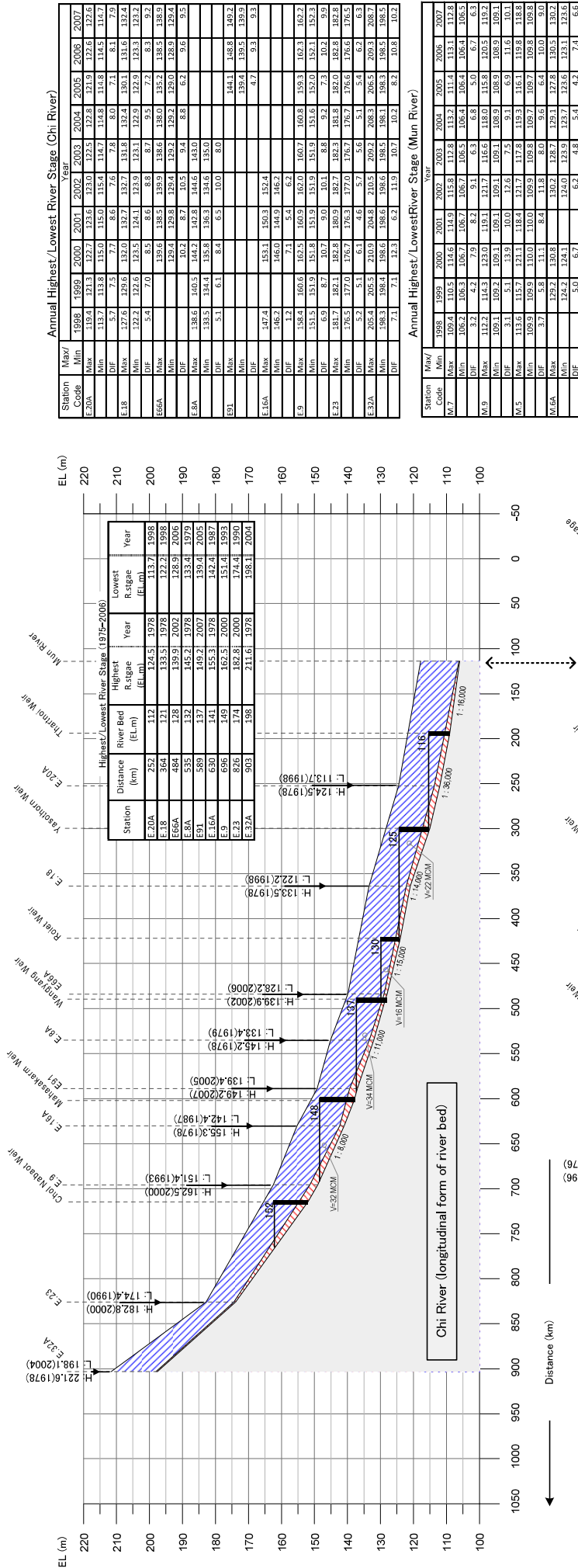
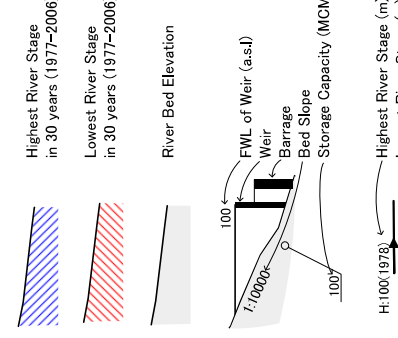


Appendix 3.7.2.2. River Profile of Khong Chi and Mun River with Max/Min River Stage



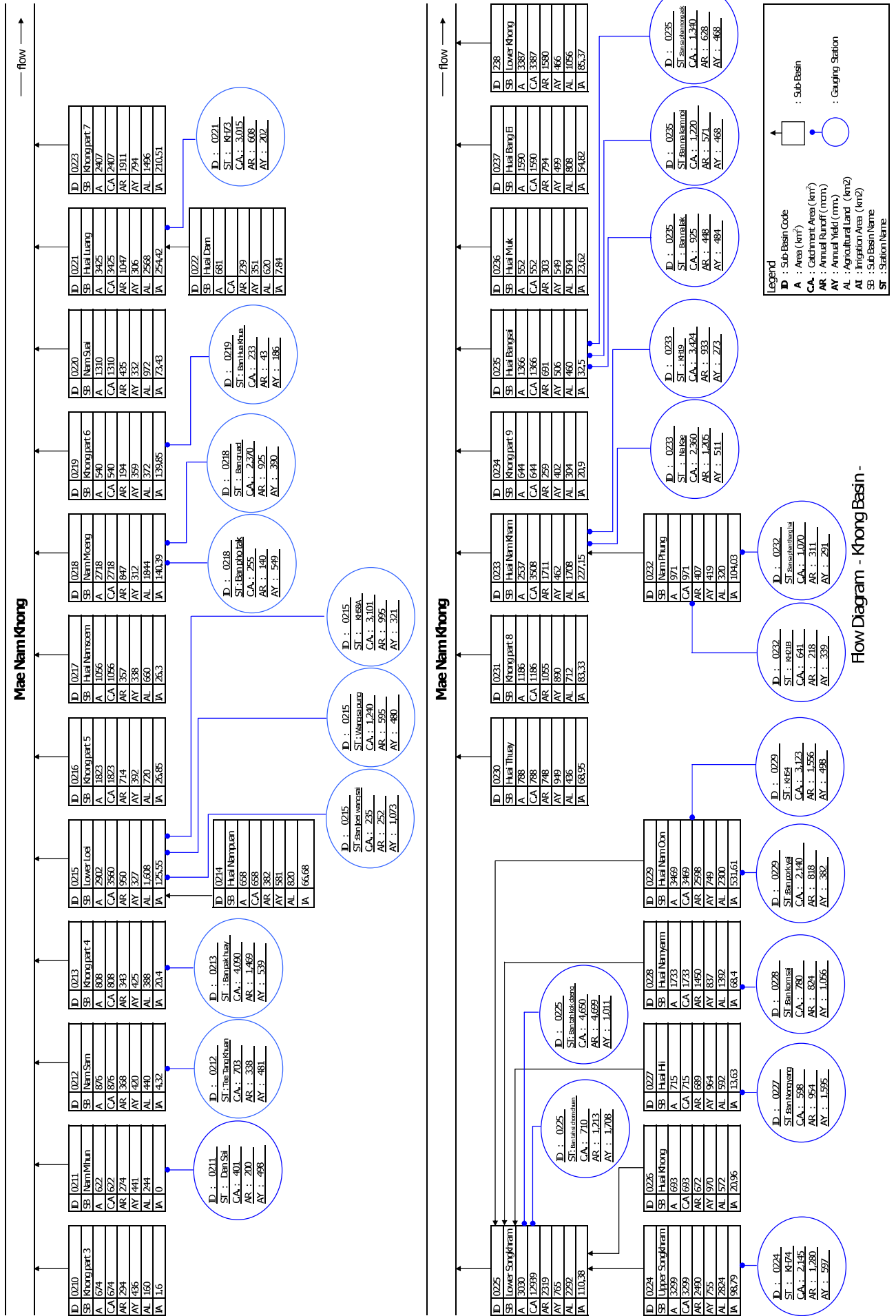
LEGEND

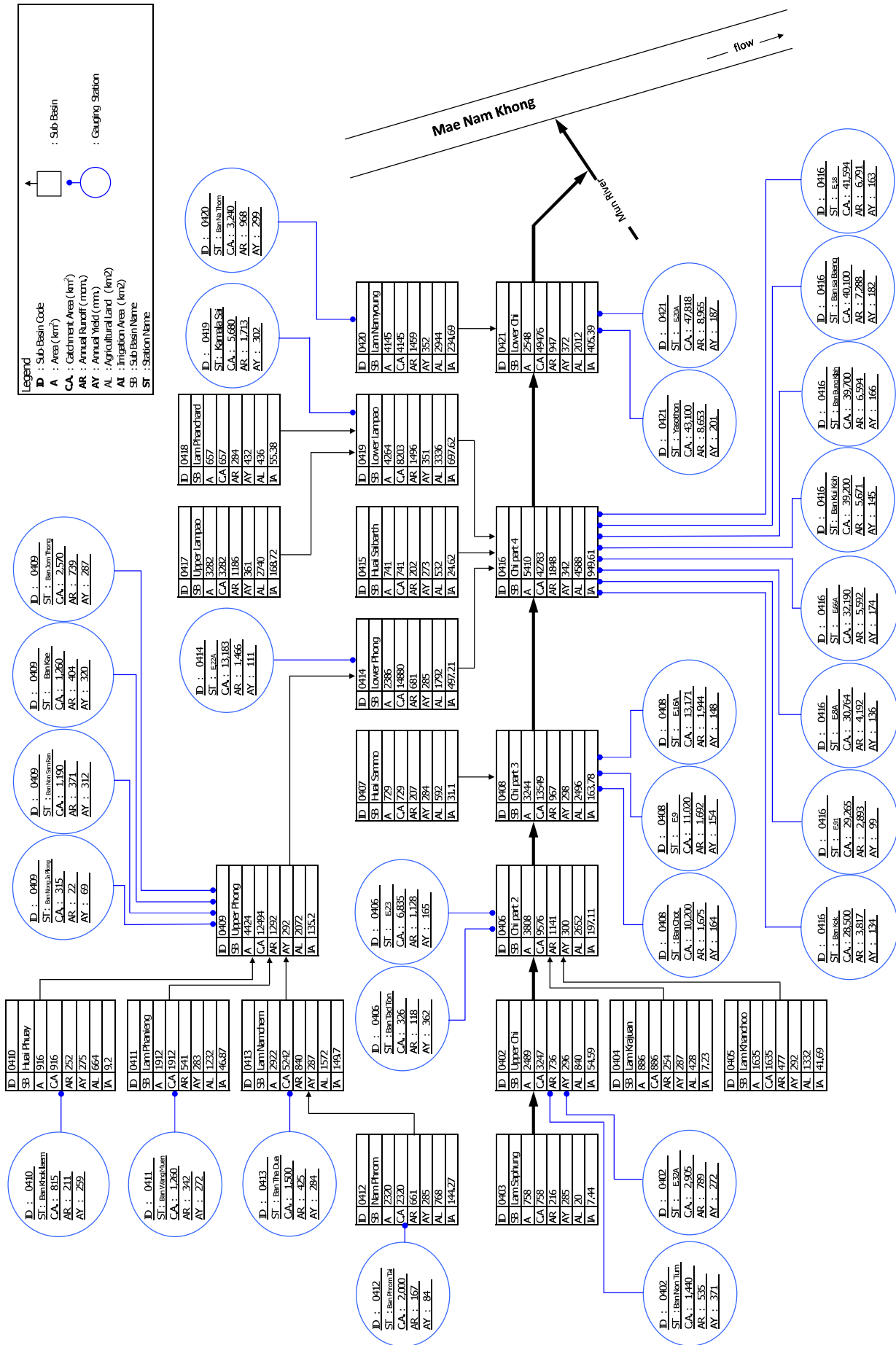


H:100(1978)
L:50(1993)

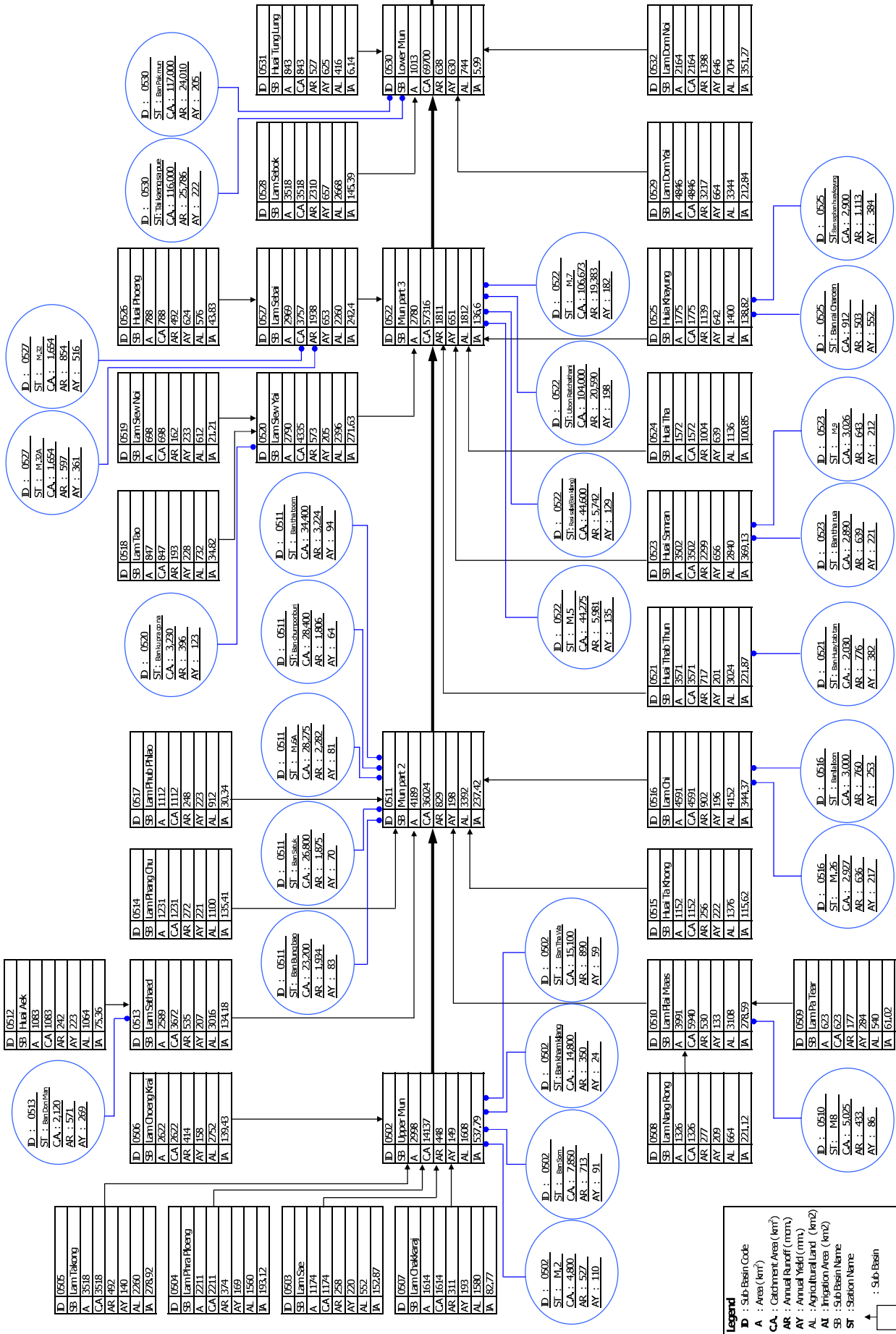
Highest Flood Stage of Chi and Mun River in Recent 30 years (1975-2006)

Appendix 3.7.3 Flow Diagram of Tributaries in Khong, Chi and Mun Basin



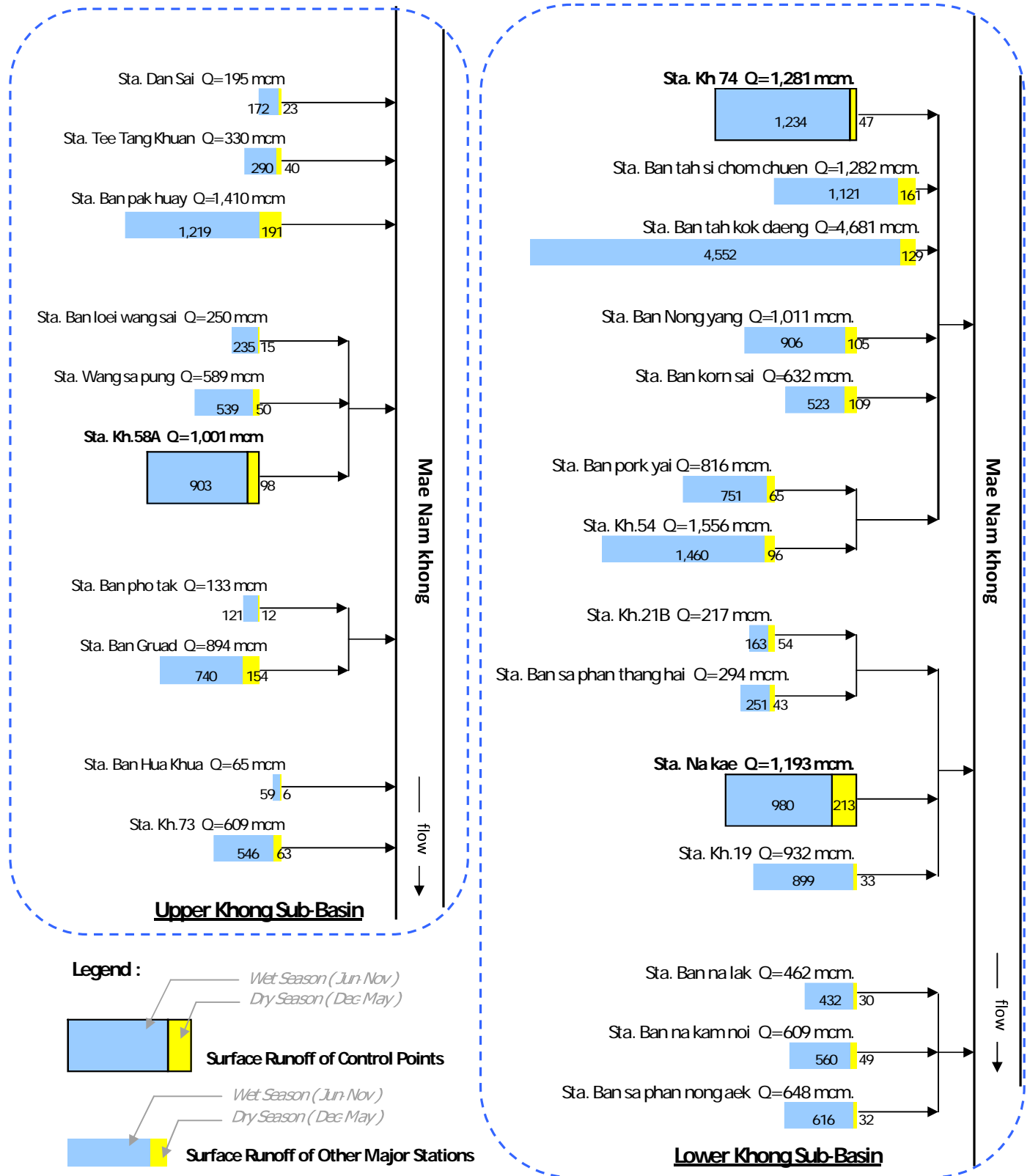


Flow Diagram - Chi Basin -

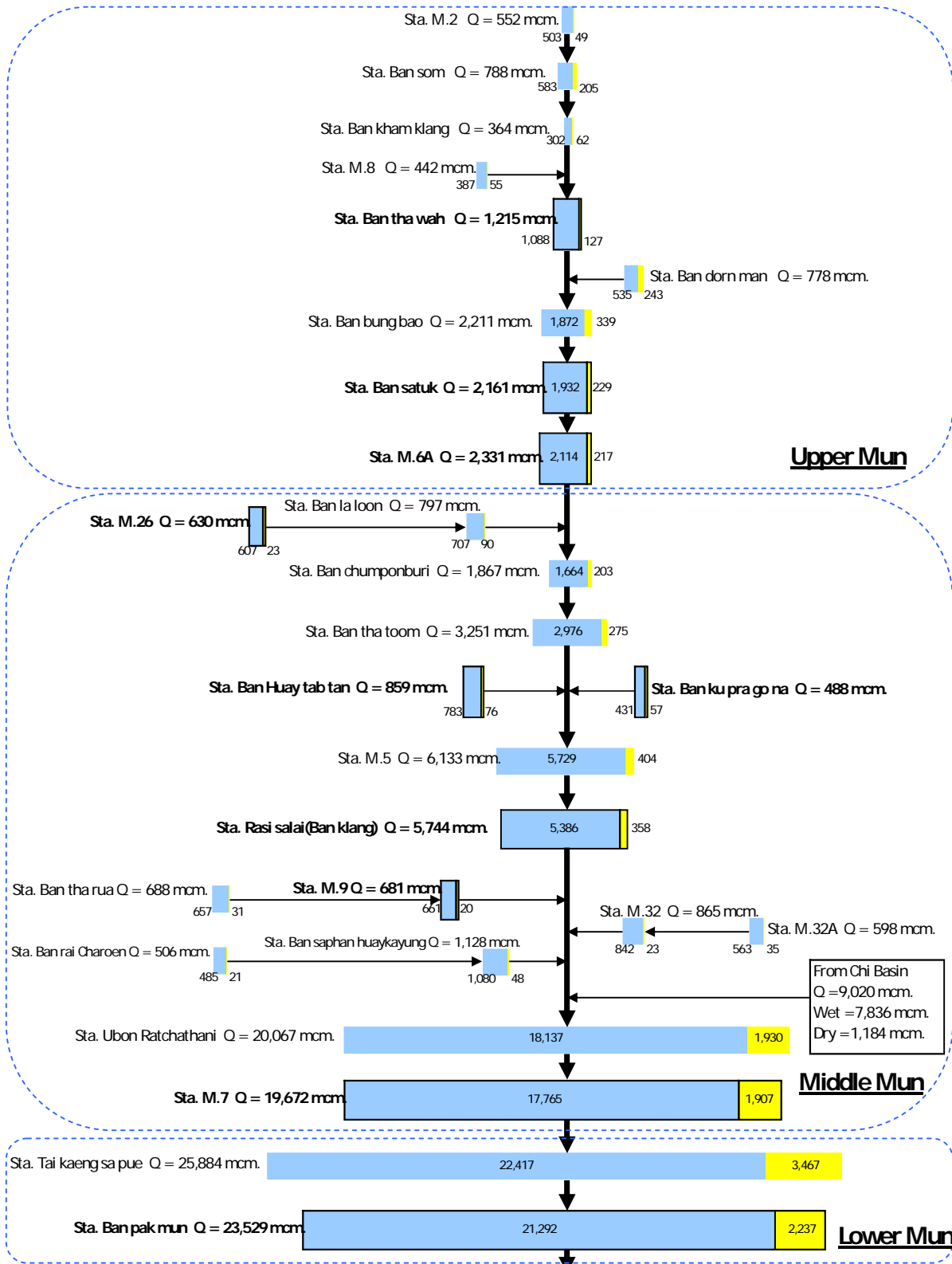


Flow Diagram - Mun Basin -

Appendix 3.7.4 Summary of Surface Runoff in Khong, Chi and Mun Basin



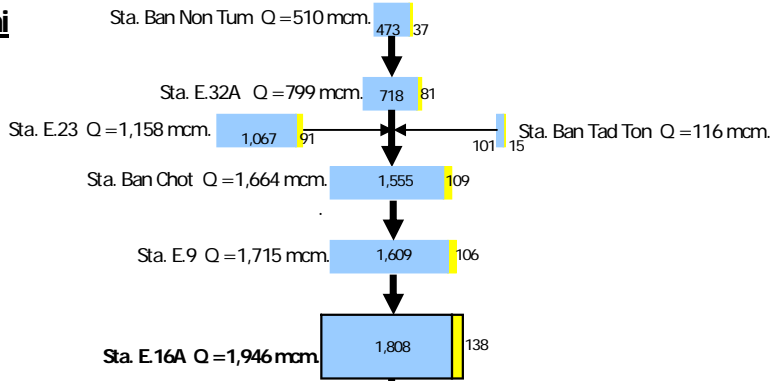
Surface Runoff of Khong River Basin (Average 1970-2006)



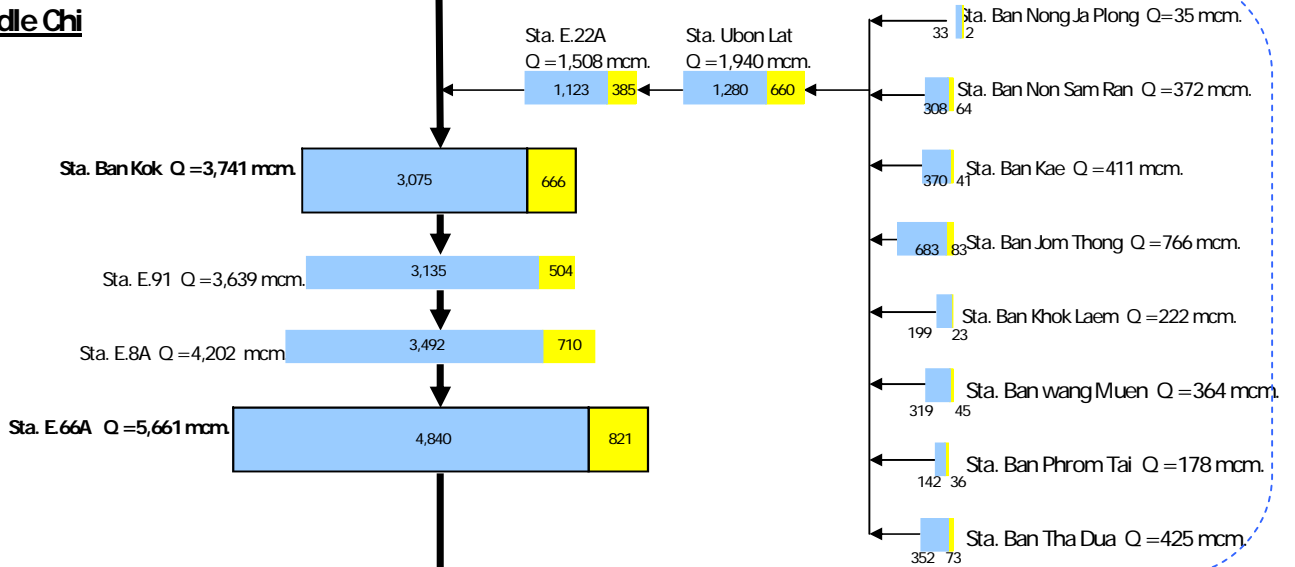
Data sources : Processed by Jica Study Team based on RID, DWR's observation records

Surface Runoff of Mun River Basin (Average 1970-2006)

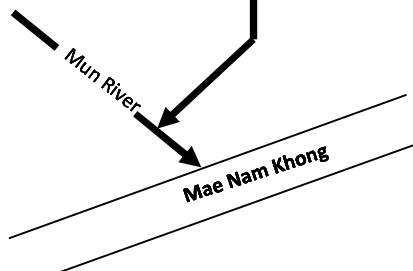
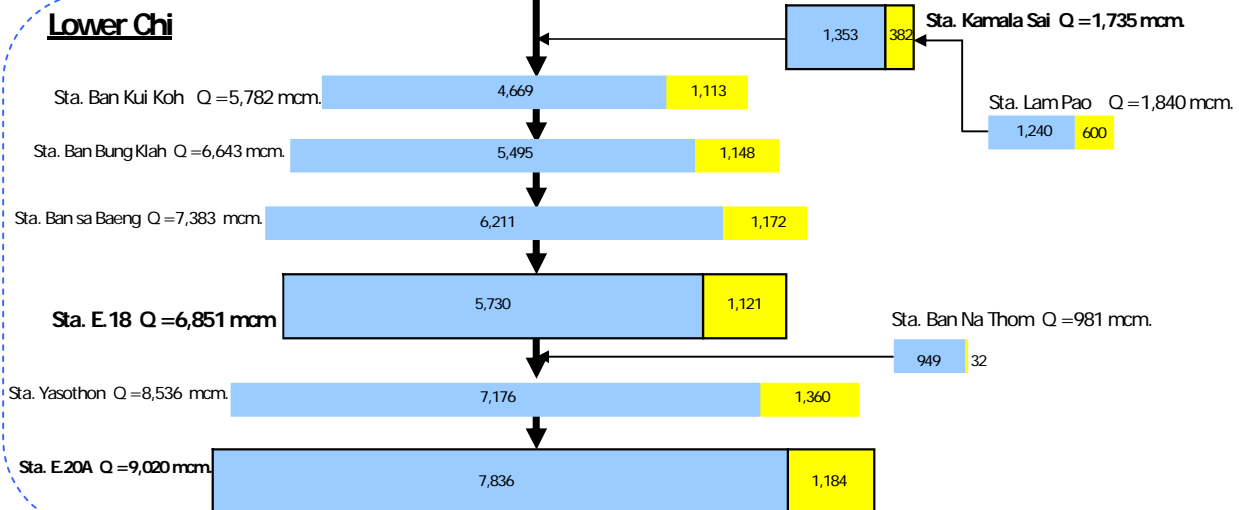
Upper Chi



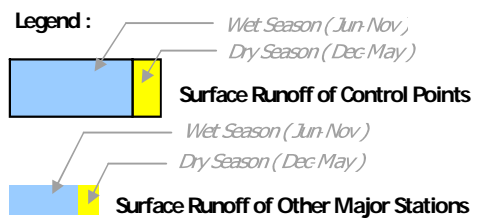
Middle Chi



Lower Chi

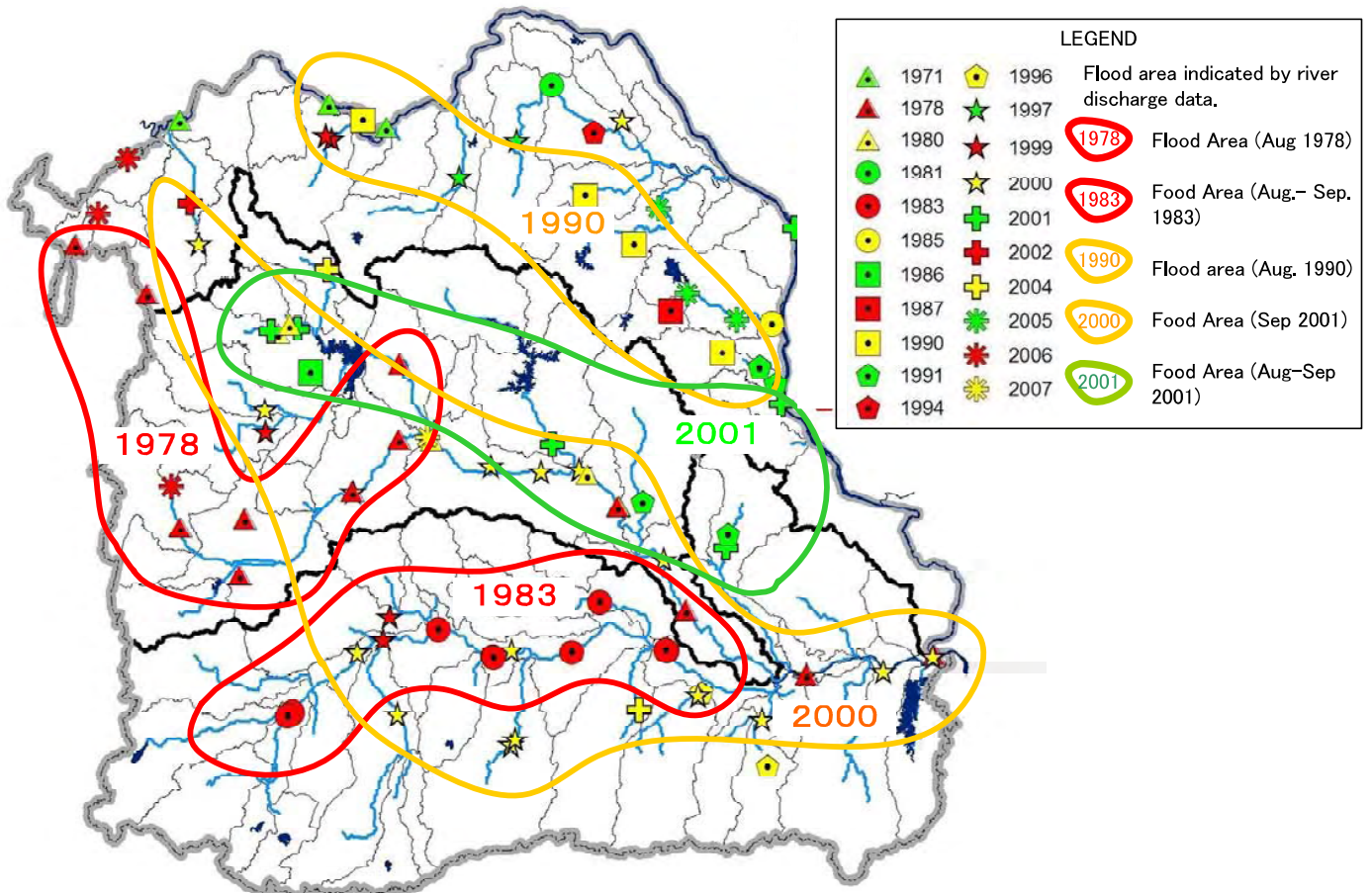


Surface Runoff of Chi River Basin (Average 1970-2006)

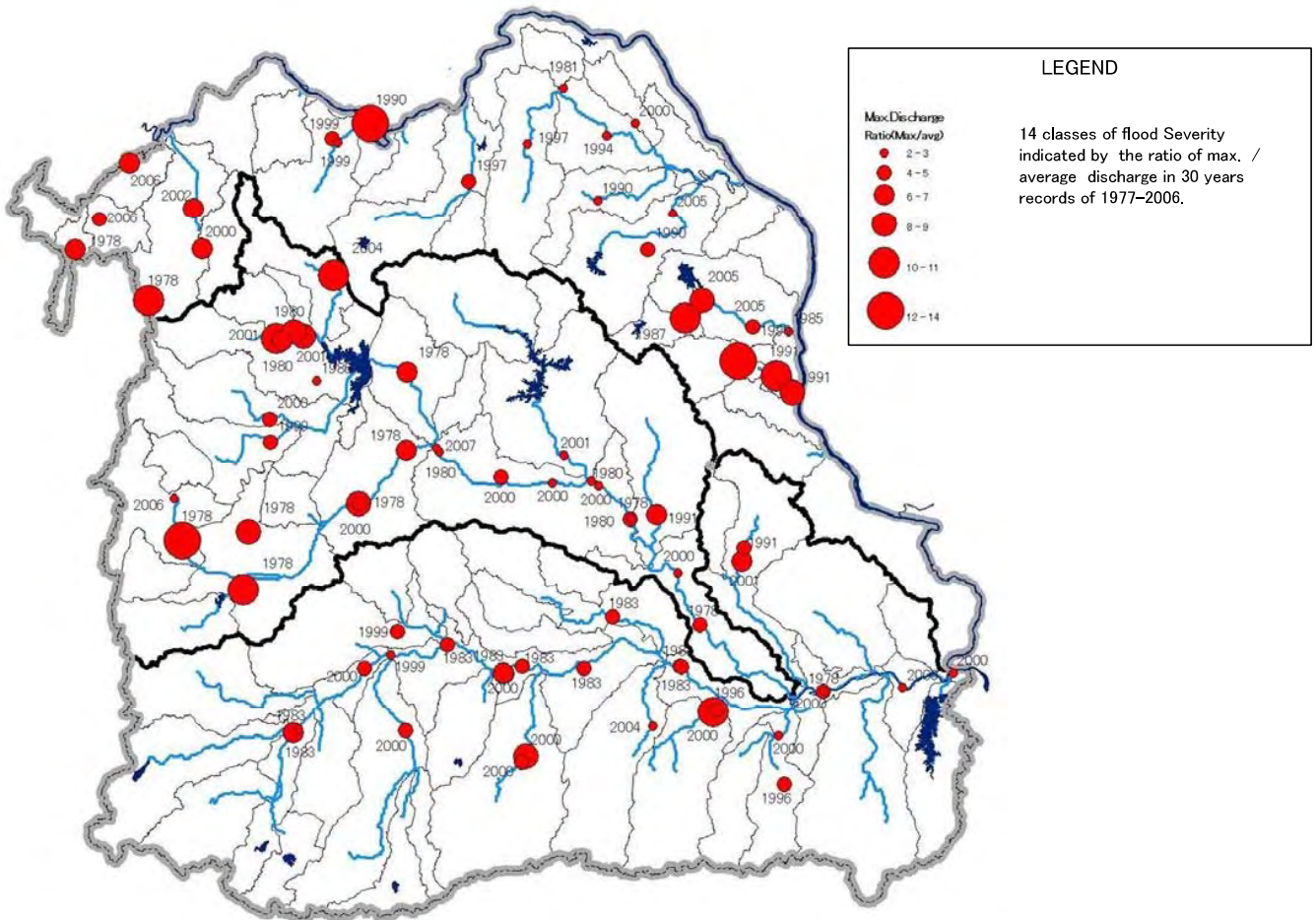


Data sources: Processed by Jica Study Team based on RID, DWR's observation records.

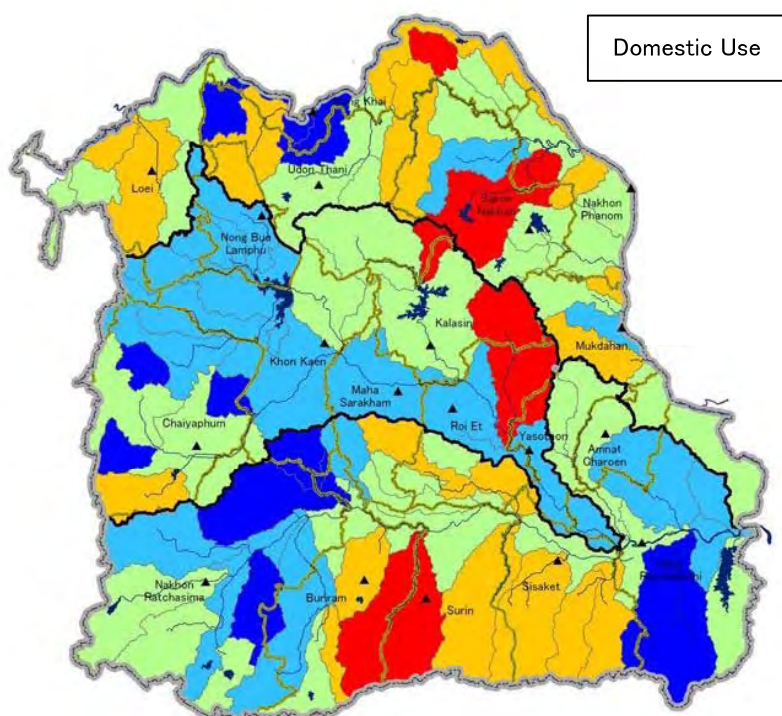
Appendix 3.7.5 Station Observed Max. Runoff (Flood) in 1966-2007



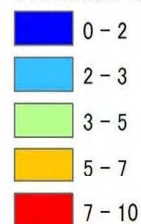
Station Observed Max. Discharge (Flood) in 1966-2007



Severity rate of Discharge (Flood) Compared with Average Discharge Level



% of Drought Village (Domestic Use)

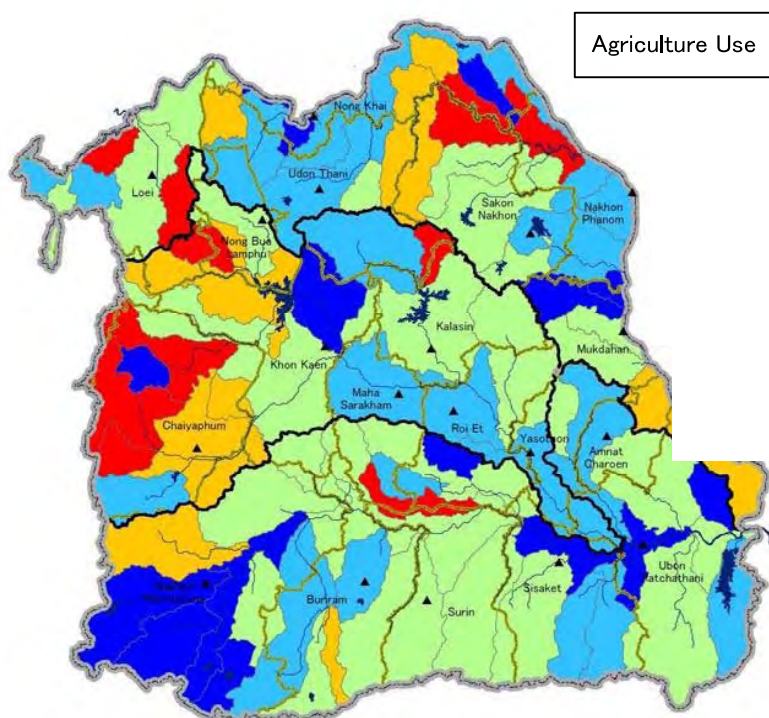


Severer Drought Sub-basins in Domestic Water Use *1						
NO	Code	Name	Basin	Agriculture Area (rai)	Irrigation Area(rai)	% of Villgae *2
1	0210	Khong part 3	Khong	96,081	1,500	13
2	0418	Lam Phanchard	Chi	188,766	33,029	8
3	0226	Huai Khong	Khong	333,408	1,000	8
4	0420	Lam Namyoung	Chi	1,474,093	90,571	7
5	0229	Huai Nam Oon	Khong	1,121,893	277,895	7
6	0516	Lam Chi	Mun	1,978,601	159,236	7
7	0218	Nam Moeng	Khong	999,964	67,967	7
8	0234	Khong part 9	Khong	184,380	23,836	7
9	0224	Upper Songkhram	Khong	1,405,566	40,718	6
10	0521	Huai Thab Thun	Mun	1,459,709	63,554	6

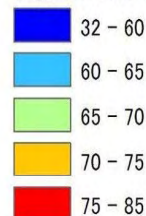
*1/ Data Source: Kor Chor Chor.2kor (2009)

*2/ porortion(%) of village suffered by serious drought in domestic water use

Drought Village % in Domestic Use (unit: %)



% of Drought Village (Agriculture Use)



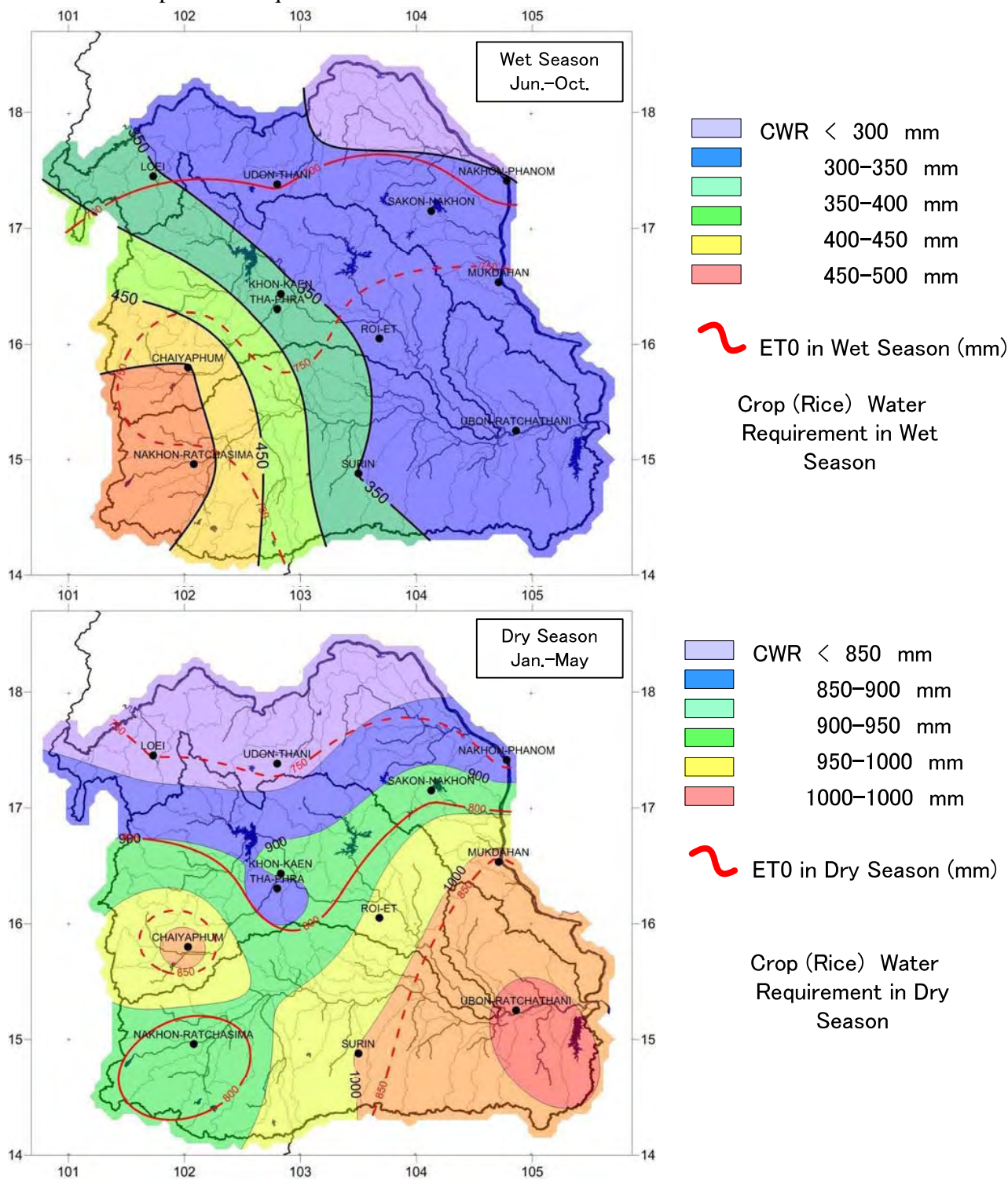
Severer Drought Sub-basins in Agriculture Water Use*1						
NO	Code	Name	Basin	Agriculture Area (rai)	Irrigation Area(rai)	% of Villgae *2
1	0213	Khong part 4	Khong	237,502	900	85
2	0402	Upper Chi	Chi	447,608	1,000	82
3	0214	Huai Nampuan	Khong	467,103	900	78
4	0412	Nam Phrom	Chi	383,332	62,548	78
5	0517	Lam Phub Phlao	Mun	468,092	350	78
6	0410	Huai Phuay	Chi	335,867	1,200	77
7	0418	Lam Phanchard	Chi	188,766	33,029	77
8	0404	Lam Krajuan	Chi	225,946	1,200	76
9	0225	Lower Songkhram	Khong	1,169,978	34,894	75
10	0407	Huai Sammo	Chi	251,118	19,379	75

*1/ Data Source: Kor Chor Chor.2kor (2009)

*2/ porortion(%) of village suffered by serious drought in agriculture water use

Drought Village % in Agriculture Use (unit: %)

Appendix 3.8.1 Crop Water Requirement

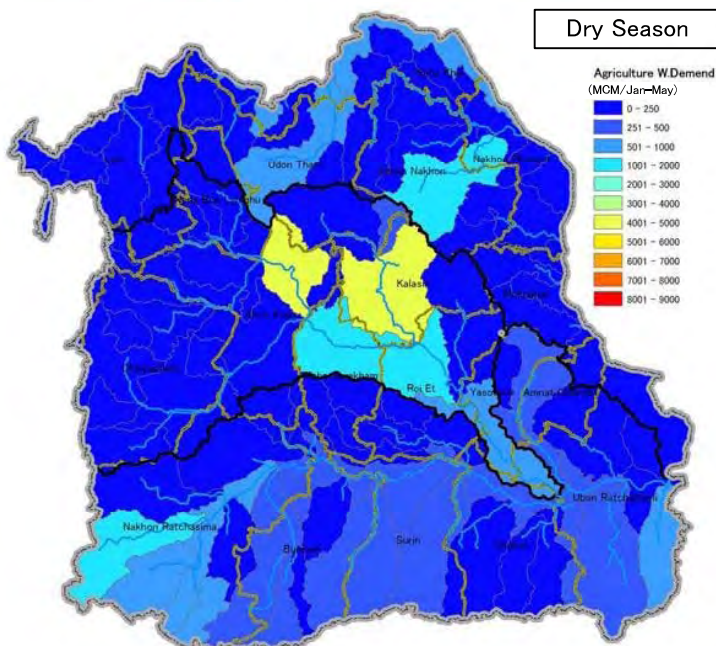
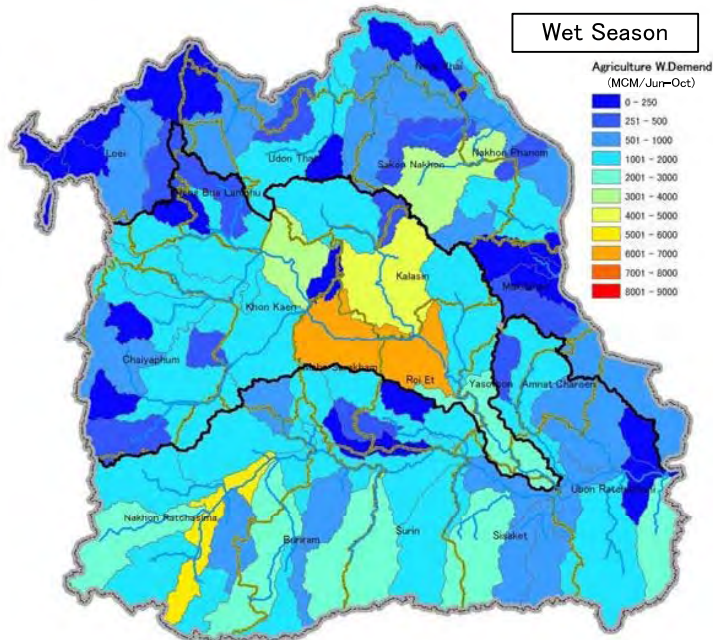
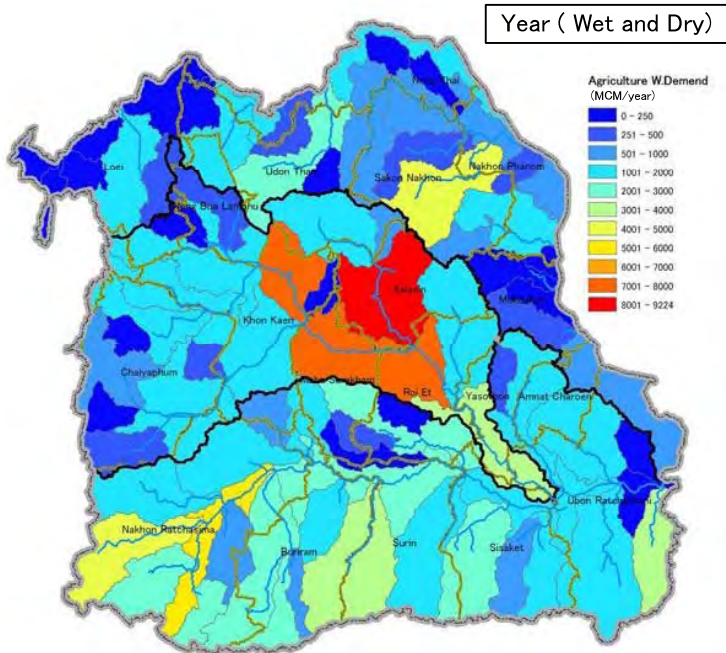


Station	ETO Year Avg. (mm/day)	ETO Year Total (mm/year)	Wet Season (mm/Jun-Nov)				Dry Season (mm/Dec-May)			
			ETO	Etc	Eff rain	CWR	ETO	Etc	Eff rain	CWR
UDON-THANI	4.0	1,442	744	607	704	306	698	665	194	822
UBON-RATCHATHANI	4.6	1,678	889	674	732	313	789	790	178	1,059
THA-PHRA	4.1	1,483	770	614	583	377	713	679	179	844
SURIN	4.4	1,606	838	668	670	349	768	744	169	1,003
SAKON-NAKHON	4.2	1,519	795	618	718	309	725	711	210	931
RO-LET	4.4	1,591	822	668	692	341	769	724	188	964
NAKHON-RATCHASIMA	4.1	1,508	767	653	547	521	741	677	176	901
CHAIYAPHUM	4.6	1,674	884	635	716	311	790	769	177	1,020
MUKDAHAN	4.4	1,615	854	619	629	353	761	683	205	829
LOEI	4.0	1,447	749	648	643	361	698	691	166	924
KHON-KAEN	4.2	1,530	785	571	796	301	745	653	220	863
NAKHON-PHANOM	3.9	1,422	741	684	582	503	680	794	190	1,031

NOTE: ETO: Potential evapotranspiration is calculated by CROPWAT with FAO CLIMAT's data.
 WET: Wet Season from Jun. to Oct.
 DRY: Dry Season from Jan. to May.
 Etc: Evapotranspiration under standard conditions.
 Eff rain: Effective rainfall.
 CWR: Crop water requirement.

Summary of ETO and crop water requirement

Agricultural Water Demand for Sub-Basins



Subbasin Name	Code	W. Reqr. (MCM) -Year-	W. Reqr. (MCM) -Wet-	W. Reqr. (MCM) -Dry-
Khong part 3	0210	1	1	0
Nam Mhun	0211	0	0	0
Nam Sarn	0212	3	3	0
Khong part 4	0213	16	15	1
Huai Nampuan	0214	48	47	1
Lower Loei	0215	102	91	11
Khong part 5	0216	18	18	0
Huai Namsoem	0217	18	17	1
Nam Moeng	0218	111	91	21
Khong part 6	0219	160	87	73
Nam Suai	0220	49	45	5
Huai Luang	0221	209	156	53
Huai Dam	0222	5	5	0
Khong part 7	0223	179	125	54
UPPER KHONG		920	701	219
Upper Songkhrum	0224	63	59	4
Lower Songkhrum	0225	72	66	7
Huai Khong	0226	12	12	0
Huai Hili	0227	8	8	0
Huai Namyarn	0228	45	41	3
Huai Nam Oon	0229	478	325	153
Huai Thuay	0230	46	42	5
Khong part 8	0231	56	50	6
Nam Phung	0232	71	65	6
Huai Nam Kham	0233	156	140	16
Khong part 9	0234	14	13	1
Huai Bangsai	0235	22	20	2
Huai Muk	0236	17	15	2
Huai Bang Ei	0237	40	34	5
Lower Khong	0238	59	52	6
LOWER KHONG		1,159	944	215
KHONG (TOTAL)		2,079	1,645	434
Upper Chi	0402	52	52	0
Lam Saphung	0403	7	7	0
Lam Krajuan	0404	7	7	0
Lam Khanchoo	0405	45	43	3
Chi part 2	0406	196	193	3
Huai Sammo	0407	28	28	0
Chi part 3	0408	134	131	2
UPPER CHI		469	461	8
Upper Phong	0409	105	102	2
Huai Phuay	0410	7	7	0
Lam Phanieng	0411	34	32	1
Nam Phrom	0412	144	126	18
Lam Namchem	0413	135	123	12
Lower Phong	0414	769	342	427
Huai Saibarth	0415	17	17	0
Chi part 4	0416	773	663	111
MIDDLE CHI		1,983	1,412	571
Upper Lampao	0417	133	108	25
Lam Phanchard	0418	62	35	28
Lower Lampao	0419	922	460	462
Lam Namyoung	0420	171	151	20
Lower Chi	0421	334	263	71
LOWER CHI		1,622	1,017	605
CHI (TOTAL)		4,074	2,890	1,184
Upper Mun	0502	592	533	58
Lam Sae	0503	211	149	62
Lam Phra Ploeng	0504	277	198	79
Lam Takong	0505	411	291	120
Lam Choeng Krai	0506	147	145	2
Lam Chakkaraj	0507	84	79	5
Lam Nang Rong	0508	218	192	25
Lam Pa Tear	0509	69	52	17
Lam Plai Maas	0510	297	251	46
Mun part 2	0511	204	168	36
Huai Aek	0512	65	65	1
Lam Sathaed	0513	128	126	2
Lam Phang Chu	0514	115	108	7
UPPER MUN		2,817	2,357	460
Huai Ta Khong	0515	104	91	13
Lam Chi	0516	306	260	46
Lam Phub Phlao	0517	22	22	0
Lam Tao	0518	27	26	1
Lam Siew Noi	0519	18	15	4
Lam Siew Yai	0520	208	189	19
Huai Thab Thun	0521	181	152	29
Mun part 3	0522	115	88	27
Huai Samran	0523	271	249	22
Huai Tha	0524	69	67	2
Huaia Khayung	0525	115	91	24
MIDDLE MUN		1,437	1,249	188
Huai Phoeng	0526	28	28	0
Lam Sebai	0527	187	154	33
Lam Sebok	0528	108	91	17
Lam Dom Yai	0529	162	137	25
Lower Mun	0530	5	4	1
Huai Tung Lung	0531	4	4	0
Lam Dom Noi	0532	305	222	83
LOWER MUN		798	639	159
MUN (TOTAL)		5,052	4,244	808
HONG/CHI/MUN (TOTAL)		11,205	8,780	2,426

Appendix 3.8.3

Livestock Water Demand and Main Crops Water Requirement

Water demand for livestock in NE at the year 2009 and 2039 is estimated by the Department of Livestock Development for three river basins in NE as shown in the Table 1.

Table 1 Estimated Water Demand for Livestock

Basin	Water demand for livestock (MCM)	
	Present (2009)	Future (2039)
Khong	49	64
Chi	62	88
Mun	136	184
Total of Northeast region	247	336

Data source: Department of Livestock Development (Ministry of Agriculture and Cooperatives)

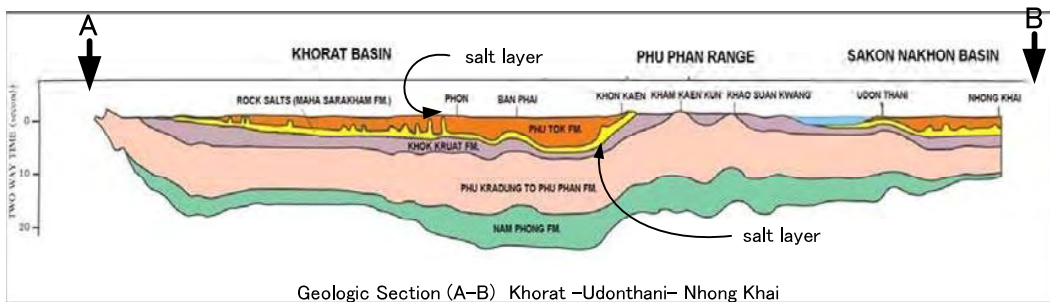
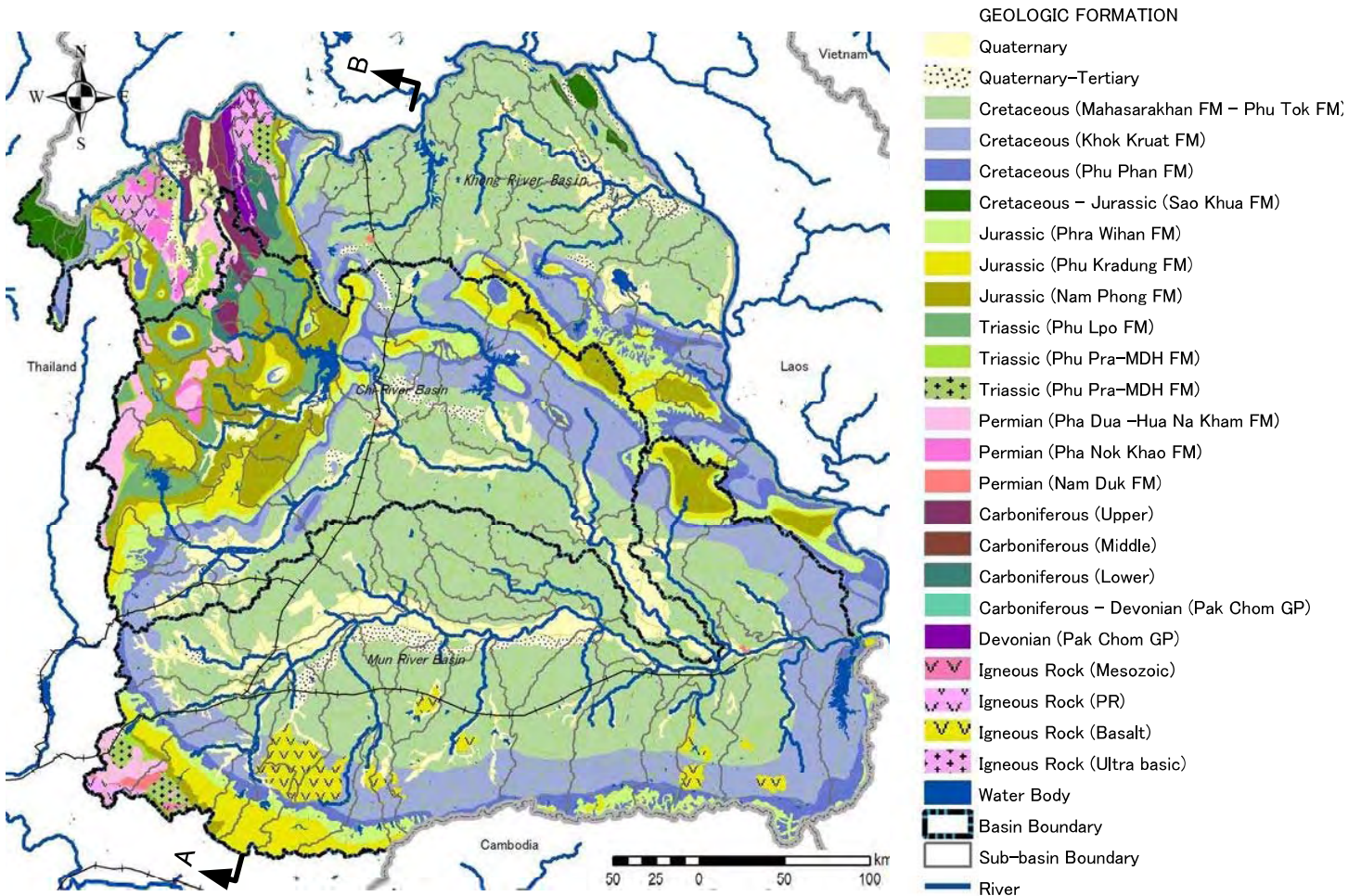
In addition, Summary of estimation results of water requirement for main crops is tabulated below. Among crop water requirements in the dry season, those for vegetable, maize, and groundnut are estimated about 30% to 35% of that for rice.

Table 2 Comparison on Water Requirement for Main Crops in Dry and Wet Seasons

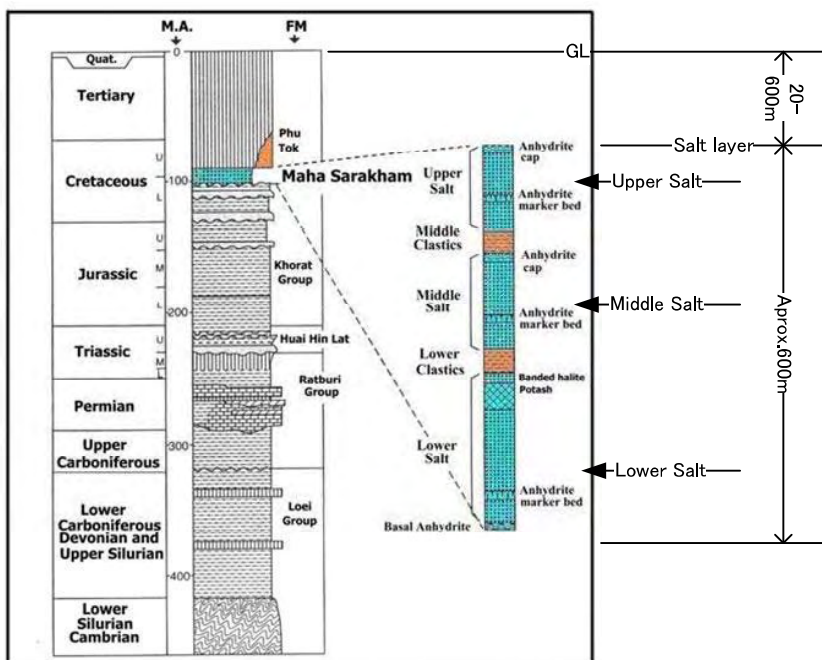
Crop water Requirement (Dry Season)							
Crops	Potential Water Requirement (mm)	Effective Rainfall (mm)	Irrigation Requirement (mm)	Irr. Req for Rice's (%)	Calc. Planting Date (Month, Decade)	Calc. Harvesting Date	Growing Period
Rice	691	166	924	100	Jan (2)	May(2)	5 month
Vegetable	382	82	298	32	Jan (2)	Apr(2)	3 month
Maize	476	187	310	34	Jan (2)	May(2)	4 month
Groundnut	514	207	319	35	Jan (2)	May(3)	4 month
Sugarcane	1,511	877	645	70	Jan (2)	Jan (2)	1 Year
Crop water Requirement (Wet Season)							
Crops	Potential Water Requirement (mm)	Effective Rainfall (mm)	Irrigation Requirement (mm)	Irr. Req for Rice's (%)	Calc. Planting Date (Month, Decade)	Calc. Harvesting Date	Growing Period
Rice	846	643	361	100	May (2)	Oct(2)	5 month
Vegetable	348	412	2	0	Jun (2)	Sep(2)	3 month
Maize	391	531	21	6	Jun (2)	Oct(2)	4 month
Groundnut	426	544	6	2	Jun (2)	Oct(3)	4 month
Sugarcane	1,501	877	780	216	Jun (2)	Jun(2)	1 Year

Note: Calculation is made with CROPWAT based on RID and FAO information based on Agro-climate data of Khon Kaen Province.

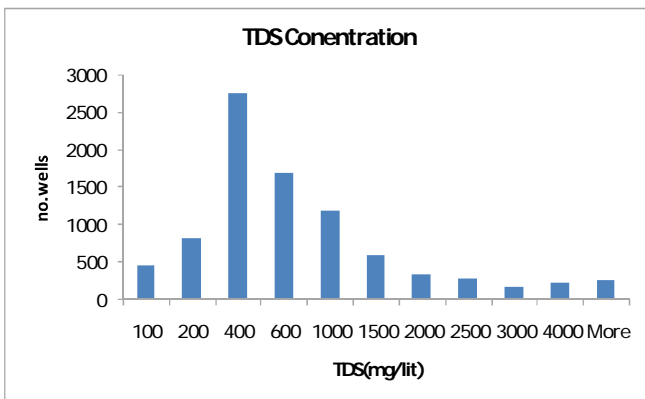
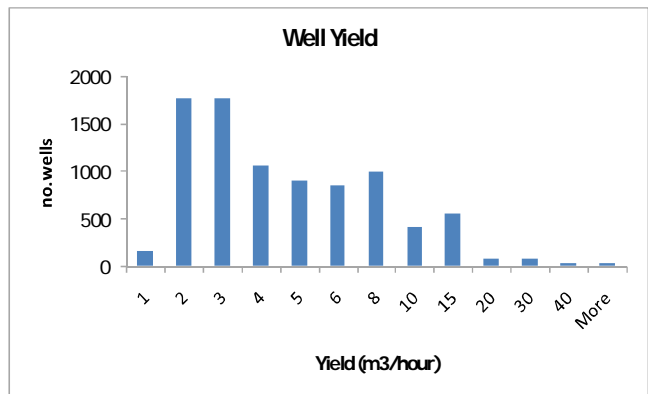
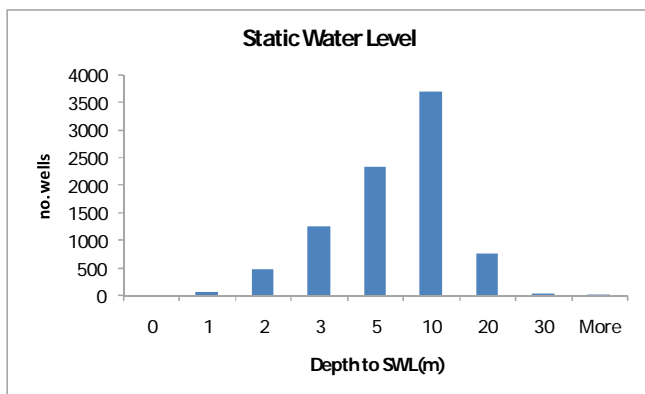
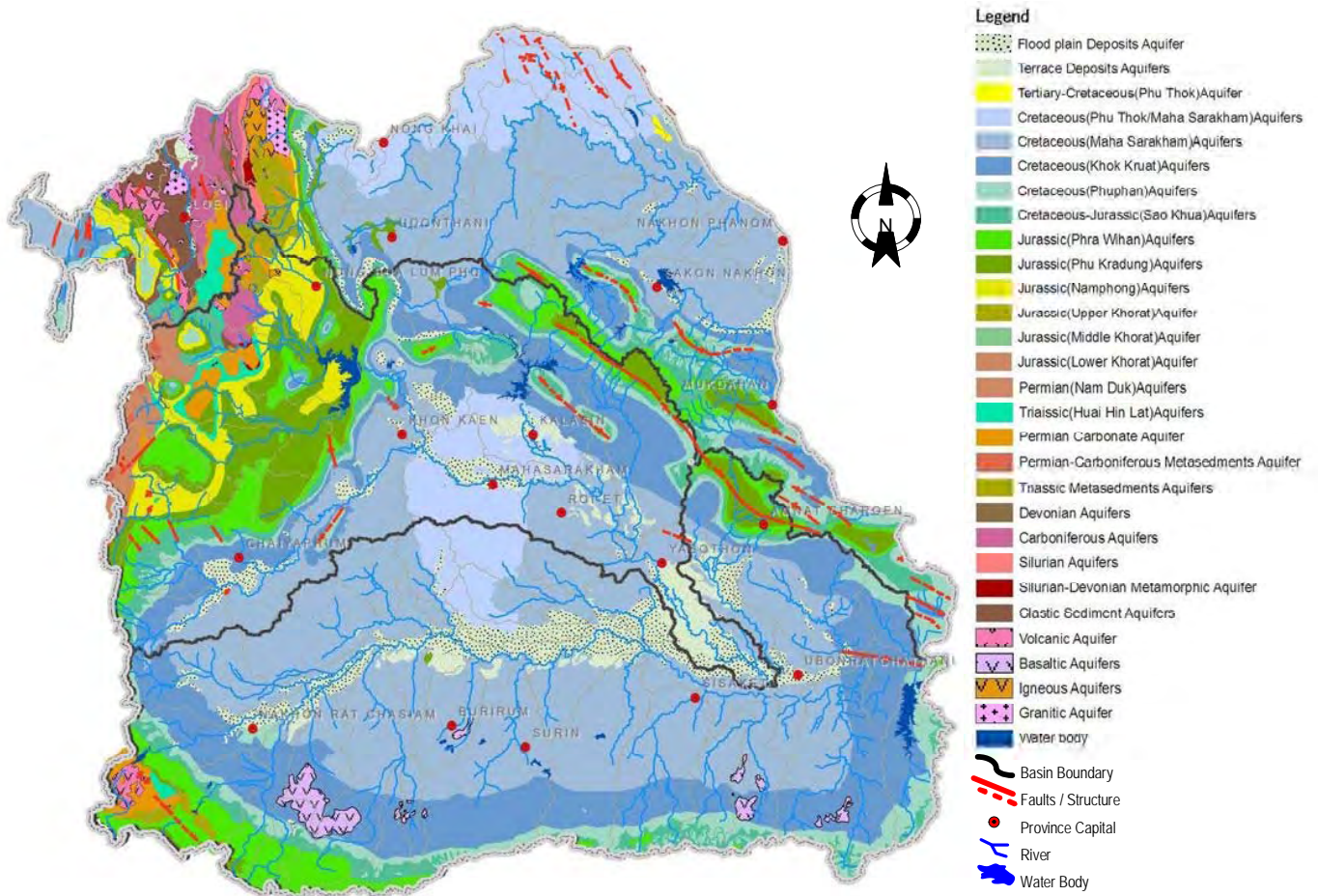
Appendix 3.9.1 Geologic Map and Salt Layer of Khong, Chi and Mun Basin



Geologic Map of Northeast Thailand (DMR, 1999)



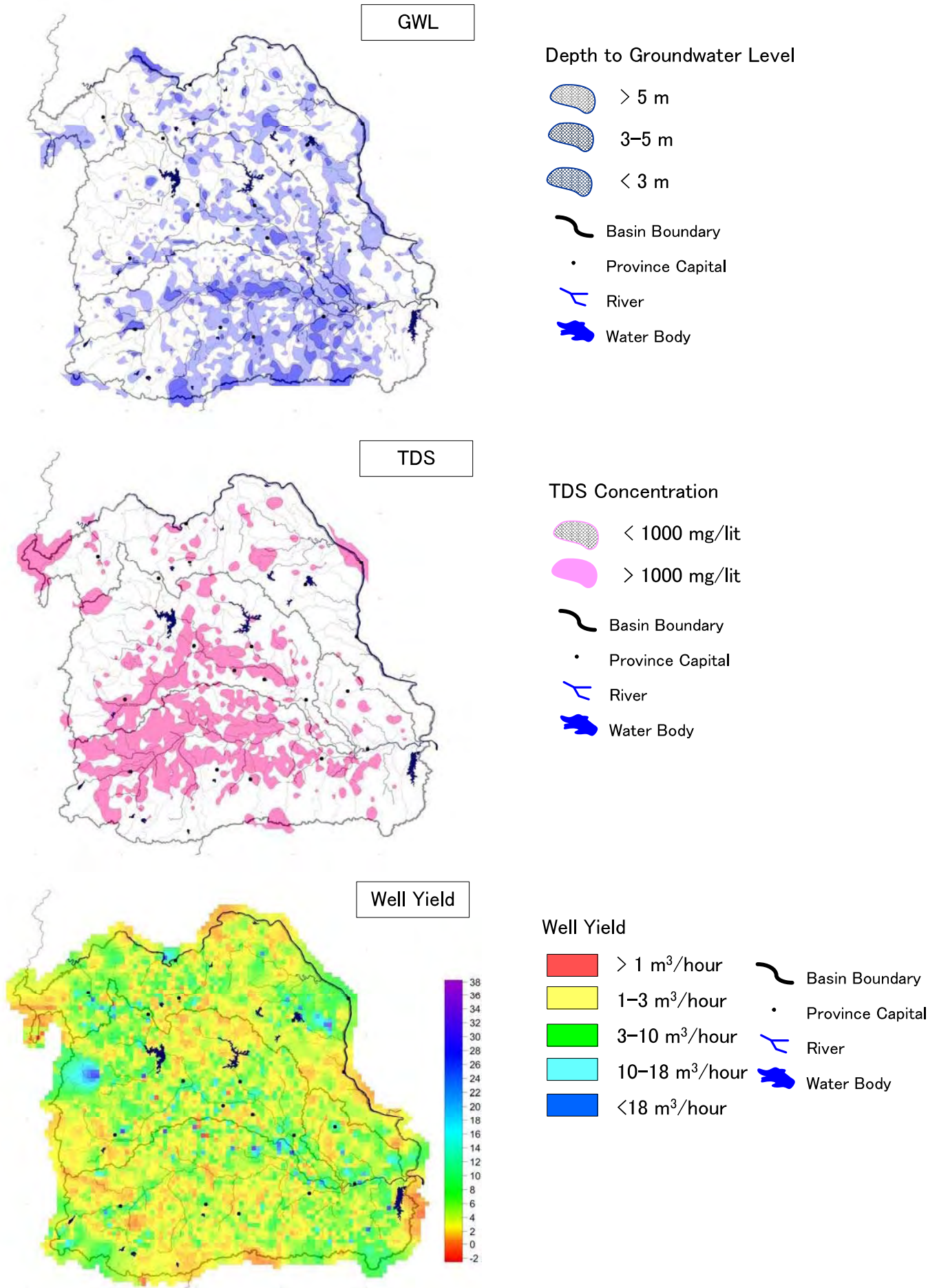
Appendix 3.9.2 Hydrogeologic Map of Khong, Chi and Mun Basin



Hydrogeologic Map of Northeast Thailand

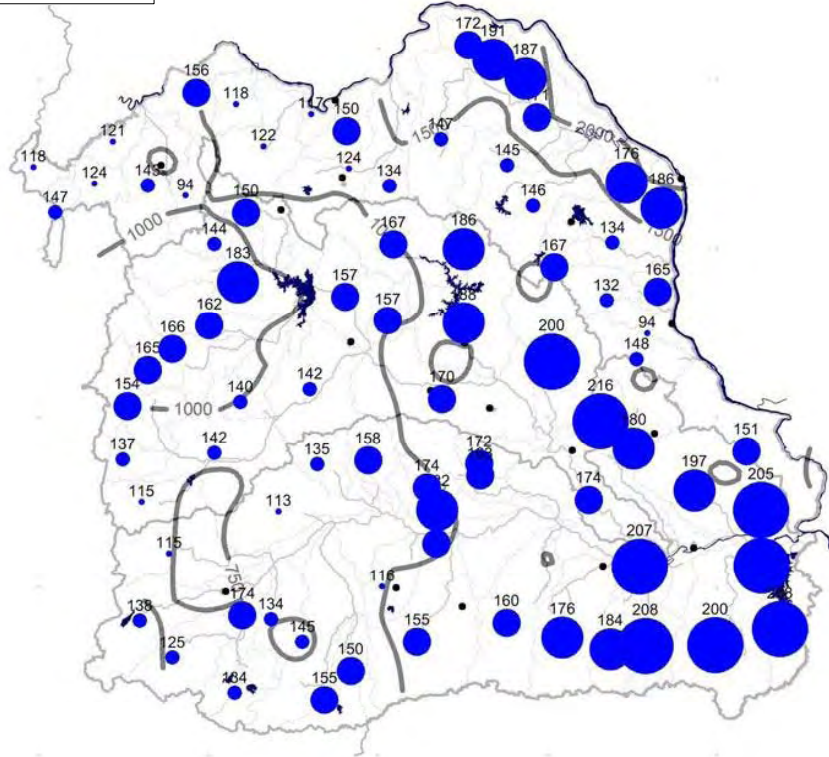
Note: Hydrogeologic Map is drawn based on DGR GIS data ,and well data is arranged by DGR inventory data carried out with the compilation of 1:50000 map of North East Hydrology.

Appendix 3.9.3 Well and Hydrogeologic Information of Khong, Chi and Mun Basin



Well and Hydrologic Information (DGR 1999)

Infiltration



Groundwater Infiltration

- > 125 mm/year
- 125–150 mm/year
- 150–175 mm/year
- 175–200 mm/year
- <200 mm/year

1000 Isohyets of Rainfall (wet season)

Basin Boundary

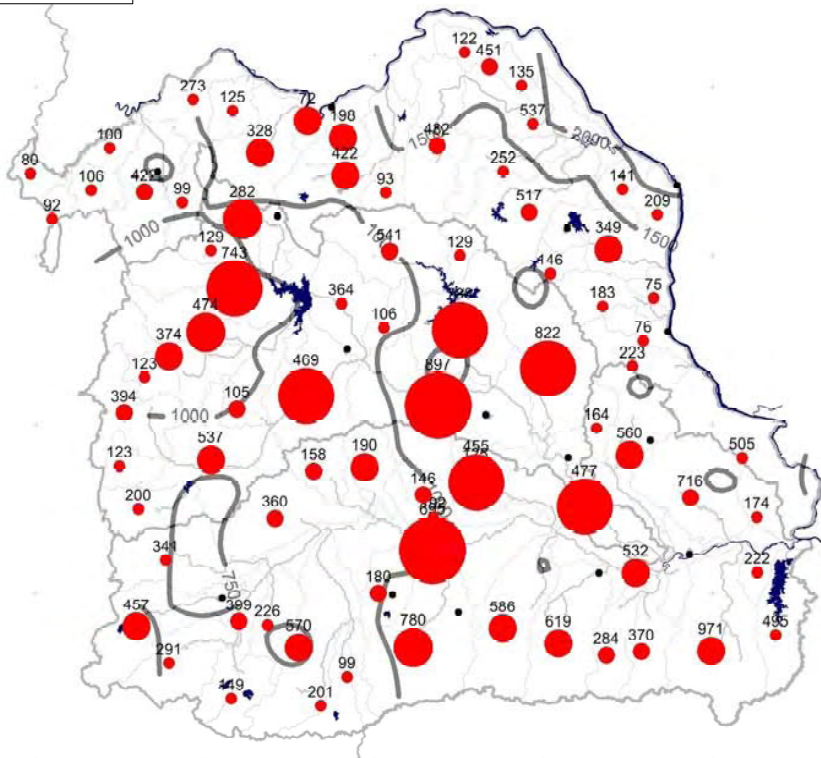
• Province Capital

— River

Water Body

Note: Groundwater Infiltration is estimated by Study team with referenced to area rainfall, DGR's basin-wide data and aquifer storage capacity.

Withdraw



Groundwater Withdraw

- > 3 MCM/year
- 3 – 7 MCM/year
- 7 – 10 MCM/year
- 10 – 13 MCM/year
- 13–17 MCM/year
- < 17 MCM/year

Note: Groundwater Withdrawal is estimated based on DGR's basin-wide data. The allocation for sub-basin is followed by density of wells.

Groundwater Infiltration and Withdrawal

Appendix 3.10.1 Government Agencies Practice in Water Resources Management

Ministry	Department	Responsibility
1. Ministry of Agriculture and Cooperatives	1.1 Royal Irrigation Department (RID) 1.2 Bureau of Royal Rainmaking and Agricultural Aviation 1.3 Department of Land Development	<ul style="list-style-type: none"> - Water resources development in the river basin by potentiality and equality - Efficient water management, equity and sustainable - Promotion of People's participations in the integrated water development and management - Protection of any water disaster - Rain making for national water resources management - Research and develop technology for weather control - Aviation service and communication for agriculture purposes - Study, survey, analyze and research soil and land use for policy making in land development for agriculture - Inspection and advisory for water, crop, fertilizer concerning land development - Technology transfer to other government agencies and farmers
2. Ministry of National Resources and Environment	2.1 Department of Water Resources (DWR)	<ul style="list-style-type: none"> - Policy making, master plan for water resources development, conservation, rehabilitation as well as solving of water crisis - Promotion of technology development, standard, criteria for water management and maintenance of water for domestic, industry and tourism - Monitoring network, evaluation in water resources development and management - Study, research and provision of hydrological mapping - Conservation and rehabilitation of natural water resources, in order to have more efficient storage and improvement of hydraulic structures - Promotion of people participation, water user group, and water resources management network

Government Agencies Practice in Water Resources Management (Cont'd)

Ministry	Department	Responsibility
	2.2 Department of Underground Water	<ul style="list-style-type: none"> - Policy and measures making concerning underground water resources - Survey, management, development, conservation, and rehabilitation of underground water resources - Conduct, coordinate, monitor, evaluate and problem solving for underground water resources
	2.3 Department of Pollution Control	<ul style="list-style-type: none"> - Policy making, master plan for promotion and maintenance of environmental quality, especially, pollution control - Conduct the environmental quality standard and pollution control standard for the point sources - Mitigation plan for environmental management, protective and problem solving for pollution control - Development of system, method for water quality, air and noise pollution
	2.4 Office of Natural Resources and Environmental Policy and Planning (ONEPP)	<ul style="list-style-type: none"> - Policy making for natural resources and environmental management - Coordinating and mitigation plan making for natural resources and environment - Study, analysis, coordinating and conduct measures for the issue of natural resources and environmental protection area - Environmental Impacts Assessment for the projects or activities of Government or private sector
3. Ministry of Interior	3.1 Department of Disaster Prevention and Mitigation	<ul style="list-style-type: none"> - Planning, Monitoring, Protecting and warning - Administration and action for emergency evacuation from the disaster area - Fundamental assistance for the victims - Rehabilitation of disaster area

Government Agencies Practice in Water Resources Management (Cont'd)

Ministry	Department	Responsibility
4. Ministry of Information and Communication Technology (ICT)	4.1 Department of Meteorology	<ul style="list-style-type: none"> - Weather forecasting - Promote the awareness of people in natural disaster, saving of life and reduce the natural disaster impacts - Information center, service center for national meteorology
5. Ministry of Industry	5.1 Department of Industrial Work (DIW)	<ul style="list-style-type: none"> - Management, directing the industrial business including, poisonous materials, productions, environment, safety - Promotion and information support for the knowledge of equipment, machine - Registration of industrial machine
6. State Enterprise	<p>6.1 Electric Generating Authority of Thailand (EGAT)</p> <p>6.2 Metropolitan Waterworks Authority (MWA)</p> <p>6.3 Provincial Waterworks Authority (PWA)</p> <p>6.4 Industrial Estate Authority of Thailand</p>	<ul style="list-style-type: none"> - Services for the qualitative energy with trust in fair price - Maintain equality of social welfare and environment - Water supply services with standard and quality - Survey and provision of raw water resources - Procuring and supply of water in metropolitan area and their perimeter (Nonthaburi, Samut Prakarn) - Conducting survey, providing sources of water and procuring raw water production - Producing, delivering and distribution water supply across the country except Bangkok Metropolitan area, Nonthaburi and Samut Prakarm province - Undertaking other business related to the continuation of water supply business - Provision of Industrial Estate Location - Support the private sector to conduct the industrial estate - Conduct the public services beneficiary in the industrial business - Promotion of private investment - Promotion of environmental management and protective solution for any disaster from industrial business

Existing Institutional Framework

The National Water Resources Committee (NWRC)¹ is a national level organization established under the office of Prime Minister's regulations on the National Water B.E. 2532. The committee is chaired by Prime Minister and consists of members who are appointed by Prime Minister. The committee comprises one Deputy Prime Minister assigned by the Prime Minister to be the chairman, ministers, permanent secretaries, directors-general, heads of state enterprises, representatives of water users organizations of all sectors, technical experts, qualified persons, representatives of non-government organizations etc. Director General of Water Resources Department of Water Resources is a member and the committee secretary. Deputy Director General of the Department of Water Resources as duly assigned and Director of Bureau of Water Resources Policy and Plan act as assistant secretaries.

Summary of NWRC Authority and Duties are as follow :

- 1) To submit to the Cabinet for approval of the objectives and policy on ensuring the availability of large, medium and small scale water resources to meet water demand of people;
- 2) To set guidelines and directives for government agencies, state enterprises and various organizations regarding formulation of plans or projects for water resources development of construction as well as coordination;
- 3) To scrutinize and approve plans, and to direct, control, supervise, and oversee implementation of plans and report its implementation in terms of water quantity and quality;
- 4) To consider and solve any urgent problems or impediments;
- 5) To prioritize water allocation and regulate the use of water from various sources to meet the requirements for consumption, hydropower generation, industry, agriculture, and others and also to report to the Cabinet; and
- 6) To propose to the Cabinet any introduction or revision of rules, regulations or laws relating to construction or development, control, prevention, and conservation of water resources and water quality

The structure of NWRC is presented in Figure 1 and related agencies is presented in Table 1

¹ Role in Thailand's Water Management, Department of Water Resources, 2008

Appendix 3.10.2 (1) Summary of DWR Expenditure Statement

Operating Expenditures	Department of Water Resources, Expenditure Statement (unit:baht)		
	Yr. 2006*	Yr.2007**	Yr.2008
Personnel expenditure	624,988,564.08	645,663,935.96	665,945,787.06
Pension expenditure	75,102,761.68	92,063,103.55	101,344,440.48
Training expenditure	36,713,740.29	37,839,835.41	30,157,240.29
Travelling expenditure	55,074,424.40	63,614,331.68	70,387,641.46
Logistic and accommodation expenditure	407,683,782.72	829,174,748.84	616,448,689.11
Public utility expenditures	34,741,935.95	31,490,246.49	15,506,712.65
Depreciation and disposal expenditures	110,398,663.77	187,919,397.13	262,001,400.44
Supporting expenditure	12,190,599.76	1,448,445,393.96	13,862,047.32
Other expenditures	40,693,747.48	48,719,818.43	6,807,920.62
Total	1,397,588,220.13	3,384,930,811.45	1,782,461,879.43

* as of September 2006

**as of September30,2007

***as of September 2008

sources : Annual Report, 2006,2007 and 2008. Department of water resources, Ministry of Natural Resources and Environment.

Appendix 3.10.2 (2)
Budget of Department of Water Resources on Fiscal year 2009

Items	Description	Budget	Ratio (%)
1.	Personnel	636,956,600	17.66%
2.	Operation	169,430,337	4.70%
3.	Investment	2,564,801,423	71.13%
4.	Government Grant	15,733,000	0.44%
5.	Other Expenses	218,919,804	6.07%
	<i>Total</i>	<i>3,605,841,164</i>	<i>100%</i>

Appendix 3.10.3 Budget for Fiscal Year 2009 (Royal Irrigation Department, MOAC)

Unit: Million Baht

Planning/Project	Personnel	Operation	Investment	Government Grant	Other Expenses	Grand Total
Plan: Water Resources Development and increase efficiency of Irrigation System						
- Irrigation Water Management	3,923.52	918.67	8,967.32	0.31	123.89	13,933.71
- Providing water source and increase irrigation area	1,727.02	121.18	11,293.69	0.22	19.34	13,161.45
- Supporting for development of Royal Project	144.71	22.58	386.04	-	-	553.33
- Protection and Disaster from Water	332.72	123.28	3,819.18	-	8.50	4,283.68
- Khlong Si Yat Project	11.20	1.40	234.32	-	-	246.92
- Khlong Tha Dan Project	30.32	3.29	49.92	-	-	83.53
- Pra-sae Project	13.30	1.90	252.84	-	-	268.04
- Khwae Noi Dam Project	13.78	9.75	749.10	-	-	772.63
- Tha Sae Project	13.83	2.10	190.91	-	-	206.84
- Kew Kho Mar Project, Lam Pang	9.92	4.41	310.50	-	-	324.83
- Suwannabhum Drainage Project	13.21	1.21	1,350.12	-	-	1,364.54
Plan: Rehabilitation and Promotion on Economic						
Construction and Development water resource for Agricultural Project	-	-	1,933.60	-	-	1,933.60
Grand Total	6,233.53	1,209.77	29,537.54	0.52	151.73	37,133.09

Appendix 3.10.4 RID Budget (Classification)

Budget Specify by Economical condition
Expenditure in fiscal year 2009
RID, MOAC

Work plan - Output/Project	Regular expenditure				Investment expenditure	
	Budget for employ staff	Operating statement	Subsidy	Others	Investment budget	All expense budget
Work plan : Water source development and irrigation system efficiency increase						
Output : Irrigation water management	✓	✓	✓	✓	✓	
Output : Water source providing and irrigation area increase	✓	✓	✓	✓	✓	
Output : To sustain the Development Project under the Royal initiative of His Majesty the King	✓	✓	✓	✓	✓	
Output : Flood protection and mitigation						✓
Project: Si Yad Canal Project						✓
Project: Tha Dan Dam Project under the Royal initiative of His Majesty the King, Nakhon Nayok						✓
Project: Pra Sae Project						✓
Project: Khwae Noi Dam Project under the Royal initiative of His Majesty the King						✓
Project: Tha Sae Project						✓
Project: Kiew Kho Mah Project, Lampang						✓
Project: Water drainage project in Suwannaphumi airport area						✓
Work plan: Rehabilitation and strengthening on economic confident						
Project: Agricultural water source development and implementation project						✓

Source: Budget document no. 6, Budget Bureau

Budget Specify by Economical condition
Expenditure in fiscal year 2008
RID, MOAC

Work plan - Output/Project	Regular expenditure				Investment expenditure	
	Budget for employ staff	Operating statement	Subsidy	Others	Investment budget	All expense budget
Budget plan: Adjustment on Agriculture, Industry, and Tourism Structure						
Service and Trading sector						
Output 1: Irrigation water management	✓	✓	✓	✓	✓	
Output 2: To sustain the Development Project under the Royal initiative of His Majesty the King	✓	✓	✓	✓	✓	
Budget plan: Water Resources Management						
Output 1: Water source providing and irrigation area increase	✓	✓	✓	✓	✓	
Output 2: Flood protection and mitigation						✓
Project 1: Si Yad Canal Project						✓
Project 2: Pasak Basin Development Project under the Royal initiative of His Majesty the King						✓
Project 3: Tha Dan Dam Project under the Royal initiative of His Majesty the King, Nakhon Nayok						✓
Project 4: Prasae Project						✓
Project 5: Tha Ramar Weir Project						✓
Project 6: Khwae Noi Dam Project under the Royal initiative of His Majesty the King						✓
Project 7: Tha Sae Project						✓
Project 8: Kiew Kho Mah Project, Lampang						✓
Project 9: Water drainage project in Suwannaphumi airport area						✓

Source: Budget document no. 6, Budget Bureau

Budget Specify by Economical condition
Expenditure in fiscal year 2007
RID, MOAC

Work plan - Output/Project	Regular expenditure				Investment expenditure	
	Budget for employ staff	Operating statement	Subsidy	Others	Investment budget	All expense budget
Budget plan: Adjustment on Agriculture Structure						
Output 1: Irrigation water management	✓	✓	✓	✓	✓	
Output 2: To sustain the Development Project under the Royal initiative of His Majesty the King	✓	✓	✓	✓	✓	
Budget plan: Water Resources Systemable Management						
Output 1: Water source providing and irrigation area increase	✓	✓	✓	✓	✓	
Output 2: Flood protection and mitigation						✓
Project 1: Si Yad Canal Project						✓
Project 2: Pasak Basin Development Project under the Royal initiative of His Majesty the King						✓
Project 3: Tha Dan Dam Project under the Royal initiative of His Majesty the King, Nakhon Nayok						✓
Project 4: Prasae Project						✓
Project 5: Tha Ramar Weir Project						✓
Project 6: Khwae Noi Dam Project under the Royal initiative of His Majesty the King						✓
Project 7: Tha Sae Project						✓
Project 8: Kiew Kho Mah Project, Lampang						✓
Project 9: Water drainage project in Suwannaphumi airport area						✓

Source: Budget document no. 6, Budget Bureau

Appendix 3.10.5 (1) RID Budget (Detail Average 2007-2009)
 Expenditure status in GFMS System by Economical condition - Provincial group - Provincial finance
 Average of Fiscal year 2007 -2009
 RID, MOAC

Code	Provincial finance	Regular expenditure	Irrigation water management	Water source providing and irrigation area increasing			To sustain the Development Project under the Royal initiative of His Majesty the King	Flood protection and Mitigation	Total	Grand Total
				Small and Medium Scale	Large Scale	Investment Expenditure				
	Grand total	7,101,348,927	8,165,026,326	10,876,486,679	5,567,739,668	279,962,357	3,516,253,728	28,405,468,757	35,506,484,351	
	Comptroller General's Department	5,929,453,338	460,958,315	498,678,532	335,243,424	3,793,600	616,361,272	1,915,035,143	7,844,488,481	
	Northern regional group	225,570,155	1,392,919,794	2,989,842,640	1,387,302,908	227,320,567	675,265,012	6,672,650,922	6,898,221,077	
	Upper Northern provincial group	117,718,996	706,556,206	874,083,870	271,031,327	216,230,833	148,824,029	2,216,726,265	2,334,445,261	
	Lower Northern provincial group	107,851,159	686,363,589	2,115,758,770	1,116,271,581	11,089,733	526,440,984	4,455,924,657	4,563,775,816	
	Central regional group	415,717,580	2,840,635,340	2,610,086,775	3,260,489,775	1,477,107	1,282,727,125	9,995,416,121	10,411,133,701	
	Upper central provincial group	263,294,824	1,318,578,338	358,405,014	164,142,806	-	635,671,019	2,476,797,177	2,740,092,001	
	Lower central provincial group	152,422,756	1,522,057,002	2,251,681,761	3,096,346,969	1,477,107	647,056,105	7,518,618,944	7,671,041,700	
	Eastern regional group	46,930,183	227,116,374	714,867,113	512,665,161	20,000	104,272,160	1,558,940,808	1,605,870,991	
	Northeastern regional Group	324,452,348	1,948,616,080	2,511,267,902	-	28,138,483	537,728,174	5,025,750,640	5,350,202,988	
	Upper Northeastern Provincial Group	177,798,414	956,456,612	1,433,538,119	-	28,138,483	332,814,947	2,750,948,161	2,928,746,575	
	4100 Udon Thani	50,704,548	82,128,884	158,813,054	-	339,567	14,815,800	256,097,305	306,801,853	
	3900 Non Bua Lam Phu	984,167	10,471,133	26,700,576	-	-	5,742,333	42,914,042	43,231,542	
	4300 Nong Khai	6,953,795	39,225,839	83,736,613	-	-	14,287,142	137,249,594	144,203,388	
	4200 Loei	1,042,750	24,481,127	59,426,557	-	-	9,259,067	93,166,751	94,209,501	
	4900 Mukdahan	839,388	23,774,034	56,214,488	-	-	1,007,500	87,729,355	88,568,742	
	4700 Sakon Nakhon	18,769,756	139,749,618	179,622,023	-	27,665,583	7,277,000	354,314,225	373,083,981	
	4600 Kalasin	4,620,761	51,183,477	426,900,078	-	33,333	40,264,687	518,381,575	523,002,336	
	4000 Khon Kaen	80,460,197	146,339,334	133,247,714	-	33,333	17,647,722	297,234,769	377,694,966	
	4400 Maha Sarakham	3,711,329	141,340,978	111,120,046	-	-	17,295,331	269,756,355	273,467,685	
	4500 Roi Et	4,912,090	165,628,560	70,925,353	-	66,667	42,564,388	279,184,967	284,097,058	
	Lower Northeastern Provincial Group	146,653,934	992,159,469	1,077,729,783	-	-	204,913,227	2,274,802,479	2,421,456,413	
	3000 Nakhon Ratchasima	60,444,041	274,473,063	379,772,288	-	-	19,089,207	673,334,558	733,778,599	
	3600 Chaiyaphum	2,570,931	109,074,721	40,547,571	-	-	3,009,000	152,631,292	155,202,223	
	3100 Buriram	7,242,080	109,931,041	172,832,404	-	-	149,589,947	432,353,392	439,595,472	
	3200 Surin	4,708,634	90,161,649	68,441,127	-	-	19,601,867	178,204,643	182,913,277	
	3400 Ubon Ratchathani	61,804,630	287,317,245	140,656,045	-	-	6,447,774	434,441,063	496,245,693	
	3700 Amnat Charoen	1,658,940	41,920,507	88,437,694	-	-	5,442,000	135,800,201	137,459,141	
	3300 Si Sa Ket	3,257,697	52,332,175	152,978,215	-	-	1,388,433	206,697,823	209,955,520	
	3500 Yasothon	4,966,982	26,950,067	34,064,440	-	-	325,000	61,339,507	66,306,489	
	Southern regional group	159,225,323	1,294,780,423	1,551,743,717	72,038,399	19,212,600	299,899,985	3,237,675,124	3,396,900,446	
	Southern provincial group	76,135,449	521,503,405	1,064,657,404	72,038,399	19,142,267	164,913,052	1,842,254,527	1,918,389,975	
	Southern provincial group in border	83,089,874	773,277,018	487,086,313	-	70,333	134,986,933	1,395,420,597	1,478,510,471	

Appendix 3.10.5 (2) RID Budget (Detail 2007)

Expenditure status in GFMS System by Economical condition - Provincial group - Provincial finance
Fiscal year 2007
RID, MOAC

Code	Provincial group - finance		Regular expenditure	Irrigation water management	Water source providing and irrigation area increasing			Investment Expenditure		Flood protection and Mitigation	Total	Grand Total
	Provincial finance	Grand total			Small and Medium Scale	Large Scale	To sustain the Development Project under the Royal initiative of His Majesty the King					
Comptroller General's Department		7,114,224,094	6,034,758,678	7,141,432,542	8,639,495,111	491,314,703	8,046,528,160	190,988,248	5,547,900	2,694,474,941	26,712,919,002	33,827,143,096
Northern regional group		202,505,126	106,665,268	1,294,783,826	2,757,031,632	730,779,876	1,730,142,000	152,122,348	136,945,348	577,133,631	6,511,213,437	6,713,718,563
Upper Northern provincial group		95,839,858	619,281,112	675,502,714	2,026,251,756	1,452,214,300	1,452,214,300	15,177,000	15,177,000	451,912,731	4,564,836,899	2,053,041,806
Lower Northern provincial group		399,231,487	248,467,068	2,486,145,894	1,333,855,301	197,565,963	5,361,993,796	400,000	-	1,199,796,325	10,382,191,316	10,781,422,803
Upper central provincial group		130,764,419	1,337,229,442	1,148,916,452	1,136,289,338	5,059,181,796	302,812,000	400,000	-	639,293,540	2,288,587,955	2,557,055,023
Lower central provincial group		44,383,978	265,546,119	1,337,229,442	630,429,740	5,059,181,796	5,059,181,796	-	-	560,502,785	8,093,603,361	8,224,367,780
Eastern regional group		294,509,903	169,082,974	1,589,540,916	2,137,736,131	1,168,807,952	-	26,530,200	26,530,200	168,032,300	3,921,839,547	4,216,349,450
Upper Northeastern Provincial Group		48,733,268	828,943,701	93,151,817	1,168,807,952	197,180,066	-	256,800	256,800	114,507,200	2,138,789,053	2,307,872,027
4100 Udon Thani		897,900	4,070,900	17,243,342	45,675,932	17,243,342	-	-	-	210,000	21,524,242	381,132,851
3900 Non Bua Lam Phu		643,400	32,329,100	28,838,985	45,675,932	45,675,932	-	-	-	22,991,000	97,505,917	103,482,387
4300 Nong Khai		721,650	2,275,300	2,275,300	49,192,100	49,192,100	-	-	-	23,540,600	101,087,145	101,730,545
4200 Loei		15,263,071	146,172,110	146,172,110	170,456,295	170,456,295	-	-	-	1,950,000	73,617,400	74,339,050
4900 Mukdahan		4,240,000	50,524,050	50,524,050	262,223,358	262,223,358	-	-	-	4,511,000	347,012,805	362,275,876
4700 Sakon Nakhon		3,302,904	68,055,600	68,055,600	173,638,285	173,638,285	-	-	-	6,435,000	319,282,408	323,522,408
4600 Kalasin		82,689,178	125,376,135	125,376,135	75,599,811	75,599,811	-	-	-	1,449,700	243,243,585	246,546,489
4000 Khon Kaen		4,065,333	119,864,234	119,864,234	47,646,299	47,646,299	-	-	-	1,238,800	202,214,746	284,903,924
4400 Maha Sarakham		2,550,400	138,065,470	138,065,470	84,735,019	84,735,019	-	-	-	8,930,200	176,440,733	180,506,066
4500 Roi Et		125,426,929	54,434,420	760,597,215	968,928,179	968,928,179	-	-	-	1,440,000	224,460,489	227,010,889
Lower Northeastern Provincial Group		1,262,400	65,311,360	65,311,360	380,576,700	380,576,700	-	-	-	53,525,100	1,783,050,494	1,908,477,423
3000 Nakhon Ratchasima		7,281,704	93,106,063	93,106,063	182,784,408	182,784,408	-	-	-	11,249,120	608,540,470	662,974,890
3600 Chaiyaphum		3,084,655	37,115,060	37,115,060	42,560,970	42,560,970	-	-	-	34,454,080	102,373,856	103,636,256
3100 Buriram		50,672,150	279,737,038	279,737,038	72,076,694	72,076,694	-	-	-	-	310,344,551	317,626,255
3200 Surin		1,001,200	26,282,150	26,282,150	63,249,570	63,249,570	-	-	-	1,994,000	353,807,732	404,479,882
3400 Ubon Ratchathani		1,780,900	17,801,018	17,801,018	179,349,041	179,349,041	-	-	-	2,963,000	92,494,720	93,495,920
3700 Amnat Charoen		5,909,500	24,529,876	24,529,876	11,268,300	11,268,300	-	-	-	2,864,900	200,014,959	201,795,859
3300 Si Sa Ket		138,834,922	1,048,788,758	1,048,788,758	1,289,127,604	1,289,127,604	97,276,800	6,387,800	203,112,738	94,782,800	1,733,000,913	1,795,813,572
3500 Yasothon		76,022,263	549,222,889	549,222,889	253,928,960	253,928,960	-	-	-	211,000	911,692,787	987,715,050
Southern regional group		138,834,922	1,048,788,758	1,048,788,758	1,289,127,604	1,289,127,604	97,276,800	6,387,800	203,112,738	94,782,800	2,644,693,700	2,783,528,622
Southern provincial group		62,812,659	499,565,869	499,565,869	1,036,198,644	1,036,198,644	97,276,800	6,176,800	6,176,800	94,782,800	1,733,000,913	1,795,813,572
Southern provincial group in border		76,022,263	549,222,889	549,222,889	253,928,960	253,928,960	-	-	-	211,000	911,692,787	987,715,050

Appendix 3.10.5 (3) RID Budget (Detail 2008)
 Expenditure status in GFMS System by Economical condition - Provincial condition - Provincial finance
 Fiscal year 2008
 RID, MOAC

Code	Provincial finance	Regular expenditure	Irrigation water management	Water source providing and irrigation area increasing			To sustain the Development Project under the Royal initiative of His Majesty the King	Flood protection and Mitigation	Total	Grand Total
				Small and Medium Scale	Large Scale					
	Grand total	7,047,230,481	8,023,983,759	11,148,937,407	5,410,733,485	268,058,942	3,661,521,427	28,513,235,020	35,560,465,500	
	Comptroller General's Department	5,933,784,882	436,770,069	538,111,713	203,699,079	5,547,900	657,439,931	1,841,568,692	7,775,353,574	
	Northern regional group	217,627,383	1,371,833,751	3,106,780,937	1,588,000,499	227,932,142	710,777,313	7,005,324,642	7,222,952,025	
	Upper Northern provincial group	112,378,454	700,540,227	1,012,399,110	215,569,400	217,334,142	161,198,160	2,307,041,039	2,419,419,493	
	Lower Northern provincial group	105,248,929	671,293,524	2,094,381,827	1,372,431,099	10,598,000	549,579,153	4,698,283,603	4,803,532,532	
	Central regional group	398,922,970	2,920,117,605	3,005,007,358	2,912,501,624	-	1,454,803,497	10,292,430,084	10,691,353,053	
	Upper central provincial group	255,398,514	1,362,537,297	397,514,956	189,616,417	-	598,268,456	2,547,937,126	2,803,335,640	
	Lower central provincial group	143,524,456	1,557,580,308	2,607,492,402	2,722,885,207	-	856,535,041	7,744,492,958	7,888,017,413	
	Eastern regional group	41,080,329	205,335,341	565,824,664	641,295,983	-	87,380,900	1,499,836,888	1,540,917,217	
	Northeastern regional group	303,590,398	1,815,160,564	2,527,903,873	-	28,723,900	503,330,461	4,875,018,798	5,178,609,196	
	Upper Northeastern Provincial Group	164,930,024	973,085,202	1,319,116,697	-	28,723,900	54,472,300	2,375,398,099	2,540,328,123	
	4100 Udon Thani	49,409,406	90,072,740	132,516,242	-	505,100	420,100	223,514,182	272,923,588	
	3900 Non Bua Lam Phu	865,700	17,456,800	23,345,800	-	-	17,017,000	57,819,600	56,685,300	
	4300 Nong Khai	7,188,983	45,108,378	50,720,100	-	-	1,606,600	95,828,478	103,017,461	
	4200 Loei	611,700	15,601,624	52,730,500	-	-	69,938,724	70,550,424	70,550,424	
	4900 Mukdahan	715,523	35,779,783	35,122,741	-	-	585,000	71,487,524	72,203,047	
	4700 Sakon Nakhon	16,614,374	137,711,655	137,491,474	-	28,218,800	1,613,000	305,034,929	321,649,303	
	4800 Nakhon Phanom	3,746,500	47,374,073	437,306,674	-	-	8,459,000	493,139,747	496,886,247	
	4600 Kalasin	3,439,200	60,215,249	145,824,117	-	-	2,869,685	208,909,051	212,348,251	
	4000 Khon Kaen	75,635,730	149,418,611	154,627,980	-	-	1,021,315	305,067,906	380,703,636	
	4400 Maha Sarakham	3,588,637	166,282,273	113,005,147	-	-	1,907,500	281,194,920	284,783,557	
	4500 Roi Et	3,114,271	208,064,016	36,425,922	-	-	18,973,100	263,463,038	266,577,309	
	Lower Northeastern Provincial Group	138,660,374	842,075,362	1,208,687,176	-	-	448,858,161	2,499,620,699	2,638,281,073	
	3000 Nakhon Ratchasima	57,385,932	284,578,315	558,153,079	-	-	4,115,700	846,847,094	904,233,026	
	3600 Chaiyaphum	2,317,185	91,722,982	26,252,026	-	-	-	117,975,008	120,292,193	
	3100 Buriram	8,591,781	110,072,532	204,279,636	-	-	410,289,461	724,641,629	733,233,410	
	3200 Surin	4,419,793	82,311,718	78,825,508	-	-	28,304,200	189,441,426	193,861,219	
	3400 Ubon Ratchathani	54,868,126	187,917,855	97,591,782	-	-	5,208,400	290,718,037	345,586,163	
	3700 Amnat Charoen	1,694,619	26,325,047	74,225,995	-	-	-	100,551,042	102,245,661	
	3300 Si Sa Ket	2,052,284	35,674,845	135,076,803	-	-	940,400	171,689,048	173,741,332	
	3500 Yasothon	7,330,654	23,475,068	34,282,347	-	-	-	57,757,415	65,088,069	
	Southern regional group	152,224,519	1,274,766,429	1,405,408,862	65,236,300	5,855,000	247,789,325	2,999,055,916	3,151,280,435	
	Southern provincial group	77,956,689	456,987,511	917,693,629	65,236,300	5,855,000	153,917,400	1,599,689,840	1,677,646,529	
	Southern provincial group in border	74,267,830	817,778,918	487,715,233	-	-	93,871,925	1,399,366,076	1,473,633,906	

Appendix 3.10.5 (4) RID Budget (Detail 2009)
 Expenditure status in GFMS System by Econmical condition - Provincial condition - Provincial finance
 Fiscal year 2009
 RID, MOAC

Code	Provincial finance	Regular expenditure	Irrigation water managemnet	Water source providing and irrigation area increasing			To sustain the Development Project under the Royal initiative of His Majesty the King	Flood protection and Mitigation	Total	Grand Total
				Small and Medium Scale	Large Scale					
	Grand total	7,142,592,207	9,329,662,676	12,841,027,518	3,245,957,358	380,839,880	4,192,764,817	29,990,252,249	37,131,844,456	
	Comptroller General's Department	5,819,816,455	489,477,846	466,609,180	600,958,130	285,000	672,835,737	2,230,165,893	8,049,982,348	
	Northern regional group	256,577,955	1,512,141,806	3,105,715,352	843,766,226	301,907,210	737,884,093	6,501,414,687	6,757,992,642	
	Upper Northern provincial group	134,113,266	743,625,676	879,072,625	319,596,881	294,413,010	160,053,026	2,396,761,218	2,530,874,484	
	Lower Northern provincial group	122,464,689	768,516,130	2,226,642,727	524,169,345	7,494,200	577,831,067	4,104,653,469	4,227,118,158	
	Central regional group	448,998,284	3,115,642,520	3,491,397,666	1,506,973,904	4,031,320	1,193,581,552	9,311,626,962	9,760,625,246	
	Upper central provincial group	266,018,890	1,444,281,264	480,134,123	-	-	669,451,062	2,593,866,449	2,859,885,339	
	Lower central provincial group	182,979,394	1,671,361,256	3,011,263,543	1,506,973,904	4,031,320	524,130,490	6,717,760,513	6,900,739,907	
	Eastern regional group	55,326,243	210,467,662	948,346,934	240,657,000	60,000	197,843,781	1,597,375,377	1,652,701,620	
	Northeastern regional Group	375,256,743	2,441,146,761	2,868,263,702	-	29,161,350	941,821,762	6,280,393,575	6,655,650,318	
	Upper Northeastern Provincial Group	199,382,243	1,067,340,932	1,812,689,708	-	29,161,350	829,465,341	3,738,657,331	3,938,039,574	
	4100 Udon Thani	53,970,969	63,162,096	146,742,855	-	256,800	2,216,400	212,378,151	266,349,120	
	3900 Non Bua Lam Phu	1,189,500	9,885,700	39,512,585	-	-	-	49,398,285	50,587,785	
	4300 Nong Khai	7,695,931	43,730,154	154,813,806	-	-	19,870,426	218,414,386	226,110,317	
	4200 Loei	1,873,151	25,512,658	80,331,726	-	-	2,630,000	108,474,384	110,347,535	
	4900 Mukdahan	1,080,990	33,267,018	84,328,622	-	-	487,500	118,083,140	119,164,130	
	4700 Sakon Nakhon	24,431,822	135,365,090	230,918,301	-	28,904,550	15,707,000	410,894,941	435,326,763	
	4800 Nakhon Phanom	5,875,782	55,652,307	581,170,203	-	-	105,900,060	742,722,570	748,588,352	
	4600 Kalasin	7,656,796	247,930,035	61,032,448	-	-	483,642,548	792,605,031	800,261,827	
	4000 Khon Kaen	83,055,684	164,223,255	169,515,350	-	-	50,683,050	384,421,655	467,477,339	
	4400 Maha Sarakham	3,480,018	137,876,426	172,708,693	-	-	41,048,294	351,633,413	355,113,431	
	4500 Roi Et	9,071,600	150,736,193	91,615,119	-	-	107,280,063	349,631,375	358,702,975	
	Lower Northeastern Provincial Group	175,874,500	1,373,805,829	1,055,573,994	-	-	112,356,421	2,541,736,244	2,717,610,744	
	3000 Nakhon Ratchasima	69,511,770	322,126,225	200,587,085	-	-	41,902,800	564,616,110	634,127,880	
	3600 Chaiyaphum	4,133,209	170,189,820	58,328,191	-	-	9,027,000	237,545,011	241,678,220	
	3100 Buriram	5,852,754	126,614,529	131,433,168	-	-	4,026,300	262,073,997	267,926,751	
	3200 Surin	6,621,454	151,058,169	83,936,903	-	-	30,501,400	265,496,472	272,117,926	
	3400 Ubon Ratchathani	79,873,613	394,296,841	252,299,659	-	-	12,200,921	658,797,421	738,671,034	
	3700 Amnat Charoen	2,281,000	73,154,325	127,837,516	-	-	13,363,000	214,354,841	216,635,841	
	3300 Si Sa Ket	5,939,908	103,520,662	144,508,800	-	-	360,000	248,389,462	254,329,370	
	3500 Yasothon	1,660,792	32,845,258	56,642,672	-	-	975,000	90,462,930	92,123,722	
	Southern regional group	186,616,527	1,560,786,081	1,960,694,684	53,602,098	45,395,000	448,797,892	4,069,275,755	4,255,892,282	
	Southern provincial group	87,636,998	607,956,834	1,241,079,939	53,602,098	45,395,000	246,038,956	2,194,072,827	2,281,709,825	
	Southern provincial group in border	98,979,529	952,829,247	719,614,745	-	-	202,758,936	1,875,202,928	1,974,182,457	

Appendix 3.10.6 National Water Resource Committee

1. Major General Sanan Khachornprasart Vice Prime Minister	Chairman
2. Mr. Suwit Khunkitti Minister, Ministry of Natural Resources and Environment	Vice-chairman
3. Mr. Theera Wongsamut Minister, Ministry of Agriculture and Cooperatives	Vice-chairman
4. Mr. Woottipong Chaiseang Minister, Ministry of Science and Technology	Vice-chairman
5. Permanent Secretary, Ministry of Agriculture and Cooperatives	Committee
6. Permanent Secretary, Ministry of Transport	Committee
7. Permanent Secretary, Ministry of Natural Resources and Environment	Committee
8. Permanent Secretary, Ministry of Science and Technology	Committee
9. Permanent Secretary, Ministry of Energy	Committee
10. Permanent Secretary, Ministry of Interior	Committee
11. Permanent Secretary, Ministry of Industry	Committee
12. Director general of Bureau of the Budget	Committee
13. The Secretariat of Office of The National Economic and Social Development Board	Committee
14. Director General of Royal Irrigation Department	Committee
15. Director General of Department of Groundwater Resources	Committee
16. Mr. Jetsada Kaewkallaya	Committee
17. Mr. Chana Rungsaeng	Committee
18. Mr. Nipon Tangthum	Committee
19. Mr. Mingsan Kaosa-ard	Committee
20. Mr. Santi Bang-or	Committee
21. Mr. Suphat wongwisetsomjai	Committee
22. Mr. Aphichart Anukulamphai	Committee
23. Mr. Siripong Hangsapuk Director General, Department of Water Resource	Committee Secretariat
24. Vice-director, Royal Irrigation Department	Assistant to Committee Secretariat
25. Mr. Surapol Pattani Vice-director, Department of Water Resources	Assistant to Committee Secretariat
26. Director, Bureau of Water Resources Planning and Policy	Assistant to Committee Secretariat

Additional Committee (Mar.2009)

Representative Government

- | | |
|--|-----------|
| 1. Permanent Secretary, Ministry of Information and Communication Technology | Committee |
| 2. Director General, Department of Disaster Prevention and Mitigation | Committee |

Experts

- | | |
|---|-----------|
| 1. Delegate of Provincial Administration Organization of Thailand | Committee |
| 2. Delegate of Sub district Administration Organization of Thailand | Committee |
| 3. Delegate of the National Municipal League of Thailand | Committee |
| 4. Delegation of River Basin Committee 9 persons | Committee |

4.1 Mr. Suriya Maked

Committee of Ping river basin, Agricultural sector representative, Tak

4.2 Mr. Virot Rimchan

Committee of Kok and Khong river basin, Agricultural sector representative, Chiang rai

4.3 Mr. Apichat Srisawat

Committee of Khong river basin(NE),
Representative of Commercial Service and Tourism sector, Mukdahan

4.4 Mr. Nimit Ngamyingsaisan

Committee of Chi river basin, Industrial sector representative, Kalasin

4.5 Mr. Winai Rungrittidet

Committee of Mae Klong river basin,
Representative of Commercial Service and Tourism sector, Samut Songkram

4.6 Asst.Prof. Charoen Piyarom

Committee of East Coast river basin
Agricultural sector representative, Chanthaburi

4.7 Mr. Somphop Somapha

Committee of Pa-sak river basin
Representative of Commercial Service and Tourism sector, Lop buri

4.8 Mr. Jirawut Jiraphongchan

Committee of Pattani river basin
Representative of Commercial Service and Tourism sector, Yala

4.9 Mr. Kraiwan Ackarakul

Committee of SE river basin
Agricultural sector representative, Nakhon Sritammarat

Existing Institutional Framework

The National Water Resources Committee (NWRC)¹ is a national level organization established under the office of Prime Minister's regulations on the National Water B.E. 2532. The committee is chaired by Prime Minister and consists of members who are appointed by Prime Minister. The committee comprises one Deputy Prime Minister assigned by the Prime Minister to be the chairman, ministers, permanent secretaries, directors-general, heads of state enterprises, representatives of water users organizations of all sectors, technical experts, qualified persons, representatives of non-government organizations etc. Director General of Water Resources Department of Water Resources is a member and the committee secretary. Deputy Director General of the Department of Water Resources as duly assigned and Director of Bureau of Water Resources Policy and Plan act as assistant secretaries.

Summary of NWRC Authority and Duties are as follow :

- 1) To submit to the Cabinet for approval of the objectives and policy on ensuring the availability of large, medium and small scale water resources to meet water demand of people;
- 2) To set guidelines and directives for government agencies, state enterprises and various organizations regarding formulation of plans or projects for water resources development of construction as well as coordination;
- 3) To scrutinize and approve plans, and to direct, control, supervise, and oversee implementation of plans and report its implementation in terms of water quantity and quality;
- 4) To consider and solve any urgent problems or impediments;
- 5) To prioritize water allocation and regulate the use of water from various sources to meet the requirements for consumption, hydropower generation, industry, agriculture, and others and also to report to the Cabinet; and
- 6) To propose to the Cabinet any introduction or revision of rules, regulations or laws relating to construction or development, control, prevention, and conservation of water resources and water quality

The structure of NWRC is presented in Figure 1 and related agencies is presented in Table 1

¹ Role in Thailand's Water Management, Department of Water Resources, 2008

Appendix 3.10.8 River Basin Organization, National and Basin Levels



Appendix 3.10.9 River Basin Committee in Northeast

1) Khong river basin Committee

1. Advisor

- 1) Governor, Nong Bua Lam Phu
- 2) Governor, Amnat Charoen

2. Committee

- | | |
|--|-----------------------|
| 1) Governor, Udon Thani | Committee |
| 2) Governor, Nong Khai | Committee |
| 3) Governor, Loei | Committee |
| 4) Governor, Sakon Nakhon | Committee |
| 5) Governor, Nakhon Phanom | Committee |
| 6) Governor, Mukdahan | Committee |
| 7) Delegate, Royal Irrigation Department | Committee |
| 8) Delegate, Land Development Department | Committee |
| 9) Delegate, Marine Department | Committee |
| 10) Delegate, Office of the Permanent Secretary, Ministry of Natural-
Resources and Environment | Committee |
| 11) Delegate, Royal Forest Department | Committee |
| 12) Delegate, Department of Water Resources | Committee |
| 13) Delegate, Department of National Parks, Wildlife and Plant-
Conservation | Committee |
| 14) Delegate, Department of Disaster Prevention and Mitigation | Committee |
| 15) Delegation, Local Administration Organization, 3 persons | Committee |
| 16) Delegation, Agricultural Water user group , 4 persons | Committee |
| 17) Delegation, Industrial Water user group, 2 persons | Committee |
| 18) Delegation, Water user group for Commercial, Service and Tourism,
2 persons | Committee |
| 19) Experts 5 persons | Committee |
| 20) Director of Water Resources Regional Office 3 | Committee Secretariat |
| 21) Director of Coordination and Watershed management Section,
as assigned | Secretariat assistant |
| 22) Director of Coordination and Watershed management Section,
as assigned | Secretariat assistant |

2) Chi river basin Committee

1. Committee

- | | |
|--|-----------------------|
| 1) Governor, Chaiyaphum | Committee |
| 2) Governor, Khon Kaen | Committee |
| 3) Governor, Nong Bua Lam Phu | Committee |
| 4) Governor, Maha Sarakham | Committee |
| 5) Governor, Kalasin | Committee |
| 6) Governor, Roi Et | Committee |
| 7) Governor, Yasothon | Committee |
| 8) Delegate, Royal Irrigation Department | Committee |
| 9) Delegate, Land Development Department | Committee |
| 10) Delegate, Department of Agricultural Extension | Committee |
| 11) Delegate, Office of the Permanent Secretary, Ministry of Natural-
Resources and Environment | Committee |
| 12) Delegate, Royal Forest Department | Committee |
| 13) Delegate, Department of Water Resources | Committee |
| 14) Delegate, Department of National Parks, Wildlife and Plant-
Conservation | Committee |
| 15) Delegate, Department of Disaster Prevention and Mitigation | Committee |
| 16) Delegate, Electricity Generating Authority of Thailand | Committee |
| 17) Delegation, Local Administration Organization, 3 persons | Committee |
| 18) Delegation, Agricultural Water user group , 4 persons | Committee |
| 19) Delegation, Industrial Water user group, 2 persons | Committee |
| 20) Delegation, Water user group for Commercial, Service and Tourism,
2 persons | Committee |
| 21) Experts 5 persons | Committee |
| 22) Director of Water Resources Regional Office 4 | Committee Secretariat |
| 23) Director of Coordination and Watershed management Section,
as assigned | Secretariat assistant |
| 24) Director of Coordination and Watershed management Section,
as assigned | Secretariat assistant |

3) Mun river basin Committee

1. Advisor

- 1) Governor, Chaiyaphum
- 2) Governor, Khon Kaen
- 3) Governor, Maha Sarakham
- 4) Governor, Roi Et
- 5) Governor, Yasothon

2. Committee

- | | |
|--|-----------------------|
| 1) Governor, Nakhon Ratchasima | Committee |
| 2) Governor, Buri ram | Committee |
| 3) Governor, Surin | Committee |
| 4) Governor, Sisaket | Committee |
| 5) Governor, Ubon Ratchathani | Committee |
| 6) Governor, Amnat Charoen | Committee |
| 7) Delegate, Royal Irrigation Department | Committee |
| 8) Delegate, Land Development Department | Committee |
| 9) Delegate, Marine Department | Committee |
| 10) Delegate, Office of the Permanent Secretary, Ministry of Natural-
Resources and Environment | Committee |
| 11) Delegate, Department of Water Resources | Committee |
| 12) Delegate, Department of Groundwater Resources | Committee |
| 13) Delegate, Department of National Parks, Wildlife and Plant-
Conservation | Committee |
| 14) Delegate, Department of Disaster Prevention and Mitigation | Committee |
| 15) Delegation, Local Administration Organization, 3 persons | Committee |
| 16) Delegation, Agricultural Water user group , 4 persons | Committee |
| 17) Delegation, Industrial Water user group, 2 persons | Committee |
| 18) Delegation, Water user group for Commercial, Service and Tourism,
2 persons | Committee |
| 19) Experts 5 persons | Committee |
| 20) Director of Water Resources Regional Office 5 | Committee Secretariat |
| 21) Director of Coordination and Watershed management Section,
as assigned | Secretariat assistant |
| 22) Director of Coordination and Watershed management Section,
as assigned | Secretariat assistant |

Appendix 3.10.10

Budget of River Basin Committee

Process Plan for River Basin Management, Fiscal year 2552
Khong Basin section 2, First transfer 500,000 baht

Activity	Target	Detail/Requirements
Management process of 25 main river basin committee 1. River basin committee management 1.1 Coordinate and office Administrative 1.2 Watershed Committee meeting 1.3 Watershed Committee meeting.... 1.4 River basin working group provincial level meeting 1.5 Workshop for setting river basin working group branch 1.6 Working group meeting for setting Strategy and plan 1.7 setting new network of new sub basin 1.8 Support exist network	1 office 3 times 3 times 2 times 1 time 3 times 2 network 12networks	-together with Khong Basin section 3 -to consider work plan/river basin project -process in the area of river basin branch at lease 1 sub basin -meeting with working group of river basin branch for setting strategy and collecting sub basin information. -in sub basin assigned in yr.2552
2. Developing tool for water resources management 2.1 Work shop for management plan and development basin 2.2 Training for basic knowledge of project planning, development and conservation 2.3 Training of registering small scale water resources	3 times 1 time 1 time of each province	-main river basin -in river sub basin of pilot area -SAO in main basin each province
3. Support Participation 3.1 Setting Strategy and Management plan by Publish hearing 3.2 Public relation 3.3 Conservation and developing river, canal by people participate	3 times issue/copy 4 province, 4 places	-in sub basin assigned in yr.2552 -Publishing newsletters and brochures -within September 20,2552. with report and other print material.

Process Plan for River Basin Management, Fiscal year 2552
Khong Basin section 3, First transfer 500,000 baht

Activity	Target	Detail/Requirements
<p>Management process of 25 main river basin committee</p> <p>1. River basin committee management</p> <p>1.1 Coordinate and office Administrative</p> <p>1.2 Watershed Committee meeting</p> <p>1.3 Watershed Committee meeting....</p> <p>1.4 River basin working group provincial level meeting</p> <p>1.5 Workshop for setting river basin working group branch</p> <p>1.6 Working group meeting for setting Strategy and plan</p> <p>1.7 setting new network of new sub basin</p> <p>1.8 Support exist network</p>	<p>1 office</p> <p>3 times</p> <p>3 times</p> <p>2 times</p> <p>1 time</p> <p>3 times</p> <p>2 network</p> <p>12networks</p>	<p>-together with Khong Basin section 2 (section2 budget)</p> <p>- Khong Basin section2 budget</p> <p>-to consider work plan/river basin project (section2 budget)</p> <p>-process in the area of river basin branch at lease 1 sub basin</p> <p>-meeting with working group of river basin branch for setting strategy and collecting sub basin information.</p> <p>-in sub basin assigned in yr.2552</p>
<p>2. Developing tool for water resources management</p> <p>2.1 Work shop for management plan and development basin</p> <p>2.2 Training for basic knowledge of project planning, development and conservation</p> <p>2.3 Training of registering small scale water resources</p>	<p>3 times</p> <p>1 time</p> <p>1 time of each province</p>	<p>-main river basin(section2 budget)</p> <p>-in river sub basin of pilot area</p> <p>-SAO in main basin each province</p>
<p>3. Support Participation</p> <p>3.1 Setting Strategy and Management plan by Publish hearing</p> <p>3.2 Public relation</p> <p>3.3 Conservation and developing river, canal by people participate</p>	<p>3 times</p> <p>issue/copy</p> <p>4 province,</p> <p>4 places</p>	<p>-in sub basin assigned in yr.2552</p> <p>-Publishing newsletters and brochures</p> <p>-within September 20,2552. with report and other print material.</p>

Process Plan for River Basin Management, Fiscal year 2552
Upper Chi Basin, First transfer 500,000 baht

Activity	Target	Detail/Requirements
<p>Management process of 25 main river basin committee</p> <p>1. River basin committee management</p> <p>1.1 Coordinate and office Administrative</p> <p>1.2 Watershed Committee meeting</p> <p>1.3 Watershed Committee meeting....</p> <p>1.4 River basin working group provincial level meeting</p> <p>1.5 Workshop for setting river basin working group branch</p> <p>1.6 Working group meeting for setting Strategy and plan</p> <p>1.7 setting new network of new sub basin</p> <p>1.8 Support exist network</p>	<p>1 office</p> <p>3 times</p> <p>3 times</p> <p>2 times</p> <p>1 time</p> <p>3 times</p> <p>2 network</p> <p>12networks</p>	<p>-together with Lower Chi Basin</p> <p>-to consider work plan/river basin project</p> <p>-process in the area of river basin branch at lease 1 sub basin</p> <p>-meeting with working group of river basin branch for setting strategy and collecting sub basin information.</p> <p>-in sub basin assigned in yr.2552</p>
<p>2. Developing tool for water resources management</p> <p>2.1 Work shop for management plan and development basin</p> <p>2.2 Training for basic knowledge of project planning, development and conservation</p> <p>2.3 Training of registering small scale water resources</p>	<p>3 times</p> <p>1 time</p> <p>1 time of each province</p>	<p>-main river basin</p> <p>-in river sub basin of pilot area</p> <p>-SAO in main basin each province</p>
<p>3. Support Participation</p> <p>3.1 Setting Strategy and Management plan by Publish hearing</p> <p>3.2 Public relation</p> <p>3.3 Conservation and developing river, canal by people participate</p>	<p>3 times</p> <p>issue/copy</p> <p>3 province,</p> <p>3 places</p>	<p>-in sub basin assigned in yr.2552</p> <p>-Publishing newsletters and brochures</p> <p>-within September 20,2552. with report and other print material.</p>

Process Plan for River Basin Management, Fiscal year 2552
Lower Chi Basin, First transfer 500,000 baht

Activity	Target	Detail/Requirements
Management process of 25 main river basin committee 1. River basin committee management 1.1 Coordinate and office Administrative 1.2 Watershed Committee meeting 1.3 Watershed Committee meeting.... 1.4 River basin working group provincial level meeting 1.5 Workshop for setting river basin working group branch 1.6 Working group meeting for setting Strategy and plan 1.7 setting new network of new sub basin 1.8 Support exist network	1 office 3 times 3 times 2 times 1 time 3 times 2 network 12networks	-together with Upper Chi Basin (Upper Chi Budget) - Upper Chi Basin Budget -to consider work plan/river basin project (Upper Chi Budget) -process in the area of river basin branch at lease 1 sub basin -meeting with working group of river basin branch for setting strategy and collecting sub basin information. -in sub basin assigned in yr.2552
2. Developing tool for water resources management 2.1 Work shop for management plan and development basin 2.2 Training for basic knowledge of project planning, development and conservation 2.3 Training of registering small scale water resources	3 times 1 time 1 time of each province	-main river basin (Upper Chi Budget) -in river sub basin of pilot area -SAO in main basin each province
3. Support Participation 3.1 Setting Strategy and Management plan by Publish hearing 3.2 Public relation 3.3 Conservation and developing river, canal by people participate	3 times issue/copy 3 province, 3 places	-in sub basin assigned in yr.2552 -Publishing newsletters and brochures -within September 20,2552. with report and other print material.

Process Plan for River Basin Management, Fiscal year 2552
Upper Mun Basin, First transfer 500,000 baht

Activity	Target	Detail/Requirements
Management process of 25 main river basin committee 1. River basin committee management 1.1 Coordinate and office Administrative 1.2 Watershed Committee meeting 1.3 Watershed Committee meeting.... 1.4 River basin working group provincial level meeting 1.5 Workshop for setting river basin working group branch 1.6 Working group meeting for setting Strategy and plan 1.7 setting new network of new sub basin 1.8 Support exist network	1 office 3 times 3 times 2 times 1 time 3 times 2 network 12networks	-together with Lower Mun Basin -to consider work plan/river basin project -process in the area of river basin branch at lease 1 sub basin -meeting with working group of river basin branch for setting strategy and collecting sub basin information. -in sub basin assigned in yr.2552
2. Developing tool for water resources management 2.1 Work shop for management plan and development basin 2.2 Training for basic knowledge of project planning, development and conservation 2.3 Training of registering small scale water resources	3 times 1 time 1 time of each province	-main river basin -in river sub basin of pilot area -SAO in main basin each province
3. Support Participation 3.1 Setting Strategy and Management plan by Publish hearing 3.2 Public relation 3.3 Conservation and developing river, canal by people participate	3 times issue/copy 3 province, 3 places	-in sub basin assigned in yr.2552 -Publishing newsletters and brochures -within September 20,2552. with report and other print material.

Process Plan for River Basin Management, Fiscal year 2552
Lower Mun Basin, First transfer 500,000 baht

Activity	Target	Detail/Requirements
<p>Management process of 25 main river basin committee</p> <p>1. River basin committee management</p> <p>1.1 Coordinate and office Administrative</p> <p>1.2 Watershed Committee meeting</p> <p>1.3 Watershed Committee meeting....</p> <p>1.4 River basin working group provincial level meeting</p> <p>1.5 Workshop for setting river basin working group branch</p> <p>1.6 Working group meeting for setting Strategy and plan</p> <p>1.7 setting new network of new sub basin</p> <p>1.8 Support exist network</p>	<p>1 office</p> <p>3 times</p> <p>3 times</p> <p>2 times</p> <p>1 time</p> <p>3 times</p> <p>2 network</p> <p>12networks</p>	<p>-together with Upper Mun Basin(Upper Mun Basin budget) (Upper Mun Basin budget)</p> <p>-to consider work plan/river basin project (Upper Mun Basin budget)</p> <p>-process in the area of river basin branch at lease 1 sub basin</p> <p>-meeting with working group of river basin branch for setting strategy and collecting sub basin information.</p> <p>-in sub basin assigned in yr.2552</p>
<p>2. Developing tool for water resources management</p> <p>2.1 Work shop for management plan and development basin</p> <p>2.2 Training for basic knowledge of project planning, development and conservation</p> <p>2.3 Training of registering small scale water resources</p>	<p>3 times</p> <p>1 time</p> <p>1 time of each province</p>	<p>-main river basin (Upper Mun Basin budget)</p> <p>-in river sub basin of pilot area</p> <p>-SAO in main basin each province</p>
<p>3. Support Participation</p> <p>3.1 Setting Strategy and Management plan by Publish hearing</p> <p>3.2 Public relation</p> <p>3.3 Conservation and developing river, canal by people participate</p>	<p>3 times</p> <p>issue/copy</p> <p>2 province,</p> <p>2 places</p>	<p>-in sub basin assigned in yr.2552</p> <p>-Publishing newsletters and brochures</p> <p>-within September 20,2552. with report and other print material.</p>

Process Plan for River Basin Management by River basin committee, Fiscal year 2553
Khong Basin section 2, First transfer 800,000 baht

Activity	Target	Detail/Requirements
<p>Management process of 25 main river basin committee</p> <p>1. River basin committee management</p> <p><u>Main Basin</u></p> <p>1.1 Coordinate and office Administrative</p> <p>1.2 Watershed Committee meeting</p> <ul style="list-style-type: none"> - River basin committee meeting - Sub committee meeting - River basin working gr. Meeting - Working gr. Of registering small scale water resources information <p><u>Sub basin</u></p> <p>1.3 Workshop for review of setting river basin committee (branch)</p> <p>1.4 River basin working group meeting</p> <p><u>Network</u></p> <p>1.5 Setting and Knowledge transfer to water user group (network)</p> <p>1.6 Water management project (existing network)</p>	<p>1 office</p> <p>4 times</p> <p>2-3 times</p> <p>2-3 times</p> <p>2-3 times</p> <p>1 time</p> <p>3 times each branch</p> <p>2 network</p> <p>5 networks</p>	<p>-together with Khlong section 3 Basin</p> <p>-sub committee meeting</p> <p>-meeting to consider work plan/project</p> <p>-process in the area of river basin branch</p> <p>-setting operation plan yr.53 for consider budget yr.54 and evaluate</p> <p>-existing project which not yet transferred to local</p>
<p>2. Developing tool for water resources management</p> <p>2.1 Work shop for management plan and Integrated development plan</p> <p>2.2 Training for water use, maintenance and management (For Transfer Project and SP2 yr.2555)</p>	<p>3 times</p> <p>Local administration &community</p>	<p>-main river basin(Planning Yr.54 and frame work yr.55-59)</p>
<p>3. Publish and Support People Participation</p> <p>3.1 Publish hearing in review and setting of water resources management plan (villager stage)</p> <p>3.2 Published, educate and create awareness of water resources</p> <p>3.3 Conservation and developing river, canal by people participate</p> <p>4. Publish hearing by Regulation of the Prime Minister yr.2548</p>	<p>1 time</p> <p>issue/copy</p> <p>1 province, 1 places</p> <p>3,000Baht/project</p>	<p>-in sub basin</p> <p>-Publishing newsletters and brochures</p> <p>-within conservation week with developing river, canal and report and other print material.</p> <p>-permitted target area</p>

Process Plan for River Basin Management by River basin committee, Fiscal year 2553
Khong Basin section 3, First transfer 800,000 baht

Activity	Target	Detail/Requirements
<p>Management process of 25 main river basin committee</p> <p>1. River basin committee management</p> <p><u>Main Basin</u></p> <p>1.1 Coordinate and office Administrative</p> <p>1.2 Watershed Committee meeting</p> <ul style="list-style-type: none"> - River basin committee meeting - Sub committee meeting - River basin working gr. Meeting - Working gr. Of registering small scale water resources information <p><u>Sub basin</u></p> <p>1.3 Workshop for review of setting river basin committee (branch)</p> <p>1.4 River basin working group meeting</p> <p><u>Network</u></p> <p>1.5 Setting and Knowledge transfer to water user group (network)</p> <p>1.6 Water management project (existing network)</p>	<p>1 office</p> <p>4 times</p> <p>2-3 times</p> <p>2-3 times</p> <p>2-3 times</p> <p>1 time</p> <p>3 times each branch</p> <p>2 network</p> <p>5 networks</p>	<p>-together with Khlong section 2 Basin(section2 budget)</p> <p>-sub committee meeting (section2 budget)</p> <p>-meeting to consider work plan/project</p> <p>-process in the area of river basin branch</p> <p>-setting operation plan yr.53 for consider budget yr.54 and evaluate</p> <p>-existing project which not yet transferred to local</p>
<p>2. Developing tool for water resources management</p> <p>2.1 Work shop for management plan and Integrated development plan</p> <p>2.2 Training for water use, maintenance and management (For Transfer Project and SP2 yr.2555)</p>	<p>3 times</p> <p>Local administration &community</p>	<p>-main river basin(Planning Yr.54 and frame work yr.55-59)</p>
<p>3. Publish and Support People Participation</p> <p>3.1 Publish hearing in review and setting of water resources management plan (villager stage)</p> <p>3.2 Published, educate and create awareness of water resources</p> <p>3.3 Conservation and developing river, canal by people participate</p> <p>4. Publish hearing by Regulation of the Prime Minister yr.2548</p>	<p>1 time</p> <p>issue/copy</p> <p>1 province, 1 places</p> <p>3,000Baht/project</p>	<p>-in sub basin</p> <p>-Publishing newsletters and brochures</p> <p>-within conservation week with developing river, canal and report and other print material.</p> <p>-permitted target area</p>

Process Plan for River Basin Management by River basin committee, Fiscal year 2553
Upper Chi Basin, First transfer 800,000 baht

Activity	Target	Detail/Requirements
Management process of 25 main river basin committee 1. River basin committee management <u>Main Basin</u> 1.1 Coordinate and office Administrative 1.2 Watershed Committee meeting - River basin committee meeting - Sub committee meeting - River basin working gr. Meeting - Working gr. Of registering small scale water resources information <u>Sub basin</u> 1.3 Workshop for review of setting river basin committee (branch) 1.4 River basin working group meeting <u>Network</u> 1.5 Setting and Knowledge transfer to water user group (network) 1.6 Water management project (existing network)	1 office 4 times 2-3 times 2-3 times 2-3 times 1 time 3 times each branch 2 network 5 networks	-together with Lower Chi Basin -sub committee meeting -meeting to consider work plan/project -process in the area of river basin branch -setting operation plan yr.53 for consider budget yr.54 and evaluate -existing project which not yet transferred to local
2. Developing tool for water resources management 2.1 Work shop for management plan and Integrated development plan 2.2 Training for water use, maintenance and management (For Transfer Project and SP2 yr.2555)	3 times Local administration &community	-main river basin(Planning Yr.54 and frame work yr.55-59)
3. Publish and Support People Participation 3.1 Publish hearing in review and setting of water resources management plan (villager stage) 3.2 Published, educate and create awareness of water resources 3.3 Conservation and developing river, canal by people participate 4. Publish hearing by Regulation of the Prime Minister yr.2548	1 time issue/copy 1 province, 1 places 3,000Baht/project	-in sub basin -Publishing newsletters and brochures -within conservation week with developing river, canal and report and other print material. -permitted target area

Process Plan for River Basin Management by River basin committee, Fiscal year 2553
Lower Chi Basin, First transfer 800,000 baht

Activity	Target	Detail/Requirements
Management process of 25 main river basin committee 1. River basin committee management <u>Main Basin</u> 1.1 Coordinate and office Administrative 1.2 Watershed Committee meeting - River basin committee meeting - Sub committee meeting - River basin working gr. Meeting - Working gr. Of registering small scale water resources information <u>Sub basin</u> 1.3 Workshop for review of setting river basin committee (branch) 1.4 River basin working group meeting <u>Network</u> 1.5 Setting and Knowledge transfer to water user group (network) 1.6 Water management project (existing network)	1 office 4 times 2-3 times 2-3 times 2-3 times 1 time 3 times each branch 2 network 5 networks	-together with Upper Chi Basin (upper chi budget) -sub committee meeting(upper chi budget) -meeting to consider work plan/project -process in the area of river basin branch -setting operation plan yr.53 for consider budget yr.54 and evaluate -existing project which not yet transferred to local
2. Developing tool for water resources management 2.1 Work shop for management plan and Integrated development plan 2.2 Training for water use, maintenance and management (For Transfer Project and SP2 yr.2555)	3 times Local administration &community	-main river basin(Planning Yr.54 and frame work yr.55-59)
3. Publish and Support People Participation 3.1 Publish hearing in review and setting of water resources management plan (villager stage) 3.2 Published, educate and create awareness of water resources 3.3 Conservation and developing river, canal by people participate 4. Publish hearing by Regulation of the Prime Minister yr.2548	1 time issue/copy 1 province, 1 places 3,000Baht/project	-in sub basin -Publishing newsletters and brochures -within conservation week with developing river, canal and report and other print material. -permitted target area

Process Plan for River Basin Management by River basin committee, Fiscal year 2553
Upper Mun Basin, First transfer 800,000 baht

Activity	Target	Detail/Requirements
Management process of 25 main river basin committee 1. River basin committee management <u>Main Basin</u> 1.1 Coordinate and office Administrative 1.2 Watershed Committee meeting - River basin committee meeting - Sub committee meeting - River basin working gr. Meeting - Working gr. Of registering small scale water resources information <u>Sub basin</u> 1.3 Workshop for review of setting river basin committee (branch) 1.4 River basin working group meeting <u>Network</u> 1.5 Setting and Knowledge transfer to water user group (network) 1.6 Water management project (existing network)	1 office 4 times 2-3 times 2-3 times 2-3 times 1 time 3 times each branch 2 network 5 networks	-together with Lower Mun Basin -sub committee meeting -meeting to consider work plan/project -process in the area of river basin branch -setting operation plan yr.53 for consider budget yr.54 and evaluate -existing project which not yet transferred to local
2. Developing tool for water resources management 2.1 Work shop for management plan and Integrated development plan 2.2 Training for water use, maintenance and management (For Transfer Project and SP2 yr.2555)	3 times Local administration &community	-main river basin(Planning Yr.54 and frame work yr.55-59)
3. Publish and Support People Participation 3.1 Publish hearing in review and setting of water resources management plan (villager stage) 3.2 Published, educate and create awareness of water resources 3.3 Conservation and developing river, canal by people participate 4. Publish hearing by Regulation of the Prime Minister yr.2548	1 time issue/copy 1 province, 1 places 3,000Baht/project	-in sub basin -Publishing newsletters and brochures -within conservation week with developing river, canal and report and other print material. -permitted target area

Process Plan for River Basin Management by River basin committee, Fiscal year 2553
Lower Mun Basin, First transfer 800,000 baht

Activity	Target	Detail/Requirements
<p>Management process of 25 main river basin committee</p> <p>1. River basin committee management</p> <p><u>Main Basin</u></p> <p>1.1 Coordinate and office Administrative 1 office</p> <p>1.2 Watershed Committee meeting</p> <ul style="list-style-type: none"> - River basin committee meeting 4 times - Sub committee meeting 2-3 times - River basin working gr. Meeting 2-3 times - Working gr. Of registering small scale water resources information 2-3 times <p><u>Sub basin</u></p> <p>1.3 Workshop for review of setting river basin committee (branch) 1 time</p> <p>1.4 River basin working group meeting 3 times each branch</p> <p><u>Network</u></p> <p>1.5 Setting and Knowledge transfer to water user group (network) 2 network</p> <p>1.6 Water management project (existing network) 5 networks</p>		<ul style="list-style-type: none"> -together with Upper Mun Basin(upper mun budget) -sub committee meeting(upper mun budget) -meeting to consider work plan/project -process in the area of river basin branch -setting operation plan yr.53 for consider budget yr.54 and evaluate -existing project which not yet transferred to local
<p>2. Developing tool for water resources management</p> <p>2.1 Work shop for management plan and Integrated development plan 3 times</p> <p>2.2 Training for water use, maintenance and management (For Transfer Project and SP2 yr.2555) Local administration &community</p>		<ul style="list-style-type: none"> -main river basin(Planning Yr.54 and frame work yr.55-59)
<p>3. Publish and Support People Participation</p> <p>3.1 Publish hearing in review and setting of water resources management plan (villager stage) 1 time</p> <p>3.2 Published, educate and create awareness of water resources issue/copy</p> <p>3.3 Conservation and developing river, canal by people participate 1 province, 1 places</p> <p>4. Publish hearing by Regulation of the Prime Minister yr.2548 3,000Baht/project</p>		<ul style="list-style-type: none"> -in sub basin -Publishing newsletters and brochures -within conservation week with developing river, canal and report and other print material. -permitted target area

Appendix 3.10.11 Case Study of Chi River Basin Committee

Chi River Basin Committee (CRBC) was established by the national water committee in 2008. It was shared by Khon Kaen Provincial governor. Water Resource Office Region 4 secretariats the committee. The CRBC consisted of 33 members representing different groups of stakeholders in the river basin area. In the CRBC 1/2553 meeting two more committee members were appointed. Therefore, total CRBC members are 35 people. The responsible area covers 10 provinces in the Northeast namely Khon Kaen, Chaiyaphum, Mahasarakham, Nong Bua Lamphu, Udon Thani, Loei, Nakhon Ratchasima, Roi Et, Kalasin and Yasothon.

The committee meets 3 times per year. Meeting places rotate among the member provinces in the Chi river basin. CRBC receives 1.8 million Baht annually as operating cost from the government. Other sources of financial support are Mekong River Commission, World Bank, WWF and Private companies. In 2011, CRBC will receive 1 million Baht from German Government to support the establishment of information center in Khon Kaen province. The center will serve as information center for 80 sub basins in three river basins (Khong, Chi and Mun).

In 2010, CRBC collects water resource development plan from related agencies in 10 provinces. There are 628 projects with the total budget of 6,463 million Baht. In 2011, total 928 projects are planned by the related agencies with total budget of 10,433 million Baht.

CRBC established sub-basin working group in Huai Sam Mor (HSM) sub basin as pilot area to develop the sub basin development plan. Lessons learnt from this pilot area are now documented and will be diffused to other 19 sub basin in the near future. However, lacking of budget for diffusion of the lesson learnt is major problem. CRBC estimates that it will take five years to promote the sub basin development plan in the whole basin. Total amount of 35 million Baht is needed for the diffusion.

Major problems of the CRBC are;

- 1) The committee does not understand real situation at sub basin level since there is no plan from sub basin level except in HSM area. Only general problems of the basin are discussed in meetings such as flood or drought which often occur in some provinces.
- 2) There is not enough support from policy level on both financial and strategy to the committee and the working group.

Appendix 3.10.12 Establishment of Water User Organizations (WUOs)

1. Participatory Irrigation Management (PIM)

Water scarcity becomes problem in many countries including Thailand. It is a limited resource while demand of water increases in agriculture, industry and domestic consumption.

The development of water resource for agriculture will be emphasized on qualitative oriented under sustainable development concept and appropriate technology. Farmer participation in water management will be promoted.

1.1 Definition

PIM refers to the participation of farmers in construction, operation and maintenance of irrigation system. The participation is necessary also local administration organization at provincial, district and sub-district level according to the decentralization policy.

1.2 Participation in operation and maintenance

Farmers participate in operation and maintenance of irrigation system at all levels following 11 activities of PIM guideline. These activities could be adjusted base on social, culture and geographical context. List of activities are as follows.

1. Public relation
2. Participation agreement
3. Establishment of water user group (WUG)
4. Strengthen WUG
5. Upgrade WUG to become Integrated Water User Group (IWUG)
6. Establishment of Joint Management Committee (JMC)
7. Establish Irrigation Fund
8. Contract out irrigation activities to IWUG
9. Participation in Operation and Maintenance
10. Assessment of Strength of WUO
11. Establishment of Project Database

1.3 Expectations

It is expected that after the participation of farmers and local administration organizations, they will have the feeling of belonging of irrigation infrastructures. Operation and maintenance of irrigation will be improved and the production increases.

Chapter 2: Water User Organizations (WUOs)

2.1 Definition

Water User Organizations refers to group of water users at different levels who organize themselves to maintain and operate irrigation system. WUOs could be classified into two groups namely;

1. Informal Organizations

1.1 Water User Group (WUG) operates water and maintains irrigation at tertiary level.

1.2 Integrated Water User Group (IWUG)) operates water and maintains irrigation at lateral level.

2. Legal Organizations

2.1 Farmer Group (FG) is a registered group to produce and to market their products.

2.2 Water User Association (WUA) is registered group under the Ministry of Interior with the main objective to manage irrigation water.

2.3 Water User Co-Operative (WUC) is the registered group under the Cooperative Promotion Department to operate irrigation water and to supply agricultural inputs.

2.2 Sequence of WUO development

The development of WUO development starts from the establishment of water user group, integrated water user group and water user association or cooperatives. It is recommended that the informal group should be established first.

2.3 History of WUO establishment

Farmers organized themselves to manage water in the traditional irrigation in Northern Thailand since King Mengrai period (around 700 years ago). In modern irrigation, the first water user association was established in 1966 in the Northeast Thailand. Since then water user organizations have been developed.

2.4 Structure of WUOs

Normally WUOs should have three basic components such as

1. WUO Committee who are elected from members.
2. General Meeting should be organized at least once a year.
3. Auditor is elected from group member to monitor activities.

Management structures of different level of WUOs are presented in the guideline such as WUG, IWUG, FG, WUA and WUC.

2.5 Role and responsibility of different functions in the management committee.

The guideline describe role and responsibilities of different functions of committee members such as chairman, vice chairman, secretariat members, WUG leaders, members, advisor and auditor.

2.6 Roles of WUOs

WUOs represent water users in coordinating with government agencies and work with RID officers to plan for water supply in each season, report any inconveniences to RID officers, advice members to follow regulations and organize regular meetings.

2.7 Activities of WUOs

Activities of WUOs include water management and maintenance of irrigation infrastructures, manage WUOs, and other agricultural extension activities.

2.8 Registration of WUOs

There are two types of registration namely; registration and record. Registration is for integrated water user group in large scale and medium scale irrigation only. Record is for all type of WUOs except IWUG in large and medium scale irrigation project. The authorized person who could register WUOs are:

1. Director of Department of Cooperative Promotion for Farmer Group and WUC
2. Provincial Governor for WUA
3. Director of RID regional office for IWUG

2.9 Role of WUOs

- manage water from reservoir to farmer field
- control water supply from lateral canal to tertiary canal
- set up criteria for land use and water use in each season
- coordinate with government agencies

Chapter 3: establishment of WUG

Strong WUG comes from the real need of community and participation of local administration organization.

Establishment of WUG

- set up priority
- study existing group
- collect farmer list
- set plan for establishment
- Process of establishment are public relation, farmer meeting, select WUG leader, make rules and record the WUG following step in 2.8.

Chapter 4: Upgrading WUOs

There are four types of upgrading WUOs

1. From WUG to become IWUG
2. From IWUG to become farmer group
3. From IWUG to become WUA
4. From IWUG to become WUC

Each type of upgrading follows similar steps such as assessment of readiness of the group, collect group data, plan for upgrading the group, register and some activities after registration. However, there are some details which are different from each of the upgrading type.

Appendix 3.10.13

Water user organization for PIM in Thailand

Joint Management Committee (JMC)

The JMC is the highest management body of water user organization in irrigation project. Presently, there are 22 JMCs in the whole country. Provincial governor endorses the establishment of JMC. The project engineer of medium and large scale irrigation acts as secretariat of the JMC. Chairman of JMC is usually local leader or water user leaders. Management structure of JMC consists of leader of integrated water user groups, leader of local administrative organization, representatives from local government offices and others. JMC usually meet twice a year at the beginning of each cropping season to decide the rotation schedule. Since the JMC policy is practiced in the past few years, there is no study on the performance of JMC. RID has policy to establish JMC in all projects in coming two years.

Integrated Water User Group (IWUG)

In the lateral level, IWUG is established. Leader of IWUG is one of the water user group leaders in the area. However, local leaders are also sometimes selected as IWUG leader. The committee members are water user group leaders within the lateral canal. The active IWUG meet once a month to discuss issue related to water supply such as rotation schedule, water shortage, conflict among farmers and so on. IWUG usually collect maintenance fee from the water user. It promotes ditch cleaning at the beginning of each cropping season and small repair of ditch if necessary. Royal Irrigation Department (RID) promotes the role of IWUG to participate in maintenance at lateral and ditch level by providing maintenance budget for 1 million Baht in each O&M project and Provincial Irrigation Project. Moreover, RID is now in the process of revising the law to promote the legal entity of IWUG.

Water User Group (WUG)

WUG is established wherever ditch is constructed. They are farmers who share water from the same ditch. There are usually 10 to 15 farmers. They select one of the members to be leader who represents in the IWUG. WUG cleans ditch before each cropping season, allocate water among members and collect maintenance fee from members. Since Thailand promote participatory on farm development, all farmers have to be consulted before construction of ditch. They have to sign for the approval of using the land for construction.

The role of water user organization in operation and maintenance is increasing since government decreases number of field staff in each irrigation project. Some projects achieve the most tangible result in participatory irrigation management such as Krasiew O&M project in Supanburi province and Klong Phiew Sao Hai O&M Project in Saraburi Province. It is found that the strong water user organization has good linkage with local administrative organizations.

Attachment: List of 22 JMC established

No.	Project with JMC
1	Chiang Rai Irrigation Project
2	Klong Mod Daeng Kam Phaengphet Project
3	Huai Som Hong Project, Nakhon Phanom Province
4	Huai Dong Noi Project, Nakhon Phanom Province
5	Lam Mun Bon Project, Nakhon Ratchasima Province
6	Huai Sappadoo Irrigation Project, Nakhon Ratchasima Province
7	Huai Prasatyai Irrigation Project, Nakhon Ratchasima Province
8	Klong Preiw Sao Hai Operation and Maintenance Project, Saraburi Province
9	Krasiew Operation and maintenance Project, Suphanburi Province
10	Tapsalao operation and Maintenance Project, Uthai Thani Province
11	Hua Khun Kaew Irrigation project, Uthai thani Province
12	Yang Chum Irrigation Project, Prajuab Kiri Khan Province, Royal Project
13	Fai klong Ku Thanon Irrigation Project, Nakhon Sithammarat Province
14	Fai Klong Ya Irrigation Project, Krabi Province
15	Klong Tha Phaya Irrigation Project, Lower Pak Phanang
16	Sua Hung , Nakoti, Lower Pak Phanang
17	Bangjak, Lower Pak Phanang
18	Klong Khong Irrigation Project, Lower Pak Phanang
19	Huai Nam Sai Irrigation Project, Upper Pak Phanang
20	Ranod-Kasaesin Irrigation Project, Song Kla Province
21	Pattani Operation and maintenance Project, Pattani Province
22	Khanonjeen Irrigation Project

Appendix 3.10.14 Number of Water User Organization Established (as of 2010)

RIO	On-farm WUO				Integrated WUG				WUA				WUC				Fund of irrigation			No. of committee for Irr. Management (group)	No. of irrigated volunteer (person)	Total of basic group	Total area (rai)	LSP and MSP area		Organization area per potential irrigation area (%)
	Number (group)	Area (rai)	Member (person)	Number (group)	Basic group (group)	Area (rai)	Member (person)	Number (group)	Basic group (group)	Area (rai)	Member (person)	Number (group)	On-farm group (group)	Area (rai)	Member (person)	Number (fund)	Accumulated amount	Baht	from the report of planning section (rai)					have potential for establishment (rai)		
																									Number (group)	
1	20	27,079	4,086	80	930	453,860	63,085	0	0	0	0	0	0	0	0	0	0	0	686,540	541,819	88.76					
2	360	68,177	12,093	79	1,979	383,822	49,519	0	0	0	0	1	53	7,503	568	5	33,635	0	748,632	615,093	74.70					
3	866	363,923	20,872	75	652	434,870	19,026	0	0	0	0	11	332	179,811	7,061	1	100,000	0	1,562,420	1,253,733	76.06					
4	781	398,350	22,756	90	798	672,346	35,097	0	0	0	0	2	11	22,770	768	0	0	0	1,205,111	1,584,191	69.02					
5	328	120,003	7,273	94	2,160	316,732	27,846	12	122	38,093	2,283	9	0	36,778	2,388	75	3,661,312	0	740,309	732,344	64.66					
6	978	274,384	46,134	119	2,430	507,445	46,520	13	419	42,855	2,934	8	606	86,643	5,632	6	64,000	0	1,321,547	1,119,434	81.41					
7	808	131,151	5,928	56	7,147	228,604	14,038	6	328	32,808	1,963	0	0	0	0	3	77,422	0	591,890	507,201	77.40					
8	902	171,257	13,819	115	3,038	576,481	41,020	2	164	25,500	1,237	3	224	34,785	1,898	0	0	0	1,188,484	1,483,842	54.45					
9	1,148	572,995	21,194	78	470	254,709	9,108	0	0	0	0	0	0	0	0	0	0	0	1,866,605	1,994,553	41.50					
10	1,057	585,828	20,903	103	1,234	899,869	25,697	1	26	22,772	417	2	39	14,698	1,456	0	0	0	2,330,820	2,356,434	64.64					
11	809	758,824	18,261	5	9	87,228	949	0	0	0	0	1	0	1,200	75	0	0	0	3,265,245	2,693,588	31.45					
12	2,050	952,733	46,958	135	1,985	720,711	41,881	0	0	0	0	0	0	0	0	0	0	0	2,790,402	2,756,674	60.71					
13	1,895	711,486	49,286	154	2,249	725,974	47,263	0	0	0	0	6	185	48,800	5,615	18	111,875	0	2,719,050	2,435,999	61.01					
14	180	56,583	3,587	37	928	486,765	25,207	0	0	0	0	1	0	15,056	487	0	0	0	696,150	678,245	82.33					
15	413	297,883	14,129	40	527	158,801	12,411	0	0	0	0	0	0	0	0	11	110,680	0	871,675	896,360	50.95					
16	847	294,132	10,557	28	505	371,201	18,196	1	2	5,500	403	0	0	0	0	0	0	0	755,240	685,209	97.90					
17	745	154,046	32,409	72	681	239,212	20,115	0	0	0	0	1	0	1,235	84	0	0	0	735,094	363,214	108.61					
Total	14,187	5,938,834	350,245	1,360	27,722	7,518,630	496,978	35	1,061	167,528	9,237	45	1,450	449,279	26,032	119	4,158,924	19	24,075,214	22,697,933	61.84					
NE Region	3,016	696,795	73,154	384	14,775	1,629,262	129,424	33	1,033	139,256	8,417	20	830	158,206	9,918	84	3,802,734	5	3,842,230	3,842,821						

Appendix 3.11.1 Law Related to the Irrigation Development and Management

This part is extracted from “Final Technical Legal Report” for Policies and Strategic Planning for the Thailand Irrigation Sector Reform Program (FAO, 2008)

(1) Canals Maintenance Act, 1902

Waterways and canals or “khlong” in Thai have in the past played an important role in the daily lives of Thai people. They provide sources of water for drinking, and are important for agricultural production; in addition, rivers and khlong have been the major transportation routes in the past. The Canals Maintenance Act, 1902 vests in the officials of the Ministry of Agriculture, the authority to: construct roads along the banks of the rivers and khlong; prohibit the discharge of waste; collect fees for parking boats and rafts; and set conditions for building bridges and piers.

(2) The People’s Irrigation Act, 1939

This piece of legislation was enacted to control the expansion of private irrigation facilities built for private uses, for communal uses, or for uses of other people in return for some form of service fees. There are 3 types of private irrigation facilities:

1. Private irrigation for personal use, which refer to irrigation facilities built for agricultural production for the use of one individual or for groups of people. Section 4 of this Act states that permission has to be sought from the authorities if the irrigated areas exceed 200 rai. Otherwise, permission is not needed, particularly if it is only for temporary use, provided it does not obstruct the flows of the natural waterways and does not cause damage to other people (sections 7 and 8). The State also has the power to command that water in excess of the needs of the owner of private irrigation facilities is to be shared with people in nearby fields. In return, the beneficiaries in the adjacent fields should share the costs of private irrigation facilities as deemed appropriate. Should the State feel that there is benefit to be gained for a greater number of the public in expanding the private irrigation facilities, it has the authority to take over the facility that has not been used by the private investor for at least 10 years for use as People’s Irrigation. Section 9 directs the beneficiaries to jointly compensate the private owner.

2. People’s irrigation facility refers to joint investments on irrigation for agricultural production among members of the local communities. Permission is required from the State and approval depends on whether a majority of people in the specific community would benefit (section 12). The State will appoint the Chief of Irrigation Management who is supported by a majority of the community. The State also has the authority to recruit personnel to repair and maintain the facilities (sections 13 and 14) as well as issue

prohibitions any actions that may obstruct the flow of water in irrigation facilities, streams, ponds, canals and swamps.

3. Commercial irrigation is the facility for which agricultural producers pay. Concessions to build these irrigation facilities have to be issued by the State. The latter has the authority to oversee or control the irrigation facilities according to the conditions specified by the concession.

The law gives power to the State to temporarily close all three types of irrigation facilities described above in situations where there is shortage of water (section 5). The State also has the power to intervene if at any time, water users are observed to be excessively using the water.

(3) The State Irrigation Act 1942

This Act governs the construction, operation and maintenance of irrigation facilities at public expense, and empowers the responsible government agencies.

According to section 5 of the Act, irrigation waterways are divided into four categories, viz.:

1st Category.

A waterway used for supplying, draining, conserving or retaining water for irrigation purposes.

2nd Category.

A waterway used for navigation in common with irrigation within the area benefited from irrigation works.

3rd Category.

A waterway reserved for irrigation purposes.

4th Category.

A waterway which is accessory to irrigation.

The Minister shall notify Irrigation Waterways in the Government Gazette, including an indication as to which category the waterway belongs. The MOAC has to publicly issue an announcement designating the areas to be used as irrigation waterways which can only cover the actual waterways and the reservoir area. The announcement must be supported by a map clearly showing the location. Based on the information obtained, currently there are a number of waterways used for irrigation purposes which have not been gazetted. In practice, this means that RID does not have the authority over the management of the waterways and this may be one of the main reasons for their ineffective management. Presently, RID has plans to expedite the announcements of the waterways for irrigation purposes and the issuance of ministerial orders to collect user charges for irrigation water so that RID's management is in accordance with the irrigation law.

The Act also empowers the state in a number of ways to maximize the benefits from irrigation. For example, landowners with parcels of land far from the irrigation canals can dig distribution canals past other people's land provided compensation is paid to the owners (section 9). The State can require landowners to open the water gates which block the flow of water to downstream land parcels (section 20), or any actions that may reduce the share of water of nearby land parcels (section 21). Unless granted permission by the Director General of RID or persons assigned by the Director General, the State can prohibit digging canals to link up with the irrigation canals, or any other waterway that links up with irrigation canals. The State also has the power to prevent any actions that will affect water flow or damage irrigation facilities, prohibit dredging or obstruct waterways (section 34), prohibit the abstraction or the use of irrigation water that may result in damages to other people (section 35). Penalties for violation of any of these conditions are specified by the Act.

(4) The Field Dyke and Ditches Act, 1962

This Act replaces the Paddy Bunding and Dyke Act of 1941. The changes were based on the recognition that in some localities farmers were not only planting rice but also upland crops. Landowners have the responsibility to build and maintain the dykes that can retain at least 20 centimeters of water but not exceeding 30 centimeters within 2 years. If after 1 year, the Director General of RID is of the opinion that the landowner will not be able to complete the construction within the set time, he may order that the task be completed by RID staff, but with the costs being borne by the landowner. The layout of the dyke and ditch has to be constructed as required by the DG of RID.

To ensure equitable sharing of water resources, the DG shall have the power to direct the competent official to construct the regulators or other barriers used in regulation of the water in the ditches. Landowners who benefit from these investments are required to share the costs. They also have the responsibility to look after and maintain the conditions of the ditches and dykes as well as dredge the canals once a year.

(5) The Agricultural Land Consolidation Act, 1974

This Act concerns the development of land for agricultural production, to increase output and reduce cost of production. This may involve pooling parcels of land in a particular locality to adjust the sizes and reshaping so that each land parcel will benefit from the irrigation system, drainage canals, and also from access and feeder roads. This process may also entail marketing plans, land leveling, and land improvement and production. Land consolidation may also involve changes and transfer of landownership.

The Act stipulates the appointment of a Central Land Consolidation Committee which oversees the work of the Central Land Consolidation Office and the Provincial Land Consolidation Office. This Committee is

also responsible for: designing projects of land consolidation; identifying the land consolidation project area and giving advice to the Cabinet over the purchase or expropriation of land for land consolidation purposes; approving plans for subdividing land parcels and water drainage, roads and feeder roads, land leveling, exchange of parcels, transfer of landownership, hire-purchase arrangements; and matters related to land consolidation. The Director General also has the power to settle problems that may arise and review the complaints and requests submitted by landowners and by other stakeholders in the Land Consolidation Project Area. The Director General also lays down rules and regulations regarding procedures, and financial and other management issues that concern the Central and Provincial Land Consolidation Offices. The Agricultural Land Consolidation Act, 1974 was amended in 1991 to include a section on a Land Consolidation Fund (section 50 *bis* and section 50 *ter*) which can be used as a revolving fund to finance land consolidation activities and to provide assistance to the farmers.

(6) The Amendment of the State Irrigation Act, 1942

By the requirement of the Cabinet of 8 February 2005, RID has made a proposal for amending the State Irrigation Act, 1942 to ensure consistency with the National Management Strategy 2005-2008.

1. Provide a clear definition of the term ‘agriculture’ and improve the definition of the term ‘irrigated area’ and ‘embankment’.
2. Revise the user charge for irrigation water to a floating rate.
3. Increase the area under the responsibility of RID.
4. Identify clearly where the caught offender should be sent to.
5. Increase the definition of ‘roads within irrigated areas’ which clearly imply that they fall under the responsibility of RID
6. Improve the criteria of water control which is not restricted to the obstruction of the flow of water.
7. Revise the criteria to limit the judicial review of administrative decisions.
8. Revise to expand the scope of authority of the irrigation engineer, e.g. the authority to order the removal of any obstructions on irrigation waterways.
9. Define the unauthorized uses of water and the power of the court as well as the requirement that the beneficiaries must set up meters so as to control the volume of water used.
10. Set rules over the types of vehicles allowed on the embankments.
11. Set penalties for those who defy the orders of the responsible staff.
12. Change the name of the responsible Minister in charge of implementation under the existing law.

Appendix 3.11.2 Law Related to the Establishment of the Organizations of Water Users

This part is extracted from “Final Technical Legal Report” for Policies and Strategic Planning for the Thailand Irrigation Sector Reform Program (FAO, 2008)

(1) The Cooperatives Act, 1999

This legislation was enacted for the purpose of developing cooperatives and to ensure their ability to adapt and maintain competitiveness within the changing business environment. The concept is to have a single system of cooperatives, in which members have limited responsibilities according to the number of shares held. This is to ensure steady growth.

Cooperatives will be registered under this law with the objective of promoting the economic interest of the members through mutual support. The conditions for registration are:

- (1) Members must have joint activities as specified in the registration document.
- (2) Members must be private individuals who are of legal age.
- (3) The Cooperative must have capital which comprises shares of equal value. Each member must have at least one share but the value of shares held by any one member must not exceed one fifth of the number of shares which have been paid in full.
- (4) The Cooperative must have members which have satisfied certain conditions of membership as specified in the Act (section 43(7)).

Organizations of water users in irrigated areas which have the intention to operate as a cooperative can therefore register themselves under this Act. They will then have the legal status of a corporate body which operates as a non-profit making body in the interest of members, enjoying a more secure status and clear regulations, and a transparent and accountable financial management system. In situations where farmers have organized themselves for the purpose of providing mutual support but cannot register as a cooperative under this Act, they can register themselves as farmers' groups following the procedures laid out by the Royal Decree.

(2) The Civil and Commercial Code

The Civil and Commercial Code sections 78 - 109 concern the establishment of Associations. The Code requires that any non-profit Association must be registered in order to become legally established. At least 3 people who wish to become a member of the Association should jointly submit a request to the registrar in the location where the Association office will be set up. The details to be submitted include the rules of the Association, names, addresses and information on occupation of at least 10 members, and the same for those members who will become the Committee of the Association. Once registered, the Association will have the status of a legal body. Unless otherwise

stated, members must pay the full fees on the day of application to become a member. The Association Committee must organize a general meeting at least once a year.

The Registrar has the authority to terminate the status of the Association in the following situations.

(1) When it becomes clear after registration that the objectives of setting up the Association is against the law, culturally unacceptable or imposes any risks on the welfare of the people or the security of the State; and where the Association refuses to make adjustments within the specified time period.

(2) When the Association has been inactive for more than 2 years.

(3) When the Association allows other parties who are not Committee Members to manage the affairs of the Association.

(4) When the Association has less than 10 members for two consecutive years.

This Act is a method by which WUGs in irrigated areas can register themselves as an Association. The acquired corporate legal status should in principle provide security and a leverage to provide assistance to members.

(3) The Royal Decree on the Farmers Group 2004

The Cooperatives Act, 1999 section 119 states that Farmers' Groups can be established according to the criteria and guidelines set by the Royal Decree. The main contents of the Royal Decree on the Farmers Group 2004 are:

1. Farmers' Groups can be established if there are at least 30 people who earn their major source of income from agricultural production.
2. At least 7 people should submit an application for the establishment of a Farmer's Group to the registrar in the province where it is to be set up.
3. The Farmers' Group should appoint at least 5 members as Committee Members and not more than 15 members.
4. The objectives of setting up a Farmers' Group are as follows:
 - (1) To undertake any production, trading, services or any other activities for the benefit of the members.
 - (2) To provide welfare and support services for the benefit of the members and their families.
 - (3) To provide services to members either free of charge, or in return for a fee.
 - (4) To provide technical assistance to members.
 - (5) To engage in joint investment with other farmers' groups.
 - (6) To serve as a deposit of the savings of the Farmers' Group in accordance with the set regulation and with the approval by the Registrar.
 - (7) To provide loans and other services such as rental, hire-purchasing, transfer, mortgage, pledge for the member.
 - (8) Farmers' Groups can have ownership over land and immovable property.

(9) To undertake any other activities that have been approved by the registrar which is consistent with the objectives of setting up the Farmers' Group.

(10) To take any other actions according to (5), (7) and (8) within the budget allowance approved by the registrar.

5. The founding members should organize the first General Meeting of Members within 90 days after having been officially registered. The main objective of the first general meeting of members is to elect Committee Members and the Inspector. General meetings should be organized once a year within 150 days from the end of the financial year. If there is need, Committee Members can also call for an irregular General Meeting of Members. Each member has one vote regardless of the number of shares held.
6. The registrar has the power to disagree with the decision of the General Meeting of Members, or any decisions of the Committee Members in the event that these decisions are against the law, or do not conform to the rules, regulations or the orders of the registrar.
7. Farmers' Groups can be terminated where:
 - a. Any actions are undertaken which are specified in the regulations.
 - b. There are less than 30 members for a period of longer than 120 days.
 - c. It is the decision of the General Meeting of members.
 - d. The Farmers' Group has been ruled as bankrupt by the Court.
 - e. The registrar decides that the Farmers' Groups have not been active for a specified period of time, if they do not report their financial status as required by the law, or if the operations lead to severe losses.

(4) Local administration and Decentralization Act.

The Provincial Administration Organizations' responsibilities under the Provincial Administration Organization Act, 1997 for example, include the management, conservation and protection of water resources. The municipality is established under the Municipality Act. Municipalities are also responsible for management, conservation and protection of water resources which include looking after drainages, boat landings and piers.

The Provincial Administration Organization has been established under the Provincial Administration Organization Act, 1994. TAOs are responsible for the management of water resources within their jurisdictions which cover the provision of water supply services for consumption, for agricultural production, maintenance of waterways and drainage systems. The TAOs also have general responsibilities to protect, conserve and maintain the quality of natural resources and environment.

Other than legislations specific to the different levels of local governments, the Decentralization Act, 1999, which specified the program and stages of decentralization, also stated that municipalities and TAOs are responsible for management of wastewater.

Appendix 3.11.3 Draft Addendum of the State Irrigation Act

Chapter 3/1 Irrigation Water Users Groups

Section 35/1. Beneficiaries who are utilizing water from the same irrigation system have the right to organize themselves and register as Irrigation Water Users Groups for the mutual benefit of member in the management of water and maintenance of irrigation systems.

The Irrigation Water Users Groups registered according to paragraph of this Section have the status of a juristic person.

The criteria, procedure and conditions for registering according to paragraph of this Section should be in accordance with the Ministerial Order. The Irrigation Engineer will act as the Registrar.

Section 35/2: The WUGs should appoint a Committee with at least 5, but not more than 10 WUGs committee members.

The WUG Committee should elect the chairman of the WUGs committee from Committee Members elected under Clause 1.

Section 35/3: The WUGs committee members will serve for a period of 4 years.

The WUGs committee members who have served a full term period may be re-elected as WUGs committee member but can not be appointed for more than 2 consecutive terms.

The status of the WUGs committee members will be terminated in the following situations:

- (1) Death.
- (2) Resignation.
- (3) The decision of the WUG members for to terminate the status as WUG committee member.
- (4) Has become disable or semi-disable.
- (5) Is no longer a member of the Local Government Administration.
- (6) Is no longer a staff of the Irrigation Project in that area.
- (7) Having been sentenced by a final judgment to a term of imprisonment irrespective of a suspension of the punishment, except for a suspension of the punishment in an offence committed through negligence or a petty offence or an offence of defamation.

Section 35/4: The WUG Committee has the general management responsibilities. In addition to coordinating with public agencies over management, the WUGs Committee is responsible for the following:

- (1) Conduct a survey of water needs among WUG members and cooperate with the Irrigation Project Manager and the Irrigation Engineer to develop a plan for water management.
- (2) Give advice to WUG members on how to follow the water allocation plan, the maintenance of the irrigation water ways and the irrigation facilities.
- (3) Report problems in water allocation and maintenance of the irrigation system to the Project Manager and the Irrigation Engineer.
- (4) Keep a register of WUG members.
- (5) Address any problems that occur and arbitrate when conflicts arise among members.
- (6) Organize joint meetings between the WUG Committee and Members as well as organize a General Meeting at least once per year.
- (7) Formulate policies, rules and criteria.
- (8) Set the membership fees, the user fees and fines.
- (9) The WUG Committee also has the authority to ask the members to undertake certain activities as well as prohibit WUGs members from undertaking certain activities considered to be harmful to the interests of members.
- (10) Undertake any other duties that have been assigned by concerned public agencies.

Section 35/5: Those who are eligible to become WUG Committee Members must have the following qualifications:

- (1) Have never been convicted for any crime.
- (2) Have never been fired, expelled or dismissed from services of the public and private sectors, institutions, employers for any misconduct in performing their duties.
- (3) Have never been dismissed by the majority vote of the Committee for misconduct of responsibilities.
- (4) Is not a bankrupt person.

Section 35/6 The WUG Committee should organize a general meeting at least once a year, the purpose being to:

- (1) Organize an election to appoint committee members to replace those whose terms have ended or any vacant committee members' positions due to other reasons.
- (2) Approve policy, rules, regulation, fees, user charges and fines
- (3) Approve of the membership fees, water user charges, fines and returns to WUG committee members as well as WUG Inspector (if one has been appointed)
- (4) Approve of the annual budget

(5) Report on the work progress of the WUG Committee.

Section 35/7. The WUG General Meeting must be attended by at least half of the total number of members.

Members can request other members to attend in his or her place. Each member can be representative of not more than 3 members.

Section 35/8. Unless otherwise stated, each member has one vote. WUGs could agree to have different rules over voting rights but the number of votes for each member should be based on considerations over equity issues and incentives for cooperation among WUG members.

The decision rule is based on the majority votes. In the event where there is equal number of votes, the vote of the Head of the WUG will be the decisive vote. At least two thirds of the votes for the motion to pass in the following situation:

- (1) Additional amendment of the rules and regulations.
- (2) The merging of WUGs in the irrigated areas.
- (3) The termination of any WUGs.
- (4) Any other issues as specified by the regulations.

Section 35/9. In the WUG General Meeting, if less than the minimum number of attendant are present, another meeting should be scheduled within 40 days. In the rescheduled date, the presence of at least one third of the members is considered sufficient to hold the General Meeting.

Section 35/10. A WUG Inspector should be elected from the WUG Members in the General Meeting according to the criteria, the procedure and the conditions in the regulations. The role of the Inspector is to monitor and evaluate the performance of the WUG Committee to ensure that they are in accordance with the regulations and the principles of the Royal Irrigation Act.

The Inspector serves a term of 2 years.

Section 35/11. The WUGs may receive financial support from Local Government Administration, Revolving Fund for irrigation purposes, subsidies, assets or donations.

The use of funds from the public or the private sector should be used in accordance with the set objectives. If there are no specifications as to the purpose of the use of funds, then the basic understanding is that the sum allocated will be used to support activities that serve the objective of the WUGs or will be kept as reserve funds.

Section 35/12. The WUGs will keep a financial account which meets the standard financial book keeping requirement. There should be internal auditing of the financial situation, the accounts and the assets and results should be reported to the General Meeting at least once a year.

The Inspector appointed under Section 35/10 is responsible for conducting the auditing under Clause 1.

Section 35/13. The WUG Committee should prepare an Annual Report to present to the members in the Annual General Meeting. The main contents of the report should cover the achievement of the WUG Committee in the past year, the financial accounts including the internal auditor's report and the policy of the WUG Committee including the planned programs and activities.

Section 35/14. To improve the performance and to ensure that evaluation work is undertaken according to the schedule set, the WUGs should arrange for performance evaluation according to the work schedule set by the Irrigation Engineer at least not more than 1 year.

Section 35/15. For any actions taken by the WUG Committee that may infringe upon the interest of the WUGs or its members, or any cause problems over the operational or financial aspects of the WUGs, the General Meeting of the WUG members can reach an agreement that:

- (1) The WUG Committee addresses the problems that arose according to the procedure and within the set timeframe.
- (2) Require that WUG Committee terminate the actions believed to be the cause of the problems and infringes upon the interests of the WUG or of its members.
- (3) Temporarily suspend any activities undertaken by the WUG Committee until the problems have addressed according to the procedure and within the set timeframe.
- (4) Dismiss the entire WUG Committee, or just Committee Members who are responsible for the problems that arose.

Section 35/16. If there is agreement that all the WUG Committee Members should be dismissed, the General Meeting should reach an agreement that a temporary WUG Committee be appointed. The temporary WUG Committee will have the same authority and responsibilities and serve a period of not more than 180 days from the date of appointment.

Before the term comes to a close, the temporary WUG Committee should organize a General Meeting for purpose of electing the entirely new set of people to become the WUG Committee.

In the event that the General Meeting's decision is to terminate the status of some members of the WUG Committee, the remaining WUG Committee Members should call for a General Meeting to

elect a replacement within 30 days after the termination of the former WUG Committee members. If the General Meeting cannot be held, or if no replacements can be elected, then it falls upon the remaining WUG Committee Members to appoint a replacement. The elected or appointed WUG Committee Member will serve only the remaining term of the person he or she is replacing.

Section 35/17. The WUGs in any irrigated areas can be terminated in the following situations:

- (1) When there are fewer members than the minimum numbers required by the announcement of the Director General over a period of 120 days.
- (2) When it is the decision of the majority in the General Meeting.
- (3) When the Irrigation Engineer makes a decision that it should be terminated according to Section 35/18.

If termination of the WUGs is due to either (1) or (2), a written notification should be sent to the Irrigation Engineer within 50 days of the termination. If termination of the WUGs is due to (3), the Irrigation Engineer should issue a written notification to the WUG Committee without delay.

Section 35/18. The Irrigation Engineer has the authority to terminate the existence of the WUGs in the following situation:

- (1) When the WUG has not taken any action for a period of one year from the date of registration, or when a WUG has not been operable for a period of more than 2 years.
- (2) When actions undertaken by the WUGs have resulted in severe damages, or when it has become apparent that no benefits can be gained from the operation of the WUG.

Section 35/19. When WUGs terminate, clearing of accounts should follow procedures set by the Ministerial Order.

Section 35/20. Any two or more WUGs can merge provided that they have the approval of the Irrigation Engineer.

Section 35/21. The newly merged WUGs must register themselves as a new WUG.

Section 35/22. The specifications under Section 35/1 and 32/21, irrigation beneficiaries have the right to organize themselves into other forms of organization such as cooperatives, associations or water user groups under other Acts.