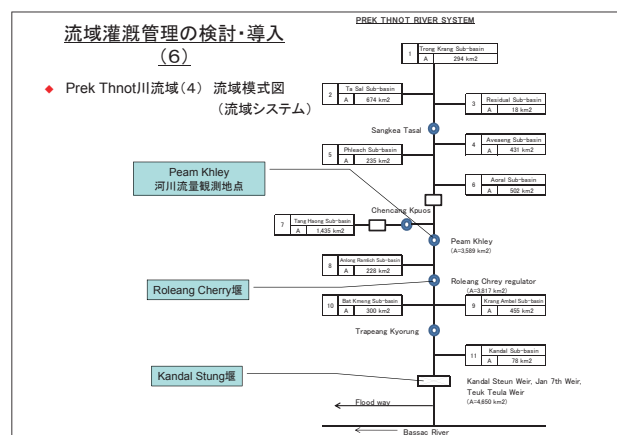
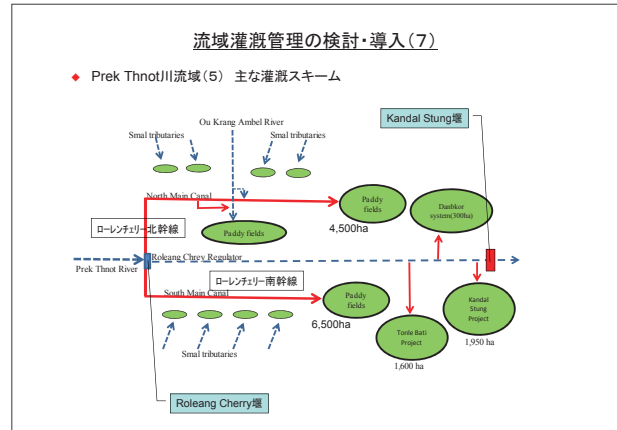


Rainfall Observation Station

Manual Station (Peam Khley)
Automatic Station (Roleang Chrey)

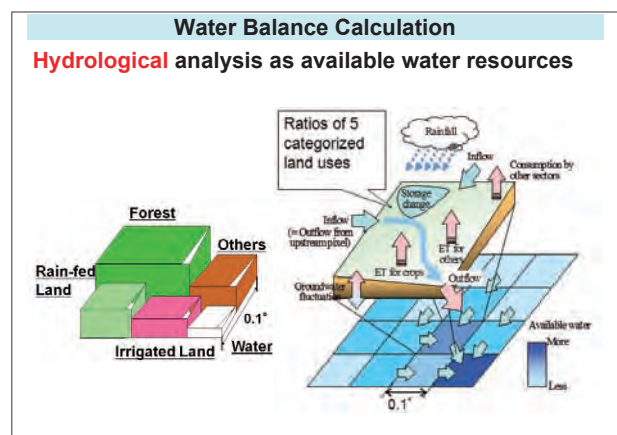
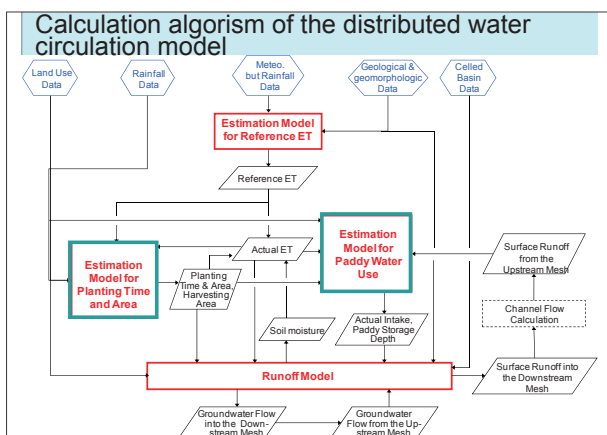
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Japan International Cooperation Agency

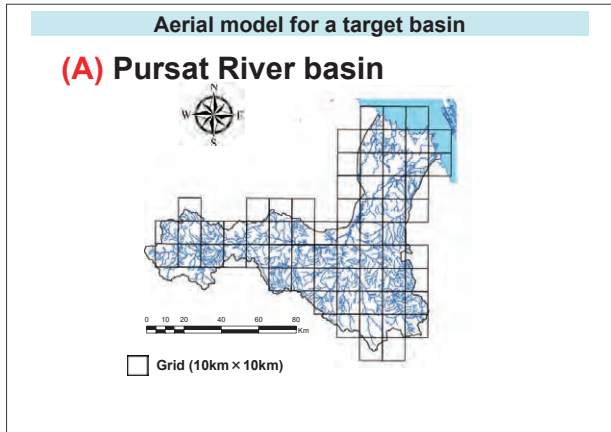




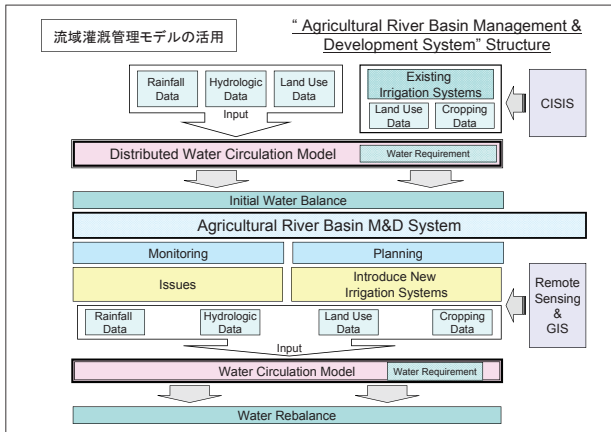
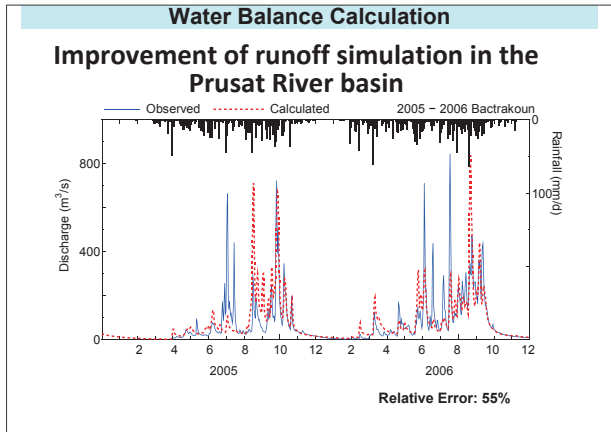
- ### 流域灌漑管理の検討・導入(8)
- ◆ Prek Thnot川流域(6) 水収支の検討(例)
 - ◆ Roleang Cherry堰地点における現状
 - ◆ 各灌漑スキームにおける必要水量
 - ◆ 稲作パターン: 雨季早期作、雨季作(2)、乾季作
 - ◆ 単位用水量: 各灌漑スキームで算定
 - ◆ Roleang Cherry堰地点での利用可能量
 - ◆ 降雨量: 既存データから5年のうち4年は期待できる雨量を算定
 - ◆ 河川流量: 既存データから5年のうち4年は期待できる流量を算定
 - ◆ 年間流出量: 5,238million m³
 - ◆ 水収支: 現在、短期専門家によるCPsへの指導を通じて検討中

- ### 流域灌漑管理の検討・導入(9)
- ◆ Pursat川流域(1) 取り組みの基本的方向
 - ◆ 背景: 降雨量、河川流量等のデータが少ない
 - ◆ 方策: 分布型水循環モデルの導入
 - ◆ 蒸発散量推定モデル、水田作付時期・面積推定モデル、水田利用モデル及び流出モデルで構成
 - ◆ 別に、流域モデルとして、流域の約10km四方分割メッシュを導入
 - ◆ モデルの特徴
 - ◆ 流量、農地水利用(水田作付、取水量等)等が任意(時点・地点)で推定可能
 - ◆ 流域水循環への影響を評価或いは予測可能





- 流域灌漑管理の検討・導入(10)
- ◆ Pursat川流域(2) モデルの開発と検証
 - ◆ モデル開発手順
 - ◆ 流域分割メッシュの開発
 - ◆ 入力データの算定
 - ◆ 地形、土地利用の計測
 - ◆ 気象等観測データに替わる気象研データの活用
 - ◆ モデルの検証と確立
 - ◆ 水循環モデルで得た流量と既存データとの比較検証
 - ◆ 観測データの精度向上によるモデルの向上→確立
 - ◆ 流域灌漑管理・計画への応用
 - ◆ モデルの開発と確立作業と併行して、同モデルによる流域灌漑研修コースを整備、かつ実施しつつ、その活用方策を提案



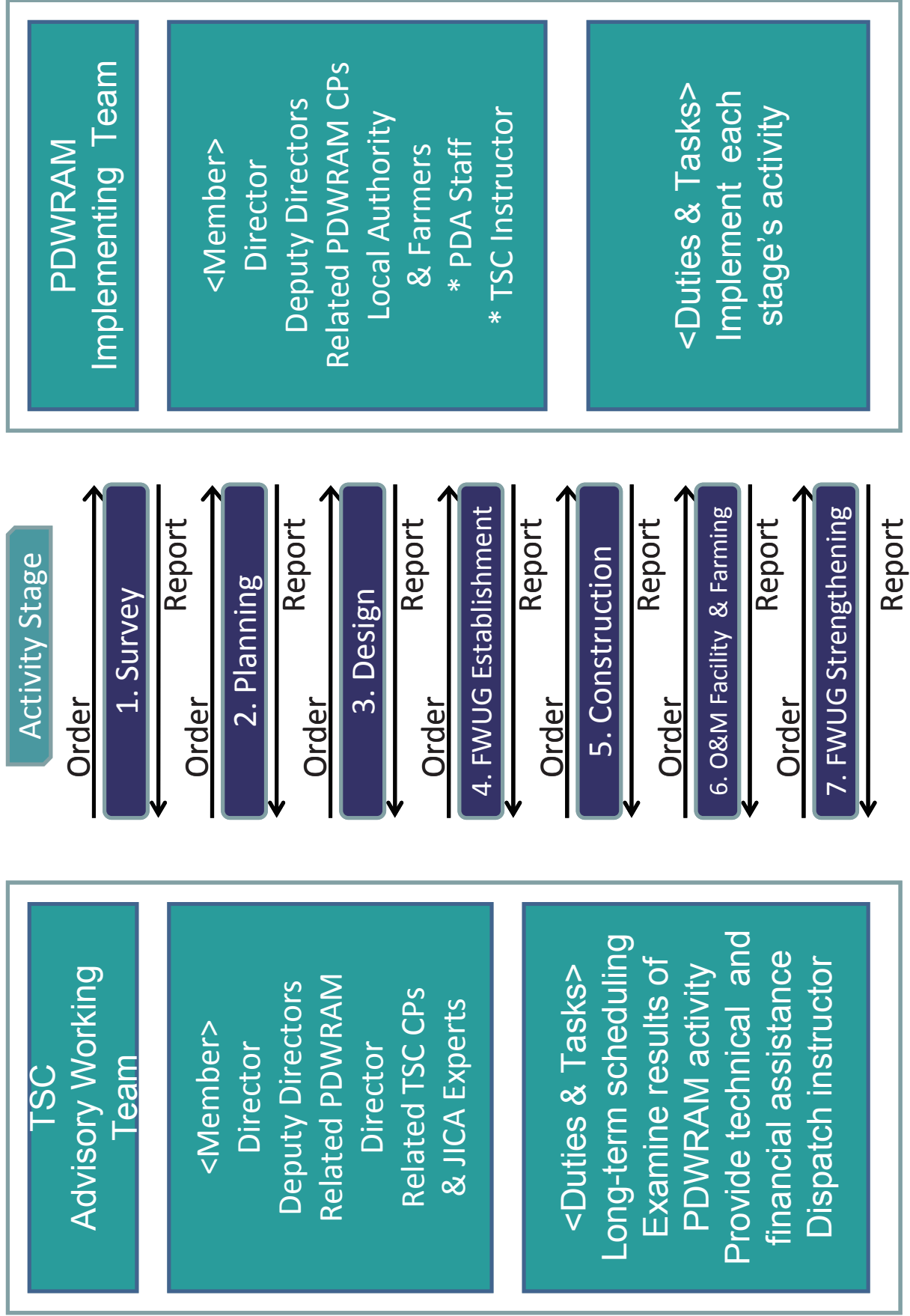
The End

TSC3専門家チーム

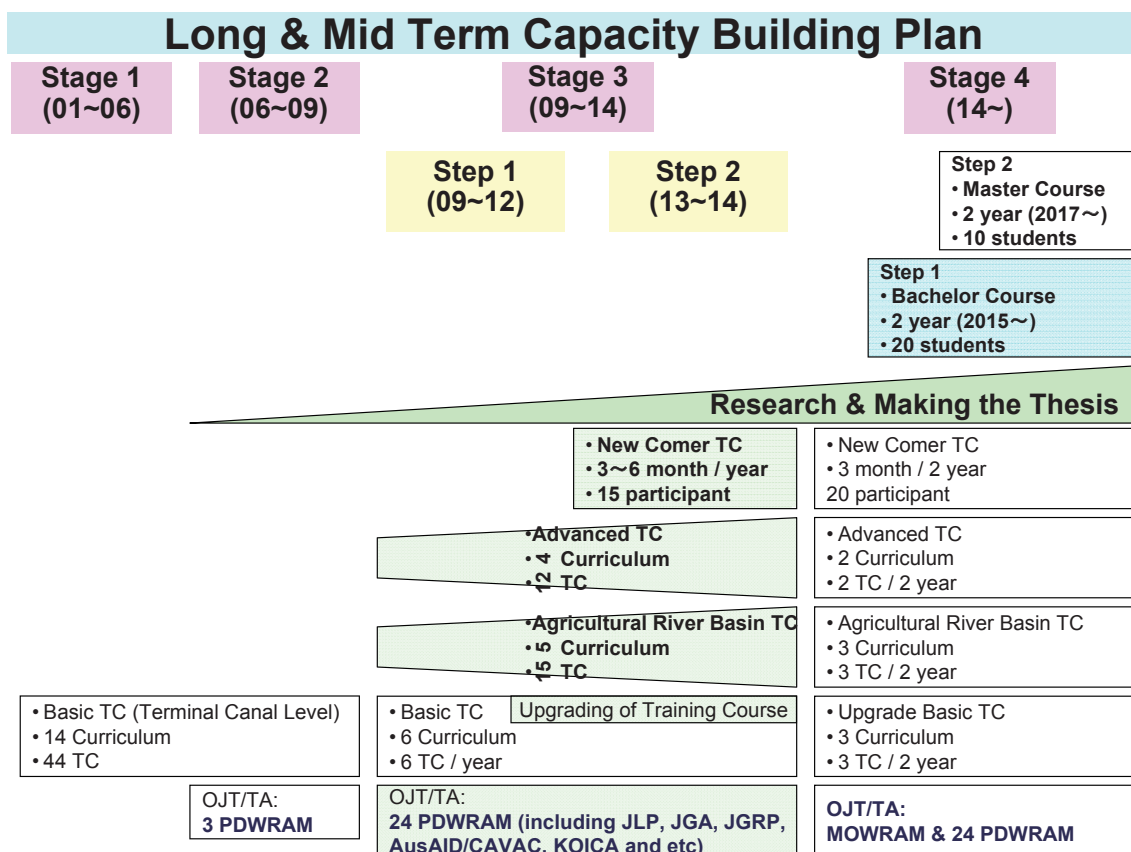
Location and Name of Model Sites

No	Province	Model Site's Name	Area	Implementation Period	Remarks
1	Kampong Chhnang	Lum Hach	119ha	2010	Will Start Topographical Survey in 2012
2		Damnak Ampil	100ha	2010	Design Stage
3		Wat Loung	100ha	2013	Soft Component
4		Wat Chre	100ha	2012	Soft Component
5	Pursat	Thlea Maorm	300ha	2010	Completed Construction Phase I
			450ha	2012	Will Start Activity in 2012 Phase II
6	Battambang	Por Canal	100ha	2010	Completed Construction
7		Ream Kun	100ha	2013	Soft Component
8	Takeo	Upper Slakou	100ha	2010	Design Stage
9		Thomney	300ha	2010	Completed Construction Some Part Phase I
				2012	Construction 3 Canal Lines Phase II
10	Kampong Speu	Roleang Chrey	200ha	2010	Finish Topographical Survey & Drawing
11	Kandal	Kandal Stung	400 or 500ha	2011	Will Start Activities in 2012

Set up New Working System of Model Site Activity



Plan of Strengthening TSC for its Sustainability



Next Five Year Capacity Building Plan Drafted

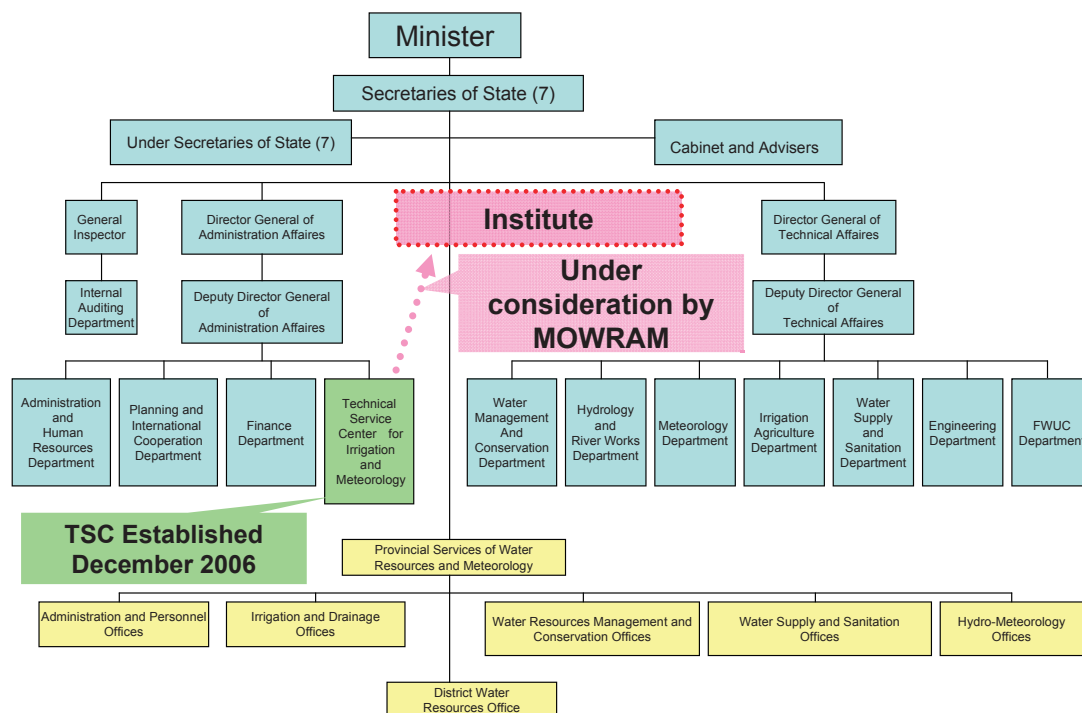
New Comer Training Course	
1	3~6 month training course for new comer of MOWRAM
Advanced Training Course	
1	Advanced AutoCAD & Land Development
2	Route & Topographic Survey by Auto level, Total Station & High Accuracy GPS
3	Structural Analysis & Design of Foundation of Irrigation Facilities
4	Operation and Maintenance of Large Scale Irrigation Facilities by PDWRAM & FWUC
Agricultural River Basin Development & Management	
1	Agricultural River Basin Management & Development by GIS, GPS, and field survey
2	Survey, Data Collection, Data Base & Plan making for Agricultural River Basin Management & Development
3	Enhancement of Agricultural Extension Service by Viewpoint of Irrigation for Effective & Efficiency Use of Water
4	Analysis and Monitoring of Water Balance and Water License
5	Issuing Procedure of Water License
6	Stake Holder involvement & Meeting for Sustainable Agricultural River Basin Development and Management
7	Enhancement of Agricultural Extension Service by Viewpoint of Irrigation for Effective & Efficiency Use of Water
Basic Training Course	
1	Route & Topographic Survey
2	Hydrology, Meteorology & Crop Water Requirement and Irrigation Planning
3	Irrigation Planning by GIS
4	Hydraulic Design, Drawing & Cost Estimation of Irrigation Facilities by Excel & AutoCAD
5	Supervision & Construction Management
6	Sustainable Operation and Maintenance of Irrigation Facilities by PDWRAM & FWUC

Road Map Planned by MOWRAM

	Stage 1 (2001~6)	Stage 2 (2006~9)	Stage 3 (2009~14)	Stage 4 (2014~18)
Budget for operation	Target: 0% TSC building (250,000\$)	Target: 30% (77,000\$/year)	Target: 50% (300,000\$/year)	Target: 80% (500,000\$/year)
Counterpart Fund	N.A	77,060\$	300,000\$	300,000\$
Staff (C/P)	17 (C/P:11)	23 (C/P:10)	30 (C/P:15)	40 (C/P:25)
Staff salary	20~30\$	20~30\$	Apply of PMBI (Priority & Merit-Based Performance Incentive)	
Status & function of organization	N.A	Department of MOWRAM (Center)	General Directorate of MOWRAM (Institute)	Partnership Institute with Ministry of Education (Institute & University)
Expected cooperate donor/project	JICA/TSC1	JICA/TSC2	JICA/TSC3, AFD, BTC, JICA (Loan), ADB AusAID/CAVAC	JICA, AusAID, WB, ADB, AFD, BTC, Spain
Partnership institute / university	N.A	N.A	5	10

	Stage 1 (2001~6)	Stage 2 (2006~9)	Stage 3 (2009~14)	Stage 4 (2014~18)
Number of training course	9	35 (10times/year)	60 (12times/year)	60 (12times/year)
Course for Bachelor degree	N.A	N.A	N.A	20 student
Course for Master degree	N.A	N.A	N.A	10 student
Quality of training course	Training of C/P for lecture level	Basic & middle class training course	•Advanced & Result based training course •Training course for recruit	•Advanced & Result based training course •Training course for recruit
Onsite training course (technical assistance)	N.A	50 times	100 times	50 times
Expected assisting irrigation site through PDWRAM	1 (MS)	MS: 1 PS: 3 JGRP: 5	JBIC: 6 JGRP: 15 JGA: 1 CPF/JNPGA: 3 CAVAC: 3	JBIC: 10 JGRP: 15 CPF/JNPGA: 5
Research program	N.A	N.A	5	20
Visiting professor	N.A	N.A	2	5
C/P level	Master: 1 Bachelor: 1 Assistant BA: 9	Master: 1 Bachelor: 9	Doctor: 2 Master: 8 Bachelor: 5	Professor : 3 Doctor: 5 Master: 12 Bachelor: 5

Organization Structure of TSC Strengthening Plan



**Record of Discussions on
ADB's Technical Assistance for TSC in MOWRAM Under
Water Resources Management Sector Development Program
Between
The Asian Development Bank and
Japan International Cooperation Agency**

Date: September 7, 2011

Place: Phnom Penh, Cambodia

The Asian Development Bank Mission (ADB Mission) and the mission for the Mid-term Review for the Improvement of Agricultural River and Basin Management and Development Project (TSC3) from the Japan International Cooperation Agency (JICA) had a series of discussions on the scope of the technical assistance for Technical Services Centre (TSC) in MOWRAM under Water Resources Management Sector Development Program (WRMSDP) approved by ADB. ADB Mission and JICA hereby confirm the results of their discussions as stated in the main points discussed, subject to the approval by the competent higher authorities of both sides.

For ADB



Christopher Wensley
Mission Leader (Water Resources
Management Sector Development
Program)
ADB

For JICA



Kenichiro Kobayashi
Mission Leader
The Mission for the Mid-term review
for the Improvement of Agricultural
River and Basin Management and
Development Program
JICA

MAIN POINTS DISCUSSED

1. JICA explained the concerns over ADB's technical assistance for TSC in MOWRAM under WRMSDP which is in the planning stage, with regard to the operation of JICA's assistance "Improvement of Agricultural River Basin Management and Development Project" (TSC3). JICA expressed its opinion that the operation of TSC and JICA's assistance would be affected by ADB's assistance as additional component may overload TSC's capacity. ADB Mission fully understood such concerns and explained that the purpose of ADB's technical assistance for TSC is to enhance the capacity of TSC through the delivery of trainings using the existing scheme supported by JICA, and ADB does not intend to implement the assistance that duplicates TSC3, or to prevent it from achieving its objectives.
2. ADB Mission explained that the scope of the assistance for TSC is in the planning stage and is flexible at this time. ADB Mission also explained that it would be possible that under ADB's assistance, ADB can fund the operating cost for TSC including cost to deliver trainings, payment for the participants, etc., subject to concurrence of ADB' TA co-financed by AusAID and Nordic Development Fund. It would also be possible for ADB to provide Priority Operating Cost (POC) to the entire TSC staff including the counter parts for TSC3, subject to the agreement of the Royal Government of Cambodia. ADB will continue discussing with MEF and MOWRAM on POC.
3. JICA explained the concerns over the shortage in counterpart personnel in TSC as anything additional to the existing scheme would require additional counterpart personnel (ex. Training for Climate Change Resilience). ADB Mission explained that it can be expected to secure additional counterpart personnel referring to the discussion between the ADB Mission and MOWRAM. JICA further explained the seriousness of the situation, and expressed JICA's view on the demarcation which depends on the availability of the additional C/P with enough ability.
4. ADB mission confirmed that the trainings in TSC will continue to be managed by JICA, and if there is any proposed major change to the training

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curriculum, it will be discussed and agreed by TSC, ADB and JICA. The definition of “major change” will be continued to be discussed between ADB and JICA.

5. The ADB Mission explained that the management of the hardware component of WRMSDP such as construction/rehabilitation of irrigation facilities and the software component such as establishment of FWUC/G would be done by PDOWRAM staffs through the supervision of international/national consultants procured by ADB. The model sites in TSC3 will continue to be financed by JICA.
6. Both sides agreed to continue the discussion to find the appropriate collaboration mechanism acceptable to TSC, ADB, and JICA.
7. Both sides agreed upon the proposed idea for demarcation between ADB and JICA as described in the table below.

Training Management		JICA
Cost	Training Cost	Some Basic Courses: WRMSDP(ADB)
		Some Basic Courses and River Basin Management Courses: TSC3 (JICA)
	POC	WRMSDP(ADB)

8. Both sides confirmed that ADB would provide JICA with the concrete plan of TA to TSC after obtaining the information on additional counterpart by the end of September 2011. Both sides confirmed that it needed further discussion to scrutinize the plan and that would set the both understanding in an official manner, through an MOU between the two agencies and TSC.

