

ANNEX-G

Irrigation/Drainage

G.3.2. Rough Sketch of Irrigable Area with Existing Irrigation System ----	G-49
G.3.3. Rough Sketch of Installation Plan of Booster Pump -----	G-50
G.3.4. Rough Sketch of Removal Plan of Pump Station -----	G-51
G.4. Phonthan Area -----	G-52
G.4.1. Drainage Basin of Irrigation Pond -----	G-52
G.4.2. Rough Sketch of Existing Irrigation System -----	G-53
G.4.3. Rough Water Balance Study (Present Condition) -----	G-54
G.4.4. Rough Sketch of Irrigation Canal Extension Plan -----	G-55
G.4.5. Rough Water Balance Study (Planning) -----	G-56
G.4.6. H-V-A Curves of Irrigation Pond -----	G-57
G.4.7. Longitudinal Dike Profile of Irrigation Pond -----	G-58

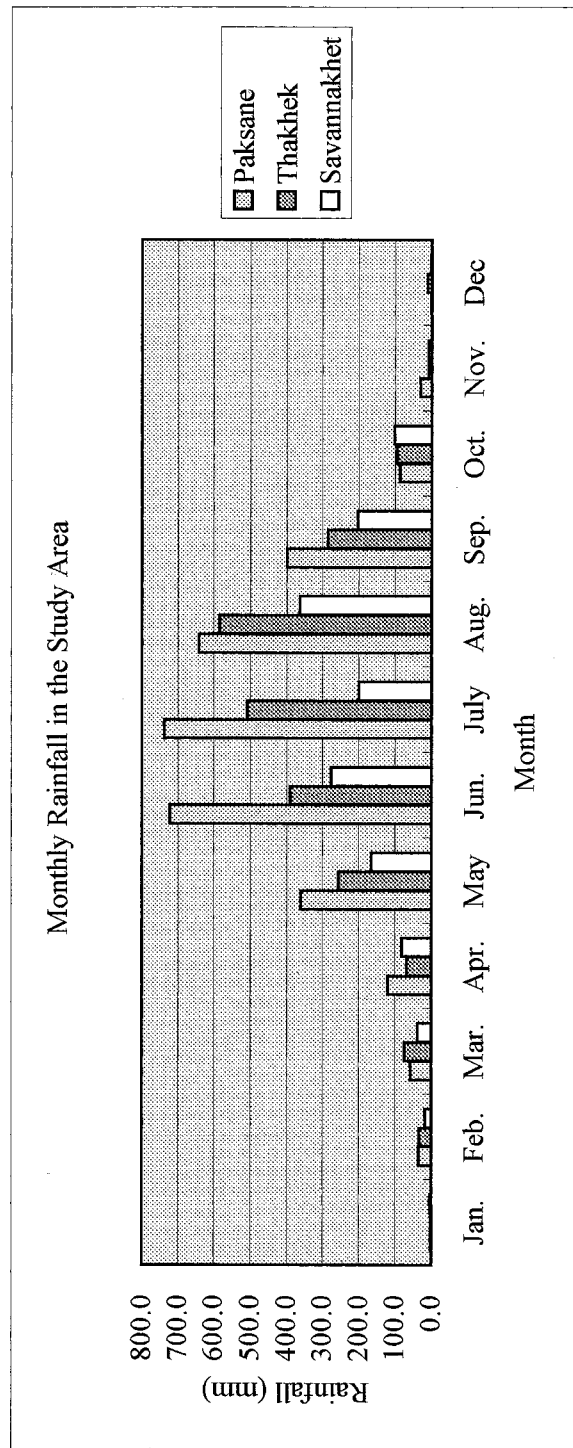
G.1.1. Monthly Rainfall

Monthly Rainfall of the Study Area

Station	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.	Oct.	Nov.	Dec	Total
Paksane	3.4	35.1	57.0	120.1	360.4	720.9	738.4	641.5	399.2	87.0	31.6	1.4	3,196.1
Thakhek	2.3	33.7	73.2	67.8	255.1	391.1	508.8	583.8	285.6	95.0	8.6	11.8	2,316.7
Savannakhet	4.0	17.0	37.9	81.1	165.2	276.5	200.0	363.1	202.3	102.0	9.2	2.7	1,454.1

Source : DOMH, Paksane 1987-97, Thakhek 1988-97, Savannakhet 1978-97

Monthly Rainfall in the Study Area



Monthly Rainfall (Savannakhet)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1978	0.0	8.8	111.2	28.9	175.4	395.2	314.6	418.3	226.4	2.2	0.0	0.0	1,681.0
1979	0.0	11.2	0.0	115.9	141.3	411.7	103.2	243.6	208.7	0.0	0.0	0.0	1,235.6
1980	0.0	10.7	32.0	122.8	131.4	254.4	249.1	104.6	545.4	170.1	14.3	0.8	1,635.6
1981	0.0	20.6	26.7	93.2	222.4	412.0	229.9	216.9	55.9	86.1	17.4	0.0	1,381.1
1982	0.0	1.0	25.1	60.7	149.8	209.1	68.8	453.1	331.7	166.4	25.6	0.0	1,491.3
1983	4.7	1.4	0.0	78.1	156.4	287.3	67.4	403.0	145.9	176.8	0.0	0.0	1,321.0
1984	0.0	0.0	50.2	146.6	186.4	235.8	265.8	415.2	183.5	129.5	46.9	0.0	1,659.9
1985	36.6	5.1	43.1	70.0	98.1	444.2	118.5	373.3	121.3	128.6	0.0	0.0	1,438.8
1986	0.0	0.0	0.0	123.1	277.3	250.9	158.8	315.9	128.0	107.4	21.9	0.5	1,383.8
1987	0.0	8.3	15.7	40.7	127.3	386.5	247.9	336.6	227.1	63.6	0.0	0.0	1,453.7
1988	0.0	0.4	6.3	72.8	197.5	151.4	164.6	307.9	43.4	189.5	0.0	0.0	1,133.8
1989	0.0	0.0	95.2	103.9	119.2	225.8	234.1	411.6	150.3	148.6	0.0	0.0	1,488.7
1990	0.3	108.1	23.6	13.6	231.4	346.7	191.8	434.2	180.2	158.2	25.4	0.0	1,713.5
1991	0.0	0.0	12.7	4.9	95.2	250.8	168.1	403.4	400.6	169.0	0.0	33.8	1,538.5
1992	32.4	33.8	9.3	69.1	193.2	234.4	204.8	446.4	75.6	60.7	0.0	19.7	1,379.4
1993	0.0	0.5	33.5	26.3	266.5	92.1	288.4	220.4	183.4	1.7	2.3	0.0	1,115.1
1994	0.0	73.4	39.0	49.4	138.1	337.7	152.5	565.1	188.1	60.0	0.0	0.0	1,603.3
1995	0.0	11.6	86.3	40.2	127.7	183.7	385.9	355.2	7.2	88.0	7.2	0.0	1,293.0
1996	2.4	1.8	88.3	285.8	163.0	166.4	245.0	432.3	490.1	41.7	23.6	0.0	1,940.4
1997	3.6	43.6	60.1	75.0	106.3	254.0	141.6	405.7	154.1	91.2	0.0	0.0	1,335.2
Average	4.0	17.0	37.9	81.1	165.2	276.5	200.0	363.1	202.3	102.0	9.2	2.7	1,454.1

Monthly Rainfall (Paksane)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1987	0.0	31.3	45.0	84.6	143.7	477.8	467.7	566.9	524.5	82.7	105.6	0.0	2,529.8
1988	0.0	44.5	79.1	64.8	413.6	420.4	484.8	770.9	133.5	226.3	0.1	0.0	2,638.0
1989	11.3	0.0	15.7	133.1	339.0	1,181.9	606.0	463.9	504.8	86.0	0.0	0.0	3,341.7
1990	2.5	52.0	91.6	154.0	416.9	930.6	751.1	570.5	353.1	62.4	78.2	0.5	3,463.4
1991	2.5	0.0	43.4	13.4	270.3	303.0	601.8	576.6	92.1	17.5	0.0	0.0	1,920.6
1992													
1993	0.0	10.0	0.0	177.0	392.0	643.5	621.0	241.5	500.0	0.0	0.0	0.0	2,585.0
1994	0.0	71.6	146.4	56.3	278.8	1,275.6	887.2	781.2	385.4	48.5	3.0	12.9	3,946.9
1995	1.0	0.0	20.5	98.1	544.4	821.2	1,143.3	1,061.0	433.3	223.3	0.1	0.0	4,346.2
1996	3.2	113.2	46.2	188.3	304.5	418.2	698.4	678.5	518.0	102.0	128.7	0.0	3,199.2
1997	13.7	28.7	82.5	231.7	500.3	737.2	1,123.1	704.1	547.4	20.8	0.0	0.4	3,989.9
Average	3.4	35.1	57.0	120.1	360.4	720.9	738.4	641.5	399.2	87.0	31.6	1.4	3,196.1

Monthly Rainfall (Thakhek)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1988	0.0	17.2	87.6	0.0	305.5	160.1	333.6	875.4	105.9	147.0	0.0	0.0	2,032.3
1989	0.2	0.0	105.1	64.4	203.4	341.3	497.5	327.9	246.2	241.1	0.0	0.0	2,027.1
1990	9.8	125.6	52.2	67.1	321.3	567.2	557.0	766.2	483.4	67.7	37.9	0.0	3,055.4
1991	0.0	0.0	90.6	11.9	128.5	655.8	357.8	709.2	241.7	37.3	0.0	32.4	2,265.2
1992	10.5	31.8	12.5	45.6	213.5	297.8	462.3	459.5	337.6	42.5	0.0	85.4	1,999.0
1993	0.0	10.8	5.2	134.3	583.5	299.9	628.5	437.5	101.7	46.7	0.8	0.0	2,248.9
1994	0.0	61.2	95.2	55.8	167.7	709.2	512.1	427.6	242.8	40.6	1.0	0.2	2,313.4
1995	0.0	31.6	62.3	22.3	300.2	385.2	660.6	699.3	173.6	111.6	14.7	0.0	2,461.4
1996	0.0	1.2	46.9	168.8	171.8	173.2	272.3	543.2	798.2	30.8	31.7	0.0	2,238.1
1997	2.1	57.3	174.6	107.9	155.8	320.8	806.0	591.9	125.3	184.3	0.0	0.4	2,526.4
Average	2.3	33.7	73.2	67.8	255.1	391.1	508.8	583.8	285.6	95.0	8.6	11.8	2,316.7

G.1.2. Monthly Temperature and Other Meteorological Data

Average Temperature (Mean min) (1985-94)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Vientiane	15.9	17.1	20.0	23.1	24.2	24.4	24.6	24.5	24.0	23.6	20.4	15.3	21.4
Thakhek	15.0	16.8	19.9	24.3	24.1	23.9	23.8	23.1	22.9	20.4	18.0	14.1	20.5
Savannakhet	15.2	18.5	20.8	23.9	24.9	24.9	24.5	24.2	24.0	21.2	17.8	14.1	21.2

Average Temperature (Mean max) (1985-94)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Vientiane	28.8	31.2	33.1	35.4	33.2	31.5	31.1	30.8	31.6	30.3	29.0	28.3	31.2
Thakhek	28.9	31.6	33.1	35.3	34.1	31.4	31.2	31.6	31.6	30.2	30.1	28.8	31.5
Savannakhet	29.1	31.6	33.1	35.3	33.3	31.6	31.2	30.7	31.4	30.3	28.4	27.4	31.1

Average Temperature (1997)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Vientiane	22.2	24.0	27.0	26.8	29.3	29.0	27.0	27.5	27.0	27.4	25.7	24.5	26.5
Savannakhet	21.7	23.4	26.2	27.1	28.9	28.1	27.2	26.7	26.8	26.8	25.3	23.5	26.0

Duration of Sunshine (1997)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Vientiane	256.9	228.7	256.5	230.1	247.3	200.2	64.7	122.0	159.5	247.1	271.6	203.1	207.3
Savannakhet	248.0	198.8	179.8	231.0	207.7	171.0	173.6	170.5	189.0	189.1	243.0	248.0	204.1

Unit: hours

Average Max Humidity (percent) (1997)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Vientiane	88	82	87	92	92	95	93	94	94	92	92	91	91
Savannakhet	97	94	93	92	92	93	96	95	96	96	96	97	95

Average Min Humidity (percent) (1997)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Vientiane	40	44	44	60	57	62	63	66	66	53	57	48	55
Savannakhet	37	46	37	44	49	57	68	68	57	51	42	39	50

G.1.3. Water Level and Discharge of the Major River

List of Available Water Level Observation Station

Station Name	River Name	Number on Map	Drainage Area (km ²)	Observation Period	Remark
Tributary of Mekong River					
B. Tad Leuk	N. Leuk	40	592	1991-1994	-
B. Hatkhay	N. Mang	41	743	1991-1994	Closed in 1994
B. Muang Mai	N. Ngiep	43	4,305	1991-1996	
B. Muang Kao	N. Sane	42	2,029	1991-1996	
B. Signo	N. Theune	44	3,370	1991-1996	
B. Kengkuang	N. Theune	47	5,650	1991-1996	
B. Phonesy	N. Cading	48	14,175	1991-1994	Closed in 1994
Kuanepho	Sebangfai	83	3,216	1991-1996	No observation in 1996
Mahaxay	Sebangfai	52	4,520	1991-1996	
Selanong	M. Nong	77	2,011	1991-1996	
Bridge 13	Sebangfai	53	8,560	1991-1996	
B. Muangchanh	Sepon	84	1,465	1991-1996	
Phalan	Sesangsoy	56	892	1991-1996	
Bridge 9 (M.Phine)	Sethamuak	55	608	1993-1996	
Kengkok	Sechamphone	58	2,733	1991-1996	
Donghen	Sechamphone	57	19,400	1991-1996	
Sopnam	Sebanghieng	54	4,362	1991-1996	
Kengdone	Sebanghieng	59	19,400	1991-1996	No observation in 1992
Lahanam	Sebanghieng	86	18,500	1996	Only Jan.-Sep.
kengtagnan	Sebanghieng	60	19,850	1996	
B.Khua	Sebangnuane	61	-	1996	Only May-Dec.
Mekong River					
Km4(Vientiane)	Mekong	9	299,000	1991-1996	
Paksane	Mekong	10	-	1991-1996	
Thakhek	Mekong	11	373,000	1992-1996	
Savannakhet	Mekong	12	391,000	1991-1996	

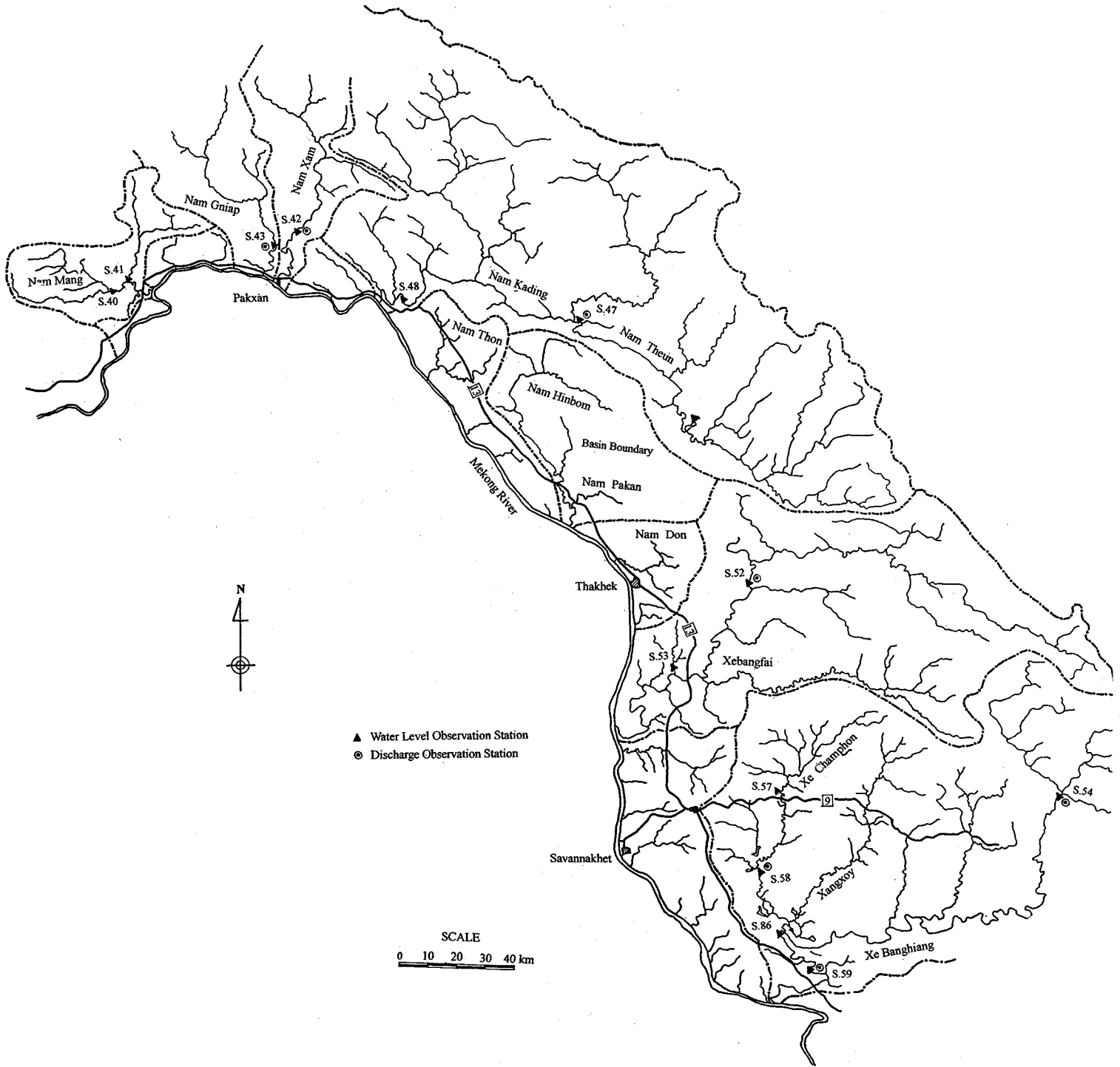
Source : Hydrological Data Book on the Mekong River Basin in Lao PDR, September, 1997

Discharge Measurement Record

Station	Number on Map	Drainage Area (km ²)	Measurement record
B. Muang Mai	43	4,305	H=0.45m, Q=37.76m ³ /s (18, Mar.,1997)
B. Muang Kao	42	2,029	H=1.85m, Q=20.76m ³ /s (19, Mar.,1997)
Bridge 13	53	8,560	H=6.31m, Q=20.76m ³ /s (20, Mar.,1997)
B. Muangchanh	84	1,465	H=3.78m, Q=7.80m ³ /s (22, Mar.,1997)
Bridge 9 (M.Phine)	55	608	H=0.07m, Q=0.49m ³ /s (21, Mar.,1997)
Kengkok	58	2,733	H=1.14m, Q=1.56m ³ /s (10, Feb.,1996) H=0.96m, Q=0.82m ³ /s (20, Mar.,1997)
Donghen	57	19,400	H=1.85m, Q=0.20m ³ /s (20, Mar.,1997)
Sopnam	54	4,362	H=2.13m, Q=29.23m ³ /s (21, Mar.,1997)
Lahanam	86	18,500	H=1.33m, Q=37.22m ³ /s (20, Mar.,1997)

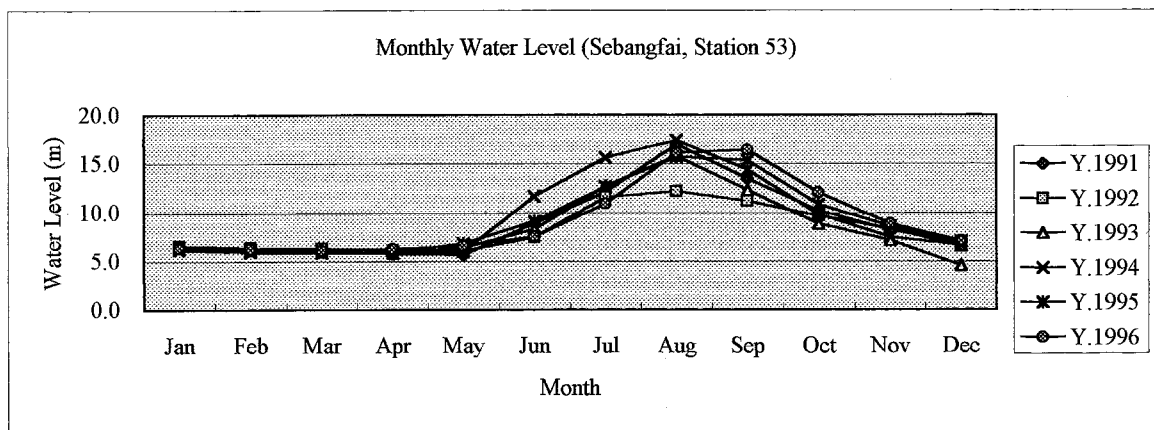
Source : Hydrological Data Book on the Mekong River Basin in Lao PDR, September, 1997

Location of Hydrological Observation Station



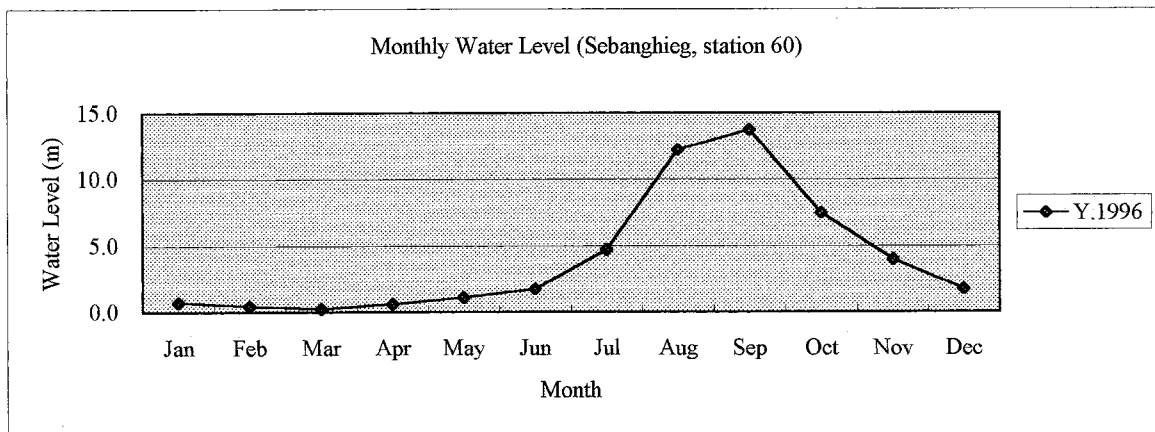
Monthly Water Level (Sebangfai, station 53)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1991	6.37	6.16	6.07	5.78	5.62	8.86	12.13	16.96	13.49	10.19	8.14	6.93	20.94	5.53
Y.1992	6.51	6.38	6.28	6.07	6.03	7.47	11.55	12.18	11.18	9.64	8.31	6.51	15.48	5.76
Y.1993	6.33	6.15	5.99	5.80	6.33	8.26	12.70	15.80	12.34	8.80	7.10	4.56	17.78	5.58
Y.1994	6.15	5.91	5.88	5.82	5.99	11.66	15.64	17.43	14.41	9.82	7.47	6.64	19.72	5.69
Y.1995	6.36	6.16	5.99	5.91	6.80	9.10	12.64	15.71	15.34	10.85	8.56	7.02	19.55	5.76
Y.1996	6.35	6.23	6.08	6.23	6.56	7.51	10.88	16.09	16.46	12.07	8.82	7.06	20.68	6.03



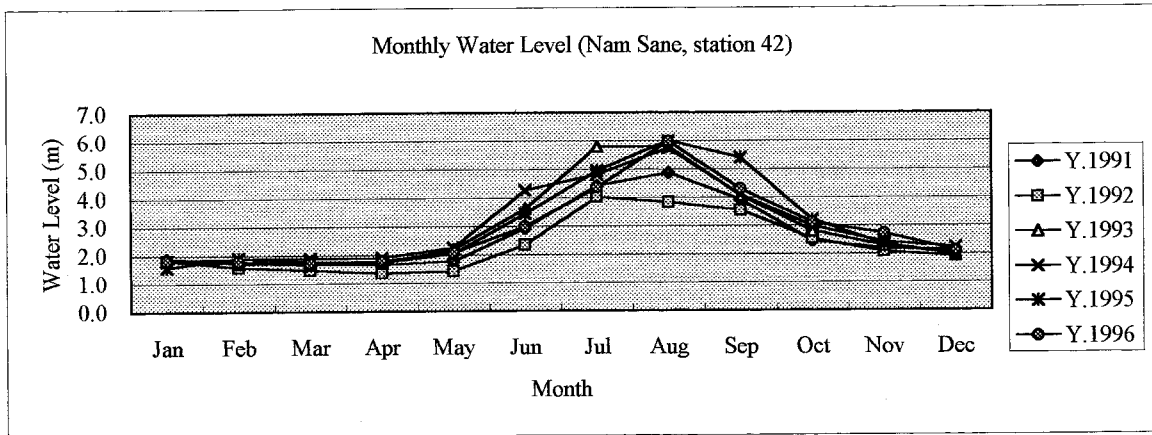
Monthly Water Level (Sebanghieng, station 60)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1996	0.72	0.45	0.23	0.59	1.08	1.74	4.69	12.21	13.74	7.50	3.98	1.73	19.87	0.10



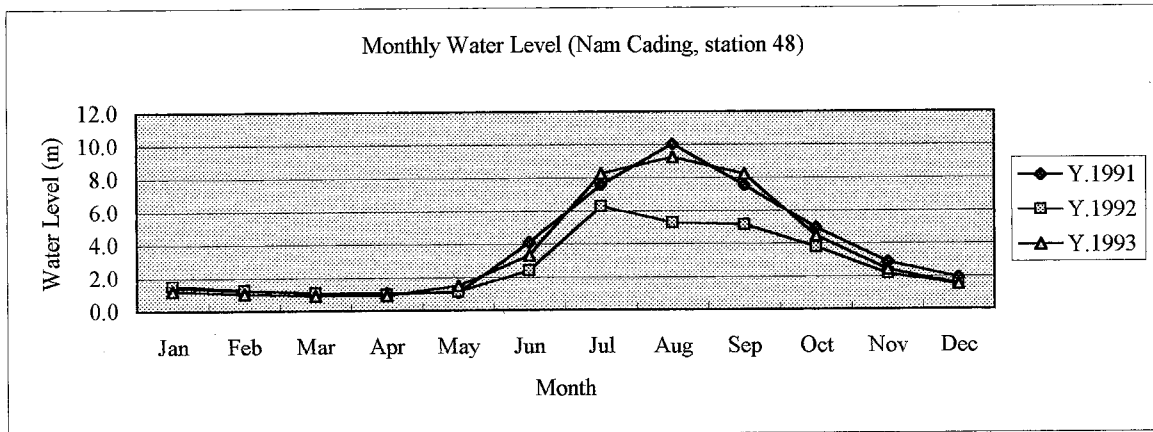
Monthly Water Level (Nam Sane, station 42)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1991	1.88	1.77	1.69	1.66	1.77	2.93	4.42	4.86	3.92	2.46	2.18	2.11	7.96	1.59
Y.1992	1.83	1.59	1.47	1.35	1.43	2.34	4.01	3.83	3.55	2.52	2.08	1.90	6.32	1.24
Y.1993	1.82	1.74	1.67	1.71	2.18	3.60	5.79	5.80	4.08	2.82	2.28	1.99	9.96	1.61
Y.1994	1.83	1.89	1.88	1.90	2.25	4.27	4.82	5.73	4.10	2.99	2.41	2.22	7.91	1.64
Y.1995	1.59	1.90	1.78	1.74	2.04	3.44	4.95	6.00	5.39	3.21	2.34	1.98	8.94	1.60
Y.1996	1.81	1.79	1.72	1.80	2.07	2.99	4.35	5.99	4.30	3.12	2.72	2.12	8.71	1.69



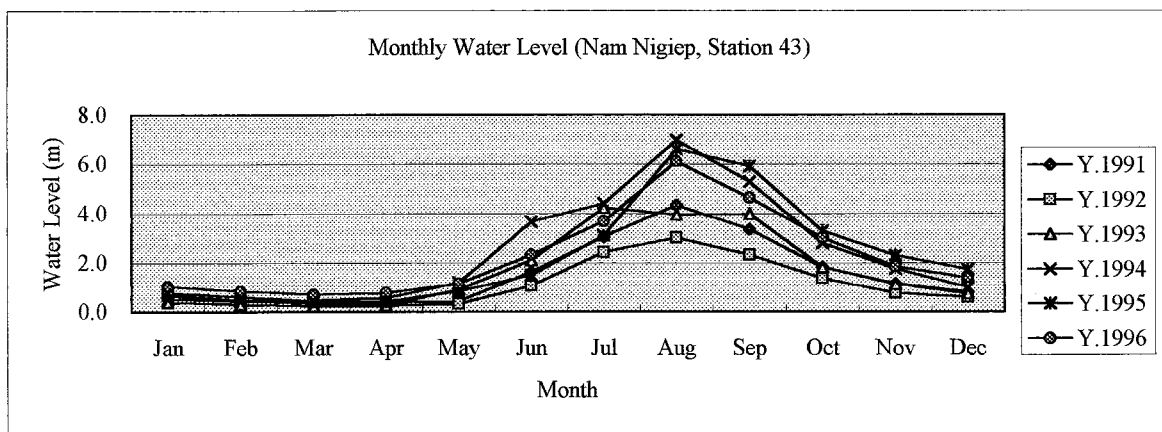
Monthly Water Level (Nam Cading, station 48)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1991	1.38	1.22	1.07	1.07	1.08	4.12	7.58	10.03	7.53	4.95	2.88	1.94	14.20	0.94
Y.1992	1.53	1.27	1.08	0.96	1.13	2.42	6.28	5.26	5.15	3.80	2.18	1.48	10.14	0.90
Y.1993	1.21	1.04	0.92	0.92	1.49	3.34	8.25	9.21	8.22	4.45	2.41	1.51	14.99	0.78



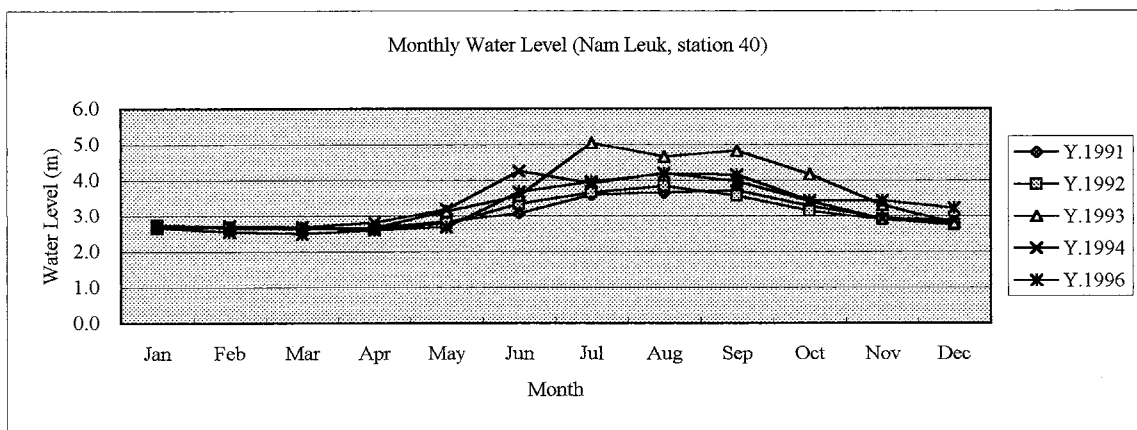
Monthly Water Level (Nam Ngiep, station 43)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1991	0.64	0.45	0.34	0.38	0.44	1.62	3.05	4.33	3.37	1.82	1.14	0.81	6.85	0.20
Y.1992	0.68	0.48	0.37	0.25	0.33	1.07	2.42	3.02	2.31	1.36	0.76	0.58	6.95	0.17
Y.1993	0.40	0.30	0.23	0.27	0.92	2.10	4.23	3.95	3.98	1.83	1.12	0.73	9.71	0.13
Y.1994	0.51	0.44	0.48	0.57	1.20	3.66	4.40	6.99	5.28	2.79	1.76	0.99	8.87	0.32
Y.1995	0.78	0.60	0.44	0.41	0.84	1.49	3.11	6.62	5.91	3.30	2.30	1.73	9.09	0.34
Y.1996	1.03	0.84	0.71	0.78	1.14	2.31	3.68	6.12	4.64	3.02	1.85	1.38	8.33	0.60



Monthly Water Level (Nam Leuk, station 40)

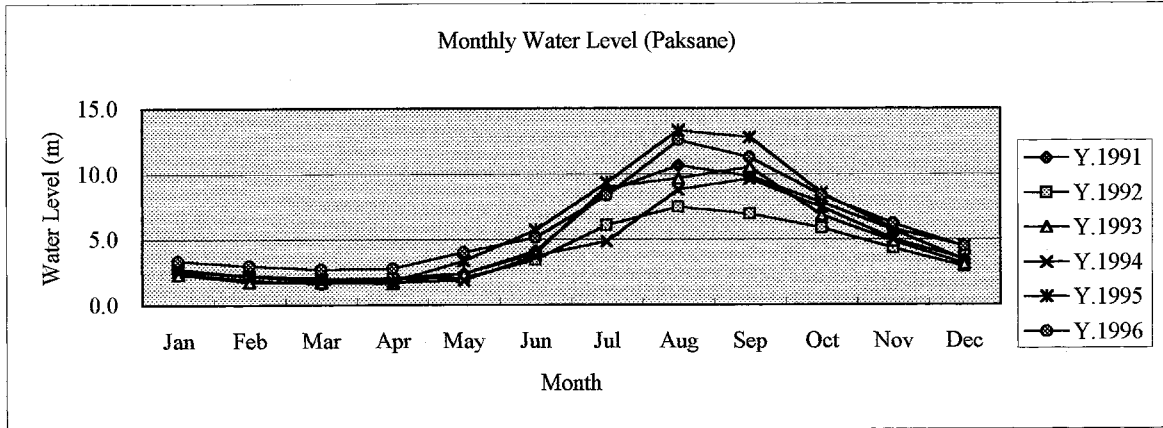
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1991	2.72	2.67	2.66	2.67	2.84	3.07	3.59	3.66	3.71	3.29	2.96	2.79	4.67	2.61
Y.1992	2.75	2.68	2.64	2.63	2.79	3.35	3.66	3.83	3.57	3.15	2.89	2.75	4.54	2.60
Y.1993	2.70	2.65	2.63	2.65	3.14	3.56	5.04	4.65	4.82	4.16	3.31	2.79	5.92	2.60
Y.1994	2.70	2.72	2.68	2.80	3.19	4.26	3.91	4.20	3.97	3.42	2.92	2.88	5.93	2.58
Y.1995	not available													
Y.1996	2.66	2.55	2.50	2.59	2.68	3.67	3.95	4.18	4.15	3.44	3.44	3.23	5.34	2.44



Water Level of Mekong River

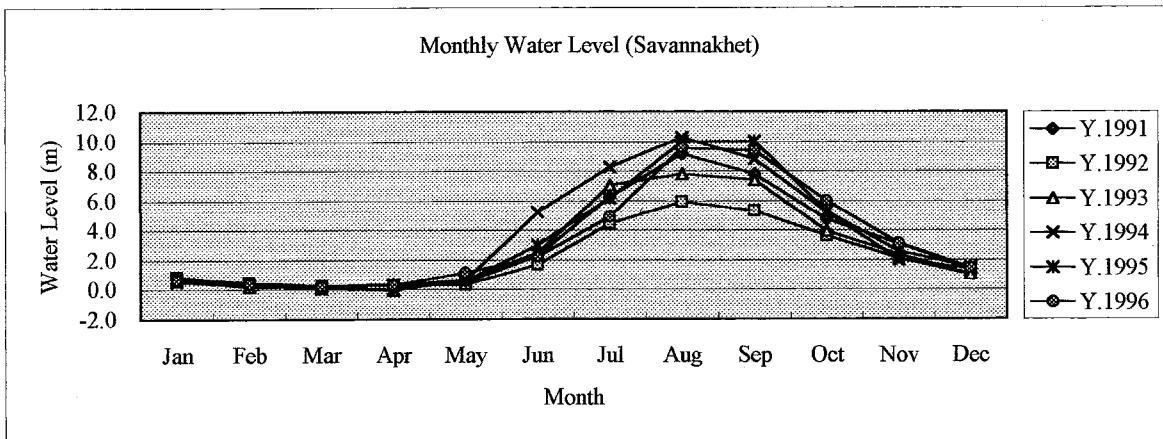
Monthly Water Level (Paksane, station 10)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1991	2.40	1.91	1.57	2.06	2.42	4.10	8.65	10.63	9.84	7.82	5.70	3.44	12.79	1.55
Y.1992	2.64	2.25	2.02	2.00	2.06	3.46	6.07	7.45	6.92	5.88	4.34	2.92	8.75	1.74
Y.1993	2.34	1.76	1.71	1.63	2.40	3.95	8.95	9.66	10.50	6.86	4.85	3.12	12.69	1.23
Y.1994	2.61	2.17	1.80	1.70	1.88	3.75	4.87	8.81	9.63	7.45	5.00	3.49	11.88	1.50
Y.1995	2.79	2.25	2.01	1.80	3.40	5.72	9.34	13.34	12.80	8.55	5.80	4.47	14.77	1.40
Y.1996	3.38	3.00	2.74	2.82	4.02	5.15	8.37	12.56	11.27	8.41	6.21	4.46	14.20	2.10



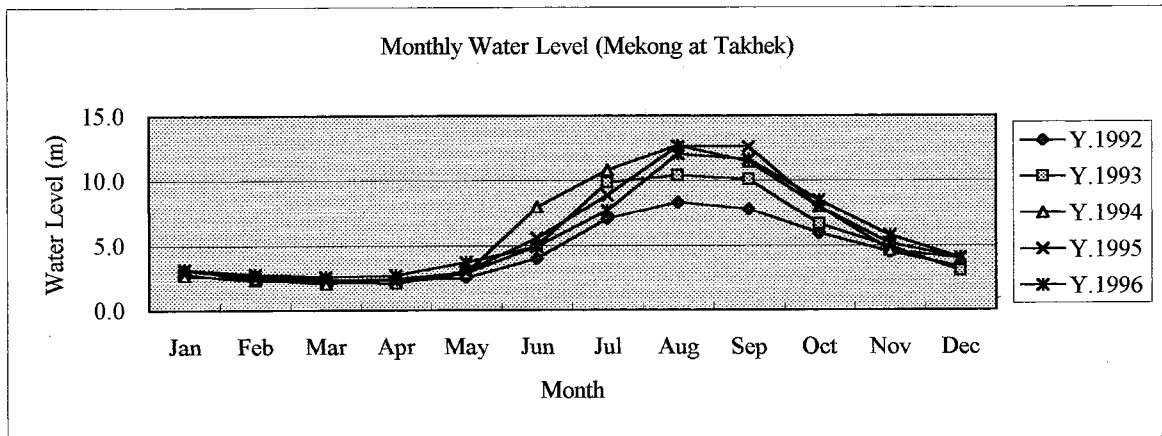
Monthly Water Level (Savannakhet, station 12)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1991	0.76	0.34	0.24	0.38	0.47	2.28	6.24	9.14	7.80	4.74	3.09	1.40	11.41	0.18
Y.1992	0.83	0.48	0.28	0.25	0.33	1.67	4.44	5.90	5.30	3.60	2.11	1.00	6.95	0.02
Y.1993	0.60	0.18	0.07	-0.05	0.66	2.46	7.02	7.79	7.40	3.95	2.35	1.04	10.15	-0.08
Y.1994	0.51	0.32	0.06	0.38	0.63	5.23	8.24	10.26	8.80	5.25	1.98	1.40	11.12	0.01
Y.1995	0.75	0.31	0.15	0.01	0.56	3.01	6.17	9.98	10.01	5.26	2.56	1.50	12.48	-0.27
Y.1996	0.68	0.36	0.20	0.30	1.14	2.22	4.90	9.55	9.38	6.00	3.10	1.46	12.10	0.05



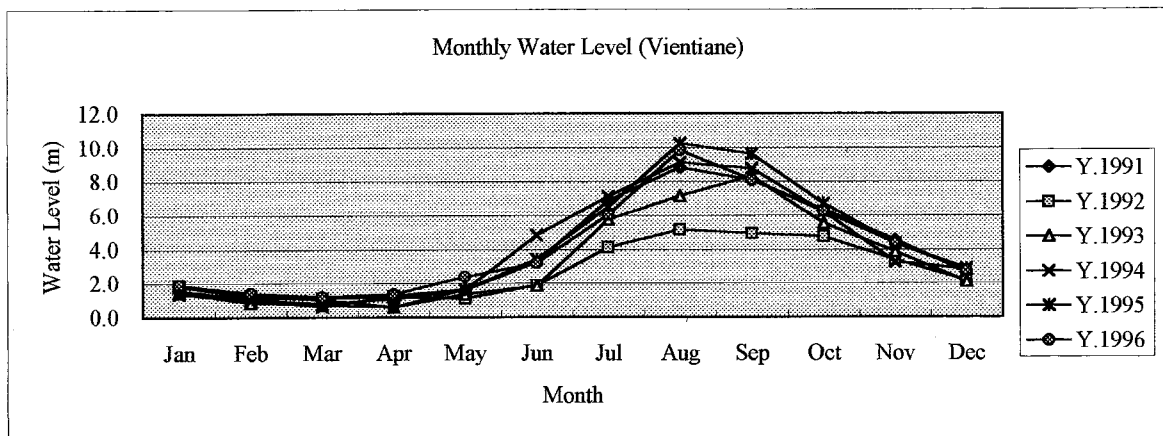
Monthly Water Level (Takhek, station 11)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1992	3.09	2.68	2.45	2.40	2.51	3.99	7.03	8.31	7.80	5.95	4.48	3.32	9.35	2.15
Y.1993	2.79	2.26	2.15	2.05	2.88	4.96	9.84	10.39	10.08	6.64	4.89	3.07	12.70	1.26
Y.1994	2.69	2.43	2.03	2.48	2.90	7.95	10.78	12.70	11.44	8.01	4.61	4.00	13.49	1.87
Y.1995	3.12	2.46	2.27	2.25	2.99	5.58	8.88	12.66	12.63	7.95	5.16	4.02	14.85	1.90
Y.1996	3.16	2.79	2.61	2.73	3.70	4.92	7.72	12.05	11.61	8.50	5.76	4.02	13.71	2.45



Monthly Water Level (Vientiane, station 9)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max	Min
Y.1991	1.58	1.08	0.80	1.07	1.60	3.28	6.89	8.82	8.07	6.34	4.56	2.64	11.22	0.70
Y.1992	1.92	1.30	1.10	1.20	1.10	1.87	4.12	5.14	4.94	4.74	3.39	2.17	6.67	0.77
Y.1993	1.46	0.84	0.72	0.60	1.35	1.85	5.76	7.17	8.34	5.54	3.87	2.12	9.78	0.30
Y.1994	1.36	0.99	0.64	1.27	1.63	4.83	7.12	9.11	8.78	6.22	3.26	2.84	11.14	0.47
Y.1995	1.81	1.19	1.03	0.60	1.64	3.42	6.50	10.23	9.60	6.71	4.33	2.88	11.95	0.07
Y.1996	1.89	1.42	1.18	1.36	2.38	3.20	6.03	9.82	8.12	6.25	4.36	2.77	11.84	0.93



Monthly River Discharge (m³/s)

Se Bang Fai at Mahaxai

Mont Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1988								720.00	241.00	282.00	58.50	35.80	267.46
1989	22.60	14.60	10.50	9.42	81.90	242.00	401.00	834.00	315.00	319.00	87.60	42.80	198.37
1990	22.70	18.10	22.90	12.30	24.50	385.00	490.00	533.00	1,040.00	249.00	103.00	36.60	244.76
1991	18.70	14.30	10.20	8.40	9.99	318.00	539.00	1,310.00	444.00	284.00	93.30	55.90	258.82
1992	38.60	23.10	17.00	14.50	14.50	120.00	509.00	323.00	244.00	310.00	177.00	34.10	152.07
1993	22.10	15.30	12.10	11.90	43.80	130.00	486.00	978.00	294.00	104.00	47.50	38.80	181.96
Mean	24.94	17.08	14.54	11.30	34.94	239.00	485.00	783.00	429.67	258.00	94.48	40.67	217.24

Se Champhone at Kengkok

Mont Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1987	1.37	0.86	0.53	0.25	4.92	47.70	146.00	170.00	177.00	21.10	4.61	3.16	48.13
1988	2.53	2.04	1.50	1.00	24.00	10.50	31.10	189.00	21.30	47.00	3.53	1.87	27.95
1989	1.44	1.17	0.83	0.46	1.66	29.00	67.10	196.00	174.00	71.70	5.85	2.52	45.98
1990	1.79	5.25	1.65	2.23	4.39	88.40	133.00	393.00	343.00	192.00	55.20	6.09	102.17
1991	2.00	1.57	1.09	0.74	0.42	12.60	85.10	226.00	167.00	28.40	4.21	2.67	44.32
1992	2.03	1.62	1.24	0.90	0.72	44.50	62.60	217.00	211.00	21.70	3.63	2.95	47.49
1993	1.97	1.43	0.97	0.62	11.10	31.30	67.40	146.00	95.50	5.04	2.77		33.10
Mean	1.88	1.99	1.12	0.89	6.74	37.71	84.61	219.57	169.83	55.28	11.40	3.21	49.87

Se Bang Hieng at Tchepon (Sop Nam)

Mont Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1988	27.0	18.6	13.8	10.7	33.4	36.7	48.1	310.0	71.8	385.0	80.6	67.1	91.9
1989	43.6	22.0	20.6	20.4	241.0	170.0	418.0	459.0	189.0	387.0	137.0	127.0	186.2
1990	62.7	63.3	62.5	53.8	64.7	249.0	196.0	404.0	984.0	771.0	296.0	119.0	277.2
1991	60.0	36.4	33.8	29.0	36.9	152.0	163.0	748.0	213.0	298.0	86.7	49.2	158.8
1992	56.1	44.9	37.7	33.2	27.6	162.0	227.0	407.0	204.0	610.0	241.0	109.0	180.0
1993	86.0	78.4	72.7	73.3	89.1	85.7	104.0	245.0	315.0	115.0	86.3	116.0	122.2
Mean	55.9	43.9	40.2	36.7	82.1	142.6	192.7	428.8	329.5	427.7	154.6	97.9	169.4

Nam Sane at Muong Borikhane

Mont Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1987	93.30	69.90	51.70	46.90	49.50	161.00	257.00	448.00	217.00	105.00	58.20	34.80	132.69
1988	15.40	15.00	12.70	10.50	52.40	55.70	259.00	332.00	212.00	97.60	52.40	31.20	95.49
1989	20.90	15.20	12.40	15.10	43.60	196.00	235.00	299.00	259.00	131.00	66.70	37.90	110.98
1990	24.20	17.80	20.60	13.90	65.70	280.00	278.00	194.00	195.00	99.30	60.00	36.70	107.10
1991	21.10	14.40	10.80	9.80	16.90	128.00	367.00	437.00	267.00	72.50	45.10	40.70	119.19
1992	21.00	6.53	1.28	0.46	2.80	57.80	285.00	257.00	208.00	80.80	40.00	26.90	82.30
1993	19.00	14.40	10.90	13.20	49.80	229.00	670.00	653.00	293.00	109.00	52.70	29.70	178.64
Mean	30.70	21.89	17.20	15.69	40.10	158.21	335.86	374.29	235.86	99.31	53.59	33.99	118.06

Nam Nhiep at Muong Mai

Mont Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1987	99.4	82.2	68.2	64.9	65.9	160.0	236.0	411.0	201.0	110.0	73.3	54.9	135.6
1988	34.7	28.4	24.9	24.3	75.0	102.0	246.0	389.0	198.0	160.0	96.7	54.0	119.4
1989	43.8	36.7	33.2	37.4	85.1	288.0	319.0	383.0	310.0	235.0	113.0	70.7	162.9
1990	50.6	41.5	41.6	32.5	112.0	291.0	461.0	427.0	307.0	172.0	104.0	70.8	175.9
1991	54.6	41.1	32.3	34.6	43.9	161.0	328.0	519.0	363.0	157.0	89.2	61.7	157.1
1992	56.8	41.0	32.8	25.0	30.4	93.5	238.0	290.0	219.0	122.0	63.6	48.8	105.1
1993	40.5	34.5	30.2	32.9	79.7	206.0	524.0	452.0	447.0	160.0	93.2	64.8	180.4
Mean	54.3	43.6	37.6	35.9	70.3	185.9	336.0	410.1	292.1	159.4	90.4	60.8	148.1

Nam Theun at Kham Keut

Mont Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1990	57.40	42.30	48.70	25.30	66.70	495.00	806.00	609.00	1,020.00	934.00	219.00	105.00	369.03
1992	0.00	0.00	0.00	2.99	4.25	166.00	537.00	231.00	387.00	216.00	70.60	26.10	136.75
1993	9.81	3.11	0.52	0.49	32.60	180.00	683.00	1,020.00	437.00	280.00	65.00	35.30	228.90
Mean	22.40	15.14	16.41	9.59	34.52	280.33	675.33	620.00	614.67	476.67	118.20	55.47	244.89

Se Bang Hieng at Ban Keng Done

Mont Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1988								1,250.0	228.0	857.0	154.0	91.7	516.1
1989	44.5	21.1	14.2	19.9	103.0	385.0	291.0	1,270.0	985.0	441.0	116.0	76.4	313.9
1990						672.0	689.0	1,410.0	2,520.0	1,060.0		117.0	1,078.0
1991	54.9	29.9	19.0	16.8	48.8	294.0	666.0	2,750.0	1,700.0	764.0	210.0	99.6	554.4
1992			22.0	13.2	35.3	510.0	630.0	2,600.0	1,240.0	522.0	293.0	83.2	594.9
1993	135.0	118.0	94.7	124.0	151.0	198.0	404.0	750.0	717.0	214.0	160.0		278.7
Mean	78.1	56.3	37.5	43.5	84.5	411.8	536.0	1,671.7	1,231.7	643.0	186.6	93.6	556.0

Mekong at Vientiane

Month Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1987	1,720	1,350	1,140	1,040	1,110	2,100	3,070	7,560	9,070	6,930	3,820	2,240	3,429
1988	1,500	1,220	1,070	1,110	2,290	3,030	5,140	10,200	8,720	5,830	2,960	1,920	3,749
1989	1,290	1,040	955	927	1,320	2,880	5,470	8,370	7,450	8,360	4,050	2,130	3,687
1990	1,430	1,160	1,140	1,010	1,820	5,960	9,330	9,480	7,670	6,710	3,780	2,130	4,302
1991	1,510	1,190	1,050	1,200	1,560	3,220	7,980	11,600	9,910	7,050	4,550	2,420	4,437
1992	1,780	1,320	1,210	1,260	1,210	1,740	4,080	5,340	5,010	4,770	3,210	2,000	2,744
1993	1,430	1,070	1,020	980	1,370	1,760	6,260	8,470	10,300	5,830	3,740	1,950	3,682
Mean	1,523	1,193	1,084	1,075	1,526	2,956	5,904	8,717	8,304	6,497	3,730	2,113	3,718

Mekong at Mukdahan

Month Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1987	2,330	1,930	1,620	1,450	1,620	3,810	7,440	16,700	16,200	10,300	5,180	3,280	5,988
1988	2,220	1,770	1,570	1,650	3,300	5,370	8,740	19,000	14,000	9,070	4,500	2,830	6,168
1989	1,960	1,580	1,370	1,350	2,220	7,160	10,100	16,400	14,100	13,100	6,170	3,190	6,558
1990	2,320	1,860	1,840	1,480	2,630	12,700	17,700	19,400	17,100	11,600	6,030	3,350	8,168
1991	2,370	1,930	1,680	1,850	2,180	5,330	14,400	22,900	17,900	10,700	6,550	3,540	7,611
1992	2,790	2,280	1,780	1,730	1,820	3,840	9,840	12,800	11,200	7,350	4,640	2,770	5,237
1993	2,050	1,650	1,550	1,450	2,300	4,970	15,900	17,900	16,700	7,750	4,680	2,710	6,634
Mean	2,291	1,857	1,630	1,566	2,296	6,169	12,017	17,871	15,314	9,981	5,393	3,096	6,623

Mekong at Nakhon Phanom

Month Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1987	2,070	1,630	1,350	1,200	1,330	3,310	5,660	13,800	13,700	8,840	4,470	2,880	5,020
1988	1,920	1,470	1,270	1,200	2,720	4,370	7,330	16,300	12,600	7,710	3,850	2,480	5,268
1989	1,630	1,250	1,060	1,030	1,870	5,990	8,480	13,700	12,100	11,300	5,200	2,800	5,534
1990	2,010	1,560	1,540	1,230	2,240	10,500	15,200	16,300	13,800	9,530	4,960	2,930	6,817
1991	2,030	1,530	1,300	1,460	1,800	4,670	12,200	18,900	15,400	8,560	5,240	3,190	6,357
1992	2,260	1,750	1,500	1,530	1,600	3,390	8,120	10,500	9,360	5,940	3,970	2,440	4,363
1993	1,770	1,290	1,220	1,110	2,020	4,620	14,400	16,000	15,100	7,110	4,490	2,560	5,974
Mean	1,956	1,497	1,320	1,251	1,940	5,264	10,199	15,071	13,151	8,427	4,597	2,754	5,619

Nam Theun at Ban Signo

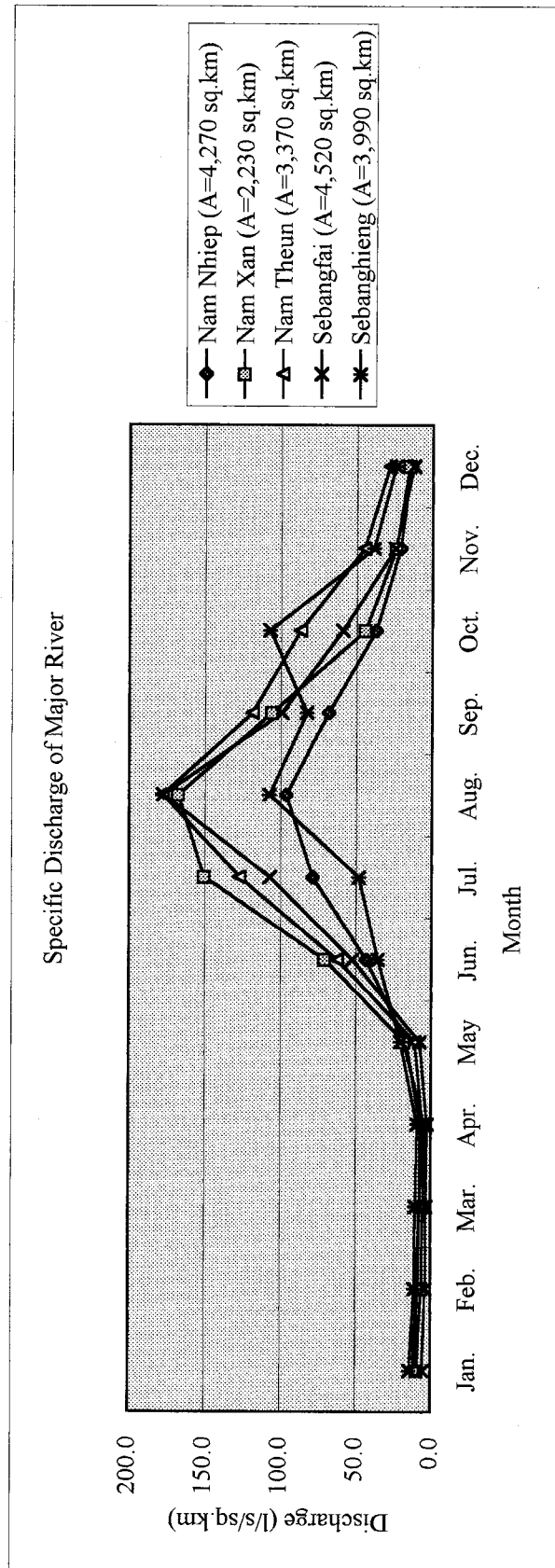
Month Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual mean
1987	45.8	36.7	33.7	20.1	49.2	106.0	324.0	691.0	463.0	235.0	176.0	127.0	192.3
1988							73.1	592.0	271.0	357.0	93.1	60.5	241.1
1990	38.9	31.0	34.1	20.0	45.5	255.0	379.0	371.0	590.0	440.0	223.0	73.1	208.4
1991	38.4	31.0	19.7	18.5	19.5	315.0	476.0	943.0	295.0	209.0	98.3	77.9	211.8
1992	42.5	28.5	18.3	12.3	20.9	199.0	441.0	231.0	340.0	227.0	95.1	60.6	143.0
1993	34.2	28.0	20.7	21.6	50.5	179.0	518.0	675.0	331.0	287.0	101.0	65.8	192.7
Mean	40.0	31.0	25.3	18.5	37.1	210.8	368.5	583.8	381.7	292.5	131.1	77.5	198.2

G.1.4. Specific Discharge of Major River

Specific Discharge of Major River

Unit : l/s/sq.km

River	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Nam Nhiep (A=4,270 sq.km)	11.0	8.7	7.6	7.3	16.5	43.6	78.7	96.1	68.5	37.3	21.2	14.2
Nam Xan (A=2,230 sq.km)	9.1	6.2	5.1	4.7	18.0	70.9	150.6	167.9	105.7	44.5	23.9	15.2
Nam Theun (A=3,370 sq.km)	11.9	9.2	7.5	5.5	11.0	62.6	127.1	178.1	118.6	87.0	45.1	28.5
Sebangfai (A=4,520 sq.km)	5.5	3.8	3.2	2.5	7.7	52.8	107.1	177.7	99.2	59.4	24.6	12.2
Sebanghieng (A=3,990 sq.km)	14.0	11.0	10.1	9.2	20.6	35.7	48.3	107.3	82.7	107.2	38.7	24.5



Specific Run-off (Nam Nhiep Muong Mai A=4,270 Km*2)

Unit ; l/s/km*2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Y.1987	23.3	19.2	16.0	15.2	15.4	37.4	55.2	96.3	47.0	25.3	17.2	12.8
Y.1988	8.1	6.7	5.8	5.7	17.6	24.0	57.7	91.0	46.4	37.6	22.7	12.7
Y.1989	10.3	8.6	7.8	8.8	19.9	67.5	74.6	89.8	72.6	55.0	26.5	16.5
Y.1990	11.9	9.7	9.8	7.6	26.2	68.2	108.0	100.0	71.9	40.3	24.4	16.6
Y.1991	12.8	9.6	7.6	8.1	10.3	37.7	76.8	122.0	85.1	36.8	20.9	14.5
Y.1992	13.3	9.6	7.7	5.9	7.1	21.9	55.8	67.9	51.4	28.5	14.9	11.4
Y.1993	9.5	8.1	7.1	7.7	18.7	48.2	123.0	106.0	105.0	37.4	21.8	15.2
Ave.	11.0	8.7	7.6	7.3	16.5	43.6	78.7	96.1	68.5	37.3	21.2	14.2

Specific Run-off (Nam Sane Muong Borikhane A=2,230 Km*2)

Unit ; l/s/km*2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Y.1987	41.8	31.3	23.2	21.0	22.2	72.1	115.0	201.0	97.1	47.1	26.1	15.6
Y.1988	6.9	6.7	5.7	4.7	23.5	25.0	116.0	149.0	94.9	43.8	23.5	14.0
Y.1989	9.4	6.8	5.6	6.8	19.6	88.0	106.0	134.0	116.0	59.0	29.9	17.0
Y.1990	10.9	8.0	9.2	6.2	29.5	126.0	124.0	87.0	87.3	44.5	26.9	16.5
Y.1991	9.5	6.5	4.8	4.4	7.6	57.5	164.0	196.0	120.0	32.3	20.2	18.3
Y.1992	9.4	3.0	0.6	0.2	1.3	25.9	128.0	115.0	93.3	36.2	17.3	12.0
Y.1993	8.5	6.5	4.9	5.9	22.3	102.0	301.0	293.0	131.0	48.9	23.6	13.3
Ave.	9.1	6.2	5.1	4.7	18.0	70.9	150.6	167.9	105.7	44.5	23.9	15.2

Specific Run-off (Nam Theum Ban Signo A=3,370 Km*2)

Unit ; l/s/km*2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Y.1987	13.6	10.9	10.0	6.0	14.6	31.5	96.3	205.0	137.0	69.6	52.3	37.6
Y.1988								205.0	113.0	107.0	65.3	51.0
Y.1989												
Y.1990	11.5	9.2	10.1	5.9	13.5	75.8	113.0	110.0	175.0	131.0	66.0	21.7
Y.1991	11.4	9.2	5.8	5.5	5.8	93.5	141.0	280.0	87.5	62.0	29.2	23.1
Y.1992	12.6	8.5	5.4	3.6	6.2	59.1	131.0	68.5	101.0	67.4	28.2	18.0
Y.1993	10.2	8.3	6.1	6.4	15.0	53.0	154.0	200.0	98.2	85.1	29.3	19.5
Ave.	11.9	9.2	7.5	5.5	11.0	62.6	127.1	178.1	118.6	87.0	45.1	28.5

Specific Run-off (Nam Theum, Kham Keut A=5,560 Km*2)

Unit ; l/s/km*2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Y.1987												
Y.1988												
Y.1989												
Y.1990	10.3	7.7	8.7	4.6	12.0	88.8	145.0	109.0	183.0	168.0	39.4	18.8
Y.1991												
Y.1992				0.5	0.8	29.7	121.0	152.0	125.0	72.6	28.8	12.8
Y.1993	1.8	0.6	0.1	0.1	5.9	32.3	123.0	183.0	78.5	50.2	11.7	6.3
Ave.	6.0	4.1	4.4	1.7	6.2	50.3	129.7	148.0	128.8	96.9	26.6	12.6

Specific Run-off (Sebangfai, Mahaxat A=4,520 Km*2)

Unit ; l/s/km*2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Y.1987												
Y.1988								187.0	79.2	66.5	35.4	26.8
Y.1989	5.0	3.2	2.3	2.1	18.1	53.5	88.7	184.0	69.7	70.6	19.4	9.5
Y.1990	5.0	4.0	5.1	2.7	5.4	85.1	108.0	118.0	229.0	65.1	22.7	8.1
Y.1991	4.1	3.2	2.3	1.9	2.2	70.3	119.0	290.0	98.2	62.8	20.6	12.4
Y.1992	8.5	5.1	3.8	3.2	3.2	26.5	113.0	71.4	54.0	68.5	39.2	7.5
Y.1993	4.9	3.4	2.7	2.6	9.7	28.7	107.0	216.0	65.0	22.9	10.5	8.6
Ave.	5.5	3.8	3.2	2.5	7.7	52.8	107.1	177.7	99.2	59.4	24.6	12.2

Specific Run-off (Sechamphone, Kengkok A=2,640 Km*2)

Unit ; l/s/km*2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Y.1987	0.5	0.3	0.2	0.1	1.9	18.1	55.4	64.4	67.0	8.0	1.8	1.2
Y.1988	1.0	0.8	0.6	0.4	9.1	4.0	11.8	71.5	8.1	17.8	1.3	0.7
Y.1989	0.5	0.4	0.3	0.2	0.6	11.0	25.4	74.1	66.1	27.2	2.2	1.0
Y.1990	0.7	2.0	0.6	0.8	1.7	33.5	50.4	149.0	130.0	72.6	20.9	2.3
Y.1991	0.8	0.6	0.4	0.3	0.2	4.8	32.2	85.6	63.4	10.8	1.6	1.0
Y.1992	0.8	0.6	0.5	0.3	0.3	16.9	23.7	82.1	79.9	8.2	1.4	1.1
Y.1993	0.8	0.5	0.4	0.2	4.2	11.9	25.5	55.1	36.2	1.9	1.1	
Ave.	0.7	0.8	0.4	0.3	2.6	14.3	32.1	83.1	64.4	20.9	4.3	1.2

Specific Run-off (Sebanghieng, Tchepon A=3,990 Km*2)

Unit ; l/s/km*2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Y.1987												
Y.1988	6.8	4.7	3.5	2.7	8.4	9.2	12.0	77.6	18.0	96.4	20.2	16.8
Y.1989	10.9	5.5	5.2	5.1	60.5	42.6	105.0	115.0	47.5	97.0	34.3	31.8
Y.1990	15.7	15.9	15.7	13.5	16.2	62.3	49.1	101.0	247.0	193.0	74.1	29.7
Y.1991	15.0	9.1	8.5	7.3	9.3	38.1	40.8	187.0	53.5	74.7	21.7	12.3
Y.1992	14.1	11.3	9.4	8.3	6.9	40.5	56.9	102.0	51.2	153.0	60.5	27.2
Y.1993	21.6	19.6	18.2	18.4	22.3	21.5	26.1	61.4	79.0	28.9	21.6	29.0
Ave.	14.0	11.0	10.1	9.2	20.6	35.7	48.3	107.3	82.7	107.2	38.7	24.5

Specific Run-off (Sebanghieng, Ban Kengdone A=19,400 Km*2)

Unit ; l/s/km*2

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Y.1987												
Y.1988								64.4	11.7	44.2	8.0	4.7
Y.1989	2.3	1.1	0.7	1.0	5.3	19.8	15.0	65.7	50.8	22.7	6.0	3.9
Y.1990						34.6	35.5	72.3	130.0	54.5		6.0
Y.1991	2.8	1.5	1.0	0.9	2.5	15.1	34.3	142.0	87.8	39.4	10.8	5.1
Y.1992			1.1	0.7	1.8	26.3	32.5	134.0	64.1	26.9	15.1	4.3
Y.1993	6.9	6.1	4.9	6.4	7.8	10.2	20.3	38.7	37.0	11.1	8.2	
Ave.	4.0	2.9	1.9	2.2	4.4	21.2	27.5	86.2	63.6	33.1	9.6	4.8