. MOWRAM and MAFF shall, at their own expense, provide the Japanese study team with the following, in cooperation with other organizations concerned:

- (1) Security-related information on as well as measures to ensure the safety of the Japanese study team,
- (2) Information on as well as support in obtaining medical services,
- (3) Available data (including maps and photographs) and information related to the Study,
- (4) Counterpart personnel,
- (5) Suitable office space with necessary equipment, and
- (6) Credentials or identification cards.

#### VIII. UNDERTAKINGS OF JICA

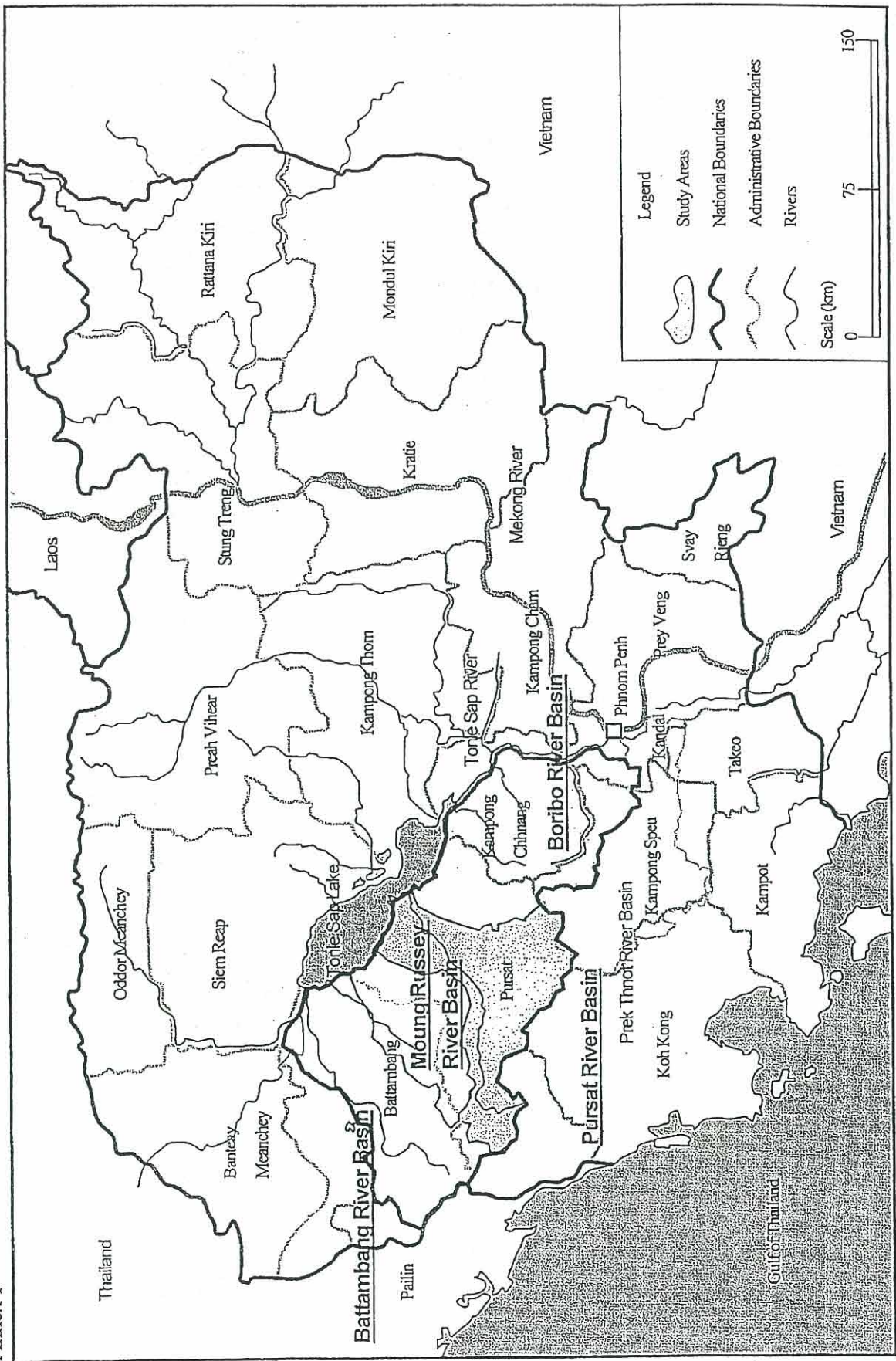
For the implementation of the study, JICA shall take the following measures:

1. To dispatch, as its own expense, the Japanese study team to the Kingdom of Cambodia, and
2. To pursue technology and skills transfer to Cambodian counterpart personnel in the course of the Study.

#### IX. CONSULTATION

JICA, MOWRAM and MAFF shall consult with each other in respect of any matter that may arise from or in connection with the Study.





Study Area of Basin-wide Basic Irrigation and Drainage Master Plan Study





## Draft Terms of Reference (TOR) for Environmental and Social Consideration

### Initial Environmental Examination (IEE)

The IEE study includes the following items.

1. Policy, Legal and Administrative Framework
2. Project Description
3. Description of Environment in the Study Area
4. Environmental Impacts
5. Analysis of Alternatives
6. Environmental Management Plan  
To prepare mitigation measures and monitoring plans
7. Stakeholder Consultation  
To record consultation meetings with stakeholders

Terms of Reference for Environmental Impact Assessment (EIA) are prepared.

### Environmental Impact Assessment (EIA)

The following items are examples of the study contents. TOR is decided in IEE study.

1. Policy, Legal and Administrative Framework
2. Project Description
3. Description of Environment in the Study Area
4. Environmental Impacts
5. Analysis of Alternatives
6. Environmental Management Plan
7. Stakeholder Consultation



*Attachment-2*  
*Minutes of Meeting on Inception Report*

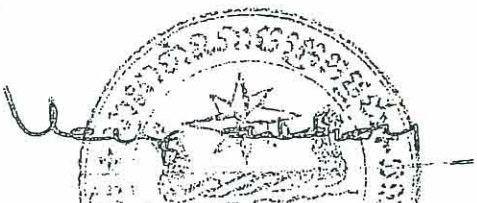
MINUTES OF MEETING  
ON  
INCEPTION REPORT  
FOR  
BASIN-WIDE BASIC IRRIGATION AND DRAINAGE MASTER PLAN STUDY  
IN THE KINGDOM OF CAMBODIA

The Study Team arrived in Cambodia on 31 January 2007 for commencement of the 1<sup>st</sup> Field Work in Phase I for Basin-wide Basic Irrigation and Drainage Master Plan Study (herein after referred to "the Study"). In connection with the commencement of the Study, the Study Team submitted beforehand (30) thirty copies of the Inception Report in English and Khmer respectively, to the Ministry of Water Resources and Meteorology (herein after referred to as "MOWRAM"), in accordance with the Scope of Work for the Study signed between the MOWRAM and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on 26 October 2006.


A meeting on the Inception Report was held on 21 February 2007 with participants from line agencies such as Ministry of Water Resources and Meteorology, Ministry of Agriculture, Forestry and Fisheries, Ministry of Environment, Ministry of Economy and Finance, Cambodia National Mekong Committee, and donors such as Embassy of Japan, Asian Development Bank, Agence France Development.

In the meeting, the Study Team explained the contents of the Report and further highlighted basic approaches and plan of operation of the Study. Thereafter, a series of discussions was made among them. As a result of the discussions, in principle the Report was agreed by both sides. The main issues discussed by the both sides and the list of participants are shown in Annexes attached hereto.

26 February 2007



H.E. VENG Sakhon  
Chairman of the Steering Committee  
Secretary of State  
Ministry of Water Resources and Meteorology  
The Kingdom of Cambodia



KODAMA Masayuki  
Leader  
The Study Team

Encl.



#### Main Issues Confirmed and Agreed at the Meeting

- (1) Coordination with MOWRAM and MAFF  
A coordination between MOWRAM and MAFF in the Study was requested by JICA Cambodia Office for smooth execution of the Study.
- (2) Coordination with other projects  
MOWRAM is studying and executing many projects in the Study area under his own budget and assistance by several donors. Participants to the meeting requested that the Study should have a coordination with them.
- (3) Formation of steering committee  
MOWRAM is waiting for nomination of members from line ministries to form the Steering Committee.
- (4) River basin conservation and management  
Several participants to the meeting emphasized degradation in the river basins have been processed by human activity and natural disasters. Participants also indicated that the basin-wide conservation and management program should be studied and implemented in the earliest time in collaboration with development projects within an umbrella of MOWRAM.  
In this connection, participants to the meeting suggested that a hydraulic model tool should be developed and hand over to MOWRAM in order to MOWRAM can continue analysis, study and implementation by himself. The hydraulic modeling tool can help MOWRAM to monitor and evaluation of water resources available, especially can help to predict flood and drought events. The hydraulic model have been set up in a few projects in and around the Study Area such as Boribo, Svay Don Keo, and Mongkol Borey basins by ADB and AFD.  
The Study Team explained that:
  - i) The Study Team will review the runoff model developed by the projects mentioned above.
  - ii) The meteorological and hydrological data are very scarce in the Study Area. One of the main work of the Study is to install rainfall recorders and water level gauges and recorders in order to accumulate data which can be utilized in future.
  - iii) The Study Team will make a recommendation of study and implementation of basin-wide water resources conservation and management activities based on the Master Plan study.
- (5) Pilot Project  
Participants to the meeting suggested that pilot project would be implemented in parallel with the Study just like the Study on Comprehensive Agricultural Development Plan of Prek Thnot River Basin which is being conducted by JICA and study team. The Study Team was requested to inform the suggestion to JICA Head Quarters.
- (6) Expansion of the Study Area  
A participant suggested to expand the Study Area to one more a few river basins, especially Mongkol Borey River Basin. The Study Team explained that the Study covers five basins e.g. Bttambang, Mounng Russey, Pursat, Boribo, and part of Prek Thnot in accordance with the Scope of Work on 26 Octoer 2996.

(7) Crop diversification

The Study Team replied to participants question about crop diversification which is one of the important policy of the Government of Cambodia in agricultural development:

- i) The demand of rice will keep increasing due to increase of population and improvement of people income.
- ii) The Study Area is rice granary in the country, and has a good potential to increase rice production which will be a main food crop in the country in future.
- iii) The Study will center to improve rice production by introducing high quality rice and or double cropping of high yield varieties taking into account availability of irrigation water and land use.
- iv) Cultivation of other crops than rice will be also carefully studied taking into account availability of irrigation water, topography and land use, farmers willingness, necessity of extension services, marketability, and so on.

## List of Participants

### 1. Government of Cambodia

#### 1.1 MOWRAM

- 1) H.E. Mr. VENG SAKHON Secretary of State
- 2) Mr. CHEA CHHUNKEAT Director of Administration
- 3) Mr. CHHEA BUNRITH Director of Planning and International Cooperation
- 4) Mr. LONG VUTH Director of Internal Audit
- 5) Dr. THENG TARA Director of Water Resources Conservation and Management
- 6) Mr. TE AUV KIM Director of Irrigated Agriculture
- 7) Mr. SOK MONIRATANA Director of Sanitation and Water Supply
- 8) Mr. EA PISETH Director of PDOWRAM Kg. Speu
- 9) Mr. CHUN PENG LONG Director of PDOWRAM Kandal Province
- 10) Mr. CHEA SOKNY Deputy Director of Cabinet
- 11) Mr. CHEK TRY Vice chief of Dept. of Planning and International Cooperation
- 12) Mr. THENG BUNTENG Chief of Office, Dept. of Engineering
- 13) Mr. KHETH PISETH Official, Dept. Planning and International Cooperation

#### 1.2 MAFF

- 1) HE. Mr. IT NODY Secretary of State Ministry of Agriculture, Forestry and Fisheries
- 2) Mr. CHIM SOKKHON Director of PDA Kandal Province
- 3) Mr. BIN SHRETA Director of PDA Kg. Speu

#### 1.3 Others Government Agencies

- 1) HE. Mr. NHEAN LENG Under secretary of State, Ministry of Economy and Finance
- 2) Mr. BEN DARAMONY Chief of Division, Ministry of Economy and Finance
- 3) Mr. KONG RATANAK Chief of office, Ministry of Economy and Finance
- 4) Mr. YEN SOPHAN Deputy of ADB & WB, Ministry of Economy and Finance
- 5) Mr. NGOUN KONG Deputy Director General, Ministry of Environment
- 6) Mr. WATT BOTKOSAL Director of Planning Dep. Cambodia National Mekong Committee

#### 1.4 Donors

- 1) Mr. ACAIN GOFFEA Project Officer ADB/MOWRAM
- 2) Mr. PINTIA FISARA Consultant for NWISP/PTLA, BCEOM
- 3) Mr. HIEV LUC Officer of AFD

### 2. Japanese side

#### 2.1 Embassy of Japan

- 1) Mr. KOBAYASHI Kenichi Second Secretary, Embassy of Japan

#### 2.2 JICA Cambodia Office

- 1) Mr. MURAKAMI Yusuke Deputy Resident Representative, JICA Cambodia
- 2) Ms. TANAKA Tomoko Assist. Resident Representative, JICA Cambodia

#### 2.3 JICA Expert

- 1) Mr. MORIYAMA Nobuhiro JICA Advisor to MOWRAM
- 2) Mr. SAKAI Shinobu Technical Service Center of MOWRAM

#### 2.4 Study Team

- 1) Mr. SHIMAZAKI Hitoshi Leader of Study Team for Comprehensive Agriculture Develop. in the Prek Thnot River Basin
- 2) Mr. KODAMA Masayuki Leader for Basin-wide Basic Irrigation & Drainage Master Plan Study

*Attachment-3*  
*Minutes of Meeting on Progress Report (1)*



MINUTES OF MEETING  
ON  
PROGRESS REPORT (1)  
FOR  
BASIN-WIDE BASIC IRRIGATION AND DRAINAGE MASTER PLAN STUDY  
IN THE KINGDOM OF CAMBODIA

The Study Team submitted thirty (30) copies of the Progress Report (1) in English on 17<sup>th</sup> October 2007, to the Ministry of Water Resources and Meteorology (herein after referred to as "MOWRAM"), in accordance with the Scope of Work for the Study signed between the MOWRAM and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on 26<sup>th</sup> October 2006.

A Steering Committee Meeting on the Progress Report (1) was held on 23<sup>rd</sup> October 2007 with the participants from line agencies such as MOWRAM, Ministry of Agriculture, Forestry and Fisheries (MAFF), and Ministry of Environment (MOE).

In the Meeting, the Study Team explained the contents of the Report and further highlighted the Road Map for Irrigation and Drainage Development in the Four River Basins Toward Year 2020 (the Road Map 2020) and proposed 21 projects and 4 project supporting programs formulated under the Study. Thereafter, a series of discussions was made among them. As a result of the discussions, in principle the Report was agreed by both sides. The main issues discussed by the both sides and the list of participants are shown in Annexes attached hereto.

24<sup>th</sup> October 2007



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H.E. VENG Sakhon  
Chairman of the Steering Committee  
Secretary of State  
Ministry of Water Resources and Meteorology  
The Kingdom of Cambodia



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KODAMA Masayuki  
Leader  
The Study Team

Encl.

#### Main Issues Confirmed and Agreed at the Meeting

- (1) Importance of Participatory Irrigation Management and Development (PIMD)  
The participants have agreed to the importance of PIMD currently emphasized by MOWRAM. Therefore, the concept will be fully incorporated into the Study.
- (2) Necessity of Referring to PIMD Master Plan to be carried out by AFD and FAO  
AFD and FAO will jointly carry out the Master Plan Study on PIMD from December 2007 to the end of 2008. The participants have agreed that JICA Study Team will refer to abovementioned study for preparing Pre-feasibility Study (Pre-F/S) as well as finalizing M/P in the next phase
- (3) Importance of Software Component  
Since irrigation sector can be sustainable with the combination of both hardware and software component, the participants have agreed that the Study focus on both aspects concurrently to enable irrigation vital in the future.
- (4) Fund for the Implementation of the Road Map 2020  
The participants have agreed that how to materialize project implementation is of importance in the earliest period. Currently, donor agencies have also understood the consequence of software component, therefore, MOWRAM is requested to prepare assistance application including both hardware and software based on the need as well as the Study result. In this connection, JICA added that it would be seemingly difficult for the single agency to assist such large areas as target Four River Basins under the M/P. MOWRAM is, therefore, needed to actively contact with various donors to obtain support for the implementation of the Road Map 2020.
- (5) Return Period utilized for the Drainage Plan  
The participants confirmed about the meaning of return period utilized for the Drainage Plan. The Study Team further explained that the return period needs to be determined by considering the purpose and the importance of the target structures. The one utilized for the Drainage Plan under M/P is appropriate in the Asian Countries including Cambodia.
- (6) Responsibility of Environment Impact Assessment  
Reference was made to page 11-5 in the Main Report. Delegation of EIA responsibility to the Provincial Environmental Department (DOE) is made for the project with the cost of less than US\$ 2 million, therefore, the figure in the Report needs to be revised. The Study Team agreed and will revise in the preparation of the Interim Report.
- (7) Rice Balance Result  
The figures presented in the rice balance analysis seemed to be different from the one shown in "the Development Scenario for Agriculture Sector in Cambodia" prepared by MAFF. The Study Team replied that the balance study by the Team was carried out by fully reviewing MAFF's scenario and utilizing different assumptions. Therefore, the result shows slight differences.
- (8) Necessity of Emphasis on the Importance of Water Resources for the Irrigation Sector  
Irrigation and drainage development is sustained and managed by water resources as one of the most important resources. In order to properly assess water resources for irrigation, basic



information collection through Meteorological and Hydrological Observation is essential in the future. In the Interim Report, this matter needs to be addressed in the Proposed Project Supporting Program as well as recommendation.

(9) Risks of Mines and UXO

The Study Team assessed the risks of mines and UXO based on the data from Cambodian Mine Action Center (CMAC). MOWRAM mentioned that this assessment is surely good information to promote de-mining for irrigation development. MOWRAM added that they will provide the Study Team with updated information for mines and UXO to be utilized for the finalization of M/P in the next phase.

(10) The following comments were forwarded from Cambodian National Mekong Committee (CNMC) to the Study Team through MOWRAM as comments for the Progress Report (1).

- i) More attention is required on Integrated Water Resources Management (IWRM) Approach that was addressed in the Article 4 of the Law on Water Resources Management in the Kingdom of Cambodia (29<sup>th</sup> June 2007).
- ii) The word, the target area is more appropriate rather than objective area utilized in the summary sheet of the project in the Chapter 8. In addition, the Report needs to explain the concept of the M/P in the Chapter 8 since the title of the Chapter 8 is "formulation of Master Plan for Irrigation and Drainage Development." At present, the Chapter 8 elaborated only proposed projects.
- iii) Some projects proposal should be multipurpose including irrigation, drainage, fisheries and navigation benefits which also need to be dealt with in accordance with IWRM principles and concepts.
- iv) Descriptions of the Chapter 10, implementing organization, are not clear enough. For example, the meaning of co-implementing needs to be clearly explained in the Report.

The Team responded in these matters as follows:

- i) The Team understands the importance of IWRM concept. Although the Study concentrate on the formulation of irrigation M/P as well as Pre-F/S for selected areas, strengthening of meteorology and hydrology observation system is also considered so as to contribute to support establishment of IWRM framework in the future.
- ii) The concept of M/P was separately explained in the Chapter 6 and the Chapter 9. The Team re-arrange and touch up the contents when preparing the Interim Report
- iii) Since the Study aims to develop irrigation and drainage in the Four River Basins, proposed M/P concentrate on irrigation sector. However, the Team understands the importance of indirect effect against other sectors, therefore, mitigation measures for negative impact toward such other sectors will be considered in the Pre-F/S and M/P finalization in the next phase.
- iv) Description of the Chapter 10 will be revised when the Interim Report is prepared for clearly explaining tasks and relations of relevant institutions.

The Study Team concluded that the discussions made in the meeting are carefully considered, particularly item number (1): PIMD, (3): Importance of Software Component, (8): Importance of Water Resources, and (9): Risks of Mines and UXOs, in the course of the Study.

## List of Participants

1. Government of Cambodia
  - 1.1 MOWRAM
    - 1) H.E. Mr. VENG SAKHON Secretary of State
    - 2) H.E. Mr. SIN VUTHY Inspector General
    - 3) Mr. CHANN SINATH Deputy Director for General of Technical Affairs
    - 4) Mr. CHUON BITHOL Deputy Director for General of Technical Affairs
    - 5) Mr. CHHEA BUNRITH Director of Planning and International Cooperation
    - 6) Mr. LONG SARAVUTH Director of Meteorology Department
    - 7) Mr. HOU KA Deputy Director of Administration and Human Resources
    - 8) Mr. PHENG SEANG MENG Deputy Director of Hydrology and River Works Department
  - 1.2 MAFF
    - 1) HE. Mr. IT NODY Under Secretary of State Ministry of Agriculture, Forestry and Fisheries
    - 2) Mrs. NEOU SINTHAN Vice Chief Director of Planning Department
  - 1.3 Other Government Agencies
    - 1) Mr. CHAN THAN KONG Official, Department of Local Administration, Ministry of Interior
    - 2) Mr. RATH PISITH Deputy Director, Ministry of Land Management, Urban Planning and Construction
    - 3) Mr. SAROM SOTHOEUN Staff, Ministry of Economy and Finance
    - 4) Mr. NGOUN KONG Deputy Director General, Ministry of Environment
2. Japanese side
  - 2.1 JICA Cambodia Office
    - 1) Ms. TANAKA Tomoko Assistant Resident Representative, JICA Cambodia Office
    - 2) Ms. SIV CHEANG Program Officer, JICA Cambodia Office
  - 2.3 JICA Expert
    - 1) Mr. MORIYAMA Nobuhiro JICA Advisor to MOWRAM
    - 3) Mr. TAKASHIMA Tomozo JICA Expert to MAFF
  - 2.4 Study Team
    - 1) Mr. KODAMA Masayuki Leader of the Study Team for Basin-wide Basic Irrigation & Drainage Master Plan Study
    - 2) Mr. MASAKI Manabu Irrigation & Drainage Facilities / Water Management
    - 3) Mr. SHIRAKI Takashi Agriculture / Farming Practice / Market
    - 4) Mr. OTSUKA Shigeya Environment & Socio-Economy
    - 5) Mr. MATSUMOTO Yutaka Project Evaluation
    - 6) Mr. ITO Hajime Coordinator/ Design & Cost Estimate
    - 7) Mr. RANDY Veng Assistant of JICA Study Team
    - 8) Mr. SHIMAZAKI Hitoshi Leader of the Study Team for Comprehensive Agriculture Develop. in the Prek Thnot River Basin