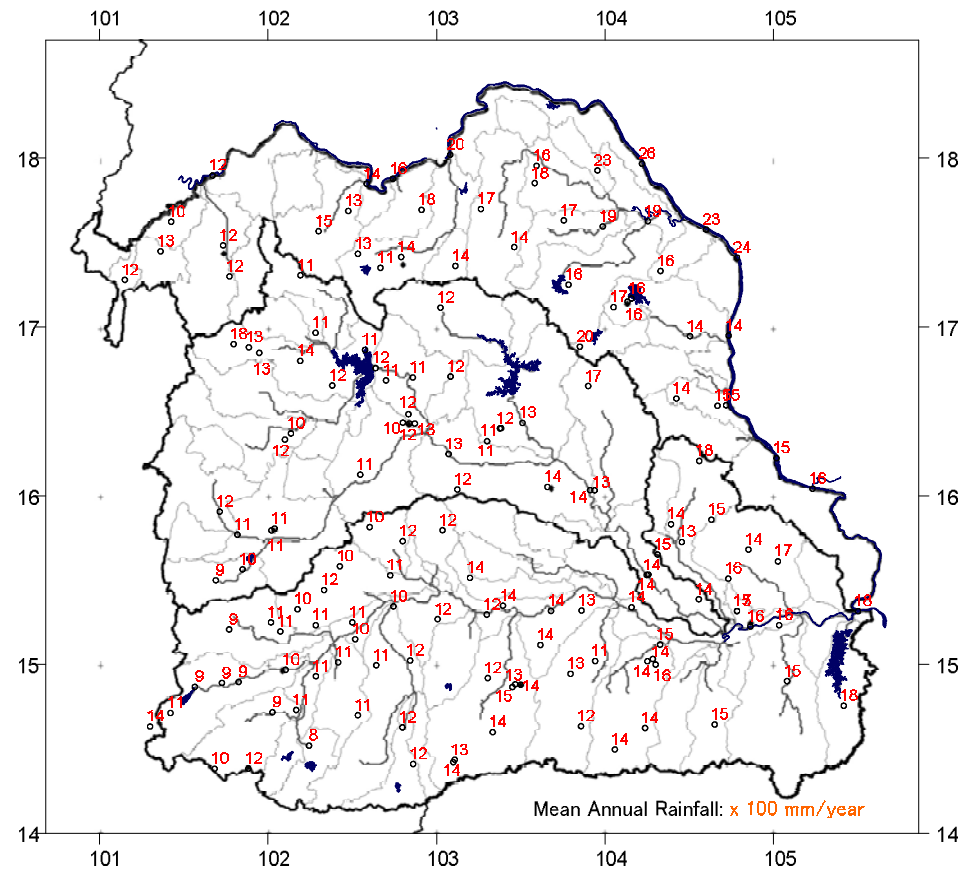
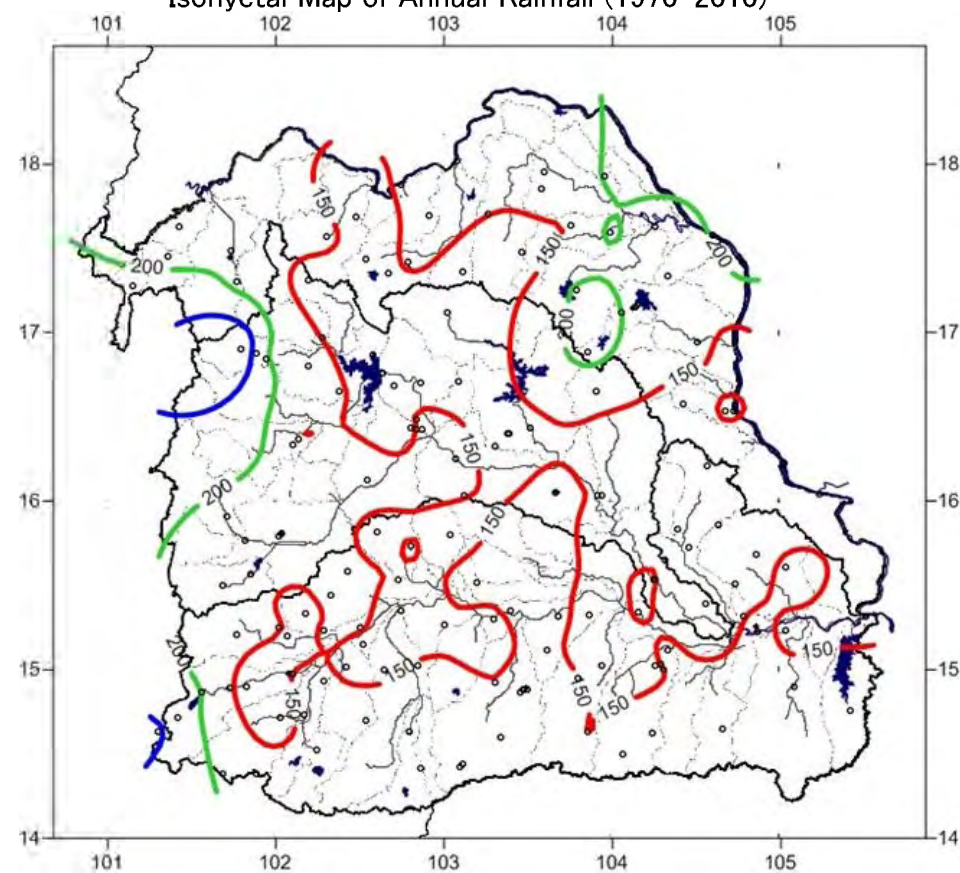


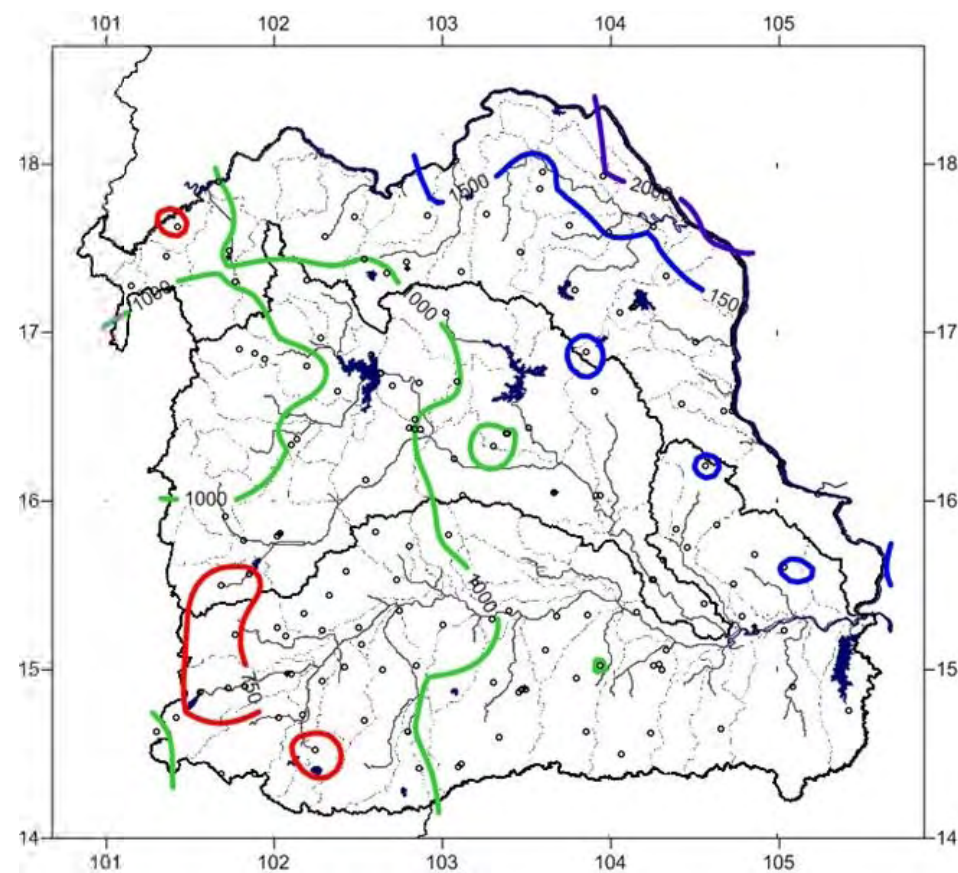
Isohyetal Map of Annual Rainfall (1970-2010)



Mean Annual Rainfall (1970-2010)



Isohyetal Map of Rainfall in Dry Season (1970-2010)



Isohyetal Map of Rainfall in Wet Season (1970-2010)

2-6

Isohyetal Map of Annual Rainfall in Wet and Dry Season












Note:

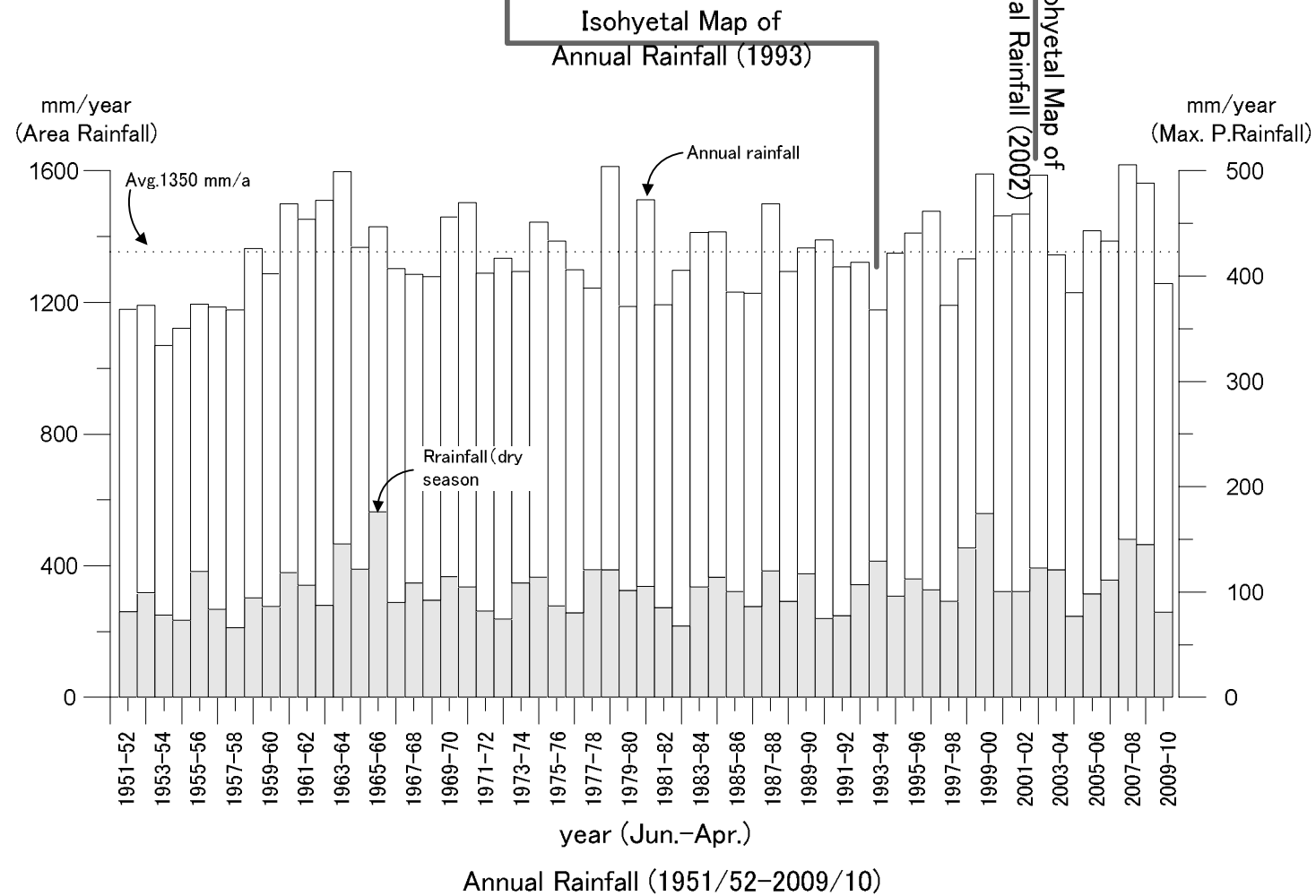
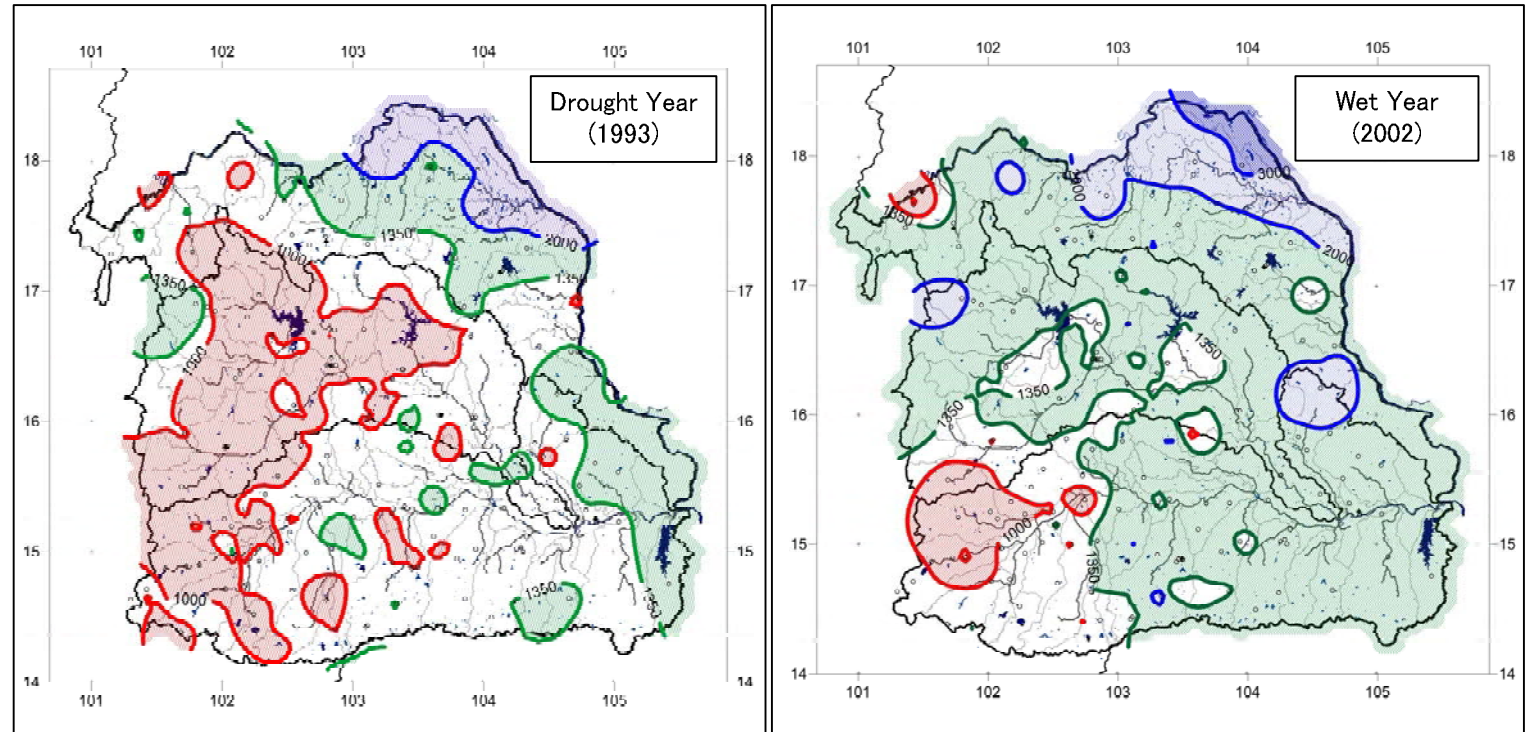
Data Source: Processed by JICA study Team using TMD observation data

Date: September 2010

LEGEND

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-  1350 Average Annual Rainfall
-  1000 Annual Rainfall 1000 mm/year
-  2000 - do - 2000 mm/year
-  2500 - do - 2500 mm/year
-  Supplemental Contour lines
-  RID rain gage Sta. selected by observation Period over 25 years'
-  Major Water Body
-  Basin Boundary
-  Sub-Basin Boundary
-  Rivers
-  ¹⁵ Mean Annual Rainfall: x 100 mm/year



2-7

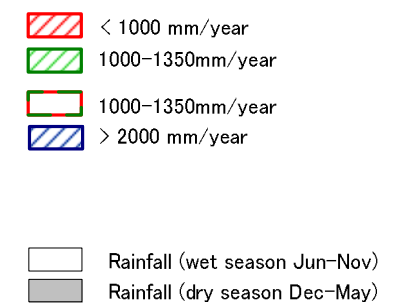
Isohyetal Map of Annual Rainfall in Wet and Dry year

Note:

Data Source: Processed by JICA study Team using TMD observation data

Date: September 2010

LEGEND



2-8

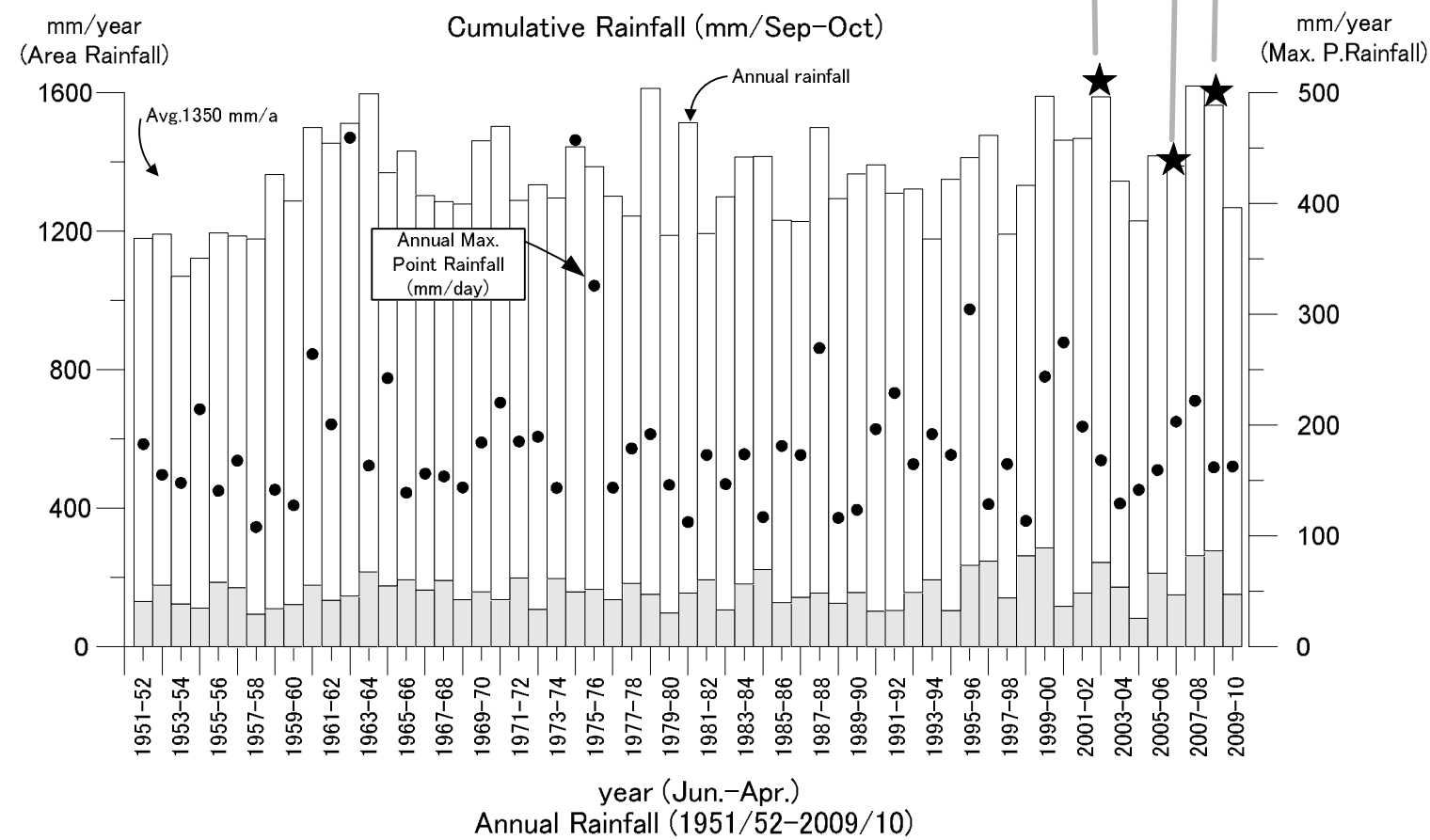
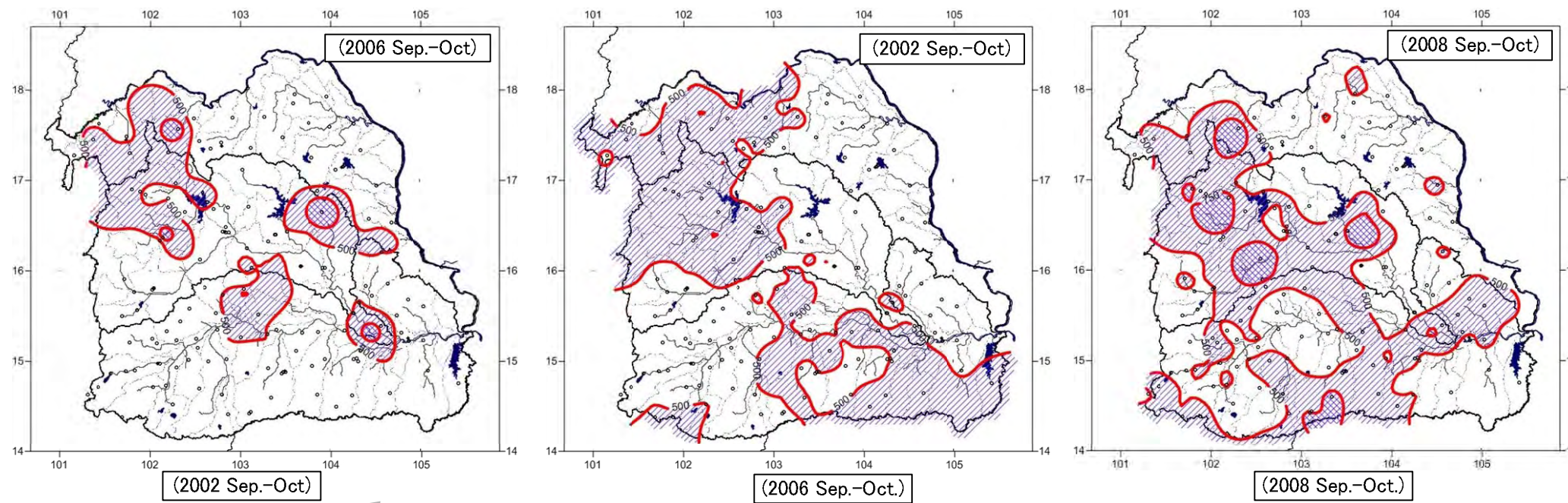
Isohyetal Map of Annual Rainfall in Wet Month (Sep.-Oct.)

Note:

Data Source: Processed by JICA study Team using TMD observation data

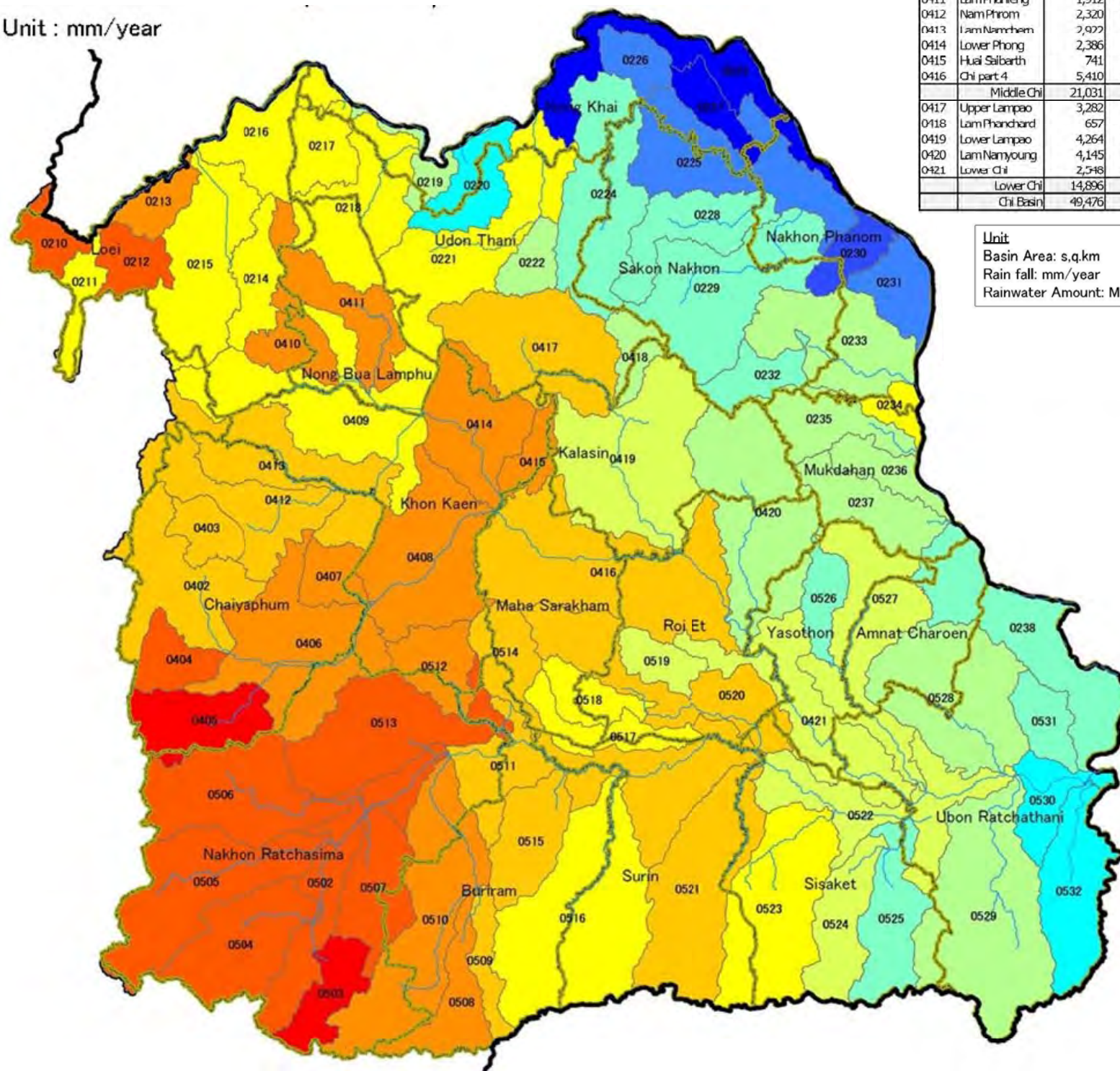
Date: September 2010

LEGEND



Area Rainfall and Rainwater Amount Estimated for Tributaries (Sub-basins)

Unit : mm/year



Chi Basin

Code	Name	Basin Area	Rainfall -year-	Rainwater Amount -year-
0402	Upper Chi	2,489	1,239	3,084
0403	Lam Saphung	758	1,266	960
0401	Lam Krojan	886	1,081	960
0405	Lam Khandoo	1,635	957	1,565
0406	Chi part 2	3,808	1,103	4,200
0407	Huai Semmo	729	1,122	818
0408	Chi part 3	3,244	1,131	3,668
	Upper Chi	13,549	1,126	15,256
0409	Upper Phung	4,424	1,314	5,813
0410	Huai Phuay	916	1,105	1,012
0411	Lam Pharieng	1,912	1,154	2,206
0412	Nam Phrom	2,320	1,260	2,923
0413	Lam Namthem	2,922	1,264	3,708
0414	Lower Phong	2,386	1,193	2,846
0415	Huai Saibarth	741	1,115	826
0416	Chi part 4	5,410	1,298	7,022
	Middle Chi	21,031	1,253	26,356
0417	Upper Lampao	3,282	1,291	4,237
0418	Lam Phandard	657	1,531	1,006
0419	Lower Lampao	4,264	1,447	6,170
0420	Lam Nanyoung	4,145	1,551	6,429
0421	Lower Chi	2,548	1,405	3,733
	Lower Chi	14,896	1,448	21,575
	Chi Basin	49,476	1,277	63,187

Unit
Basin Area: s,q,km
Rain fall: mm/year
Rainwater Amount: MCM/year

Khong Basin

Code	Name	Basin Area	Rainfall -year-	Rainwater Amount -year-
0210	Khong part 3	674	1,076	725
0211	Nam Mhun	622	1,329	827
0212	Nam Sem	876	1,089	954
0213	Khong part 4	808	1,113	899
0214	Huai Nampuan	658	1,359	894
0215	Lower Loel	2,902	1,309	3,799
0216	Khong part 5	1,823	1,350	2,461
0217	Huai Namsoem	1,056	1,334	1,409
0218	Nam Moeng	2,718	1,356	3,686
0219	Khong part 6	540	1,508	814
0220	Nam Suai	1,310	1,702	2,230
0221	Huai Luang	3,425	1,387	4,750
0222	Huai Dam	681	1,529	1,041
0223	Khong part 7	2,407	2,108	5,074
	Upper Khong	20,500	1,442	29,563
0224	Upper Songkhram	3,299	1,643	5,420
0225	Lower Songkhram	3,030	1,993	6,039
0226	Huai Khong	693	1,972	1,367
0227	Huai Hli	715	2,132	1,524
0228	Huai Namyam	1,733	1,635	2,833
0229	Huai Nam Oon	3,469	1,678	5,821
0230	Huai Thuay	788	2,007	1,582
0231	Khong part 8	1,186	1,965	2,394
0232	Nam Phung	971	1,691	1,642
0233	Huai Nam Kham	2,537	1,549	3,930
0234	Khong part 9	644	1,303	839
0235	Huai Bangsai	1,366	1,511	2,064
0236	Huai Muk	552	1,548	854
0237	Huai Bang Ei	1,590	1,576	2,506
0238	Lower Khong	3,387	1,677	5,680
	Lower Khong	25,960	1,712	44,455
	Khong Basin	46,460	1,593	74,018

Mun Basin

Code	Name	Basin Area	Rainfall -year-	Rainwater Amount -year-
0502	Upper Mun	2,998	1,042	3,124
0503	Lam Sae	1,174	994	1,167
0504	Lam Phra Ploeng	2,211	1,031	2,280
0505	Lam Takong	3,518	1,017	3,578
0506	Lam Choeng Krai	2,622	1,019	2,672
0507	Lam Chakkaraj	1,614	1,098	1,772
0508	Lam Nang Rong	1,326	1,184	1,570
0509	Lam Pa Tear	623	1,244	775
0510	Lam Phai Maas	3,991	1,117	4,458
0511	Mun part 2	1,189	1,298	5,137
0512	Huai Aek	1,083	1,143	1,238
0513	Lam Sathaed	2,589	1,088	2,817
0514	Lam Phiang Chou	1,231	1,205	1,483
	Upper Mun	29,169	1,110	32,371
0515	Huai Ta Khong	1,152	1,222	1,408
0516	Lam Chi	4,591	1,329	6,101
0517	Lam Phub Phiao	1,112	1,348	1,499
0518	Lam Tao	847	1,351	1,144
0519	Lam Siew Noi	698	1,406	981
0520	Lam Siew Yai	2,790	1,275	3,557
0521	Huai Thab Thun	3,571	1,283	4,582
0522	Mun part 3	2,780	1,498	4,164
0523	Huai Samran	3,502	1,382	4,840
0524	Huai Tha	1,572	1,414	2,223
0525	Hua Khayung	1,775	1,632	2,897
	Middle Mun	24,390	1,369	33,396
0526	Huai Phoeng	768	1,632	1,286
0527	Lam Sebai	2,969	1,475	4,379
0528	Lam Sebok	3,518	1,593	5,604
0529	Lam Dom Yai	4,846	1,568	7,599
0530	Lower Mun	1,013	1,712	1,734
0531	Huai Tung Lung	843	1,616	1,362
0532	Lam Dom Noi	2,164	1,790	3,874
	Lower Mun	16,141	1,601	25,030
	Mun Basin	69,700	1,314	91,605
	Khong/Chi/Mun	165,636	1,381	228,810

2-9

Annual Rainfall and Rainwater Amount Estimated for Tributaries

Note:

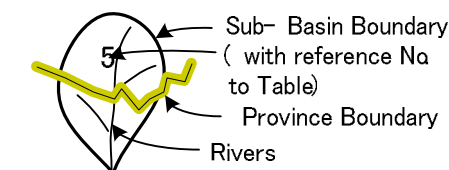
Data Source: Processed by JICA study Team using TMD observation data

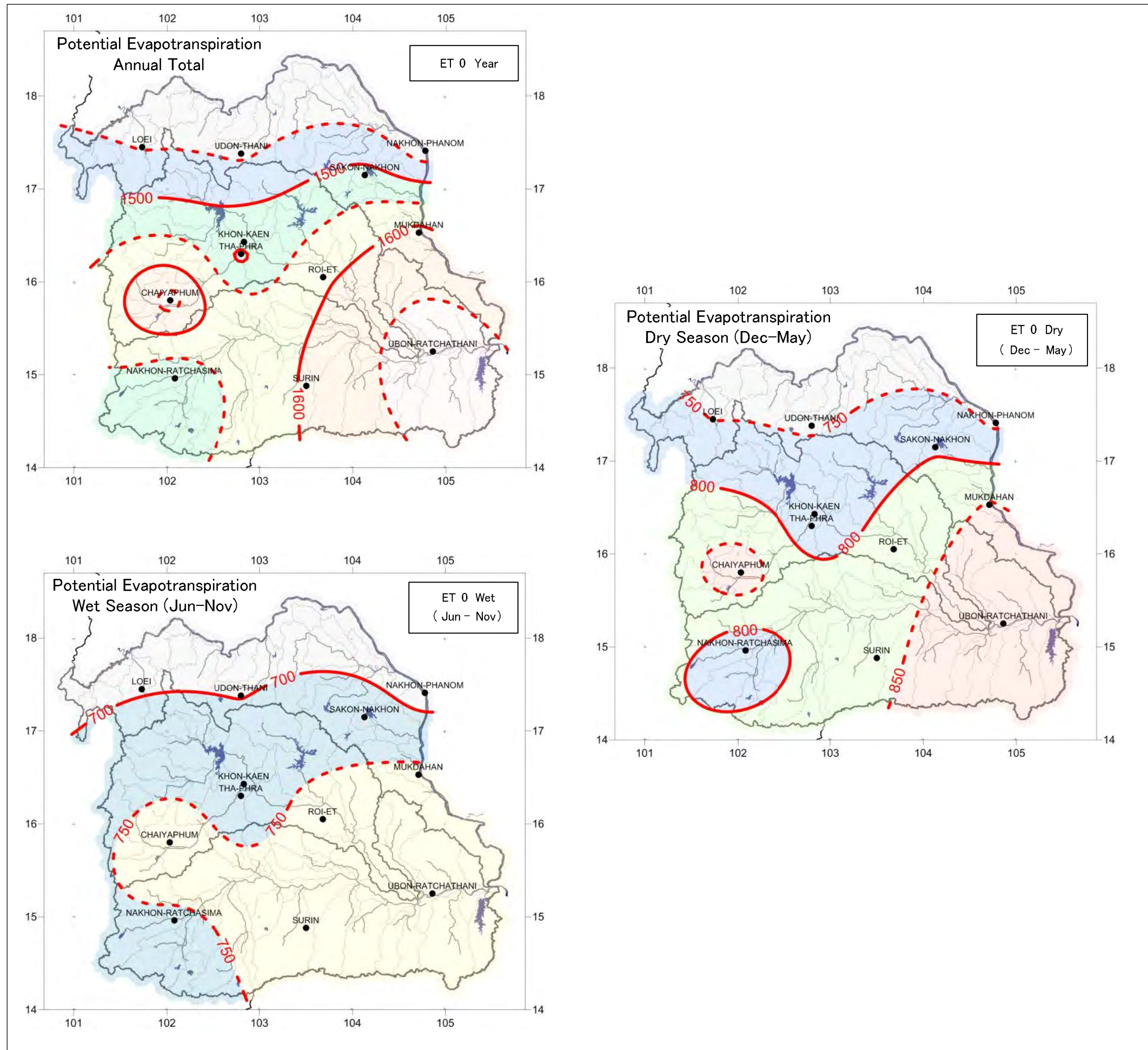
Date: September 2010

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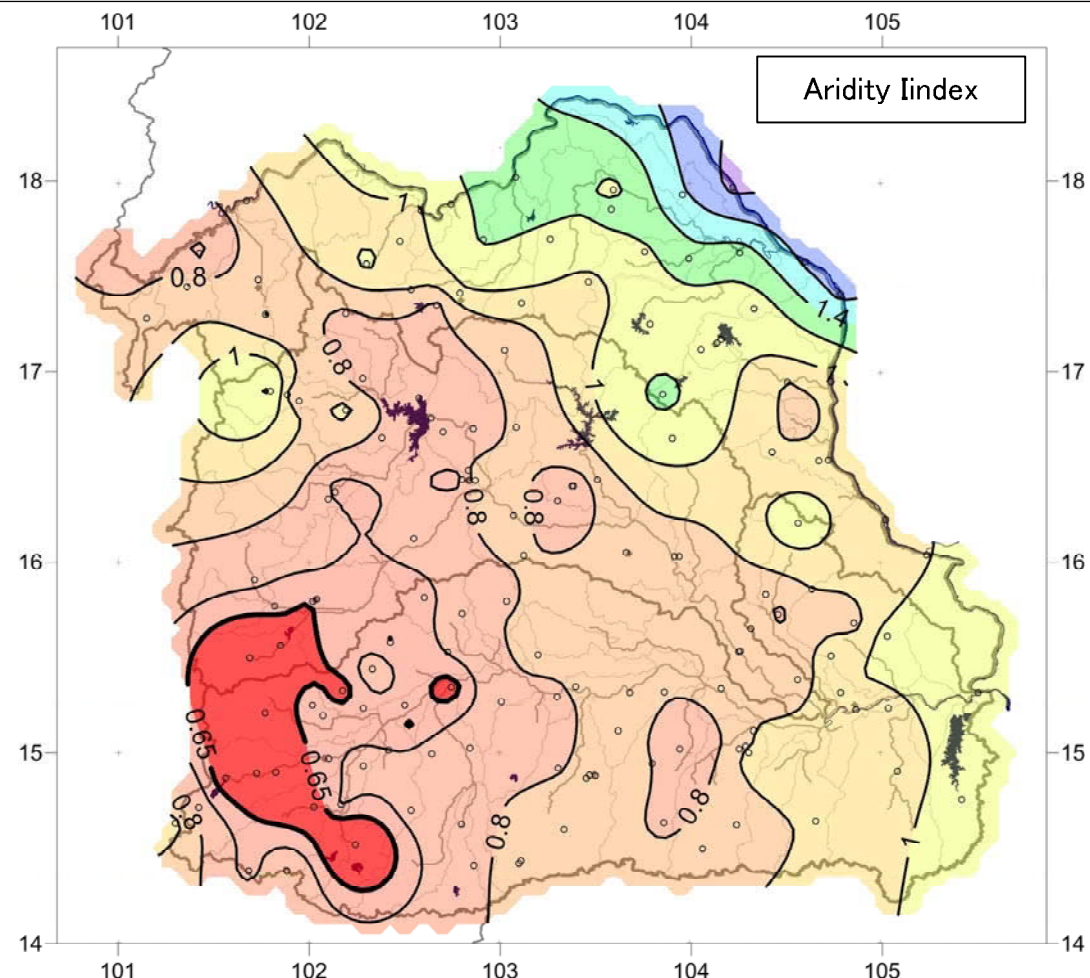
2-10
Potential Evapotranspiration (ET₀)
in Khong, Chi and Mun Basin

Note:
Data Source: Processed by JICA study Team using
FAO climate data

Date: September 2010

LEGEND

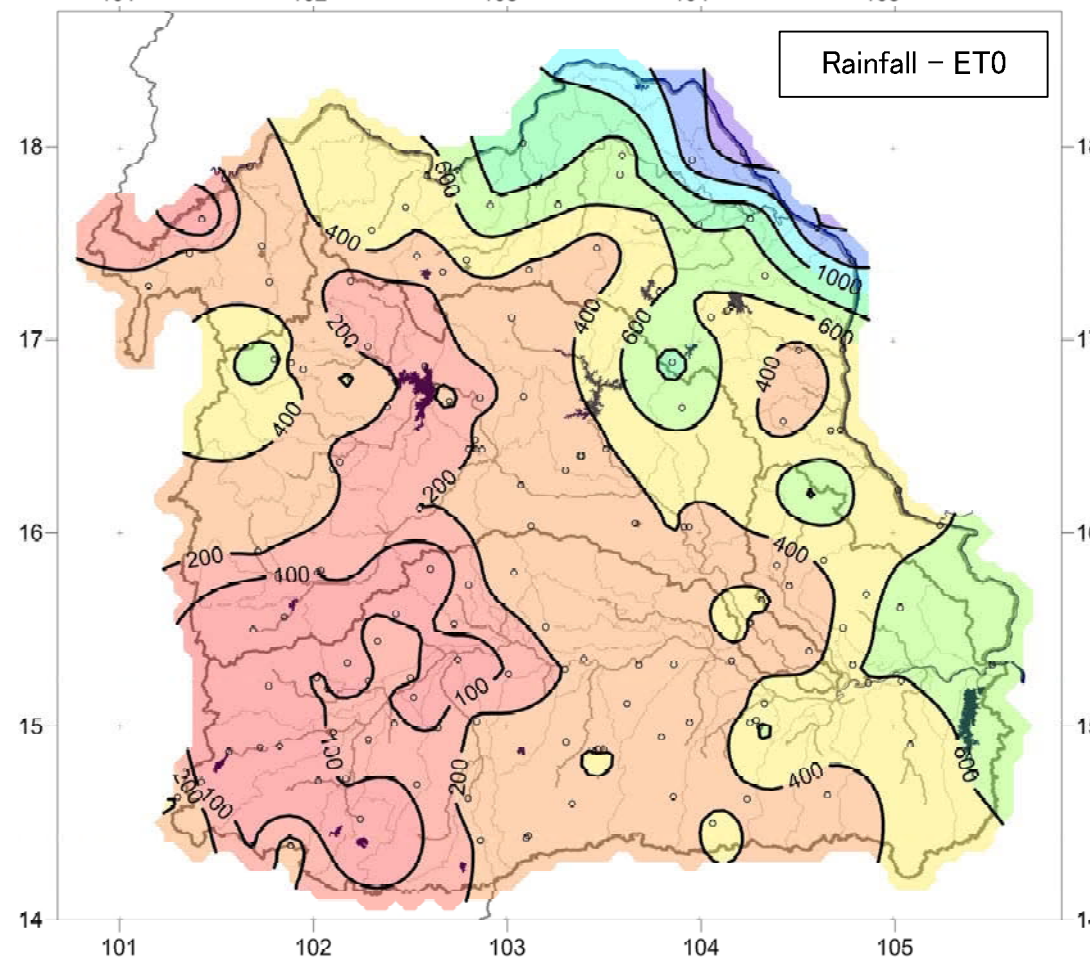
- Annual Total**
- HIGH (> 1600mm/year)
 - MIDDLE 1550- 1600mm/year
 - MIDDLE 1500- 1550mm/year
 - LOW (1450- 1400mm/year)
 - LOW (< 1400mm/year)
- Dry Season**
- HIGH (> 750mm/year)
 - MIDDLE 700- 750mm/year
 - LOW (< 700mm/year)
- Wet Season**
- HIGH (> 850mm/year)
 - MIDDLE 800- 850mm/year
 - MIDDLE 750- 800mm/year
 - LOW (< 750mm/year)



Aridity Index of Khong Chi Mun

Aridity Index (AI) = P/PET
 where PET is the potential evapotranspiration and P is the average annual precipitation (UNEP, 1992).
 With AI, degrees of aridity defines as follows:

Classification	Aridity Index	Global land area
Hyperarid	AI < 0.05	7.50%
Arid	0.05 < AI < 0.20	12.10%
Semi-arid	0.20 < AI < 0.50	17.70%
Dry subhumid	0.50 < AI < 0.65	9.90%
Others, Humid	> 0.65	52.80%



Index for Potential Water Resources

Basin	Area (km ²)	Amount (MCM)	%
Kong	47,232	28,664	44%
Chi	48,806	14,675	23%
Mun	70,924	21,302	33%
Total	166,962	64,641	100%

2-11

Aridity Index of Khong, Chi and Mun Basin

Note:

Data Source: Processed by JICA study Team using TMD observation data and FAO CLIMAT database

Date: September 2010

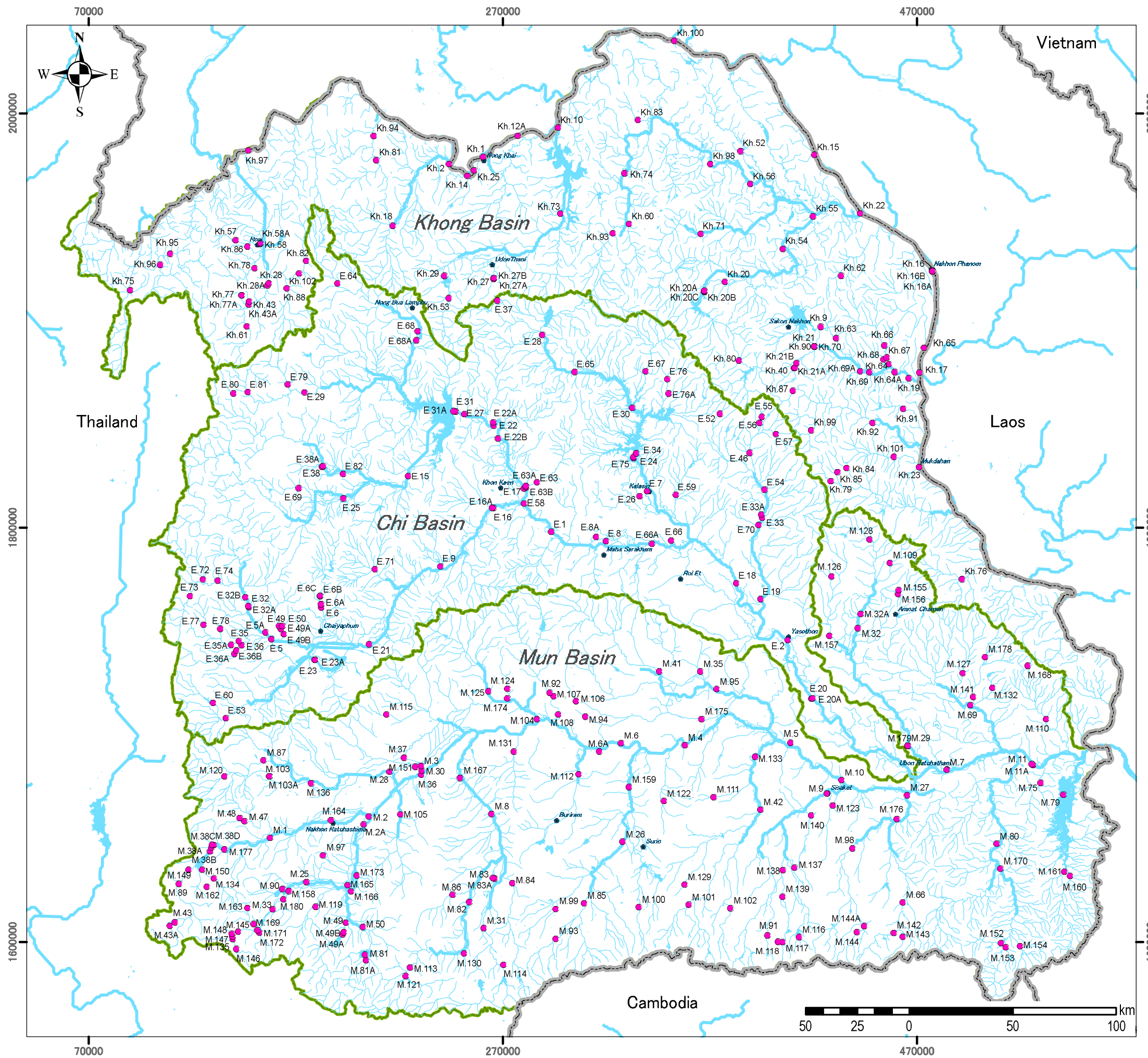
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Aridity Index of Khon Chi Mun

- < 0.65
(Arid Area: Dry subhumid)
- 0.65–0.80
- 0.8–1.0
- 1.0–1.2
- 1.2–1.4
- 1.4–1.6
- > 1.6

Index for Potential Water Resources

- < 200 mm
- 200–400 mm
- 400–600 mm
- 600–800 mm
- 800–1000 mm
- 1000–1200 mm
- > 1200 mm



3-1 Location Map of River Gauging Station in Northeast Region

Note:
Data Source: RID

Date: September 2010

LEGEND

- Discharge Station
- International Boundary
- Basin Boundary
- River