



**Improvement of Irrigation Efficiency
on Paddy Fields
in the Lower Mekong Basin project**

**Progress Report
for the 2006 Funding
July 2006 to July 2007**

**under the framework of
“Programme to analyze and evaluate
water and ecosystem in Asian paddy fields”**

**funded by the Ministry of Agriculture, Forestry and
Fisheries, Japan**

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Mekong River Commission**

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LIST of ABBREVIATIONS and ACRONYMS

ADB	Asian Development Bank
AEWEPF	Programme to analyze and evaluate water and ecosystem in Asian paddy fields
AIFP	Agriculture, Irrigation and Forestry Programme, MRCS
CEO	Chief Executive Officer, MRC
CNMC	Cambodia National Mekong Committee
CPWF	Challenge Programme on Water and Food
DMPF	Project to Demonstrate the Multi-Functionality of the Paddy Fields over the Mekong River Basin
ESPIIM	Evaluation Study of Paddy Irrigation under Monsoon Regime
FAO	Food and Agriculture Organization of the United Nations
FAO-RAP	FAO Regional Office for Asia and the Pacific
GMS	Greater Mekong Sub-region
ICCS	International Cooperation and Communication Section, MRCS
IIEPF	Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong Basin project
INWEPF	International Network for Water and Ecosystem in Paddy Fields
JC	Joint Committee, MRC
JPY	Japanese Yen (currency)
LA(s)	Line Agency(ies)
LMB	Lower Mekong Basin
LNMC	Lao National Mekong Committee
MAF	Ministry of Agriculture and Forestry, Laos
MAFF	Ministry of Agriculture, Forestry and Fisheries, Japan
MOWRAM	Ministry of Water Resources and Meteorology, Cambodia
MRC	Mekong River Commission
MRCS	Mekong River Commission Secretariat
NMC(s)	National Mekong Committee(s)
OPD	Operations Division, MRCS
RAP	Rapid Appraisal Process
RID	Royal Irrigation Department, Thailand
SIWRR	Southern Institute of Water Resources Research, Vietnam
TNMC	Thai National Mekong Committee
TSD	Technical Support Division, MRCS
TOR	Terms of Reference
USD	US dollar
VNMC	Vietnam National Mekong Committee
WSMP	Watershed Management Project

1 Introduction

Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong Basin project (IIEPF) aims to improve irrigation efficiency through the introduction of the guidelines, which cover technical, institutional and managerial aspects of irrigation scheme and facilities operation, and to contribute water use in more efficient manners in the basin.

In this context, IIEPF sets overall and immediate objectives as below:

Overall objective:

To improve irrigation efficiency on paddy fields in the Lower Mekong Basin

Immediate objectives:

1. to appraise irrigation efficiencies and the irrigation system based on the modern concepts in the selected irrigation schemes;
2. to enhance capacity of all the stakeholders in using up-to-date concepts of irrigation efficiencies and water balance and modern tools and procedures for their assessment; and
3. to produce guidelines for improving irrigation efficiency on paddy field based on actual water use conditions in the member countries

This project is funded by the Ministry of Agriculture, Forestry and Fisheries, Japan under the framework of “Programme to analyze and evaluate water and ecosystem in Asian paddy fields (AEWEPF.)”

IIEPF is implemented under the framework of the MRC. IIEPF works closely with the project “Demonstration of Multi-functionality of Paddy Fields” (DMPF.) Both projects, IIEPF and DMPF, manage a part of the first component of the Agriculture, Irrigation and Forestry Programme (AIFP) of the MRC.

Activities under the first year (July 2005 to July 2006) can be summarized as formulation of the detail action plan of project implementation, revision the project document and commencement of the field observation at four selected pilot sites. Detail of the first year activities were reported as “Progress Report for the Funding 2005 MK G/R-06026” in November 2006.

Since the revised project document was agreed in principle by member countries at the first regional workshop, the project has commenced substantial activities with line agencies mainly at the field level.

This progress report is describing the second year activities conducted by the 2006 funding from July 2006 to July 2007 in principle.

Among those below, for dry season field observation, submission of the interim reports from the line agencies was delayed in spite that field observation had been completed as planned. Due to this delay, related costs lying with the 2006 funding were spent after

the due date of July 2007. A summary report was therefore issued in April 2007, while further details and supplementary information are now included in this report. On the other hand consultancy service, which is not covered by the 2006 funding, is partially reported here because procurement process completed before the submission of this report.

Major contents of this report are summarized as follows:

- Rapid Appraisal Process (RAP) training workshop,
- Initial scheme assessment by RAP,
- Brief training on electro-magnetic current meter,
- Initial discussions for field observation,
- Field observation by line agencies and its backstopping,
- Interim report for 2006/07 dry season field observation,
- Procurement of the consultancy service,
- Annual consultation meeting with the donor,
- Related publicity on the project, and
- Other capacity building activities for MRCS staff

2 Activities

2.1 *Rapid Appraisal Process (RAP) training workshop*

The RAP training workshop was conducted as a part of capacity building activities as the project document describes as below.

Outputs and activities

To meet the objective 2: to enhance capacity of all the stakeholders in using up-to-date concepts of irrigation efficiencies and water balance and modern tools and procedures for their assessment, the following outputs are planned;

Output 2.2: Training workshop on RAP

Activity 2.2.1: Organizing and conducting RAP workshop

This training workshop was organized in cooperation with FAO Regional Office for Asia and the Pacific (FAO-RAP) as a part of FAO-MRC collaboration under the project.

The training workshop was conducted on 18 to 21 July 2006 at MRC conference room, Vientiane, Lao PDR with participation of 22 attendances in total. These included four (4) participants each from member countries, two (2) resource persons from FAO-RAP, one (1) from FAO Laos office and two (2) professional staff and one (1) support staff from the MRC secretariat.

This four-days workshop basically included four sessions a day, two in the morning and two in the afternoon. First two days were mainly spent for general information of

- What is the irrigation system modernization and why it is important,
- Water control methods in order to realize irrigation modernization, and
- Modern concept of water balance, irrigation efficiency and productivity including multiple use of irrigation water.

Last two days were mainly spent for RAP itself, which included:

- Outline of RAP,
- How to interpret indicators from RAP,
- How to set up modernization plan from the RAP result, and
- Review of filled RAP worksheets prepared by the participants.

Detail of the workshop has been separately reported by the workshop proceedings report with the result of initial scheme assessment described in 2.2 below. This workshop proceedings report was delivered to the donor, NMCs and line agencies in September 2007 and is also posted on the MRC web site.
(<http://www.mrcmekong.org/programmes/AIFP/publications.htm>)

2.2 *Initial scheme assessment by RAP*

Following the above RAP training workshop, performance assessment of the selected pilot sites was conducted with the application of RAP. This assessment was carried out

by the line agencies with technical support by two resource persons from FAO-RAP and with facilitation by the MRCS from July to August 2006. Schedule is shown in Table 1.

This activity has two major purposes, which are:

- On the job training to follow up the RAP training workshop and
- Initial assessment of performance level of the schemes by currently available data.

The second purpose is to meet the project's immediate objective #1 as described in the project document as follows, and is followed by additional two sub-purposes, which are:

- To identify options for scheme improvement and
- To identify missing data to complete RAP at the final stage of field observation.

Outputs and activities To meet the objective 1: to appraise irrigation efficiencies and the irrigation system based on the modern concepts in the selected irrigation schemes, the following outputs are planned; Output 1.4: Rapid Appraisal Process Activity 1.4.1: Organizing data required to conduct RAP Activity 1.4.2: Conducting RAPs in the selected irrigation schemes
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The mission has been warmly welcomed by the line agencies assisting for the first implementation of the RAP in their countries.

These first results have allowed consolidating necessary and valuable information for the formulation of some proposals to improve the performance of the schemes but the missing data does not make it possible to reach a final conclusion. Detail of this activity was reported by the separate publication "Report on the RAP Training Workshop and Initial Assessment of Irrigation Scheme Performance" published in September 2007 and also posted on the MRC web site as mentioned in 2.1 above.

Follow-up activities of this initial assessment are succeeded by the field observation described in 2.5 below.

Table 1 Outlined schedule of RAP initial assessment

Country	Duration	Venue	Resource persons
Laos	24 to 27 July 2006	Nam Houm project, Vientiane province	Dr. Chen
Cambodia	31 July to 5 August	Kompong Puoy project, Battambang province	Dr. Chen
Thailand	7 to 12 August	Huay Luang project, Undonthani province	Mr. Facon
Vietnam	21 to 26 August	Long Hai district, Go Cong project, Tien Giang province	Mr. Facon

2.3 Brief training on electro-magnetic current meter

The supplier of the electro-magnetic current meter – IPSH SDN.BHD based in Malaysia – offered a free of charge training to manipulate the current meter. This training was conducted by a dispatched engineer, Mr. Jacky Cheong, on 26 Sept 2006 at Tha Ngon project, suburban of Vientiane, Lao PDR. The training was composed of a three-hours lecture for the basic function and operation of the current meter followed by the practice on the field. Three members of the field observation team from Lao line agencies were provided training. Essence of the training was complied as a brief note and disseminated to other three countries' team members by AIFP programme officer at the initial discussion mentioned in 2.4 below.

The brief note for operation is attached in Annex-1.

		
Lecture	Preparation	Practice

2.4 Initial discussions for field observation

Sub-contracts for field observation were concluded with four NMCs from October to November 2006. Once the contract was concluded initial discussion with line agencies was held to confirm the detail of field activities.

Items listed below are the purposes of this discussion.

- Comprehensive discussion for overall activities of the whole work
- Detail discussion for short term activities to launch the field observation
- Facilitation of the discussion among the team members (between NMC and Line Agencies), if required
- Hand over a set of current meter
- Brief training how to use current meter

Discussions were held as followed schedule;

Lao PDR	3 November 2006,
Thailand	10 November,
Vietnam	20, 21 November, and
Cambodia	4, 18 to 20 December.

Discussions have deepened understanding of the field activities by the team, clarified the detail work plan for the beginning stage of the field observation and contributed to smooth implementation of the fieldwork.

Prepared documents are attached as Annex-2. Discussion records are also attached as Annex-2.

2.5 *Field observation by line agencies and technical backstopping*

Field observation has commenced from 2006/07 dry season crop and is still on going at the four pilot sites based on agreed TOR and the detail work plan proposed by the line agencies. A common TOR is attached as Annex-11 of the previous (2005) progress report. Proposed and agreed work plans from the line agencies are attached as Annex-3. Based on the proposed work plan, crop calendar and irrigation practice, monitoring and technical backstopping have been planned as shown in Table 2.

Table 2 *Monitoring Plan*

	2006		Year 2007												Year 2008											
	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A				
Crop calendar and irrigation schedule																										
Komping Pouy (Cambodia)																										
Nam Houm (Laos)																										
Huay Luang (Thailand)																										
Go Cong (Vietnam)																										
Monitoring plan																										
Komping Pouy (Cambodia)				F		F		O	F			F		O												
Nam Houm (Laos)		F	F		F			F				F		O												
Huay Luang (Thailand)			F	F	F				F			F														
Go Cong (Vietnam)				F				F				F														

F:Field, O:Office

To date monitoring and technical backstopping have been conducted. Through each field visit, the MRCS have provided recommendations and advices to the field team, which are summarized as Back-to-office report. This process has contributed to support filed observation and also permitted a strengthening of field team capacities.

The four countries have implemented the scheduled activities well. Thus,

- In Komping Pouy in Cambodia, the field team have done important work on collecting data and measurements. The field assessment methods implemented by the field team have been agreed by AIFP programme officers. Next step for this scheme will be to compile and analyse data collected and share results with local officials and CNMC.
- In Num Houm in Lao PDR, the support of AIFP programme officers has allowed an improvement of the data recording. Now most of the measurements are well functioning. For the next step, the team have to work on the analysis of collected data.

- In Huay Luang in Thailand, data have been collected by the field team well. Some tools have already been made, like maps. The field team will begin the collection of information for water allocation/management and also analysis of data during the next crop season.
- In Go Cong in Viet Nam, the field team has improved the accuracy of data recording at the field level. Data has been recorded since December 2006 and discussions with local officials now allow the presentation of first conclusion on the water management of paddy fields. First meetings have been held at the local level to propose methods to improve irrigation systems in the pilot site. Proposals have been well welcomed and will be tried as soon as possible.

Detail of monitoring and technical backstopping are reported as Back-to-office reports and attached as Annex-4 together with their summary table.

2.6 Interim report for 2006/07 dry season field observation

As mentioned in 2.5, field observation is still on going, but 2006/07 dry season observation was completed in March to May 2007 depending on the crop calendar of each pilot site and draft interim reports from the line agencies were submitted to MRCS from July to September 2007. For the quality control of the report, MRCS has provided the outline of the interim report as guidance for the line agencies in advance. MRCS has also provided written comments on the draft interim report respectively. The outline is attached as Annex-5.

Based on the written comments, individual discussion was held as followed schedule;

Cambodia	24 August 2007 (after 4 th DMPF workshop)	with Dr. Tara
Vietnam	19 September (during NIRE's field visit)	with Mr. Toan
Thailand	9 October (individual visit)	with Mr. Somsak & Mr. Pramote

For Lao PDR, the written comment was delivered to LNMC and fieldwork team in October and discussion is planned in November 2007.

Written comments and individual discussion have accepted by each team. NMCs agreed to revise/finalize and resubmit the interim reports.

MRCS has conducted in depth analysis of irrigation efficiency and water productivity based on three pilot schemes with gravity irrigation. The result was complied as a technical paper and was presented at the 3rd Southeast Asia Water Forum in October 2007. This paper and presentation slide show are uploaded on the MRC web site (http://www.mrcmekong.org/download/Papers/Irrigation_efficiency_paper.pdf, http://www.mrcmekong.org/download/Papers/Irrigation_efficiency_ppt.pdf).

2.7 Procurement of the consultancy service

In the third year (from July 2007) the project plans to hire consultant(s) to draft guidelines for efficient irrigation water use as the final output of the project.

Recruitment process has been initiated since the beginning of 2007. Advertisement was made in May 2007 and National Institute for Rural Engineering, Japan was appointed to carry out this service in August 2007.

Planned workflow and draft work plan including recruitment process are shown in Figure 1 and Table 3 respectively. TOR for this consultancy service is attached as Annex-6.

Figure 1 Workflow

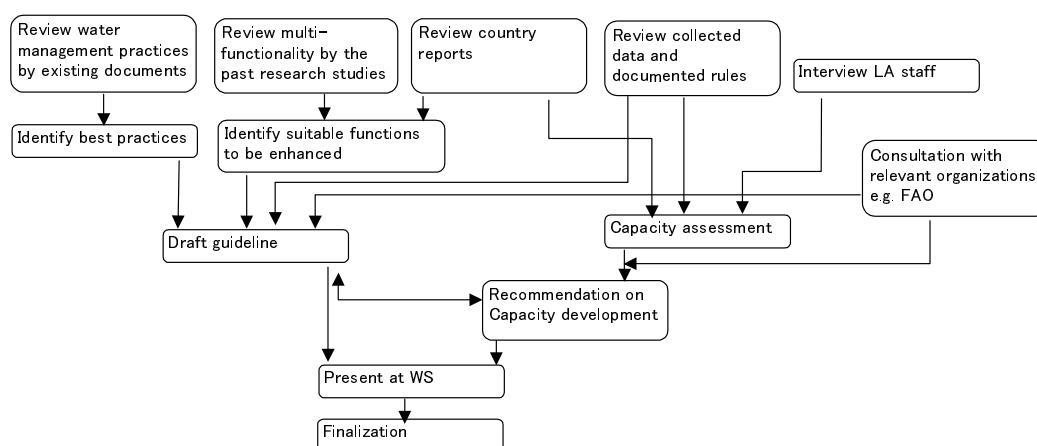


Table 3 Detail workplan

	2006		Year 2007												Year 2008											
	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A				
Crop calendar and irrigation schedule																										
Komping Pouy (Cambodia)																										
Nam Houm (Laos)																										
Huay Luang (Thailand)																										
Go Cong (Vietnam)																										
Monitoring plan																										
Komping Pouy (Cambodia)																										
Nam Houm (Laos)																										
Huay Luang (Thailand)																										
Go Cong (Vietnam)																										
Report from field work																										
RAPs																										
Procurement of consultancy service																										
drafting/approval of TOR																										
invitation of 2007 funding																										
funding																										
advertisement																										
deadline of application																										
evaluation																										
contract																										
Consultancy service																										
inception discussion with MRCS																										
preliminary field visits																										
office work (review documents, reports etc.)																										
field survey and discussion with teams																										
drafting guidelines																										
regional workshop																										
finalizing guidelines																										

2.8 Annual consultation meeting with the donor

The donor – the Ministry of Agriculture, Forestry and Fisheries, Japan – has dispatched two officials to hold the annual consultation meeting with MRCS. The mission stayed Vientiane from 31 January to 2 February 2007 and had a series of discussions with MRCS.

The progress of the project together with DMPF and their perspectives of the forthcoming implementation were discussed and confirmed. The mission appreciated MRC's effort for the implementation of both DMPF and IIEPF and pledged 2007 funding to IIEPF with same amount as the previous years at JPY basis.

The mission also spent time to share ideas for the future cooperation with MRC after the completion of this current three years project.

Agenda of the mission and internal memorandum to record meeting result are attached as Annex-7.

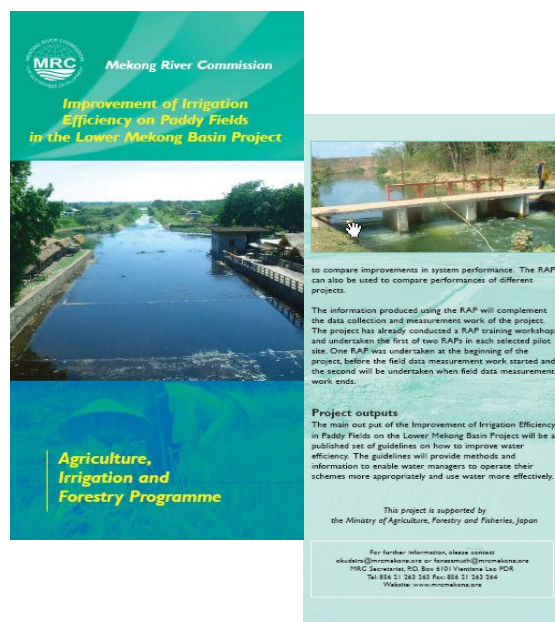
2.9 Related publicity of the project

Since the project content was fixed by completion of the revised project document, several works to publicize the project have been conducted under the 2006 funding. Below are the brief descriptions of those works.

(1) Brochure

A triple-fold leaflet to briefly describing the background, objectives, activities, methodology and expected output of the project was produced in cooperation with the Communications Unit/ICCS of the MRCS. This project brochure was delivered to the member countries (NMCs) and the donor in October 2006 and is used to brief the outline of the project at various occasions, such as CPWF International Forum on Water and Food, ADB initiating GMS working group meeting and to the visitors to MRCS. Image of the brochure is shown on the right and full document is available from the MRC web site.

(http://www.mrcmekong.org/download/programmes/AIFP/agriculture_Irrigation_leaflet.pdf)



(2) International Conference in Chaing Rai

The MRC co-organized an international conference on “Mekong Research for the People of the Mekong” in October 2006 in Chaing Rai, Thailand. On this occasion, AIFP team has made a presentation to introduce the project outline.

Full text delivered at the conference is available on the MRC web site (http://www.mrcmekong.org/download/Papers/fullpaper_impr_of_irrigation.pdf). Back-to-the-office report and the slide show for the oral presentation are attached as Annex-8.

(3) Poster

The project is going to produce a series of posters to highlight the progress of the project semi-annually. This work was originally initiated for MRC Governance meetings, i.e. JC and Council meetings, to present progress of the project activity in visualized format. The first poster was prepared for the Thirteenth meeting of the Council in December 2006 in Ho Chi Minh city, Vietnam. Second and third posters were also prepared for JC meeting in May and August 2007 respectively. All those are posted on the MRC web site.

(<http://www.mrcmekong.org/download/programmes/AIFP/Improvement-poster1.pdf>, poster2.pdf, poster3.pdf)

A4 size posters are also attached in Annex-9.

(4) Revision of website information

The AIFP website information was revised in order to reflect the finalization of the project content and other structural changes of the AIFP, i.e. the commencement of WSMP phase 2, the transfer of CPWF from TSD. This work has conducted in cooperation with the Communications Unit/ICCS of the MRCS, together with the contributions from other AIFP projects. Revised website (<http://www.mrcmekong.org/programmes/agriculture.htm>) includes concise but comprehensive information of each project under AIFP and some visual outputs of the projects especially from the DMPF.

2.10 Other Capacity building activities

(1) ICID

ICID conference was held in Kuala Lumpur, Malaysia in September 2006 organized by the Malaysian National Committee on Irrigation and Drainage. The Programme officer of AIFP attended this conference. The conference has provided various important technical information on irrigation practices presented by professors from universities around the world and senior engineers from different organizations such as ADB, FAO, World Bank, etc. This information has contributed to providing a wider and clearer vision on irrigation activities and water management throughout the world to the Programme officer. The conference also provided him opportunity to build up wider

network with other irrigation specialists around the world to sharing information and learning together.

(2) E training

The Programme officer participated in the Online Short Training Course on “Service Oriented Management of Irrigation System (SOMIS)” which was hosted by UNESCO-IHE, Netherlands in September 2006 with 140 hours actual learning time. The course was very useful, especially for building up his capacity and for IIEPF implementation because the course provided the knowledge and skill of field practice with up-to-date concept of service oriented management of irrigation systems including physical, economic and institutional aspects of services. The course was also opened the chance for participants to discuss and share experience with each other and professors also. The lesson and the provided documents are helpful and useful as references for project implementation.

(3) Seminar on River and Development

In April 2007, Programme officer of AIFP attended an international seminar on river and development held in Bali, Indonesia organized by Indonesian Association of Hydraulic Engineers and Water Resources Ministry of Public Works of Indonesia. Activities of this event provided various insight to him. Especially a half-day field visit to traditional irrigation system in Bali provided him a good example of paddy field multi-functionality, i.e. formulation of beautiful scenery, domestic use of irrigation water, watershed protection of paddy fields, agriculture and irrigation linking to religion and so on.

(4) ADB GMS meeting

Senior advisor attended Asian Development Bank (ADB) initiating Greater Mekong Sub-region (GMS) meeting namely fourth meeting of the working group on agriculture in December 2006 held in Siem Reap, Cambodia. Various initiatives to contribute regional scale (beyond the countries' boarder) agricultural development were reported and discussed. The meeting provided comprehensive information of GMS activities on agriculture in the region.

4 Outputs

4.1 Collaboration with FAO

As agreed by the exchange of Letter of Agreement in April 2006 (detail reported in the previous (2005) progress report) FAO-RAP has provided continuous support to the project implementation, i.e. 1) to dispatch two resource persons to RAP training workshop and 2) to dispatch one resource person each to initial scheme assessment at four pilot sites.

4.2 Improved knowledge on irrigation modernization

16 engineers from member countries participated in a four-day RAP training workshop have gained/improved basic knowledge of irrigation modernization (improvement) in terms of

- What is the irrigation system modernization and why it is important,
- Water control methods in order to realize irrigation modernization,
- Modern concept of water balance, irrigation efficiency and productivity including multiple use of irrigation water.

They have also acquired basic idea of RAP, a diagnostic tool for irrigation scheme performance, with views of

- Outline of RAP,
- How to interpret indicators from RAP,
- How to set up modernization plan from RAP result.

4.3 Initial assessments

The performance of four pilot irrigation schemes were assessed, analyzed and compared by common diagnostic tool, RAP. This will be a good reference and benchmark of the on-going field observation and forthcoming analysis under this project implementation. This assessment has also provided for participants an occasion to deepen understanding of RAP through its application as an On-the-Job training.

5 Financial Status

5.1 Fund status

Fund status report of the project as of the end of October 2007 is attached as Table 5. Balance as of the end of October 2007 is 4,070.16 USD.

All the activities under this 2006 funding are completed except 2007 rainy season field observation. Therefore only remaining transaction under this fund is the final payment of the field observation entrusted as sub-contract to four NMCs and second payment of this sub-contract to LNMC. Necessary fund for these payments is reserved as unliquidated obligations. Once these unliquidated obligations are cleared, approximately 7,500 USD of negative balance will be caused. This negative balance will be solved by shifting to the funding 2007 when the amount becomes determined.

Once final payment is made and the project account is closed, the closure is to be reported to the donor by separate account information with official notification letter from the MRCS. This is planned in the first quarter of 2008.

Item by item analysis shows a number of budget line have negative balance, which are mainly covered by the surplus under BL30 – Training (or Workshop.) Major negative-balanced items and their reasons are as follows:

[International Experts]

Negative balance is caused mainly because of repatriation grant (7,576.43 USD to the 2006 funding) and increment of hardship allowance and post adjustment (29.3% on appointment to over 35% at most and 31.6% at the latest.)

Repatriation grant is an allowance to international staff on separation to encourage soft landing to his home country. This entitlement is calculated based on years of services and from 2006 this is charged to the project each year the yearly increase instead of the total sum at the end of the assignment. However since this expenditure was not budgeted when three-year project budget plan was established, this has caused negative balance in the 2006 funding. For this arrangement, the project has not requested the donor's individual approval, because this is within MRC's regulation and its application.

[Support staff]

Communication/publication assistance provided by Communication unit has caused the negative balance. Detail can be referred in 5.2.

[Official Travel]

More than predicted/planned number of field visits and other external events has caused negative balance.

[Riparian professional staff]

Remuneration of AIFP Programme coordinator for three month (August to October 2006) charged to this budget line has caused negative balance. This arrangement was explained to the donor before taking action and also at annual consultation meeting and acknowledged by the donor.

[Sub-contract]

Proposed contract values from NMCs/line agencies were slightly higher than the planned budget. This is the reason of negative balance.

5.2 Summary of expenditure

(1) BL12 - International experts

This budget line covers remuneration of Senior advisor of AIFP (from August 2006 to July 2007), yearly reserve for repatriation grant and other related expenditure. The cost for his home leave is also charged.

(2) BL13 - Support staff

This budget was originally secured for hiring riparian staff temporally supporting International expert to reduce his workload. Since the project requires the assistance for editing the published documents, such as the workshop proceeding, the project brochure, the poster, website information and so on, the project requested Communication unit/ICCS of MRCS to provide their assistance and the cost is charged to this budget line.

(3) BL15 - Official travels

All the travel cost for Senior advisor and Programme officer of AIFP is covered. This is mainly composed of the meetings with line agencies and participation of other external meetings, forums and conferences.

(4) BL18 - Riparian Professional staff

This budget line covers remuneration of Programme officer of AIFP (from August 2006 to July 2007.) Remuneration of AIFP Programme coordinator for three month (August to October 2006) is also charged to this budget line.

(5) BL21 - Sub-contract

Second and final payment (30% of contract value respectively) of the field observation and analysis work entrusted to four National Mekong Committees are charged to this budget line. Second payment to LNMC and final payment to four NMCs have not been made yet and budget for those is reserved as unliquidated obligation under this budget line.

(6) BL 30 - Training (Workshop)

This budget line covers the expenditure for RAP training workshop and initial scheme assessment for member countries participants. For the initial assessment, travel cost of

the FAO resource persons is included. Some portion of these expenditures is shared with this budget line for the previous year (2005) in order to spend out its surplus.

(7) BL41 - Equipment

Small office equipment were procured under this budget line.

(8) BL52 - Reporting costs

Printing the RAP training workshop proceeding, the project brochure and the progress report is charged to this budget line.

Date: Thursday, November 01, 2007
Time: 11:18AM
User: PHANIPHONG

Project: 1.153106JPNIA
Improvement of Irrigation Efficiency on Paddy Fields in the LMB, MK2006/12

Mekong River Commission
Fund Status Report - Detail

Period Ending : 10-2007
Funding Source : Japan

Page: 1 of 1
Report: PA199.rpt
Company: MRCS

Budget Line	Description	Approved Budget (1)	Mth-To-Date Actual (2)	Proj-To-Date Actual (3)	Unliquidated Obligations (4)	Total Expenditure (5) = (3) + (4)	Budget Balance (6) = (1) - (5)	Expenditure / Budget (7) = (5) / (1)
12-00-00	International Staff (MRCS)	120,000.00	0.00	132,723.62	0.00	132,723.62	-12,723.62	110.60 %
13-00-00	Support Staff	500.00	0.00	3,000.00	0.00	3,000.00	-2,500.00	600.00 %
15-00-00	Official Travel	16,600.00	264.00	19,297.11	0.00	19,297.11	-2,697.11	116.25 %
18-00-00	Repairing Professional Staff	35,000.00	0.00	39,511.96	0.00	39,511.96	-4,511.96	112.89 %
21-00-00	Sub-contract	105,000.00	38,390.00	43,390.00	64,104.90	107,494.90	-2,494.90	102.38 %
30-00-00	Training	22,900.00	0.00	7,272.32	0.00	7,272.32	15,627.68	31.76 %
42-00-00	Non-expendable Equipment	500.00	0.00	98.00	0.00	98.00	402.00	19.60 %
52-00-00	Reporting Cost	1,000.00	1,620.00	2,331.47	0.00	2,331.47	-1,331.47	233.15 %
53-00-00	Miscellaneous	803.00	49.58	2,702.03	0.00	2,702.03	-1,899.03	336.49 %
	Subtotal :	302,303.00	40,323.58	250,326.51	64,104.90	314,431.41	-12,128.41	104.01 %
70-00-00	Management & Admin. Fee (11%)	39,299.00	0.00	23,100.43	0.00	23,100.43	16,198.57	58.78 %
	Total :	341,602.00	40,323.58	273,426.94	64,104.90	337,531.84	4,070.16	98.81 %

Total Fund Received : 341,602.00
Outstanding Advance: 0.00
Total Cash available: 68,175.06

Table 5 Fund status

ANNEXES

Annex 1

Note for electro-magnetic current meter operation

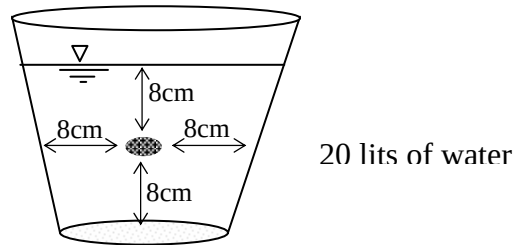
Brief note of Current Meter operation

Composition of equipment

1. An indicator:
1 year warranty; rain resistant. In case of dropping into the water, quickly pull out and wipe off to dry
2. An open-canal-velocity sensor:
5 years warranty; with 6.5 m long of black cable. The sensor can measure the velocity with the range of -0.15 to 6m/s
3. A carrying case (bag):
4. Battery:
Operation life is 25-30 hours. Two **alkaline** batteries are recommended to replace every time once run out
5. Standard wading rod
Total length of 2 m: 4 parts, 0.5 m/part, 5 cm in each mark

Zero Adjustment (see manual at pages 8 and 9)

The zero adjustment should be done approximately 1 time/month to keep equipment functioning accurate.



The procedure of zero adjustment is as follows:

1. Clean sensor with soap and water, not with oil and grease (see manual at page 12)
2. Prepare a bucket and filled by 20 lits of water
3. Set sensor in the middle with more than 8 cm distance from any directions (see figure above)
4. Make sure water is not moving and keep waiting for 10-15 min
5. Then press **RCL** **STO** keys at the same time, number "3" will be shown on the display and then press **↓** 3 times continually to count it down to "0"
6. Keep waiting for another 30 seconds while displayed number "32" counts down to "0", then zero adjustment is completed.

For better maintenance

1. Use battery with good quality
2. Wash the sensor with soap and water after every fieldwork

Key Functions (page 11)

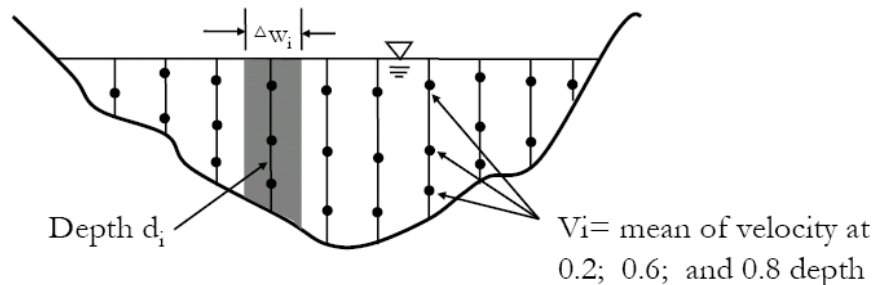
One-Key Functions

-  - Turns Unit ON. Clears the display and restarts the meter.
-  - Turns Unit OFF.
-  - Increments FPA, TC, and Memory Location.
-  - Decrements FPA, TC, and Memory Location.
-  - Alternates Between Recall and Real-Time Operating Modes.
-  - Stores Values In Memory. (Max. up to 19 data)

Two-Key Functions

-   - Change Units, Turns Beeper ON/OFF.
-   - Alternates Between FPA and rC Filtering. (See the footnote 1)
-   - Clears Memory. (Delete all data set, not one by one)
-   - Initiates zero adjust sequence. Zero stability is ± 0.05 ft/sec.

Conduct measurement and calculate Q (m^3/s) in each cross section



Calculate Flow Quantity

$$V_i = 1/3 \times (V_{i0.2} + V_{i0.6} + V_{i0.8})$$

$$a_i = d_i \times \Delta w_i$$

$$q_n(\text{partial}) = V_n \times a_n \quad \Rightarrow \quad Q(\text{total}) = \sum_1^n V_n a_n \quad \text{OR} \quad \sum_1^n q_n$$

¹ **FPA system:** measuring with every pre-set interval time (ranging from 2s to 30s), suitable for natural river flow with wide fluctuation of current speed.

rC system: Tracing the fluctuation and feeding it back, therefore value obtained is moving at the beginning and it is needed to wait for a while (around 10s) until the value is stable before recording (recommended for canal flow). See manual at page 5 and 6.

Annex 2

Initial discussion for field observation

**Note for the initial discussion on
Field Observation and Data Analysis for Irrigation Efficiency on IIEPF**

1. Purpose

- Comprehensive discussion for overall activities of the whole work
- Detail discussion for short term activities to launch the field observation
- Facilitation of the discussion among the team members (between NMC and Line Agencies), if required
- Hand over a set of current meter
- Brief training how to use current meter (except Laos)

2. Participants

Team members

Representative(s) from NMC, if required

All the members from the Line Agencies

AIFP of MRCS

Okudaira & Fongsamuth

3. Agenda

1) Hand over the current meter

For MRCS regulation, the current meter will be rent out to NMC and Line Agencies during fieldwork period with signed acknowledgment t as attached.

2) Internal discussion among the team members

If NMC and Line Agencies are welcome MRCS to facilitate your internal discussion especially in terms of formality between NMC and Line Agencies to conduct actual works under working agreement with MRCS.

3) Discussion for both overall and short term activities

- NMC and Line Agencies are kindly requested to prepare concrete idea for each task under the working agreement. This will be developed from the technical proposal, work plan and other attachment.
- Power point presentation nor any other kind of documentation is not necessarily requested, but a brief note is highly appreciated to support oral presentation or explanation.
- Explanation on short term activities should indicate 1) exact date, 2) name of the persons to conduct, 3) locations and 4) specific actions to be conducted at the field of each task at the early stage of field observation, such as identifying measurement points, conducting flow measurement, etc. This means that just to say “conducting flow measurement” is not enough for this discussion.
- In Laos and Thailand, supplementary explanation in their native language (Lao or Thai) is also accepted.

4) Brief training

A few quite important instructions how to use the current meter will be briefly explained by a brief note by MRCS and the manual.

4. Date, Venue and Time frame

Date and Venue are depending on the convenience of all the relevant officers, but date should be set early enough to complete preparation before starting dry season irrigation.

Total time for the meeting will be expected **a half day**, if any particular problems are raised.



Mekong River Commission

P.O. Box 6101, 184 Fa Ngoum Road, Unit 18,
Ban Sithane Neua, Sikhottabong District, Vientiane 01000, Lao PDR
Telephone: (856-21) 263 263 Facsimile: (856-21) 263 264



Acknowledgment of equipment provision

In order to conduct fieldwork under the working agreement “Field Observation and Data Analysis for Irrigation Efficiency on IIEPF” between _____ and MRCS, MRCS provides a set of current meter to the NMC or its relevant line agency.

Current meter includes 1) Main unit with sensor connected by cable,
MARSH McBIRNEY MODEL 2000

Serial Number _____.

- 2) Carrying case,
- 3) Instruction manual, quick guide and calibration certificate,
- 4) Four sets of measurement rod,
- 5) Base plate, hanger for the sensor and clamp for PVC pipe.

NMC or line agency is responsible for any damage or loss of any parts of provided equipment. Damage or loss caused by inappropriate way of usage, storage etc. shall be compensated by NMC or line agency.

Damage or loss caused by normal condition of use shall be negotiated with MRCS to fix it.

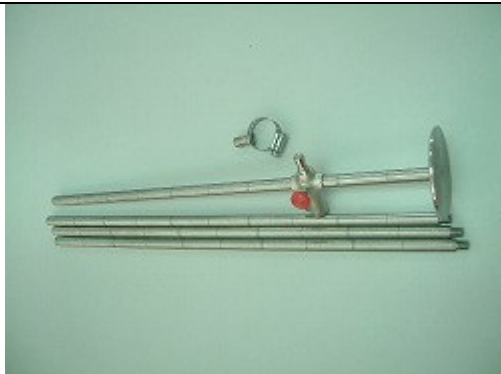
NMC or line agency will return full set of equipment listed above immediately to MRCS, when field work complete or equipment becomes no more need.

Date: 2006

For NMC or line agency

For MRC Secretariat

Okudaira Hiroshi AIFP/OPD

	
Main unit, cable and sensor	Carrying case
	
Three kinds of documents	Four rods, base plate, hanger and clamp

Initial meeting with Laos

1. Date, Time 3rd Nov. 2006 8:30-11:00

2. Venue AIFP meeting table

3. Participants

Mr. Khammay Vongsathiane, Dept. of Irrigation, MAF
Mr. Phouthone Siriphanthong, Dept. of Irrigation, MAF
Mr. Saykham Phengkhammy, Irrigation Section, Vientiane Muni.
Mr. Bounhap Vongvichith, Nam Houm Irrigation Project
Mr. Phonepaseuth Phouliphanh, LNMCS
Okudaira, Fongsamuth

4. Summary

(1) Current meter

A set of current meter was handed over to the team. Mr. Khammay, who signed acknowledgement, is responsible for during the fieldwork period.

(2) Irrigation schedule

Dry season irrigation: 15 to 20 Nov. to the end of Mar.

Harvesting: to the middle of May.

Wet season irrigation: around 25 June to the middle of Oct.

Harvesting: to the end of Nov.

(3) MRCS field visit

5 times in total (3rd week of Nov, 2nd W of Jan, 2nd W of Apr, 4th W of Jul and 3rd W of Nov.) was basically agreed by both sides.

The first field visit will be on 15th Nov, leaving MRCS at 8:30, jointly conducted by the team and MRCS.

Main purpose of this visit is to confirm the progress of preparation and measurement points at the site.

(4) Preparation work

The team plans to construct bamboo made small bridges for flow measurement and to install staff gauges for measuring water level change. Since the initial payment is still on the process within MRCS and is not expected to complete within a few weeks, the team decided to start this preparation work from the coming Sunday (5 Nov.) Payment of the purchased material will be settled after the initial payment from MRCS.

Data entry form will be drafted by the team. MRCS will help to review and improve that draft. The form is proposed to cover all the irrigation related indicators, such as reservoir storage. This is helpful for more universal use, even no use for IIEPF.

(5) Evapotranspiration and percolation

The team proposed to install two different kinds of devices, bottomed and bottomless pans, in the paddy field. Water level change inside of bottomless pan (or cylinder) counts ET and percolation, and the one inside of bottomed one counts ET only. The first one is a substitution of measuring at the paddy field with blocked in and out flow,

and the second one is a supplement of calculation from pan evaporation data at meteorology station. MRCS was welcomed and accepted this proposal and appreciate the team's initiative.

(6) Task management within the team

The team revealed that they had scarcely had their internal meeting so far except one by one telephone communication. However the team promised to have regular meeting from now on. Once a week, basically on Friday to discuss detail of coming week work, is proposed by the team.

Since the detail responsibility of the members among the team has not been discussed and fixed, further internal meeting including the field workers at the project office is planned.

Another meeting among the team regarding the procedure or contract between LNMC and each team member was also conducted as a following activity of this meeting.

Initial meeting with Thai team

1. Date, Time 10th Nov. 2006 10:15-12:00 (meeting); 13:30-14:15 (brief training)
2. Venue Huay Luang project office
3. Participants Nine (9) persons from RID, Project office and TNMC (detail attached)
Okudaira, Fongsamuth

4. Summary

(1) Current meter

A set of current meter was handed over to the team. Mr. Pramote, who singed acknowledgement, is responsible for during the fieldwork period.

(2) Irrigation schedule

Dry season irrigation: 15 (to 25) Dec. to the beginning (3) of Apr.

Harvesting: to the middle (15) of May.

Wet season irrigation: 15 Jul to the end (30) of Oct.

Harvesting: to the middle (15) of Dec.

(3) MRCS field visit

4 times in total (3rd week of Dec, 2nd W of Mar, 4th W of Jul and 2nd W of Nov.) was basically agreed by both sides.

(4) Discussion on the detail-working plan

Thai team had conducted their internal meeting among RID HQ, project office and TNMC beforehand on the day before. Explanation from the team was made based on that meeting conclusion supported by their internal document prepared in Thai. (MRCS requested and received a copy of this document to review their idea carefully.)

Data collection has started and is in progress. It is to be completed before irrigation start in the middle of Dec. Collected data, such as canal capacity and command area under the diversion works along the canal, crop types, etc., is to put into GIS database. Some information is for their own purpose rather than for the project.

The project office plans to have a meeting on 30 Nov. for this dry season irrigation. This is a regular activity and to invite stake holders of water management committee (WUA, water supply authority, representative of industrial water user.)

For some measurement point, small bridges are under construction and to be completed before irrigation starts.

Actual irrigation area is to be identified by the project staff weekly. The staff will visit the field regularly and confirm the area to reach irrigation water by their own eyes. Irrigated area is basically in accordance with the planted area. No area planted without irrigation water in dry season under this project. (→ Q: How about rainy season?) After transplanting completed, irrigated area will be double checked by planted area information from farmers' interview.

The team plans to install bottomless dram for percolation measurement. It is to be completed before 10 Dec. MRCS requested to measure at least one point of fishpond percolation.

The team explained to record all the activities related to irrigation practice. The team also agreed to compile the actual irrigation practice rules/regulations regardless of with or without documented.

(5) Data and report format

The team showed two formats of data entry sheet and requested approval of their use. Those are the standard format of RID, but for flow velocity measurement and for flow rate calculation only. As those are for the intermediate data generation only, MRCS does not have any objection and agreed to use them. On the other hand another entry format to put point-by-point flow rates and analyze conveyance loss and more is needed. For this purpose, the team agreed to draft format and request MRCS's confirmation.

The team requested MRCS to show the guideline of report structure, which would avoid the report once prepared to request to re-write to follow MRCS's requirement. The MRCS emphasised that the report should cover all the tasks described in the TOR and that was the only the requirement but no specific structure required. If any problem of the structure is found on the interim report, MRCS promised to feed it back to fix it on the final report.

(6) Contract

TNMC is waiting for the person to sign returning from abroad now, and is expecting to sign it next week. To send invoice for initial payment attached with the signed contract was confirmed. MRCS informed that internal procedure for payment took time and would need around two weeks after the receipt of the invoice.

5. Photo

	
Meeting	Meeting
	
Brief Training	Brief Training

List of Participants

Venue Huay Luang project office

Date 10 Nov 2006

Name	Organization, Department and Title	Contact (Email or Telephone)
Mr. WILAS INGKAMINAN	OBM Director of HUA LUANG Proj	0 422 45540 mobile 081950 4313
Mr. Saikapan Nimmawong	Chief - Operation & Maintenance H.L. Irrigation & maintenance project	Tel 081-8722915 0-4224-8881 E-mail: Saikapan.Ne The maha
Mr. Suvech Kitchakorn	RID	09-6966580 02-2415060
Mr. Poek hausongwan	Chief of water operation, water master Branch III	089-8638209
Mr. Sathaporn Hansadornchai	RID	naypat@hotmail.com 02-2431739
Mr. Pramote Chungsriem	Huay Luang project office	01-2631513
Mr. Somsak Viwithkeeyong	Engineer, Foreign Financed Project Administration Division	somsak-vivit@hotmail.com 089-6038087
Mr. Chatchai Boonlue	Director, Foreign Financed Project Administration Division	boonlue-e@yahoo.com
Mr. Satit Sueprasertsuk	TNMC	0892058273 kornbannork@gmail.com

Initial meeting with Vietnam team

1. Date, Time 20th Nov. 2006 15:00-17:00 (meeting)
21st Nov. 9:30-11:00 (brief training)
2. Venue Southern Institute of Water Resources Research (SIWRR) office
3. Participants 20th : Three (3) persons from SIWRR, One (1) from VNMC
21st : Four (4) from SIWRR
Two (2) from Tien Giang Irrigation Management Company (IMC)
(detail attached; one name of SIWRR on 21st missing)
Okudaira, Fongsamuth
4. Itinerary
20 Nov Vientiane – Ho Chi Minh city
Meeting at SIWRR office
21 Brief training of current meter at SIWRR office
22 Ho Chi Minh city- Vientiane

5. Summary

(1) Current meter

A set of current meter was handed over to the team. Mr. Toan signed acknowledgement. A hanger for the sensor, left in MRCS and not delivered, will be sent to SIWRR by courier service.

(2) Contract and initial payment

[Background]

Contract value with VNMC is 49,968 USD.

Initial payment stipulated by the contract is 40%, i.e. 19,987.2 USD.

Payment requested by VNMC and to be paid is 20,000 USD.

However by email dated 31 Oct, SIWRR informed that the team would get into budget shortfall if the team receives only 40%, because 15,530 USD will be used at the beginning stage for topographic survey and procurement of data recording equipment. SIWRR requested 29,305 USD (15,530 for equipment, etc and another 13,775 equivalent to 40% of the rest ($13,775 = (49,968 - 15,530) \times 0.4$)) instead.

MRCS once rejected this request because 40% of initial payment was agreed by Vietnamese side including SIWRR by the submission of the proposals.

[Discussion made]

After the internal discussion between SIWRR and VNMC, SIWRR confirmed that the team could start fieldwork. However SIWRR predicted not to be able to complete observation of the coming irrigation period. Approximately 4,500 USD (19,987-15,530) is obviously insufficient to manage the fieldwork.

If the team cannot complete the first observation, they cannot submit the interim report and will lose the mid-term payment, and then cannot complete this working agreement.

Avoiding this situation, MRCS agreed to consult with FAS to get CEO's approval to modify the payment condition of the contract and requested VNMC to raise this issue by their official letter.

The team understood that the letter should include the reason (background and justification) of this additional payment at the initial stage.

The team also agreed that the cost for equipment etc. plus another 40% of the remaining was overestimated. In general and in cases of other three countries, initial payment covers initial investment cost such as equipment. Portion of this investment varies but if it is 10 to 20%, the initial payment covers 30 to 20% of management cost in general. Based on this idea, MRCS suggested that 15,530 USD for investment plus 30% of the remaining as amended request as initial payment. The team agreed to consider and decide this figure.

(3) Irrigation schedule

Cropping period is divided into three periods in the Mekong delta, which are 1) Winter-Spring (WS), 2) Summer-Autumn (SA) and 3) Autumn-Winter (AW.)

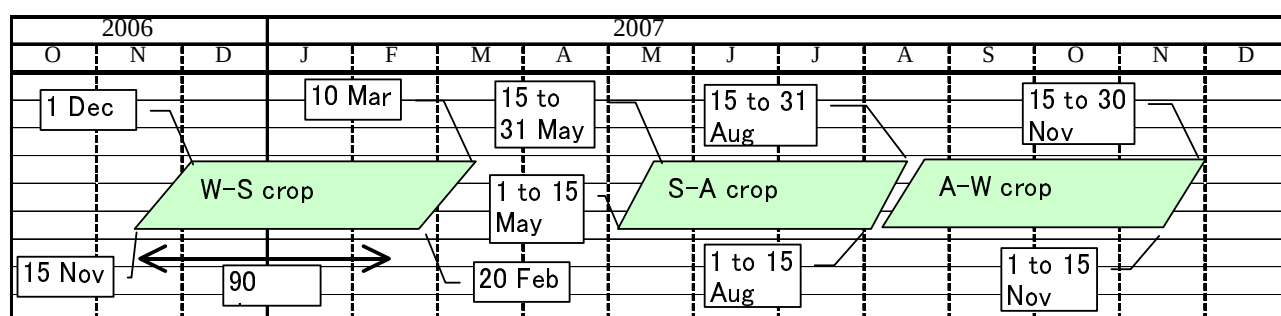
Cropping calendar of each is approximately as below.

WS: planting 15 Nov to 5 Dec, harvesting 20 Feb to 10 Mar.

SA: planting 1 to 15 May to 15 to 31 May, harvesting 1 to 15 Aug to 15 to 31 Aug

AW: planting – immediately after SA harvesting, i.e. 1 to 15 Aug to 15 to 31 Aug
Harvesting 1 to 15 Nov to 15 to 30 Nov.

(Growing period is basically 90 days.)



(4) MRCS field visit

3 times in total, basically later stage of each cropping season was agreed. Considering the confirmed cropping season above, MRCS's proposal of visit was amended and agreed as 4th week of Jan, 4th W of Jun, 4th W of Oct.

Above three times visits agreed are for field visit aiming to provide backstopping and to make confirmation of fieldwork by MRCS.

The team once suggested the field visit after the submission of the report. MRCS agreed to provide additional visit to the SIWRR office, if discussion is needed for submitted report.

VNMC agreed that MRCS would conduct field visit and discussion with SIWRR without participation of VNMC. VNMC is not necessarily invited every MRCS's visit in the future because most of those future visits will be practical work, but should be invited in case of discussing issues relating to the implementation of IIEPF itself.

(5) Confirmation of the fieldwork

[Overall schedule]

Commencement of the fieldwork is delayed around one month because of the delay of the contract. Field observation is expected to start in the middle of December that means to miss one month of irrigation practices starting from the mid-Nov. This missing period is expected to cover by the observation at A-W crop (3rd observation) overlapping with W-S crop (1st observation.)

[Schematic and scaled command area maps]

Preparation of these maps is on going as of 20 of Nov.

[Topographic map]

Topographic survey and map drawing will be shifted to the middle of December from November originally planned, because of the delay of the commencement.

[Flow measurement]

Equipment has been ordered and to be delivered in the week of 27 Nov (some of those such as data loggers and sensors have been delivered), and to be installed at the beginning of Dec.

[Identification of irrigated area]

This work will be conducted by eye view observation by field staff double checked by farmers' interview. The result of those observations will be plotted on the map, which includes land tenure information plot by plot. This work is estimated to conduct 20ha par day person.

[Value of the products]

This meeting confirmed the products included not only paddy but also other crops, like banana etc and others like livestock.

[Assessment of management practices]

So far there is no document even in Vietnamese describing the rule, regulation or know-how of how to practice irrigation water management. SIWRR in cooperation with provincial IMC promised to document management practices through the project.

[Data entry form]

SIWRR promised to produce the data collection form before 1 Dec, which was based on the one for Chu Chi project, once AusAide conducted similar irrigation efficiency project and to hand over to Tien Giang IMC and appointed farmers to fill in data in the fields.

[RAP]

RAP is to be conducted three times, at ending stage of every irrigation period. Through these three RAPs, some values and data will be improved step by step and the rest, which are common, will be shared.

[Report]

Even the contract and the TOR stipulate the submission of the interim report in May 2007, the team agreed to submit after the completion of the first observation (of W-S crop), probably in April 2007.

MRCS confirmed that there is no standard format or structure of the report. If the report covers all the tasks under the TOR with its process (how to conduct the tasks) and result, it would be acceptable. If any specific problem is observed in the interim report, this lesson will be feed back to the team and should be reflected to the draft final report.

5. Photo

	
Meeting	Brief Training
	
Brief Training	Brief Training

List of Participants

Venue SIWRR. (Ms. Long's room)

Date 20. Nov. 2006

[illegible]

List of Participants

Venue SIWRR

Date 21. Nov. 2006

[illegible]

Preparatory meeting with CNMC and Cambodia team

1. Itinerary

2 Dec	Vientiane – Phnom Penh	(No flight available on 3 Dec)
4	Meeting with CNMC, MOWRAM	
5	Phnom Penh – Siem Reap	
	GMS meeting registration and welcome reception	
6, 7	Participating GMS meeting	
8	Siem Reap – Phnom Penh – Vientiane	

2. Summary of the meetings with CNMC and MOWRAM

(1) with Mr. Sok Khom, CNMC

4 Dec 9:00-9:30

- Contract under IIEPF signed but official letter for submission and request of initial payment not prepared
- Official letter promised to submit in the afternoon
- For initial meeting with the team, proceeding the preparation with MOWRAM agreed
- Meeting purpose, proposed date explained based on copy of email and support document
- CNMC participation promised if available

(2) with Mr. Moriyama, JICA expert to MOWRAM

4 Dec 9:45-10:30

- Information of 1) WB-WUP DSF training and 2) WB study on water resources development and management in the Mekong delta shared
- Information of JICA cooperation to MOWRAM also shared

(3) with Dr. Theng Tara, MOWRAM

4 Dec 10:30-11:30

- Regarding the provision of the current meter, Dr. Tara was reluctant the content of acknowledge letter and requested to delete the clause of responsibility by Cambodian side. He also insisted that the signer should be CNMC.
- Okudaira explained that the said clause was necessary to guarantee the effort to deal with the equipment carefully and properly. He also explained that the direct person to control and manage the equipment is preferable for the signer, and added the examples of other three countries (e.g. the proposed content signed by line agencies' staff.)
- Discussion will continue at the next visit.
- Dr. Tara agreed the schedule of the initial meeting from 14:00 on 18th Dec at MOWRAM and two days visit to Battambang on 19th and 20th Dec as discussed by email in advance and confirmed his accompanying to the province.
- Dr. Tara also agreed to arrange a car to Battambang.

- Okudaira explained the expected input from MOWRAM at the initial meeting was the detail work plan for the field observation including, for example, exact location of measurement point, fixed members of observation team, fixed date of each activity up to the commencement of observation etc.
- Dr. Tara understood that overall coordination was his own responsibility and detail work plan was the responsibility of Mr. Kimsan, and promised to request Mr. Kimsan to prepare this in advance. He also tries to visit Battambang to discuss with Mr. Kimsan in advance.
- Even Dr. Tara promised preparation for the initial meeting, they had not yet started anything at all. Fongsamuth and Okudaira should carefully consider the tactics to discuss with them in advance.
- Dr. Tara promised to discuss with Mr. Sok Khom of CNMC the coming internal procedures up to the commencement of the fieldwork, e.g. sub-contract between the team members and CNMC under the contract between MRCS and CNMC and others.
- In this regard, Mr. Sok Khom's participation to the initial meeting is fully appreciated.

(4) with Mr. Sok Khom, CNMC

4 Dec 14:00-14:30

- Signed contract and official letter for initial payment received
- Schedule of initial discussion (18 to 21 Dec) confirmed and invitation to the meeting on 18 Dec. made

Initial meeting with Cambodia team

1. Date, Time 18th Dec. 2006 14:00-15:30
19th Dec. 14:30-18:30
20th Dec. 8:15-10:00 (Brief training) 10:00-11:30 (Field visit)
2. Participants 18th : Sok Khom (CNMC) Theng Tara & Thach Sovanna (MOWRAM)
19th : Theng Tara, Hong Kimsan (PDOWRAM)
20th : Theng Tara, Hong Kimsan, Kea Channy and Yan Seudy Okudaira, Fongsamuth

3. Itinerary

- | | |
|--------|---|
| 18 Dec | Vientiane – Phnom Penh
Meeting at MOWRAM office |
| 19 | Phnom Penh – Battambang
Meeting at RATTANAK hotel |
| 20 | Brief training and field visit at Komping Pouy project
Battambang – Phnom Penh |
| 21 | drafting BTO report
Phnom Penh- Vientiane |

4. Summary

(1) Meeting on 18th

Discussion is concluded as below.

- Provincial office is in charge of both field observation and data analysis. Mr. Kimsan is responsible for these works as a field level manager.
- Detail work plan will be explained by Mr. Kimsan on the coming day.
- Dr. Tara is responsible for overall management, supports the provincial office in case of Mr. Sovanna not available. He is also in charge of report writing.
- Mr. Sovanna provides technical support to the provincial office through visiting the field, reviewing collected data and prepared report.
- Handing over of the current meter was pending because the acknowledge letter was not accepted by Cambodia side

(2) Meeting on 19th

[background]

- Mr. Kimsan had recognized that the contract procedure was still underway because of the lack of communication among Cambodia team. Therefore he had not completed to set up detail work plan for each task.
- However through this meeting, Okudaira and Fongsamth requested him to explain his own current idea how to conduct each specific task and provided comments and suggestions to let him establish clearer plan to conduct each task. This confirmation was made one by one following the TOR.

[summary of the suggestions]

- Three major works needed urgent preparation were summarized as:
1) schematic and scaled maps, 2) bridge construction and cross section identification of the measurement points and 3) installation of the measurement tools (staff gauges and so on) at paddy field for evaporation and percolation measurement.

- The team agreed that the schematic map included canal alignment and Q, A (area), number of beneficiary farmers on each branch, which would be produced from existing but not perfectly correct one, and scaled command area map was composed of one sheet for the whole area and combination of separated sheets covering block by block with common and appropriate scale to plot and identify irrigated area on those maps. The team assigned one assistant, Mr. Kea Channy, to conduct this work and promised to complete by 20th Jan with 30 working days.
- Detail discussion how to measure flow rate and what is the necessary work for this activity was made. As a conclusion, the team agreed to construct simple wooden bridges with reference marking on them, as Lao team done, and to identify cross section. This work was agreed to complete by the end of Jan.
- The team also explained to establish two observation teams headed by PDOWRAM staff with two assistant field workers. Heads of teams are Mr. Yan Seudy and Ouk Sarit.
- Through the discussion, the team recognized several small but important sub-tasks should be conducted before starting the observation of water level changes at paddy fields. Those sub-tasks are site selection including the negotiation with responsible farmers for their acceptance, appointment of observers among the farmers, a brief training for gauge reading and data recording, installation of the gauges.
- In stead of simple vertical staff gauge, the mission introduced a combination of staff gauge with bottomless and bottomed dram as the Lao team done, which could eliminate the influence of water flow-in and simplify this task. After the discussion the team appreciated this method and agreed to apply to their work.
- The team explained that meteorology data would be imported from agricultural station, where daily recorded.
- Identification of the irrigated area will be conducted by interview to the farmers using survey form with 10days interval. The survey will identify accumulated areas of nursery, transplanting, broadcasting and harvesting with a certain interval. This will be confirmed by GPS survey by the office staff.
- What is the multiple use of irrigation water was once confirmed. Even discussion made, the team does not seem to reach in-depth understanding of this task. This needs future follow-up.
- The final expected output of the tasks #18 to #21 for management aspect was concluded as “documentation of the existing rules, know-how etc. of how to conduct water distribution in practice.” This also needs future follow-up.

[further confirmation]

- Even this meeting improved Mr. Kimsan’s idea for implementation, no physical preparation has not been started on site yet. In order to secure adequate field observation, the mission recognized another confirmation mainly focusing on on-

site preparation needed. Fongsamuth agreed to come back to the pilot site some day in the middle or late January, when the field level preparation has been already or nearly completed. Exact date will be decided through the email communication between the team and AIFP. This confirmation will be done as a part of MRCS's backstopping and the team agreed the cost (DSA for team staff and transportation) would be covered by the contract.

- This meeting also identified that Mr. Kimsan's management skill was not sufficient to overview all the activities up to the end and establish work plan for all. This means that AIFP should provide frequent interventions and backstopping time by time in accordance to the progress. This next intervention mainly to discuss later part of the fieldwork is proposed in Feb. or Mar.
- Dr. Tara was welcome and appreciated this approach and promised to support Mr. Kimsan in cooperated with AIFP in terms of progress management.

[equipment]

- Cambodia side agreed the content of the acknowledgement letter for the current meter with the additional examples of what is "inappropriate way." After this addition, letter was signed and equipment was passed to PDOWRAM on 20th after the training.

(3) Brief training and filed visit

- Except two management staff (Dr. Tara and Mr. Kimsan) two staff from the PDOWRAM (provincial department of water resources and meteorology) joined, who are Mr. Kea Channy mainly in charge of office work such as data compilation, analysis, drawing map etc., and Mr. Yan Seudy one of the heads of two field observation teams. Unfortunately Mr. Seudy could not stay by the end of training because of his another appointment.
- Fongsamuth provided overall instruction of how to manipulate the current and showed demonstration at the canal. Then the team practiced the operation.
- The team and AIFP mission jointly visited several selected points of measurement and reviewed the present conditions of those. Regardless of the width, all the points are along the open canal and recognized to put simple wooden bridges hanging over the canal for measurement. The mission instructed to put fixed mark on the bridge from the left to the right facing to the flow direction uniformly. This mark will be useful as a reference point when measurement. The team accepted bridge construction and marking.

5 Photos



Meeting at MOWRAM



Meeting at battambang



Brief Training



Brief Training



Practice



Practice



Measurement point



Measurement point

List of Participants

Venue MOWRAM

Date 18-12-2006

Name	Organization, Department and Title	Contact (Email or Telephone)
Thach Sovanna	MOWRAM	thachSovanna@yahoo.com
Sok Khom	ENME	khom@enme.gov.kh
THENG TARA	MOWRAM	thengtara@yahoo.com

List of Participants

Venue Battambang Province
Date 19-12-2006

Date 19.12.2006

[illegible]

Annex 3

Field observation work plan

Technical Propopsal

1- Introduction

The Mekong River Commision Secretariat (MRCS) is implementing the project “*improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong Basin project (IIEPF)*” in order to contribute to improve in irrigation efficiency of the scheme through introduction of basic guideline covering institutional, managerial and technical aspects of irrigation facilities operation. Rapid Appraisal Process (RAP) is also proposed for evaluating irrigation scheme perfomance as one of the specific inputs provided by FAO under collaboration framework between MRCS and FAO.

In this regard, the MRCS is entrusting “Field Observation and Data Analysis Work “ to Cambodian National Mekong Committee (CNMC) and line agencies to Ministry of Water Resource and Meteorology and Ministry of Agriculture, Forestry and Fiseries. This work aims to analyze and document actual condition regarding water use in selected irrigation scheme representing irrigation typology of the basin.

2- Project Title

Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong Basin project (IIEPF)

3- Title of the working agreement

Field Observation and Data Analysis for Irrigation Efficiency on IIEPF.

4- Implementing Agency

Ministry of Water Resource and Meteorology (MOWRAM); Ministry of Agriculture, Forecstry and Fisereis (MAFF); and Kamping Puoy iriragtion Project in association with Cambodian National Mekong Committee (CNMC).

The implementing/working team members comprise of:

- | | | |
|----|-------------------|--------------------------------|
| 1) | Dr. Theng Tara | (Team leader, MOWRAM) |
| 2) | Mr. Thach Sovanna | (MOWRAM) |
| 3) | Mr. Hong Kim San | (PDOWRAM, Battambang Province) |
| 4) | Mr. Meas Peov | (MAFF) |
| 5) | Mr. Sok Khom | (CNMC) |

The team member’s CVs are attached in Annex1.

5- Duty Station

Battambang Province in Kamping Puy Irrigation Scheme (See in ANNEX 2)

6- Background of Kamping Pouy Scheme

6.1- Geography:

The irrigation system of Kamping Pouy, constructed during 1975-1979, is located at 13° latitude north and 102° 52' longitude east. It is in Ta Ngen Village, Ta Kream Commune, Banan District, Battambang Province, around 32Km West from Battambang Town .

6.2-Reservoir condition:

The Komping Pouy Reservoir was built in mountainous area, consisting of two soil dams. The main dam extends from Ta Ngen Mountain to Komping Pouy Mountain, it is 6.5 km long, 5 to 8 m high, and 10 to 20 m wide. Along the main dam, there are two structures, Sluice Gate 10 and Sluice Gate 8. Sluice Gate 10 is considered the most important structure as it has the potential to irrigate the largest area of paddy field (about 10500 ha). Sluice Gate 8 (not rehabilitated) as the potential of irrigating 3000 ha of paddy fields.

The second dam is 7.5 km long, 3 to 4 m height and 4 to 5 m wide, extends from Ta Ngen Mountain to westward. It comprises 4 outlet structures which can irrigate small part of rice field in the southern of the reservoir as well.

6.3-Water sources

There will be two water sources to fill this reservoir. The first, and only one at present, is through rainfall. The catchments area is approximately 345 km, which includes mountainous area (elevation 200m to 300m) to the west of the reservoir. The second water source will be from Mong Kol Borey River. At the present there is diversion barrier across the river and canal, which will redirect the water from its natural course, however it is currently incomplete.

6.4-Capacity of the reservoir

The Vietnamese engineers (1985) designed an elevation of the dam to reach a maximum capacity of 110,000,000 m³ after collecting data as unique reservoir survey. In the late 1999, this reservoir was surveyed again, by APS in association with Water Resources and Meteorology Department. The survey states that the capacity is approximately 90,000,000 m³. The capacity of 110,000,000 m³ can reach if the reservoir is rehabilitated.

6.5-Irrigation system

The water capacity of the Komping Pouy Reservoir is sufficient for rainy season supplementary irrigation of 13500ha of rice field and 4,500ha of dry season rice production. This irrigation area is supplied by main canal, 9,020m in length, and secondary canal, total distance of 29,000 m divided to three secondary canals like secondary canal No 1, No 2 and No 3. A small number of these canals were built during 1975-79 and majorities were built during 1987 to 1989.

6.6- Assistance to the Komping Pouy Irrigation System

There has not been any assistance to its reconstruction and maintenance except for limited support from World Vision International (WVI) and the World Food Program (WFP). This support has been restricted to small-localized areas. It was just contributed little to the function of the whole system, nearby main canal.

In 1998 the Italian Government signed an agreement with the Royal Government of Cambodia to rehabilitate Komping Pouy Irrigation System. This project is implemented by APS (Associazione per la Partecipazione allo Sviluppo), in partnership with the Provincial service of Water Resources and Meteorology. This rehabilitation project has been implemented in the number of stages:

- The rehabilitation of the main sluice gate, 10gate structure, of the reservoir and it was accomplished since middle of 1998.

- The rehabilitation of the first part irrigation system for 700 ha consists of repairing the main canal and building tertiary canals and other required structures and it was started in April 1999 and was accomplished since the end of 2000.

-The rehabilitation of the second part irrigation system for 1200 ha of paddy field consists of repairing the main canal and building tertiary canals and other required structures is being implemented and will accomplished in the middle of 2002.

- In March 2001, Battambang Provincial Department of Water Resource and Meteorology received granted aid from Japanese Government to rehabilitate the Irrigation System covering 550 ha of rice field of Secondary Canal No 2, which consists of repairing the Secondary Canal No 2 and building tertiary canals and other required structures.

- In March 2002, Battambang Provincial Department of Water Resource and Meteorology received granted aid from Japanese Government to rehabilitate the Irrigation System covering 400 ha of rice field of Secondary Canal No 2, which consists of repairing the Secondary Canal No 2 and building tertiary canals and other required structures.

- In 2006, Battambang Provincial Department of Water Resource and Meteorology received granted aid from Italian Government to rehabilitate the Irrigation System covering 2,200 ha of rice field of Secondary Canal No 1, which consists of repairing the Secondary Canal No 1 and building tertiary canals and other required structures. It is being implemented and will be accomplished in 2008.

By 2008, the gravity irrigated area of Komping Pouy Irrigation System will cover the command area of 5050 ha. This area will be available for both wet and dry season rice production.

With reference to capacity of the reservoir and irrigated area 5050 ha above, there is still not proportion yet. It means that the potential of the reservoir is much more than 5050 ha.

7- Project Activity

Based on the TOR proposed by MRCS, the explanation of project activities, which will be conducted by implementing agency, are described as follows.

I. Preparation for data collection

(1) Identify appropriate pilot project site (irrigation scheme):

The site selection was completed. Komping Pouy irrigation project was selected as pilot project site.

(2) Prepare schematic plan of irrigation system:

Schematic plan will be produced based on existing information and maps which are available on MOWRAM office and Battambang irrigation project office. The plan will be produced with no scale, but it will consist of the following details

- Canal alignment and canal net work (main, secondary, tertiary, and quarterly canals) with diversion structure points,
- Kilometer marking point at each diversion structure and offtakes from the head of their parent canal,

- Data and information of design irrigated areas and design discharge or volume of each offtakes, and
- Boundary of design irrigated areas of each water user group.

One engineer and 1 technician are required for 4 home working days of this task (see Annex 2).

(3) Prepare scaled command area map of the irrigation scheme:

Scaled command area map will be plotted using existing maps: GIS maps, AutoCAD maps, and topographic maps. The map will be produced as GIS file with appropriate scale and included the main following information:

- Project location,
- Design irrigated areas (command areas) with appropriate scale, and
- Reservoir and canal alignments with scale and detail of each diversion structures.

See Annex 2 for working days and labor inputted.

II. Assessment of water balance and irrigation efficiency

(4) Inflow and outflow measurements:

To monitor water balance and to assess the overall irrigation efficiency, 23 points for inflows and 18 points for outflows (see Annex 4 (a) and (b) for the measurement locations) were selected in consultation with MRCS. Intensive measurement of 1 time/week¹ will be conducted and 1 time measurement will spend for 4 days continually. Two sets of current meters (1 from MRCS, and 1 Hydrology Department of Cambodia) will be used for 2 teams to conduct water flow quantity at selected points. Methods of measurement and calculation will be followed the backstopping note provided by MRCS. It is required MRCS to provide short training of flow meter used and flow quantity calculation during starting period of conducting flow measurement.

Working days and labor required of this task are shown in Annex 2.

(5) Obtain rainfall and climate data:

Rainfall and climate information will be collected from the nearest station i.e. Battambang Meteorological Station. The team will go to collect the data continually 2 every month (for 12 months, one year round). One technician is required for 1 working day/month to go to the station for collecting data. See Annex 2 for details.

(6) Calculate ETo and Kc:

ETo and Kc information will be obtained from Battambang Meteorological Station and also from available sources such as MOWRAM and IRRI.

One engineer and 1 technician will responsible for the task with 2 home working days in dry season and 2 days in wet season (see Annex 2).

(7) Calculate ETc:

ETc will be calculated based on climate data and information obtained from (6). The calculating ETc will be followed backstopping note provided by MRCS.

¹ It is noted that frequency of measurement may be changed and adapted depending on actual irrigation schedule of each canal operated by project manager.

One engineer and 1 technician are inputted for this task with 2 home working days in each season. See Annex 2.

(8) Identify actual irrigated area:

To identify actual irrigated areas, 2 times of field observation in dry season and 2 times in wet season will be conducted to record actual planted areas. The GPS will be used to record points and boundaries of actual irrigated areas. The head of WUGs will be interviewed to mark their own actual boundary of irrigated areas. The collected information will be then plotted into schematic ground plan of irrigation scheme. The actual irrigated areas will be recorded monthly in order to fulfill RAP purpose.

One engineer and 2 technicians are needed for 3 working days for observation and interview. See Annex 2 for details.

(9) Record cropping pattern and crop calendar:

Table (form for data collection) will be produced and provide to each water user group to record cropping pattern and crop calendar for their own groups. The information will be crosschecked by conducting field observation of 2 times in dry season and for 2 times in wet season, and 1 day will be used for each time recording (Annex 2). The table or form will include the main information as follows.

- Kinds and hectares of crops to be grown
- Date/ time and length (number of days) of land preparing , translating and harvesting periods

(10) Record multiple uses of irrigation water:

Irrigation water in the pilot site is mostly used for paddy crop, but water use for other purpose such as non-paddy crop will be monitored. This task will be done by interviewing farmers and water users concerning what purpose the water is use for, the time or length of taking water from the canal through their own small-potable pumps.

The activity will be conducted by using 1 engineer and 1 technician, the same team and the same period with conducting task (8) and (9).See Annex 2.

(11) Record water level changed in paddy field:

Water level in paddy fields will be observed everyday (24 hours after previous record). Six points are selected, 2 points in each zone of paddy areas. Wooden pole with readily scale will be installed in the selected point. Recording will be done by 1 farmer in each zone (the head of the zone). The period of recording is shown in the work plan (Annex 2).

(12) Calculate total scheme water requirement:

Total scheme water requirement will be computed separately paddy and non-paddy crops. The sum of these will represent total scheme water requirement. The water requirement of fishpond will not be taken into account as there is no fish pond in the command areas. The formula of crop water requirement will be followed the instruction from MRCS through backstopping note. CROPWAT software (version 4.0) is proposed for computing crop water requirement.

The calculation will be done for 2 times in each season, middle and the end of each season. One engineer and 1 technician are inputted for the task (Annex 2).

(13) Conduct conveyance lost test and calculation of conveyance efficacy :

The estimation of 36 flow measurement points is selected to conduct conveyance lost test in main, secondary, tertiary, and quarterly canals. A certain canal sections will be selected as representative of canal level (see Annex 4(c) for selecting locations). In each selection section, inflow and outflow will be measured for determining the loss. The conveyance efficiency will be calculated based on the formula provided by MRCS. The average conveyance efficiency of all canal levels will be represented for overall system

The conveyance lot test will be conducted for 2 times in each season (2 weeks /time), one at the beginning of the season when the peak water is supplied for land preparation and once before the end of irrigation period.

One engineer, 2 technicians, and 4 labors are required for the task with continually working for 14 days in each time (Annex 2).

(14) Produce rated canal section curves (H-Q curves):

Flows at the main hydraulic structures are proposed to calibrate. The calibration curve will be useful for flow monitoring when some data is missing. They will be also used as important data for project operation, in particular for water distribution and management.

The task is not required labor input since flow data will be obtained from water balance and conveyance lost conducting. These data will be daily put and curves will be produced. Three main points of a main canal intake and 2 secondary canal intakes are selected to produce H-Q curves (see Annex 4 (c) for the locations).

(15) Calculate overall command area efficiency:

The efficiency will be computed using information of total scheme water requirement, effective rainfall and water delivery to user as described in backstopping note. The estimating of effective rainfall will be consulted MRCS regarding formula and calculating method. Water delivery to user will be determined from water balance data.

Three home working days are expected with 1 engineer and 1 technician for the task (Annex 2).

III. Assessment of water productivity

(16) Obtain yield of paddy:

The table (form) recording paddy yield and non paddy yield will be produced and provided to the head of each WUG to record the production of their own groups. The data will be crosschecked with field observation by taking rice samples (1 m²) during harvested season. One tertiary canal is planed for taking 1 rice sample, so together 16 points for whole system in each season. The production information will be also collected from MAFF.

On technician and 3 labors are required with 5 field working days in each season (Annex 2).

(17) Calculate crop water productivity:

Crop water productivity will be calculated based on the yield obtained with water supply and water consumption. Labor required and work plan are listed in Annex 2.

VI. Scheme management appraisal

(18) Identify stakeholders for decision making on water distribution:

Information regarding decision making on water allocation, distribution, resource mobilization, etc in different organization level, project, WUG , and farmer levels, will be recorded and also collected from existing available information. Procedure and participation of farmer in water supply and delivery will be identified at different levels of canal system (main, secondary, tertiary).

The task is planed to conduct 2 times in each season, at the beginning and at the end of each cultivation season. One engineer and technician are needed (Annex 2).

(19) Draw organizational charts of stakeholders:

Organization chart will be plotted into diagram. The coordinating and relationship between project authority, water user group, and community organizations will be included into diagram. The task will be conducted with the same persons and the same period as task (18).

(20) and (21) Record water allocation rules and practice:

Rules, regulations and guidelines regarding water allocation facilitate the decision making process for allocating water for different uses within the irrigation scheme will be documented. The official rules and practice situation followed by the project authorities to allocate water will also be documented. The data recorded by this ask will concern:

- Official water distribution rules and actual water distribution practices
- Official rules and procedures to operate irrigation facilities
- Actual operation of the irrigation facilities
- The criteria are used by the project authorities to allocate water to different users for different crops: paddy and other crops
- Water distribution method to different parts of the command areas
- The water distribution rules used by dry and wet seasons

The task will be conducted with the same persons and the same period with task (18) and (19).

V. RAPs

(22) RAP conducting:

The RAP is planned to conduct 1 time/season, at the end of dry and wet season. Three field working days are needed for scheme observation and interview, and 2 days are required for filling and analyzing information. The missing information in first RAP conducting will be filled and completed in this final RAP conducting. One engineer and 2 technicians are inputted for this task (Annex 2).

VI. Others

(23) Facilitate technical backstopping by the MRCS made on demand by implementing agency:

To facilitate working implemented and to support technical backstopping, it is planed to invite MRCS for 2 times during field works in dry season, 2 times for field work in wet season, and 1 times for facilitating analysis work at the end of each season (see Annex 2). The plan is not fixed; it may be changed depending on the real situation of

time schedule, urgent problems, etc. Transportation is the responsibility of implanting agency, but MRC staff will cover their own DSA.

(24) Take part in the training workshops organized by MRCS within the framework of this project:

Implementing agency will take part in any kind of training workshop organized by MRCS within the framework of this project. However, the estimation cost does not take into account for this activity.

(25) Assist Program Officer in collecting any other information required for analysis within the framework of this project:

Implementing agency will support program officer to collect other related information within the framework of this project.

(26) Assist MRCS in organizing national workshops planned to be conducted in January 2008:

Implementing Agency will assist MRCS organizing national workshop at the end of the project at 2008.

8- Expected Output

Three major outputs below are expected through implementation of this working agreement.

- 8.1- Assessment of irrigation efficiencies of the selected irrigation schemes
- 8.2- Scheme management appraisal
- 8.3- Scheme appraisal by Rapid Appraisal Process

For irrigation efficiencies, items below shall be included as a part of output 1.

- I- Location and detailed map of the irrigation system with all the selected locations
- II- Water flow quantity at selected points over five time
- III- Infiltration/Seepage/Percolation rate at selected points over time
- IV- Irrigation efficiencies based on above observation
- V- Cropping pattern and crop calendars
- VI- Water requirement for different water uses within the command area of the selected irrigation scheme
- VII- Precipitation and Evapotranspiration (either measured or obtained from the closest meteorological station) over time (this must correspond with the time period of field data collection)
- VIII- Crop water productivity (yield per cubic meter of water diverted) values of rice paddy

For scheme management appraisal, the documented output shall include items below.

- IX- Organizational structure (be it formal or informal) of the different stakeholders (for example Department of Irrigation and Water Users Association)
- X- A document describing users and other stakeholders' participation in the decision making of water allocation and distribution
- XI- Mechanism to decide water allocation and to put it into practice
- XII- Procedures and rules for operating the system

For Scheme appraisal by RAP, the output shall include the following items:

XIII- Filled RAP sheets

9- Time Schedule: Implementation of the work will take one year (see in work plan)

10- Cost : The total cost US\$ 43,391.50 (see cost exstimation in Annex 3)

Phnom Phenh , .../ / 2006

Prepared by MOWRAM and MAFF

Date.....

Annex 2: Work Plan

[illegible]

	Field Work
	Home Work

f.w : field work ; h.w : home work

Technical Proposal

1. Project Title

Improvement of irrigation Efficiency on Paddy Fields in the Lower Mekong Basin Project (IIEPF)

2. Title of Working Agreement

Field Observation and Data collection and Analysis for Irrigation Efficiency on IIEPF

3. Implementing Agency

Department of irrigation, Ministry of Agriculture and Forestry, Irrigation Sector of Vientiane Municipality and Nam Houm Irrigation Project in associated with Lao National Mekong Committee Secretariat and technical advice by MRC programme officer.

o The field observation teams consisted by representative from above mentioned line agencies such:

- 1) Mr. Khammay Vongsathiane Team leader, Dept. of Irrigation, MAF
- 2) Mr. Phouthone Siriphanthong Sub-team leader, Dept. of Irrigation, MAF
- 3) Mr. Saykham Phengkhammy Team member, Irrigation Section, Vientiane Muni.
- 4) Mr. Bounhap Vongvichith Team member, Nam Houm Irrigation Project
- 5) Mr. Sourasay Phoumavong Deputy Director of LNMCS, Supervisor
- 6) Mr. Phonepaseuth Phoulipanh National Programme Coordinator/LNMCS

4. Target Area

Nam Houm Irrigation Project, Naxaithong District, Vientiane Municipality, is determining as: 9300 m of Main canal and secondary canal, third canal and 2400 ha of command area.

5. Duration

The work activities is under Agreement is expected to be conducted from October 2006 to end of January 2008

- The Field work Preparation
- Field Observation and water measurement for Irrigation Efficiency for Dry season cropping in 2006 and Wet season cropping 2007
- Rapid Appraisal Process (RAP)

6. Project Activities

1. Preparation for data collection

Prepare scale schematic map in Nam Houm irrigation system that including main canal, secondary canal and third canal. Identification of paddy field area which one can be irrigated area in the both season.

2. Assessment of irrigation efficiencies

- Conducting water balance

Determine the point of inflow and outflow for measurement in command area

2.1 Civil work preparation

Constructing the facility of 44 points as the bridges for crossing of main canal, secondary canal and third canal that can be measured.

2.2 Conduct measurement and calculate flow quantity and outflow measurement.

Our team or the project's staff will conduct that activity on the selected points for the both in wet and dry season cropping.

- **Assessment of water requirement**

2.3 Obtain rainfall and other climate data the nearest meteorological station

The collection of rainfall in project site and other climate data should be collected everyday by data collector for 12 months in Meteorology Department.

2.4 Calculate or obtain potential (reference) evapotranspiration (ET_o) and crop coefficient value (K_c)

According to the potential condition that we determine for 2 seasons cropping calculation. That we should formatted the form to interview the farmers in command area for their crops cultivation and fishponds water used and fish production in yearly.

2.5 Calculate crop evapotranspiration based on (ET_o) and (K_c) obtained

Crop evapotranspiration will be calculated due to the real potential did the evapotranspiration and crop coefficient gained.

2.6 Record cropping pattern and crop calendar for different crops

Cropping pattern and crop calendar in the command area will be recorded for the both seasons from the farmers' activities.

2.7 Record multiple use of irrigation water quantity

Irrigation water quantity will be recorded of the activities in command area including fishponds, pig farm and chicken farm.

2.8 Civil work preparation

The experiment on the paddy field and the other purpose as fishpond should be set up the staff gauge in paddy field and fishpond in command area.

2.9 Record water level changed in paddy field and fishponds.

Water level changed in paddy field and fishponds that should be observed and recorded for 11 month in command area.

2.10 Calculation total scheme water requirement

Total scheme water requirement will be calculated monthly based on crop water requirement of paddy field and fishpond requirement.

2.11 Conduct conveyance losses test and calculate conveyance co efficiency

According to the 44 points which were selected of inflow-outflow that should be measured, this test should be done in main canal, secondary canal and third canal. That will do 2 times a month per point.

2.12 Calculate command area efficiency based on water balance concept

Command area efficiency could be calculated based on total scheme water requirement, effective rainfall and total water distributed to the fields which conveyance efficiency is concerned. It is implementing in each cropping season, wet and dry season.

3. Assessment of water productivity

3.1 Obtain yield of paddy

The implementing should be interviewing the farmers in command area and also to practice on the field to take 144 of samples in order to get yield of the productivity. That should do for 2 times in wet season and dry season.

3.2 Calculate crop water productivity

According to data collected from the command area due water diverted.

4. Scheme management appraisal

4.1 Identify stakeholders for decision making on distribution of irrigation water within the scheme

According to the WUG and project's staff on water management concept.

4.2 Document procedure of decision making for water allocation and distribution

According to the stakeholder organization will be documented.

4.3 Document operation rules and actual practices to ensure delivery of the above allocated and planned water to the users.

Water distribution in the command area that should considering on the official rules and procedures to operate irrigation facilities.

4.4 Office expenses, stationery, miscellaneous for the field expenses and making reports

The project's staff should do the reports and necessary concerning on the administration work of the implementing agency.

4.5 LNMC expenses

The LNMC will participate and visit the project about 8 times and LNMC will support the administration working as project facilitator and etc..., for the whole period of the project.

4.6 Facilitate technical backstopping by the MRCS (Meeting expenses and vehicle for field visit)

MRCS is needed to visit the project in order to advice and recommendations about 8 times for the whole period of the project.

4.7 Spare parts of vehicles used in the IIEPF project (pick-up, motor cycle)

Some spare parts is needed to change or fixed some vehicles used in the project.

4.8 Total cost of gasoline and lubricant for IIEPF staff's vehicle

The project needed gasoline and lubricant for the vehicle to transport during implementing on the work IIEPF activity in Nam Houm area.

5. Reports

- Interim, draft for final and final.

6. Relationship

- During data collection that should communicated and discussing among officers in charge as well as possible

7. Outputs

The implementation on RAP of the working group that expected for three major below:

1. Assessment of irrigation efficiencies of the selected irrigation schemes
2. Scheme management appraisal
3. Scheme appraisal by Rapid Appraisal Process

Assessment of irrigation efficiencies are following:

- a) Selection location for measurement in irrigation system
- b) Water flow quantity at selected points
- c) Infiltration/Seepage/Percolation rate at selected points over time
- d) Irrigation efficiencies based on above observation
- e) Cropping pattern and crop calendars
- f) Water requirement for different water uses within the command area of the selected irrigation scheme
- g) Precipitation and Evapo-transpiration(either measured or obtained from the nearest meteorological station) over time (this must correspond with the time period of field data collection)
- h) Crop water productivity (yield per cubic meter of water diverted) values of paddy

The scheme management appraisal, the output shall include items below:

- i) Organization chart which is different stakeholders
- j) A document describing users and other stakeholders' participation in the decision making of water allocation and distribution
- k) Mechanism to decide water allocation and to put it into practice
- l) Procedures and rules for operating the system

The RAP procedure appraisal, the output shall filled RAP sheets.

Work Plan For 2006-2008

No	Activity	Y 2006			Y 2007												Y 2008			Remak
		O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	
1	Preparation for data collection																			
1.2	prepare scaled command area map of the irrigation scheme																			
2	Assessment of Irrigation Efficiencies																			
*	<i>Conducting Water Balance :</i>																			
2.1	Civil work preparation (constructing bridge for water measurement																			
2.2	Conduct measurement and calculate flow quantity based on selected points																			
	<i>Assessment of Water Requirement :</i>																			
2.3	obtain rainfall and other climate data from the nearest meteorological station																			
2.4	calculate or obtain potential (reference) evapotranspiration (ET_o) and crop																			
	coefficient values (K_c) for paddy, fishponds, and other crops																			
2.5	calculate crop evapotranspiration (ET_c) based on (ET_o) and (K_c) obtained																			
2.6	record cropping pattern and crop calendar for different crops																			
2.7	record multiple use of irrigation water quantity (e.g. water use for fishpond etc.)																			
2.8	Civil work preparation (constructing staff gate)																			
2.9	record water level changed in paddy fields and fishponds																			
2.10	calculate total scheme water requirement																			
*	<i>Calculate Irrigation Efficiencies :</i>																			
2.11	conduct conveyance losses test and calculate conveyance efficiency																			
2.12	calculate command areas efficiency based on water balance concept																			
3	Assessment of water productivity																			
3.1	obtain yield of paddy																			
3.2	calculate crop water productivity (yield per cubic meter of water diverted, and water consumption)																			
4	Scheme management appraisal																			
4.1	identify stakeholders for decision making on distribution of irrigation																			
	water within the scheme																			
4.2	document procedure of decision making for water allocation and distribution																			
4.3	document operational rules and actual practices to ensure delivery of the																			
	above allocated and planned water to the users																			
4.5	LNMC visiting																			
4.6	Facilitate technical backstopping																			
5	Report																			
5.1	Interim report																			
5.2	Draf final report																			
5.3	Final report																			
6	RAPs																			
6.1	Implementing on the RAPs activities																			

Technical Proposal

1. Project Title

Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong Basin Project (IIEPF)

2. Title of the Working Agreement

Field Observation and Data Analysis for Irrigation Efficiency on IIEPF

3. Implementing Agency

Royal Irrigation Department, Bangkok, Thailand

4. Target Area

Huay Luang Operation and Maintenance Project, Khok Sa-ad Sub-District, Muang District, Udon Thani Province

Target canal

Left Main Canal (LMC) which is 48.900 km long and selected lateral with tertiary canal approximately 20 km long. LMC covers the irrigated area of 49,000 rai or about 7,800 ha.

5. Duration

The tasks under this working agreement are expected to be conducted from the beginning of August 2006 to the end of January 2008

- Preparation to start field work
- Measurements and field observation for irrigation efficiency for dry season cropping in 2006 and wet season cropping in 2007
- Rapid Appraisal Process (RAP)

6. Project Activities

Contents of each activity

1. Preparation for data collection

- Prepare scale command area map of the irrigation scheme

Activities

To survey the topographic data of irrigation system including main canal, lateral canal and examine the exist irrigation structures in Left Main Canal and selected lateral canal of Huay Luang Operation and Maintenance Project. This is also to identify location and size of each farm plot of irrigated area in Left Main Canal which is divided into 4 zone.

2. Assessment of irrigation efficiencies

- **Conducting water balance**

Inflow and Inflow and outflow measurement

2.1 Civil work preparation

Activities

The bridges will be constructed across the main canal, lateral canal and sub-lateral canal in order that water velocity can be measured.

2.2 Conduct measurement and calculate flow quantity based on selected points

Activities

The Project's staff will conduct flow rate and calculate flow quantity. The measurement will be conducted both in wet and dry season cropping.

- **Assessment of water requirement**

2.3 Obtain rainfall and other climate data from the nearest meteorological station

Activities

The rainfall and other climate data will be collected everyday by Data Collector for 11 months.

2.4 Calculate or obtain potential (reference) evapotranspiration (ET_o) and crop coefficient values (K_c)

Activities

Potential Evapotranspiration will be calculated 2 times, that is in wet season and dry season cropping.

2.5 Calculate crop evapotranspiration (ET_c)

Activities

Crop Evapotranspiration will be calculated according to Potential Evapotranspiration and Crop coefficient gained.

2.6 Record cropping pattern and crop calendar for different crops

Activities

Cropping pattern and crop calendar will be recorded for both seasons, wet season and dry season in each zone.

2.7 Record multiple use of irrigation water quantity

Activities

Irrigation water quantity in each activity will be recorded in each zone.

2.8 Civil work preparation

Activities

The experiment field plot will be built by metal block & necessary things in order to install equipments to measure water level changed. The experiment field plot will be done in each zone (4 zone).

2.9 Record water level changed in paddy fields and fishponds

Activities

Water level in paddy field and fishponds will be recorded for 11 months in each zone.

2.10 Calculate total scheme water requirement

Activities

Total scheme water requirement can be calculated based on crop water requirement of paddy rice and fishpond water requirement in each month.

2.11 Conduct conveyance losses test and calculate conveyance efficiency

Activities

Conveyance losses test will be conducted by inflow-outflow measurements. This test will be done in left main canal ,lateral canal, sub-lateral canal, and ditch. Total section is about 22 sections. It is supposed to do 2 times a month.

2.12 Calculate command area efficiency based on water balance concept

Activities

Command area efficiency could be calculated based on the total scheme water requirement, effective rainfall and total water distributed to the farmers which conveyance efficiency is concerned. It is supposed to do in each cropping season, wet and dry season.

3. Assessment of water productivity

3.1 Obtain yield of paddy

Activities

4 Data Collectors will interview the farmers in each zone about 40-60 samples in order to get yield of paddy. This will be done for 2 times ,wet season and dry cropping season.

3.2 Calculate crop water productivity

Activities

Water productivity of paddy rice will be calculated according to data collected from the field and water diverted.

4. Scheme management appraisal

4.1 Identify stakeholders for decision making on distribution of irrigation water within the scheme

Activities

Key players or stakeholders, Huay Luang O&M Project's staff, Integrated Water Users Group, Water Supply Authority, will be identified for decision making on water allocation, distribution, resource mobilization, etc. Water will be allocated based on the consensus which the consideration of integrated water management concept.

4.2 Document procedure of decision making for water allocation and distribution

Activities

The structure of identified stakeholders organization will be documented.

4.3 Document operation rules and actual practices to ensure delivery of the above allocated

and planned water to the users

Activities

Consideration to the constraints and opportunities of irrigation efficiency, water distribution in Huay Luang O&M Project, document of official water distribution rules and procedures to operate irrigation facilities should be done.

4.4 Office expenses, stationary, miscellaneous for field expenses and making reports

Activities

The Project's staff must do the report and necessary things concerning the administration work of the implementing agency.

4.5 Total cost of gasoline & lubricant for IIEPF staff's vehicle

Activities

The project needs gasoline and lubricant for the vehicles to transport around the Huay Luang O&M Project.

4.6 Spare parts of vehicles used in the IIEPF Project (pick-up, motor cycle)

Activities

Some spare parts are supposed to be changed or fixed for such vehicles used in the Project.

4.7 TNMC expenses

Activities

The TNMC will participate and visit the Projects about 8 times and TNMC will support the administration working ,such as organize the meeting and etc, for the whole period of the Project.

4.8 Facilitate technical backstopping by the MRCS (Meeting expenses and Vehicle for field visit)

Activities

MRCS is needed to visit the Project in order to give advices and recommendations about 4 times for the whole period of the Project.

7. Expected Outputs

Three major outputs below are expected through implementation of this working agreement.

1. Assessment of irrigation efficiencies of the selected irrigation schemes
2. Scheme management appraisal
3. Scheme appraisal by Rapid Appraisal Process

For irrigation efficiencies, items below shall be included as a part of output 1.

- i. Detailed map of the irrigation system with the selected locations for measurements
- ii. Water flow quantity at selected points over time
- iii. Infiltration/Seepage/Percolation rate at selected points over time
- iv. Irrigation efficiencies based on above observation
- v. Cropping pattern and crop calendars
- vi. Water requirement for different water uses within the command area of the

- selected irrigation scheme
- vii. Precipitation and Evapotranspiration (either measured or obtained from the closet meteorological station) over time (this must correspond with the time period of field data collection)
- viii. Crop water productivity (yield per cubic meter of water diverted) values of rice paddy

For scheme management appraisal, the documented output shall include items below.

- ix. Organizational structure (be it formal or informal) of the different stakeholders
- x. A document describing users and other stakeholders' participation in the decision making of water allocation and distribution
- xi. Mechanism to decide water allocation and to put it into practice
- xii. Procedures and rules for operating the system

For scheme appraisal by RAP, the output shall include the following items:

- xiii. Filled RAP sheets

Plan of Operation of the Field Observation and Data Analysis for Irrigation Efficiency on Improvement of Irrigation Efficiency on Paddy Fields in the Lower Maekong Basin Project (IIEPF)

No.	Project Activities	Budget	Improvement of Irrigation Efficiency on Paddy Fields in the Lower Macrong Basin Project (IIEPF)												Year 2007												Year 2008																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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**MEKONG RIVER COMMISSION SECRETARIAT
VIETNAM NATIONAL MEKONG COMMITTEE**

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**IMPROVEMENT OF IRRIGATION EFFICIENCY ON PADDY FIELDS
IN THE LOWER MEKONG BASIN PROJECT (IIEPF)**

TECHNICAL PROPOSAL

FIELD OBSERVATIONS AND DATA ANALYSIS FOR IIEPF

HOCHIMINH CITY, SEPTEMBER 2006

1. PROJECT TITLE

IMPROVEMENT OF IRRIGATION EFFICIENCY ON PADDY FIELDS IN THE LOWER MEKONG BASIN PROJECT (IIEPF)

2. THE WORKING AGREEMENT

FIELD OBSERVATIONS AND DATA ANALYSIS FOR IIEPF

- Case study: Long Hai Irrigation System – Go Cong Irrigation Project

3. IMPLEMENTING AGENCY

Southern Institute of Water Resources Research, Vietnam

28 Ham Tu street, District 5, Hochiminh City

Tel: +84.8.9238320

Fax: +84.8.9235028

E-mail: htqt-siwrr@yahoo.com

4. DURATION

From August 2006 to the end of January 2008 with the following deadlines:

- Preparation to commence field work will be completed no later than the middle of October 2006.
- Measurements and field observations for irrigation efficiency will start following the field work preparation and will continue until the end of December 2007.
- Water distribution practice will be monitored and examined following the field work preparation and will continue for 12 months from the starting date.
- Rapid Appraisal Process will be completed no later than 15 January 2008.

5. OBJECTIVE OF THE WORKING AGREEMENT

“Field observations and data analysis” aims to analyse and document actual conditions regarding water use in selected irrigation schemes representing irrigation typology of the Basin to support the objective of the “Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong Basin” project of the MRCS.

6. EXPECTED OUTPUTS

Three major outputs are expected through implementation of this working agreement:

1. Assessment of irrigation efficiencies of the selected irrigation schemes
2. Scheme management appraisal
3. Scheme appraisal by Rapid Appraisal Process

7. GENERAL INTRODUCTION OF IRRIGATION SYSTEMS IN THE MEKONG DELTA

The Mekong Delta of Vietnam has a total area of about 3.9 million ha, of which agricultural land accounts for 2.4 million ha. It is surrounded by the South China Sea to the east, the Gulf of Thailand to the west, and Cambodia to the north. The delta is a very flat plain with an average elevation of 1 m above mean sea level (MSL). Most agricultural land has an elevation range from 0.5 to 3.5 m.

The delta is affected by tidal variation which ranges from – 2.0 to +1.6 m in the South China Sea and from -0.5 to 1.0 m in the Gulf of Thailand. Tidal variation in the inland area varies by location and season; during the dry season tidal variation in the Plain of Reeds is about 0.5 to 1.0 m, and during the flood season is much smaller.

Tidal irrigation is very common in the delta. During high tide periods, flow from the Mekong River is diverted into the canal network and farmers take water onto their fields by gravity. During low tide periods water flows from the canal network back to the main river. It seems that there is no limitation for water use in the delta. Farmers can take as much water as they need. The main constraints on water use in the delta occur when there is a shortage of water or the salinity is too high (>2 g/L). During the low tidal period (low tide) farmers have to use pumps for irrigation. Therefore in lowland areas gravity irrigation is used, and in higher areas gravity and/or pump irrigation are combined depending on the level of water in the canal.

Most canal systems in the delta are linked together and to natural rivers by open junctions or with gates. Therefore the irrigation system in the Mekong delta is generally an open irrigation system. Irrigation and drainage is combined in a very high density canal network. The total length of the river and main canal system is an estimated 7.4 million m, approximately 1.9 m/ha. The length of the river as well as the main and secondary canals is around 15.2 million m, approximately 3.9 m/ha. The tertiary canal system is approximately 3.9 m/ha.

The classification of a canal as main, secondary or tertiary is based on its service area or its dimensions. The three levels of canals are linked together as illustrated in Figure 1. Water supply for each tertiary canal is from both ends and may come from different canal levels. The classification of the irrigation system is based on an evaluation of the possible impact area of the main canal, e.g. the Quan Lo - Phung Hiep, O Mon – Xa No and Tam Phuong projects; however these irrigation systems do not have fully closed boundaries. The dimensions of the canals in the delta are much larger than that of the gravity irrigation systems elsewhere because the irrigation and canal networks are combined. The canals have many purposes, such as irrigation, drainage, navigation, soil reclamation and on farm storage of water.

Canal design is typically meant to convey a designated discharge but in the delta it also has to be large enough to reduce the head loss of the water level in the canal in order to gain maximum gravity irrigation area by tide. The water flow regime in the delta is affected by semi-diurnal tidal variation. The high tide period during the day is very short (about 6 hours for each tidal cycle), therefore canals need to be large enough to reduce the head loss and reduce the conveyance period such to extend the time duration of gravity irrigation. The extra

conveyance inflow to the actual water demand seems to be the regulation volume for salinity intrusion control.

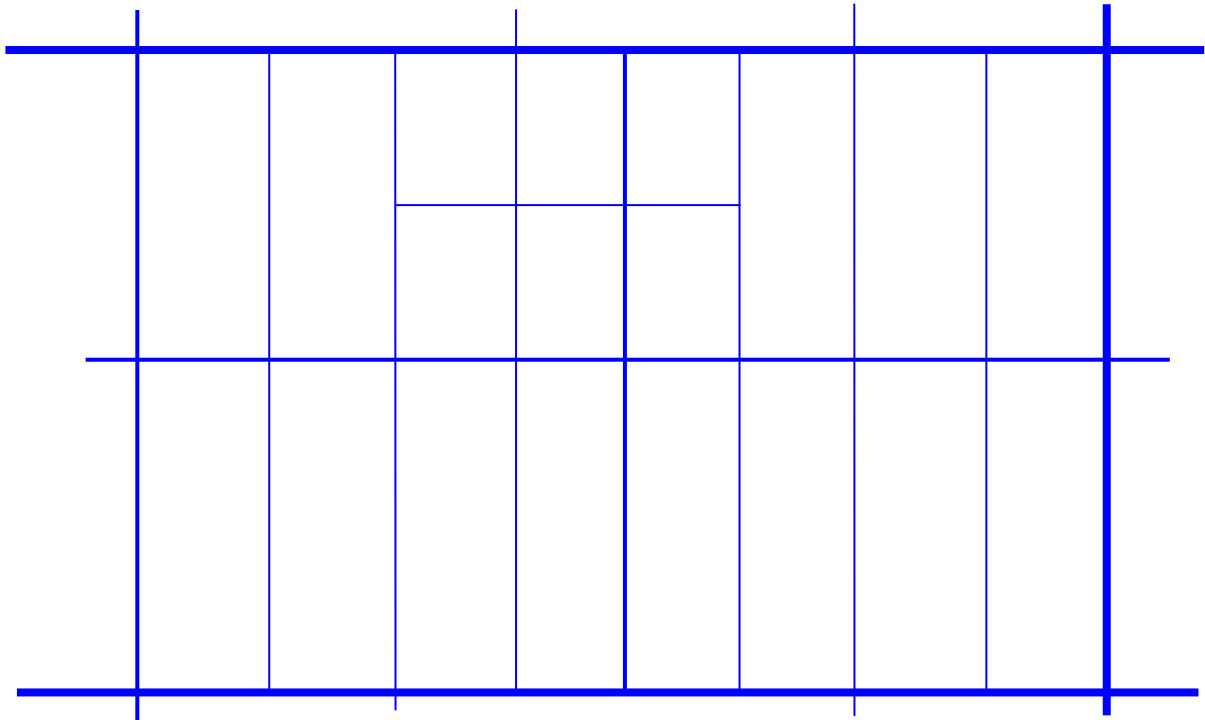


Figure 1: An illustration of irrigation canals in the Mekong Delta

Until now, not many studies have investigated the conveyance coefficient for the canal network in the Mekong delta. One reason is that the delta has a characteristically open irrigation system where water flows freely in and out of the canal network. Another reason is that in the lowland area the canal network is not only used for irrigation but also for drainage and navigation. The average elevation of the land is low (about 1 m). Water levels in the canal system range from 0.3 to 1.5 m and the water table is rather high. The recharge of the groundwater aquifer is limited because the water table is close to the soil surface and any infiltration from the field into the canal can be reused. Seepage and leakage seem to be negligible because the depth of clay soil layer is about 1.5m.

8. IRRIGATION PRACTICE IN THE MEKONG DELTA

Most of the agricultural areas in the delta can use tidal irrigation. During the daily high tide period or the high spring tidal period, when water levels in the canal system are high, gravity irrigation can be used. During the leap tidal cycle when water levels are low, farmers on the higher land have to use small pumps to take water from the canals.

Water is always available in the canal system and farmers can use water at any time. However, the main constraints on water use occur when there is no access to the water for irrigation and utility in the dry season, water levels in the canal system are too low or the salinity of the water is higher than 2 g/L.

Based on the present practice of irrigation in the delta we found that water diverted into the canal is not used only for irrigation. The main purpose for water diversion is to ensure a

maximum water level in the canal during each daily tidal cycle for gravity irrigation. The surplus flow will return back to the river during the low tidal period.

9. SITE SELECTION

Based on the objective of the project, the work load and the criteria for site selection, the Long Hai irrigation system was selected for the case study.

It was evaluated that the Go Cong irrigation system is one of the most successful irrigation systems in the Mekong delta.

Lessons learnt from the Go Cong irrigation system could be extended to other irrigation systems in the delta. Therefore, this is a good system to select as a case study for the improvement of irrigation efficiency in paddy fields.

10. INTRODUCTION TO LONG HAI IRRIGATION SYSTEM

The Long Hai irrigation system is part of the Go Cong Irrigation project. It is about 100 km from Ho Chi Minh City, with a total area of 924 ha, including two communes, Long Binh and Binh Tan, in Go Cong Tay district. The land elevation ranges from 0.85 to 1.2 m above MSL. The total agricultural area is about 667 ha, of which 604 ha are rice fields and 63 ha is used for upland crops and long-term tree plantations. There are 1,225 families in the project area with a total of 6,176 people who mostly rely on agriculture cultivation.

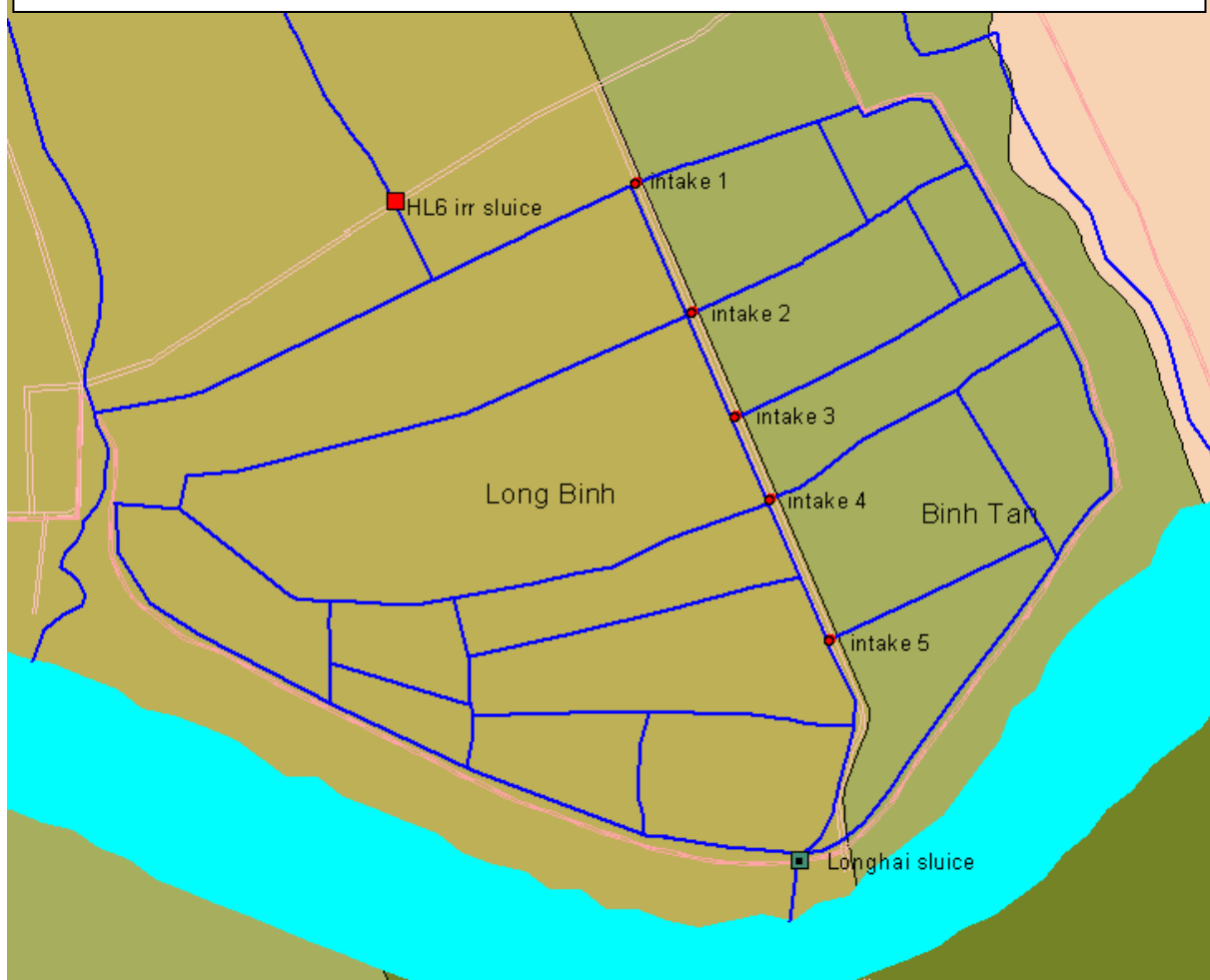
The system consists of 1 main irrigation canal and 1 main drainage sluice. There are 5 intakes, as under-road sluices, to take water from the main canal to the tertiary canals as shown in Figure 2. There are 7 km of main canals and about 20 km of tertiary canals. All the junctions between the tertiary canals and the main irrigation canal are open without sluice gates which is characteristic of the canal system in the delta. The agricultural area partially uses gravity irrigation driven by tidal variation. The remaining area is irrigated by pumps. Each farmer has their own pump and therefore they can use water when they need it. The irrigation system is managed by the Go Cong Irrigation Enterprise which operates the sluices.

There are 3 main rice crops in the area: winter-spring, summer–autumn and autumn–winter rice. The cropping pattern is 3 rice crops per year or 2 rice crops and 1 dry crop. Farmers manage the water on their fields by themselves as there is no water user group in the area.

There are two main sources of irrigation water supply to the area:

- Water supply from the main irrigation canal number 14 via the Long Hai canal and the sluice under road No. 6 throughout the year.
- Long Hai sluice. The main purpose of this sluice is for salinity intrusion prevention. It also supplies additional irrigation water to the area from August to November during which it is the main irrigation water supply for the area. Gravity irrigation area during this period is about 400 ha. During the period when the sluice is closed for salinity prevention it will operated every 15 days to replace the stagnant water.

Fig 2: LONG HAI IRRIGATION SYSTEM – GO CONG IRRIGATION PROJECT



11. METHODOLOGIES

The TOR contained 24 tasks which were categorized into 6 groups. In order to carry out these tasks, the following measures are needed:

- field measurements, monitoring and surveying
- interviewing
- lecture reviewing
- data collection and data analysis

Most of these measures are clearly described in the project document “Technical Guidance for Implementation of the Field Program: Some technical backstopping for implementation of the program” and in the “Terms of Reference for the Working Agreement between IIEPF and VNMC for the Field Observation and Data Analysis for Irrigation Efficiency on IIEPF”. Therefore, this technical proposal will not repeat how to achieve and carry out each task.

As previously mentioned, the irrigation system as well as irrigation practices in the Mekong delta are very different from other locations, and the concept of ‘conveyance losses’ is not clearly understood for the irrigation systems in the Mekong Delta. Therefore, the following sections will clearly describe the concept of ‘conveyance losses’ for the Mekong delta. Key

measures will be implemented in order to achieve the objective of project within the limited budget.

The irrigation system in the Mekong delta is unique with water levels and flows changing throughout the day. With a limited budget it is not possible to monitor flows throughout the day and night during the project period. Therefore, technology such as data loggers and water level sensors have to be used to record the water levels and from this information, rating curves will be made.

Irrigation efficiencies vary according to the irrigation practices used. For example, during periods of tidal irrigation, additional volumes of water are needed to raise the water level in the canal system, and this additional water will be included in the conveyance losses. During low tidal periods, when farmers use pumps to take water directly from the canals to their field, conveyance losses are mainly due to evaporation and infiltration from the canal system. Therefore, irrigation efficiencies for each period have to be analysed and it is requested that levelling be completed in order to identify the gravity and pumped areas as well as gravity and pumped periods.

The canal system in the delta has many purposes such as irrigation, drainage, navigation, on-farm storage, and environmental flows; however it is very difficult to evaluate water demands other than the irrigation demand. In order to evaluate the water balance, the closed Long Hai irrigation system was selected and the following measurements will be introduced to the area:

- Data loggers and water level sensors will be installed upstream and downstream of the Huong Lo 6 (HL6) irrigation sluice and the Long Hai sluice and will record water levels at an hourly interval.
- Additional current flow monitoring using a current meter will be undertaken and this data used to produce rating curves of Q - H (discharge and water levels)
- Because there are two way flows, the rating curves for flow from each direction will be different. Therefore flow will be simulated from each direction.
- Field measurements of percolation and infiltration will be monitored in fields of selected farmers.
- Water balance during gravity irrigation and combined gravity and pumping irrigation will be evaluated.

12. EQUIPMENT REQUIREMENTS

- Data loggers and sensors will need to be purchased for monitoring of water levels upstream and downstream of the sluices
- One current meter is required for the local staff to monitor flow when the rating curve needs to be checked.

13. WORK LOAD AND WORKPLAN

The work load and work plan is based on the TOR for the Working Agreement between IIEPF and VNMC for the Field Observation and Data Analysis for Irrigation Efficiency on IIEPF. The detailed work load is outlined below.

13.1 Preparation for data collection (Task 10.1)

- (1) prepare schematic plan of irrigation system

- (2) prepare scaled command area map of the irrigation scheme
- (3) topographic map (scale 1:1000)

Based on the project document and the TOR, all available maps will be used. Additionally, a GPS survey and levelling will be conducted. There are an estimated 700 ha that need to be levelled (667 ha of cultivated area, not including main canals and roads).

13.2 Assessment of Irrigation Efficiencies (Task 10.2)

Conducting Water Balance:

- (4) inflow and outflow measurements and irrigation application:
 - inflow and outflow at the HL6 irrigation sluice will be monitored through the period (24 hr/day for 15 months)
 - inflow and outflow at the Longhai sluice will be monitored through the operation period (24 hrs/day for 6 months)
 - irrigation application of 5 farmers will be monitored and the lift of pumping head and expent fuel and time will be recorded
 - flow quantity for each selected point will be calculated for 2 days per one month at hourly intervals
 - Staff from SIWRR will travel monthly to the project area (a total of 15 times) to download data, monitor the flow and conduct rating curves if needed, and to collect relevant data from IMC
 - Additional training for farmers on tasks and use of survey forms will be done by SIWRR staff

Assessment of Water Requirement:

- (5) obtain rainfall and other climate data from the Mytho meteorological station
- (6) calculate evapotranspiration (ET_o) and crop coefficient values (K_c) for paddy, fishponds, and other crops
- (7) calculate crop evapotranspiration (ET_c)
- (8) identify actual irrigated areas within command areas
- (9) record cropping pattern and crop calendar
- (10) record multiple use of irrigation water quantity (e.g. water use for fishpond etc.)
 - Tasks 8 to 10 will be carried out by field survey and interviewing the farmers before, during or at the end of each crop. It is estimated that 1 staff member can survey 20 ha/day and in total there are around 600 ha, so there will be 30 days of surveying for 1 crop season. There are a total of 3 crops per year so 90 days are required to carry out the tasks. Additionally, training and survey forms for local staff to carry out the tasks will be done by SIWRR staff.
- (11) record water level changes in paddy fields (for monitoring percolation)
 - Monitoring and recording water level changes during the wet and dry seasons will be completed to evaluate the percolation during the two seasons. This will be done in the fields of 5 selected farmers. Additionally, training and survey forms for farmers to carry out the tasks will be done by SIWRR staff
- (12) calculate total scheme water requirement: will be done for each crop season. The topographic survey data will be used to identify the gravity

and pumped irrigation area and the gravity irrigation period will be evaluated.

- (13) calculate the command area efficiency based on water balance concept: will be done for each crop season

13.3 Assessment of water productivity (Task 10.3)

- (14) obtain yield of paddy: direct monitoring of the paddy yield, consumed fuel based on selected farmer's paddy fields, or obtained yield from the farmer. Yield and all kind of products in project area will be collected as well; survey forms will be produced.
- (15) calculate crop water productivity (yield per cubic meter of water diverted, and water consumption)

13.4 Scheme management appraisal (Task 10.4)

- (16) identify stakeholders for decision making on distribution of irrigation water within the scheme
- (17) draw organisational charts of stakeholders (irrigation managers, water users, others) involved in the decision making of the scheme management
- (18) document procedure of decision making for water allocation and distribution
- (19) document operational rules and actual practices to ensure delivery of the above allocated and planned water to the users
- In co-ordination with the IMC, the task 17 to 20 will be implemented.

13.5 RAPs (Task 0.5)

- (20) conduct RAP: will be conducted by the end of each crop season, and completed by the end of the data collection period

13.6 Others (Task 10.6)

- (21) facilitate technical support by the MRCS made on demand by implementing agency
- (22) take part in the training workshops organized by MRCS within the framework of IIEPF
- (23) assist Programme Officer in collecting any other information required for analysis within the framework of IIEPF
- (24) assist MRCS in organizing national workshops planned to be conducted in January 2008.
 - 1. It is expected the MRCS will facilitate technical backstopping around 3 times, taking into account the workload of MRCS staff for the 4 countries: the first time will be when most of flow monitoring activities are working, the second time after submission of the interim report and the last time after the submission of the draft final report.
 - 2. The working team promises to participate in all other work as described in tasks 23 to 24, however the workload for these tasks has not been estimated because it was designed by MRCS, and therefore the expenditure for these tasks will be paid as DSA in addition to the estimated cost of the project.
- (25) Overall coordination and reporting is accounted for 18 working days

The detailed work load and work plan is given in Table 1.

14. REPORTING

The SIWRR will submit to the MRCS through VNMC an interim and a final report.

- The interim report will be submitted no later than May 2007
- The draft final report will be submitted by the end of November 2007
- The final report will be submitted no later than 31 January 2008.

15 STAFFING

- 1 staff from SIWRR will be responsible for data monitoring and data analysis
- 1 staff from SIWRR will be responsible for water balance and data analysis
- 1 staff from SIWRR will be responsible for project coordination
- 2 staff from IMC will be responsible for field and crop surveys
- 5 farmers will participate on the water use application

Table 2: LIST OF PARTICIPANTS INVOLVED IN THE PROJECT

Ord.	Name	Duties	Position and Address
1	Dr. Vo Khac Tri	Coordinator, reporter	Head of ITCD, SIWRR
2	MSc. To Quang Toan	Water balance and data analysis	Researcher, SIWRR
3	MSc. Pham Duc Nghia	Training and data monitoring and collection	Researcher, SIWRR
4	MSc. Ung Hong Nghi	Field data collection	Vice Director of Tien Giang IMC
5	Eng. Do Thanh Son	Field data collection	Head of Gocong Irrigation station

Annex4

BTO report of backstopping

Summary of BTO reports

Note: "by" means O(kudaira Hiroshi), F(ongsamuth Phengphaengsy)

Date	Country				Summary of findings and Outline of backstopping	by
	C	L	T	V		
15 Nov 06		*			- Detail irrigation practice confirmed - Bridge construction for flow measurement almost completed - Percolation measurement points fixed - Know-how for measurement and flow rate calculation provided	O, F
17 Dec 06		*			- Marking on the bridge for measurement suggested to be improved - Sharing know-how for observation among the team requested - Date recording sheet suggested to be produced confirmed - Three percolation measurement tanks ready but not installed, quick installation promised - Two staff gauges for percolation in fishpond installed - Evaporation pan and rain gauge installed - Date sheet to record irrigated area distributed to farmers - Observation/Interview to supplement data collection suggested - Document of irrigation practices being collected	F
8-9 Jan 07			*		- Schematic and command area map not completed - Improvement/modification of existing schematic map suggested - Calculation of crop water requirement well prepared - Crop calendar information not collected and requested to start - Irrigated area identification on-going - Lotus farming and fishpond identified/confirmed as multiple use - Conveyance test planned Jan to Feb 2007 - No progress on management practices made and promised to start	F
16, 19 Jan 07		*			- Flow measurement regularly conducted twice a month - Suggestions to improve accuracy provided - Four bridges suggested to raise up elevation avoiding turbulence - All three percolation measurement tanks installed - Measurement being conducted twice a day - Evaporation being recorded - Assign one staff exclusively for accurate reading suggested - Identification of irrigated area waiting for transplanting completed - For vegetable and fishpond, data collection on-going - Method to estimate fishpond water use provided - Assistance to conduct conveyance test promised - Gate calibration at three points agreed to be conducted - Producing maps delayed and emphasized to complete soon - Management practice information being collected, but documentation not started yet	F
26-29 Jan 07	*				- Maps prepared, but requested further improvement - Bridge completed except points without flow in dry season - Measurement points changed/added/deleted based on detail survey - Cross section survey completed - Form for flow rate recording and percolation completed - Canal clearance initiated and being continued - Five percolation tanks ready, installation points fixed and agreed by farmers, installation waiting for broadcasting - Recorder of percolation assigned - Evaporation pans made available and to be installed - Arrangement for rainfall data acquisition made - No action for management practice information made - Further explanation for this work required	F

Date	Country				Summary of findings and Outline of backstopping	by
	C	L	T	V		
26-28 Feb 07				*	- Topographic survey postponed until harvesting - Maps not produced and to be initiated after topo-survey - Two data loggers for water level observation installed - Flow measurement for H-Q curve to be conducted in flood season - Five sets of 5 staff gauges for percolation installed and farmers assigned to gauge reading - Scales suggested to be replaced, because hard to read - Percolation measurement not initiated - Evaporation rainfall and cropping pattern recording commenced - Some Vietnamese information for management practice identified	O, F
21 Mar 07		*			- Detail of conveyance test decided - Flow measurement being conducted appropriately - Percolation measurement also being conducted well even one point stopped because of readiness of harvesting - Evaporation/rainfall measurement being continued but suggested slight improvement on gauge reading - Planted area information collected, collection of spatial information under way - Fishpond water use recording on-going - Gate calibration partially conducted	F
3, 4 Apr 07	*				- Improvement of two kinds of maps suggested and agreed - Enough experience of the observation team for flow measurement confirmed - Flow measurement done properly with well-organized data sheet - For accurate flow measurement, cleaning up canals, 3 times measurement for one point suggested - Percolation, evaporation & rainfall measurement instrument well installed & observers trained - Method to identify actual irrigated area discussed and agreed - Conveyance loss test not conducted, detail procedure with measurement points discussed and agreed - H-Q curve measurement point confirmed, and other points added - Data analysis not yet started but promised to do soon - Information of management procedures collected but not compiled	F
10,11 Apr 07			*		- Maps produced but further improvement requested which includes to translate from Thai to English, to add canal name roads and other information - Flow measurement, conveyance loss test, and collection of percolation, rainfall and other meteo-info. properly conducted - Information of management procedures not collected yet and this task requested to start soon - Outline of interim report presented by MRCS and agreed	F
22-24 Jun 07	*				- Outline of interim report supplementary discussed - Analysis work delayed and further needs of backstopping for analysis identified - Measurement instruments still in good conditions - Production data collection demonstrated and agreed	F
20-22 Jul 07				*	- Detail discussion on submitted draft interim report conducted based on written comments by MRCS - Effort for more accurate data confirmed by field visit, which includes percolation and flow rate	F

Field visit to Nam Houm project

1. Date, Time 15 Nov. 2006 9:30-11:30
2. Itinerary
8:30 Meet the team at MRCS
9:30 Arrive the project office
11:30 End of visit
Lunch
13:00 Arrive MRCS
3. Participants Mr. Khammay Vongsathiane, Dept. of Irrigation, MAF
Mr. Phouthone Siriphanthong, Dept. of Irrigation, MAF
Mr. Saykham Phengkhammy, Irrigation Section, Vientiane Muni.
Mr. Bounhap Vongvichith, Nam Houm Irrigation Project
(One person from the project office)
Okudaira, Fongsamuth
4. Summary
 - (1) Purpose
This trip aims to confirm the progress of preparation for the field observation at the site, jointly with the Laos team and MRCS staff.
 - (2) Findings
 - 1) Irrigation practices
During this field visit, the project office was also conducting the meeting with Water Users' Group to decide detail of this dry season irrigation practices. Because of the delay of harvesting, starting of irrigation is supposed to delay to around 20th Nov from original 15th.
 - 2) Bridge for measurement
Among 44 bridges planned, 40 were completed and 4 were in progress. (See photos below.)
As the initial payment to LNMC is delayed, the team temporally contributes their own fund to purchase materials for bridge and other preparation work. Water Users' Group members were engaged in this construction work.
 - 3) Percolation
3 places for paddy fields and 2 places for fishponds were proposed to install drums for percolation measurement. Drums and staff gauges have been ordered but not delivered yet. The team promised to complete installation before irrigation starts.

One site for paddy field was observed. This is located downstream part of the command area with apparently high percolation rate. The project officer recognizes that supplied water is absorbed quickly but he does not have idea of how much the rate is. He also recognizes that the reason is mainly soil type.
Another two candidates are located middle reach of the command area under the secondary canal but were not observed this time.

Among two proposed, one fishpond just downstream of the reservoir was proposed for percolation measurement. However this visit identified that pond was supplying water to downstream ponds. Short discussion concluded to choose the most downstream pond for this work avoiding measuring outflow and concentrating to inflow and percolation only.

(3) Suggestion made

MRCS suggested to 1) put marks on the bridge, 2) measure the depth and identify the cross section of each point and 3) prepare calculation sheet for flow quantity, prior to irrigation (and measurement) starts, even the team planed to conduct those (especially 1) and 2)) simultaneously with measurement. For 1) and 2) the team agreed, and for 3) the team leader promised to prepare and pass to the project office.

MRCS also proposed to visit the project again during the team conducting the measurement. Team members from Vientiane are not requested to join this visit. MRCS will contact the project office to fix the date and time for this.

5. Others

Apart from the fieldwork, MRCS got information that MAF Laos was going to start another improvement project for irrigation performance supported by French government.

Outline of the project is two years with 1 million Euro targeting 20 irrigation schemes. Because of the reshuffle of central government staff, the process is now delayed but one international consultant will be selected early next year to be responsible for project implementation.

Selection of the consultant is to be made by panel members composed by MAF Laos and French Embassy (AFD.) Mr. Phouthone, the team member of this work, is one of them.

This consultant with the assistance of national consultant(s) will conduct appraisal of irrigation schemes and then improvement. He will be working under the supervision of Director General of Irrigation Department with to-be-assigned counterpart from MAF. Since the meeting, MAF planned on 3rd Nov, was postponed because two key persons - Mr. Khammay and Mr. Phouthone – were occupied for the meeting with MRCS, detail arrangement, such as assignment of CP, has not been decided yet.

Nothing is decided for selection of the target schemes.

MRCS recognizes there is overlap with IIEPF and decides to share idea and information when this project starts.

6. Photo

	
Bamboo bridge for measurement	ditto



Mekong River Commission

BACK-TO-OFFICE REPORT Travel to visit Num Houm Irrigation Projects in (Laos) (17 December 2006)

1. Travellers:

- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IEFPF

2. Itinerary:

<u>Date</u>	<u>Place</u>	<u>Activities</u>
17 –December- 06	Num Houm Project, Vientiane	Field visit with the implementing team to check progressing of field work and discussing about future plan

3. Objectives:

- To visit Num Houm project to monitor the progress of field work of IIEPF conducted by implementing team regarding flow measurement, percolation installation for paddy and fishponds, and recording data of other activities based on the activities listed in the TOR.
- To backstop the implementing team in technical aspect of how to conduct flow measurement properly and making forms of data recording
- To discuss about difficulties and future activities

4. Report:

The major findings of field visits are summarized as follows.

[Flow measurement]

- The conducting cross sections with marking of flow measurement point at the bridge were completed, but most of them were marked at inappropriate position. Along canal cross section, only 1 point was conducted flow measurement. The AIFP/IEFP suggested re-marking flow measurement point again to cover at least 3 points in the canal. The implementing team promises to re-conduct cross section and making flow measurement point again and it is expected to complete by the middle of January.
- The project manager, IIEPF member, who is the main person conducting field work in the project has clear idea of conducting, but lacking of transferring lesson to the members who are conducting flow measurement. The AIFP/IEFP recommended to project manager to work closely with the member and to monitor work intensively. The project manager promise to have evaluation and checking field work with his member every month.
- The AIFP/IEFP visited 2 measurement points at 5LN1 and 4LN1 canals. It was found that the conducting teams still confuse how to conduct and recording data appropriately. AIFP/IEFP showed example the procedure to conduct flow measurement and let the team to follow it.
- The form of recoding flow data was produced clearly by the implementing team. The filling information into the form will be done by project manager before handing to

the head of the team for arranging information. This procedure was not checked by the AIFP/IEPF yet.

[Percolation Measurements]

- 3 sets of measurement tanks (photos attached) were produced to install at 3 places in the command areas for monitoring percolation loss in the paddy field, 1 will be installed at the command area of main canal, 1 at command area of N1 canal, and 1 at command area along N3 canal.
- The percolation tanks should be installed at the beginning period when irrigation started, but no installation of percolation measurement were reported during the field visit. The implementing team are waiting after finishing land preparation period because the installation may disturb farmer activities.
- The AIFP/IEPF responded to the team that the percolation for the beginning stage is important as it is usually high during the first stage and this will be affected to the calculation of average value during 1 year monitoring.
- One set was then installed at the command areas of canal N3. The other 2 sets will be installed within 2 days after.
- The installation of 2 simple staff gauges (photos attached) for monitoring percolation in the fish pond was completed. The data is recorded 2 times a days, at 8 am and 16 pm. The implementing team assigned fish pond owner recording data. But the recording was not so accurate because the recorder/ fish pond owners are not well educated and has low skill of reading staff gauge. The AIFP/IEPF recommended the implementing team to record data by themselves.

[Evaporation Measurement and rainfall]

- The implementing team installed evaporation tank and simple rainfall gauge at the project office to collect evaporation and rainfall data. These data will be compared with collected data from HDM. The record is done by project staff.

[Identify Actual Irrigated Areas]

- The forms recording crop type, areas and date of transplanting were produced and distribute to the head of each WUG. But apart from this, the implementing team has no clear idea how to conduct this activity.
- The AIFP/IEPF reviewed explanation to identify actual irrigated areas. Apart from recording data, field observation and interviewing the heads of WUG are needed in order to draw boundary of actual irrigated area and command area.
- The implementing team plan to conduct field observation at the end of January 2007.

[Management documents]

- Implementing team is collecting information related to Num Houm irrigation project in order to produce management appraisal.
- The team started to write some management information of the project.

5. Follow-up:

The urgent activities needed to be confirmed and monitored are as follows.

- The 3rd round of flow measurement will be conducted at the middle of January. Although the team is conducting the activity, AIFP/IIEPF is still unsatisfied with the quality of work, and AIFP/IIEPF plan to monitor intensively and closely with the conducting team in each measurement point in order to make sure the implanting team is doing in appropriate way.
- The installation of percolation sets are needed to be confirmed by end of December 2006. The recording is needed to be checked carefully by the middle of January 2006.
- Filling flow information into the excel sheets and other information that are prepared by the implementing team are needed to be checked carefully in order to avoid mistake in the future. This is planned by the beginning of January.

6. List of people contacted:

The list of participants is attached

7. Photos



Conduct flow measurement



Make cross section and re-mark measurement point



Equipment set for percolation in paddy field



Staff gauge for percolation in fish pond (1)



Staff gauge for percolation in fish pond (2)



Evaporation and rainfall tanks at reservoir (project office)

List of Participants

Vientiane

Venue New Houm Irrigation Project

Date 17 - 12. 2006

Name	Organization, Department and Title	Contact (Email or Telephone)
1. Mr. Phonthone	ORM Division, Department of Irrigation, MAF	S-phonthone@yahoo.com Tel: 020- ~~5898484~~
2. Mr. Saykham	Irrigation Section, Agriculture & Forestry Vientiane Capital	020-5502301
3. Mr. Bounthab	New Houm Irrigation Project	020-7703023
4. Mr. Phet	New Houm Irrigation Project	
5. Mr. Khammone	New Houm Irrigation Project	



Mekong River Commission

BACK-TO-OFFICE REPORT

Travel to visit Huay Luang Irrigation Projects in Udonethani (Thailand) (8-9 January 2007)

1. Travellers:

- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IIEPF

2. Itinerary:

<u>Date</u>	<u>Place</u>	<u>Activities</u>
08 Jan. 2007	Huay Luang Project, Udonethani	Discussing the progress of field work implementation and future plan.
09 Jan. 2007	Huay Luang Project, Udonethani	Checking progress of flow measurement and percolation test installations in paddy fields and fishponds.

3. Objectives:

- To visit Huay Luang project to monitor the progress of field work of IIEPF conducted by implementing team regarding flow measurement, percolation installation for paddy fields and fishponds, identify actual irrigated area and recording data of other field activities based on the TOR.
- To backstop the implementing team in technical aspect of how to conduct flow measurement properly, installing percolation test equipments, and producing forms of data recording.
- To discuss about constraints of conducting field works of the team and follow-up activities.

4. Report:

The major findings of discussion are summarized as follows.

[Discussing about implanting progress]

Date: 08.01.2007, Time: 10:00 – 14:00

Attendances: (1) Mr. Pramote
(2) Mr. Fongsamuth

Head of Branch # 3, Huay Luang Project
P.O of AIFP/ MRCS

- As promised by the implementing team on the last visit, 2 maps: schematic map and scale command should be finished on the end of December 2006. But the maps are still on producing period. Since the schematic map is available, AIFP/IIEPF suggested the team to modify this map first by including information of discharge, command area, length of canal in each intake of secondary and tertiary canal into the

- schematic map. The area is typically divided into 4 zones for water management and the AIFP/IIEPF also requested the team to divide the area in the schematic map. The information of numbers of households and water users groups also was also required to add. For scale-command area map, AIFP/IIEPF requested the team to modify as in GIS file with including information of command area boundary, canal alignment, natural rivers, location of zone offices, and main roads in the command area.
- Rainfall and evaporation data is corrected in 4 weather stations at the project site and inside command area. ETo and Kc information which is borrowed from Royal Irrigation Department is available in the project. The team is calculating and updating scheme water requirement information weekly for their own water management purpose. This information is published in the website: www.water3hl.org.
 - For cropping calendar and cropping pattern work was not started yet. The AIFP/IIEPF asked the team to start this work as soon as possible since many crops were already grown in the areas. The AIFP/IIEPF requested the team to produce separately between rice, other crops and fishpond.
 - For identifying actual irrigated area, the team is recording data weekly to monitor the progress numbers of transplanting areas. This year, the actual irrigated area seems to be larger since higher storage capacity in the reservoir and project allow farmers to grow more crops.
 - Multiple use of water is considered for lotus farming and fishpond activities in this project and it is included when considering scheme water requirement.
 - Conveyance test is not conducted yet, but the team is making plan to conduct during the end of January and the beginning of February, 2007.
 - For scheme management appraisal, no any progress was found. The team however promises to arrange information and start to write this information from now on.

[Join meeting of project activity]

Date: 08.01.2007, Time: 14:00 – 17: 00

Attendances:	(1) Mr. Pramote	Head of Branch # 3, Huay Luang Project
	(2) Water Master	
	(3) Head of O&M of Branch # 3 Huay Luang project	
	(4) Head of each zone	Huay Luang project
	(5) Mr. Fongsamuth	P.O of AIFP/ MRCS

- Meeting discussed about progress of water distribution practice and between zone mans and head of the branch. Constraints were reported to the head of the branch and zone number 4 is facing water shortage problem at the end of canals.
- Percolation test was of IIEPF activity was discussed in the meeting, AIFP/IIEPF explained how to conduct and install percolation test properly in the field and fishponds.
- The head of each zone was assigned by the head of branch to record percolation test every day in their zone installing in the paddy field and fishponds.

[Monitoring field activities]

Date: 09.01.2007, Time: 08:00 – 16: 00

Attendances: (1) Mr. Pramote	Head of Branch # 3, Huay Luang Project
(2) Team staff	Huay Luang project
(3) Mr. Fongsamuth	P.O of AIFP/ MRCS

- AIFP/IIEPF together with the team visited 4 station of percolation test. The installation works were completed except zone # 4. One station is installed in each zone. Although the installation work is almost completed, but the data is not recorded yet, the team is waiting after transplanting period. The AIFP/IIEPF suggested the team to record from now because the percolation is usually high in the first state of irrigation applied and it will affect to estimated value through the whole season.
- The AIFP/IIEPF visited the team to conduct water flow in main, secondary, and tertiary canals. The team is conducting properly and be careful on accuracy. Cross section an area is divided into several segments for conducting flow followed instruction by AIFP/IIEPF. The team how ever spends much time in each measurement point. One of the reasons is due the methodology conducting. The team is measuring top bank every time conducting flow instead of marking fixed point. There is no error interns conducting and flow estimation, but it only make the procedure slow. AIFP/IIEPF shared the information and method applying by the Lao team to Thai team. However it is not easy to change the method because the team is familiar with their own style and they have no problem with time consuming. AIFP/IIEPF agreed use original method.
- The flow measurement is divided into 2 teams. One current meter from IIEPF project is used in team # 2 and current meter from DMPF project is used by the team # 1.

5. Follow-up:

The urgent activities needed to be followed up are as follows.

- The team promised to finish schematic map on the end of January 2007 and scale-command area map on the end of February 2007.
- Conveyance test will be conducted during the end of January and beginning of February 2007.
- The arrangement of scheme mismanagement appraisal is started from now on.
- The recording percolation in the paddy field and fishponds is started from now on.
- The format of flow measurement data is needed to be discussed and modified for the next time visit.
- The next monitoring date is expect at the 2nd week of February 2007 to see the team conducting conveyance test.

6. List of people contacted:

The list of participants is attached

7. Photos



Meeting with project and heads of water zone



Flow measurement team #1



Percolation staff gauge installed in fishpond



Flow measurement team # 2



Installation of percolation test in paddy field



Percolation test in paddy field

List of Participants

Venue Hway Laming OXH Project

Date 8-9.01.2007

[illegible]



Mekong River Commission

BACK-TO-OFFICE REPORT Travel to visit Num Houm Irrigation Projects in (Laos) (16 and 19 January 2007)

1. Travellers:

- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IIEPF

2. Itinerary:

<u>Date</u>	<u>Place</u>	<u>Activities</u>
16 - January – 07	Num Houm Project, Vientiane	Site visit to check the progress of flow measurement, percolation, evaporation, and to discuss and to make comments on field activities
19 – January – 07	MAF, Vientiane	Meeting with the team on progressing of data input and analysis works.

3. Objectives:

- To visit Num Houm project to check the progress of field work of IIEPF conducted by implementing team regarding flow measurement, percolation installation for paddy and fishponds, and recording data of other activities based on the activities listed in the TOR.
- To backstop the implementing team to conduct field work and data analysis.
- To make comments on the team to conduct the field work by following the plan in order to avoid the delay in the future.

4. Report:

The major findings of field visits are summarized as follows.

4.1 Field Work Report

Date: 16.01.2007; Time: 08:00-17:00

Place: Num Houm Irrigation Project

Main Participants: (1) Mr. Bounharb and the project staff (Project Officers)
(2) Mr. Saykham (Agriculture & Forestry, Vientiane Capital)
(3) Mr. Fongsamuth (AIFP/MRCS)

[Flow measurement]

- The team has conducted flow measurement along irrigation for 2 times a month. It takes 3 days for one time measurement. The first time is on 1st to 3rd and the second time is from 16th to 18th of each month. According to the TOR, more intensive and frequently of measurement is proposed. The IIEPF/AIFP will discuss with the team to add one more time of flow measurement in a month.
- Based on observation, all members of the team become more understand and experience on conducting flow. The time spend in each point is faster than before

.However, the team is still not pay attention enough on accuracy. The edge of water along canal cross section is still estimated by the eye adjustment, not using tape for measuring. The reading of velocity value takes time at some measurement point because the value is not constant due to the water fluctuation. The team took unrealistic value sometime. The IIEPF/AIFP made suggestion on these points. The team must be more careful and attention on accuracy to get appropriate values. Each kind of measurement has to be made by scale-tape measurement. Value of velocity is taken when it is almost constant.

- IIEPF/AIFP found that there are 4 bridges at the in take of secondary canals were constructed below water surface. This is disturbing flow velocity and they may not use up to 2 seasons. IIEPF/AIFP suggested to re-construct again, and the team promised to finish before field visit of donor meeting at the begging of February.
- It was informed by the LNMC that another flow measurement device of DMPF project is now available. IIEPF/AIFP asked the team if one more set of equipment is still needed. The team does not need it in this season because it takes only 3 or 4 days to cover all 23 points of measurement. From next week, the irrigation schedule will be changed to rotation method. The measurement will be conducted following the schedule and the points of measurement will be reduced.

[Percolation Measurements]

- All sets were installed. Percolation for paddy field of set No.1 is located at secondary canal N4 9 (up-stream of command area), set No. 2 is installed at the secondary canal No. 9 (middle-stream of command area), and set No. 3 is at the down-stream of command area. 2 set of staff gauges for fish ponds are located in the up-stream area.
- The recording of percolation is made regularly 2 times per day at 8am and 5pm. The head of WUAs are responsible for recording percolation data.

[Evaporation Measurement and rainfall]

- The evaporation is recorded by the staff at the project office. Because of 3 staff are assigned to do this work, accuracy of reading or obtaining information may not good enough. IIEPF/AIFP requested the team to assign only one staff to responsible for this work.
- Simple rainfall gauge is installed at the project office. During this season there is no rainfall, the data is not recorded yet. The rainfall is also collected from HDM.

[Identify Actual Irrigated Areas]

- So far, this work has not been implemented yet. The team is waiting for the area will be full transplanted. It is now under transplanting period and it is expected to complete by the end of this January.
- Due to the data is needed to be record monthly in order to fill the RAP sheet, IIEPF/AIFP requested the team making forms to record actual irrigated areas every month. The team promised to start this work from now on.
- So far, the team records the date and areas of vegetable and fishponds, but the information is not arranged yet.

[Multiple use of irrigation water]

- In this project, irrigation water is not used for only paddy rice but large amount is also used for fishponds. So far, the team has no clear idea on how to estimate water use for fishpond.
- After discussing with the team, IIEPF/AIFP recommended that main inlets from canal to the fishpond are needed to be recorded the quantity of water. The current meter can be use for estimating the velocity of the pipe inlet. The forms should be produced and provide to the persons who are responsible for main inlet to record the date and time of taking water from canal.

[Conveyance Test]

- The team has no experience on this work and so far there is no any progress. The team needs assistant from IIEPF/AIFP to guide and to select appropriate position along canals to conduct the work. The IIEPF/AIFP will find an appropriate time to accompany with the team to conducted 1 or 2 points as example. Then team can be conducted by themselves.

[Gates calibration]

- The task is not included in the TOR, but IIEPF/AIFP requested the team to conduct the work because these data will be also useful for the project of water distribution and management. The team promises to conduct at 3 main points: intake of main canal, intake of secondary canal N1 and main intake of secondary canal N4. These are the main junction of water distribution. The date and time of this activity is not decided yet.

4.2 Meeting

Date: 19.01.2007; Time: 08:00-14:00

Place: Ministry of Agriculture and Forestry (MAF), Vientiane

Main Participants: (1) Mr. Kammai (MAF, implementing team leader)

(2) Mr. Phuthone (MAF, member)

(3) Mr. Fongsamuth (AIFP/MRCS)

[Maps Producing]

- 2 kinds of maps are supposed to be finished during preparation period before conducting field work. So far, these maps have not been completed yet.
- IIEPF/AIFP requested to the team produce schematic map first and the team promised to finish with in February
- The team started to produce scale-command area map in GIS file. But a lot of improvement and modification is needed. IIEPF/AIFP requested to the team finish before March. This map will be used for identifying actual irrigated map as well.

[Field conducting works]

- The IIEPF/AIFP made comments to the team to advise the person who conducting field work to be more careful and to pay attention in terms f accuracy.
- The IIEPF/AIFP suggested to the team to re-check the bridge for whole points in order to avoid the damaging.

- All activities listed in the TOR are discussed, the team promises to start the works which are delayed.
- The team will have meeting with the members who are conducting field activities and make evaluation of the team on this weekend.
- The flow calculation was discussed. The forms recording data and analysis are still confusing. IIEPF/AIFP needs to review once again before making comments.

[Management documents]

- The team start to collect related information from different sources
- IIEPF/AIFP requested to the team start this work as soon as possible in order to avoid the delay of submitting interim report.

5. Follow-up:

The urgent activities needed to be followed-up are as follows.

- Schematic maps is expected to complete by the end of February
- Project command-area map will be finished by the end of March
- Bridges will be re-constructed and improved
- Estimated of multiple use of water will start soon
- Conveyance test will be confirmed the date by IIEPF/AIFP
- Flow calculation data will be reviewed by the IIEPF/AIFP
- Writing of management appraisal will be sated soon

6. List of people contacted:

The list of participants is attached

7. Photos



Conducting flow measurement at secondary canal



Percolation test in paddy field (1)



Percolation test in paddy field (during land preparation period, photo from last report)



Percolation test in paddy field (2)

List of Participants

Venue Nam Houn Project

Date 16.01.2007 & 19.01.2007

Name	Organization, Department and Title	Contact (Email or Telephone)
1. Mr. Boenhary	Nam Houn Project, MAF	020-7703023
2. Mr. Phet	— " —	020-5400539
3. Mr. Oun Kao	— " —	
4. Mr. Inagchai	— " —	
5. Mr. Sonthou	— " —	
Date : 19.01.2007		
1. Mr. Khammai	MAF, DOI	
2. Mr. Saykham	Agriculture & Forestry, VTE	
3. Mr. Phontome	MAF, O & M	



Mekong River Commission

BACK-TO-OFFICE REPORT

Travel to visit Komping Pouy Irrigation Projects in (Cambodia) (26-29 January 2007)

1. Travellers:

- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IIEPF

2. Itinerary:

<u>Date</u>	<u>Place</u>	<u>Activities</u>
26 - Jan.- 2007	Travelling	Vientiane to Phnom Penh and to Battambang province
27- Jan.- 2007	Battambang Province	AM: Meeting and discussing about progress of field work preparation with implanting team PM: Field observation to check bridge construction for flow measurement at down stream of command areas at drainage canal and main canal
28 - Jan.- 2007	Battambang Province	AM: Continuing field observation to check the preparation of percolation test equipments, rainfall gauges, and evaporation pans and location of their installation and also to check the bride construction at the intake of main canal. PM: travelling from Battambang to Phnom Penh
29- Jan.-2007	Travelling	Phnom Penh to Vientiane

3. Objectives:

- To visit Komping Pouy irrigation project to check the progress of field work preparation such as bridge construction at irrigation canal for measuring water flow, preparing percolation test equipments, evaporation pans and rainfall recording station.
- To assist and backstop technical terms of field conducting tasks which are still unclear by the implementing team.
- To check the completed preparation works: schematic maps and forms for recording data in the field.
- To discuss with the team for future activities and expected deadline for those works.

4. Report:

The major findings of field visits are summarized as follows.

[Map]

- Schematic map was produced with 3 pieces. One piece for one zone of command area. The information of canal capacity, command area and users are included. But IIEPF/AIFP found that it is not detail enough. IIEPF/AIFP requested to the team to add more information of canal length, making kilometre, and adding information of WUG and members of each zone.
- Scale-command area map was produced by developing of existing map in AutoCAD file. The IIEPF/AIFP asked to the team to modify more by adding location of farmer's communities offices in the map, main roads to the site and painting in different of 3 command area zones.
- The team promises to modify these 2 maps and expect to submit the IIEPF/AIFP to check it again at the next field visit of IIEPF/AIFP team.
- Actual irrigated area map is not produced yet since the field work is not conducted yet.
- IIEPF/AIFP will show 2 completed maps of schematic and scale-command area maps and to senior advisor and discuss for further development.

[Flow measurement Preparation]

- The simple bridge construction was completed for all measurement points except some outflow points where there is no water flow in dry season. (See attached of bridge photos). The team will construct the bridge at the remaining points because they afraid of broken down before using in wet season.
- One inflow point is added to conducting work. The team just found this point of secondary canal is important because it supplies water to agricultural demonstration plots.
- Some measurement point of out flow were moved and adjusted because the team conducted field survey carefully and they found these points are not realisable. The total numbers of outflow-measurement points are still the same as original design (18 points).
- The conducting of cross section work for all measurement point was completed.
- The producing of flow-data recording form was completed. The form is well organized and easy to understand, but it needs some codification to fulfil all detail collected data. IIEPF/AIFP suggested to the team to add the river edge along cross section into the form in order to check the top length of river surface correctly.
- Flow current meter which provided by the MRC is kept well in the Mr. Kimsan house. The team prepared a bag for keeping all part of flow equipment in order to avoid losing some part during field activity.
- Weed in irrigation canal was cleaned up except at the intake of main canal. The team promised to clean it before flow measurement conducting. It is difficult for flow measurement if a lot of weeds occur in canals and the results of velocity obtained maybe not realisable.
- At the beginning of February, flow measurement of these points will be started.

[Percolation & Evaporation Test Equipments]

- 5 sets of percolation test were produced. 1 set will be installed in zone 1, 1 set in zone 2, 1 set in Agriculture Development Centre, and 2 set in zone 3. In each set, scale-meter is included inside the tank. (see attached photos)
- The installation will be conducted when farmers starting to grow rice. IIEPF/AIFP requested to the team starting installation from the land preparation period, but the land preparation activity is not practiced in this project.
- Existing evaporation pans which are available in Agriculture Development Centre office will be installed in this demonstration plot with 2 small pans and 1 large pan. (see attached photos)
- Forms recording percolation data is produced.
- Places for installing percolation tanks were selected and farmers were asked for permission of installing equipments.
- 5 persons for recording this information are assigned to responsible for the work. The team have trained and explained to them how to record and these persons will be get paid by the team.

[Rainfall Data]

- Rainfall data will be collected from an existing simple rainfall gauge which is available in the Agriculture Development Centre Office. The data will be collected from hydrological station in the Battambang province.

[Document of Management Procedure]

- So far, team has not prepared any document of management yet. Since the field observation is not started yet, this work may not in a hurry. The team is however promised to start collecting existing information of the project and start to write it soon.
- It seems that the team still have no clear idea on this task yet, although the explanation was made regularly. The field visit of IIEPF/AIFP next time will bring some example and backstop to the team about this again.

5. Follow-up:

The urgent activities needed to be followed-up are as follows.

- IIEPF/AIFP will discuss to senior advisor for further modification of schematic map and command-area map. Then comments will be sent by email to the team.
- Forms of recording data will be revised by IIEPF/AIFP and comment will be made.
- IIEPF/AIFP recommended to the team finding information of hand book (manual) which produced by JICA activity for irrigation water operation and management. The information is maybe useful for IIEPF implementation.
- Proposed plan of monitoring for the next time is end of March.

6. List of people contacted:

The list of participants for field observation is attached

7. Attached: Photos



Meeting with team



Bridge for flow measurement at main canal



Bridge for flow measurement at tertiary canal



Bridge for flow measurement at secondary canal



Bridge for flow measurement at drainage canal



Outflow from drainage canal where the bridge is not constructed yet because there is no water flow in dry season



Simple rainfall gauge available in Agriculture Development Centre in command area



Percolation test tanks will be installed in paddy fields



Large evaporation tank will be installed in Agriculture Development Centre



Percolation test tanks with reading scale



Small evaporation tank



Agriculture Development Centre



Mekong River Commission

BACK-TO-OFFICE REPORT

Travel to visit GoCong Irrigation Projects in (Mekong Delta, Vietnam) (25-28 February 2007)

1. Travellers:

- Mr. Okudaira HIROSHI, Senior Advisor, AIFP
- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IIEPF

2. Itinerary:

<u>Date</u>	<u>Place</u>	<u>Activities</u>
25 - Feb.- 2007	Travelling	Vientiane (VTE) to Hochi Minh (HCM) City
26- Feb. - 2007	GoCong Project	AM: Travelling from HCM city to GoCong project and meeting with working team in Longhai office. PM: Field observation to see equipment installation including data logger sensors at Longhai gate and HL 6 gate, then visited 2 experiment plots of AIFP.
27- Feb.- 2007	GoCong Project	AM: Continuing field observation to visit 3 experiment plots of AIFP for checking installation of staff gauges for irrigation water application. PM: Travelling from GoCong project to HCM City
28- Feb.-2007	HCM (SIWRR)	AM: Meeting with working team in SIWRR office for discussing about topographic survey and future works
	Travelling	PM: HCM to VTE

3. Objectives:

- To visit GoCong irrigation project to check the progress of field work conducted by the working team.
- To check the equipments installed by the team for collecting water level, evaporation, rainfall etc.
- To discuss with the team regarding the remaining works and future plan.

4. Report:

The major findings of field visits are summarized as follows.

[Maps]

- Schematic map was not yet produced. The team will conduct this work after completion of topographic map because the team needs to have more detail information to add into the map.
- Scale-command area map was also not yet produced. The team promised to cover this task after topographic survey.
- The topographic survey was not yet conducted and it was delayed than original schedule. It was supposed to be conducted from November 2006 to January 2007. The team responded that it is difficult to conduct this season as the areas are covered by paddy. The team promised to conduct around end of March to beginning of April after harvesting of the 1st season crop.
- As proposed in the working plan in the TOR, topographic map will be conducted with 700 ha of total around 900 ha in Longhai station. This area is mainly agricultural area.
- It seems misunderstanding between the team of AIFP and working team on how to conduct topographic map. The AIFP team expected to have a map with conducting by using Theodolite and indicating contour lines and other detail of land use zone in the system. But the working team will use differential GPS system for conducting contour line with interpolation at some points.

[Flow Measurement]

- 2 data loggers (sensors) are installed in outside and inside of system at Longhai gate and HL6 gate. The sensors can record differences of water level and this will be inverted to flow rate through these 2 gates by using formula from IMC. The sensors are still working well with appropriate installation (see attached photos of the sensors). The working team is collecting this data once a month.
- Flow velocity through the HL6 gate is supposed to be measured by current meter in order to produce H-Q curve, but the team so far has yet conducted any measurement by current meter. They responded that there is no flow on HL6 gate due to the closing of Longhai gate. When Longhai gate is operating around August, they will take measurement by using current meter.

[Irrigation Water Application]

- 5 staff gauges are installed along the slope of in each experiment plot to estimate the depth of irrigation water applied to the field. The depth of water will be inverted to volume of water use in the paddy field. 5 experiment plots (5 area owners) in the longhair station were selected as the experiment plots of AIFP
- It was found that it is difficult to read the water level on the staff gauge because the scale is not clear and it is covered by rice.
- AIFP suggested the team to improve the quality of installation and reading accuracy and working team agreed to follow. See photos of installation staff gauges
- In each experiment plot, staff gauge is also installed in the canal to monitor water level in the canal or the depth lifted by pump for whole project period (see photos).

[Percolation, Evaporation, rainfall]

- Percolation was not yet conducted. The team promised to conduct for the next season crop, around the beginning of May.
- Evaporation is recorded by using simple equipment called “Piche method” (see photos). AIFP worried about the accuracy of data since it installs in the shadow inside the room without influencing of wind and sunshine. But the team replied that this system is widely used in Mekong Delta area.
- Rainfall data is collected in the Longhai station office by using simple rain gauge. The data of evaporation and rainfall will be collected from Mytho station as well.

[Cropping Pattern]

- Cropping pattern is recorded by Longhai office staff. The date and planting location are noted and this information will be drawn into existing map which is available in the office.

[Cropping Pattern]

- Although the team proposed to conduct RAP in 3 times during the project period (1 time for each season crop), the task was also not yet conducted. The team postponed to the next season crop, around May.
- Because of the RAP indicators are not suitable with some condition of the GoCong area; AIFP will contact FAO for a solution.

[Document of Management Procedure]

- So far, team has not yet prepared any document regarding water management. Some existing information in Vietnamese language is available and this data will be used as a part of this task. The team promised to cover this task very soon.

5. Follow-up:

Although the field work has been started for more than 2 months and 1st season crop is going to finish soon, not many activities have been accomplished yet. However, the team seems to be serious and active to the work and they promised to submit interim report on time with including each requested works by AIFP.

The urgent activities need to be followed-up for the next field trips are as follows.

- AIFP will contact FAO regarding RAP indicators for GoCong irrigation situation
- Topographic map will be conducted at the end of March, and then schematic and scale-command area maps will be produced.
- Percolation test will be conducted from the next season crop.
- Pump capacity test will be conducted for the next cropping season.
- Flow velocity for producing H-Q curve will be conducted around May 2007
- Scheme management document will be prepared before interim report submitting.
- Quality of recording data of irrigation water application will be improved from the next season crop.

6. List of people contacted:

The list of participants for field observation is attached

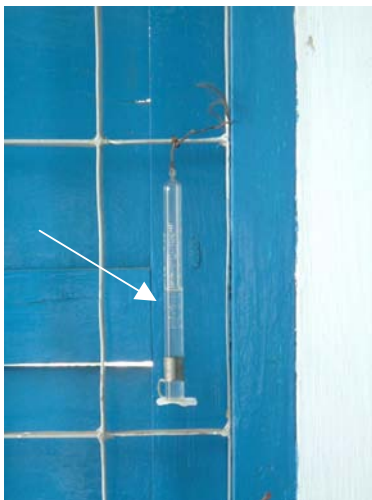
7. Attached: Photos



Data Logger (Sensor) outside of the system at Longhai sluice



Data Logger (Sensor) inside of the system at Longhai sluice



Evaporation (Piche method) at the Longhai Office (inside the room)



Data Logger installation at HL6 sluice



Pump capacity testing



Staff gauge installation for recording irrigation water application [1]



Meeting and checking data recorded by farmers



Staff gauge installation for monitoring water level changes in canal or changing of dept lifted by pump



Water applied to the filed by pump



Staff gauge installation for recording irrigation water application [2]

BACK-TO-OFFICE REPORT

Travel to visit Num Houm Irrigation Projects in (Laos) (21 March 2007)

1. Travellers:

- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IIEPF

2. Itinerary:

<u>Date</u>	<u>Place</u>	<u>Activities</u>
21- March - 07	Num Houm Project, Vientiane	Site visit to assist the team conducting conveyance test and checking the progress of field works.

3. Objectives:

- To visit Num Houm project to conduct conveyance test along irrigation canals
- To have discussion with team and to monitor field work progress

4. Report:

The major findings of field visits are summarized as follows.

[Conveyance Test]

- Conveyance test was planned to conduct with total of 6 places (selected by the AIFP in discussion with the working team), 2 places along main canal, 2 places along secondary canals and 2 places along tertiary canals (see attached).
- Due to the limited of time, AIFP assisted the working team to conduct only 2 places along main canal. The other places will be conducted by the team.
- The conducting conveyance test has 850m long for the first place (with no any outlet along canal to see canal seepage and evaporation) and 1,700m for the second place (with 3 gates or outlets along canal, but closing during the test, to see water loss also water leakage at the gates).

[Flow measurement]

- The flow measurement is going well. The tem become experience on taking measurement. The next round of water measurement will be the final stage for dry season period because the irrigation water service will be ended by the 5th of April 2007.

[Percolation Measurements]

- Point No. 1 (at canal N4), the recording data is stopping because there is no water in the paddy field. Rice will be harvested by the next week. The other 2 points, reading is still going on well.
- Percolation of the fishponds is still recorded. AIFP suggested continuing to record until the end of the project period without stopping.

[Evaporation Measurement and rainfall]

- Evaporation and rainfall is also recorded continually until the end of project period.
- AIFP suggested the team to install other ruler with more detail of reading scale in the evaporation pan for improving quality of reading and data recording.

[Identify Actual Irrigated Areas]

- The information of actual planted areas was submitted to the office working team for arrangement. AIFP will follow up this task later.
- The sketch of actual position of canal alignment and location of planted areas are not yet conducted. The team is waiting GPS which will be used to record the coordination of the important location of canals and paddy areas.
- The team planned to conduct this task by next week.

[Multiple use of irrigation water]

- Water applying for fishpond is being recorded. The team establish the main persons (fishpond owners) to record the time of taking water for fishpond.
- Measuring velocity at the inlet of the fishponds was completed.
- AIFP suggested the team to follow up and monitor the data recording persons carefully once again.

[Gates calibration]

- 2 gates (N1 and N4) were already calibrated and data was submitted to the office team. AIFP will follow up this work later.
- 1 gate (main canal intake) is not yet calibrated. The team will conduct this point after stopping irrigation period as it will not disturbing farming activity.

[Other works]

- Other tasks of the field work including data arrangement, AIFP will follow up with the office team for the next monitoring.

5. Follow-up:

The urgent activities needed to be followed-up are as follows.

- All related data which submitted to the office team will be checked and discussed around the beginning of April.
- AIFP will call the working team once again how to conduct main intake calibration.

6. List of people contacted:

The list of participants is attached

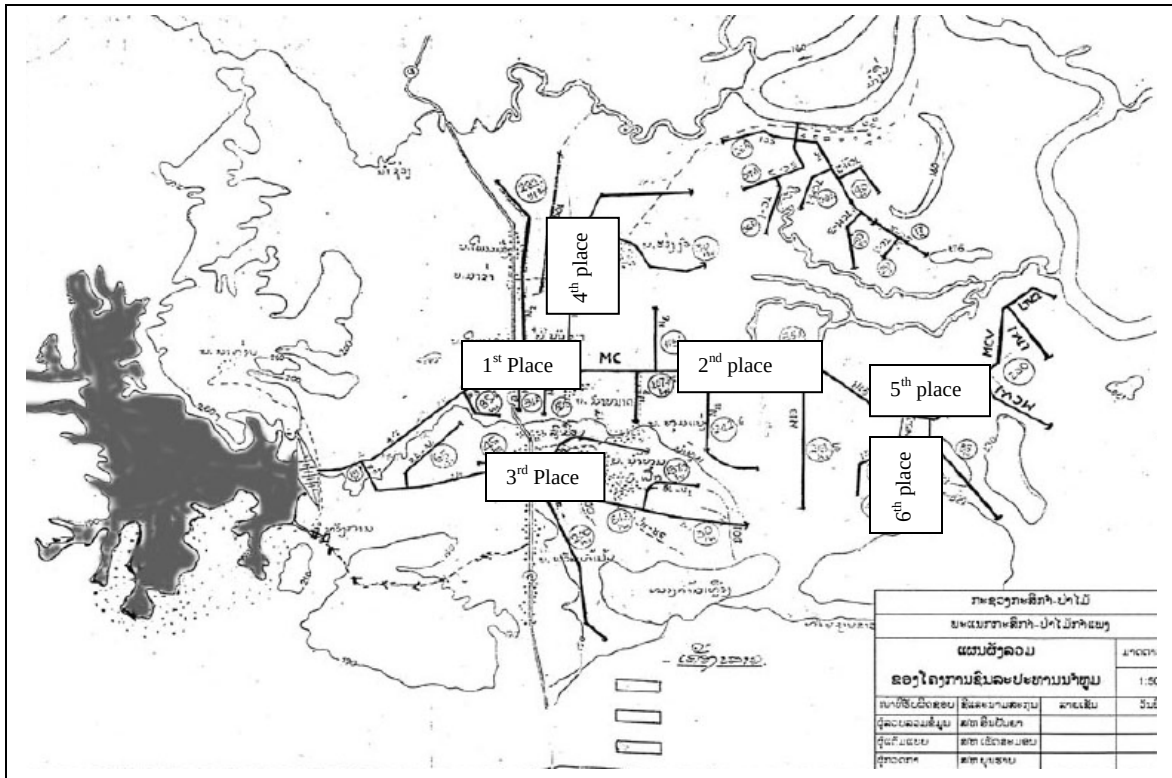
7. Photos



Flow conducting for conveyance test at main canal



Making cross section before flow measurement



Conveyance Test Locations



Mekong River Commission

BACK-TO-OFFICE REPORT

Travel to visit Komping Pouy Irrigation Projects in (Cambodia) (2-5 April 2007)

1. Travellers:

- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IIEPF

2. Itinerary:

<u>Date</u>	<u>Place</u>	<u>Activities</u>
2- Apr.- 2007	Travelling	Vientiane to Phnom Penh and to Battambang province
3- Apr.- 2007	Battambang Province	AM: Field survey to check the team conducting flow measurement in the irrigation canals at 3 points and to see the installation of the percolation test equipments in the paddy fields at point No. 1 and No. 2. PM: Continue field observation to see percolation test equipments at point No. 3, No. 4, No. 5, and No. 6.
4 - Apr.- 2007	Battambang Province	AM: Discussing the progress of each activity conducted, checking of data recorded, and making recommendation to the working team. PM: Travelling from Battambang to Phnom Penh
5- Apr.-2007	Travelling	Phnom Penh to Vientiane

3. Objectives:

- To conduct field observation to monitor each field work conducted by the working team.
- To check flow measurement if it is properly conducted by the team.
- To see and check the installation of percolation test equipments if they are correctly installed and if data is correctly recorded.
- To discuss the progress of each activity field work conducted, and check the data recoded and to make recommendations by AIFP to the team in order to improve field work conducting.

4. Report:

The major findings of field visits are summarized as follows.

[Maps]

- Based on the discussion of the AIFP team of senior advisor and programme officer regarding modification of the maps at the MRCS office on 30 March 2007, the suggestions and comments of discussion were brought to the working team as follows.
- Scale-command area map: The AIFP suggested to the team to modifying map by adding small country map and indicating the location of the pilot project, as well as showing the road accessing to the project from Battambang town. The team agreed to modify and develop the map with GIS information. Due to the confusion by AIFP about the name of tertiary canals, they were confirmed and the team replied that they are the original name during the design period. Therefore, AIFP did not ask the team to change and modify on this information.
- Schematic map: AIFP asked the team to check the data included in the map consisting of canal's capacity, service area, and number of household. The AIFP also asked the team to add information of canal length and marking kilometre on the map in each canal junction point.
- The team will review all suggestions of AIFP to edit and modifying scale-command area map and schematic maps and will include in the interim report. The AIFP will check when the next time monitoring around mid of June.

[Flow measurement]

- AIFP visited whole 6 points of AIFP visited whole 6 points. The installation are followed the preparation plan. Each point, data is recorded by farmer. The location of installation is shown in the attached map.
- The farmers were trained to install equipment and record data. The data is recorded every day and input into the computer one time per week.
- The 3 points of flow measurements demonstration. It was found that the working team has become experience and good skill on conducting flow. The process of measurement and data was carefully recorded. The team members were trained and prepared well before conducting field work.
- The team is recording data properly into the prepared forms by hand and input into computer. The forms are well organized and easy to understand. Two forms were produced for this purpose; one is for recording data and another one is for calculating velocity and flow rate in each point of measurement. The AIFP asked the team to produce one more form which will be included in the interim report. This form will be included name of canal, code and result of velocity and flow rate.
- The flow measurement was already conducted for 5 times since field work started on 22 February 2007. One time measurement spends 3 days to cover whole measurement points with 3 persons in the measurement team. The irrigation date will be ended around the end of May 2007.
- It was observed that the flow in the canal is quite gentle with low velocity in most of the canals, except 2 points that velocity reaches 0.8 m/s. The team has difficulty to read the data from measurement device because when high velocity due to the movement of velocity shown in the screen. AIFP suggested the team to keep cable line properly with the lode in order to keep the sensor working well and taking an

average value from 3 different values obtained from screen. The team agreed to follow the AIFP's instruction.

- Some recorded result showed the minus values. The AIFP suggested to the team to clean canal at the upper part of measurement point to avoid the interruption of the flow.

[Percolation]

- AIFP visited whole 6 installation places. The installation is followed with preparation plan. Each place, the set of equipment includes evapotranspiration (tank with bottom), evapotranspiration and percolation (tank without bottom), and water level of paddy field (staff gauge with scale or ruler). The simple bridge was constructed in each place for people can walk to record data. See the attached photos.
- The farmers were trained by the working team member on how to install equipment and how to record. See photos.
- The data is recorded very day by farmers and the member of working team come to collect data from farmers and monitor this work once a week.
- Two set of equipments are installed in each zone of command areas. The location is shown in the map attached.
- The percolation observed at the No. 5 seems to be strange since the water is dried up very fast and faster than the water level the outside of the tank. The reason may be influenced by soil type. The AIFP suggested the team to keep continue recording without disturbing or re-installation the tank in order to see the real situation of the percolation in this point.
- All equipment sets are properly installed, but only 2 points that the top of the tank is not high enough. Water can be overflow and farmers have to re set recording again. The AIFP suggested to the team to lift up the high of the tanks.

[Evaporation]

- One evaporation tank was installed together with percolation test equipment at the place No. 1 at Agriculture Development Centre, a command area of the project. See Photos.
- The data is recorded every day by staff of the Agriculture Development Centre.

[Rainfall]

- A simple rain gauge was also installed at the Agriculture Development Centre. The data is recorded by the same person in the office.
- The rainfall information will also be collected from the hydrological station of Battambang province.

[Identify actual irrigated area]

- The progress of actual planted area is recorded every 10 days by farmers, heads of WUGs. But the investigation of the actual irrigated boundary has not been conducted yet. The team promised to conduct this work the middle of April.
- Since the shape or boundary of planned area is regular and easy to identify, the team will use GPS to record the coordinates of boundary of planted area. The GIS map will be produced based on this information.

[Conduct conveyance loss]

- So far, the team did not understand how to conduct this work although the backstopping was made many times. This time, the conducting conveyance loss was explained again by AIFP and the team promised to conduct by the middle of this month.
- As plan, 2 points will be selected along main canal, 1 point at secondary canal and one point at tertiary canal.

[Producing H-Q curves]

- As original plan, H-Q curves will be produced at main canal intake, and intakes of secondary canals. So far, the team record and produced the H-Q curve of main gate (main canal). AIFP asked to produce more at gates of secondary canal N1 and N2. The secondary canal N3 is permanently closed.

[Analysis works]

- So far, the team has not started analysis work yet, only dealing with recording data. AIFP asked the team to start from now. The team agreed to start analysis work after Khmer New Year (middle of April).

[Document of Management Procedure]

- The team started to collect related information such as feasibility report of JICA conducted in Komping Pouy project, etc.
- So far, team has not start to write any information yet. The tam replied to start from now on.

5. Follow-up:

The urgent activities needed to be followed-up are as follows.

- The tam requested AIFP provide them the outline interim report. AIFP replied them that AIFP will prepare and have discussion with senior advisor about this.
- The conveyance test, identify actual irrigated area, producing of H-Q curves of canal N1 and N2 will be produced at the middle of April.
- The team asked for next backstopping around middle of June to assist them modify RAP sheet, analysis work and edit interim report.

6. List of people contacted:

The list of participants of this field observation is as follows.

No.	Name	Organization	Contact
1	Dr. Theng Tara	MOWRAM	012-970232 Email: thentara@yahoo.com
2	Mr. Hong Kim San	PDOWRAM	012-867475 Email:hong_kimsan@yahoo.com
3	Mr. Kea Channy	PDOWRAM	012-820760
4	Mr. Yann Jeudy	PDOWRAM	012-269320
5	Mr. Solxcheat	Farmer	-

7. Attached: Photos



Working team members



Team member trained farmers on installation and recording percolation



Farmer installed percolation test tanks



Farmer checking installation of percolation test tanks



Team members conducting flow measurement



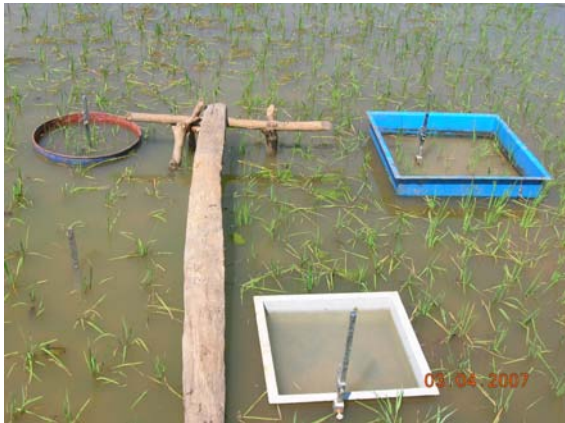
Team member recording flow measurement data



Set of percolation test during this field visit



Rain gauge at Agriculture Development Centre



Percolation test and Evaporation tank at Agriculture Development Centre



Scale or ruler installed inside percolation tank



AIFP explained on recording data



AIFP advised how to conducting flow at high velocity place



Mekong River Commission

BACK-TO-OFFICE REPORT

Travel to visit Huay Luang Irrigation Projects in Udonethani (Thailand) (10-11 April 2007)

1. **Travellers:**

- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IIEPF
- Ms. Manosouk Muongmany, Secretary of AIFP

2. **Itinerary:**

<u>Date</u>	<u>Place</u>	<u>Activities</u>
10 Apr. 2007	Huay Luang Project, Udonethani	AM: Travelling from Vientiane to Udonethani. PM: Field survey to see conveyance test and whole 4 points of percolation installation.
11 Apr. 2007	Huay Luang Project, Udonethani	AM: Discussion the progress of the field work and introduction the outline of interim report PM: Travelling back to Vientiane

3. **Objectives:**

- To visit pilot site, Huay Luang project, to check if the field activities are properly and conducted and followed the agreement between MRC and working team
- To backstop any technical concerns of the field activities
- To discuss with the team the progress of field work conducted
- To introduce to the team and ask their comments of the draft outline of interim report

4. **Report:**

The major findings of discussion are summarized as follows.

[Maps]

- Schematic map: the map was completed, but the letter in the map still written in Thai language. AIFP asked the team to translate in English and to add more information of kilometre at each junction of canal alignment. The team agreed and promised to finish next two weeks.
- Scale-command area map: The map was prepared by Arc view file. The command area and canal alignments of the project were added into the map. AIFP requested the team to modify more by adding the information of canal's name, main road accessing to the project, from Udon city, and adding the scale as well as regents of the map information. The team agreed to follow the instruction of AIFP.

[Flow measurement]

- Flow measurement along canals is regularly conducted 2 times per week. The velocity and discharge of each measurement point are calculated and fill in the excel sheet.

[Conveyance test]

- The conveyance test is conducted in 4 sections along main canal; 1 section of every secondary canal (12 secondary canals); 1 section at 3 tertiary canals of 1RL, 2 RL, and 3 RL; and 1 section at 5 farm ditches. So far, the team just completed conveyance test along main canal and 5 secondary canals. The team expect to complete this task by 2 weeks from now.

[Percolation]

- Percolation test is conducted at 4 places, one at each zone of water management. Each place, the installation includes percolation and evaporation on the paddy field and fish pond. The data is recorded by the heads of WUGs.
- The measurement in each point is going on well, except at Zone 4. The percolation seems to be very high and unrealisable. The reasons may caused by the equipment is installed at steep slope with sandy soil condition. AIFP suggested the team to move this installation place to another place closed by for the next season crop. During field observation, AIFP and the working team also selected and agreed the new place for installation.

[Rain fall and other climate data]

- The rainfall information is collected at 4 stations within the command area. Only raw data was obtained and this data has not been arranged yet.
- ETo data is not calculated, but the team borrows the data from RID which is updated every month.
- The project will need to calculate water requirement for scheme, and this calculation has not yet conducted.

[Management data]

- Although the AIFP requested to the team to start since last visit, the team has not yet started yet. The team promised again to start this task from now.
- The management information will be arranged by the Thai language first, and then will be translated in English.

[Outline of Interim Report]

- The outline of interim report which produced by AIFP was introduced to the team and asked for their comments.
- The team had no major comments on this and mostly except the outline. Only the RAP activity, the team replied that it should be included with the final report, not interim report, since the task will be conducted after rainy-season crop. AIFP agreed to follow this comment.

5. Follow-up:

The urgent activities needed to be followed up are as follows.

- The team requested to the AIFP for the next backstopping around beginning of June to assist them prepare the interim report and discussing data analysis.
- The team promised to finish schematic map on the beginning of June 2007.
- The draft of interim report will be submitted to AIFP for initial check around the mid of June.
- All analysis works expect to be finished around the end of May.

6. List of people contacted:

The list of participants in this field work is attached as follows.

No.	Name	Organization	Contact
1	Mr. Somsak	RID, Bangkok	somsak_vivit@yahoo.co.uk
2	Mr. Pramote	Huay Laung Project	water3hl@ninmungskorn.com
3	Mr. Poordee	Huay Laung Project	N.A.
2	Mr. Fongsamuth	P.O/AIFP	fongsamuth@mrcmekong.org
3	Mr. Manosouk	Secretary/AIFP	manosouk@mrcmekong.org

7. Photos



Meeting with working team



Checking percolation recording [1]



Checking gate operation at inlet of main canal



Percolation in fishpond



Backstop to conduct flow measurement by AIFP



Checking percolation in paddy field [2]



Checking flow conveyance test



Percolation test [3]



Mekong River Commission

BACK-TO-OFFICE REPORT

Travel to visit Komping Pouy Irrigation Projects in (Cambodia) (22-25 June 2007)

1. Travellers:

- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IIEPF

2. Itinerary:

<u>Date</u>	<u>Place</u>	<u>Activities</u>
22- Jun.- 2007	Travelling	Vientiane to Phnom Penh and to Battambang province
23- Jun.- 2007	Battambang Province	AM: field observation to see the team collecting sample production. PM: Continue field observation to guide CNMC staff to check equipments installed for IIEPF project.
24 -Jun.- 2007	Battambang Province	AM: Backstopping the establishment of interim report preparation and checking analysis work. PM: Travelling from Battambang to Phnom Penh
25- Apr.-2007	Travelling	Phnom Penh to Vientiane

3. Objectives:

- To backstop the team on the preparation of interim report and analysis work
- To check and assist the team to collect sample production.
- To check condition of equipments and guide CNMC staff to the field work of IIEPF.

4. Report:

The major findings of field visits are summarized as follows.

[Interim Report]

- The AIFP explained to the team the unclear points in the outline (format) of interim report which submitted to the team 3 weeks before AIFP's visit.
- The team has completed the arrangement of data collection for 1st crop season, but not completed for analysis work yet. The completion of analysis work is expected to the middle of July 2007.
- Although the backstopping was made several times to the team during field visit and discussions, the team seems has no clear idea how to analyse water requirement, water balance, etc. The AIFP again backstoped to the team the activities and guide

them to consult the concept and information of AIFP which provided to the team at the 1st regional workshop.

- As progress so far, the team has completed the draft of the 1st and 2nd parts of interim report which is described background information and outline of conducting field work. The full- completed 1st draft is expected to be submitted to AIFP by the end of July.
- AIFP requested to the team to obtain some information in advance such as information of flows in command area, rainfall, percolation, etc in order to prepare for some publication works for IIEPF.

[Field work]

- AIFP visited the agricultural centre where is one of the demonstration area for installing percolation, evaporation, and evapo-transpiration tests. The conditions of the equipments are still in good condition after finishing dry-season crop.
- Since the field work commencing, there was no visit from CNMC staff yet although they play important role to report the IIEPF work to CNMC. This field trip thus included a coordinator of AIFP from CNMC to visit the site in order to obtain the information and progress of IIEPF implementation and report to CNMC.
- AIFP explained to the staff of CNMC how the field work is conducted and how to collect information in the field.

[Production Collection]

- The working team demonstrated sample collection to AIFPP and CNMC staff at agricultural centre where its area is next to main irrigation canal. The rice was harvested at one paddy plot and dried to the sunlight for 2-3 days before weighting its production (see photos attached). The total area of the plot was measured and the production was invested into unit of [t/ha]. The same method is applied to the 5 places where the equipments of percolation an evapo-transpiration are installed.
- The data is cross-checked with the data collected by the head of water user groups. Each head of water user group collected production information from their own members.
- The method applied to production collection is accepted by AIFP.

5. Follow-up:

The major points need top be followed- up are as follows.

- The 1st draft of interim report will be submitted to AIFP by the end of July.
- The 2nd crop season will be started by the middle of July.
- The team requested to AIFP to assist them to check and advise them on the interim report.
- The next visit by AIFP is expected at the beginning of September and, in the same visit, to guide consultant observing the situation of the pilot site.

6. List of people contacted:

The list of participants of this field observation is as follows.

No.	Name	Organization	Contact
1	Dr. Theng Tara	MOWRAM	012-970232 Email: thentara@yahoo.com
2	Mr. Hong Kim San	PDOWRAM	012-867475 Email: hong_kimsan@yahoo.com
3	Mr. Kea Channy	PDOWRAM	012-820760
4	Mr. Sok Khom	CNMC	khom@cnmc.gov.kh

7. Photos



Collecting rice sample



Conducting measurement at area where collecting rice sample (1)



Conducting measurement at area where collecting rice sample (2)



Weighting rice production by weight-scale equipment after drying with sunlight



Mekong River Commission

BACK-TO-OFFICE REPORT

Travel to visit GoCong Irrigation Projects in (Mekong Delta, Vietnam) (19-22 July 2007)

1. Travellers:

- Mr. Fongsamuth Phengphaengsy, Programme Officer, AIFP/IIEPF

2. Itinerary:

<u>Date</u>	<u>Place</u>	<u>Activities</u>
19- Jul.- 2007	Travelling	Vientiane (VTE) to Hochi Minh (HCM) City
20- Jul. - 2007	GoCong Project	AM: Travelling from HCM city to GoCong project and meeting with working team and officials at Longhai office to discuss the situation of the data recording at the field and other related information. PM: Field observation to conduct flow measurement at HL 6 for calibrating H-Q curve.
21- Feb.- 2007	GoCong Project	AM: Separating into 2 teams: 1 st team to continue conducting flow measurement for H-Q curve at HL6 sluice, and, 2 nd team to visit 5 selected farmer's plots to check the condition of staff gauges for irrigation water application and to check the installation of percolation measurement. PM: Leaving GoCong project for HCM city
22- Jul.-2007	HCM (SIWRR)	AM: Meeting with the working team at the SIWRR office to discuss and make comments on interim report.
	Travelling	PM: Leaving HCM for TVE

3. Objectives:

- To discuss and make comments on the interim report
- To observe and check the situation of field work for the 2nd crop season
- To make suggestions and backstop to the team on improvement the quality and accuracy of field work and data collection
- To discuss and obtain more information on the operation of GoCong system in Mekong delta from the project officials in order to prepare ideas to input the consultant team to produce a good guideline as output of IIEPF.

4. Report:

The major findings of field visits are summarized as follows.

[Comments on Interim Report]

- The AIFP made summarization of the comments into the paper and handed to the working team. The unclear points were discussed and explained by the team during discussion.
- The major comments to the interim report include the logical connection between paragraphs, between sentences, editing sketch of water balance, adding more explanation of the working procedure, equation applied to calculate flow rate, and adding more information of daily flow as annex, editing maps in the annex, etc.
- The team mostly agreed to follow the AIFP comments on the major comments, except some points such explanation of working procedure and editing water balance sketch. The team feel that it will be too dense of information in the report. They will not add all information as comments by AIFP, but the quality will be improved.
- The revised version of the report will be sent to AIFP by the end of August 2007.
- The data of flow rate as annex will be sent to AIFP via email during these 2 weeks.

[Field Observation]

- Based on observation, the team has improved the accuracy of data recording at the field level. The scale was marked onto staff gauges installed in the paddy field for making it easy to read. The space is left and not allowed to grow paddy around the staff gauges in order to see the scale clearer (see photos attached). According to the team, some money is paid for this compassion to the plot owners.
- The team conducted level checked of staff gauges install in paddy order to make sure if the level is still in stable condition after finishing one crop season. This work is conducted one time per crop season.
- The percolation is now recorded since the December 2006 after not conducting this work for the first crop season. The data logger is installed at plot No. 1 for monitoring water level changes in the paddy field and percolation. Due to there is only one data logger is available for the team for this work; the installation will be rotated to other plots every month to cover average percolation of the command area.
- Flow rate at HL6 was conducted intensively (every hour) during 2 days of field visit. The current meter was used to measure velocity through the HL6 sluice. The data obtained was largely changed from the 1.3 m³/s at noon time to the 0.5 m³/s at 4PM. These data is used to produce H-Q curve for this sluice. The flow rate in this crop season at this sluice is different from the last crop season that was estimated by the team as average of the 0.023 m³/s. Further clarification and observation of this flow rate changing will be made continually to see the characteristic of the flow and monitor inflow into command area at this sluice though whole crop seasons.
- The Long Hai sluice is operated in this crop season after closing for whole last crop season. Time, date and length of the operation are recorded by officials at Long Hai sluice. The operating of the sluice is made for 2 reasons: (1) for storing water for irrigation inside command area when the high tidal and (2) for draining water out of

the command area when the low tidal of the river and when there is the heavy rain for flashing salinity.

[Discussion with officials of GoCong project for further information]

- AIFP had discussion with officials of GoCong project on how to improve the water management in GoCong project. The purpose of discussion is to learn more regarding the characteristic of irrigation system in Delta area. The information is prepared to input to consultant to produce a guideline for IIEPF.
- AIFP tried to propos the approach and method how to improve irrigation system in pilot site to the officials. One method to propose is to establish irrigation bock in command area and create a rotation by gravity for each block. To do this, hydraulic structure such as regulating gates need to be installed along canal to control water block by block. It is observed that the official agreed and seemed happy to see this idea.
- This information will be used as one of the output in guideline of the IIEPF project.

5. Follow-up:

The major point needs to be followed up are as follows.

- The revised version of interim report will submit to AIFP by the end of August
- The data of flow rates for 1st crop season will submit to AIFP within these 2 weeks

6. List of people contacted:

The list of participants for field observation is attached

No.	Name	Organization
1	Mr. Toan	(SIWRR)
2	Mr. Trung	(SIWRR)
3	Mr. Tuan	(SIWRR)
4	Mr. Son	(Long Hai Station)

7. Attached: Photos



Staffguage for irrigation application test



Data loger wit staffguage for percolation test



**Conducting velocity for H-Q curve at HL 6
sulce**



Ckecking level of satffguage installation

Annex 5

Outline of interim report

Outline of the IIEPF Interim Report (draft)

23 April 2007

This “outline of the interim report” provides the teams with expected outlines of the report. The interim report should at least contain the following items, but does not limit to these. The team is encouraged to improve the report structure by their own judgment.

1. Summary of major findings

1.1 Results from field observation and analysis:

Summarization of the results which are described in chapter 4, especially for water balance, system water requirement, efficiencies, productivities, water management procedures, RAP, etc.

1.2 Recommendations for field work improvement:

2. Background

2.1 General information of irrigation in the region/country

- Policies and strategies of irrigation development and water use in the region/country
- Classification and general statistic of irrigation system practiced in the region/country
- Present condition of irrigation in region
- Issues related to irrigation water use

Note that this chapter is not required as such heavy and detail work. The team can use exiting available information for describing the general irrigation situation in their country and region. It should be limited only up to 4-5 pages. The detail information of table, graph, photos, etc can be attacked in the Annex.

2.2 General information of IIEPF project

2.2.1 Objectives, targets of the field work under IIEPF

2.2.2 Background of the pilot project

- Project Location (referring to scaled-command area map with appropriated scale and size)
- Outline of the irrigation scheme : purpose, basic/primary specification of the scheme, etc. (referring to schematic map ,(showing canal system layout), with appropriate scale and size)
- Scheme management: structure, practice, etc.

2.2.3 Why scheme was selected as the pilot project

- Advantages and limitation of the scheme

3. Outline of field Observation

3.1 Process of conducting field work

The content may describe the order of field activity, conducting from the beginning until the end of field observation period. The working time frame should be included in here as well.

3.2 Methods applied to conduct filed work in each activity listed below

3.2.1 What are the procedure, map and equipments preparation before field work

3.2.2 How to conduct water balance in the scheme

- Preparation works and equipments installation before conducting flow measurement
 - Conducting inflows and outflows of the system
 - Monitoring flow in canal net-works
 - Conducting irrigation water measurement applied to the field at 5 selected farmer's fields
 - Measuring percolation in paddy fields and fish ponds
 - Obtaining rainfall, evaporation, ETo, Kc and other climate data
- 3.2.3 Record cropping pattern and crop calendars
- 3.2.4 Identify actual irrigated area
- 3.2.5 Record multiple use of irrigation waters e.g. for domestic use, fishpond, vegetable etc.
- 3.2.6 Conducting pump efficiency test at 5 selected farmer's fields
- 3.2.7 Produce H-Q curves at the main and important water gates
- 3.2.8 Obtain all kind of production (rice, vegetable, fruit, coconut, fish, duck, etc)
- 3.2.9 Documentation of scheme management including references (e.g. documents related to the pilot sites)
- Identify stakeholder for decision making on water management
 - Identify and draw the management organization chart
 - Recording procedure of water allocation
 - Documentation of rule of water management of the system
- 3.2.10 Conducting Final RAP (if the activity is already started)

4. Analysis, results and discussions

- 4.1 Crop water requirement
- 4.2 Total scheme water requirement
- 4.3 Water balance
- 4.4 Identify and estimate actual irrigated area
- 4.5 Pump efficiency at 5 selected farmers' fields
- 4.6 Overall command - area efficiency
- 4.7 Water productivities (rice, vegetable, coconut, fish, duck, etc)
- 4.8 Project water management appraisal
- 4.9 RAP (This is the improved version based on the data in this dry season observation)

Note that in each analysis above, tables, graphs, sketches/ maps, and photos are encouraged to produce with explanation and discussion and included as output, references and or conclusions.

5. Recommendation

Summarization of recommendation made in item 5, regarding implementation Work, teams, MRCS, etc.

6. Annexes

- (1) Map of project location as full or large size (scale- command area map)
- (2) Schematic map (full size)
- (3) Actual irrigated map (full size)
- (4) Topographic map as full size
- (5) Other related map as full size
- (6) Raw data of flow measurement (inflow & out Flow)

- (7) Raw data of flow inside command area
- (8) Raw information of all data collection forms recorded by the team
- (9) Photos, and
- (10) Others related information

Note that (6), (7), and (8) are supporting processed data contained in Chapter 4.

Annex 6

TOR for consultancy service

Terms of Reference For Documentation of the guidance for efficient irrigation water use

1. Project Title

Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong Basin project (IIEPF)

2. Title of Consultancy Service

Documentation of the guidance for efficient irrigation water use

3. Duty Station

MRCS, Vientiane, Lao PDR with visits to four pilot project sites, i.e.

Komping Pouy project, Battambang Province, Cambodia

Nam Houm project, Vientiane Province, Lao PDR,

Huay Laung project, Udon Thani province, Thailand

Go Cong project, Tieng Giang Province, Vietnam

4. Duration

4.2 person-months starting from August 2007

2.2 person-months at home office

2.0 person-months at MRCS and member countries, which includes two times of two-weeks long field visits

5. Background, Purpose and Objective of the Consultancy Service

The Mekong River Commission (MRC) is implementing Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong Basin project (IIEPF) in order to improve irrigation efficiency at basinwide scale. To contribute overall objective of the project, IIEPF is now conducting field observation at four selected pilot sites in the member countries. This field observation will reveal the current situation of irrigation water management by observed irrigation efficiency and other performance indicators and documented rules, regulations and other procedures practically applied on the sites. Some performance indicators will be provided as the output of Rapid Appraisal Process (RAP), which was jointly developed and widely used by Food and Agriculture Organization of the United Nations (FAO) and the World Bank for evaluating irrigation system performance and prioritizing improvements for modern management of the systems.

Based on collected information, IIEPF plans to propose guidelines for efficient irrigation water use covering institutional, managerial and technical aspects of irrigation facility operation to achieve project overall objective. In addition to promote efficient water use, the proposed guidelines are expected to enhance multi-functionality of paddy agriculture and paddy field irrigation. In this regard involvement of the consultant(s), who is/are familiar with both practical irrigation facility operation and multiple function

of paddy agriculture and paddy field irrigation, is vital to ensure the quality of the proposed guidelines.

This consultancy service aims to produce guidelines and at the same time to propose necessary capacity building activities to apply the proposed guidelines to actual facility operation and management practices.

6. Expected Outputs

The following are anticipated to deliver by this consultancy service.

1. Guidelines for efficient irrigation water use with enhancement of multiple use of paddy agriculture and paddy field irrigation on institutional, managerial and technical aspects;
2. Assessment report to identify capacity building and training requirement of the line agencies to effectively apply the proposed guidelines;
3. Power point presentation at the regional workshop to introduce draft guidelines and to explain the outline of recommendations for capacity building identified by the assessment report.

The MRCS reserves the right to reject any delivered products that do not comply with the specified outputs.

7. Responsibilities and Tasks of Consultant(s)

Under a contract to be concluded with the MRCS, the consultant(s) shall perform the following tasks with close consultation with Senior Advisor and Programme Officer, AIFP of the MRCS.

The consultant(s) is/are responsible to critically verify the indicated tasks and amend them wherever deemed necessary according to the professional judgement and the knowledge acquired during the preparation of the proposal.

The consultant(s) is/are obliged to perform all the necessary works to fulfil the output mentioned in 6. above with professional quality.

- To identify the Best Practices of water management on efficient irrigation water use by reviewing existing documents and information from the past activities mainly from the monsoon Asia region
- To identify several functions of paddy agriculture and paddy field irrigation to be enhanced through better water management by reviewing country reports from IIEPF and the past researches on multi-functionality
- To draft institutional, managerial and technical guidelines for efficient water use based on identified best practices, functions above and collected data, documented water management rules by IIEPF with the consultation with other organizations specialized in agriculture and irrigation in the monsoon Asia
- To conduct capacity building needs assessment of line agency staff to effectively apply the proposed guidelines by interview of line agency staff, review of country reports and other collected data, documented water management rules by IIEPF with the consultation with other organizations specialized in agriculture and irrigation in the monsoon Asia
- To recommend capacity building and training requirement as an assessment report based on above needs assessment

- To deliver presentations of draft guidelines and draft assessment report at regional workshop
- To finalize guidelines and assessment report
- To report to AIFP

8. Itinerary

Commencement of consultancy service:	August 2007
Inception discussion with AIFP:	August
Preliminary field visit to four pilot sites:	August
Field visits/detail discussion with Line Agencies:	October/November
Interim discussion with AIFP:	January 2008
Wrap-up workshop at MRCS or other member country:	March
Submission of the final products:	May

This itinerary is indicative and may subject to be adjusted accordingly with the progress of the consultancy service including procurement procedure.

9. Working Principles

The consultants will work under supervision of Senior Advisor and Programme Officer of AIFP.

10. Qualifications

- The consultant(s) should hold at least an university graduate degree in Irrigation, Water resource management or related fields with abundant (over 15 years) experience of research works and/or engineering service in the said fields. A master degree or higher educational background is advantageous.
- The consultant(s) should have comprehensive practical experience in study and analysis for irrigation water use especially paddy rice farming in monsoon Asia region at least 7 years.
- Advanced knowledge of multiple role of paddy agriculture and paddy field irrigation and basic knowledge of RAP are also essential.
- Experience in monsoon Asia region, especially in the Lower Mekong Basin, is advantageous.

11. Condition of payment

Payment is made in three parts.

- (1) 40% of the Contract value, after signing of the Agreement.
- (2) 30% of the Contract value, upon the completion of the workshop presentation.
- (3) 30% of the Contract value, upon submission and acceptance of the Final outputs.

Payment is to be charged to the following budget line:

1.1\81\07\JPN\A BL-11

12. Submission of the proposal

Deadline: 2nd July 2007 at 15:00hrs

The consultant(s) shall submit in English language a technical proposal and a financial proposal each in clearly marked as “Technical Offer” and “Financial Offer” respectively and sealed separate envelopes. No financial information should be contained in the technical proposal. Two envelopes containing separately a technical and a financial proposal make one set and need to be submitted to the following address:

Mekong River Commission Secretariat
Procurement Unit, **Ref AIFP/IEFP offer**
184 Fa Ngoum Road, Ban Sithane Neua, unit 18, Sikottabong district
P.O. box 6101, Vientiane, Lao PDR

13. Scope and content of the proposals

The technical proposal shall contain:

- A detail critical analysis and interpretation of the ToR by the consultant(s). The consultant(s) is/are encouraged presenting critical comments and suggestions on the ToR, if any, especially if they relate to envisaged the result of this consultancy service.
- Conceptual approach and methodology in brief to perform the consultancy service
- Logistical aspects of the consultancy service including time table/work plan and staffing schedules indicating person-month input, duration and deployment details (field and home office assignments) of the consultant(s)
- CV of the proposed consultant(s)
If two or more consultants compose a team, composition of the team and description of the tasks to be assigned to individuals should be included.
- A detailed description of tasks to be performed by the consultant(s)
- An outlined structure of the guidelines, in other words, output image of the final product

The financial proposal shall contain:

- Cost of the consultant(s) broken down to monthly or daily rate in both home office and field overseas allowance and accommodation
- International travel
- Regional and Local travel for field visits
- Production of Reports
- Miscellaneous cost

14. Evaluation of the proposals

The submitted proposals will be evaluated from three viewpoints with weighted score allocation below.

- | | |
|--|-----|
| • Experience of the firm/organization | 10% |
| • Approach/Methodology of the proposed service | 45% |
| • Qualifications of the proposed staff | 45% |

15. Special remark

Qualified tender is limited only to Japanese individual or juridical persons.

Annex 7

Annual consultation meeting

Agenda for Annual Consultation mission on Japan funding projects

Member: Mr. Miyazaki Masao Assistant director, Overseas Land Improvement office
Rural Development Bureau, MAFF
Mr. Yokota Kenichiro Int'l Coop. Div. Int'l Affairs Dept. MAFF

Jan. 31 (W)

0910 arri. Wattay airport pick up by Okudaira
1030 check-in Lao plaza hotel reservation made by EoJ
MRCS
1100 greeting to Mr. Hung, OPD director (with Ms. Prince) at OPD meeting room
perspective of 2007 funding and further future cooperation
introduction to Mr. Minh, Mr. Fongsamuth, program officer
1300 Meeting with Mr. Okudaira
general issues on MRC-MAFF Japan cooperation
1500 Meeting with Mr. Okudaira & Mr. Fongsamuth
IIEPF progress and perspective
1900 dinner with Mr. Nomi & Okudaira pick up by Okudaira
(Venue : upon mission's preference)

Feb. 1 (T)

0845 leave the Hotel pick up by Okudaira
0900 Courtesy call to Embassy of Japan Mr. Shinohara, Minister-Counsellor
1000 Meeting at MRCS with Mr. Minh
DMPF progress and perspective
(1100 *with Mr. Okudaira & Mr. Fongsamuth*
IIEPF progress and perspective)
1200 Back to the Hotel & Mr. Yokota Check-out
Lunch with Mr. Nomi & Okudaira

[Mr. Miyazaki]

accompanied by Mr. Nomi
1330- Permanent Secretary Office, MAF
1500- Irrigation Department, MAF
1630- JICA Laos office
1830 dinner with MAF officials
at Mekong Restaurant

[Mr. Yokota]

accompanied by Okudaira, Fongsamuth
1300 site visit to Nam Houm project
-1700 by MRC mini-bus
Stay at Park View
2000 dept. to the airport
2125 dept. Wattay airport

Feb. 2 (F)

900 Check-out & leave the Hotel by MRC mini-bus
accompanied by Mr. Nomi, Okudaira & Fongsamuth
1000 site visit to Huayson-Huaysua
Agri-Devlp. and service center
1400 site visit to Tha Ngon project received by Mr. Nagaoka & Mr. Shimazaki
Stay at Park View
2000 dept. to the airport
2125 dept. Wattay airport

Note: **"BOLD" fixed, "Standard" not fixed yet.**

Contact: Lao Plaza hotel 021-218-800
Embassy of Japan 021-414-400 ex. for Mr. Nomi 15
MRC 021-263-263 ex. for Okudaira 4041
Mr. Nomi (m) 020-551-4882
Mr. Okudaira (m) 020-242-3595



Mekong River Commission

P.O. Box 6101, 184 Fa Ngoum Road, Unit 18,
Ban Sithane Neua, Sikhottabong District, Vientiane 01000, Lao PDR
Telephone: (856-21) 263 263 Facsimile: (856-21) 263 264



MEMORANDUM

Date: 8 February 2007

To: Dr. Olivier Cogels CEO

CC: Mr. Wolfgang Shiefer Chief, Programme Coordination Section
Dr. Dirk Overweg Chief, Finance and Administration Section
Mr. Cao Tuan Minh Programme officer, AIFP/OPD
Mr. Fongsamuth Phengphaengsy ditto

Through: Mr. Do Manh Hung Director, Operations Division

From: OKUDAIRA Hiroshi Senior Advisor on Irrigation, AIFP, OPD

Subject: Meeting Record of the Annual Consultation Mission of the MAFF Japan

Two officials from the Ministry of Agriculture, Forestry and Fisheries Japan, the donor, has visited Lao PDR from 31 January to 2 February 2007 and have had a series of meetings with MRCS as an Annual Consultation. This is a summary of the discussions made through the meetings. (Please note that the content of this record is confirmed by the dispatched MAFF officials through email communication even without signatures by any sides.)

[Kick-off meeting]

Mr. Miyazaki explained that the mission had three purposes of the visit, which were;

- To review the progress of two trust fund projects, DMPF & IIEPF and discuss the implementation plan and schedule
- To identify the ideas for future cooperation succeeding to the current IIEPF, and
- To appraise the performance of Mr. Okudaira who was dispatched from the MAFF

Related to those purposes he emphasized further details as follows;

- Steady progress of project implementation is crucial issue. This is very important reference and indicator when negotiating the next year budget with Finance Ministry.
- The MAFF secures same amount of the budget for the next year (2007) contribution to IIEPF at Yen (Japanese currency) basis, even Japan's ODA as a whole are dropping 4% from the previous year due to domestic economic stagnation. However because Yen drops against US dollar, the amount MRC receives will be slightly decreased. (After the meeting the figure was confirmed as 326,879 USD or 14,723 less than the previous year.)
- The mission expects Mr. Minh putting his maximum effort to complete DMPF before the termination of his contract in early Dec 2007.
- The MAFF is happy and ready to continue cooperation with MRC. However MRC should understand that the firm output of the current projects could lead to the next cooperation.
- For the next cooperation, the MAFF has just started their internal discussion. In order to contribute to that discussion and prepare appropriate project offer to the MRC, the mission would like to listen to the MRC's needs. Based on the input from the MRC, the mission is

going to identify project ideas to meet the MRC's demand and to match with the MAFF's justification for cooperation.

- After the identification of those ideas, the MAFF starts negotiation with relevant sections within the MAFF and with Finance Ministry. Through this process various supporting information would be requested. The MAFF would appreciate MRC's assistance to provide relevant information through Mr. Okudaira.

Mr. Hung appreciated the continuous support to AIFP given by the Japanese MAFF and added that the two Japan funding projects currently implemented smoothly. Citing to the newly approved MRC's Strategic plan (2006-2010) he explained that MRC was now shifting to contribute to the development of the region rather than to formulate legal and institutional framework such as activities by WUP under the previous strategic plan and emphasized irrigation and hydro-power were the two high priority fields as CEO mentioned.

As with this background, formulation of new AIFP, being once initiated, was now kept suspended in order to put more emphasis on irrigation, he followed. Then he briefly explained MRC's expectation to the future cooperation by the MAFF such as 1) formulation of AIFP, 2) basinwide irrigation strategy and 3) contribution to the Drought Management project.

Ms. Prince expressed appreciation to this kind of regular consultation with the donor, which keeps updating and deepens mutual understanding not only on the project implementation status but also on the cooperation policies by both the donor and MRC sides. She also added that CEO's visit to Japan last year contributed to strengthen cooperation with Japan, which includes Foreign Affairs Ministry's suggestion to apply JAIF to formulate hydro-power project.

Mr. Miyazaki welcomed MRC's shift to emphasis on development.

Apart from trust fund related issues, he briefly introduced INWEPF with its background and activities so far and encouraged MRC's continuous involvement, in particular participation to the fourth steering meeting to be held in Bangkok on 5 July 2007.

Mr. Minh and Mr. Okudaira briefed the MRC's involvement including the previous OPD director's participation to all the steering meetings since the first one in Tokyo and promised our active participation within available budget.

[Brainstorming for the next cooperation]

After 3 hours brainstorming based on the delivered Note and additional verbal explanation, the mission recognized that each idea had both advantages and disadvantages and decided to bring back all the ideas proposed. The mission confirmed that they would identify the most reasonable idea through their internal discussion. Negotiation process within the MAFF and with Finance Ministry starts soon and continues by the end of the year. The MRC may unofficially get known which idea is chosen and under the negotiation in April or May but must not be informed the conclusion until January 2008.

Some comments and suggestions on the specific ideas are as follows;

- Idea #1 (expansion of IIEPF) is weak on its justification. Simple expansion of the area, pilot sites from the current IIEPF has little impact and is difficult to justify further support by the MAFF. The mission understood that expansion was the tasks of MRC and line agencies once donor supported project produced some output. Through the discussion, idea to focus on pump irrigation and other types was raised. This idea was welcomed by the mission with good contrast with currently focused gravity irrigation.
- Idea #2 (IIEPF Phase 2) is suitable idea for JICA base cooperation rather than by the MAFF through the MRC, because application of proposed guideline is more practical work and suitable for JICA cooperation scheme. The mission also worried that MAFF's possible contribution could not be enough for this work.

- Idea #3 (Water use estimation) seems to have difficulty to justify why the MAFF contributes to.
- Idea #4 (BDP project formulation) is attractive especially in terms of cooperation to BDP, one of the core activities of MRC. Significance to keep sending seconded staff should be once reviewed and then either AIFP or any other section, such as BDP should also be considered within the MAFF for future cooperation strategy.
- Both idea #5 (irrigation strategy) and #7 (new AIFP) are also significant as Japan's contribution to the MRC in terms of contribution to the programme level, however are questionable whether by the MAFF.
However idea #5 seems to have little necessity as MRC's business. It seems suitable for bi-lateral cooperation.

[Progress of IIEPF]

Another three hours intensive explanation and discussion based on prepared documents fully covered the progress and perspective of IIEPF implementation. The mission appreciated progress and achievement and accepted the explanation in principle.

Specific comments made for IIEPF are as follows;

- The mission again confirmed that the MAFF agreed to transfer earned interest to OEB. This transaction can be made when three-years project completes but not at every yearly fund closed. The MRC is requested its notification to the MAFF only. No approval is required.
- Procedure for the submission of the 2nd year progress report and funding arrangement for the 3rd year are requested to follow the previous arrangement, i.e. once FY2007 budget is approved in April, invitation for funding will be sent from the Embassy to the MRC in May. Summary progress report as of May is requested to be attached to the MRC reply letter. Once all the activities completed full version of progress report is requested to send to the MAFF.
- As 2nd year budget includes the final payment of the fieldwork to be made in February 2008, project account cannot be closed by then even all other activities would complete in July 2007. The mission agreed to accept the progress report if remaining fund is only for unliquidated obligation for those final payments, and requested to send fund status report (SOLOMON output) with official letter when closed.
- As closure of the 3rd year budget can be made after Mr. Okudaira's separation, same kind of arrangement is required. However detail will be discussed and fixed at the next year consultation.
- For the recruitment of the consultancy service for producing guideline scheduled as the 3rd year activities, the mission showed their preference to hire Japanese individual or juridical persons and indicated to put this (Japan tied condition) on the funding condition. The reason is explained as their advanced knowledge and experience on paddy fields multi-functionality, which is one of the key issues of the project.
- The mission appreciated several initiatives to make the output in public such as revision of web information and posters however emphasized further effort to disseminate the project output. Active participation of INWEPF with oral presentation at director level is recommended as an example.

[Progress of DMPF]

As big progress was made on DMPF implementation (such as disburse rate raised 4.4% at Dec 2005 to 73% at Dec2006) within a year, the mission fully appreciated the effort by the MRC. And then the mission left one comment on project implementation, one recommendation for dissemination of the project output and one technical suggestion on analysis.

- (Project implementation) The mission strongly requested to complete DMPF within the present timeframe, i.e. by November 2007 including wrap-up workshop, submission of the final report and closing the project account.
The mission recognized that the institute which Mr. Minh originally belonged to was

requesting him back to the institute before the completion of the project (and termination of his current contract.) The mission was seriously reluctant to this movement and recommended not to accept this offer otherwise the MRC would lose its credibility of the management. After the discussion the mission recognized that the MRC had no way to stop this kind of action if decision officially made by VNMC however requested appropriate measures taken to smoothly complete DMPF if it happens.

- (PR) Dissemination of the project output was again requested as same as IIEPF. As DMPF is on the final stage of the project, more specific recommendation was proposed. That is to let Thai and Vietnamese consultants make presentation of the analysis result at INWEPF this year and any other occasions. The mission accepted DMPF covered their travel costs.
- (Analysis) One of the concept of analysis work is to compare economic values produced from irrigated and rainfed paddy field. The mission pointed out this comparison made the impact of irrigation rather than the function of paddy field. The suggestion made was to compare paddy field (both irrigated and rainfed) and upland cropland. This reveals paddy fields functions.

Annex 8

Chaing Rai Conference

Back to the Office Report

Itinerary

17 Oct	Vientiane – Bangkok – Chiang Rai
18-21 Oct	Conference proceeding
21 Oct	Chiang Rai – Bangkok - Vientiane

Introduction

Mr. Okudaira and Mr. Fongsamuth participated in a four-days-long conference namely “International conference on Mekong Research for the people of the Mekong” in Chiang Rai, Thailand from 18 to 21 October 2006. This is a B-T-O report of this mission.

During the conference, two officers of the MRCS had chance to touch a number of interesting presentations both oral and by poster, but this report does not describe the content of any individual presentations. Detail of individual presentations or results of research works are provided by the attached abstracts and main report CD-ROM.

Contributions of AIFP officers

Mr. Fongsamuth made significant contributions to the conference, which were one oral presentation with submission of full text report, one poster presentation (please refer attached photographs) and a task as a rapporteur of the round table discussion.

Oral presentation was made in the afternoon session of the third day (20 Oct.) to present an introduction of IIEPF – an ongoing project of AIFP focusing on irrigation efficiency analysis and its improvement.

Core time of poster session was also made in the afternoon of the third day, which discussed the result to assess the performance of pump irrigation schemes in Laos in terms of both physical and managerial aspects.

The fourth day was spent for round table discussions by six groups following to the key presentations from six representatives of the riparian countries. M. Fongsamuth was engaged in this discussion as a rapporteur.

Mr. Okudaira made a short comment to the endmost presentation to raise the issue how to apply the results of the research works to the development of the region and improvement of the people’s livelihood. This comment led to the active discussion among the participants beyond the scheduled time of the third day.

Recommendations

The conference delivered a number of various research results covering from hydrology, flood analysis, irrigation, sanitation, ecosystem, salinity intrusion to trade and economy. Common key word is only focusing on the Mekong river basin or its riparian countries. This approach is unique and useful for comprehensive understanding of the region.

On the other hand, most of the works are conducted by researches in Japan and there is no specific framework to feed back the results to the region. MRCS, as knowledge based river basin organization, should consider reinforcing its possible contribution to disseminate outputs of these kinds of region-related activities to the countries.

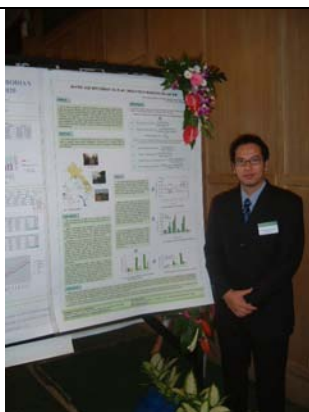
Photos



CEO



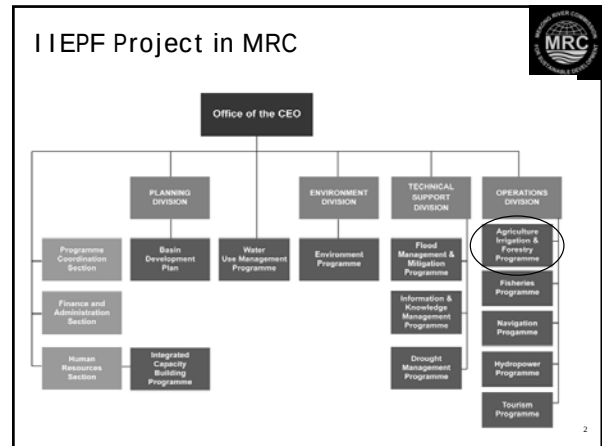
Fongsamuth's oral presentation



Fongsamuth's poster presentation -1



Fongsamuth's poster presentation -2

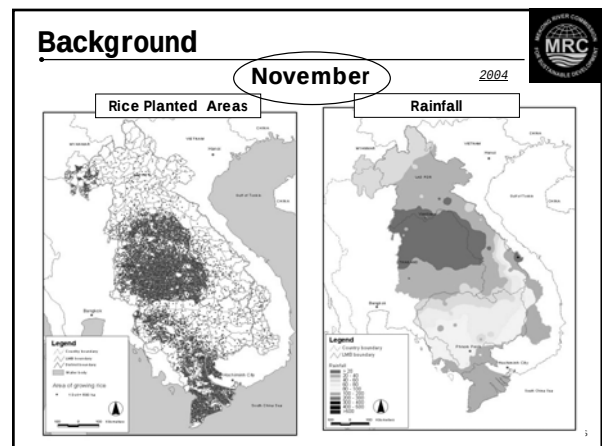
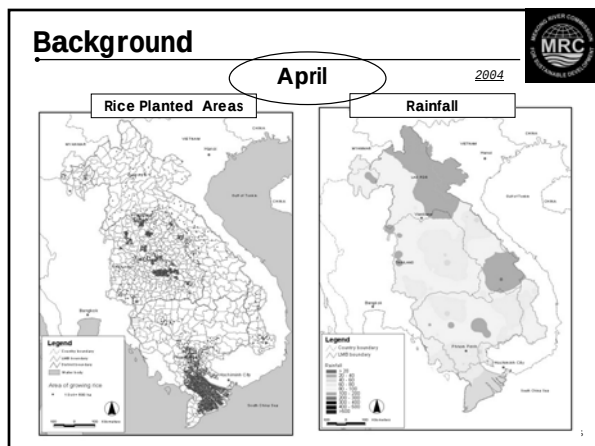


Content

- Background
- Objectives
- Project Locations
- Methodologies
- Expected Outputs

Background

- Agriculture development is still required to feed the rapidly growing population increase in the LMB region
- Rice is the dominant crop and single biggest consumptive user of fresh water
- Lack of rainfall in dry season and dry spells in rainy season are the major constraints to rice production and low water productivity
- Irrigation efficiency is an indicator of effective water resource management
- Irrigation efficiency varies greatly between countries



Background

Improve livelihood
of people

Maintain the ecology
and environment of
the river basin

Minimize gap between crop water
requirement & actual water use

Effective of Water Use

Improvement of Irrigation efficiency



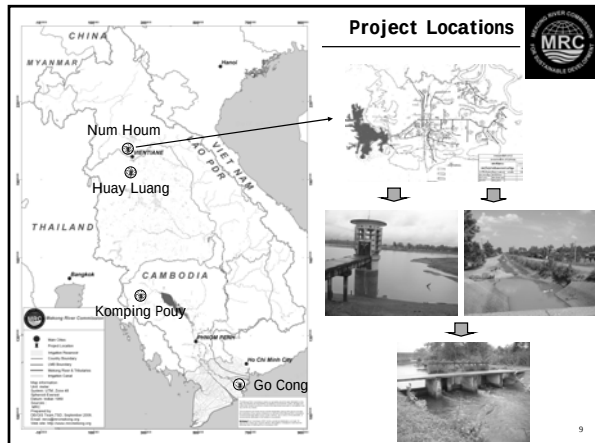
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Objectives

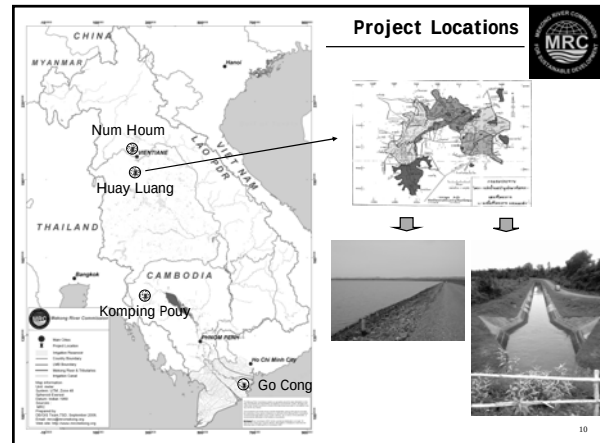
- to **appraise irrigation efficiencies** in selected irrigation systems
- to **enhance the capacity of stakeholders** in using up-to-date concepts of irrigation efficiency and water balance tools and procedures for their assessment
- to **produce guidelines** for improving irrigation efficiency on paddy fields based on actual water use practices in the LMB member countries



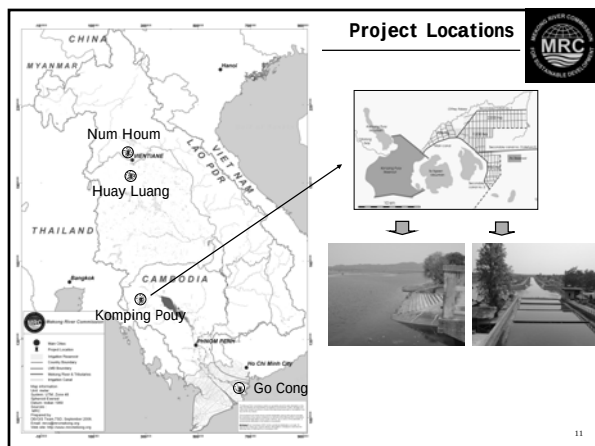
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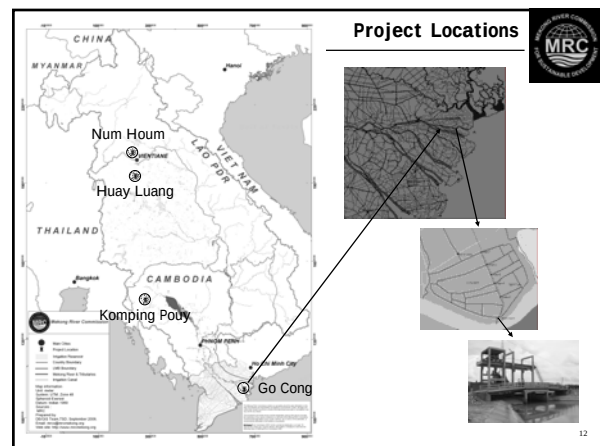
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Flow Monitoring

- Conduct flow measurement by Current Meter
- Calibrate and produce Rated Section of Canal (H-Q curve)
- Install Data Water Logger
- Install Wooden Staff Gauge for percolation monitoring



Water Data Logger



Current Meter

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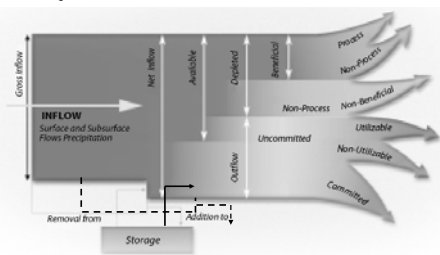
Methodology

- (1) Data Collection
1 year (Dry & Wet Seasons), starting from Oct.2006
- (2) Preparation
 - Pilot site selection
 - Topographic, schematic, and scale-command area maps
- (3) Assessment of Irrigation Efficiencies
 - Conducting Water Balance (Slide 15-17)
 - Assessment of water requirement (Slide 18-22)
 - Computing Irrigation Efficiencies:
 - Conveyance Efficiency (Slide 23)
 - Over all Command Efficiency (Slide 24)
- (4) Assessment of Water Productivities (Slide 25)
- (5) Scheme Management Appraisal (Slide 26)
- (6) Applying Rapid Appraisal Process (RAP) (Slide 27-29)
- (7) Establishment of Guidelines

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Water Accounting Concept

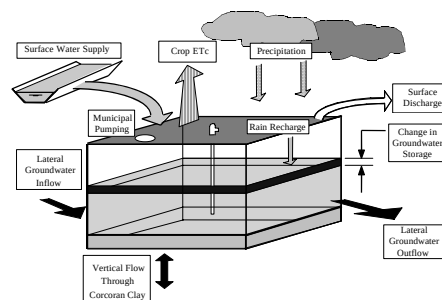
Different flow within a defined boundary and potential water use within boundary



Source: IWM1

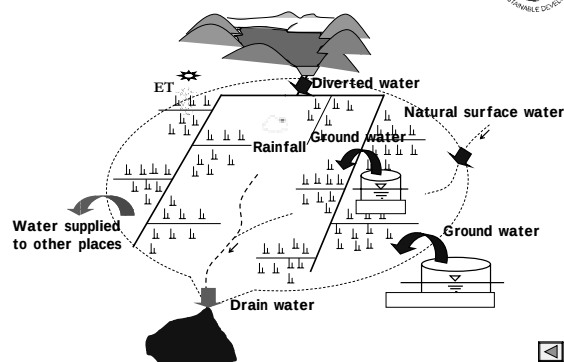
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Water Balance Components



Source: FAO

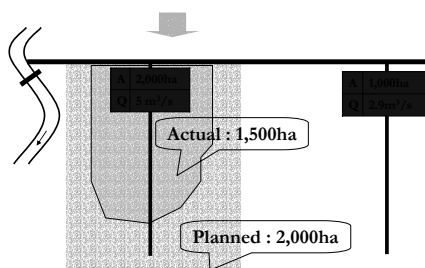
Water Balance Applied to IIEPF Project



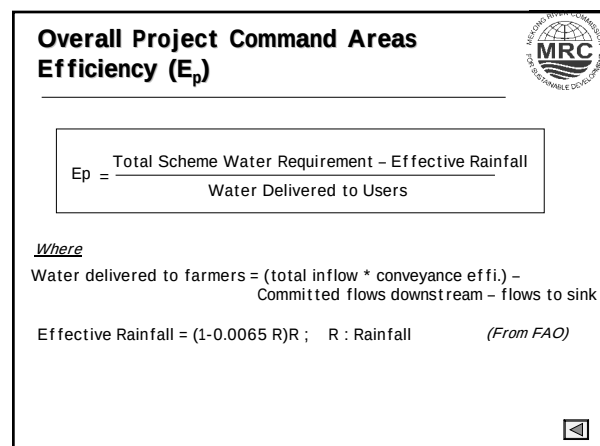
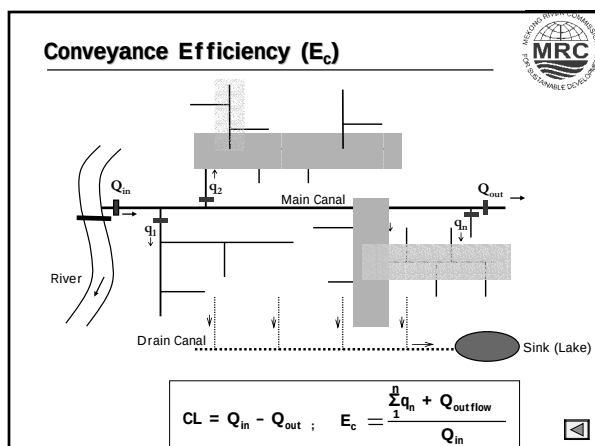
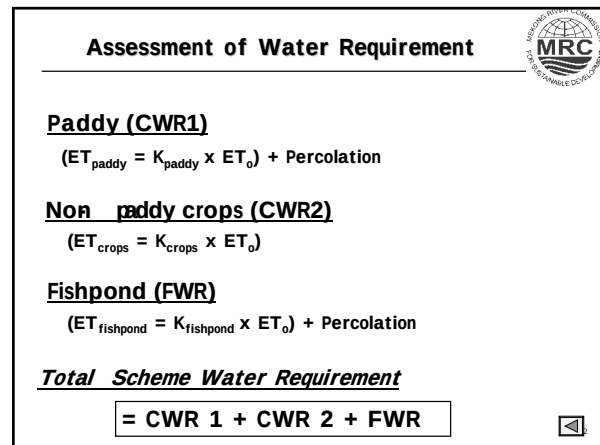
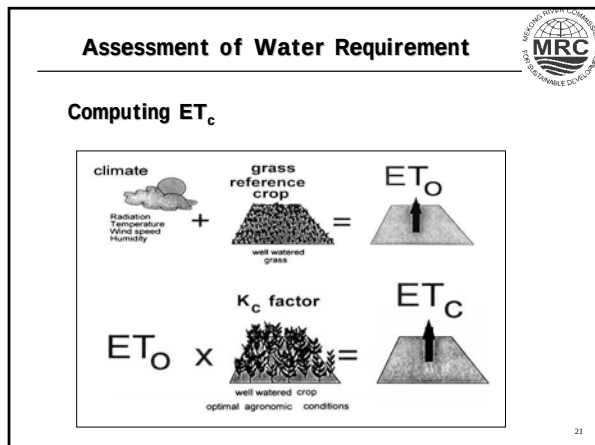
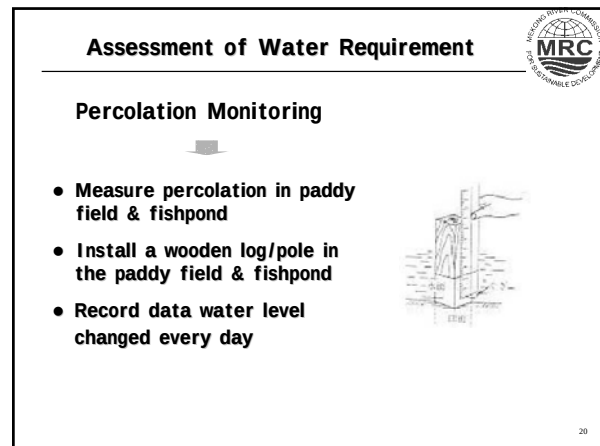
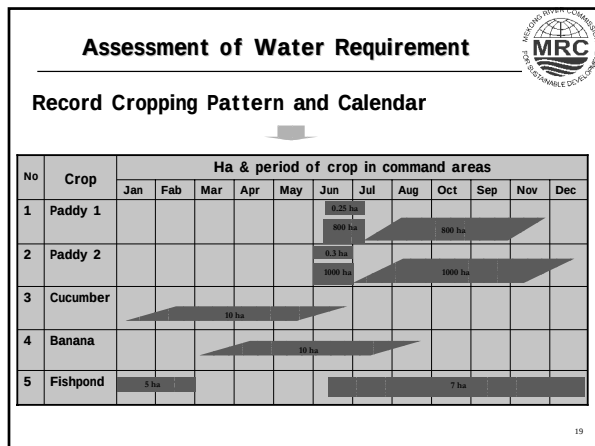
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Assessment of Water Requirement

Identify Actual Irrigated Areas



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Water Productivities

- Obtain yield of paddy through unit harvests & farmers interviews
- Water productivities:

Yield
Unit of Water Supply

Yield
Unit of Water Consumption

Production Value (US\$)
Unit of Water Consumption



Scheme Management Appraisal

- Identify stakeholders and institutional structures
- Document procedure of decision making for water allocation
- Document operational rules and actual practices



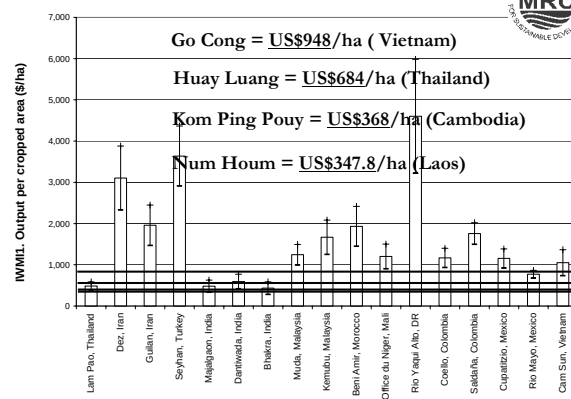
Rapid Appraisal Process - RAP

- Jointly developed by ITRC, FAO, and World Bank
- Tool to evaluate irrigation project performance with a quick time
- Provide results of internal & external indicators: technical, managerial, socio-economic and institutional aspects

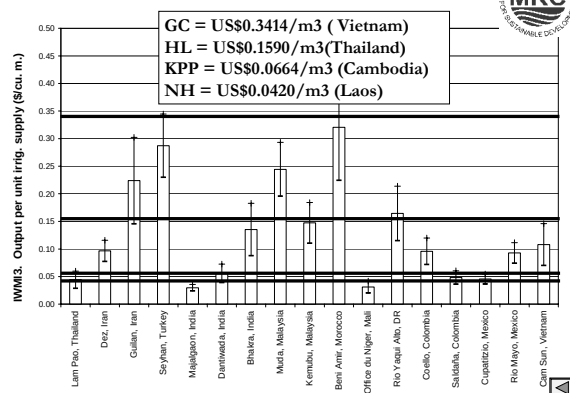
- Water allocation and distribution practices;
- Operation rules and procedures;
- Irrigation efficiencies (conveyance, field, overall project efficiencies);
- Physical infrastructure (hardware) of the system;
- Involvement of water users in the decision making process (stakeholders involvement);



Some Results of 1st RAP Conducting



Some Results of 1st RAP Conducting



Excepted Project Outputs

- Analysis Data Set
- RAP Results
- Guidelines
 - Introduction:** General situation of irrigation project in LBM countries
 - Assessment:** Diagnosis tools for scheme appraisal and assessment of efficiencies
 - Improvement:** Options for improvement



Thank You for Your Kind Attention



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Field Observation Schedule

Activities	2005		2006				2007				2008	
	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd
Working Duration					Aug.						Jan.	
Preparation of field work					Aug.		Mid. Oct.					
Field Measurement & Observation					Mid. Oct.						Dec.	
Data analysis						Jan.					Jan.	
RAP				Jul.	Aug.						Jan.	



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Annex 9

Posters

Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong (IIEPF) Project

In 2006 AIFP commenced the IIEPF project which focuses on irrigation efficiency. The project held a two-day inception workshop in May, followed by another four-day workshop providing training on a method to evaluate irrigation scheme performance called the "Rapid Appraisal Procedure (RAP)" in July.

From July to August, AIFP staff working with teams from the member countries conducted initial scheme assessments of four selected schemes by applying RAP. The training workshop and these assessments were supported by two technical staff from the FAO Regional Office for Asia and the Pacific (FAO-RAP) under a collaboration agreement between MRC and FAO-RAP.

Selected pilots projects for IIEPF are Nam Houn in Lao PDR, Huay Luang in Thailand, Komping Pouy in Cambodia and Go Cong in

Viet Nam. The report of the training workshop and initial assessments will be made available this year.

The IIEPF project has now proceeded to its next activity: intensive observation of irrigation water use at four pilot projects, identifying irrigation efficiency and water productivity and aiming to develop specific guidelines for efficient water use. Field observation started (or will start) from the middle of November to January (depending on actual cropping and irrigation practices of the countries) and continue until the end of 2007.

Further information, such as the project outline and the proceedings from the inception workshop, is now available on the MRC website. (<http://www.mrcmekong.org/programmes/AIFP/publications.htm>)



Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong (IIEPF) Project

Fig 1.



The IIEPF project aims to contribute to efficient irrigation water use through providing good institutional, managerial and technical guidance for the operation of irrigation facilities. In order to achieve this project objective, the IIEPF project is now conducting intensive field observation at four selected pilot irrigation schemes. (Fig 1.)

As an initial assessment an overview of the performance of irrigation schemes was undertaken in July and August 2006. The results of some typical indicators are shown in Figs 2 (a) and (b). A more detailed report will be published soon.

Following the initial assessment, the IIEPF commenced fieldwork in cooperation with Line Agencies of the member countries during the 2006-2007 dry season crop planting season. Fieldwork included intensive observation of irrigation water use, identifying irrigation efficiency and water productivity and documentation of water management rules and practices. This fieldwork will continue during the coming wet season crop (see workplan in Fig 3). A technical report is to be prepared after each crop season.

Relative Water Supply (RWS)

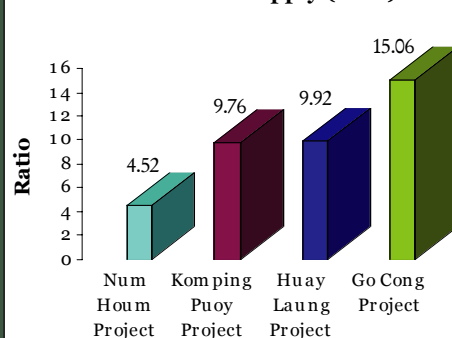
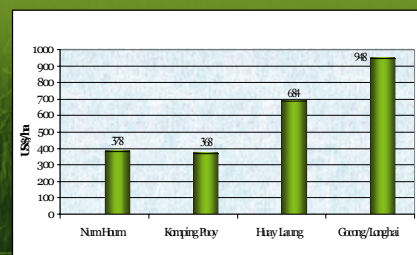
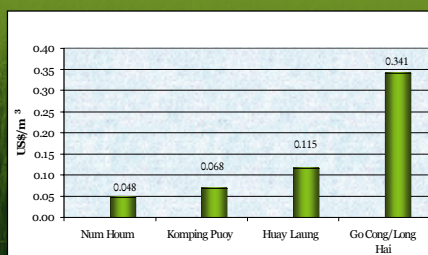


Fig 2. (a) Relative Water Supply

Fig 2 (a) shows the ratio of total external water supplied to the scheme to water required by crops in command areas. Under the tidal irrigation circumstance, a huge amount of water is introduced into the Go Cong project and this is used not only for crop production but also for navigation, salinity control etc. This leads to the high value of this indicator. In other words there is low performance of water management, but a vast amount of water being released and returned to the river. There needs to be more consideration of how to deal with this phenomenon throughout the project life.

Fig 2. (b) Productivity



The figures in Fig 2 (b) show irrigation productivity per irrigated area (left) and per delivered water (right). High values are observed at the schemes in Thailand and Viet Nam. The very intensive (three crops a year) cropping pattern at Go Cong project is one reason this area is so productive, and the high price of rice in the Mekong delta would also be another. However, scarce water resources under tidal irrigation in the Mekong delta requires stricter water management and results in high water productivity in the Go Cong project. Thanks to crop diversification in the Huay Luang project, various cash crops are planted in the dry season and this contributes to this site's higher productivity.

Fig 3. Detailed work plan

	2006												Year 2007														
	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J
Crop calendar and irrigation schedule																											
Komping Pouy (Cambodia)																											
Nam Houm (Laos)																											
Huay Luang (Thailand)																											
Go Cong (Vietnam)																											
Monitoring plan																											
Komping Pouy (Cambodia)																											
Nam Houm (Laos)																											
Huay Luang (Thailand)																											
Go Cong (Vietnam)																											
F:Field, O:Office																											



Retrieving data from the logger

Pumping water into the field



Percolation measurement



Explaining the flow meter system

Conducting flow measurements

Improvement of Irrigation Efficiency on Paddy Fields in the Lower Mekong (IIEPF) Project

Fig 1. Location Map



Flow measurements



Evaporation/Percolation measurement



Evaporation/Percolation measurement



Evaporation/Percolation measurement

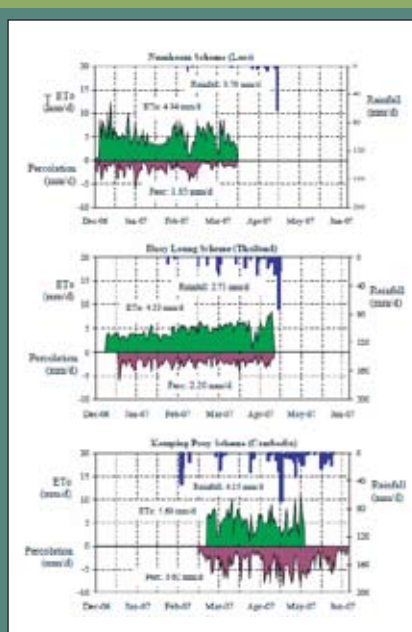


Evaporation/Percolation measurement

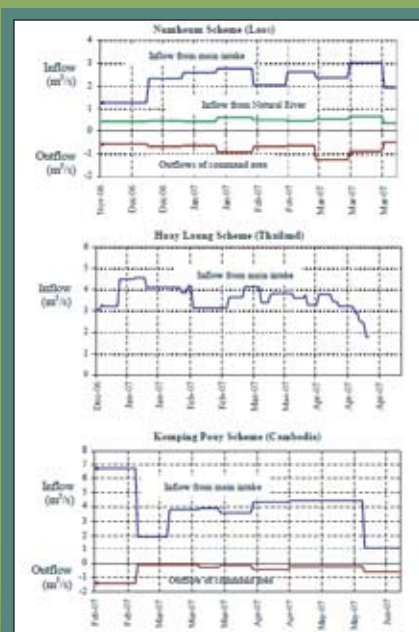
The IIEPF project aims to contribute to efficient irrigation water use through providing good institutional, managerial and technical guidance for irrigation facilities operation. In order to achieve this project objective, the IIEPF project is now conducting intensive field observation at four selected pilot irrigation schemes. (Fig 1.)

As shown in Fig 2, the IIEPF project has completed 2006/07 dry season observation and MRCS, in cooperation with line agencies, is now conducting in-depth analysis of water balance, irrigation efficiency and water productivity at command area level. The project plans to publish technical reports in various publications and forums such as the 3rd Southeast Asia Water Forum, and the Paddy and Water Environment Journal among others. These reports will be compiled as a part of the project's outputs.

The figures below show some examples of interesting results achieved so far. Further analysis is now continuing. In parallel, field observation to cover the 2007 rainy season irrigation practices is also under way at the four pilot sites. The final result of two crop seasons' observation will be made available in early 2008.



The figures above show daily rainfall, evaporation and percolation rate at three pilot sites. Observation reveals that rainfall this dry season has been generally low and only 0.7 mm/day was recorded at Nam Houm in Lao PDR. This information is to be used for field level water balance analysis.



These three figures above show the rate of water flow into and out from the command area of the schemes. This information is to be used to understand scheme-level water management practices and will be key information when proposing ideas to improve water use efficiency.

Fig 2. Detailed work plan



Evaporation/percolation measurement



Rain gauge

	2006	Year 2007													
	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J
Crop calender and irrigation schedule															
Komping Pouy (Cambodia)															
Nam Houm (Laos)															
Huay Luang (Thailand)															
Go Cong (Vietnam)															

Demonstration of Multi-functionality of Paddy Fields Project



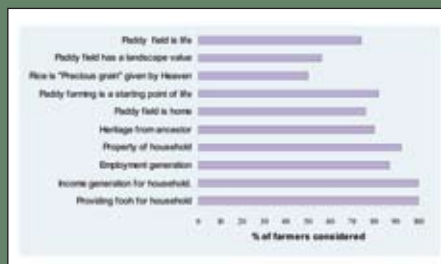
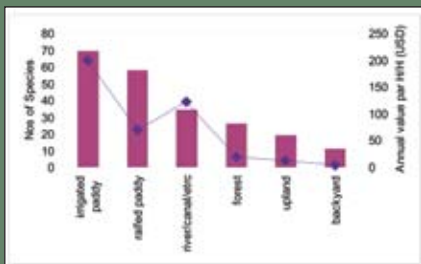
- Project achievement briefly presented at INWEPF at Bangkok in July
- Director Hung and other three attended from MRCS



- More detailed results presented at the fourth regional workshop at the MRC Secretariat in August.
- Around 30 participants from member countries, etc. attended
- Workshop also discussed how to disseminate the project outputs

The study in NE Thailand revealed:

- Farmers collected various wild species from surrounding areas.
- 69 species from irrigated paddy
- 58 from rainfed paddy
- Species from irrigated paddy were worth US\$200 per year.

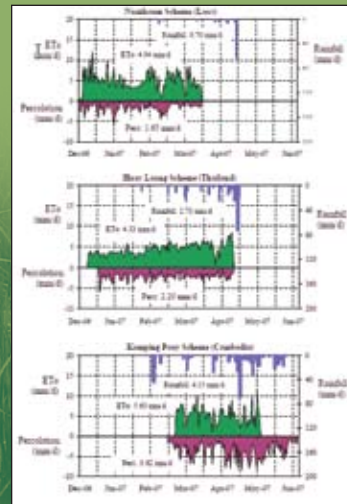
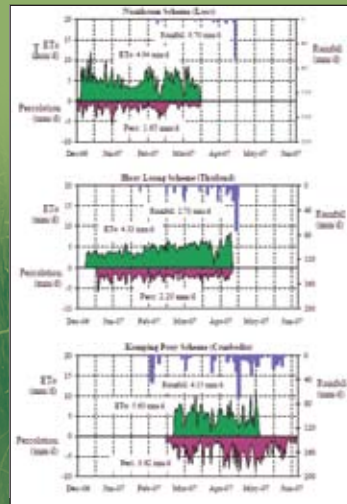


The study in the Viet Nam Mekong Delta revealed farmers acknowledging various non-production functions of paddy fields, including those on graph.

Improvement of Irrigation Efficiency on Paddy Fields Project



- Intensive field observation has been conducted at four pilot sites
- The observation has covered one year from 2006/07 dry season to 2007 rainy season



- The Lower Basin received much rainfall in the 2006/07 dry season
- Rainfall peak in Apr-May
- ETo observed was higher than standard value in Lao PDR and showed clear variation in Thailand
- Percolation was:
 - high at initial and low at late stage in Lao PDR
 - relatively constant throughout the season in Thailand
 - fluctuating substantially in Cambodia

- In the Nam Houn area in Lao PDR 83% of water is supplied by main intake and 17% by natural river.
- Much water drains out
- In Huay Luang in Thailand the peak water supply is at land preparation period approx. 20% is supplied by rainfall
- Kg. Pouy of Cambodia there was a sharp peak at land preparation time. There was a huge drain out at the same time.



Installation of evaporation tank



Flow measurement



Production survey



Interviewing water management staff

