

Table A.1.2.1 List of Meteorological Station

River Basin	Name	Province	Observation Element	Latitude (N)	Longitude (E)
Battambang	Battambang	Battambang	T, RH, SH, Vw, E	13° 05' 60"	103° 12' 00"
Pursat	Pursat	Pursat	T, RH, E	12° 33' 00"	103° 54' 00"
Prek Thnot	Pochentong	Phnom Penh	T, RH, SH, Vw, E	11° 33'	104° 50'

Source: MOWRAM

T: Temperature RH: Relative Humidity SH: Sunshine Hour

Prepared by JICA Study Team

Vw: Wind Velocity E: Evaporation

Table A.1.2.2 List of Rainfall Station

ID	Name	Province	Coordinate		Latitude (N)	Longitude (E)
			X	Y		
Battambang (Sangker) River Basin						
130301	Banan	Battambang	300,136	1,433,272	12° 57' 41"	103° 09' 13"
130305	Battambang	Battambang	305,278	1,448,570	13° 05' 60"	103° 12' 00"
120205	Chamlong Kuoy	Battambang	278,878	1,405,980	12° 42' 48"	102° 57' 35"
120311	Cheang Meanchey	Battambang	294,728	1,423,962	12° 52' 37"	103° 06' 16"
120305	Raing Kesey	Battambang	310,599	1,433,785	12° 58' 00"	103° 15' 00"
120213	Rattanak Mondol	Battambang*	241,720	1,417,740	12° 49' 00"	102° 37' 00"
130215	Samiot	Battambang	268,329	1,396,781	12° 37' 46"	102° 51' 48"
130406	Tbeng (Sdau)	Battambang	280,939	1,426,413	12° 53' 53"	102° 58' 38"
120206	Treng	Battambang	274,711	1,420,067	12° 50' 25"	102° 55' 13"
Moung Russey (Dauntri) River Basin						
120426	Beoung Khnar	Pursat	364,732	1,396,810	12° 38' 07"	103° 45' 02"
120303	Maung Russey	Battambang	332,167	1,411,952	12° 46' 14"	103° 27' 00"
581102	Svay Donkeo	Pursat	353,555	1,401,224	12° 40' 29"	103° 38' 51"
120309	Talo	Pursat	354,705	1,383,952	12° 31' 07"	103° 39' 32"
Pursat River Basin						
120320	Beoung Kantuot	Pursat	401,213	1,383,543	12° 31' 00"	104° 05' 13"
120304	Dap Bat	Pursat	368,527	1,364,407	12° 20' 33"	103° 47' 13"
120312	Kravanh	Pursat	353,555	1,401,224	12° 40' 29"	103° 38' 51"
120306	Leach	Pursat	366,334	1,365,247	12° 21' 00"	103° 46' 00"
120313	Peam	Pursat	361,461	1,358,235	12° 17' 11"	103° 43' 20"
120302	Pursat	Pursat	380,920	1,387,303	12° 33' 00"	103° 54' 00"
Boribo River Basin						
120406	Bamnak	Pursat	409,815	1,361,396	12° 19' 00"	104° 10' 00"
120410	Baribo	Kampong Chhnang	442,465	1,376,054	12° 27' 00"	104° 28' 00"
110429	Boeung Leach	Kampong Chhnang	466,456	1,314,490	11° 53' 37"	104° 41' 17"
120411	Boeung Por	Kampong Chhnang	467,769	1,330,986	12° 02' 34"	104° 42' 00"
120401	Kompong Chhnang	Kampong Chhnang	464,172	1,352,918	12° 14' 28"	104° 40' 00"
110405	Kompong Trailach	Kampong Chhnang	475,016	1,315,189	11° 54' 00"	104° 46' 00"
120403	Krakor	Pursat	415,376	1,385,212	12° 31' 56"	104° 13' 02"
120419	Krang Tamoung	Kampong Chhnang	454,058	1,340,216	12° 07' 34"	104° 34' 26"
120418	Pong Ro	Kampong Chhnang	456,107	1,356,612	12° 16' 28"	104° 35' 33"
120417	Ponley	Kampong Chhnang	442,942	1,375,290	12° 26' 35"	104° 28' 16"
120416	Rolear Phear	Kampong Chhnang	465,006	1,350,308	12° 13' 03"	104° 40' 28"
110430	Samaki Meanchey	Kampong Chhnang	458,166	1,313,217	11° 52' 55"	104° 36' 43"
120407	Sdoc Ach Romeas	Kampong Chhnang	449,630	1,333,654	12° 04' 00"	104° 31' 60"
120420	Tuk Phos	Kampong Chhnang	449,083	1,332,328	12° 03' 17"	104° 31' 42"
110414	Tuol Khpos	Kampong Chhnang	433,276	1,320,782	11° 57' 00"	104° 22' 60"
120301	Tuol Krous	Kampong Chhnang	448,903	1,366,178	12° 21' 39"	104° 31' 34"
Other Adjacent Stations						
110425	Pochengton	Phnom Penh			11° 33'	104° 50'
110404	Kompong Speue	Kompong Speue			11° 27' **	104° 32' **
130318	Boeung Raing	Battambang	300,841	1,443,833	13° 03' 25"	103° 09' 34"
130208	Bovel	Battambang	270,380	1,465,684	13° 15' 08"	102° 52' 37"
120414	Doun Pean	Kampong Chhnang	480,224	1,335,951	12° 05' 16"	104° 48' 52"
130211	Komping Pouy	Battambang	282,573	1,446,561	13° 04' 49"	102° 59' 27"
120415	Kompong Leang	Kampong Chhnang	471,418	1,355,741	12° 16' 00"	104° 43' 60"
130210	Komrieng	Battambang	225,180	1,447,531	13° 05' 04"	102° 27' 42"
130304	O Taky	Battambang	296,344	1,454,632	13° 09' 15"	103° 07' 02"
120202	Pailin	Pailin	241,915	1,422,376	12° 51' 31"	102° 37' 05"
130212	Roung Chrey	Battambang	280,550	1,467,381	13° 16' 06"	102° 58' 14"
130319	Thmar Kol	Battambang	287,021	1,467,395	13° 16' 08"	103° 01' 49"
130313	Tuol Samraung	Battambang	287,123	1,480,274	13° 23' 07"	103° 01' 49"

Source: MOWRAM and TSLSP

* changed by JICA Study Team

** estimated

Table A.1.2.3 List of Hydrological Station

ID	Name	River	Catchment (km ²)	Coordinate		Latitude (N) ° ' "	Longitude (E) ° ' "	Remarks
				X	Y			
Battambang (Sangker) River Basin								
201107	Bac Prea	Tributary Great Lake ^{a,b}		327,465	1,472,023	13° 18' 47"	103° 24' 11"	
550101	Treng	Battambang (Sangker)	2,135	273,500	1,418,500	12° 49' 20"	102° 54' 30"	X, Y Lat Long corrected
550102	Battambang	Battambang (Sangker)	3,194	305,290	1,448,764	13° 06' 07"	103° 12' 00"	
550103	Sre Ponleu	Battambang (Sangker)	566	258,582	1,408,534	12° 44' 06"	102° 46' 23"	
Moung Russey (Dauntr) River Basin								
551101	Moung Russey	Moung Russey (Dauntry)	785	332,454	1,411,688	12° 46' 05"	103° 27' 11"	
581101	Campang	Moung Russey (Dauntry)*		377,762	1,400,147	12° 39' 58"	103° 52' 12"	Location not clear
581102	Svay Don Keo	Svay Don Keo ^b	805	352,788	1,401,028	12° 40' 23"	103° 38' 24"	
581210	Kroch Seuch (up)	Moung Russey (Dauntry)*		381,043	1,405,619	12° 42' 58"	103° 54' 00"	Location not clear
581220	Kroch Seuch (down)	Moung Russey (Dauntry)*		384,512	1,407,407	12° 43' 55"	103° 55' 55"	Location not clear
Pursat River Basin								
580101	Pursat	Pursat	4,495	382,449	1,384,336	12° 31' 23"	103° 54' 50"	
580102	Taing Leach	Pursat	2,011	360,500	1,364,000	12° 20' 00"	103° 43' 00"	X, Y Lat Long corrected
580103	Bac Trakoun	Pursat	4,245	365,176	1,368,532	12° 22' 48"	103° 45' 22"	
580104	Khum Viel	Pursat	4,596	384,709	1,388,489	12° 33' 40"	103° 56' 06"	
580105	Lo Lok Sar	Pursat		381,808	1,382,666	12° 30' 29"	103° 54' 29"	
580106	Phum Kos	Pursat	387	365,503	1,350,513	12° 13' 01"	103° 45' 36"	
580110	Kbal Hong (up)	Pursat		383,195	1,387,043	12° 32' 53"	103° 55' 16"	
580120	Kbal Hong (down)	Pursat		383,367	1,387,307	12° 33' 00"	103° 55' 23"	
580201	Peam	Tributary of Pursat	243	358,720	1,343,659	12° 09' 14"	103° 41' 53"	
580301	Prey Kloug (down)	Tributary of Pursat	421	376,266	1,334,706	12° 04' 26"	103° 51' 32"	
580302	Prey Kloug (up)	Pursat		390,281	1,324,947	11° 59' 13"	103° 59' 17"	
580310	Sanlong (up)	Pursat		371,572	1,410,350	12° 45' 29"	103° 48' 47"	
580320	Sanlong (down)	Pursat		371,915	1,406,206	12° 43' 16"	103° 48' 58"	
580330	Svay At	Pursat		372,569	1,401,123	12° 40' 30"	103° 49' 23"	
581310	Wat Liep (down)	Pursat*		364,558	1,403,730	12° 41' 53"	103° 44' 56"	Location not clear
581410	Wat Liep (up)	Pursat*		363,311	1,402,609	12° 41' 17"	103° 44' 13"	Location not clear
583020	Tlea Maam (up)	Tributary of Pursat ^{a,c}	322	391,083	1,384,565	12° 31' 34"	103° 59' 38"	
Boribo River Basin								
583010	Tlea Maam (1)	* ^d		414,372	1,389,452	12° 34' 16"	104° 12' 29"	
583101	Banteay Krang	Krakor	138	414,213	1,381,888	12° 30' 07"	104° 12' 25"	
590101	Boribo	Boribo	803	433,016	1,364,795	12° 20' 53"	104° 22' 48"	
20103	Kampong Chhnang	Tonle Sap		465,810	1,355,934	12° 16' 05"	104° 40' 55"	

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^a Confluence with the Monkol Borei river

^b Changed from "tributary of Pursat"

^c At present, the Tlea Maam river is not a tributary of the Pursat river, but in the "Boribo River Basin". From coordinate, this may in the Pursat river basin.

^d This locates lake side near Krakor, but not in the Tlea Maam river basin

Table A.1.3.1 River System and Sub-basin Area

River Basin	Sub-basin	Block	(km2)	Main river
Battambang (Sangker)	a Battambang river (S) at Battambang	a1 Battambang river Hill	2,265	Battambang (Sangker) river (S)
		a2 Battambang river Plain	929	
6,053 km2	Battambang Remaining Area	b1 Battambang Plain	883	
		b2 Battambang Lake Side	1,976	
Moung Russey (Dauntri)	c Moung Russey river (S) at Moung Russey	c Moung Russey river (S) at Moung Russey	785	Moung Russey (Dauntri) river (S)
	d Moung Russey Remaining Area	d1 Sway Don Keo river at Sway Don Keo	805	Sway Don Keo river (S)
3,696 km2		d2 Moung Russey Plain	915	Kambot river
		d3 Moung Russey Lake Side	1,191	
Pursat	Pursat river (S) at Khum Viel	e1 Pursat river Hill	4,235	Pursat river (S)
		e2 Pursat river Bank	361	
5,965 km2	Pursat Remaining Area	f1 Pursat Plain	393	
		f2 Pursat Lake Side	976	
Boribo	Bomnak-Boribo (S) -Tlea Maam River Basin	g1 Bomnak river (S)	384	Bomnak river (S)
		g2 Tlea Maam river Up/Middle-stream	468	Tlea Maam river
7,154 km2		g3 Tlea Maam river Lake Side	121	
		g4 Boribo river (S) UP/Middle-stream	419	Boribo river (S)
	Boribo North Area	g5 Boribo river (S) Lake Side	30	
		h1 Boribo North Upper Area	559	
	Boribo Middle North Area	h2 Boribo North Lake Side	266	
		i1 Boribo Middle North Upper Area	759	
	Boribo Middle South Area	i2 Boribo Middle North Lake Side	223	
		j1 Boribo Middle South Upper Area	1,736	Sway Chek river
	Boribo South Area	j2 Boribo Middle South Lake Side	306	
		k1 Boribo South Upper Area	1,835	Krang Ponley river
		k2 Boribo South Lake Side	48	

Note: River name with "(S)" indicates the single river of the name, but not the River Basin of the same name.
 "Lake Side" area here is an area between the National Highway No.5 and the Tonle Sap Lake (the Great Lake).
 Prepared by JICA Study Team

Table A.1.3.2 Average Monthly Meteorological Values

Station: Battambang
Province: Battambang

Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature													
Mean (°C)	25.0	27.2	29.6	30.3	29.9	29.3	28.7	28.2	27.6	27.2	26.3	24.8	27.8
Mean max. (°C)	31.2	33.4	35.6	36.0	34.8	33.8	33.0	32.3	31.3	30.7	30.1	30.0	36.0
Mean min. (°C)	18.9	21.0	23.5	24.6	25.0	24.8	24.5	24.0	24.1	23.7	22.4	19.6	18.9
Relative humidity (%)	74	70	69	71	77	79	80	82	84	85	81	77	78
Wind velocity* (m/s)	1.3	1.4	1.6	1.5	1.6	2.0	1.9	1.8	1.4	1.2	1.2	1.3	1.5
Sunshine hours (hr/day)	9.5	9.0	8.8	7.7	7.3	5.6	6.4	5.0	5.5	6.6	7.4	8.5	7.3
Evaporation (mm/day)	4.2	4.8	5.1	5.3	4.7	4.5	4.0	3.7	3.2	3.1	3.2	3.7	4.1
(mm)	130	136	158	159	146	135	124	115	96	96	96	115	1506

* height at 10 m

Station: Pursat
Province: Pursat

Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature													
Mean (°C)	26.3	28.1	29.5	30.4	30.2	29.9	29.3	29.1	28.4	27.8	26.8	25.9	28.5
Mean max. (°C)	31.7	33.9	35.1	35.6	35.3	34.9	34.1	33.7	32.6	31.6	30.9	30.4	35.6
Mean min. (°C)	20.8	22.2	24.0	25.1	25.2	24.9	24.4	24.5	24.2	24.0	22.8	21.4	20.8
Relative humidity (%)	66	63	65	66	67	68	68	71	74	76	74	71	69
Wind velocity (m/s)	0.80	0.78	0.68	0.60	0.48	0.37	0.40	0.37	0.32	0.48	0.50	0.58	0.53
Sunshine hours (hr/day)	-	-	-	-	-	-	-	-	-	-	-	-	-
Evaporation (mm/day)	3.7	4.5	4.4	4.5	4.2	4.1	3.3	3.5	2.8	3.2	3.1	3.0	3.7
(mm)	115	126	138	135	130	121	102	107	83	98	93	92	1340

Station: Pochentong
Province: Phnom Penh

Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature													
Mean (°C)	26.3	27.6	29.3	30.1	29.9	28.9	28.2	28.2	27.9	27.2	26.5	25.9	28.0
Mean max. (°C)	31.3	32.9	34.6	35.3	34.7	33.5	32.4	32.2	31.9	31.0	30.7	30.4	35.3
Mean min. (°C)	21.5	22.5	24.2	25.5	25.6	25.0	24.8	24.7	24.2	23.8	22.7	21.6	21.5
Relative humidity (%)	73	70	70	72	77	79	81	82	85	84	80	75	77
Wind velocity (m/s)	3.2	3.9	4.1	3.8	4.1	4.6	3.9	5.0	4.3	2.7	3.6	3.7	3.9
Sunshine hours (hr/day)	8.5	8.5	8.2	8.0	7.2	6.0	5.7	5.6	5.5	5.8	7.4	8.1	7.0
Evaporation (mm/day)	4.5	5.6	6.3	6.0	4.8	4.6	4.1	4.0	3.5	3.0	3.6	4.2	4.5
(mm)	140	158	195	180	150	138	127	124	105	93	108	130	1648

* height at 12 m

Source: MOWRAM Prepared by JICA Study Team

Tmean: Mean Temperature (°C)
Tmax: Max. Temperature (°C)
Tmin: Min. Temperature (°C)
RH: Relative Humidity (%)
V: Wind Velocity (m/s)
SH: Sunshine Hour (hr/day)
E: Evaporation (mm)

Table A.1.3.4 Average Monthly Rainy Days

Station	(day)												Data* (years)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Annual
Battambang River Basin	1	2	4	7	13	14	16	18	19	16	8	2	120	42
Battambang														
Moung Russey River Basin	1	2	6	8	14	15	17	17	19	16	9	2	126	14
Moung Russey														
Pursat River Basin	0	1	4	6	12	11	13	15	17	13	8	2	102	56
Pursat														
Boribo River Basin	1	1	2	5	14	16	16	18	18	15	8	2	116	29
Krakor														
Kampong Chhnang	1	1	2	4	12	14	16	17	17	15	6	1	106	52
Other River Basins														
Pailin	2	4	8	10	15	13	15	15	17	13	8	2	122	15
Pochentong	2	1	4	7	14	16	18	19	21	19	8	3	132	15
Kompong Speue	1	1	2	5	9	10	10	13	16	15	6	1	89	21

* (Total number of month with data)/12

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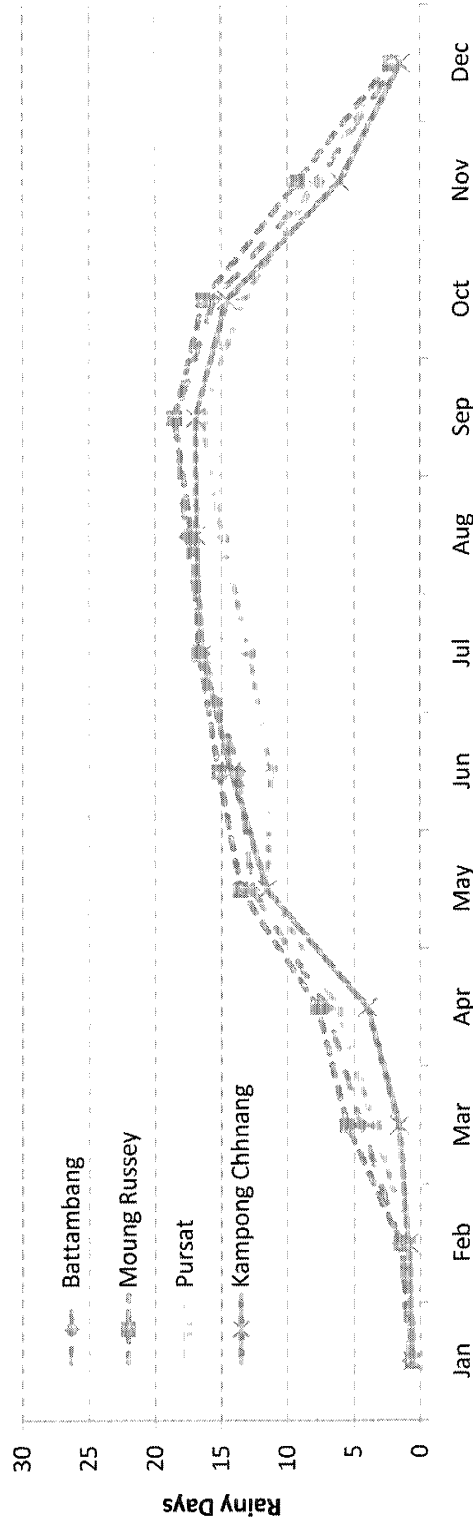


Table A.2.1.1 Meteo-Hydrological Stations Installed in the Study

No.	Station Name	River Basin	Province	District	Coordinates: UTM		Elevation Approx. Area (Km2)	Remarks
					X	Y		
Automatic Rain Gauge								
R- 1	Ratnak Mondol	Battambang	Battambang	Ratnak Mondol	280,470	1,425,751	55	- with manual gauge
R- 2	Samlot	Battambang	Battambang	Samlot	267,896	1,395,135	115	-
R- 3	Phnom Proek	Mongkol Borey	Battambang	Phnom Proek	218,362	1,463,038	130	- with manual gauge
R- 4	Basak Reservoir	Moung Russey	Battambang	Moung Russey	320,342	1,389,968	52	-
R- 5	Moung Russey	Moung Russey	Battambang	Moung Russey	331,702	1,412,740	18	-
R- 6	Roveang	Pursat	Pursat	Phnom Krovanh	342,385	1,361,942	50	-
R- 7	Svay Don Keo	Moung Russey	Pursat	Svay Don Keo	352,960	1,400,807	15	-
R- 8	Koh Chhom		Pursat	Sampov Meas	397,235	1,381,720	27	-
R- 9	Bomnak		Pursat	Krakor	410,323	1,359,608	68	-
R- 10	Boribo	Boribo	Kampong Chhnang	Boribo	444,613	1,368,895	17	-
R- 11	Ta Kab		Kampong Chhnang	Tuek Phos	440,743	1,328,650	66	-
R- 12	Peam (Krang Ponley river)		Kampong Chhnang	Kampong Tralach	450,721	1,298,030	45	-
R- 13	Kampong Tralach		Kampong Chhnang	Kampong Tralach	469,250	1,319,783	18	- with manual gauge
R- 14	Veal Veang	Pursat	Pursat	Veal Veang	294,419	1,360,758	235	-
Staff Gauge								
H- 1	Battambang	Battambang	Battambang	Battambang	305,274	1,447,682	12	3194 with AWLR-P
H- 2	Don Tung	Battambang	Battambang	Samlot	268,721	1,411,161	65	702 with AWLR-P
H- 3	Moung Russey	Battambang	Battambang	Moung Russey	330,388	1,410,310	18	785
H- 4	Prek Chik (River)	Moung Russey	Battambang	Moung Russey	325,645	1,396,938	35	717 with AWLR-P
H- 5	Prek Chik (Canal)	Moung Russey	Battambang	Moung Russey	325,949	1,397,837	35	-
H- 6	Svay Don Keo		Pursat	Svay Don Keo	352,741	1,400,941	15	805
H- 7	Koh Chhom		Pursat	Sampov Meas	397,283	1,381,727	27	614
H- 8	Bomnak		Pursat	Krakor	410,336	1,359,340	68	384
H- 9	Bomnak-A (west flow)		Pursat	Krakor	410,336	1,359,618	68	with AWLR-F
H- 10	Bomnak-B (east flow)		Pursat	Krakor	410,533	1,359,638	68	with AWLR-F
H- 11	Boribo	Boribo	Kampong Chhnang	Boribo	444,592	1,368,820	17	628
H- 12	Ta Kab		Kampong Chhnang	Tuek Phos	440,743	1,328,650	66	360 with AWLR-F
H- 13	Peam (Krang Ponley river)		Kampong Chhnang	Kampong Tralach	450,761	1,297,577	45	558 with AWLR-P
H- 14	Veal Veang	Pursat	Pursat	Veal Veang	293,934	1,359,853	235	604 with AWLR-P

Prepared by JICA Study team

Stations are installed by the JICA Study Team in cooperation with MOWRAM

AWLR = Automatic Water Level Recorder

P = Pressure type

F = Float type

Table A.3.2.1 Meteorological Data by River Basin

Battambang River Basin

Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature													
Mean (°C)	25.0	27.2	29.6	30.3	29.9	29.3	28.7	28.2	27.6	27.2	26.3	24.8	27.8
Relative humidity (%)	74	70	69	71	77	79	80	82	84	85	81	77	78
Wind velocity* (m/s)	1.02	1.07	1.23	1.17	1.27	1.54	1.50	1.37	1.06	0.94	0.94	0.98	1.17
Sunshine hours (hr/day)	9.5	9.0	8.8	7.7	7.3	5.6	6.4	5.0	5.5	6.6	7.4	8.5	7.3
Evaporation (mm/day)	4.2	4.8	5.1	5.3	4.7	4.5	4.0	3.7	3.2	3.1	3.2	3.7	4.1
(mm)	130	136	158	159	146	135	124	115	96	96	96	115	1506

Note: Data of Battambang Stati * Wind velocity is adjusted to the equivalent one at 2 m height.

Moung Russey River Basin

Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature													
Mean (°C)	25.7	27.7	29.6	30.4	30.1	29.6	29.0	28.7	28.0	27.5	26.6	25.4	28.2
Relative humidity (%)	70	66	67	68	72	73	74	77	79	81	78	74	73
Wind velocity (m/s)	0.91	0.93	0.96	0.89	0.88	0.96	0.95	0.87	0.69	0.71	0.72	0.78	0.85
Sunshine hours (hr/day)	9.5	9.0	8.8	7.7	7.3	5.6	6.4	5.0	5.5	6.6	7.4	8.5	7.3
Evaporation (mm/day)	4.0	4.7	4.8	4.9	4.5	4.3	3.7	3.6	3.0	3.2	3.2	3.4	3.9
(mm)	122	131	148	147	138	128	113	111	90	97	95	104	1423

Note: Data = Average of Battambang and Pursat Stations' data except sunshine hours

Sunshine hours = that of Battambang Sta * Wind velocity is adjusted to the equivalent one at 2 m height.

Pursat River Basin

Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature													
Mean (°C)	26.3	28.1	29.5	30.4	30.2	29.9	29.3	29.1	28.4	27.8	26.8	25.9	28.5
Relative humidity (%)	66	63	65	66	67	68	68	71	74	76	74	71	69
Wind velocity (m/s)	0.80	0.78	0.68	0.60	0.48	0.37	0.40	0.37	0.32	0.48	0.50	0.58	0.53
Sunshine hours (hr/day)	9.5	9.0	8.8	7.7	7.3	5.6	6.4	5.0	5.5	6.6	7.4	8.5	7.3
Evaporation (mm/day)	3.7	4.5	4.4	4.5	4.2	4.1	3.3	3.5	2.8	3.2	3.1	3.0	3.7
(mm)	115	126	138	135	130	121	102	107	83	98	93	92	1340

Note: Data of Pursat Stations except sunshine hours

Sunshine hours = that of Battambang Station

Boribo River Basin

Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature													
Mean (°C)	26.4	27.9	29.5	30.4	30.2	29.6	29.0	28.8	28.2	27.6	26.8	26.0	28.3
Relative humidity (%)	70	67	67	69	72	73	75	76	79	80	77	73	73
Wind velocity (m/s)	1.65	1.84	1.94	1.80	1.89	2.09	1.85	2.29	1.91	1.39	1.75	1.79	1.80
Sunshine hours (hr/day)	8.5	8.5	8.2	8.0	7.2	6.0	5.7	5.6	5.5	5.9	7.5	8.1	7.1
Evaporation (mm/day)	4.1	5.1	5.4	5.3	4.5	4.4	3.7	3.8	3.2	3.1	3.4	3.6	4.1
(mm)	127	142	167	158	139	130	115	115	94	96	101	111	1494

Note: Data = Average of Pochentong and Pursat Stations' data except sunshine hours

Sunshine hours = that of Pochentong Station * Wind velocity is adjusted to the equivalent one at 2 m height.

Prepared by JICA Study Team

Table A.3.3.1 Available Water by Sub-Basin

		80 % Dependability											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
from smaller rivers and streams													
Battambang River Basin													
(a1)	BAT-H: Battambang Hill	1.1	0.6	0.5	0.7	1.3	4.9	11.8	31.8	36.0	31.6	15.1	4.5
(a2)	Battambang River Basin in F	0.0	0.0	0.0	0.0	0.0	1.7	5.2	6.6	12.1	22.3	15.1	3.4
(b)	BAT-P: Battambang Plain	1.1	0.6	0.2	0.7	3.0	4.8	6.5	7.5	14.5	24.9	16.8	3.4
Moung Russey River Basin													
(c)	MR-H: Moung Russey Hill	2.0	0.9	0.4	0.3	3.0	3.0	4.5	5.8	14.2	23.9	16.0	4.0
(d)	MR-P: Moung Russey Plain	2.0	0.9	0.4	0.3	3.0	3.0	4.5	5.8	14.2	23.9	16.0	4.0
Pursat River Basin													
(e1)	PR-H: Pursat Hill	1.8	1.2	1.0	1.3	1.6	3.8	8.1	17.5	17.7	37.0	11.8	3.5
(e2)	Pursat River Basin in Plain	0.0	0.0	0.0	0.0	1.4	3.9	5.8	7.8	16.6	26.0	9.1	0.0
(f)	PR-P: Pursat Plain	1.8	1.0	0.9	0.8	3.5	4.2	6.3	7.9	17.8	27.5	20.5	4.6
Boribo River Basin													
(g1,4,5)	BMN-BOR: Bomnak Boribo	4.3	2.7	2.0	2.7	3.1	5.5	8.0	13.0	45.5	52.3	13.4	5.3
(g2,3)	BMN-BOR: Bomnak Boribo	2.1	0.9	0.6	0.7	5.0	5.3	6.4	9.1	21.0	19.8	16.6	3.8
(h)	BOR-N: Boribo North	2.1	0.9	0.6	0.7	5.0	5.3	6.4	9.1	21.0	19.8	16.6	3.8
(i)	BOR-MN: Boribo Middle Nor	2.1	0.8	0.3	0.4	8.3	8.1	11.0	14.4	29.1	25.3	18.2	4.5
(j)	BOR-MS: Boribo Middle Sol	2.4	0.9	0.4	0.1	3.7	4.6	7.6	11.9	26.7	20.8	15.5	4.1
(k)	BOR-S: Boribo South	3.2	1.1	0.2	0.3	2.6	3.5	3.8	7.4	21.6	24.6	15.2	4.4

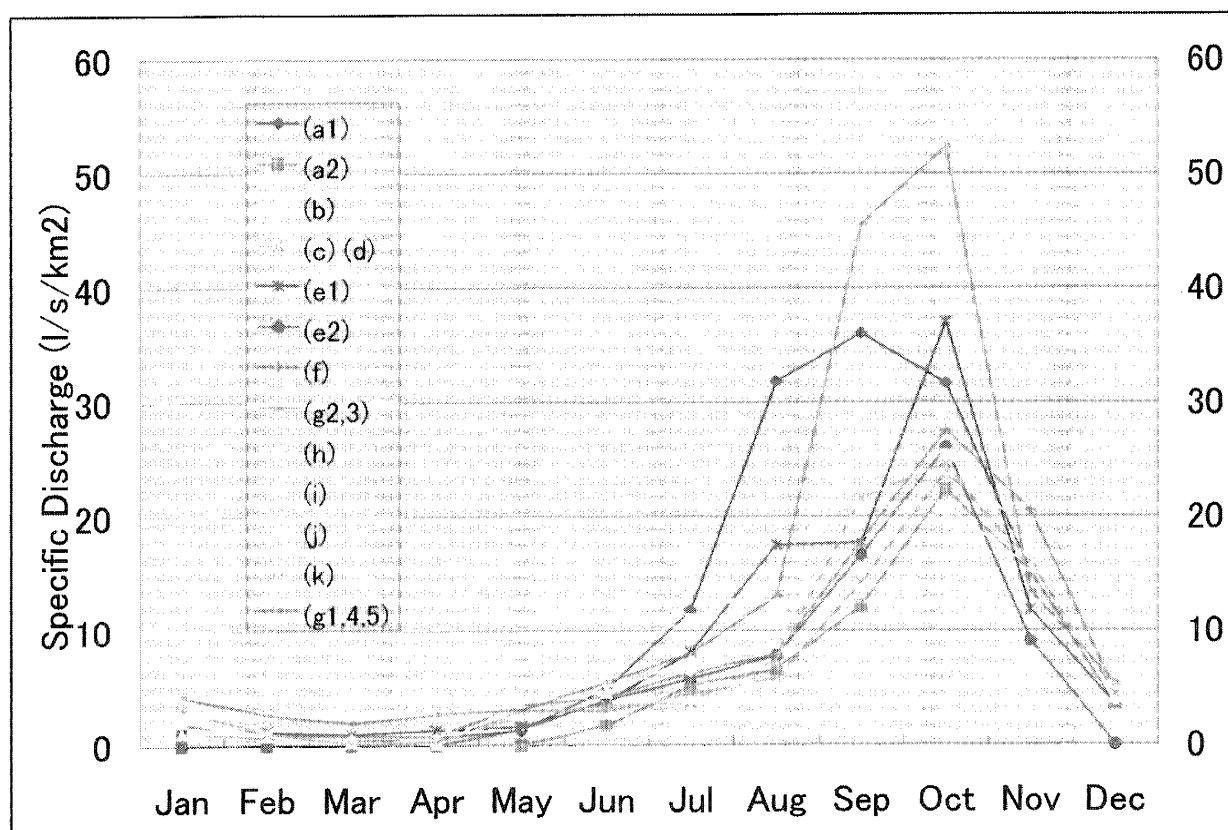


Table 5.2.1 Monthly Rainfall at Moung Russey

Station: Moung Russey River Basin: Moung russey Longitude: 103°27' Altitude:
 ID: 120303 Province: Battambang Latitude: 12°46' (Unit: mm)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1935	0.0	21.3	21.6	43.2	137.0	202.6	89.2	80.1	162.3	195.3	169.8	50.8	1,173.2
1936	5.3	7.7	2.9	4.0	239.6	149.9	30.0	45.8	81.7	79.7	17.0	0.0	663.6
1937	30.7	53.1	43.0	31.6	75.6	-	57.0	46.5	120.0	91.0	19.7	0.0	-
1938	0.0	4.0	61.5	31.0	71.4	-	-	-	-	-	-	-	-
1939	0.0	0.0	80.6	39.8	53.8	208.7	12.7	68.7	204.9	89.6	250.0	0.0	1,008.8
1940	0.0	18.2	8.0	106.0	30.2	32.6	33.0	60.3	45.6	-	-	-	-
1941	-	-	-	-	-	-	-	-	-	-	-	-	-
to	-	-	<i>Data are not available from 1941 to 1950.</i>										-
1950	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	0.0	0.0	6.8	87.0	389.2	211.5	186.0	105.4	52.3	148.0	691.6	45.5	1,923.3
1952	0.0	0.0	0.0	97.6	91.2	100.3	-	90.4	-	-	-	-	-
1953	0.0	0.0	61.2	84.4	142.2	71.3	256.0	58.0	143.0	111.5	119.8	0.0	1,047.4
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
to	-	-	<i>Data are not available from 1954 to 1960.</i>										-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-
1961	-	-	-	-	-	-	-	74.2	162.0	186.5	120.4	0.0	-
1962	2.2	0.0	19.3	93.7	182.6	12.7	196.4	147.4	382.1	111.7	64.6	25.2	1,237.9
1963	0.0	6.3	65.0	0.0	192.5	44.3	147.5	193.5	172.3	330.0	160.4	7.0	1,318.8
1964	2.7	0.0	0.0	51.0	243.8	97.3	99.4	150.8	173.8	102.9	167.7	16.5	1,105.9
1965	-	-	-	-	-	-	-	-	-	-	-	-	-
to	-	-	<i>Data are not available from 1965 to 1992.</i>										-
1992	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	0.0	0.0	4.7	84.1	107.2	99.1	140.1	77.7	277.7	468.4	29.6	0.0	1,288.6
1994	0.0	42.8	85.3	63.5	219.5	173.0	35.9	89.9	239.0	157.9	7.1	2.3	1,116.2
1995	0.0	0.0	18.2	43.5	87.2	129.1	285.5	255.5	251.6	394.1	117.6	22.3	1,604.6
1996	0.0	0.0	23.4	228.1	202.2	59.6	135.0	114.4	255.6	667.5	112.6	29.8	1,828.2
1997	0.0	0.0	105.3	23.1	65.9	61.7	114.3	78.9	191.8	101.9	21.1	0.0	764.0
1998	0.0	24.1	0.0	106.5	54.7	215.2	103.3	123.5	245.4	176.1	121.8	0.0	1,170.6
1999	8.6	0.0	63.5	229.0	119.7	168.2	133.4	126.7	153.5	110.6	181.9	18.1	1,313.2
2000	0.0	25.3	10.6	211.1	114.6	233.9	212.7	57.7	189.6	323.9	44.8	0.0	1,424.2
2001	0.0	0.0	174.1	15.0	118.2	70.9	54.3	133.5	135.0	184.3	24.7	0.0	910.0
2002	0.0	0.0	133.7	230.1	56.7	72.7	46.2	90.2	111.2	292.6	147.1	16.8	1,197.3
2003	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	0.0	0.0	24.0	113.3	55.2	101.6	115.2	68.1	220.5	216.8	0.0	0.0	914.7
2005	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	0.0	2.8	86.0	113.9	69.3	180.0	84.4	175.2	180.1	204.0	21.7	29.7	1,147.1
2007	0.0	0.0	93.9	79.6	125.5	215.9	188.7	151.0	146.5	215.6	170.7	0.0	1,387.4
2008	-	-	-	-	-	-	-	-	-	-	-	-	-
Average	2.0	8.2	47.7	88.4	129.8	126.6	119.8	106.5	179.1	215.6	120.9	11.5	1156.2

Source: MOWRAM

Prepared by JICA Study Team

Table A.5.5.1 Flood Information from Household Survey in Ream Kon and Por Canal

Question	Prolay Po	Ream Kon
Flood Damage		
1 Do you suffer from flood damage? Yes	55%	70%
2 How often do you suffer from flood in a year? 1~4 times 2-3 YEARS ONE TIME	55%	70%
3 How many days does one flood continues on average? 3 days or more	48%	70%
4 How do the floods damage you? Paddy, Veg. field or Poultry Family's Life	43% 13%	60% 10%

Prepared by JICA Study Team, through arrangement of selected data from results of "Household Survey" carried out by Social and Environmental Sector in the Study

Table A.5.5.2 Flood Information from Villagers in Moung Russey river basin

No.	Place	Interviewee	Flood scale		Frequency	Flood Month	Flood source/route	Flood Water depth/level	Inundation duration	Damage	
			Largest	Large						Damage	Level
1	Left bank near Por Canal	villager			2007		river through canal	0.3 m	half month		
2	Near the weir	villager			1/3-4Y		never overbank		2-3 days		
3	Left bank d/s of weir	villager			1/5-6Y			0.1-0.5 m			
4	Moung Russey Town	restaurant	after 1979	3-4 big floods				0.5 m	1 week		
5	Moung Russey WL St	observer		1999				near road			
6	Prek Chik (River) St	observer			usually 6Y ago			no over bank			
7	Basak Reservoir	villager			rain only	Aug e-Sep. b		0.5 m	3 days	corn, soybean corn	no damage

Prepared by JICA Study Team Y = year b = beginning e = end

Table A.6.4.1 Five-day Discharge at Damnak Ampil Weir

CA=		4,480 km ²		Pursat river							(m ³ /s)	
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Jan	1	8.2	26.2	34.0	7.1	14.5	30.7	25.6	11.9	17.3	6.2	6.8
	2	6.0	23.1	26.5	6.5	13.6	26.6	21.5	11.2	15.0	5.3	6.8
	3	5.1	14.6	21.5	5.8	13.1	24.8	19.2	10.8	14.0	4.9	6.6
	4	5.1	12.1	18.6	5.5	12.8	23.3	19.1	10.3	13.4	4.8	6.2
	5	5.1	11.5	17.1	5.1	12.0	22.1	16.8	9.9	12.8	4.7	5.6
	6	5.1	11.0	15.9	4.7	11.4	20.8	14.7	10.5	11.7	4.7	5.4
Feb	1	5.1	11.4	15.3	4.3	10.9	19.0	13.1	10.0	10.8	4.7	5.1
	2	5.1	9.7	15.4	4.1	10.7	20.1	11.9	9.0	10.5	3.8	4.9
	3	5.1	9.1	15.4	3.7	10.1	19.3	11.0	8.7	21.6	3.2	4.9
	4	5.1	8.3	13.8	3.5	9.6	14.5	10.3	8.5	21.9	3.1	4.9
	5	4.9	8.6	10.9	3.3	9.1	11.5	9.8	8.3	9.1	3.4	4.9
	6	4.9	9.0	10.4	3.1	8.8	13.9	9.5	8.2	9.0	4.0	4.9
Mar	1	4.9	9.0	-	2.8	8.4	13.2	31.2	7.9	8.9	3.2	4.7
	2	4.9	8.8	-	2.8	8.3	16.5	30.9	8.1	11.5	3.2	4.7
	3	4.9	7.6	-	2.8	8.3	20.9	32.8	7.6	11.3	3.2	4.7
	4	4.9	7.1	-	2.7	8.2	17.9	20.3	7.5	10.5	3.2	4.6
	5	4.9	7.3	-	2.5	8.0	14.5	38.6	8.1	13.1	3.1	4.1
	6	4.9	6.6	-	2.4	8.6	11.2	23.9	8.1	18.7	3.0	4.1
Apr	1	8.4	4.7	-	2.2	13.2	11.5	21.3	7.9	16.9	2.5	4.9
	2	8.1	9.5	-	2.1	72.5	11.8	18.0	8.4	12.2	2.3	4.9
	3	6.2	10.7	-	2.1	43.9	12.9	13.1	10.5	10.1	2.3	8.3
	4	6.2	14.2	-	2.2	34.2	91.6	11.6	11.1	10.0	2.8	7.9
	5	8.1	18.7	-	2.5	46.4	118.8	10.8	15.1	9.6	4.6	7.7
	6	8.3	12.2	-	3.5	39.4	88.2	10.8	13.2	19.6	3.7	9.4
May	1	9.7	20.3	-	7.4	169.5	48.5	13.1	12.1	21.6	4.1	8.4
	2	9.0	19.5	-	7.4	97.3	106.3	13.7	13.0	18.2	3.2	8.4
	3	10.7	19.3	-	8.0	95.1	124.1	13.8	16.8	14.7	2.4	7.1
	4	7.1	56.1	-	9.5	220.5	58.3	22.9	13.0	18.7	3.8	8.2
	5	6.9	68.5	-	9.8	269.7	53.9	20.4	12.3	24.6	6.5	34.7
	6	4.8	34.8	-	8.9	134.7	53.1	14.9	13.7	20.5	5.1	19.3
Jun	1	9.5	90.3	-	8.0	113.5	78.9	15.3	10.8	20.4	11.8	12.5
	2	13.0	93.2	-	8.4	205.0	155.1	31.6	10.6	21.0	17.1	10.1
	3	11.6	152.1	-	9.0	113.9	69.0	23.8	14.3	38.8	35.4	32.7
	4	15.6	165.2	-	10.8	156.8	42.7	22.3	14.9	41.5	156.7	15.5
	5	16.3	103.2	-	10.8	70.3	66.4	17.3	13.4	58.0	117.3	10.8
	6	21.9	57.4	-	11.3	73.8	103.7	77.3	19.3	63.9	62.9	10.9
Jul	1	15.6	85.8	-	12.5	191.7	161.2	100.9	16.2	60.6	27.9	15.7
	2	34.5	92.3	-	16.5	102.4	218.0	175.2	19.8	96.8	38.8	29.1
	3	34.3	141.2	-	17.4	70.7	174.6	36.3	19.7	87.8	40.9	22.8
	4	37.0	201.8	-	20.4	65.6	311.3	20.2	15.1	84.3	118.7	16.3
	5	77.2	85.3	-	19.4	48.5	125.3	19.3	15.0	120.4	115.2	36.8
	6	40.8	294.0	-	25.4	185.9	146.6	17.0	23.6	257.0	78.6	98.5
Aug	1	275.8	211.7	-	26.5	245.5	111.0	15.3	19.4	93.0	40.6	282.2
	2	133.6	116.1	-	37.4	155.0	140.6	35.3	57.9	161.7	69.8	87.5
	3	87.1	160.5	-	44.2	53.5	106.5	157.3	26.9	36.2	162.8	153.4
	4	109.5	80.5	-	55.9	40.1	170.0	162.8	58.2	42.2	99.8	59.6
	5	113.3	121.8	-	56.1	97.0	191.0	59.4	69.5	94.3	86.3	19.3
	6	333.3	130.0	-	42.7	164.9	148.9	40.3	81.0	70.2	102.3	20.9
Sep	1	446.0	121.3	-	99.1	382.2	117.0	58.2	83.3	33.6	62.4	17.8
	2	145.8	270.0	-	127.8	253.1	106.6	55.1	48.6	61.3	70.9	29.4
	3	158.5	399.4	-	82.2	127.3	106.9	39.1	72.5	73.1	60.2	58.0
	4	319.5	306.3	-	138.8	77.5	82.3	34.3	42.1	80.8	73.2	151.5
	5	288.8	137.9	-	115.4	100.8	219.0	113.6	98.8	93.3	178.2	124.0
	6	304.0	370.4	-	218.1	186.2	259.1	217.2	114.5	231.0	58.0	55.9
Oct	1	393.4	534.4	-	251.7	399.6	347.0	244.4	82.1	344.7	139.7	24.0
	2	523.8	340.6	-	230.3	218.3	218.6	398.8	96.4	438.1	301.4	40.0
	3	569.4	326.8	-	299.2	259.0	578.5	293.5	53.7	201.6	158.3	99.2
	4	260.6	363.7	-	179.2	429.4	562.6	221.3	26.7	491.6	67.1	151.4
	5	117.1	562.7	-	120.0	279.5	477.1	268.4	34.0	433.6	52.9	192.6
	6	174.7	641.1	-	84.1	502.2	390.6	234.0	250.3	230.0	48.6	337.4
Nov	1	232.3	388.5	-	48.6	672.1	340.4	155.6	134.5	82.0	43.9	88.6
	2	115.7	293.9	-	62.2	561.0	220.6	78.9	58.0	40.4	41.4	211.5
	3	260.0	261.1	-	49.8	312.4	178.6	45.8	54.6	34.0	37.3	112.1
	4	91.0	263.8	-	103.5	198.4	286.2	38.5	53.4	30.4	33.2	73.2
	5	58.7	247.4	-	83.2	109.2	263.5	30.0	49.2	25.0	30.1	71.6
	6	45.1	172.7	-	65.4	83.8	205.2	24.2	35.3	21.9	27.6	24.3
Dec	1	28.2	383.5	-	56.3	80.2	120.0	20.2	31.2	20.3	25.1	20.0
	2	23.3	177.7	-	37.4	220.2	68.9	17.6	24.9	18.7	22.5	20.5
	3	18.8	89.8	-	28.4	88.4	54.5	16.3	25.1	26.3	20.1	18.3
	4	42.5	56.0	-	23.6	58.1	67.9	16.0	18.8	14.3	15.7	16.7
	5	38.3	43.5	-	19.8	43.9	51.4	15.0	20.8	12.4	13.6	15.8
	6	30.7	33.0	-	16.6	35.4	37.2	13.8	20.1	10.7	9.0	14.8
Annual		86.8	134.1	-	43.2	128.5	125.0	58.6	32.6	68.5	42.9	43.4

Prepared by JICA Study Team

Original data source: MOWRAM, ADB and PWRI (Public Works Research Institute, Japan)

Annual average

76.4 m³/s

Table A.6.4.2 Five-day Discharge at Svay Don Keo

CA= 805 km ²		Svay Don Keo river (m ³ /s)				
		2001	2002	2003	2004	2005
Jan	1	13.7	3.3	4.4	4.1	6.2
	2	10.9	3.2	3.0	3.9	4.8
	3	9.9	3.1	2.7	3.7	3.7
	4	9.8	2.9	2.4	3.2	2.8
	5	8.6	2.7	2.1	2.6	2.3
	6	7.7	2.5	1.9	1.7	2.1
Feb	1	7.2	2.3	1.7	1.1	1.9
	2	6.3	2.1	1.5	1.0	1.8
	3	5.6	2.0	1.2	0.9	1.7
	4	5.1	2.0	1.0	0.8	1.6
	5	4.7	1.8	0.9	0.8	1.5
	6	4.4	1.6	0.8	0.8	1.5
Mar	1	4.0	1.4	0.8	0.7	1.4
	2	3.6	1.2	0.7	0.6	1.3
	3	3.7	1.1	0.7	0.6	1.2
	4	4.2	1.1	0.7	0.5	1.2
	5	6.1	1.1	0.6	0.5	1.1
	6	14.0	1.1	0.6	0.5	1.0
Apr	1	11.9	1.0	0.5	0.4	1.1
	2	7.1	1.0	0.5	0.4	1.0
	3	5.2	0.9	0.5	0.4	1.1
	4	4.7	0.9	0.4	0.5	1.8
	5	4.1	0.8	0.4	1.3	3.1
	6	3.6	4.1	0.4	1.1	6.8
May	1	3.4	20.9	1.0	4.4	8.5
	2	3.4	13.0	2.8	7.8	9.2
	3	3.8	11.1	3.5	9.7	12.2
	4	6.4	9.3	8.7	11.3	13.0
	5	5.9	10.3	8.3	7.0	9.3
	6	4.8	7.5	6.4	3.9	6.4
Jun	1	4.5	5.8	4.6	12.4	15.7
	2	6.6	4.9	2.8	19.7	22.4
	3	8.4	5.2	2.4	19.1	21.0
	4	6.5	5.6	2.2	19.5	21.2
	5	4.8	4.8	2.2	22.4	24.5
	6	4.1	4.4	2.2	25.1	23.6
Jul	1	4.2	4.4	2.4	25.1	28.8
	2	4.0	4.8	3.1	30.0	34.9
	3	3.7	3.6	4.9	23.5	30.6
	4	3.5	3.0	7.0	19.0	26.0
	5	3.8	2.5	7.4	16.8	21.2
	6	5.3	2.1	7.7	13.5	17.5
Aug	1	2.2	2.2	12.8	9.4	12.8
	2	3.5	2.1	19.7	11.1	14.4
	3	5.0	2.1	20.3	16.6	19.9
	4	6.0	2.3	19.3	15.7	18.7
	5	7.7	2.4	16.2	13.2	15.6
	6	10.1	3.8	11.3	14.7	19.1
Sep	1	14.6	9.8	5.9	15.0	18.0
	2	21.8	14.5	3.2	17.6	20.5
	3	25.1	18.8	2.8	22.9	24.7
	4	28.8	23.3	3.4	28.6	33.0
	5	32.2	29.5	5.6	34.2	37.9
	6	33.7	33.8	9.0	36.1	41.8
Oct	1	35.4	37.0	19.7	35.8	42.8
	2	35.8	38.2	30.9	33.7	39.8
	3	37.9	33.3	32.9	41.5	39.9
	4	38.1	29.9	40.4	44.0	49.9
	5	34.5	26.4	47.8	35.3	52.2
	6	32.3	40.4	51.9	31.8	43.4
Nov	1	33.7	37.1	38.0	28.4	34.3
	2	32.6	32.8	28.6	23.1	29.3
	3	29.9	27.6	23.4	18.6	24.9
	4	26.3	24.3	20.4	17.0	22.0
	5	22.4	25.0	16.9	15.1	19.9
	6	16.8	25.6	13.8	13.9	17.5
Dec	1	11.9	24.3	9.6	13.3	14.8
	2	8.2	20.8	6.3	12.6	12.0
	3	5.7	16.9	5.0	10.3	9.5
	4	5.2	11.8	4.8	8.4	7.5
	5	4.8	7.9	4.4	7.8	6.2
	6	4.0	6.2	4.3	7.0	5.4
Annual		11.9	10.8	8.9	13.3	15.9
Prepared by JICA Study Team		Annual average				
Original data source: MOWRAM and ADB		12.2 m ³ /s				

Table A.6.5.1 Flood Information from Household Survey around Pursat river

Question	Wat Loung	Wat Chrea	Remarks
Flood Damage			
1 Do you suffer from flood damage?			
Yes	50%	13%	
2 How often do you suffer from flood in a year?			
1~4 times	45%	10%	
2-3 YEARS ONE TIME	5%	3%	
3 How many days does one flood continues on average?			
3 days or more	38%	13%	
4 How do the floods damage you?			
Paddy, Veg. field or Poultry	40%	10%	
Family's Life	8%	-	

Prepared by JICA Study Team, through arrangement of selected data from results of "Household Survey" carried out by Social and Environmental Sector in the Study

Table A.6.5.2 Flood Information from Villagers in Pursat river basin

No.	Place	Interviewee	Largest Flood scale	Frequency	Flood Month	Flood source/route from the river	Flood Flow speed	Water depth/level	Inundation duration	Paddy	Damage	House etc	Comment/Episode
1	Damnak Ampil MC 2.1 (South bank)	villager	Once	no other flood		from upper land/south	walkable	1.5-1.7 m	3 days	damaged		small house	livestock to road/pagoda
2	Damnak Ampil MC 4.2 (North bank)	villager (39Y)	1996	Before, every Y	Sep-Nov	from upper land/south	not walkable	1.5-1.6 m (PF half month)	3-4 days	not serious			
3	Wat Loung near the wa	villager	1996	until 2000 after 2001	Oct/Nov	no flood		1.0 m	5-6 days x 2	damaged			a little
4	Wat Loung 2.5 km north (Dangkheab Kdam?)	villager	1996	every year		west of pagoda & can	strong flow	0.2-0.3 m	3-5 days		some		
5	Wat Chre near the wat	villager		every year	Aug e/Sep	from stream/canal		1.8 m house	3-4 days	damage	some		H=0.5m : useful
6	south of NH5 (near Wat Chre)	villager		every year	Aug e/Sep	from stream/canal		0.5-1.0 m	2-3 days				
7	Pursat Town	PDWRAM (1979-now)	1996	No flood in 2005, 2006 and 2007		river, the lake		0.2 m: house	15 days				
8	Krabau Chrum (Pursat river left bank)	villager	1996	Before, every year		upper land		0.3 m: paddy	15 days	serious			
9	Samrong Muoy (Pursat river left bank)	villager	1996**	50Y ago		river overbank	strong speed	0.3 m on road	half-1 month	serious			
10	near Bac Trakoun (Pursat river right bank)	villager	1996	nearby every Y	Aug/Sep?	river overbank	strong speed	1 m	15 days				
11	Veal Veang WL St	villager	10-20Y ago	nearby every Y	Aug/Sep?	lowland only	strong flow	0.5-0.6 m	1 week	not serious	only 5-10% 2nd: infrastructure		heavy rain in upstream basin
			2004 or 2005	rise to max. 3 days	only	only 1 overbank flood	strong flow	1.3-1.5 m road	14-15 days	not serious	animal-damage		
			2004 or 2005	some flood in some places, usually	only	only 1 overbank flood	strong flow	0.5 m ground	3-5 days	damage			
			2004 or 2005	some flood in some places, usually	only	only 1 overbank flood	strong flow	1.6-1.7 m road	1 week	small damage-no problem	some		
			2004 or 2005	some flood in some places, usually	only	only 1 overbank flood	strong flow	1.2 m	1 day	no damage			
			2004 or 2005	some flood in some places, usually	only	only 1 overbank flood	strong flow	H=approx. 10m	1 day	no damage	Bridge damaged seriously		new bridge constructed

Prepared by JICA Study Team Y = year * Flood might come from other basin. ** correction from mis-remembered 1993 NH5 = National Highway No. 5

Table A.7.2.2 Monthly Rainfall at Krakor

Station: ID:	Krakor 120403		River Bsin: Boribo Province: Pursat				Longitude: E 104°13' 02" Latitude: N 12°31' 56"				Altitude:		(Unit: mm)
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1930	24.9	6.0	67.0	45.0	160.8	96.2	248.4	196.2	111.7	716.9	149.5	108.2	1,930.8
1931	-	-	-	-	-	-	-	-	-	-	-	-	-
to	<i>Data are not available from 1931 to 1938</i>												
1938	-	-	-	-	-	-	-	-	-	-	-	-	-
1939	18.0	0.0	108.0	114.0	262.0	294.0	159.0	210.0	216.0	204.0	96.0	0.0	1,681.0
1940	-	-	-	-	-	-	-	71.3	225.0	113.0	93.0	13.0	-
1941	0.0	0.0	0.0	28.4	168.0	104.0	166.3	153.0	194.0	391.5	151.0	76.0	1,432.2
1942	17.0	0.0	221.0	72.0	191.4	206.2	167.7	203.3	204.1	151.0	176.0	0.0	1,609.7
1943	0.0	9.0	3.0	51.0	176.2	217.9	94.5	196.1	173.0	272.4	28.1	16.4	1,237.6
1944	-	-	-	-	-	-	-	-	-	-	-	-	-
1945	-	-	-	-	-	-	-	-	-	-	-	-	-
1946	0.0	0.0	0.0	74.1	423.1	227.4	83.8	288.5	295.8	210.1	110.9	12.7	1,726.4
1947	0.0	0.0	43.3	114.0	236.3	191.2	202.5	283.6	231.8	501.5	39.5	27.9	1,871.6
1948	0.0	0.0	37.0	105.9	180.1	104.8	204.5	218.2	179.8	334.0	62.0	0.0	1,426.3
1949	0.0	0.0	11.0	25.0	308.4	176.0	192.2	184.4	278.6	280.9	91.7	20.5	1,568.7
1950	24.9	0.0	2.1	47.9	195.5	200.9	225.6	263.8	270.1	380.5	33.3	0.0	1,644.6
1951	3.1	0.0	0.0	51.8	252.5	214.2	175.4	124.8	106.6	103.5	367.5	10.4	1,409.8
1952	0.0	0.0	0.0	68.3	188.7	94.2	225.1	292.0	185.0	335.5	76.6	10.9	1,476.3
1953	7.2	0.0	98.2	48.3	295.6	67.8	175.7	181.2	105.5	325.0	0.0	0.0	1,304.5
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
to	<i>Data are not available from 1954 to 1959</i>												
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	124.8	448.6	137.9	51.4	0.0	-
1961	11.2	2.0	15.1	79.0	206.4	154.5	198.6	316.0	239.7	198.9	142.0	15.0	1,578.4
1962	0.0	0.0	0.0	0.0	84.3	181.2	-	205.0	390.4	198.3	137.9	4.5	-
1963	0.0	1.0	3.5	0.6	196.8	118.0	201.8	290.6	175.0	286.9	175.1	9.7	1,459.0
1964	1.7	0.0	0.0	21.0	217.6	199.1	155.7	168.6	263.2	89.9	133.2	12.0	1,262.0
1965	0.0	58.6	5.5	71.3	135.3	158.3	129.4	208.4	240.3	296.5	0.0	0.0	1,303.6
1966	0.0	22.4	54.9	18.2	239.7	203.6	229.8	174.4	350.9	358.5	235.7	18.6	1,906.7
1967	6.1	0.0	0.0	118.5	163.9	170.2	224.6	264.2	233.4	232.4	121.3	8.0	1,542.6
1968	0.0	0.0	0.0	102.6	168.2	230.4	177.6	163.3	296.6	205.1	42.8	0.0	1,386.6
1969	8.6	3.6	9.1	67.7	185.6	278.8	216.1	167.7	142.5	181.9	19.6	1.3	1,282.5
1970	0.8	38.2	73.3	168.3	160.0	350.8	211.1	317.1	243.2	257.6	130.9	63.7	2,015.0
1971	0.0	0.0	24.8	3.2	94.7	233.2	197.3	271.4	220.7	656.7	93.1	16.3	1,811.4
1972	0.0	7.5	9.3	167.2	114.5	109.1	106.2	157.2	256.3	215.1	0.0	0.0	1,142.4
1973	-	-	-	-	-	-	-	-	-	-	-	-	-
to	<i>Data are not available from 1973 to 1993</i>												
1993	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	0.0	0.0	0.0	48.6	75.4	342.4	153.9	340.5	355.8	243.9	19.7	0.0	1,580.2
1995	0.0	0.0	38.5	33.0	231.5	125.8	180.8	99.6	329.1	301.9	87.8	20.5	1,448.5
1996	0.0	28.5	0.0	5.3	82.5	205.7	110.8	176.0	267.0	438.5	21.9	155.1	1,491.3
1997	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-	-	-	-	-	-
1999	Data are not utilized because unnatural daily rainfall pattern is not reliable.												
2000	--- ditto ---												
2001	--- ditto ---												
2002	--- ditto ---												
2003	--- ditto ---												
2004	--- ditto ---												
2005	--- ditto ---												
2006	--- ditto ---												
2007	--- ditto ---												
2008	---												
Average	4.4	6.3	29.5	62.5	192.7	187.7	178.3	210.4	241.0	287.3	96.3	20.7	1517.0

Source: MOWRAM

Prepared by JICA Study Team

Table A.7.4.1 Five-day Discharge at Lum Hach Headworks (Case 2)

CA =	735 km2		Boribo river								(m3/s)
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Jan	1	-	1.25	8.85	8.42	2.73	9.67	12.95	5.94	-	1.59
	2	-	1.21	6.34	7.00	2.66	9.77	12.95	5.94	-	1.79
	3	-	1.25	6.18	7.96	2.23	9.23	11.82	5.94	-	1.61
	4	-	1.68	5.94	8.62	1.57	8.41	10.80	5.75	-	1.41
	5	-	3.37	4.97	6.10	9.76	8.61	6.69	5.01	-	1.25
	6	-	10.95	3.97	5.04	10.61	9.64	4.63	5.01	-	1.21
Feb	1	-	8.99	6.62	4.55	8.37	10.90	4.05	4.31	-	1.05
	2	-	7.05	7.26	4.00	8.89	9.52	3.78	4.62	-	1.05
	3	-	5.88	7.00	3.35	7.96	9.53	3.49	4.25	-	1.00
	4	-	3.23	3.73	2.98	9.25	9.67	3.38	4.28	-	0.95
	5	-	2.44	2.84	2.51	9.82	9.77	3.31	4.31	-	0.83
	6	-	1.81	2.27	2.43	9.64	9.97	3.18	4.26	-	0.73
Mar	1	-	2.17	2.28	2.40	5.26	10.90	4.95	4.29	-	0.78
	2	-	2.18	2.14	2.50	4.85	9.52	5.19	3.77	-	0.72
	3	-	1.93	2.27	5.82	9.18	9.53	4.69	4.05	-	0.91
	4	-	1.72	2.43	6.72	9.82	9.67	3.83	3.86	-	0.94
	5	-	1.76	2.38	9.04	10.33	9.82	3.53	3.80	-	0.85
	6	-	2.60	2.79	5.63	9.60	10.33	3.28	4.10	-	0.92
Apr	1	-	1.61	2.25	4.01	7.19	8.42	3.86	30.42	-	0.97
	2	-	1.82	3.57	3.74	4.38	9.58	5.33	18.22	-	0.87
	3	-	2.95	4.73	3.80	4.95	8.67	5.38	14.78	-	0.77
	4	-	2.59	5.18	3.05	6.48	9.15	4.94	9.21	-	0.90
	5	-	5.51	7.13	3.59	7.22	9.72	4.87	7.74	-	0.85
	6	-	4.15	5.96	8.85	6.55	9.05	4.35	6.55	-	0.85
May	1	-	16.22	5.22	3.87	6.92	5.82	3.50	3.37	-	1.27
	2	-	13.59	4.97	3.10	6.60	2.63	3.09	3.37	-	1.96
	3	-	13.61	4.31	2.30	9.02	2.55	3.74	4.42	-	3.05
	4	-	51.18	4.15	2.08	9.97	3.58	3.62	6.96	-	3.95
	5	-	92.76	4.15	2.06	10.43	4.73	4.09	9.88	-	4.20
	6	-	30.46	3.86	2.06	6.49	3.69	4.68	8.53	-	4.55
Jun	1	1.40	14.19	7.62	8.13	8.12	3.52	4.65	13.57	-	4.48
	2	3.82	22.01	10.61	9.63	10.22	4.23	7.82	8.59	-	4.78
	3	4.60	37.95	17.83	9.58	9.58	3.20	10.82	5.79	-	5.76
	4	3.75	61.93	22.12	9.38	9.62	3.31	10.98	5.01	-	6.32
	5	2.44	42.08	26.17	9.28	2.93	5.16	11.18	5.85	-	12.89
	6	1.36	45.42	22.73	8.70	6.52	6.46	6.80	12.78	-	18.76
Jul	1	3.19	20.67	44.29	6.53	5.16	6.44	6.02	15.14	-	9.06
	2	3.66	16.78	59.15	4.49	9.35	5.64	5.98	19.74	-	9.45
	3	3.87	20.30	14.15	6.34	6.64	6.55	6.86	22.67	-	13.40
	4	4.11	19.35	25.70	8.00	7.26	5.52	5.98	22.67	-	11.80
	5	4.93	26.29	44.46	5.79	5.69	8.52	14.84	17.08	-	13.95
	6	10.61	18.31	64.62	5.09	7.54	11.46	13.31	9.66	-	11.48
Aug	1	9.81	16.71	23.21	9.24	10.61	12.03	12.28	6.96	-	10.10
	2	13.81	10.83	71.81	16.41	14.92	5.99	11.82	6.96	-	5.26
	3	14.04	8.29	52.98	18.11	18.11	4.25	10.03	6.96	-	4.37
	4	16.70	10.34	40.73	20.33	25.41	3.72	12.11	6.96	-	14.31
	5	12.49	16.31	26.77	13.31	21.93	2.79	30.34	7.87	-	33.76
	6	14.18	27.09	20.25	16.29	18.39	2.74	26.50	10.53	-	69.62
Sep	1	40.47	89.58	19.47	42.56	20.70	2.45	54.35	13.57	-	63.74
	2	25.75	43.96	32.82	61.56	20.53	3.17	74.03	16.09	-	29.90
	3	25.01	29.49	19.68	44.52	32.82	5.62	22.29	23.84	-	35.17
	4	47.48	20.48	18.72	74.80	56.06	16.49	32.98	37.73	-	77.02
	5	43.63	40.30	18.72	38.16	85.21	33.01	26.64	53.66	-	42.30
	6	80.21	58.63	28.64	36.40	54.73	88.34	11.68	97.88	-	35.00
Oct	1	46.70	73.21	34.29	72.30	18.73	74.60	33.29	13.05	-	37.82
	2	28.16	28.59	48.08	62.10	24.36	38.28	85.70	17.96	-	62.85
	3	23.21	53.20	134.99	47.27	11.76	33.51	53.28	6.96	-	79.15
	4	39.30	33.47	93.58	29.08	10.64	32.80	25.54	8.84	-	103.37
	5	22.58	19.37	75.34	25.55	26.18	32.05	16.67	12.19	-	48.52
	6	23.50	46.86	52.19	21.28	101.51	19.85	11.84	20.93	-	26.60
Nov	1	23.83	122.18	40.15	20.31	21.88	16.71	6.37	7.93	-	20.66
	2	25.40	104.65	23.16	16.51	13.68	13.37	5.01	6.96	-	16.07
	3	30.88	37.24	16.83	15.29	29.71	9.32	5.01	6.96	-	11.98
	4	34.51	30.12	20.05	13.07	14.10	6.47	5.01	8.78	-	14.84
	5	29.09	18.74	24.73	12.04	10.93	5.08	4.42	7.18	-	14.91
	6	24.73	17.28	18.19	9.04	6.75	4.97	9.76	6.96	-	10.86
Dec	1	-	16.83	8.85	6.50	7.86	4.20	9.56	6.96	2.43	9.29
	2	-	50.51	6.34	5.26	5.99	3.86	8.09	6.96	2.43	7.99
	3	-	18.30	6.18	4.32	4.94	15.74	7.61	6.96	2.43	7.19
	4	-	16.12	5.94	3.09	4.65	13.64	6.96	6.96	2.43	6.21
	5	-	13.59	4.97	2.55	4.55	12.72	6.96	8.78	2.25	4.60
	6	-	9.80	3.97	2.09	4.45	12.71	6.96	9.23	1.86	3.80
Annual	-	23.96	20.65	13.72	14.02	11.84	12.45	11.46	-	14.91	
Prepared by JICA Study Team									Annual average		15.38 m3/s
Original data at Boribo station: 1998-2005 MOWRAM & ADB, 2007 MOWRAM and the Study Team											

Table A.7.4.2 Five-day Discharge at Lum Hach Headworks (Case 7)

CA =	735 km2		Boribo river							(m3/s)	
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Jan	1	-	0.94	5.86	5.58	1.90	6.39	8.51	3.97	-	1.16
	2	-	0.92	4.23	4.66	1.85	6.45	8.50	3.97	-	1.29
	3	-	0.94	4.13	5.28	1.57	6.10	7.78	3.97	-	1.17
	4	-	1.22	3.97	5.70	1.14	5.57	7.12	3.85	-	1.04
	5	-	2.31	3.35	4.08	6.44	5.70	4.46	3.37	-	0.94
	6	-	7.21	2.70	3.39	7.00	6.37	3.13	3.37	-	0.91
Feb	1	-	5.82	4.28	2.94	5.41	7.05	2.62	2.79	-	0.68
	2	-	4.56	4.70	2.59	5.75	6.16	2.44	2.99	-	0.68
	3	-	3.81	4.53	2.16	5.15	6.16	2.26	2.75	-	0.65
	4	-	2.09	2.42	1.93	5.98	6.26	2.18	2.77	-	0.61
	5	-	1.58	1.84	1.62	6.35	6.32	2.14	2.79	-	0.53
	6	-	1.17	1.47	1.57	6.24	6.45	2.06	2.75	-	0.47
Mar	1	-	1.40	1.47	1.55	3.40	7.05	3.50	2.77	-	0.50
	2	-	1.41	1.38	1.62	3.14	6.16	3.33	2.44	-	0.46
	3	-	1.25	1.47	4.30	5.94	6.16	2.88	2.62	-	0.59
	4	-	1.11	1.57	4.35	6.35	6.26	2.42	2.50	-	0.61
	5	-	1.14	1.54	5.85	6.68	6.35	2.28	2.46	-	0.55
	6	-	1.69	1.81	3.64	6.21	6.69	2.09	2.65	-	0.60
Apr	1	-	1.04	1.46	2.60	4.65	5.45	2.80	29.66	-	0.63
	2	-	1.18	2.31	2.42	2.83	6.20	3.47	14.65	-	0.56
	3	-	1.91	3.06	2.46	3.20	5.61	3.31	10.26	-	0.50
	4	-	1.68	3.35	1.97	4.19	5.92	3.31	5.96	-	0.58
	5	-	3.56	4.61	2.32	4.67	6.29	3.08	5.01	-	0.55
	6	-	2.68	3.85	5.72	4.24	5.85	2.72	4.23	-	0.55
May	1	-	12.85	4.07	3.19	5.17	4.46	2.82	2.87	-	1.51
	2	-	9.77	3.91	2.69	4.96	2.39	2.79	2.87	-	1.96
	3	-	9.66	3.48	2.18	6.53	2.34	3.07	3.55	-	2.66
	4	-	51.87	3.37	2.04	7.14	3.01	3.03	5.19	-	3.25
	5	-	93.45	3.37	2.02	7.44	3.75	3.46	7.16	-	3.40
	6	-	29.59	3.19	2.02	4.89	3.08	3.74	6.21	-	3.64
Jun	1	1.59	10.11	5.61	6.02	5.93	2.96	3.78	9.70	-	3.58
	2	3.15	20.45	7.54	6.91	7.29	3.42	6.88	6.23	-	3.77
	3	3.66	38.63	15.05	6.87	6.87	2.75	7.12	4.42	-	4.40
	4	3.11	62.55	20.61	6.75	6.91	2.82	8.95	3.92	-	4.77
	5	2.26	42.76	25.59	6.68	2.57	4.02	7.10	4.47	-	9.33
	6	1.56	43.93	21.43	6.31	4.89	4.86	4.86	9.19	-	16.46
Jul	1	2.99	18.88	42.40	5.14	4.26	5.09	4.79	11.87	-	6.78
	2	3.29	13.62	58.56	3.83	6.97	4.56	4.86	17.75	-	7.03
	3	3.42	18.38	10.46	5.02	5.21	5.16	5.30	21.59	-	10.63
	4	3.58	17.10	25.14	6.10	5.62	4.49	4.84	21.59	-	8.55
	5	4.11	26.03	45.38	4.66	4.60	6.43	15.19	14.16	-	11.00
	6	7.79	15.69	65.54	4.21	5.80	8.51	9.48	7.17	-	8.34
Aug	1	7.55	13.81	22.49	7.19	8.07	8.99	9.16	5.71	-	7.75
	2	10.51	8.22	72.31	13.97	11.40	5.09	8.79	5.71	-	4.61
	3	10.67	6.57	53.32	15.71	15.71	3.96	7.44	5.71	-	4.04
	4	13.93	7.90	41.00	18.72	25.21	3.62	12.11	5.71	-	10.67
	5	9.29	13.53	26.13	9.85	20.84	3.01	34.79	6.30	-	33.47
	6	11.87	24.97	18.60	13.50	16.08	2.98	20.12	8.02	-	70.54
Sep	1	42.51	92.02	18.78	43.30	20.73	4.03	75.60	11.46	-	66.16
	2	26.17	46.31	34.09	64.00	20.21	4.49	59.22	14.54	-	30.76
	3	24.65	30.31	19.07	46.05	35.02	6.08	20.77	24.14	-	37.20
	4	49.92	20.14	17.76	77.24	58.50	14.77	39.87	38.22	-	79.46
	5	46.07	42.53	17.76	40.60	87.65	34.71	19.46	55.62	-	43.69
	6	82.65	61.07	28.32	38.84	56.96	90.78	13.04	100.32	-	36.47
Oct	1	48.82	75.33	36.41	74.42	17.46	76.72	49.83	11.10	-	39.76
	2	30.06	29.73	50.20	64.22	24.38	40.40	73.70	16.42	-	64.64
	3	23.52	55.32	137.11	49.39	9.76	35.63	55.34	6.62	-	81.27
	4	41.04	35.11	95.70	30.58	9.21	34.92	23.41	7.84	-	105.49
	5	22.66	18.32	77.46	26.31	26.11	34.17	13.34	10.62	-	50.64
	6	23.90	48.10	54.31	20.91	103.63	18.97	9.78	20.25	-	27.86
Nov	1	23.76	123.70	41.67	18.99	21.13	14.12	4.76	6.65	-	19.47
	2	25.88	106.17	22.85	13.85	11.73	10.25	4.76	6.02	-	13.26
	3	32.24	38.76	14.29	12.20	30.32	7.55	4.76	6.02	-	9.27
	4	36.03	31.38	18.57	9.97	11.35	5.70	4.71	7.20	-	11.97
	5	30.41	16.87	24.98	9.31	8.59	4.81	4.38	6.16	-	12.02
	6	24.98	14.90	16.13	7.37	5.89	4.73	9.02	6.02	-	8.59
Dec	1	-	13.14	6.11	4.59	5.46	3.09	5.89	4.88	1.95	6.39
	2	-	50.25	4.48	3.78	4.25	2.87	5.62	4.88	1.95	5.55
	3	-	15.14	4.38	3.18	3.57	11.68	5.16	4.88	1.95	5.03
	4	-	12.18	4.22	2.38	3.39	9.21	4.88	4.88	1.95	4.40
	5	-	9.21	3.60	2.03	3.32	8.61	4.88	6.06	1.83	3.35
	6	-	6.72	2.95	1.73	3.26	8.60	4.88	6.35	1.58	2.84
Annual	-	23.00	19.74	12.60	12.40	10.24	11.11	9.84	-	14.23	

Prepared by JICA Study Team

Annual average 14.14 m3/s

Original data at Boribo station: 1998-2005 MOWRAM & ADB, 2007 MOWRAM and the Study Team

Table A.7.5.1 Flood Information from Household Survey in Lum Hach Area

Question	Lum Hach	Remarks
Flood Damage		
1 Do you suffer from flood damage?		
Yes	8%	
2 How often do you suffer from flood in a year?	8%	
1~4 times	-	
2-3 YEARS ONE TIME		
3 How many days does one flood continues on average?	5%	
3 days or more		
4 How do the floods damage you?	8%	
Paddy, Veg. field or Poultry		
Family's Life		

Prepared by JICA Study Team, through arrangement of selected data from results of "Household Survey" carried out by Social and Environmental Sector in the Study

Table A.7.5.2 Flood Information from Villagers in Boribo river basin

No.	Place	interviewee	Largest	Flood scale	Frequency	Month	Flood source/route	Flood speed	Water depth/level	Inundation duration	Paddy	Other crop	House etc.	Damage Level	Comment/Episode
1	Bomnak	commune chief	1987, 1994	2 L.f/d/20Y	Oct, e				0.2-1.2 m	3-7 days	not serious				evacuation system
2	Boribo WL St	observer's daughter	1/10Y	every year normal scale			not come to road		0.5-2.5 m (up) 0.5 m (down)	3 days	problem	not serious			
3	Sathi Hap village	villager*		never flooded			1 km upward from the pond in Lum Hach			3 days			dyke broke at 2 places		
4	Ou Rum Chek villax villager (No.3)		2000						0.5-2 m	1 day only	not serious				Boribo river shifted.
5	Khnar village	villagers (stay 20Y)	>10Y ago	some floods before break of dyke	no flood after break of dyke		over top dyke->breach		0.5-1.0 m	1-2 days					
6	Tang Trapeang (probably)	villager (f 64Y)	1950s (She was 8Y)	=only 1 flood in 70Y	Oct e-Nov b		from mountain	not strong	0.5 m	3 days	good after flood		not serious		the river was small
7	Left bank	villagers (m 39Y, f 47Y)	1983	from small rivers** and Boribo river	strong, hard to walk		from small rivers including Prek Chik		1.5 m	4-5 days					the river was small
8	Preak Koul village	villagers (f 66Y)***	2007	2006	Sep		Boribo river		1.8 m	1 week					
9	Kampong Chhnang Town	PDWRAM	1950± (Y15)***	1983 or 84	Sep				0.6 m	3-5 days					
			50-60Y ago						1.7-1.8m	1 week, inundation 45 days					
			2000	medium flood			Tonle Sap near the river bank	travel by boat	0.3-0.5 m NH	15-20 days					
				small flood 2001, 2002			no overroad		0.1 m land	10 days	2nd not so serious, remake 30-40% 1st infrastructure				
										1 week					

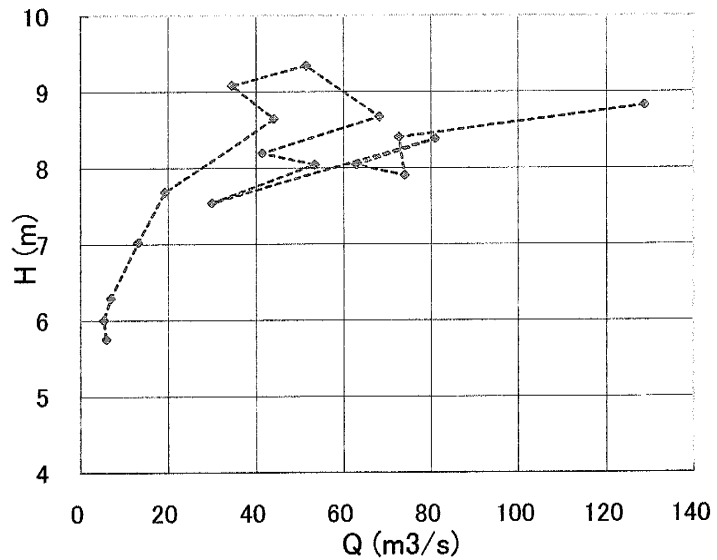
Prepared by JICA Study Team Y = year m = male f = female b = beginning e = end * moving downward ** Flood might come from other basin *** Maybe not precise

Table A.8.3.1 (1/6) Discharge Measurement Record and Rating Curve (1/6)

Battambang

Discharge measurement record

No.	Year	Date	H (m)	Q (m ³ /s)
1	2007	Jul 1	8.82	128.80
2	2007	Jul 12	8.40	72.61
3	2007	Jul 25	7.90	73.92
4	2007	Aug 9	8.04	62.92
5	2007	Aug 23	8.38	80.89
6	2007	Sep 8	7.54	29.87
7	2007	Sep 16	8.04	53.50
8	2007	Sep 25	8.19	41.42
9	2007	Oct 4	8.67	68.16
10	2007	Oct 22	9.34	51.53
11	2007	Nov 4	9.08	34.43
12	2007	Nov 19	8.64	44.10
13	2007	Dec 7	7.68	19.26
14	2007	Dec 19	7.02	13.15
15	2008	Jan 9	6.29	6.81
16	2008	Jan 26	6.00	5.21
17	2008	Feb 9	5.75	5.78



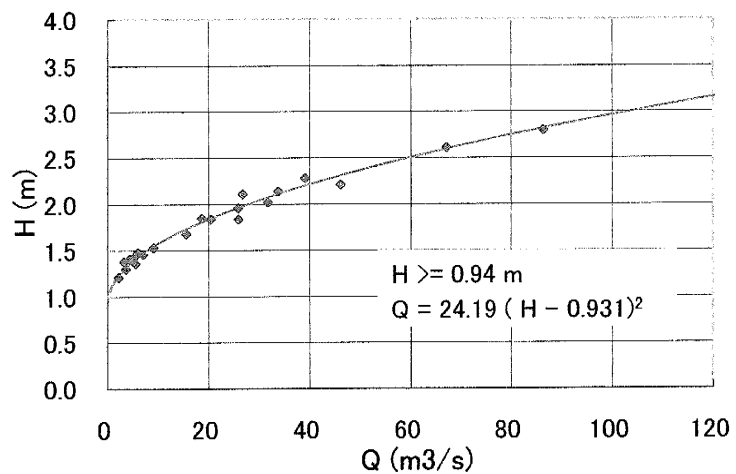
Station: Battambang

Dong Tung

Discharge measurement record

No.	Year	Date	H (m)	Q (m ³ /s)
1	2006	Dec 13	1.46	7.09
2	2007	Jan 3	1.36	5.51
3	2007	Jan 23	1.30	3.56
4	2007	Feb 20	1.21	2.15
5	2007	Mar 7	1.21	2.16
6	2007	Jun 29	2.28	39.10
7	2007	Jul 12	2.14	33.71
8	2007	Jul 24	2.11	26.65
9	2007	Aug 9	1.84	25.85
10	2007	Aug 24	2.21	46.13
11	2007	Sep 9	1.85	18.67
12	2007	Sep 16	1.96	25.79
13	2007	Sep 25	1.84	20.45
14	2007	Oct 4	2.80	86.51
15	2007	Oct 23	2.02	31.65
16	2007	Nov 4	1.68	15.61
17	2007	Nov 19	2.61	67.11
18	2007	Dec 7	1.53	9.18
19	2007	Dec 19	1.48	5.96
20	2008	Jan 8	1.42	5.13
21	2008	Jan 26	1.38	3.21
22	2008	Feb 5	1.41	4.37

Rating Curve for 2007



Station: Dong Tung

Note. Discharge measurement results from No. 1 to 5 were prepared by the JICA Cambodia Office

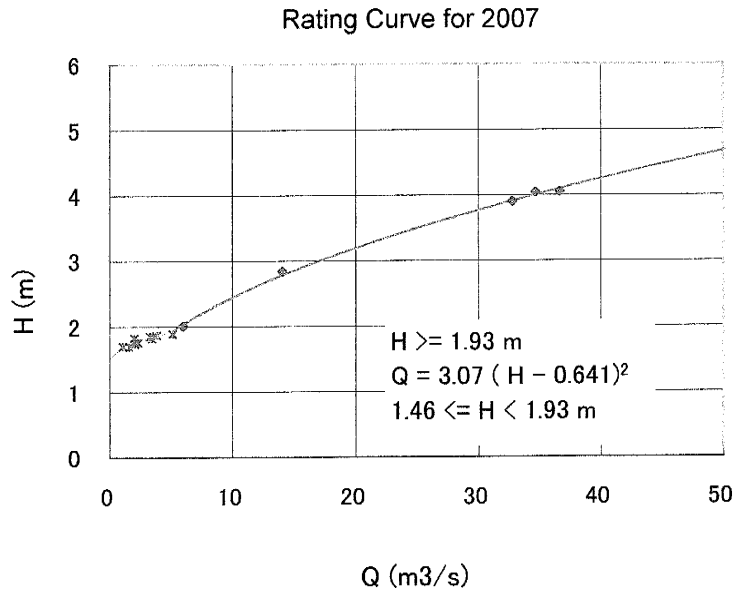
Prepared by JICA Study Team

Table A.8.3.1 (2/6) Discharge Measurement Record and Rating Curve (2/6)

Moung Russey

Discharge measurement record

No.	Year	Date	H (m)	Q (m3/s)
1	2007	Jul 2	2.01	6.02
2	2007	Jul 12	1.82	3.46
3	2007	Jul 25	1.89	5.16
4	2007	Aug 10	1.69	1.60
5	2007	Aug 25	1.87	3.88
6	2007	Sep 9	1.85	3.28
7	2007	Sep 17	3.90	32.78
8	2007	Sep 26	1.76	2.32
9	2007	Oct 5	1.74	2.06
10	2007	Oct 24	4.05	36.66
11	2007	Nov 5	2.84	14.09
12	2007	Nov 20	4.04	34.66
13	2007	Dec 8	1.82	2.03
14	2007	Dec 20	1.70	1.07
15	2008	Jan 9	1.70	0.00
16	2008	Jan 26	1.60	0.00
17	2008	Feb 9	1.62	0.00



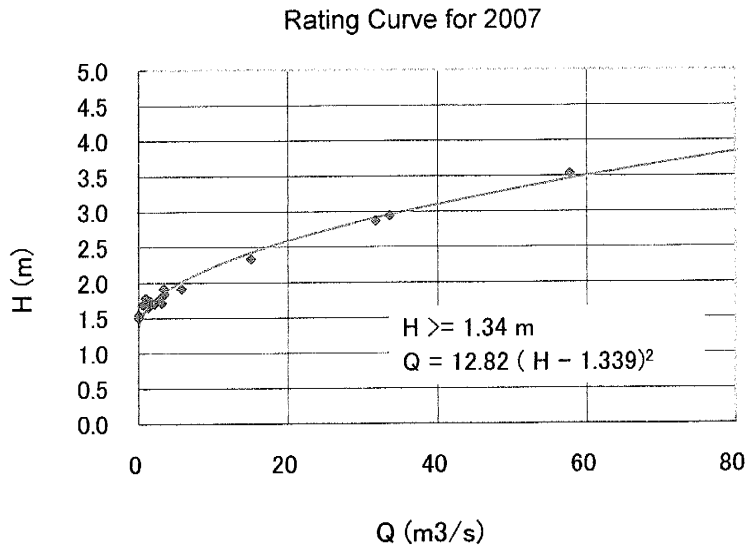
} Not used

Station: Moung Russey

Prek Chik (River)

Discharge measurement record

No.	Year	Date	H (m)	Q (m3/s)
1	2007	Jul 2	1.91	5.78
2	2007	Jul 13	1.91	3.37
3	2007	Jul 25	1.84	3.49
4	2007	Aug 10	1.65	1.31
5	2007	Aug 25	1.71	3.13
6	2007	Sep 9	1.70	2.14
7	2007	Sep 17	2.94	33.52
8	2007	Sep 26	1.77	2.85
9	2007	Oct 5	1.74	1.53
10	2007	Oct 24	2.87	31.64
11	2007	Nov 5	2.33	15.02
12	2007	Nov 20	3.53	57.75
13	2007	Dec 8	1.78	0.92
14	2007	Dec 20	1.68	0.57
15	2008	Jan 9	1.50	0.00
16	2008	Jan 27	1.54	0.00
17	2008	Feb 9	1.54	0.00



Station: Prek Chik (River)

Prek Chik (Canal)

No running water was seen in this station, rating curve is not prepared.

Prepared by JICA Study Team

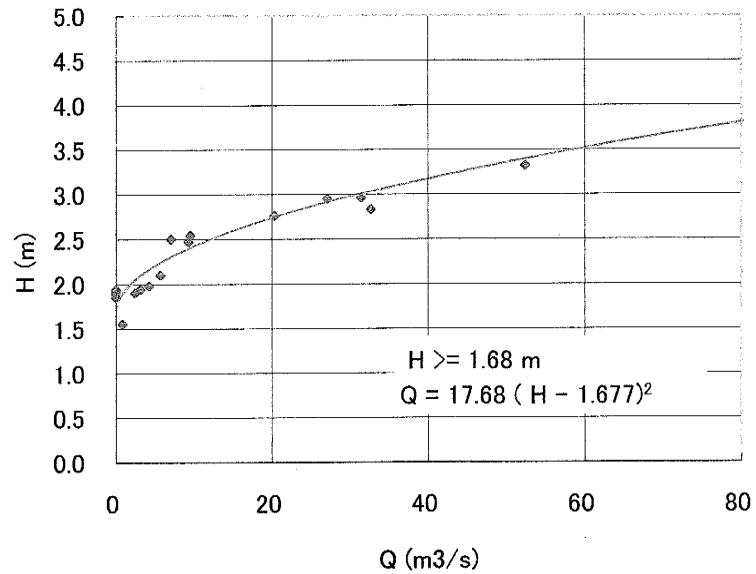
Table A.8.3.1 (3/6) Discharge Measurement Record and Rating Curve (3/6)

Svay Don Keo

Discharge measurement record

No.	Year	Date	H (m)	Q (m ³ /s)
1	2007	Jul 3	2.83	32.70
2	2007	Jul 13	2.10	5.68
3	2007	Jul 26	1.91	0.00
4	2007	Aug 10	1.85	0.00
5	2007	Aug 25	1.94	3.12
6	2007	Sep 9	1.98	4.24
7	2007	Sep 17	2.47	9.23
8	2007	Sep 26	2.76	20.33
9	2007	Oct 5	2.54	9.48
10	2007	Oct 25	3.32	52.37
11	2007	Nov 5	2.96	31.46
12	2007	Nov 20	2.95	27.11
13	2007	Dec 8	2.50	7.00
14	2007	Dec 20	1.90	2.45
15	2008	Jan 9	1.55	0.85
16	2008	Jan 27	1.94	0.00
17	2008	Feb 9	1.89	0.00

Rating Curve for 2007



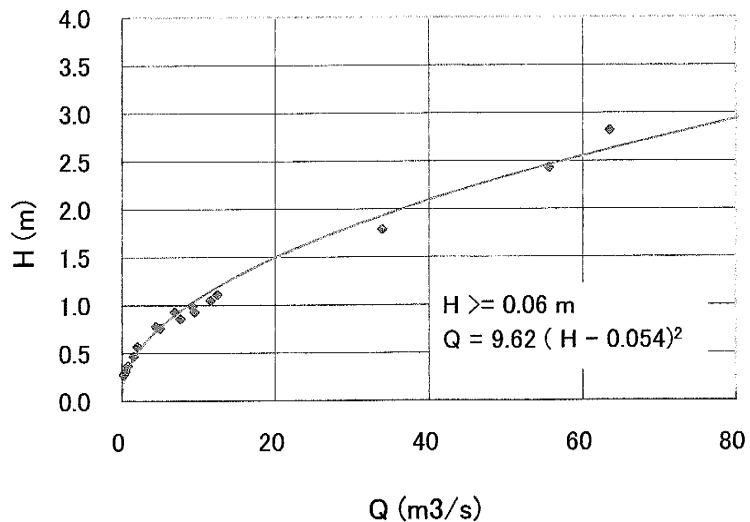
Station: Svay Don Keo

Koh Chhom

Discharge measurement record

No.	Year	Date	H (m)	Q (m ³ /s)
1	2007	Jul 3	0.76	4.95
2	2007	Jul 14	0.99	9.13
3	2007	Jul 26	0.78	4.39
4	2007	Aug 11	0.57	1.97
5	2007	Aug 27	2.43	55.66
6	2007	Sep 10	0.93	6.81
7	2007	Sep 18	2.82	63.58
8	2007	Sep 28	1.79	33.86
9	2007	Oct 6	1.05	11.51
10	2007	Oct 26	1.11	12.38
11	2007	Nov 6	0.86	7.53
12	2007	Nov 21	0.93	9.39
13	2007	Dec 9	0.47	1.51
14	2007	Dec 21	0.37	0.73
15	2008	Jan 10	0.31	0.44
16	2008	Jan 27	0.28	0.25
17	2008	Feb 11	0.28	0.21

Rating Curve for 2007



Station: Koh Chhom

Prepared by JICA Study Team

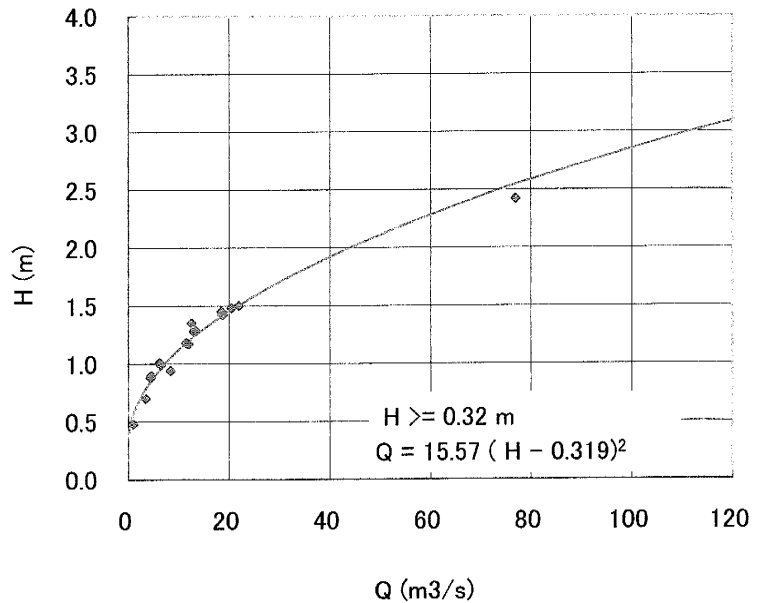
Table A.8.3.1 (4/6) Discharge Measurement Record and Rating Curve (4/6)

Bomnak

Discharge measurement record

No.	Year	Date	H (m)	Q (m ³ /s)
1	2007	Mar 10	0.48	0.96
2	2007	Jul 4	1.17	11.90
3	2007	Jul 14	0.94	8.38
4	2007	Jul 27	1.18	11.48
5	2007	Aug 11	0.99	6.41
6	2007	Aug 26	2.42	76.96
7	2007	Sep 10	1.28	13.00
8	2007	Sep 18	1.45	18.51
9	2007	Sep 28	1.50	21.87
10	2007	Oct 6	1.42	18.70
11	2007	Oct 26	1.48	20.45
12	2007	Nov 6	1.29	13.34
13	2007	Nov 21	1.35	12.57
14	2007	Dec 9	1.01	6.17
15	2007	Dec 22	0.90	4.52
16	2008	Jan 10	0.70	3.43
17	2008	Jan 27	0.88	4.40
18	2008	Feb 7	0.69	2.39

Rating Curve for 2007



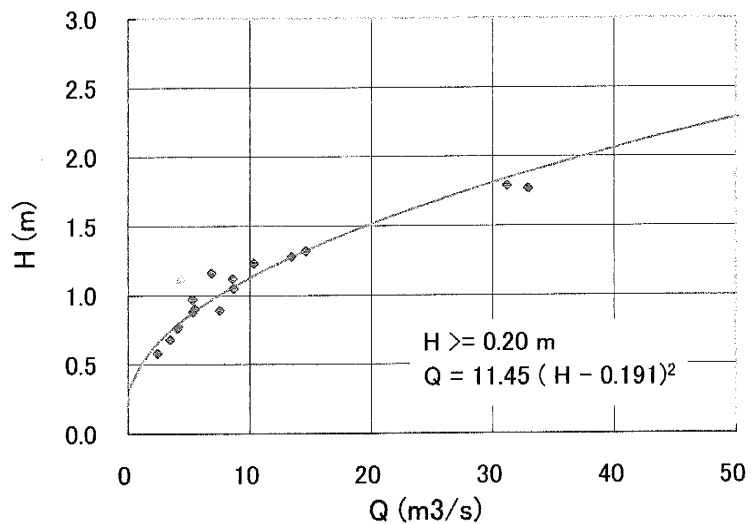
Station: Bomnak

Bomnak-A (west)

Discharge measurement record

No.	Year	Date	H (m)	Q (m ³ /s)
1	2007	Jul 4	1.12	4.32
2	2007	Jul 14	0.90	5.50
3	2007	Jul 27	0.89	7.55
4	2007	Aug 11	0.97	5.30
5	2007	Aug 26	1.79	31.19
6	2007	Sep 10	1.05	8.65
7	2007	Sep 18	1.77	32.90
8	2007	Sep 28	1.28	13.41
9	2007	Oct 6	1.23	10.33
10	2007	Oct 26	1.32	14.62
11	2007	Nov 6	1.12	8.57
12	2007	Nov 21	1.16	6.87
13	2007	Dec 9	0.88	5.35
14	2007	Dec 22	0.77	4.15
15	2008	Jan 10	0.68	3.48
16	2008	Jan 27	0.76	4.08
17	2008	Feb 7	0.58	2.43

Rating Curve for 2007



Station: Bomnak-A (west)

Prepared by JICA Study Team

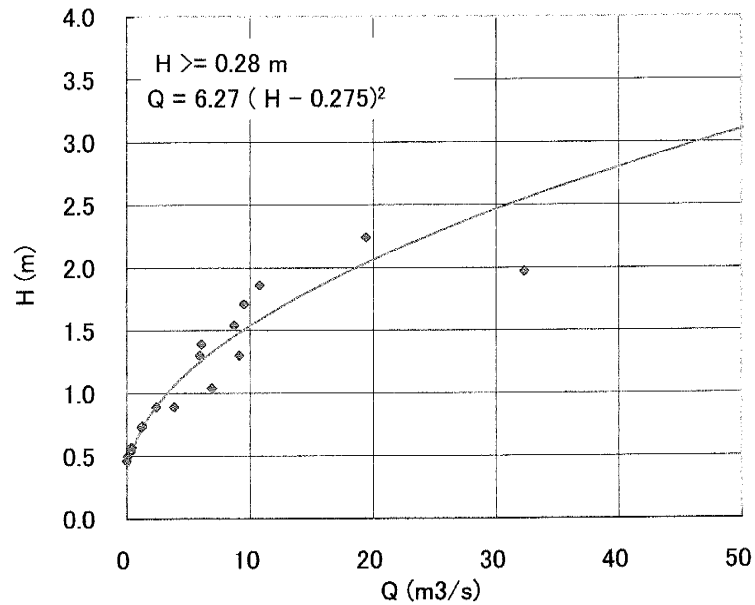
Table A.8.3.1 (5/6) Discharge Measurement Record and Rating Curve (5/6)

Bomnak-B (east)

Discharge measurement record

No.	Year	Date	H (m)	Q (m3/s)
1	2007	Jul 4	1.04	6.94
2	2007	Jul 14	0.89	2.44
3	2007	Jul 27	0.89	3.90
4	2007	Aug 11	0.74	1.30
5	2007	Aug 26	1.97	32.33
6	2007	Sep 10	1.39	6.10
7	2007	Sep 18	2.24	19.43
8	2007	Sep 28	1.71	9.53
9	2007	Oct 6	1.54	8.73
10	2007	Oct 26	1.86	10.77
11	2007	Nov 6	1.30	5.96
12	2007	Nov 21	1.30	9.15
13	2007	Dec 9	0.73	1.22
14	2007	Dec 22	0.57	0.42
15	2008	Jan 10	0.50	0.11
16	2008	Jan 27	0.54	0.37
17	2008	Feb 7	0.46	0.03

Rating Curve for 2007



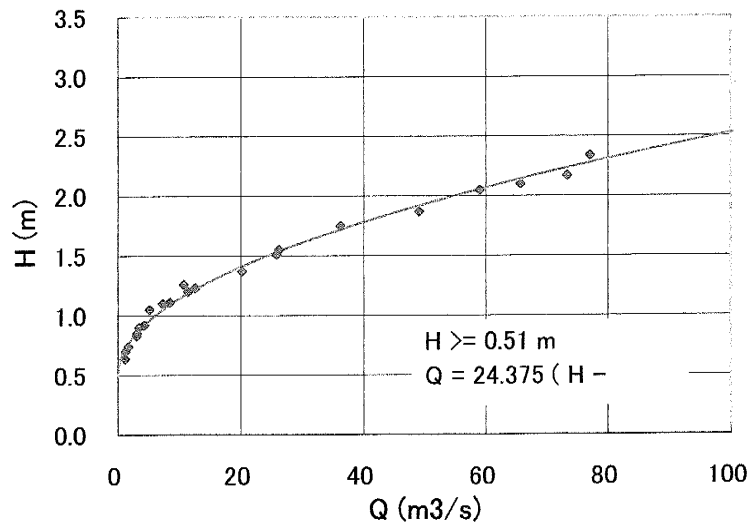
Station: Bomnak-B (east)

Boribo

Discharge measurement record

No.	Year	Date	H (m)	Q (m3/s)
1	2006	Dec 19	0.90	3.47
2	2007	Jan 7	0.83	3.07
3	2007	Jan 26	0.74	1.71
4	2007	Feb 16	0.70	1.25
5	2007	Mar 11	0.64	1.21
6	2007	Jul 5	1.26	10.80
7	2007	Jul 15	1.23	12.64
8	2007	Jul 29	1.37	20.22
9	2007	Aug 13	1.11	8.54
10	2007	Aug 28	1.75	36.29
11	2007	Sep 11	2.17	73.35
12	2007	Sep 19	2.34	77.13
13	2007	Sep 29	2.05	59.02
14	2007	Oct 7	2.10	65.68
15	2007	Oct 27	1.87	49.04
16	2007	Nov 7	1.55	26.22
17	2007	Nov 22	1.51	25.83
18	2007	Dec 10	1.20	11.48
19	2007	Dec 24	1.05	5.20
20	2008	Jan 11	0.92	4.30
21	2008	Jan 28	1.10	7.36
22	2008	Feb 11	0.85	3.13

Rating Curve for 2007



Station: Boribo

Prepared by JICA Study Team

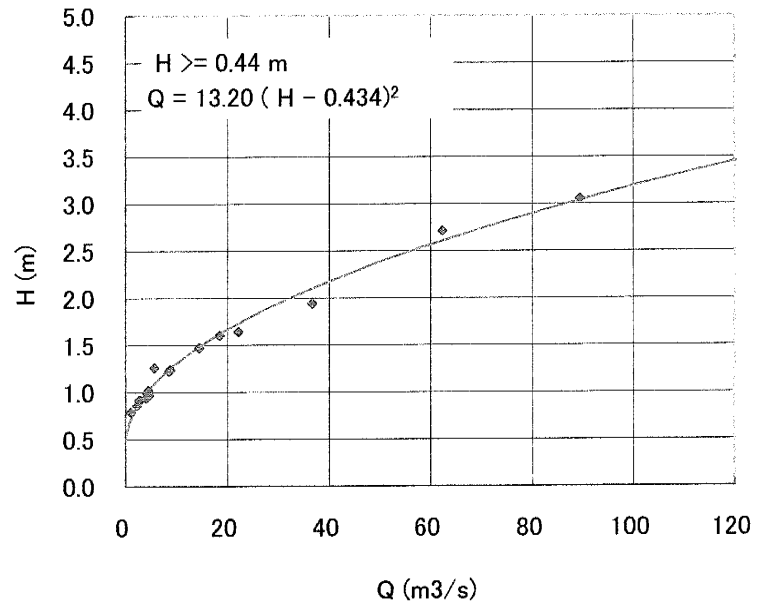
Table A.8.3.1 (6/6) Discharge Measurement Record and Rating Curve (6/6)

Ta Kab

Discharge measurement record

No.	Year	Date	H (m)	Q (m ³ /s)
1	2007	Jul 6	1.24	8.84
2	2007	Jul 15	1.02	4.48
3	2007	Jul 29	0.97	4.67
4	2007	Aug 13	0.94	4.09
5	2007	Aug 28	2.71	62.33
6	2007	Sep 11	1.60	18.48
7	2007	Sep 19	1.64	22.15
8	2007	Sep 29	3.05	89.42
9	2007	Oct 7	1.94	36.67
10	2007	Oct 27	1.47	14.47
11	2007	Nov 7	1.26	5.67
12	2007	Nov 22	1.22	8.58
13	2007	Dec 10	0.99	4.26
14	2007	Dec 24	0.91	2.72
15	2008	Jan 11	0.86	2.24
16	2008	Jan 28	0.92	2.73
17	2008	Feb 11	0.79	1.06

Rating Curve for 2007



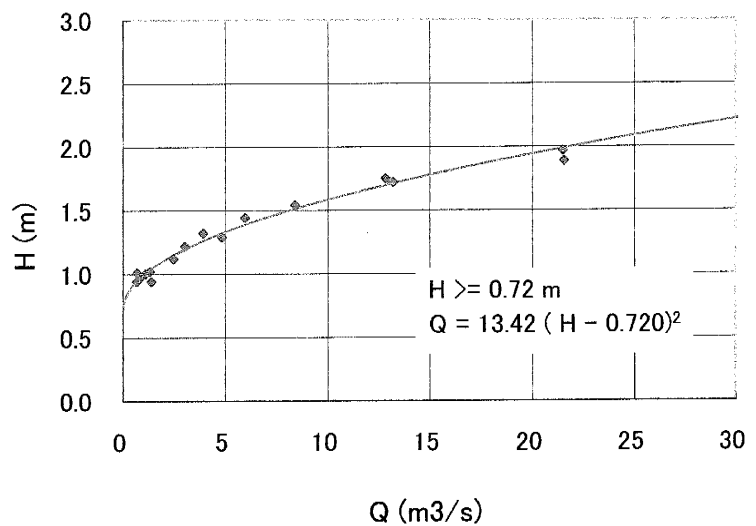
Station: Ta Kab

Peam (Krang Ponley)

Discharge measurement record

No.	Year	Date	H (m)	Q (m ³ /s)
1	2007	Jul 6	1.22	3.04
2	2007	Jul 17	1.00	1.10
3	2007	Jul 29	1.02	1.33
4	2007	Aug 15	1.01	0.69
5	2007	Aug 29	1.97	21.51
6	2007	Sep 11	1.54	8.40
7	2007	Sep 19	1.75	12.83
8	2007	Sep 29	1.89	21.56
9	2007	Oct 7	1.72	13.20
10	2007	Oct 27	1.44	5.96
11	2007	Nov 7	1.32	3.93
12	2007	Nov 22	1.29	4.84
13	2007	Dec 10	1.12	2.48
14	2007	Dec 25	0.94	1.40
15	2008	Jan 11	0.98	0.85
16	2008	Jan 28	0.94	0.67
17	2008	Feb 12	0.98	0.88

Rating Curve for 2007



Station: Peam (Krang Ponley River)

Prepared by JICA Study Team

Figures

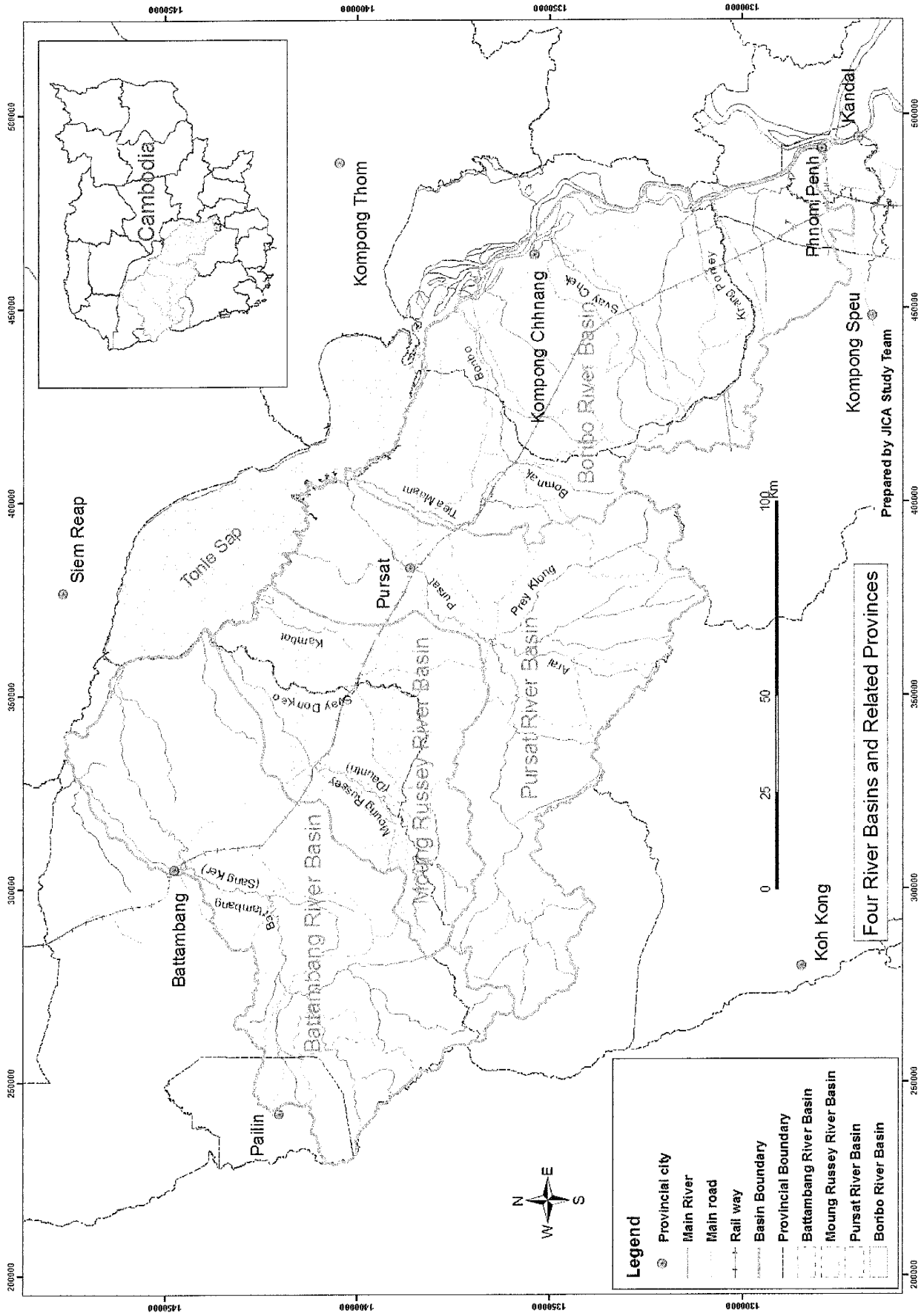
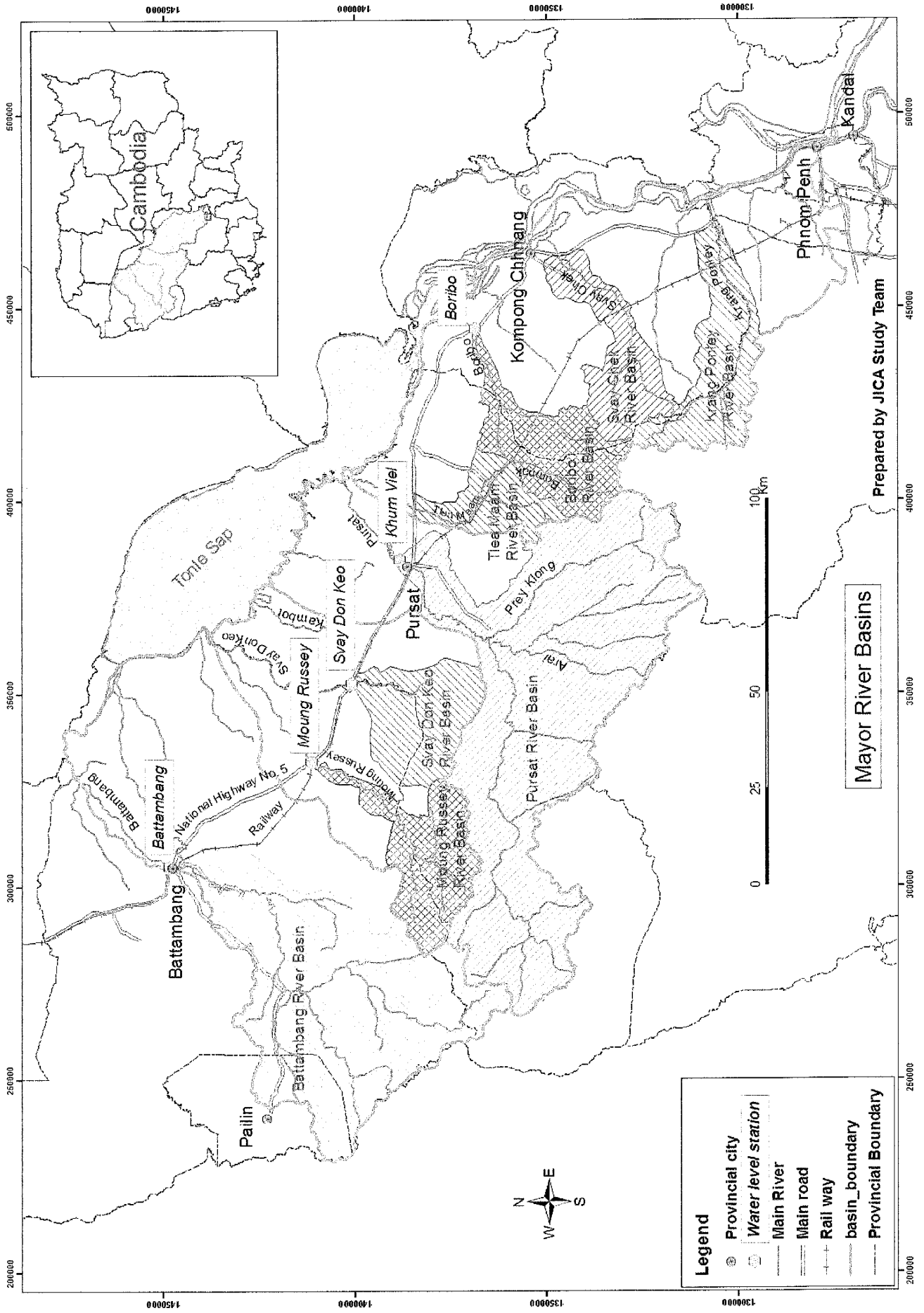


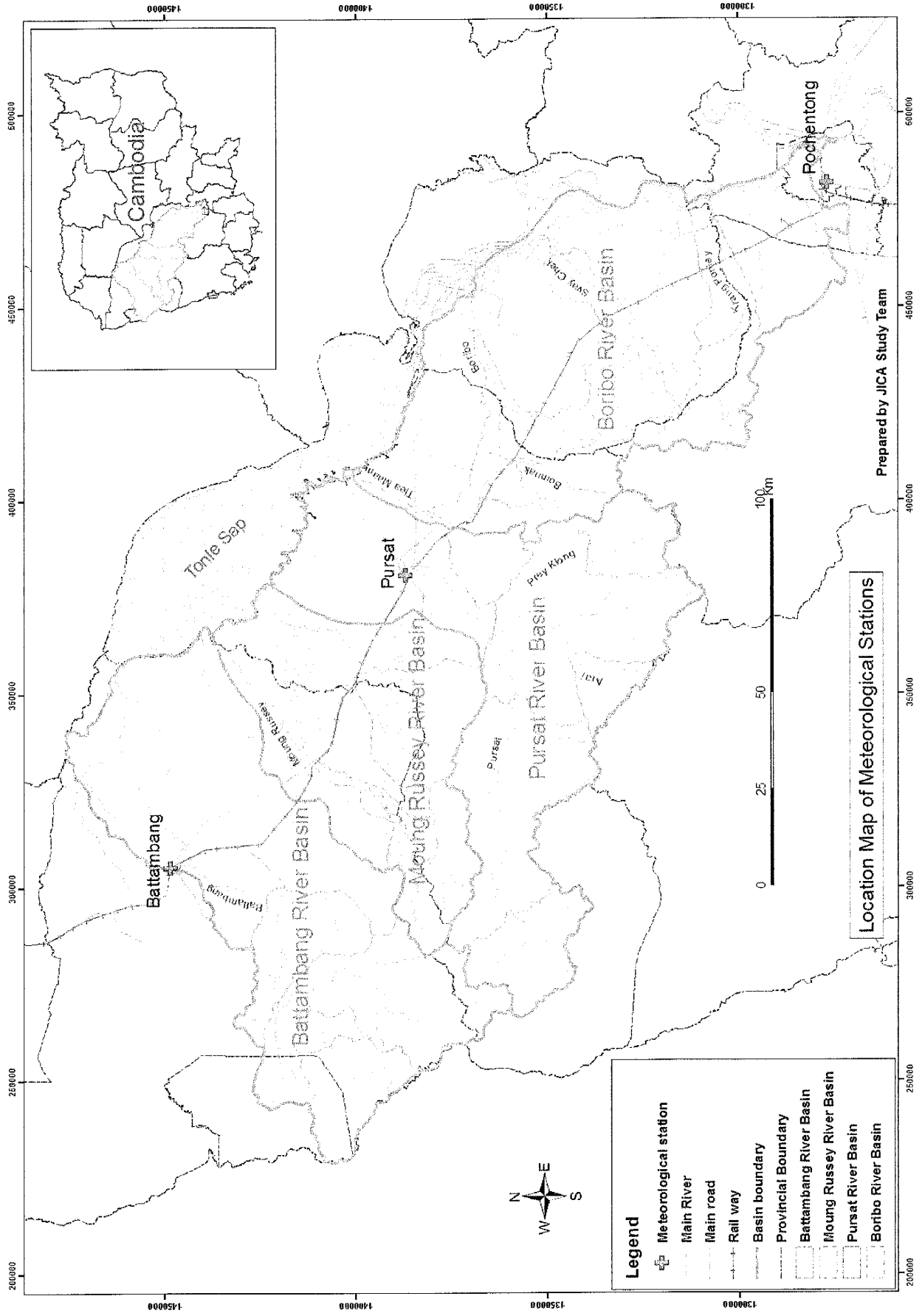
Figure A.1.1.1 Four River Basins and Related Provinces



Prepared by JICA Study Team

Mayor River Basins

Figure A.1.1.2 Mayor "river basins"



Prepared by JICA Study Team

Figure A.1.2.1 Location Map of Meteorological Stations

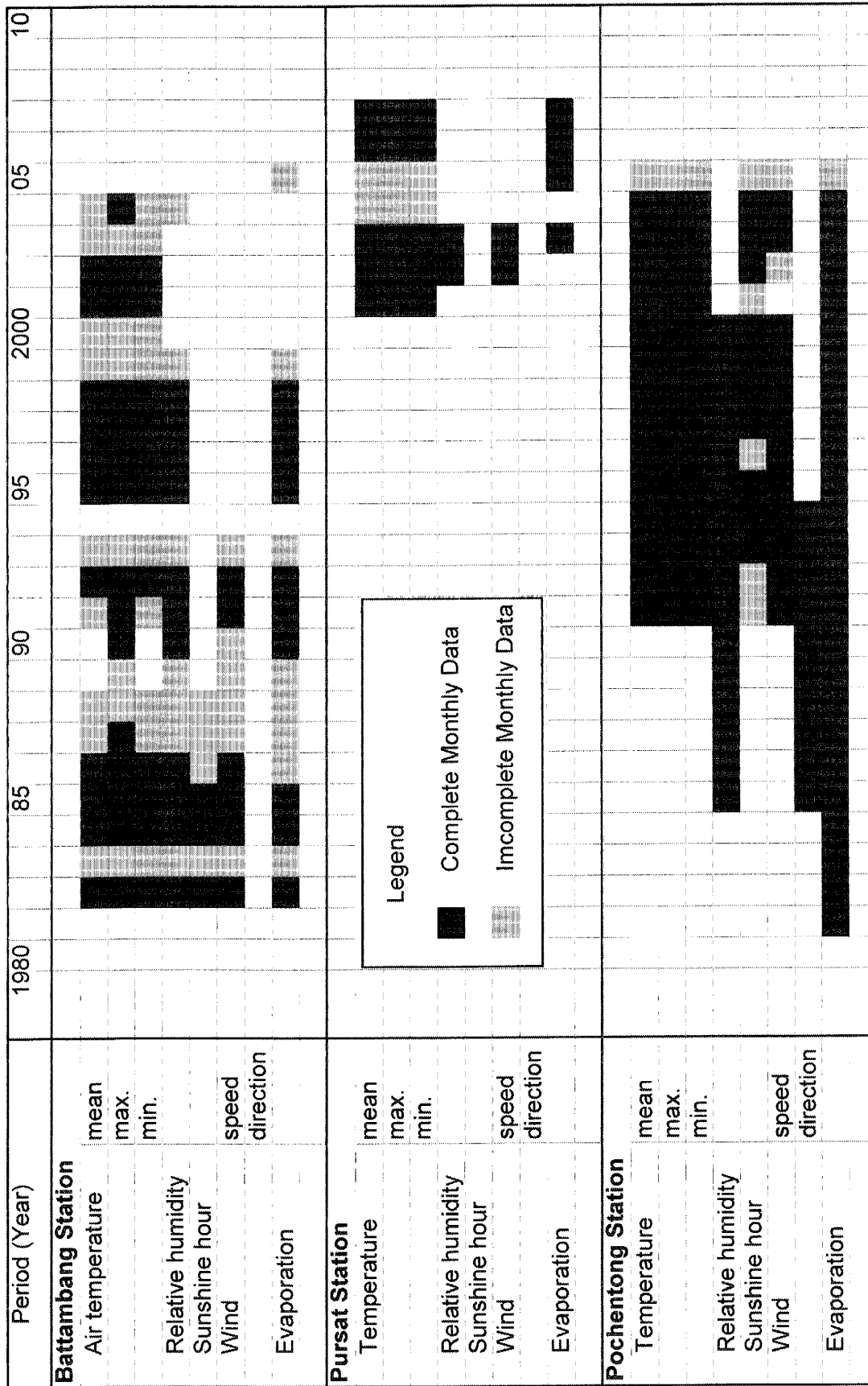


Figure A.1.2.2 Meteorological Data Availability Chart

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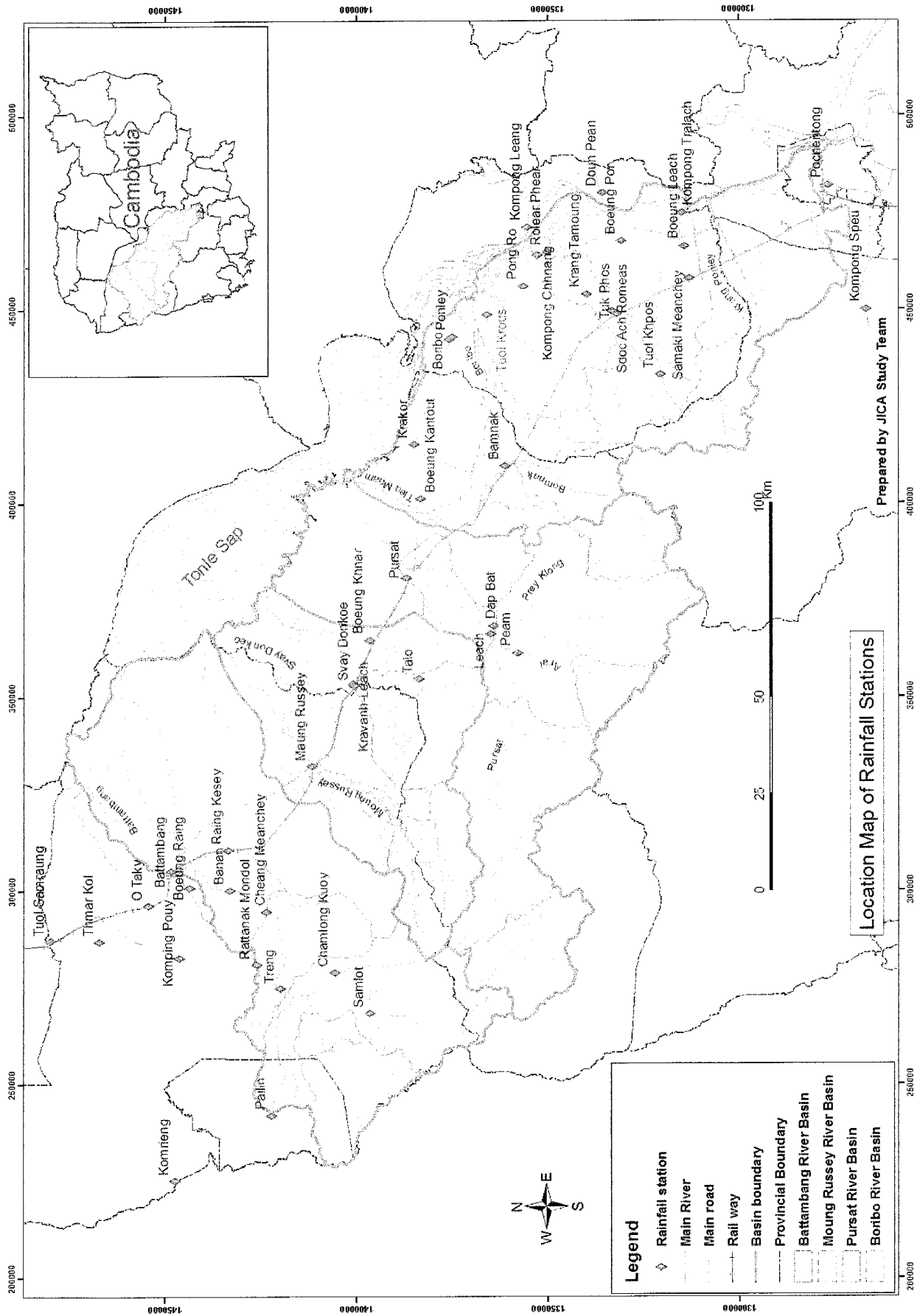


Figure A.1.2.3 Location Map of Rainfall Stations

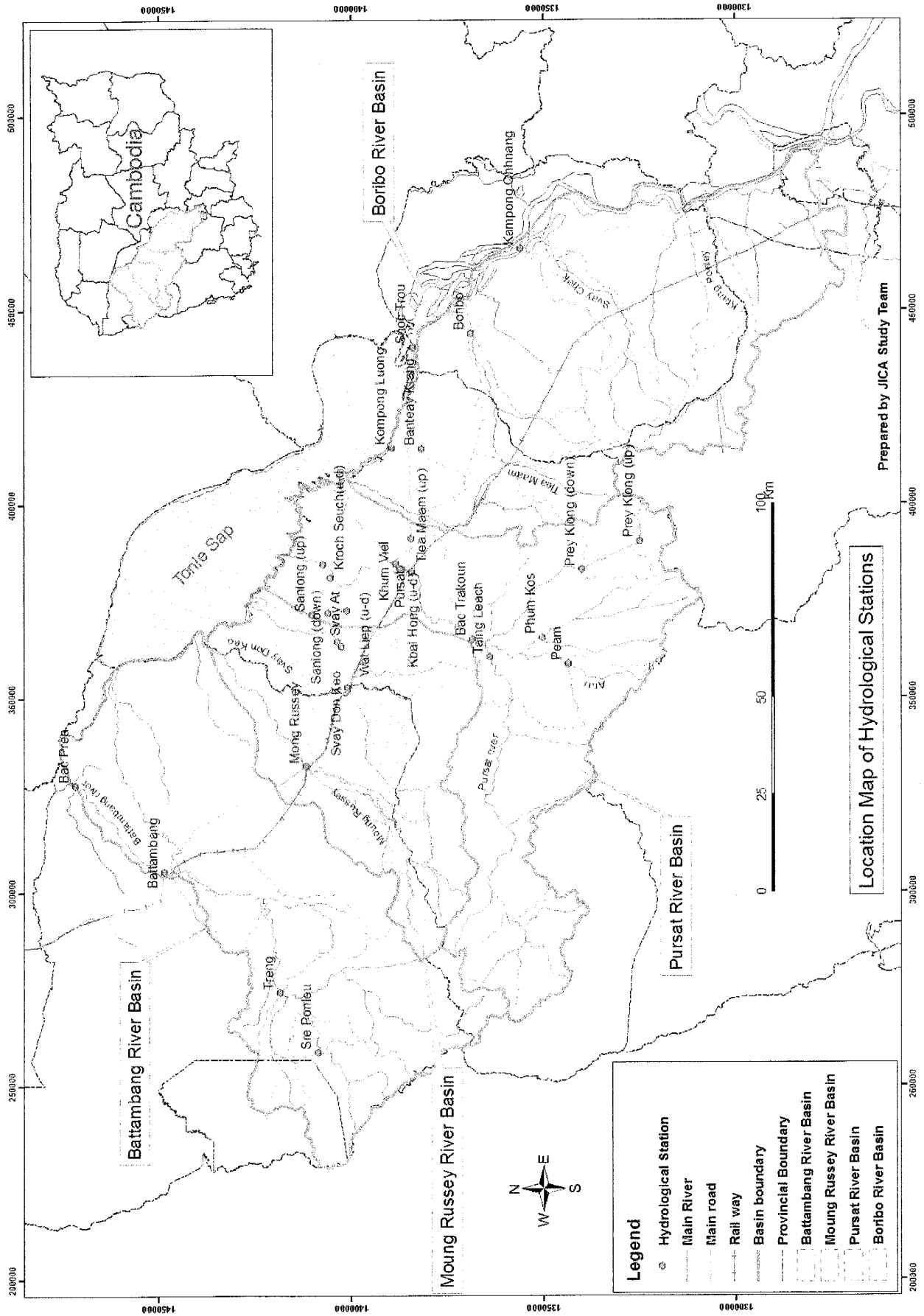


Figure A.1.2.5 Location Map of Hydrological Stations

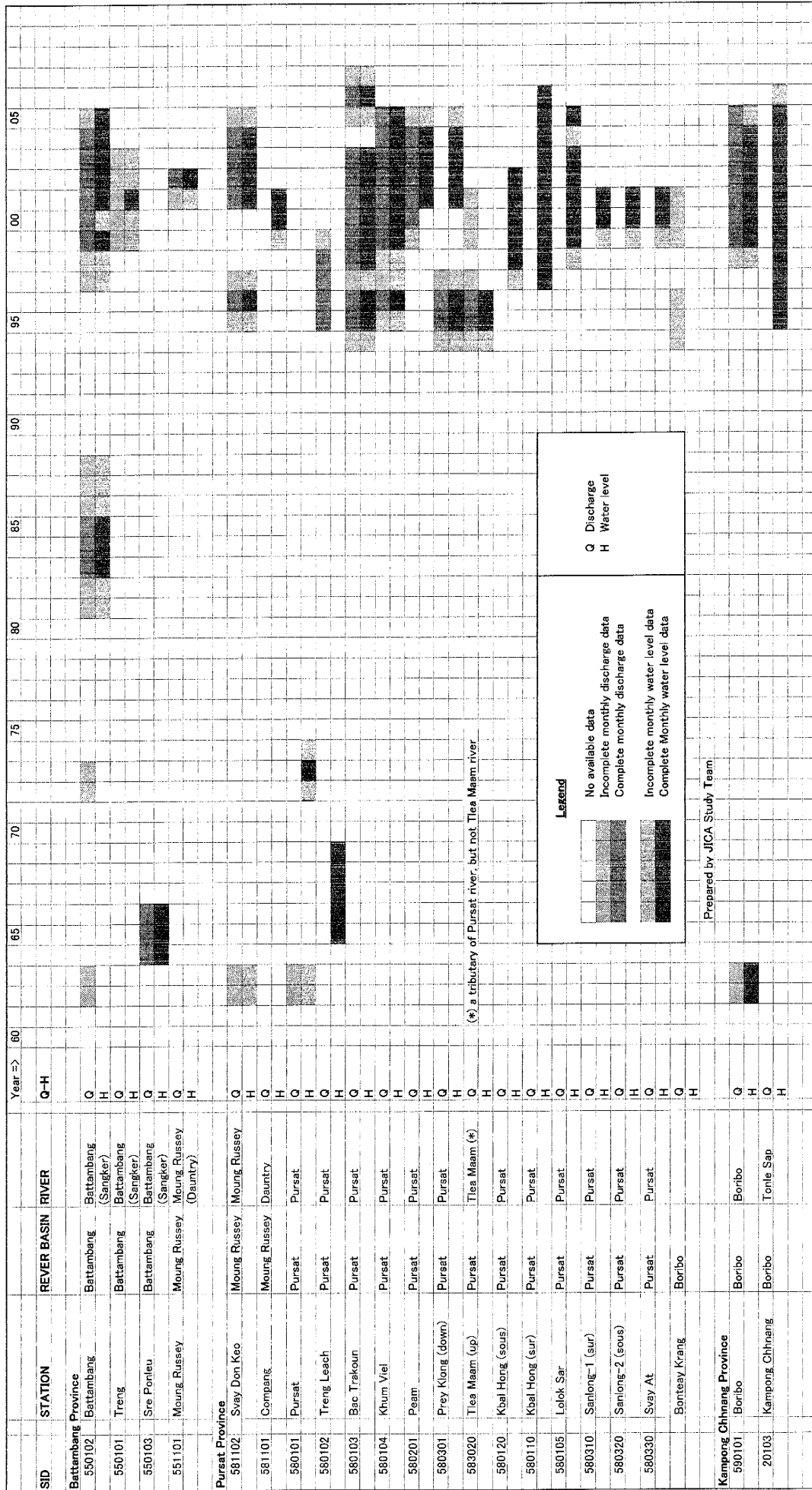


Figure A.1.2.6 Hydrological Data Availability Chart

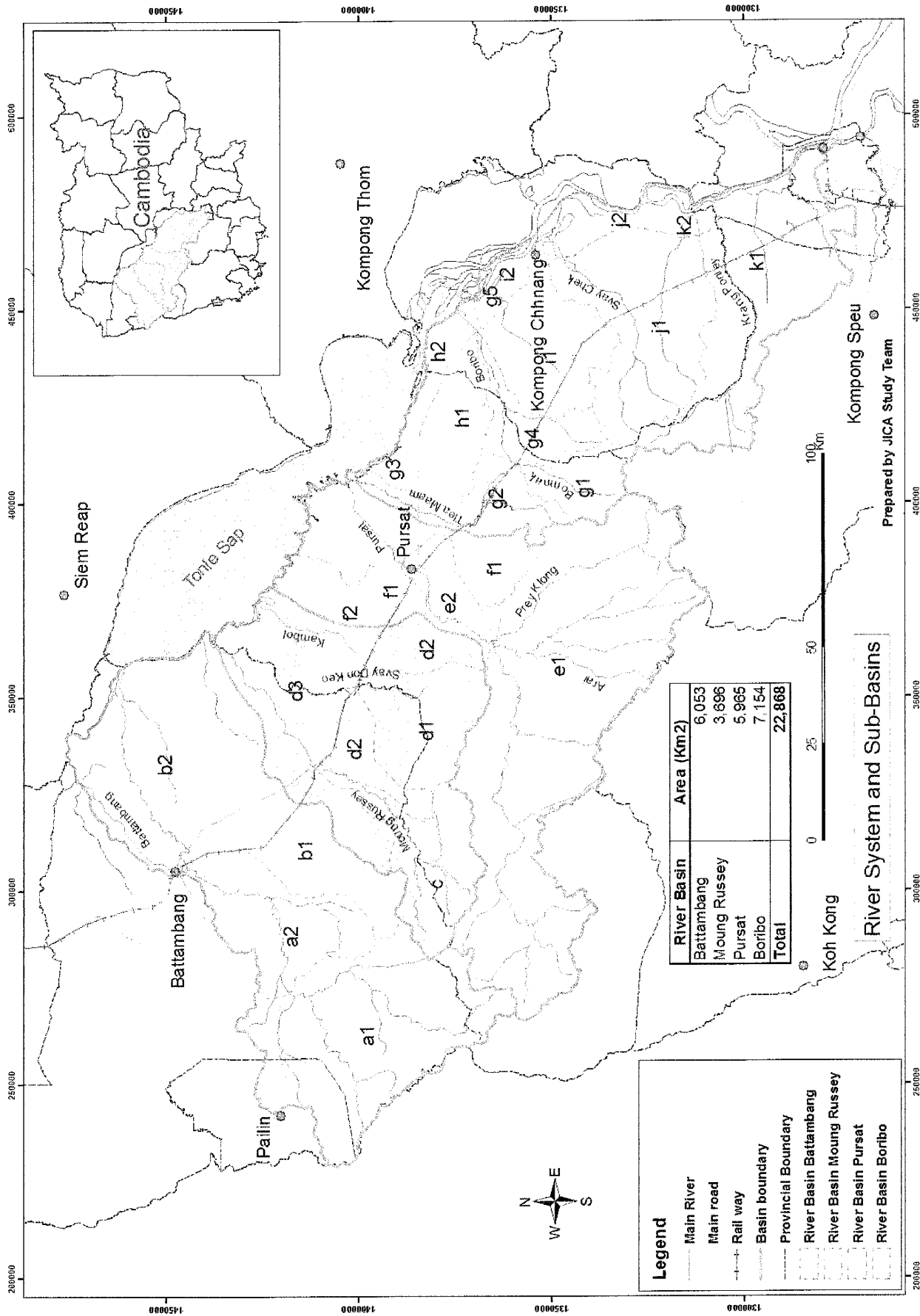


Figure A.1.3.1 River System and Sub-Basins

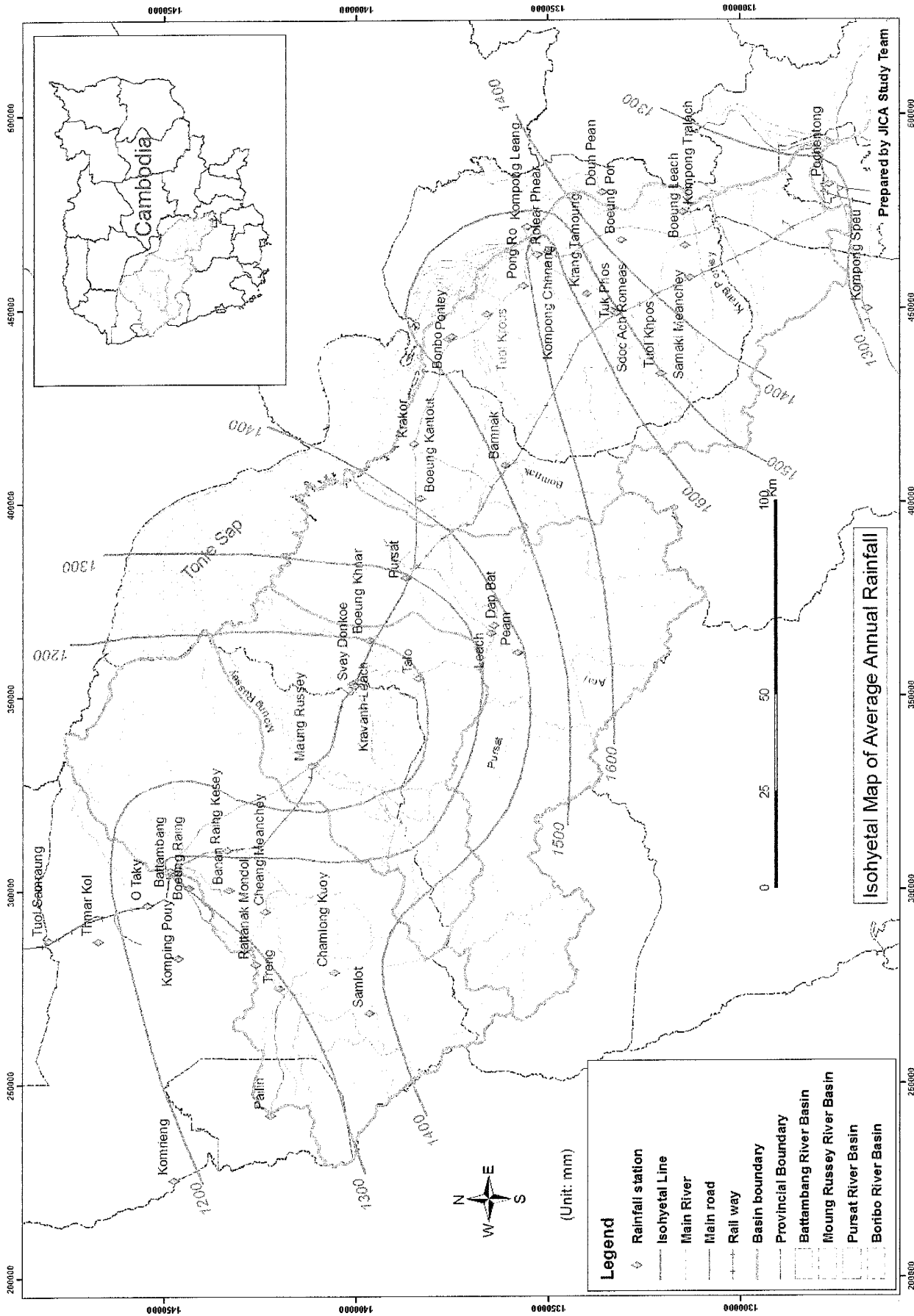
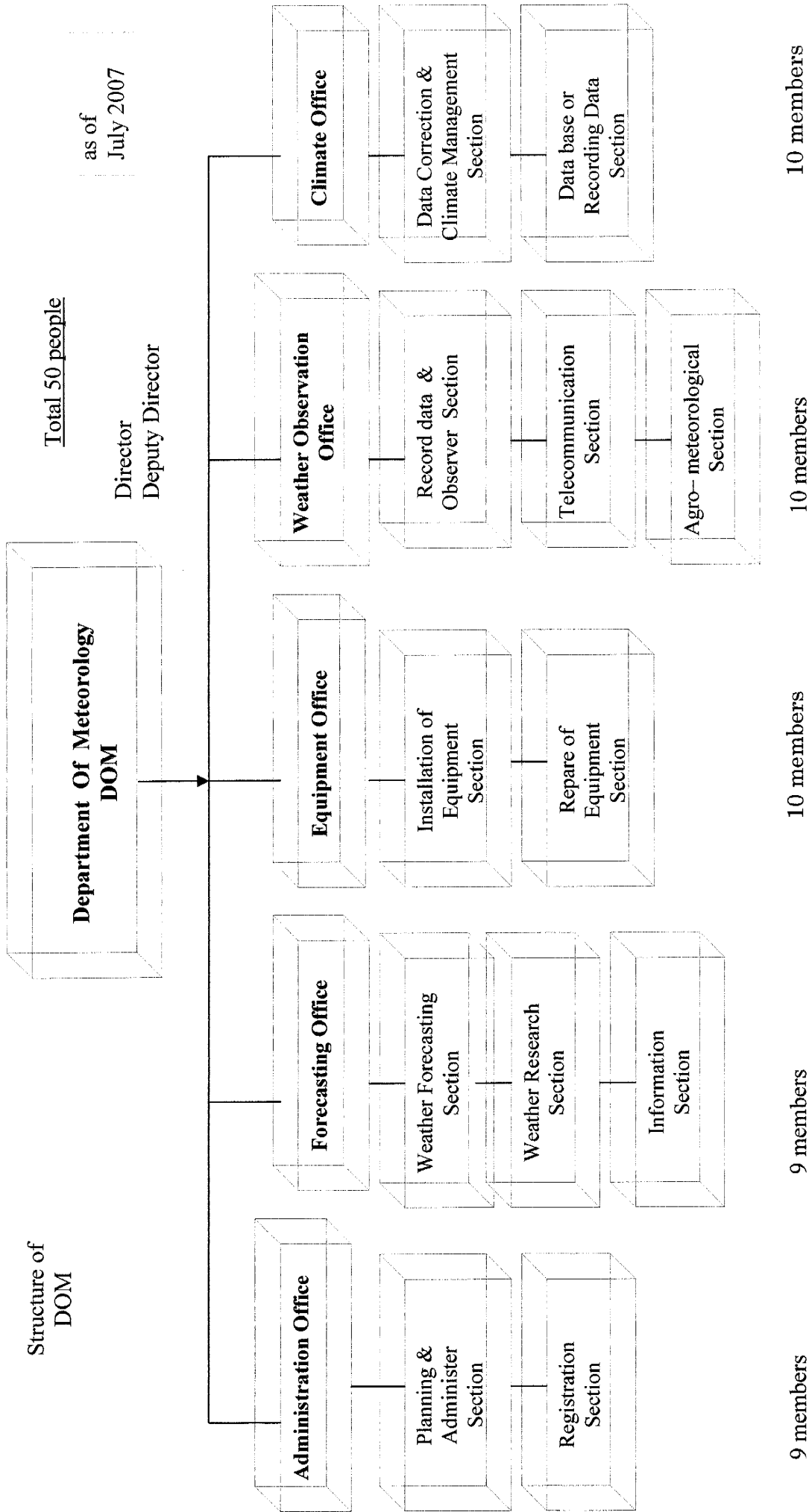


Figure A.1.3.2 Isohyetal Map of Average Annual Rainfall



Source: DOM. MOWRAM

Figure A.1.4.1 Organization Chart of DOM

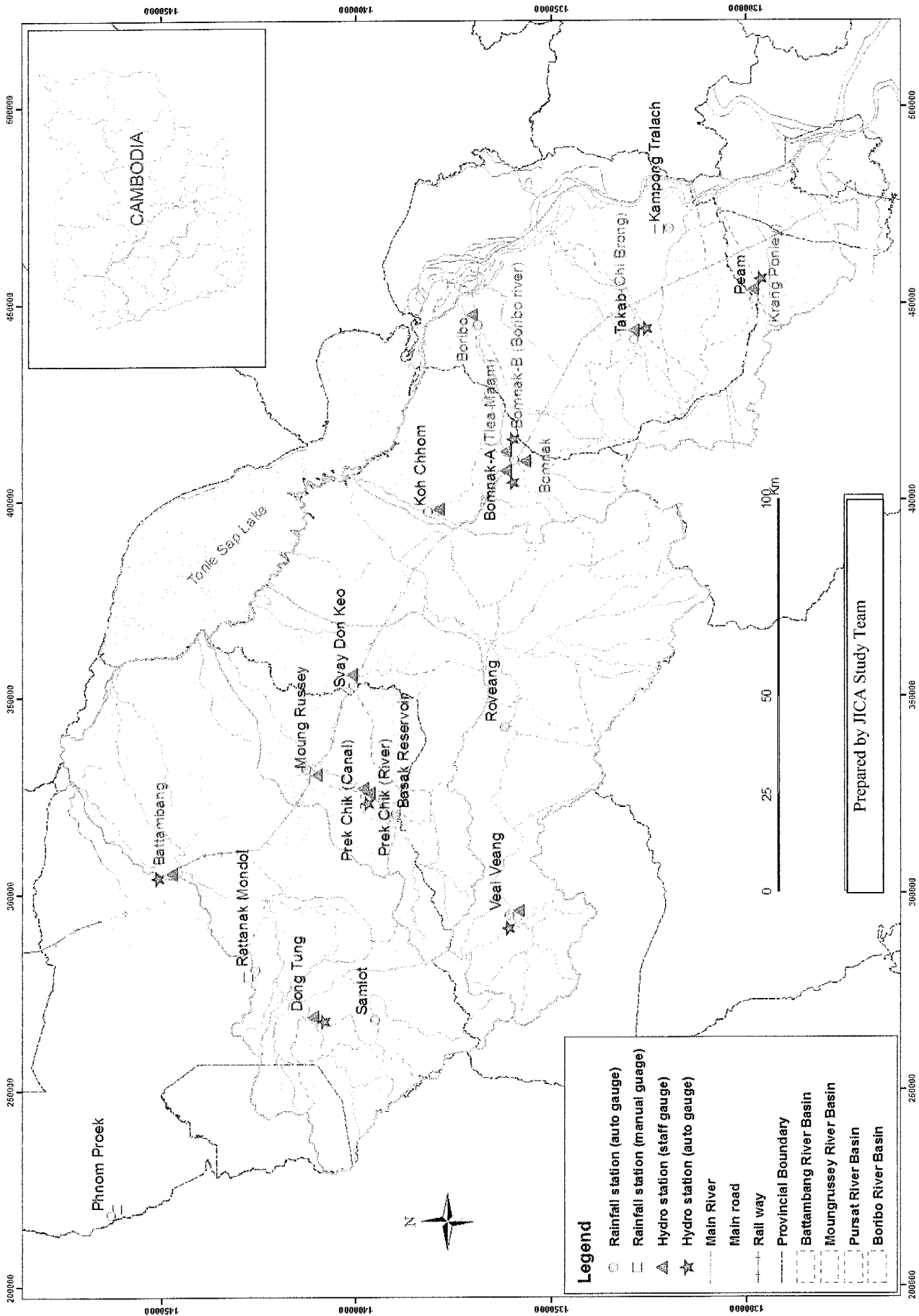


Figure A.2.1.1 Additionally Installed Stations in the Study

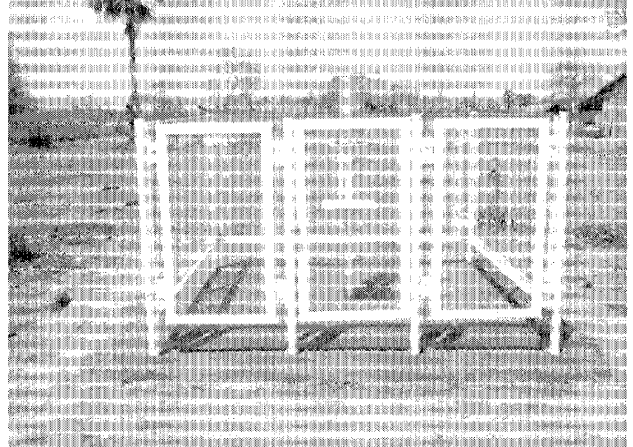
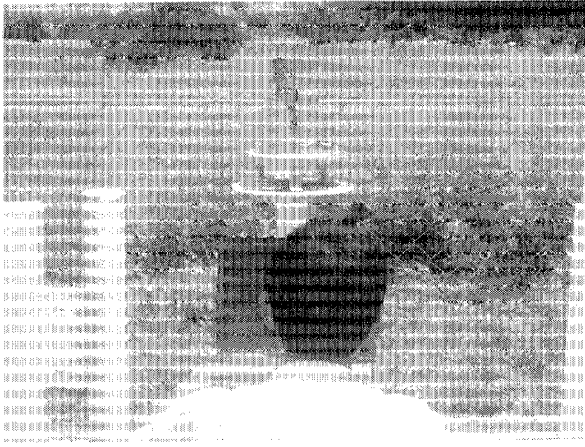


Figure A.2.3.1 Rainfall Station

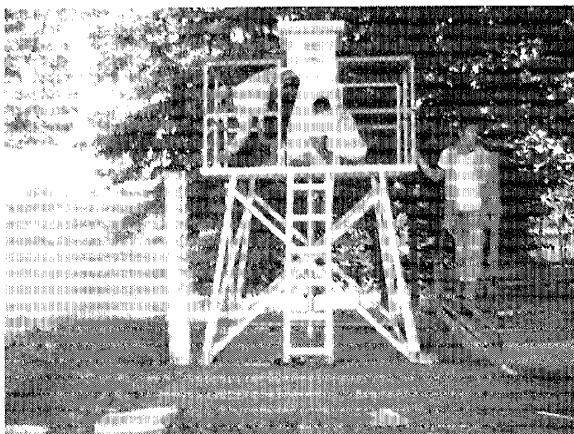
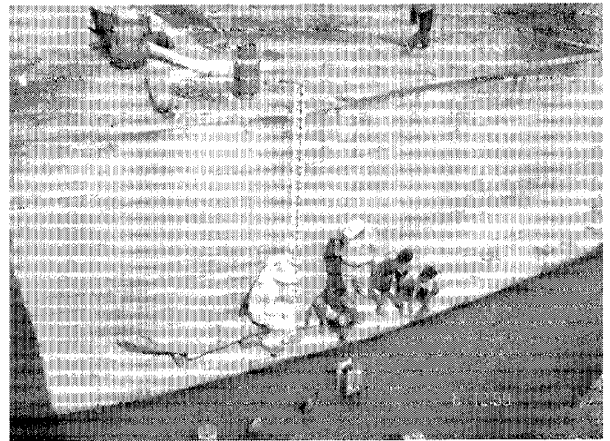
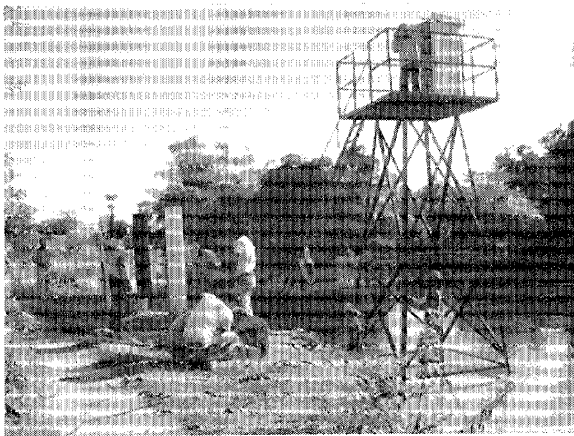


Figure A.2.4.1 Water Level Station

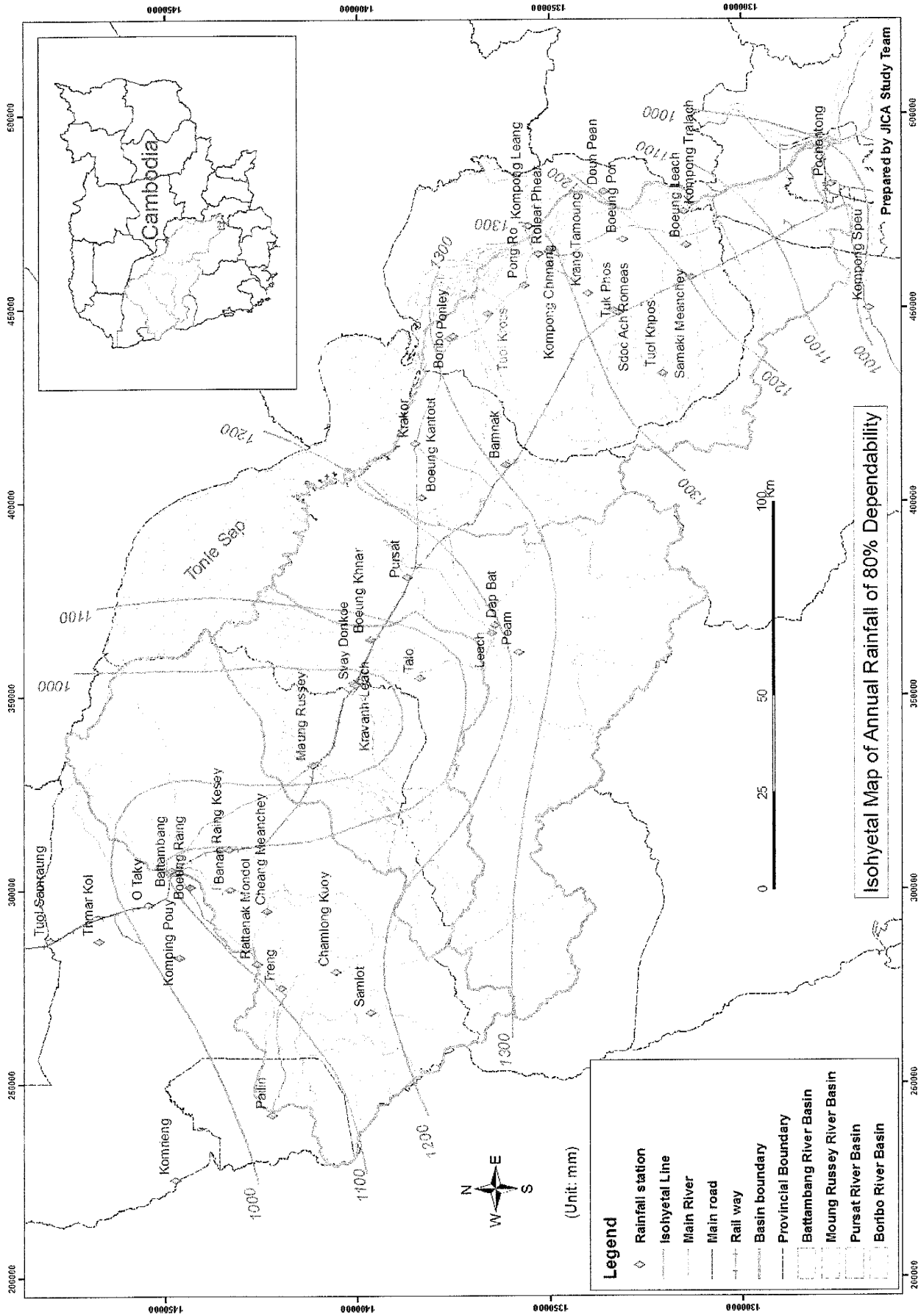


Figure A.3.2.1 Isohyetal Map of Annual Rainfall of 80% Dependability

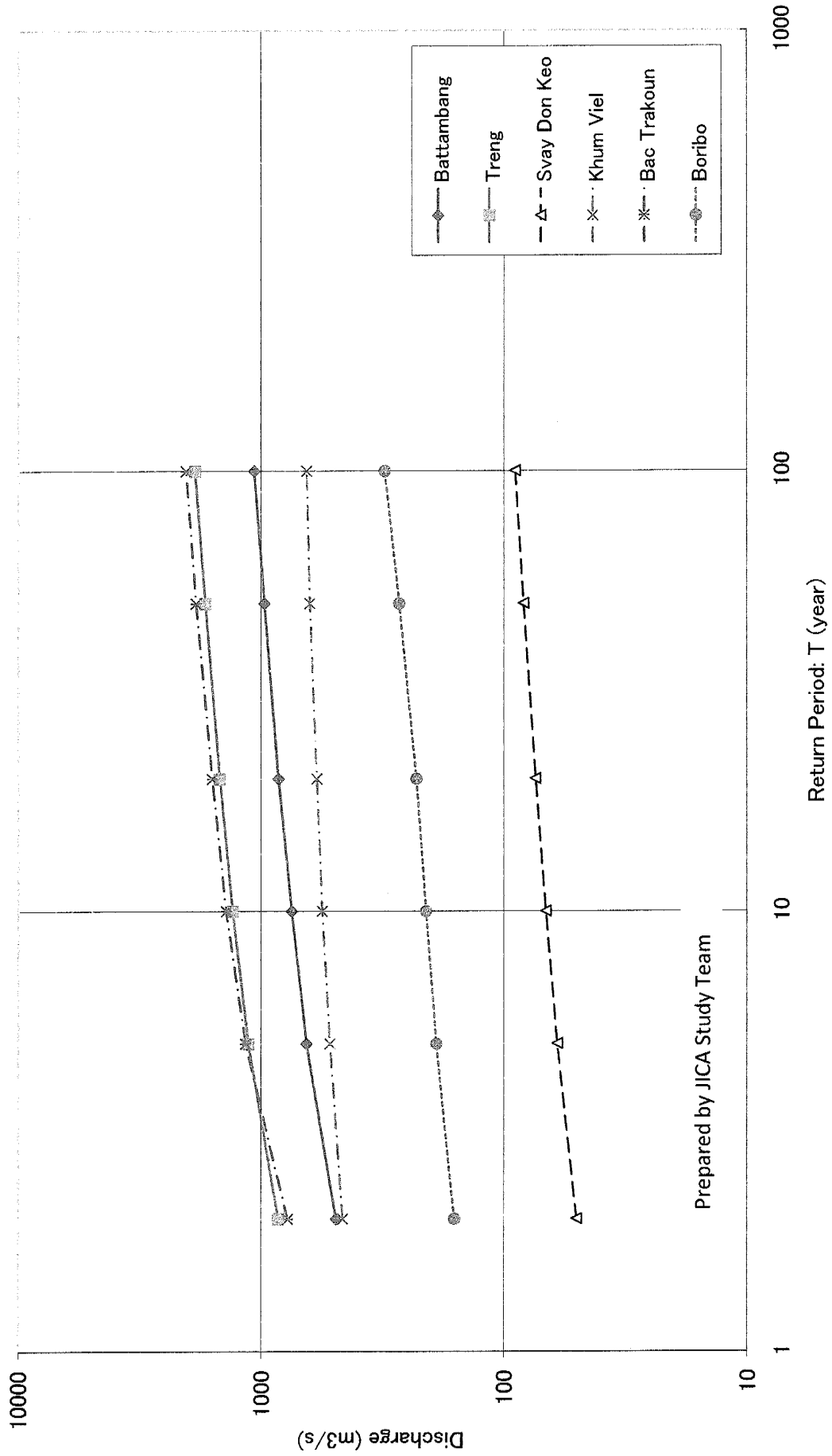


Figure A.3.4.1 Probable Annual Maximum Daily Discharge

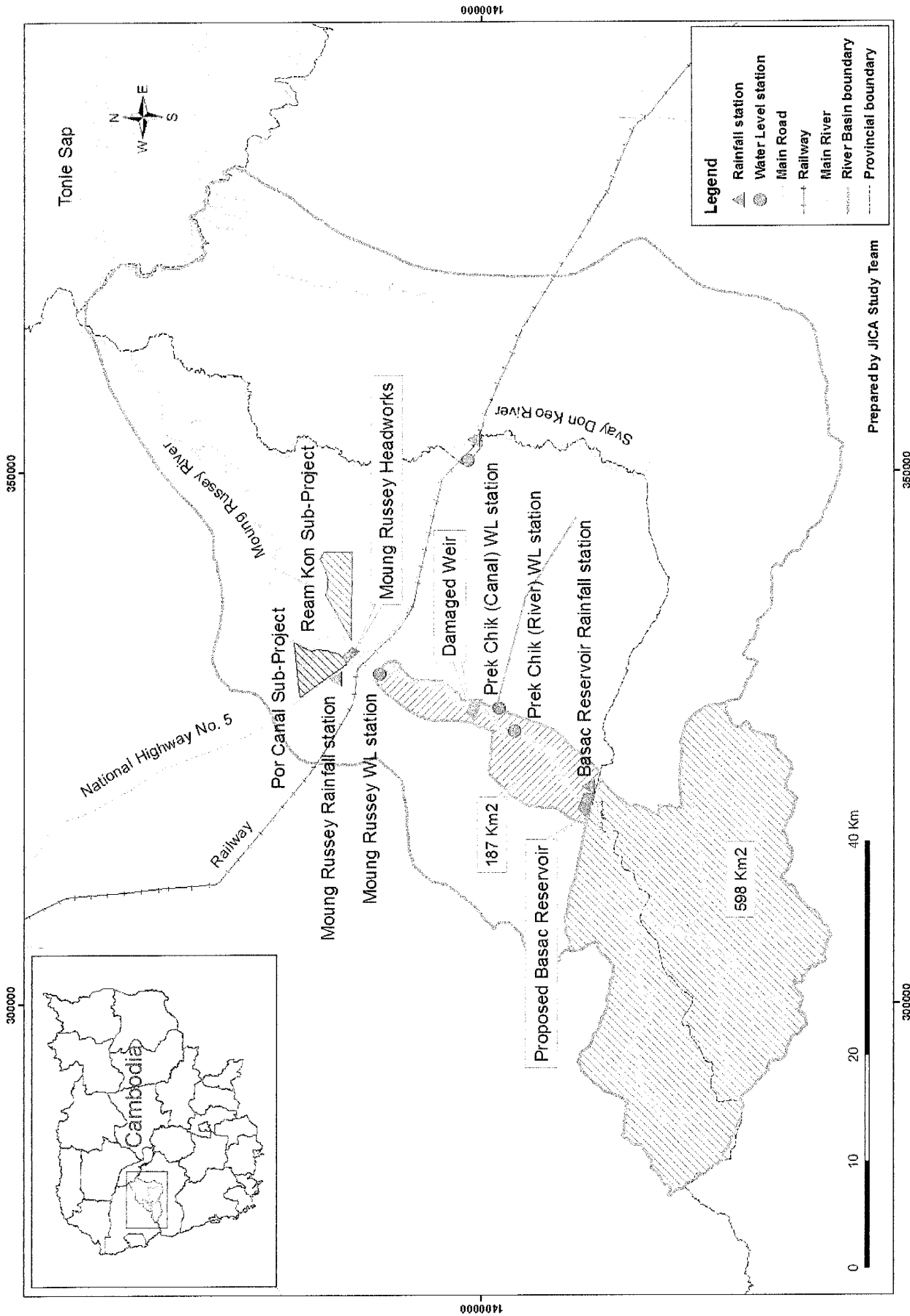
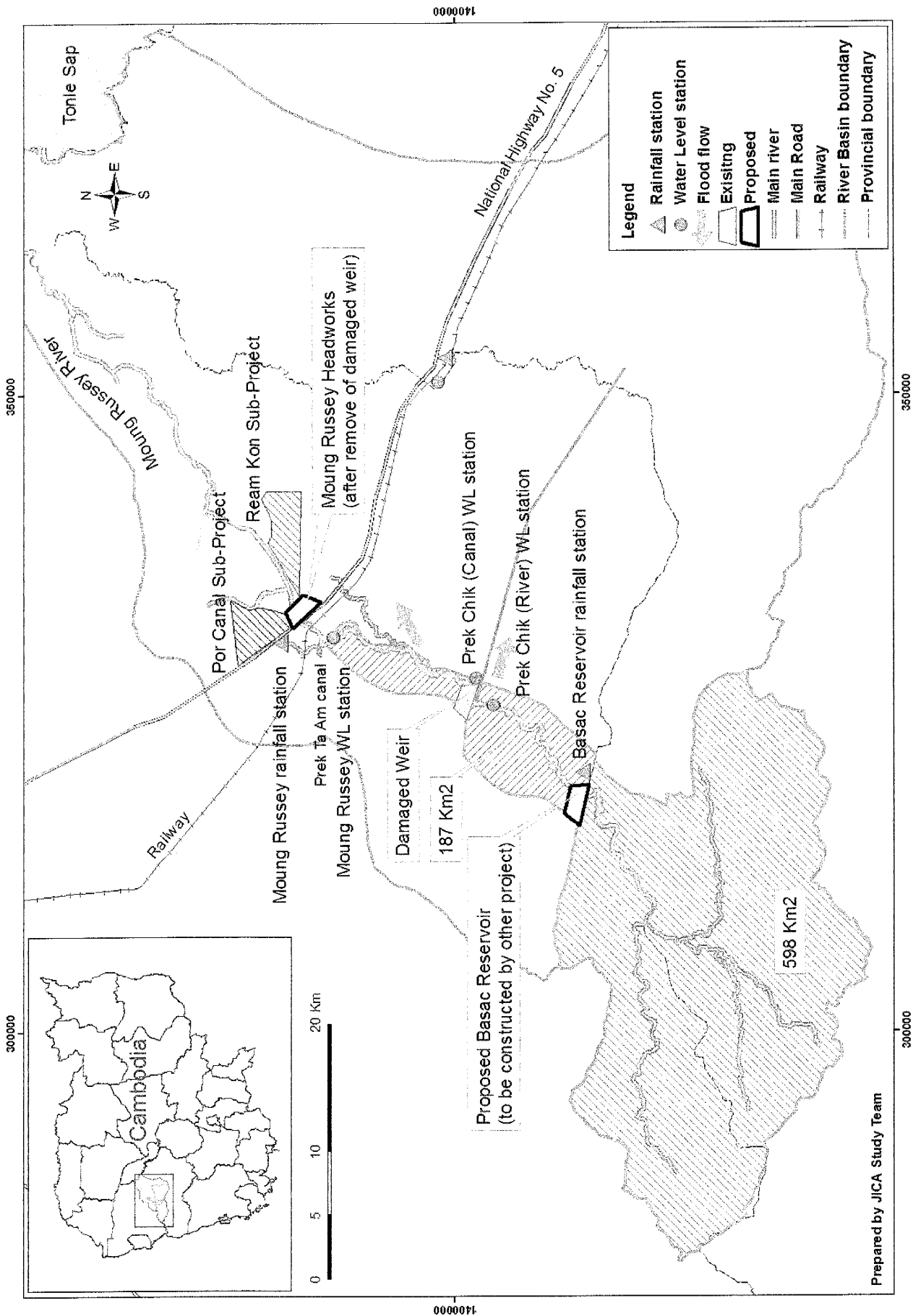


Figure A5.1.1 Catchment Area of Moung Russey Headworks, and Ream Kon and Por Canal Sub-Projects



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Figure 5.3.1 Channel Shape of Mung Russey river and Overbank Flood Flow

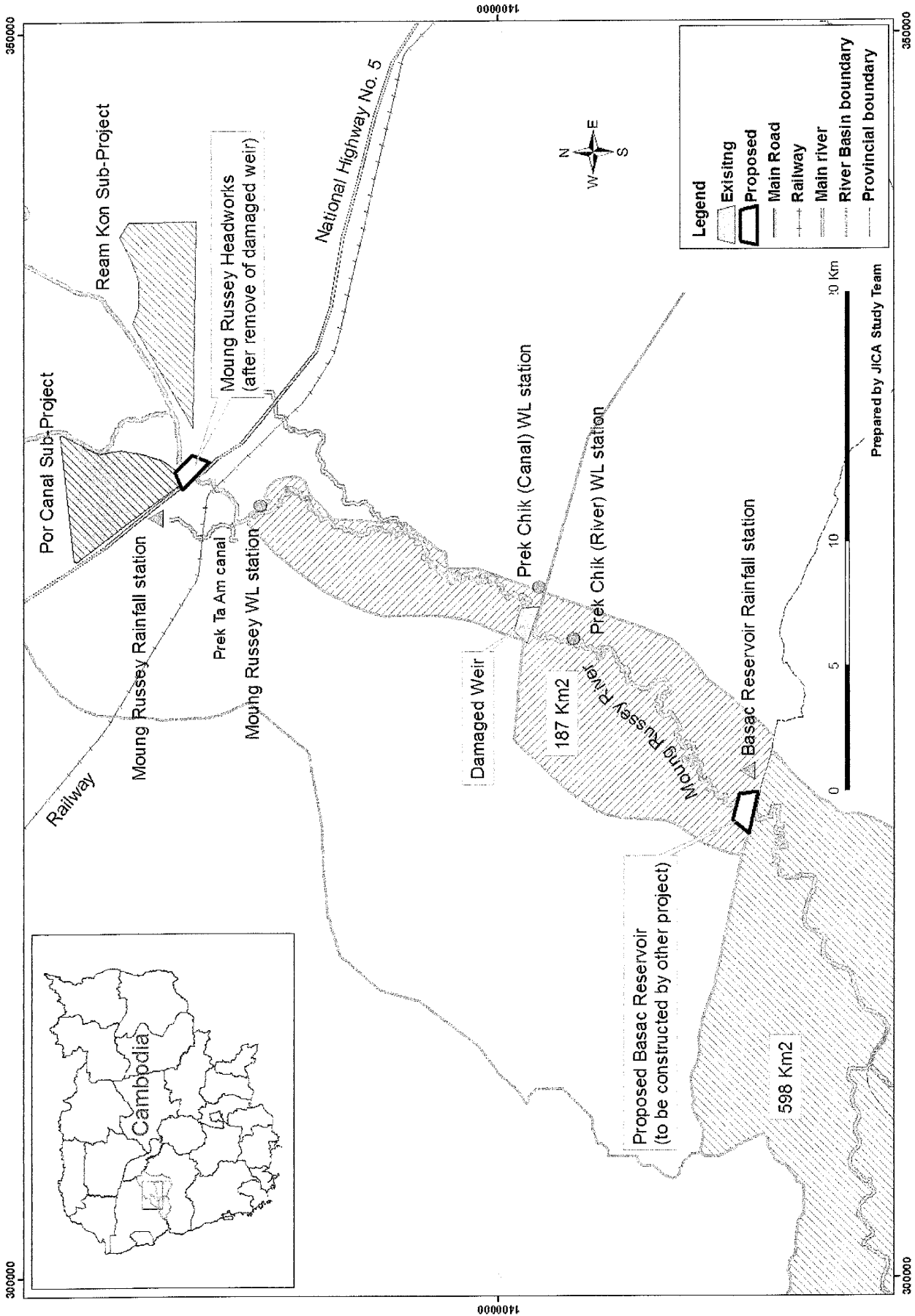


Figure 5.3.2 Moung Russey river and Moung Russey Headworks

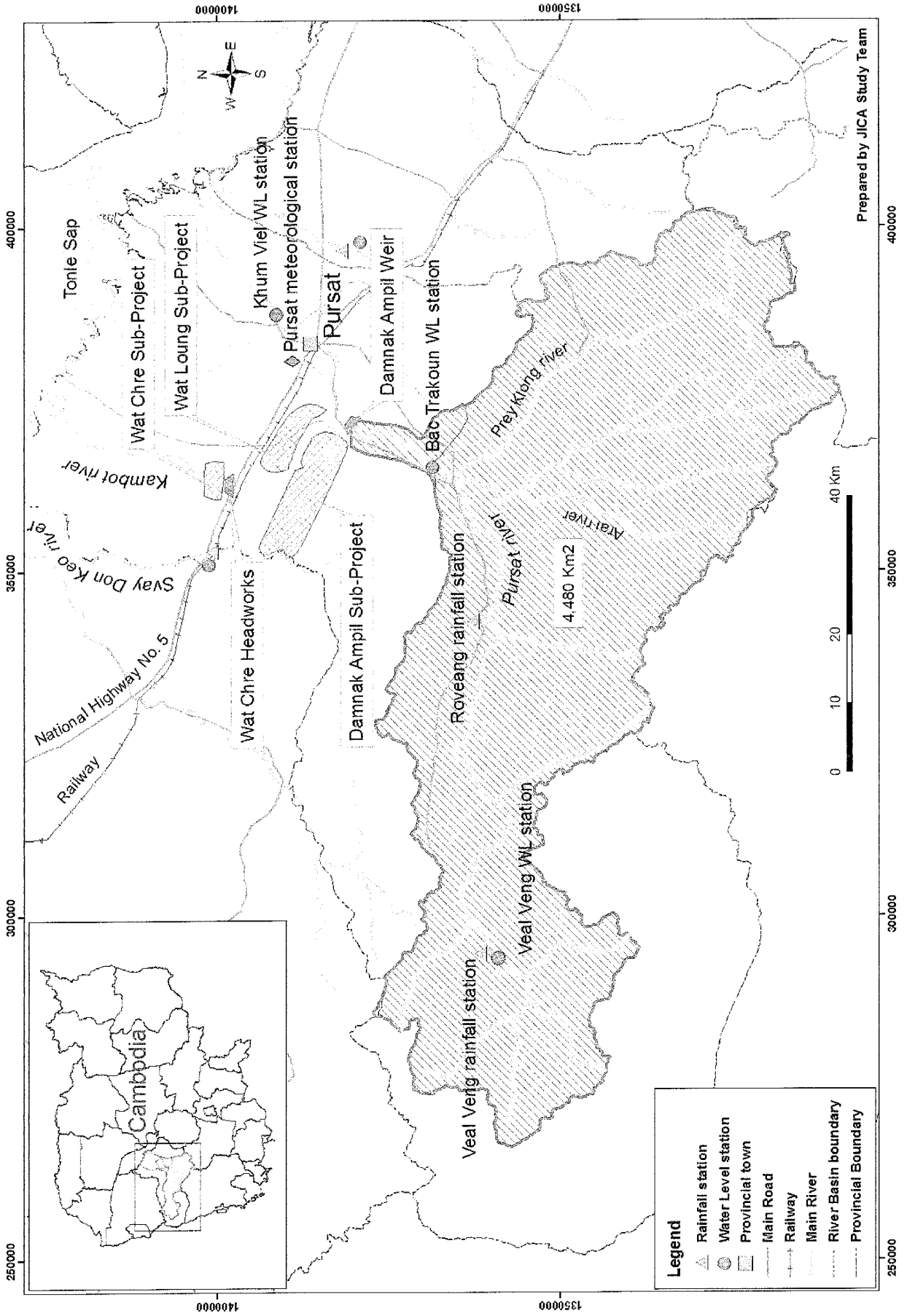


Figure 6.1.1 Catchment Area of Damnak Ampil Weir, Wat Loung and Wat Chre Sub-Projects

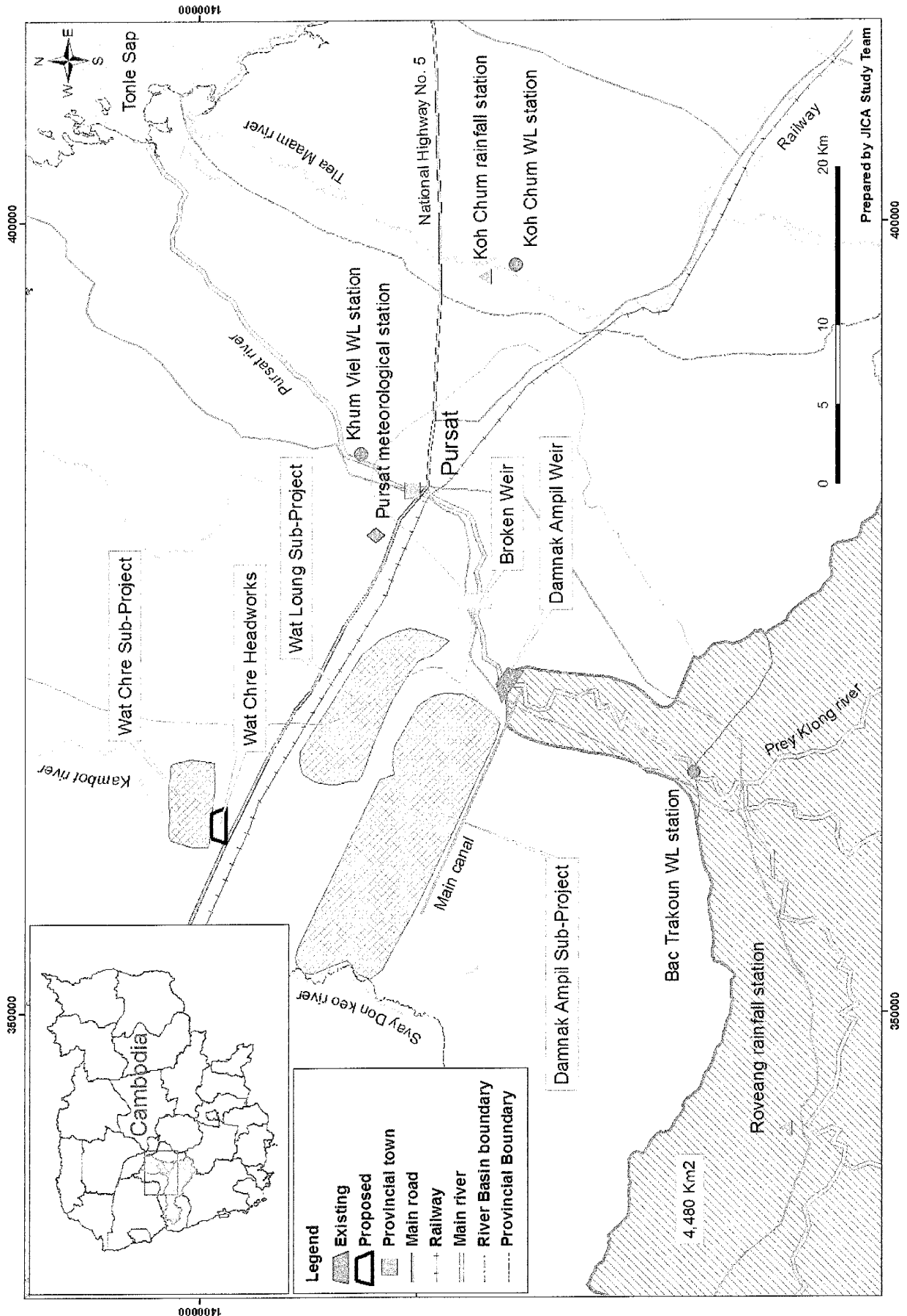


Figure A.6.3.1 Pursat River, Damnak Ampil Weir and Wat Chre Headworks

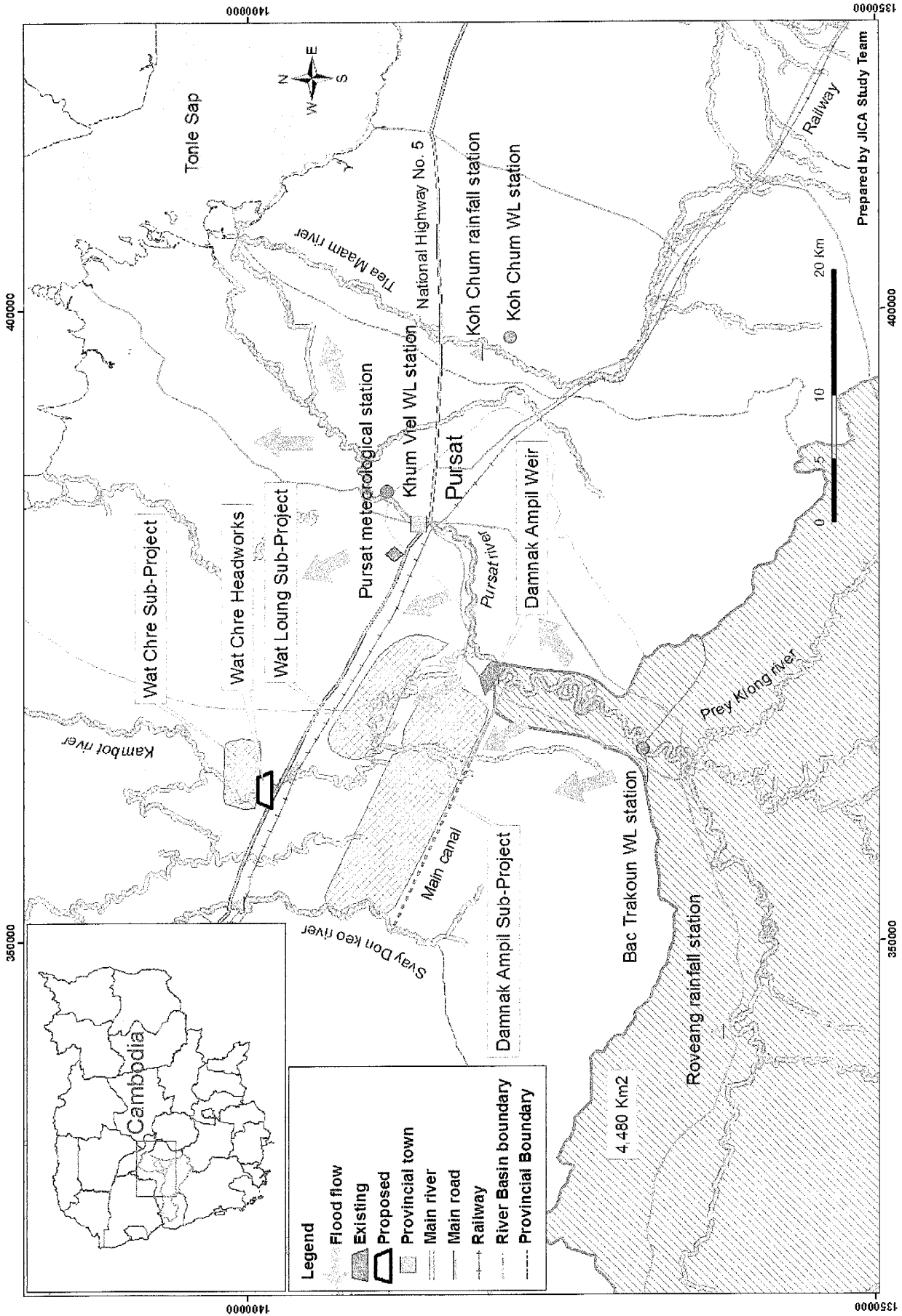


Figure A.6.5.1 Pursat River Channel Shape and Main Flood Flow

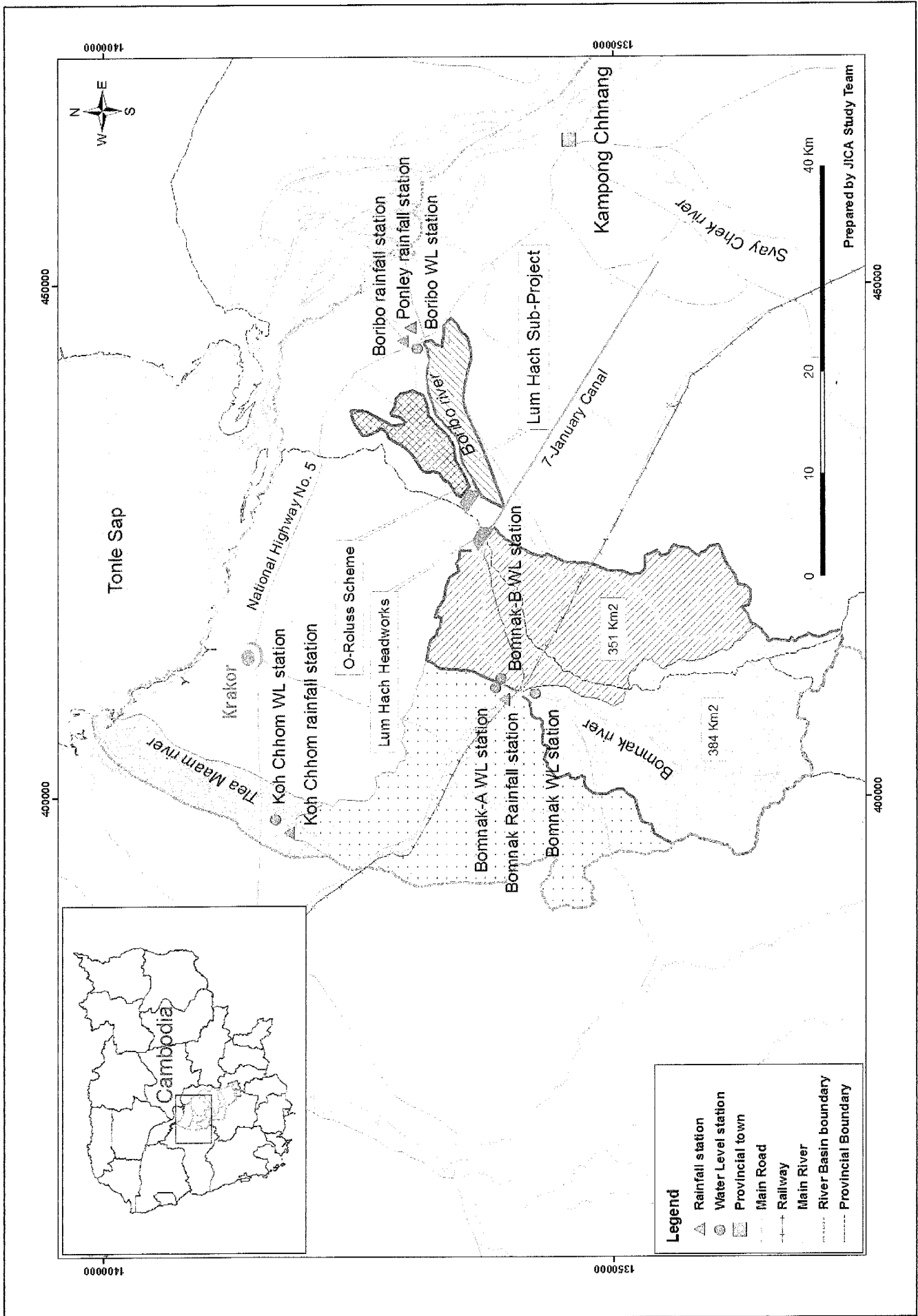


Figure A.7.1.1 Catchment Area of Lum Hach Headworks and Lum Hach Sub-Project

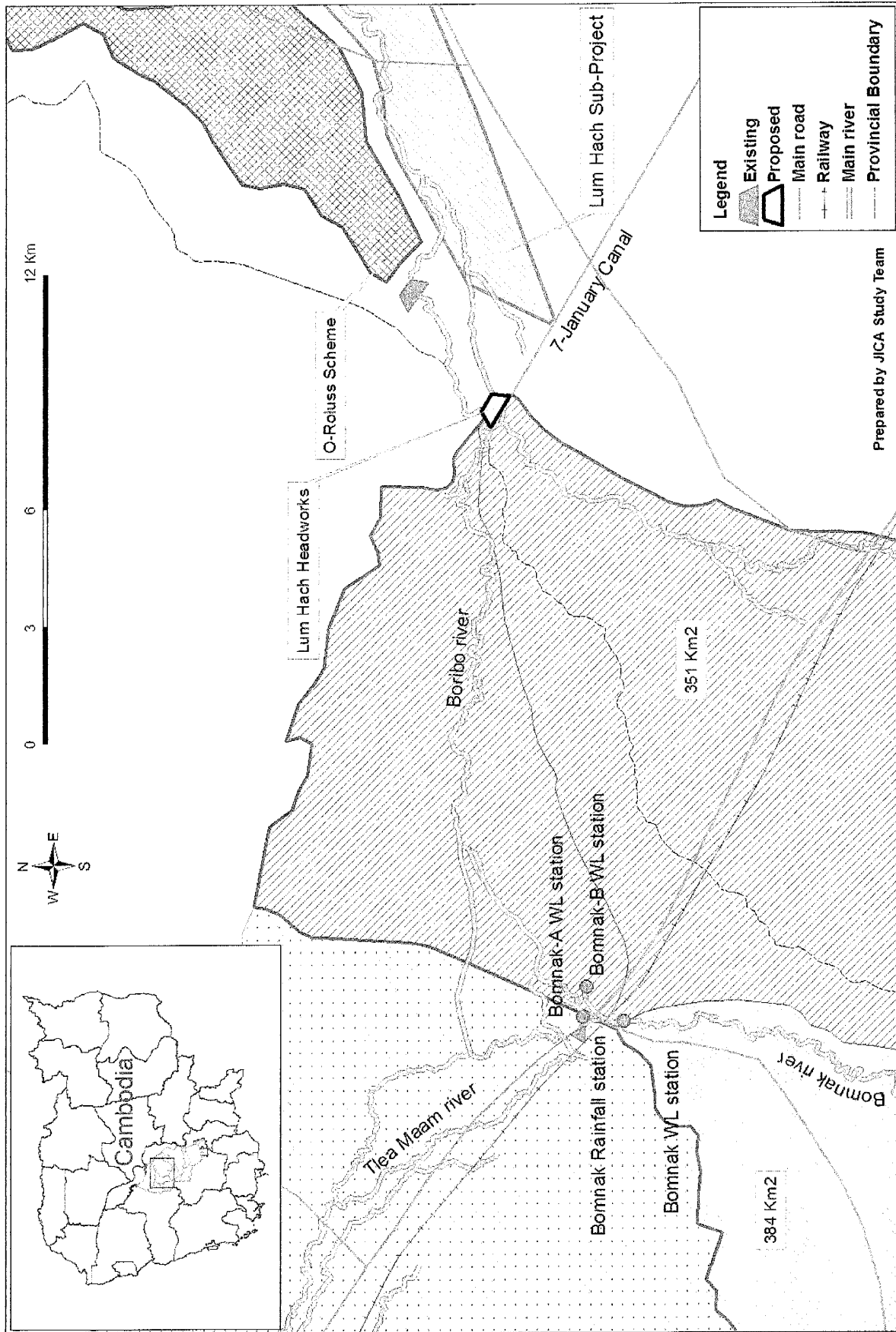


Figure A.7.1.2 Boribo River and Lum Hach Headworks

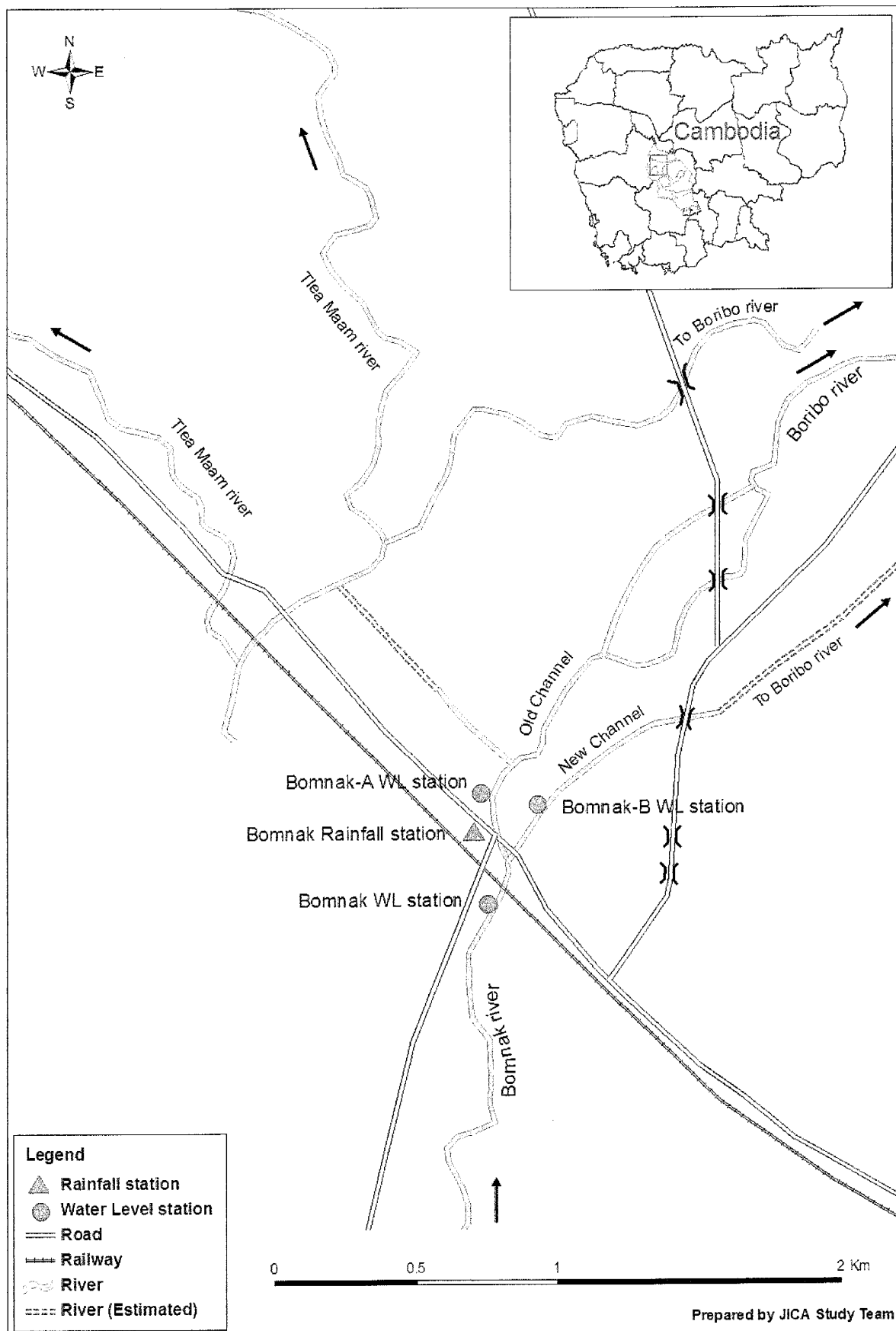


Figure A.7.3.1 Bomnak-Boribo river Bifurcation

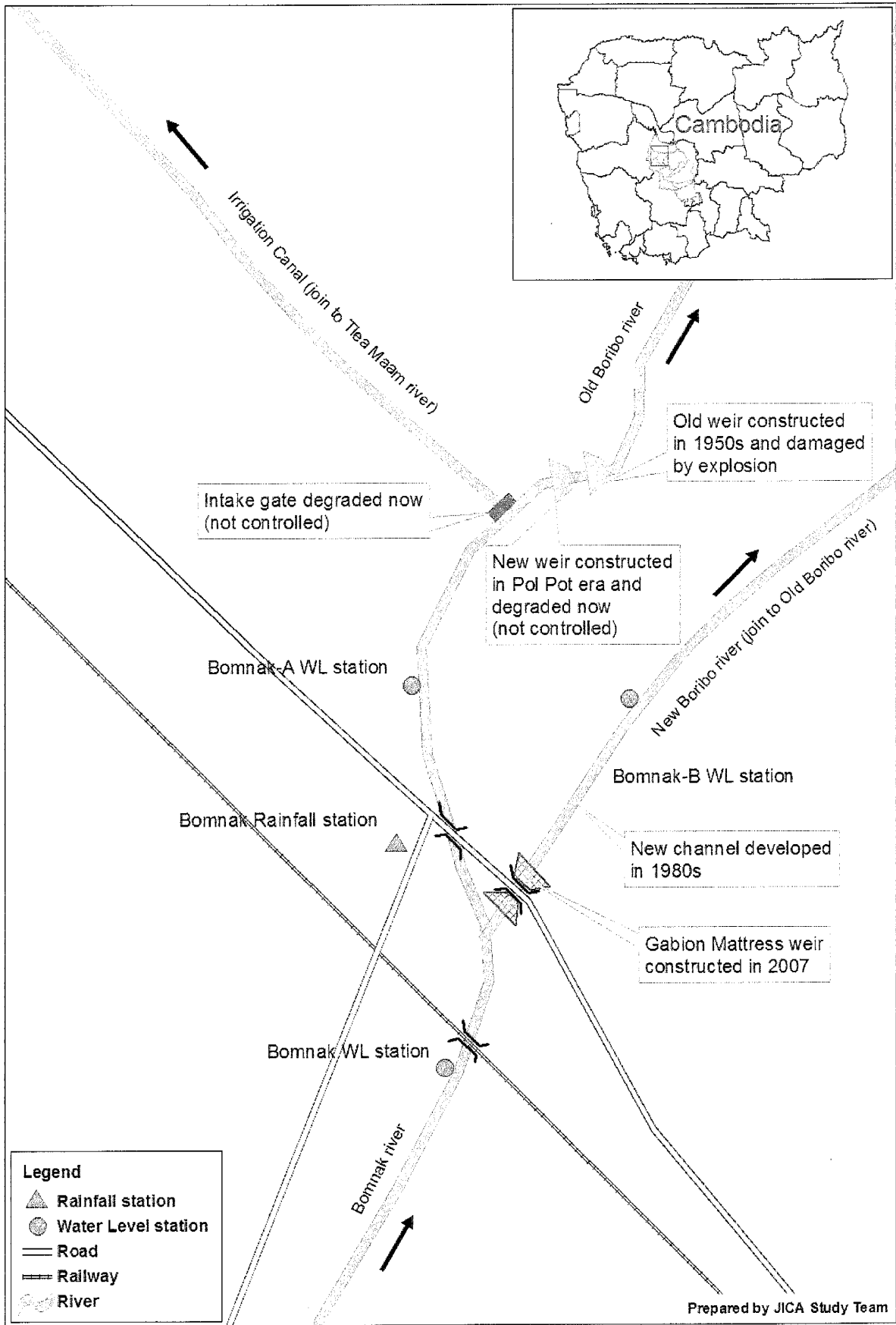


Figure A.7.3.2 Bomnak Diversion

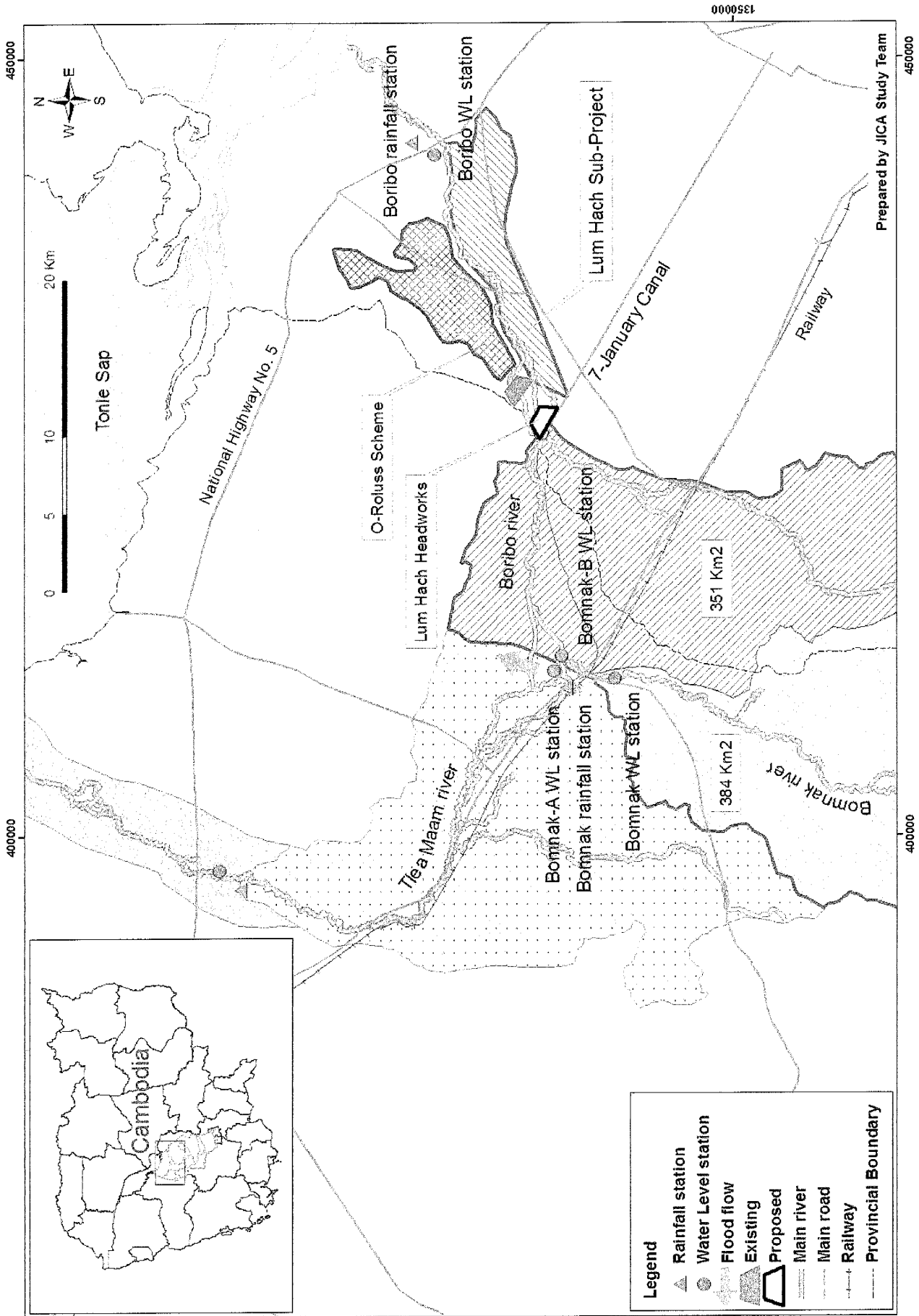


Figure A.7.5.1 Boribo River Channel Shape and Main Flood Flow

as of June 2008

Station	Year		2006												2007												2008																	
	Month		11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12				
Battambang Province																																												
R-1		Ratanak Mondol**																																										
R-2		Samlot																																										
R-3		Phnom Phroek**																																										
R-4		Bassac Reservoir																																										
R-5		Moung Russey																																										
Pursat Province																																												
R-6		Roveang																																										
R-7		Svay Don Keo																																										
R-8		Koh Chhum																																										
R-9		Bomnak																																										
R-14		Veal Veang*																																										
Kampong Chhnang Province																																												
R-10		Boribo																																										
R-11		Takab																																										
R-12		Peam-Krang Ponley																																										
R-13		Kampong Tralach*																																										
Observed by Automatic Rain gauge that were installed in February to March 2007, except for R-13 and 14 or marked station with "**"																																												
* : Installed in February 2008																																												
** : With manual gauge																																												
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3">Legend</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> </td> <td>No available data</td> </tr> <tr> <td style="text-align: center;"> </td> <td>Incomplete daily data</td> </tr> <tr> <td style="text-align: center;"> </td> <td>Complete daily data</td> </tr> </tbody> </table>																																	Legend				No available data		Incomplete daily data		Complete daily data			
Legend																																												
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	Incomplete daily data																																											
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Prepared by JICA Study Team																																												

Figure A8.2.1 Availability of Rainfall Data Observed in the Study

as of June 2008

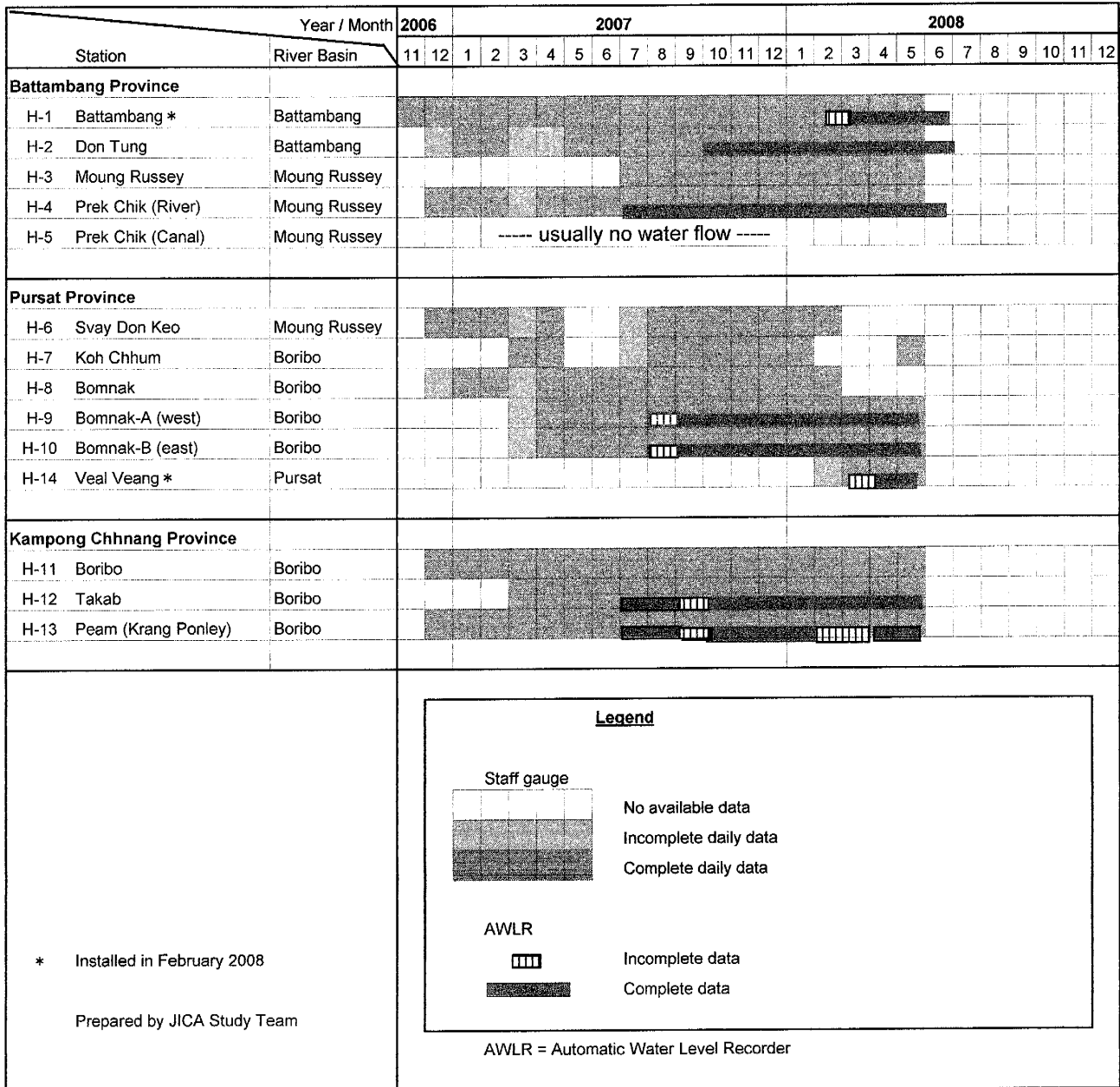


Figure A8.2.2 Availability of Water Level Data Observed in the Study