

Fig. 5-15 Rating curve at Bertan

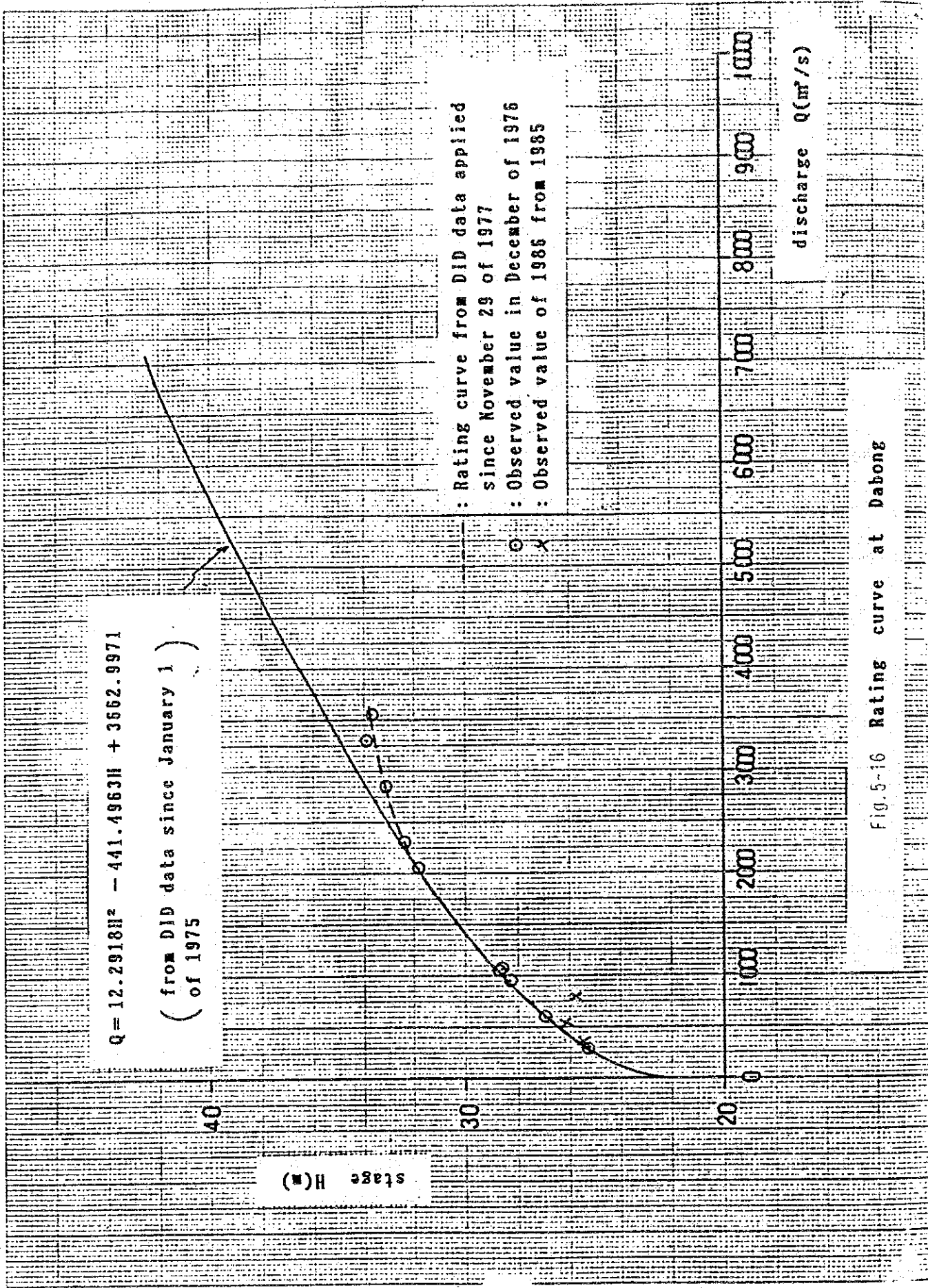


FIG. 5-16 Rating curve at Dabong

-----: Rating curve from DID data applied since January 1 of 1970
 - - - - -: Rating curve from DID data applied since January 1 of 1960
 ○ : Observed value in 1965 and 1966

$H > 19.99\text{m}$
 $Q = 2801.7458H - 45521.1536$
 (from uniform flow calculation)

$H \leq 19.99\text{m}$
 $Q = 59.4890H^2 - 865.2068H + 3405.1866$
 (from DID data since January 1 of 1964)

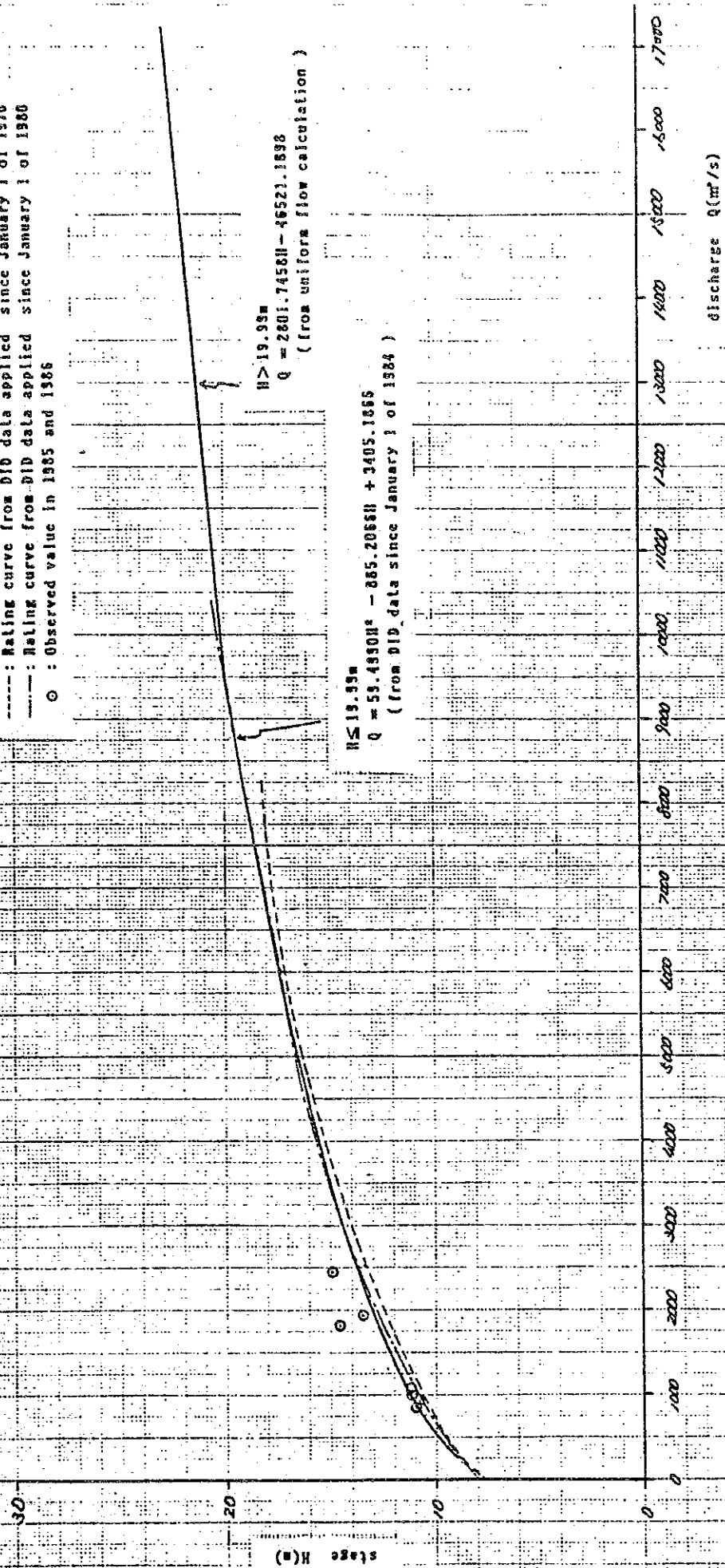


FIG. 5-17 RATING CURVE AT GUILLEMARD BRIDGE

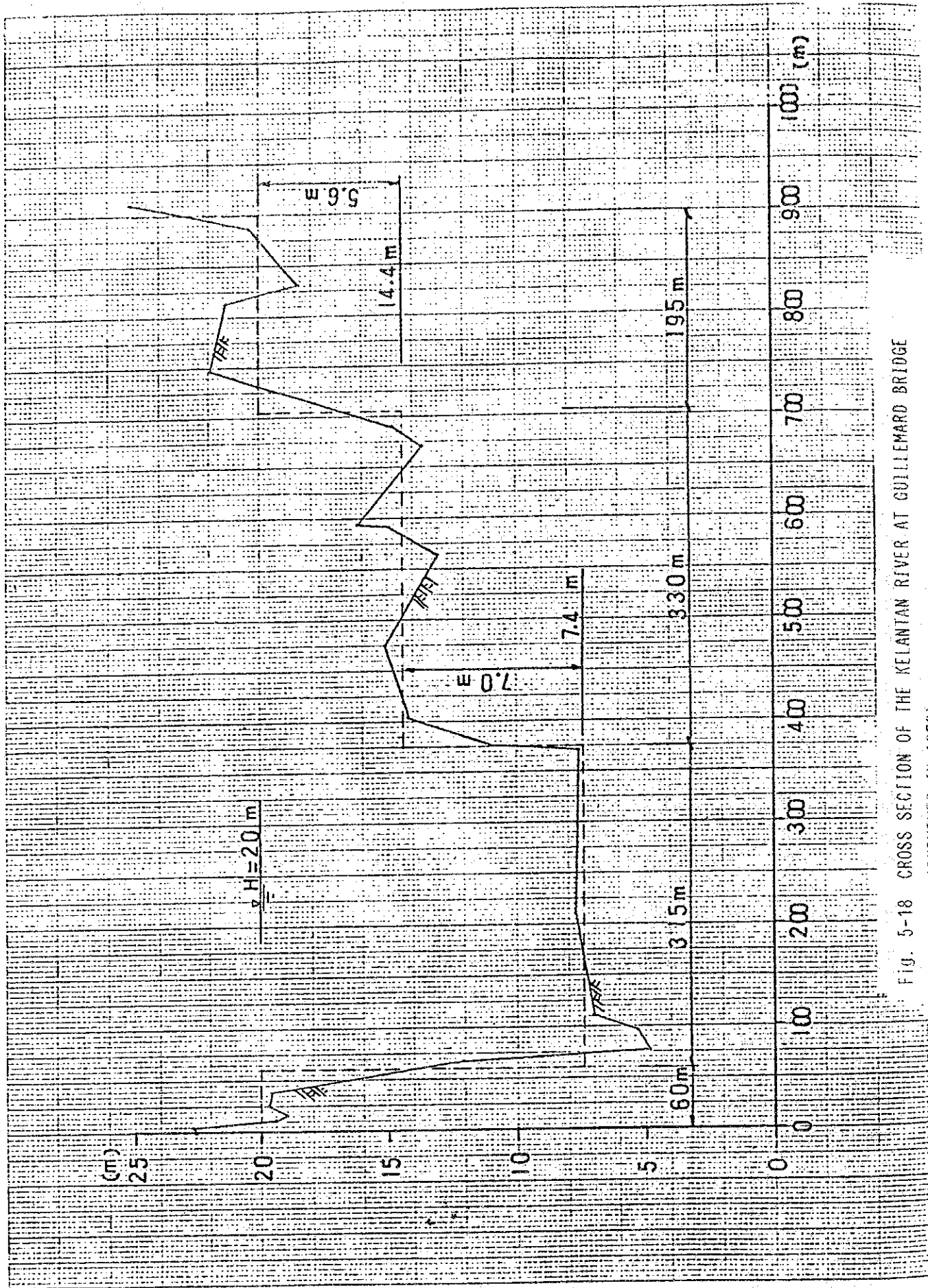


Fig. 5-18 CROSS SECTION OF THE KELANTAN RIVER AT GUILLEMARD BRIDGE

(SURVEYED IN 1976)

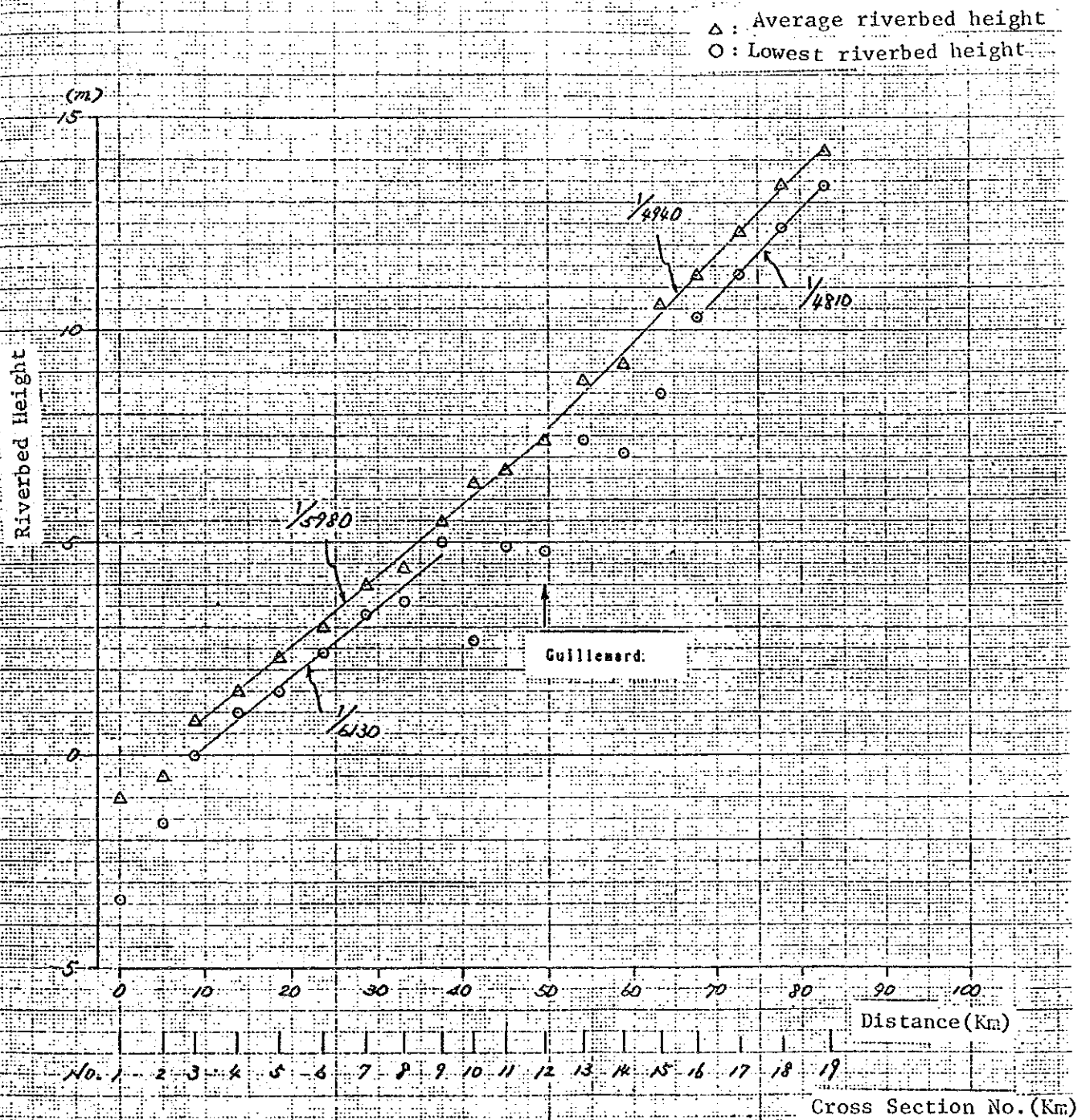


Fig. 5-19 Kelantan Riverbed Profile (surveyed in 1976)

Fig. 5-20 LOCATION OF CROSS SECTIONS ALONG THE KELANTAN RIVER WHERE DATA COLLECTED

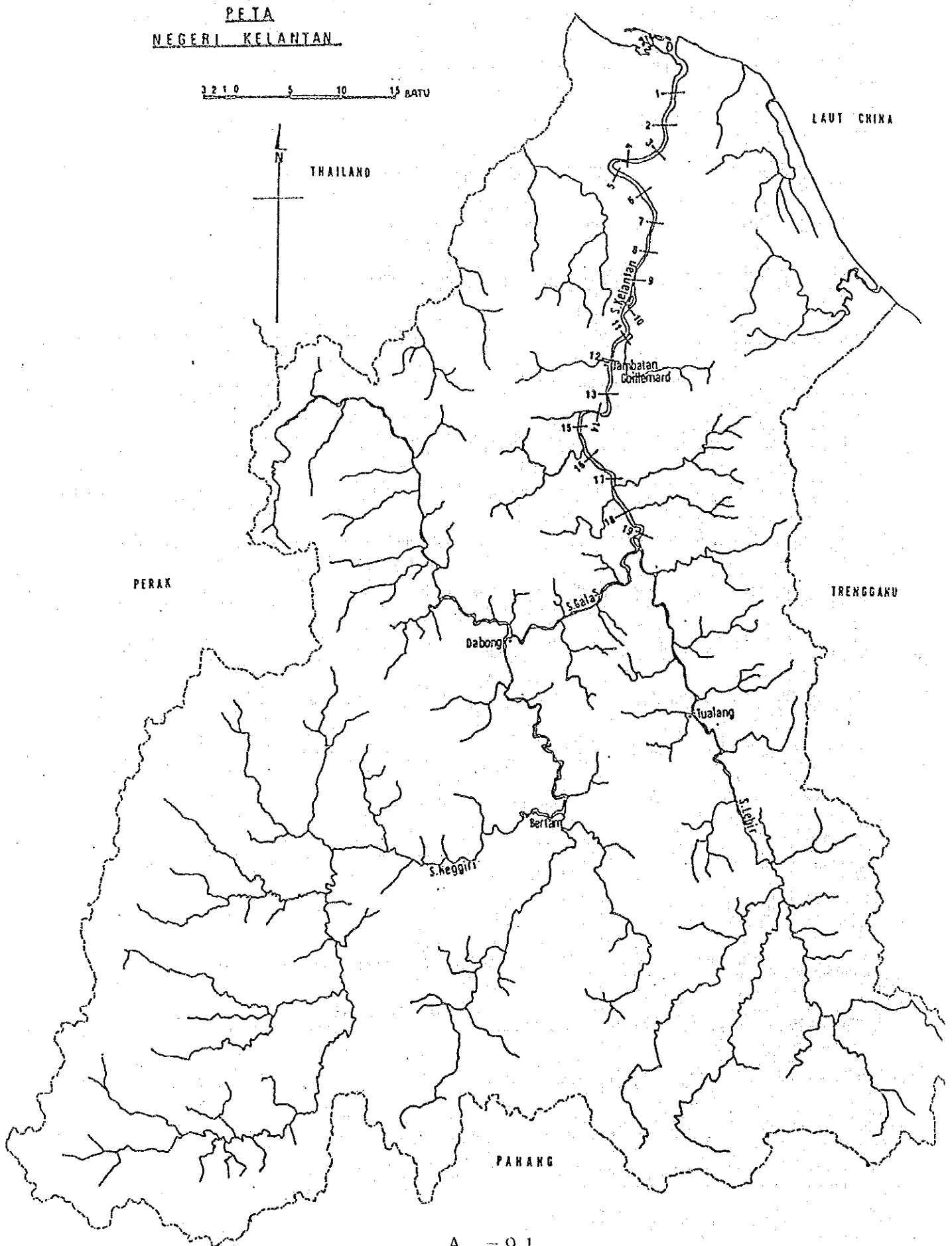
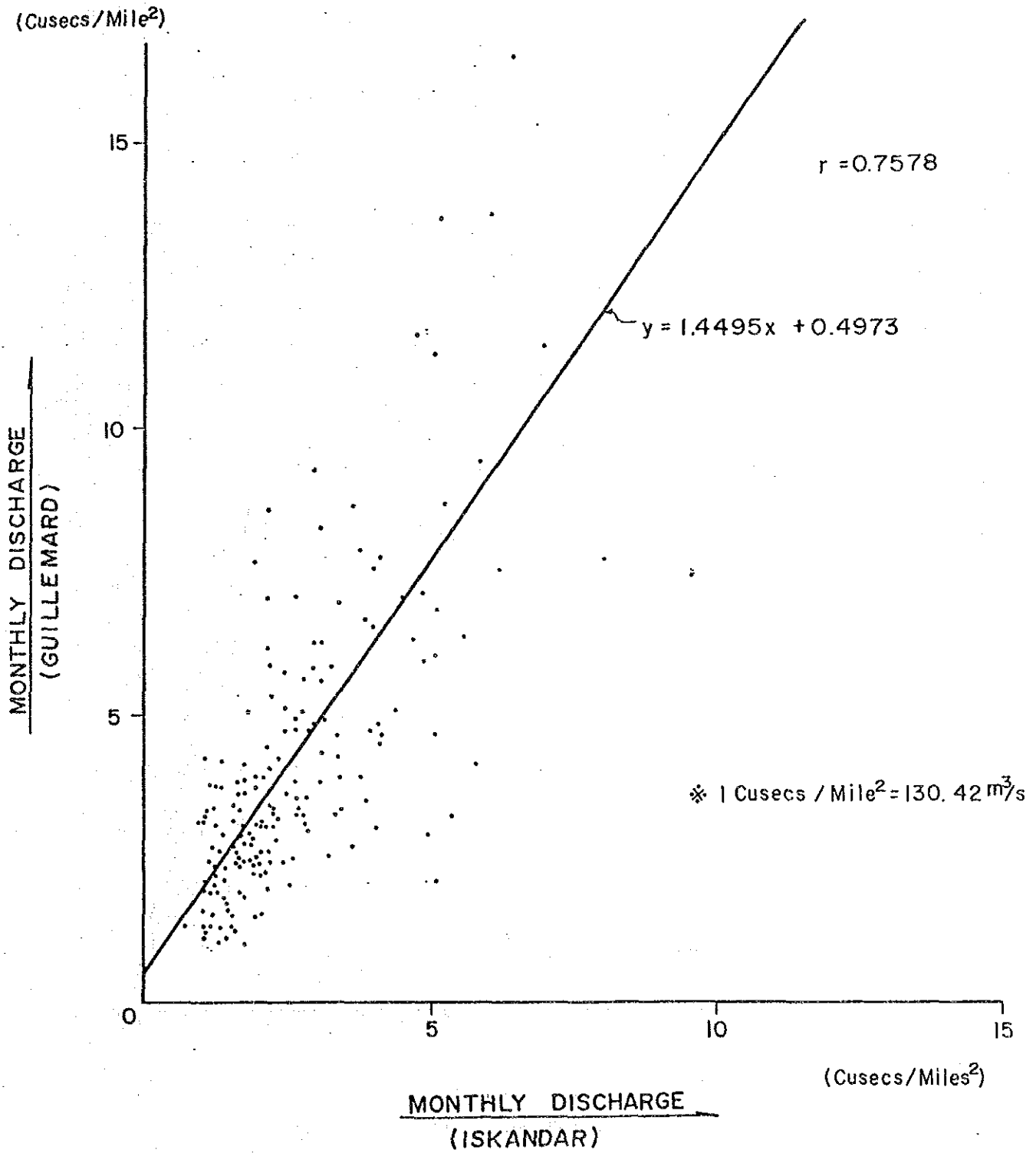


Fig. 5-21 RELATIONSHIP BETWEEN GUILLEMARD AND ISKANDAR
OF MONTHLY DISCHARGE (JAN ~ DEC)



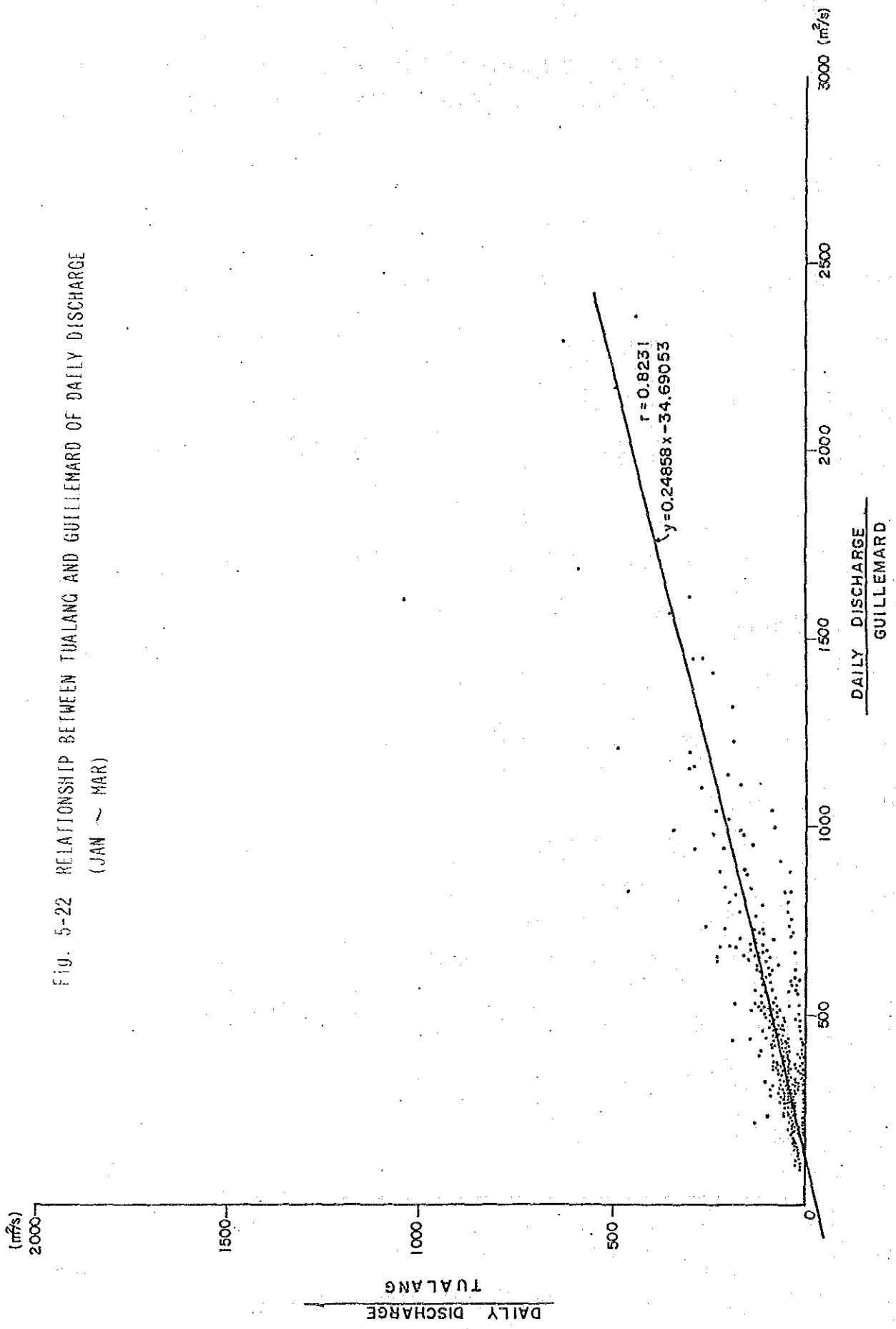


FIG. 5-22 RELATIONSHIP BETWEEN TUALANG AND GUILLEMARD OF DAILY DISCHARGE
(JAN ~ MAR)

FIG. 5-23 RELATIONSHIP BETWEEN TUALANG AND GUILLEMARD OF DAILY DISCHARGE
(APR ~ SEP)

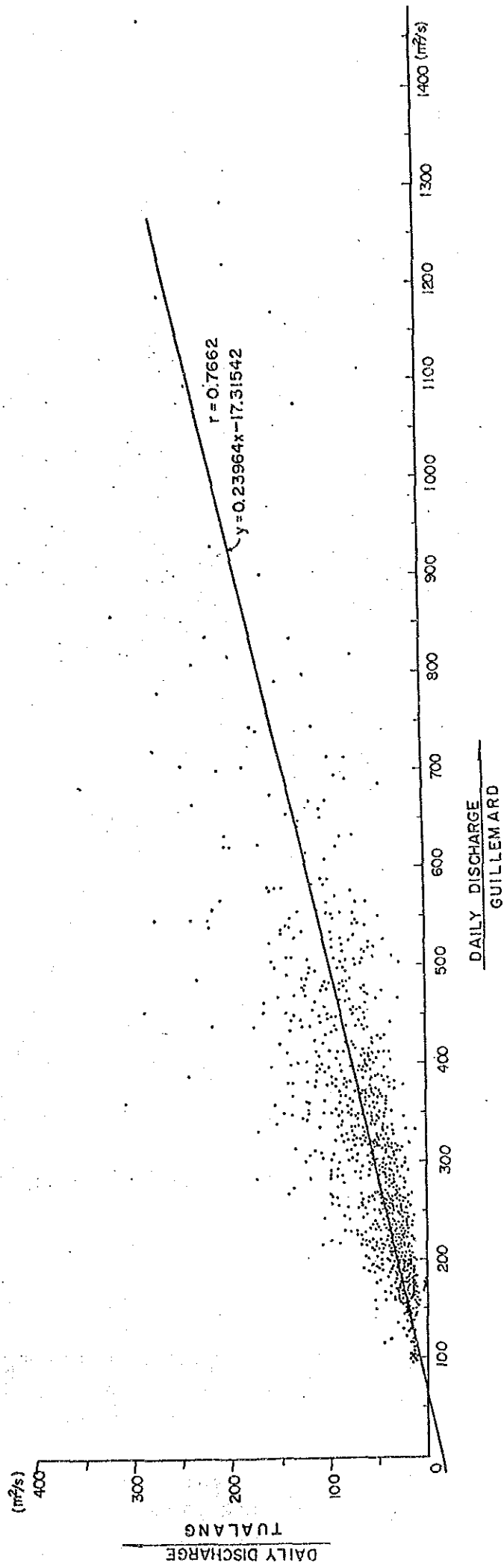


FIG. 5-24 RELATIONSHIP BETWEEN TUALANG AND GUILLEMARD OF DAILY DISCHARGE
(OCT ~ DEC)

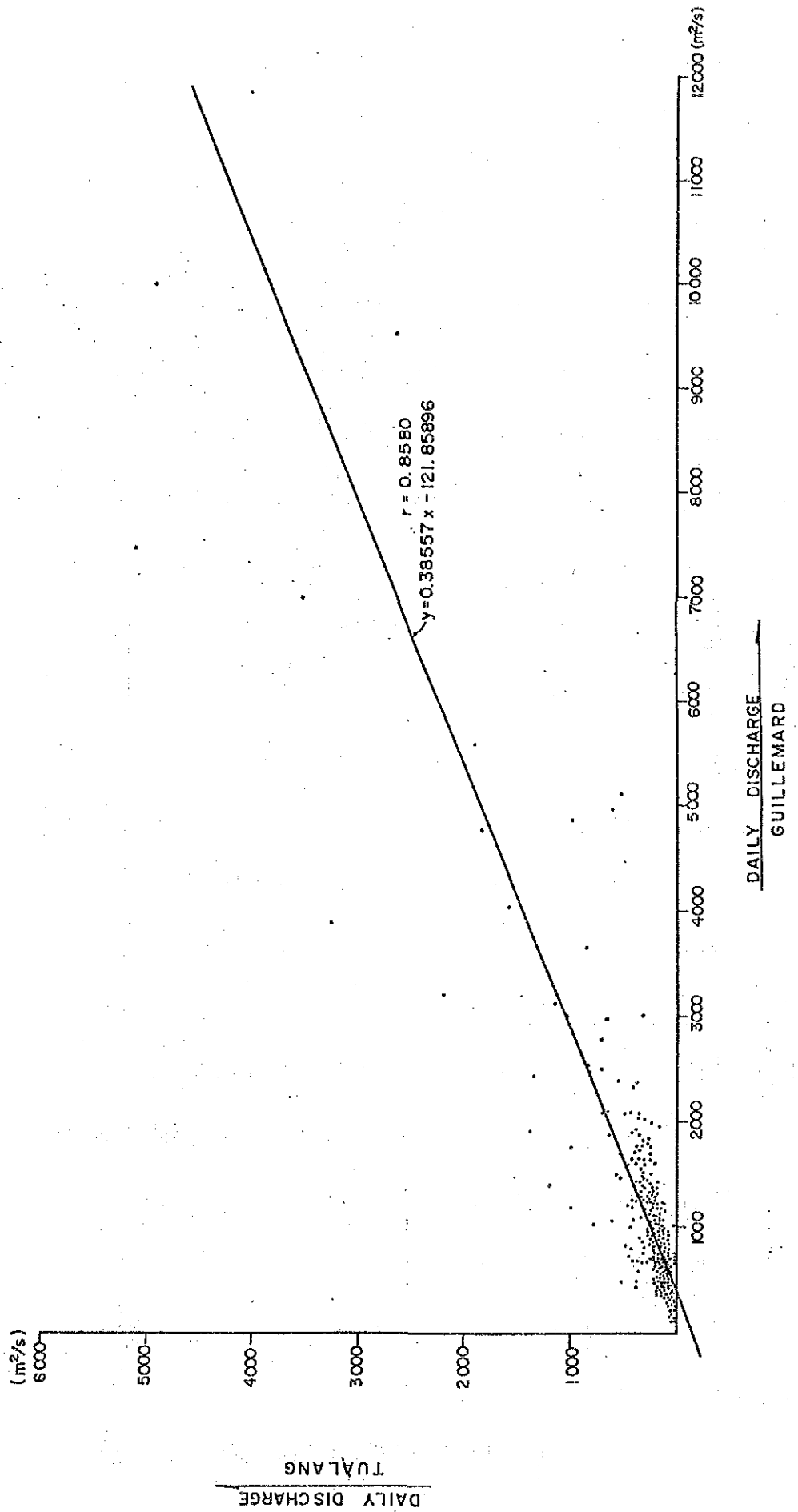


Fig. 5-25 10-DAY DISCHARGE AT GUILLENARD BRIDGE WITHOUT LEBIR DAM

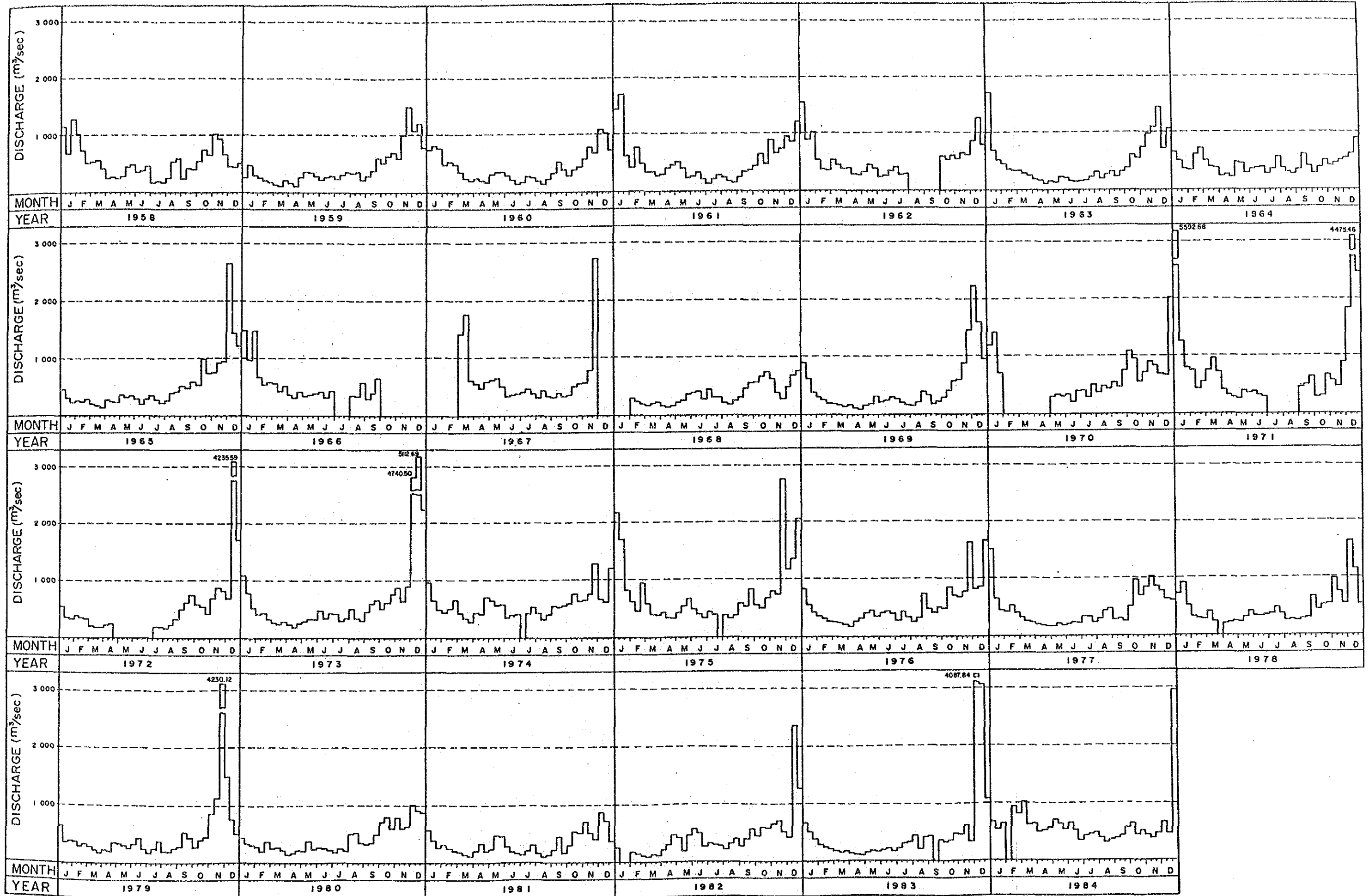


Fig. 5-26 10-DAY DISCHARGE AT GUILLEMARD BRIDGE AFTER COMPLETION OF LEBIR DAM WITH DAILY DISCHARGE OF 70 CMS

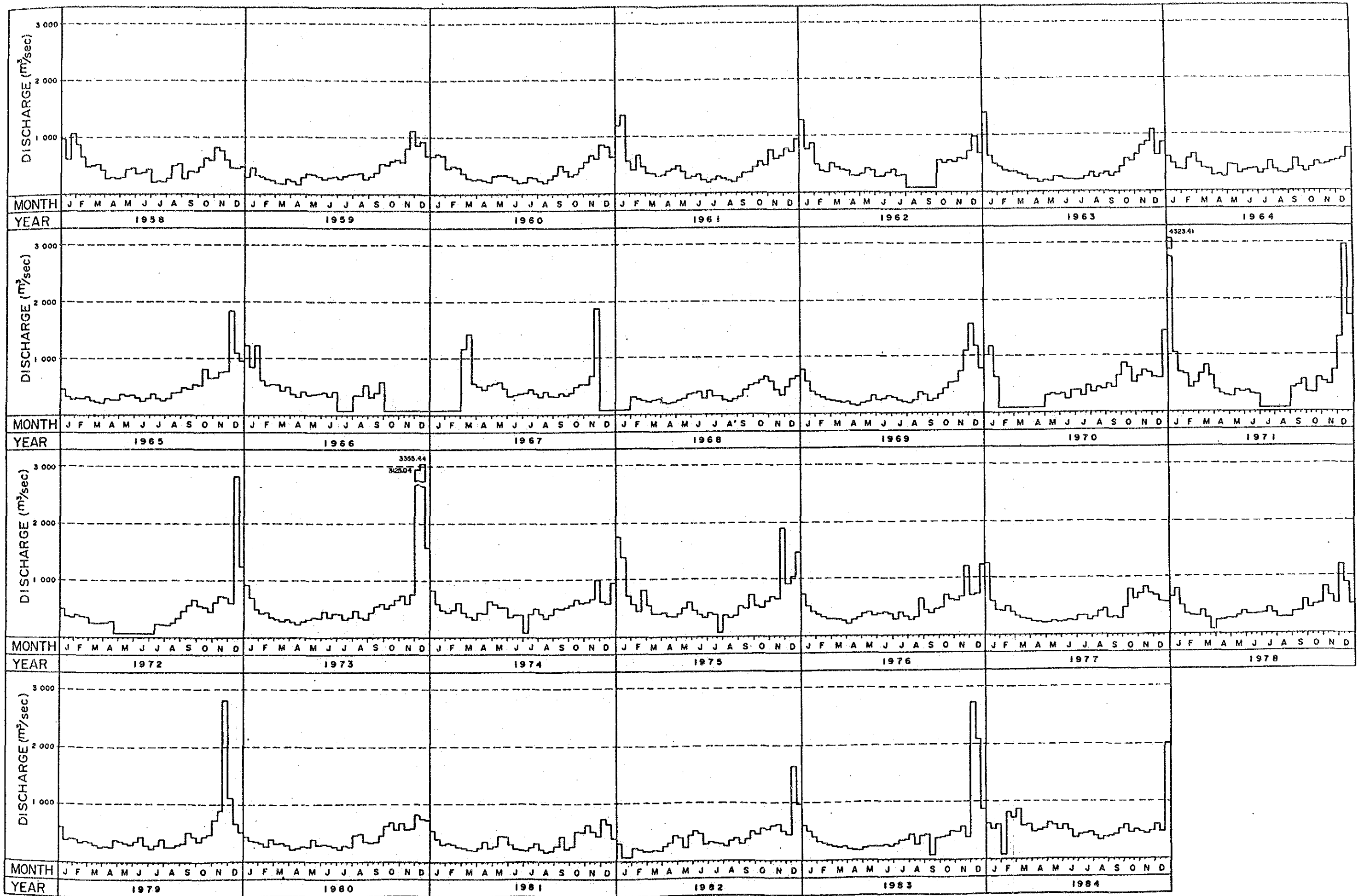


Fig. 5-27 10-DAY DISCHARGE AT GUILLEMERD BRIDGE AFTER COMPLETION OF LEBIR DAM WITH DAILY DISCHARGE OF 80 CMS

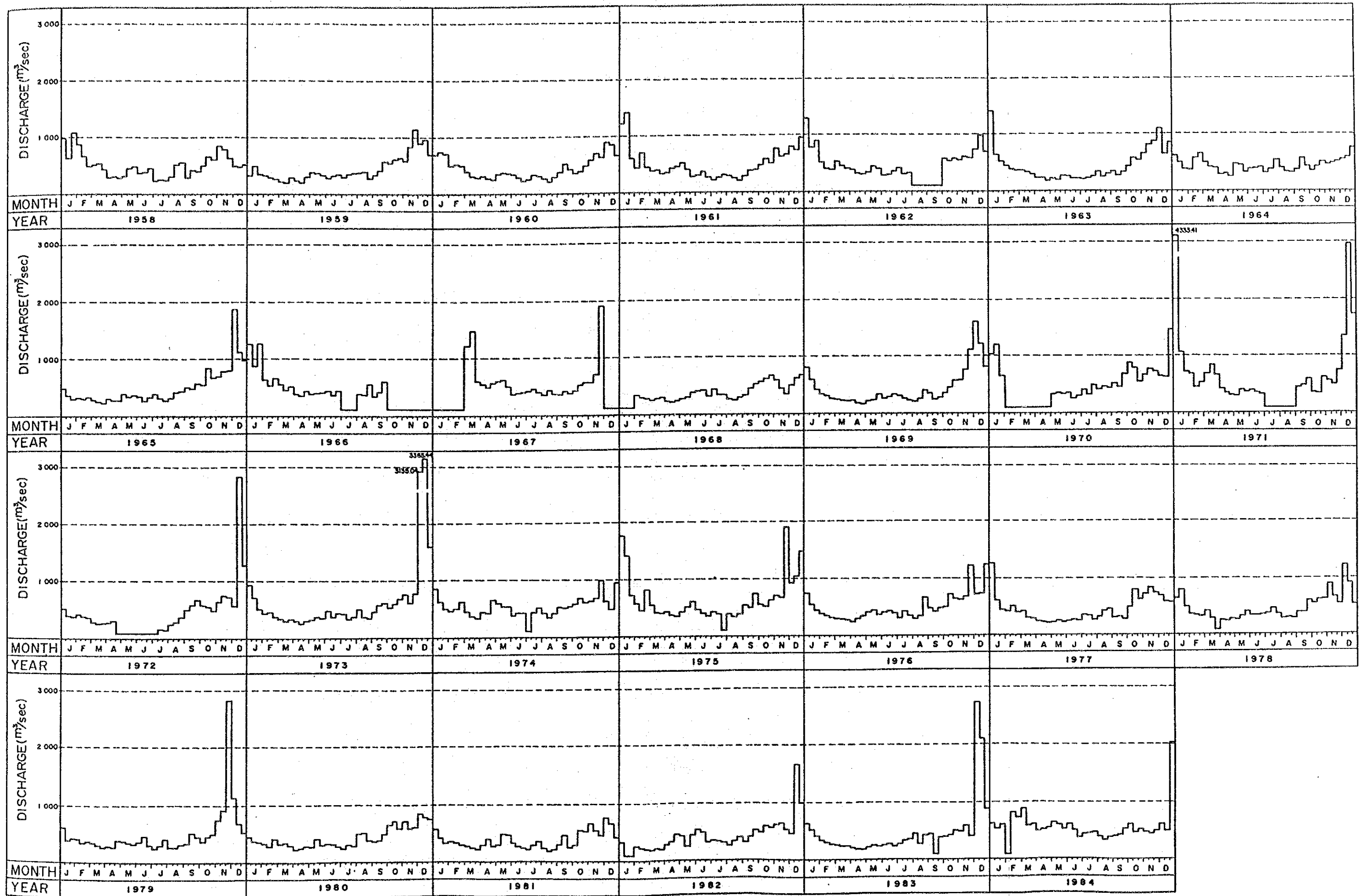
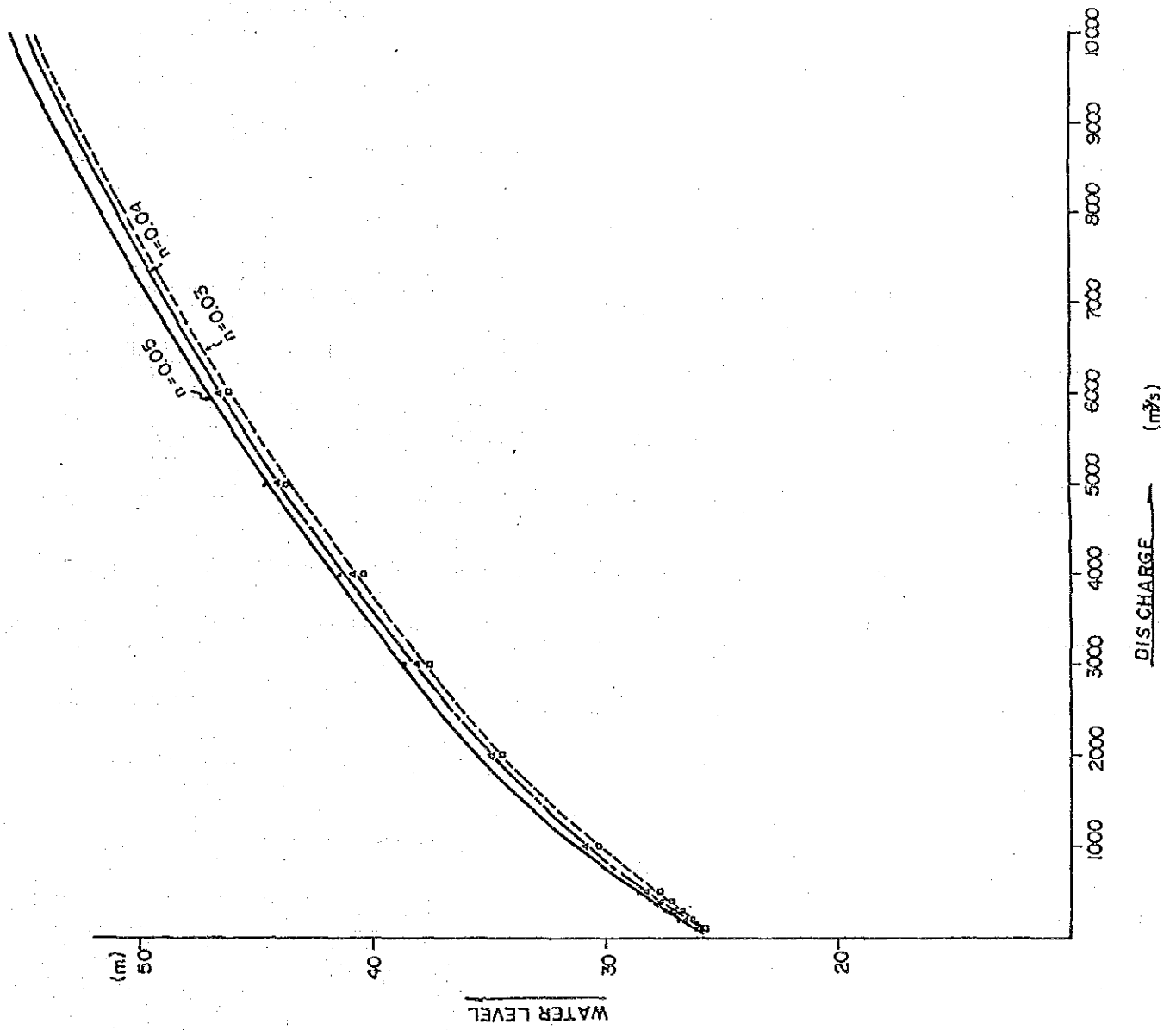


FIG. 5-28 WATER LEVEL AT DAM DOWNSTREAM (TAILRACE OUTLET) V.S. RIVER DISCHARGE



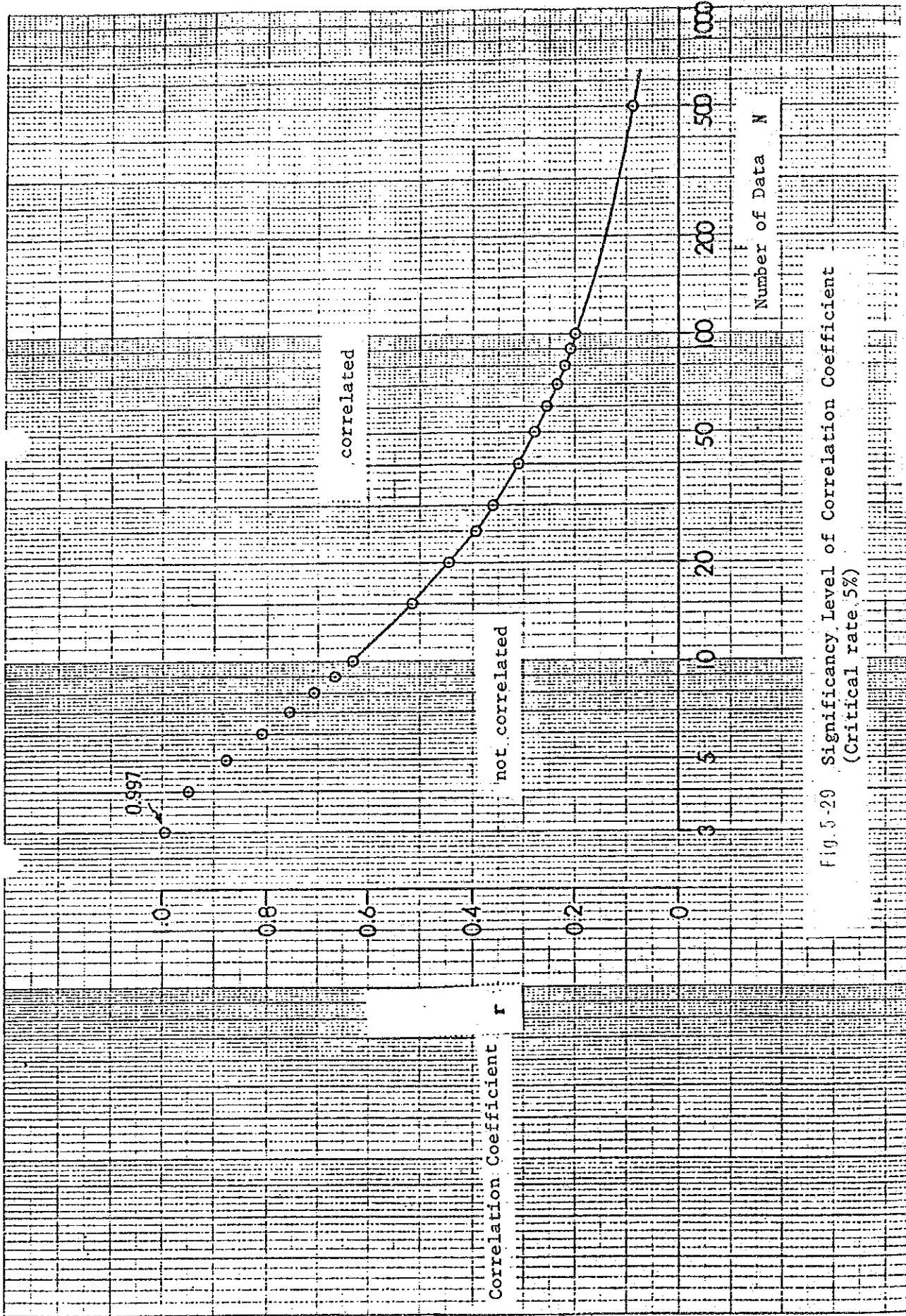


Fig. 5-29 Significance Level of Correlation Coefficient (Critical rate 5%)

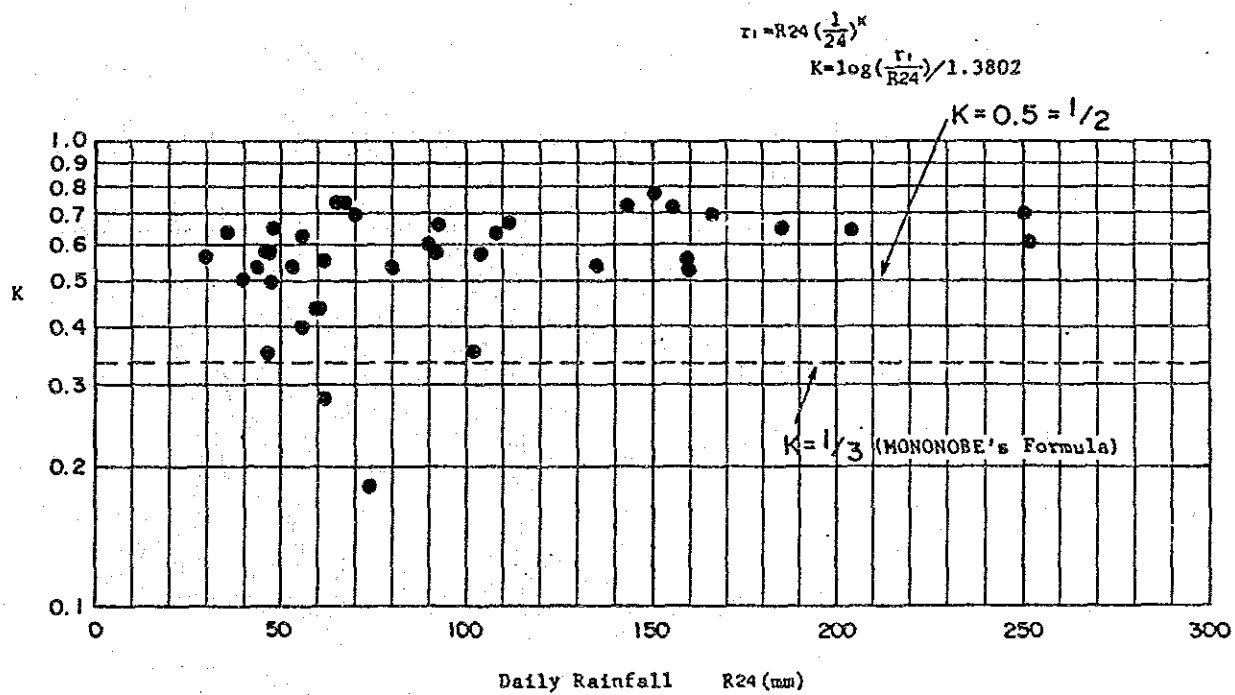


Fig. 5-30 RELATIONSHIP BETWEEN DAILY RAINFALL AND PEAK HOURLY RAINFALL

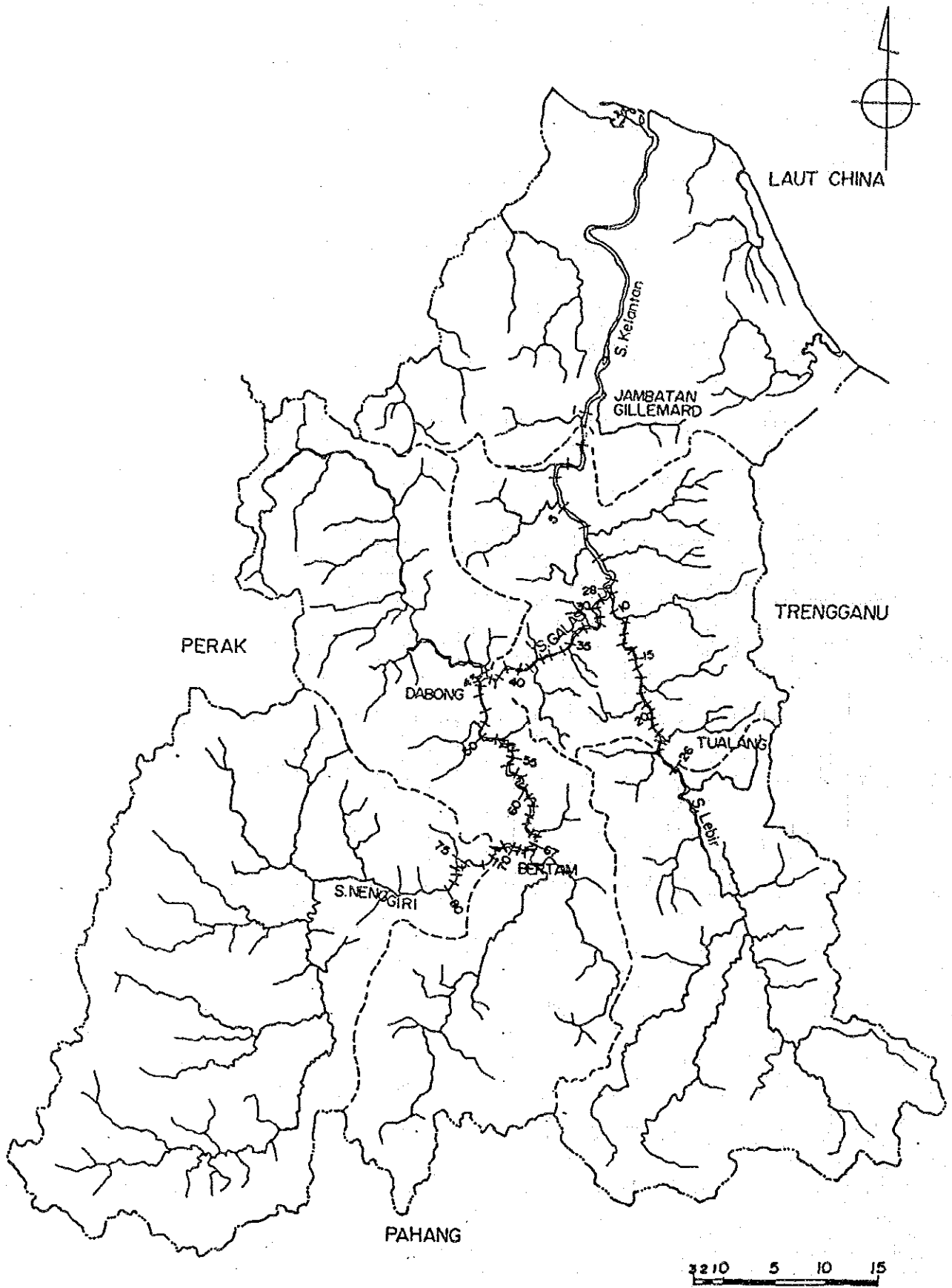


Fig. 5-31 LOCATION OF RIVER-CROSS SECTION ADOPTED

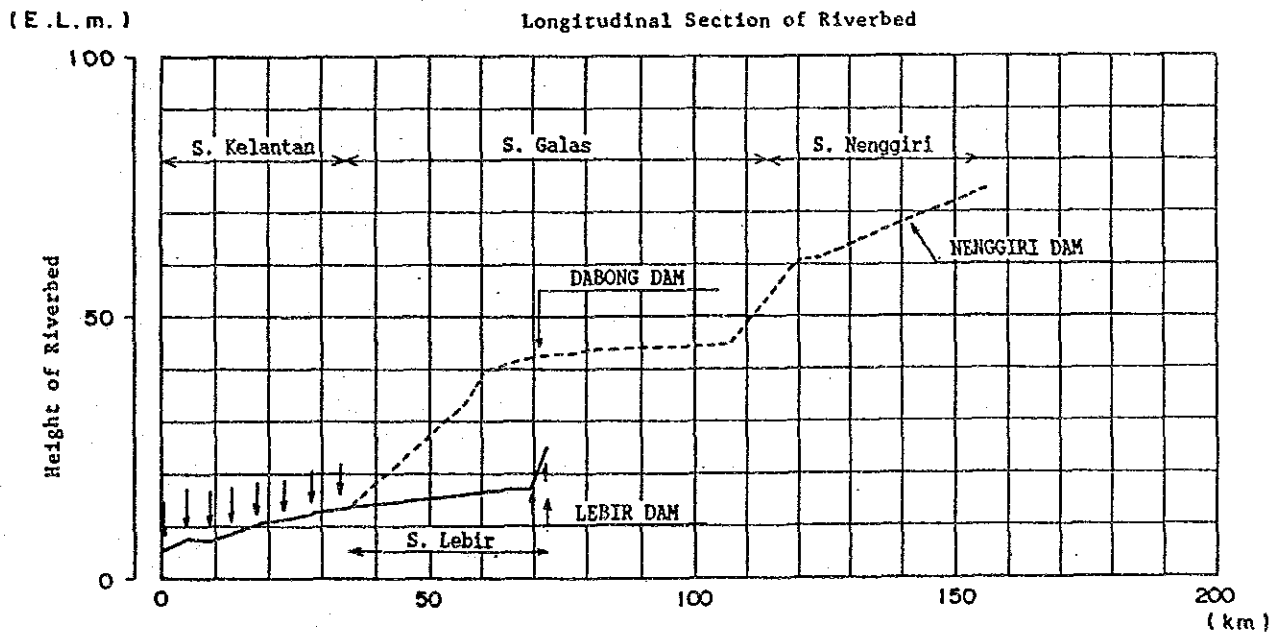
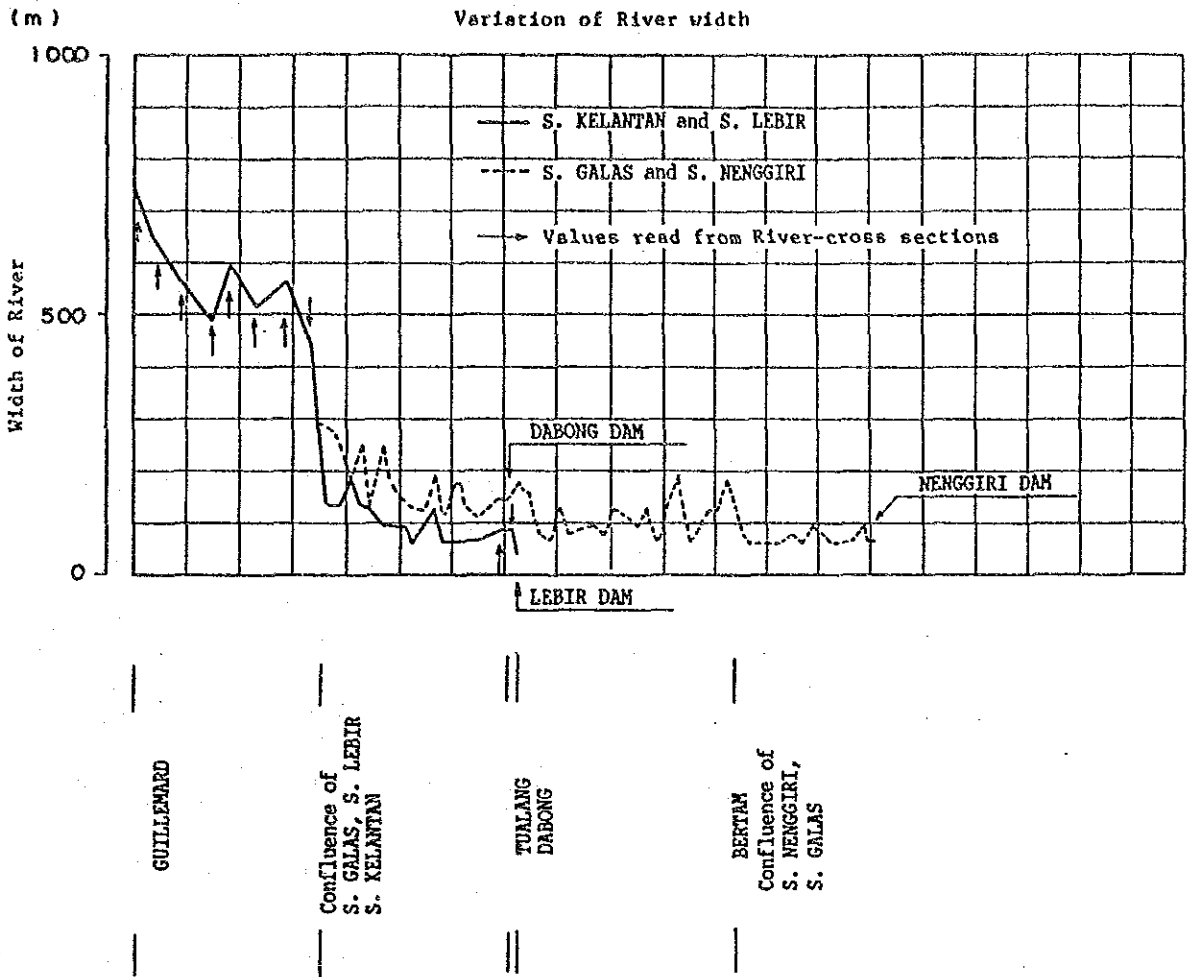


Fig. 5-32 LONGITUDINAL SECTION OF RIVERBED
VARIATION OF RIVER WIDTH

(Kelantan River. Lev Lebir River. Galas River. Nenggiri River)

Fig. 5-53 Simulation of Flood with 10000-Year Probable Rainfall

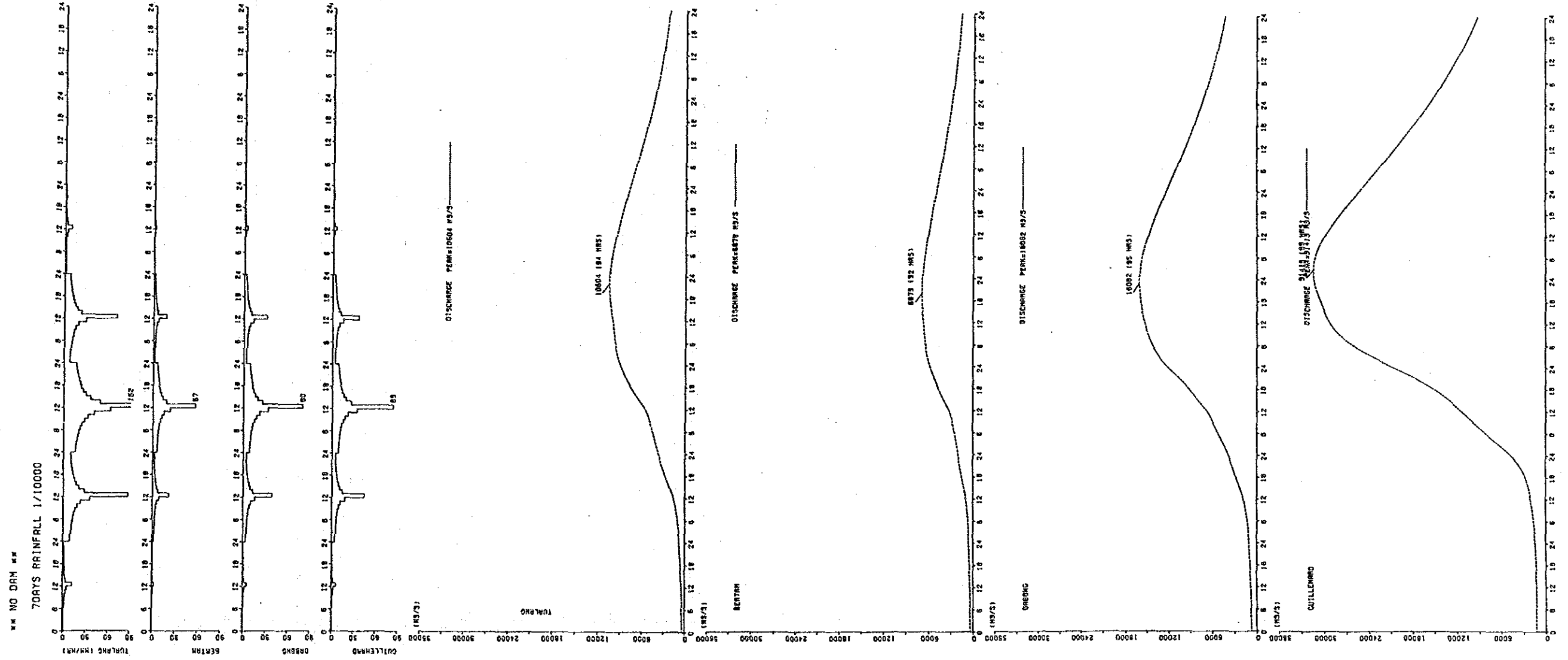


Fig. 5-34 Simulation of Flood with 1000-Year Probable Rainfall

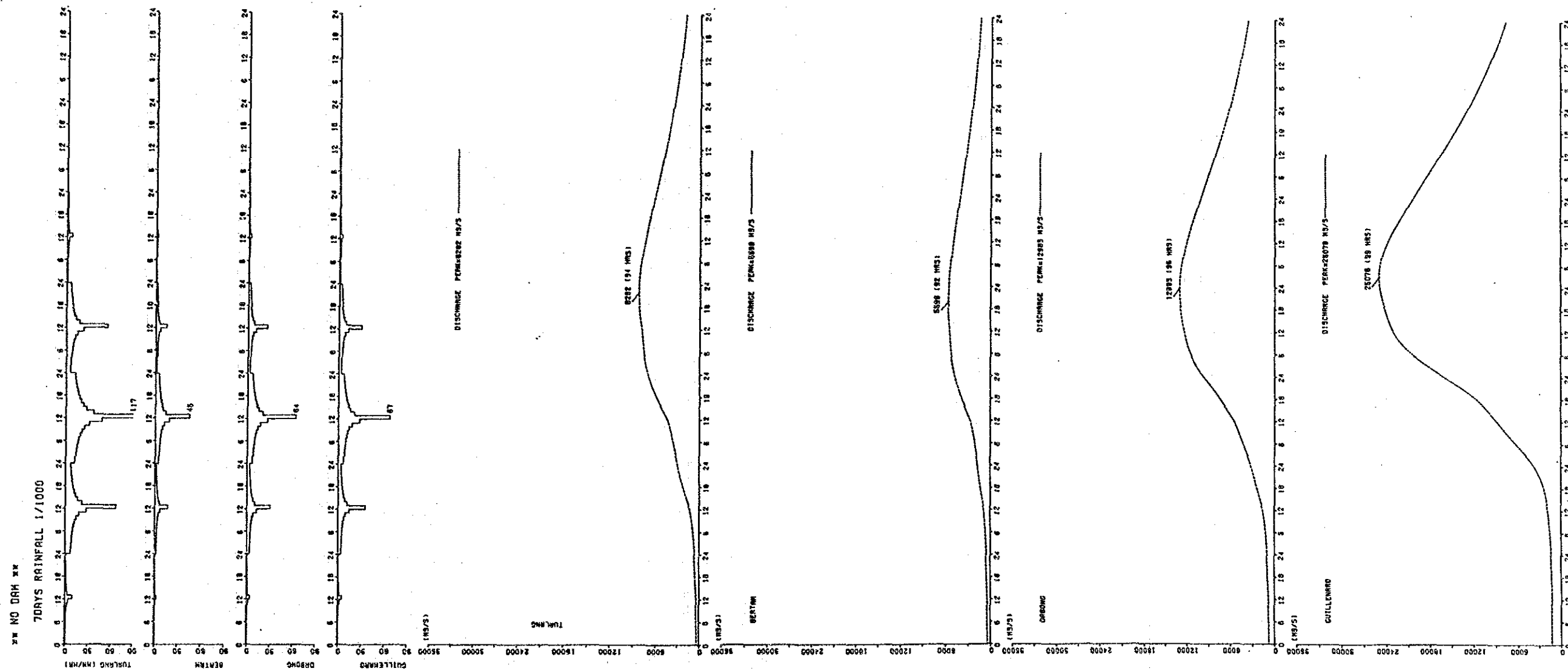
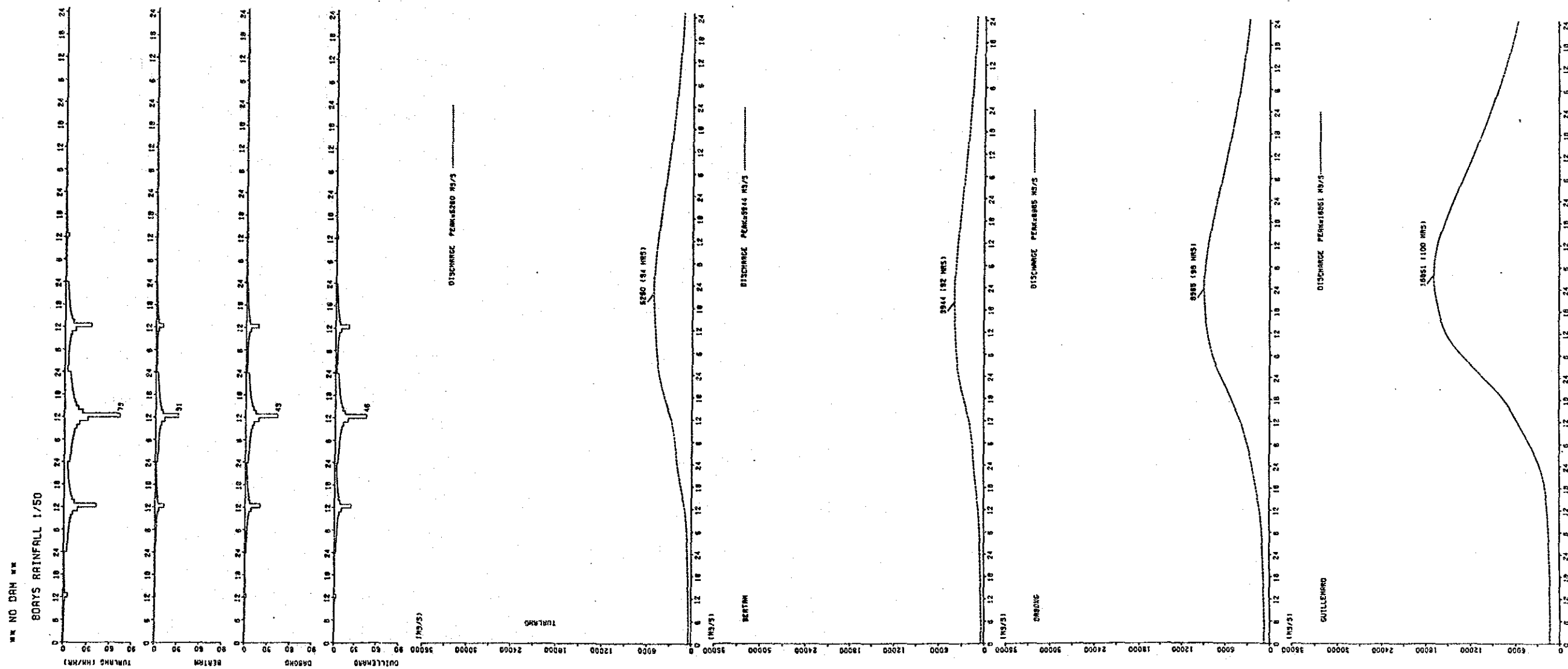


Fig. 5-35 Simulation of Flood with 50-Year Probable Rainfall



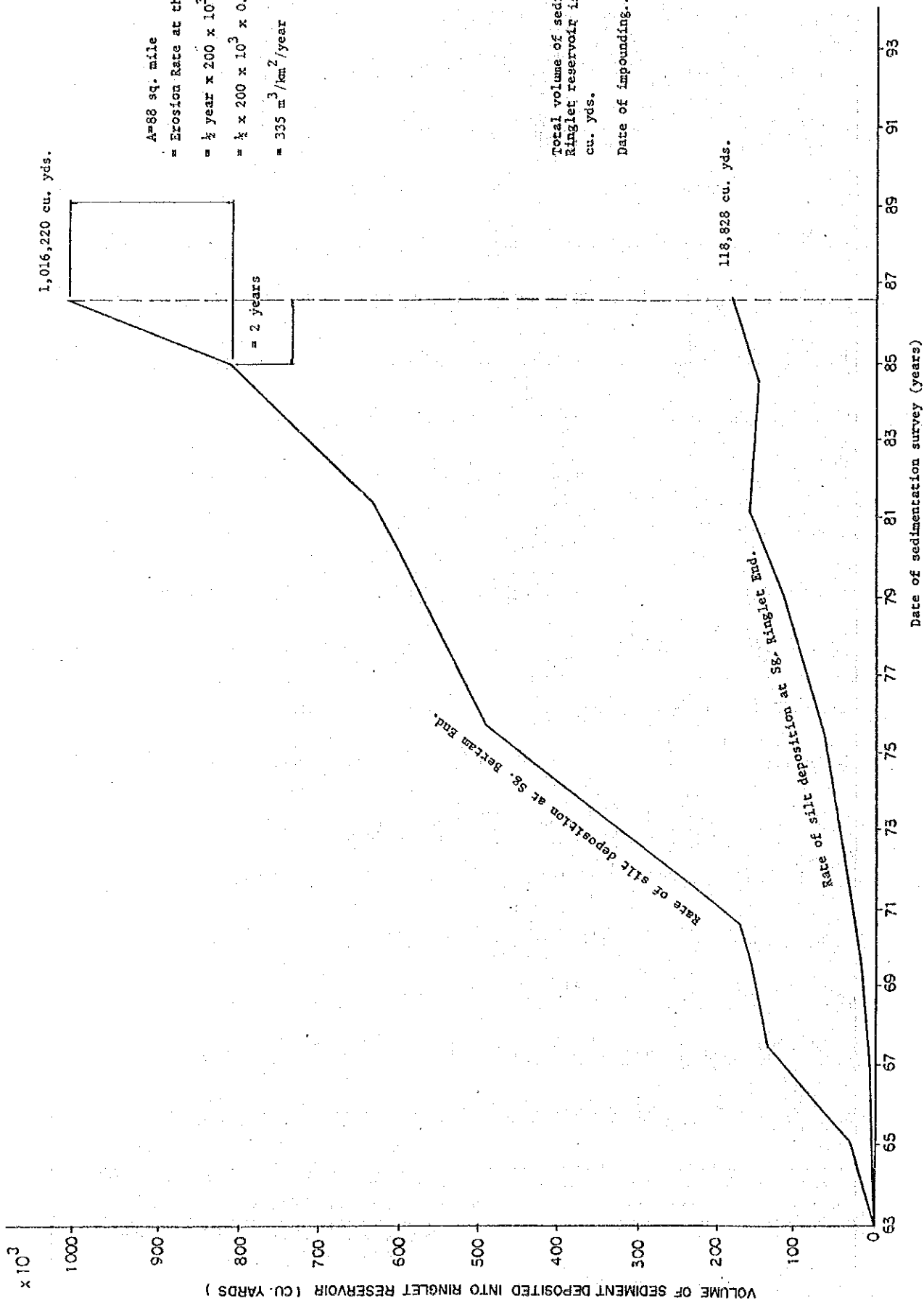


Fig. 5-37 SEDIMENT SURVEY AT RINGLET FALLS RESERVOIR

Fig. 8-1-1 PLANTING SCHEDULE OF PADDY IN KIMUBU, PASIR MASS

MS : Supply of water - SEE i. Sawing on nursery bed.
 TP : Transplanting STW : Stop of water supply HA : Harvest

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1st crop												
2nd crop												
3rd crop												

PLANTING SCHEDULE OF PADDY IN LEMAL

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1st crop												
2nd crop												
3rd crop												

TABLES

Table 5 - 1 CORRESPONDING MONTHLY AVERAGE DISCHARGES AT GUILLEMARD BRIDGE AND TUALANG GAUGING STATION

	APR		MAY		JUN		JULI		AUG		SEP		OCT		NOV		DEC		JAN		FEB		MAR	
	G·B	T	G·B	T	G·B	T	G·B	T	G·B	T	G·B	T	G·B	T	G·B	T	G·B	T	G·B	T	G·B	T	G·B	T
1976	248.0	27.22	396.0	87.36	408.0	84.74	329.0	64.35	441.0	93.07	457.0	101.14	675.0	121.05	1031.0	169.16	1139.0	241.93	851.0	158.04	446.0	53.10	261.0	37.87
1977	177.0	15.96	179.0	17.22	207.0	19.10	286.0	30.72	379.00	72.88	266.0	49.23	715.0	136.94	952.00	131.10	665.0	100.67	746.0	123.91	304.0	37.93	217.00	24.72
1978	206.00	21.00	320.0	49.57	334.0	55.06	402.0	74.27	241.0	45.60	472.17	76.14	484.59	124.51	759.06	168.55	1084.53	231.87	462.98	74.10	339.81	43.26	240.50	29.30
1979	272.19	36.33	305.47	41.48	348.33	44.45	287.37	30.95	229.20	26.96	431.38	74.25	383.19	75.79	2078.72	735.52	912.78	176.19	363.07	61.84	287.85	57.33	292.56	41.58
1980	245.22	36.02	288.48	56.35	280.71	42.27	212.44	32.74	468.57	98.60	585.53	121.42	928.2	204.94	1012.51	228.20	862.24	216.68	410.84	89.58	263.04	54.12	157.41	127.63
1981	254.66	49.96	402.28	84.61	213.58	41.78	226.51	47.69	130.15	20.09	285.75	46.39	446.23	122.45	547.23	80.16	646.51	132.60	268.56	30.62	134.87	17.64	114.26	15.94
r	0.8006		0.9534		0.8606		0.7497		0.9821		0.9442		0.8905		0.9708		0.9176		0.96644		0.677		0.9032	
a	2.3038		2.9252		3.1787		2.7676		3.9355		3.8975		4.3629		2.1291		3.2945		4.8771		4.6473		6.5246	
b	162.2383		151.107		146.342		161.0645		80.5257		110.2972		34.0651		526.6534		281.0556		79.6873		91.9293		21.2689	

$Y = ax + b$

$Y = ax + b$ (Y: TUALANG, X: GUILLEMARD)

	r	a	b
JAN ~ MAR	0.9588	4.9521	73.0062
APR ~ SEP	0.9369	0.2492	-24.3265
OCT ~ DEC	0.9308	3.7283	195.0837
JAN ~ DEC	0.9399	0.2829	-41.0378

Table 5-4 ANNUAL MAX. DISCHARGE RECORDED AT GUILLENHARD BRIDGE

No.	Year	Annual max discharge	remark	No.	Year	Annual max discharge	remark
		m ³ /sec				m ³ /sec	
1	1940	2030	}	24	1964	1610	} a
2	1942	11480		25	1965	6170	
3	1943	4630		26	1966	16000	
4	1944	5230		27		18000	d
5	1945	12850		28	1967	8280	} a
6	1946	3970		29	1968	1700	
7	1947	13580		30	1969	6650	
8	1948	3420		31	1970	8800	
9	1949	7050		32	1971	5550	
10	1950	8090		33	1972	10260	
11	1951	2600		34	1973	11130	
12	1952	1970		35	1974	4490	} b
13	1953	4060		36	1975	5247	
14	1954	4550		37	1976	2610	
15	1955	2310		38	1977	2525	
16	1956	3580		39	1978	3291	
17	1957	6050		40	1979	10400	
18	1958	1500		41	1981	2028	} c
19	1959	3440		42	1982	7172	
20	1960	3610		43	1983	12007	
21	1961	2700		44	1984	7744	b
22	1962	3410		45	1985	1722	} c
23	1963	2790			1986	6901	

a : ENEX REPORT : Inter Report on River Hydro Copy Aug. 1976

b : DID Data

c : JICA RATING CURVE

d : This Study

Table 5-5 PEAK DISCHARGES OF THE FLOOD RECORDED
BOTH AT TUALANG AND GUILLEMARD BRIDGE

year	Guillemard	Tualang	Remark
	m ³ /sec	m ³ /sec	
1926	27,000	7,500	} a
1931	17,500	4,500	
1967	18,000	4,200	
	(16,000)		c
1973	11,180	3,700	} a
1974	3,910	470	
1975 (Jan.)	4,490	820	
1975 (Nov.)	5,450	2,440	}
1975 (Dec.)	4,890	850	
1976	2,610	951	} b
1977	2,525	661	
1978	3,291	1,190	
1979	10,400	5,322	
1981	2,028	536	
1982	7,172	3,518*	

* : Daily discharge

a : ENEX REPORT Interim Report River

Hydro Copy Aug. 1976

b : DID Data

c : This Study

Table 5-6 Stage - Discharge Table (Tualang Site) Upper: Water Stage(mm) Lower: Discharge(ltr./sec)
 (applied since January 1, 1976)

SITE: 5222452

RATING APPLIES FROM : 760101

NUMBER OF DATUM PAIRS: 95

16000	21660	21715	21765	21816	21866	21913	21962	22003	22042	22087	22124
0	4000	4400	5320	6220	7241	8501	9521	11441	13482	14902	16742
22168	22206	22239	22270	22303	22345	22410	22442	22479	22540	22570	22601
18762	21063	23503	26284	28884	30804	36045	38606	40886	46607	49507	52081
22460	22592	22726	22755	22816	22873	22923	22964	22992	23050	23084	23111
58249	60829	63469	66490	72211	78312	84073	86853	89954	95955	98495	101271
23150	23179	23235	23257	23266	23348	23430	23462	23548	23582	23663	23721
103716	106916	112957	116578	119518	125259	134701	137361	146503	149103	154843	164541
23774	23837	23925	23957	24008	24065	24164	24207	24293	24324	24374	24431
171146	176567	185729	188369	195078	201171	210973	216474	223613	229396	235077	241151
24597	24684	24715	24866	24925	25091	25200	25271	25331	25402	25564	25741
260071	269062	275743	288201	297046	316770	329472	339933	345734	356296	372743	389381
25914	25987	26147	26401	26494	26672	26939	27163	27758	27863	27932	27981
418226	429647	447490	481415	495618	546045	556828	587473	686588	706251	722654	734511
25023	28127	28342	28402	28468	28616	28684	28785	28868	28923	28945	28959
747818	767641	816309	834532	851374	875061	911724	948350	980835	998618	1008059	

Table 5-7 Stage-Discharge Table (Bertam Site)
(applied since January 1, 1976)

Upper: Water Stage (mm)
Lower: Discharge (ltr./sec.)

RATING TABLE - STAGE(MM) VERSUS DISCHARGE(LITRES/SEC)

SITE: 5120401.

RATING APPLIES FROM 760101.

NUMBER OF DATUM PAIRS: 125

47701.	47769.	47836.	47909.	47979.	48051.	48121.	48263.	48333.	48408.	48483.	48551
0.	5901.	13803.	20305.	27657.	34358.	41510.	55614.	63065.	69167.	75418.	82820
48622.	46691.	48766.	48930.	48998.	48962.	49031.	49167.	49231.	49299.	49431.	49561
89922.	97274.	103475.	112278.	119879.	128382.	136133.	151487.	160139.	167991.	184445.	201199
49628.	49821.	49875.	49950.	50015.	50077.	50141.	50201.	50267.	50327.	50390.	50450
209301.	235008.	263210.	252112.	260514.	269766.	278418.	288071.	296323.	305875.	314777.	324530
50576.	50637.	50695.	50757.	50816.	50879.	50936.	50998.	51051.	51110.	51171.	51344
342534.	351836.	362039.	371141.	380894.	390296.	400399.	409501.	420703.	430606.	440008.	470616
51403.	51457.	51517.	51572.	51743.	51852.	51909.	51961.	52018.	52126.	52339.	52394
480689.	491821.	501323.	512176.	543283.	565089.	575441.	587094.	597297.	619502.	664963.	675516
52444.	52500.	52401.	52657.	52707.	52760.	52809.	53012.	53204.	53257.	53303.	53358
687569.	698371.	722127.	732780.	744733.	756086.	768539.	816000.	866163.	877365.	890319.	901371
53454.	53604.	53694.	53891.	53934.	53986.	54075.	54123.	54165.	54216.	54308.	54356
926377.	962386.	988893.	1037905.	1051408.	1063061.	1089668.	1102221.	1116324.	1128927.	1154033.	1166486
54397.	54491.	54763.	54859.	54945.	54990.	55029.	55076.	55165.	55214.	55254.	55344
1180690.	1206246.	1285266.	1310522.	1337729.	1350932.	1365695.	1378639.	1405295.	1417493.	1431952.	1438658
55386.	55482.	55567.	55796.	56020.	56115.	56278.	56412.	56708.	56957.	57038.	57124
1472762.	1497765.	1525375.	1590741.	1657307.	1682613.	1739877.	1779787.	1877011.	1961832.	2002492.	2017846
57172.	57332.	57416.	57490.	57893.	58119.	58161.	58192.	58378.	58600.	58675.	58756
2030549.	2088113.	2116070.	2146527.	2290613.	2380635.	2395038.	2411392.	2487261.	2578433.	2608441.	2636998
58905.	59476.	59662.	59743.	59775.	59775.	59775.	59775.	59775.	59775.	59775.	59775
2697673.	2921418.	2997236.	3025593.	3042197.	3042197.	3042197.	3042197.	3042197.	3042197.	3042197.	3042197

Table 5-8(1) Stage - Discharge Table (Dabong Site) Upper: Water Stage (mm)
 (applied since January 1, 1975) Lower: Discharge (ltr./sec.)

RAISING TABLE - STAGE (MM) VERSUS DISCHARGE (LITRES/SEC)											
SITE: 220643											
RAISING APPLIES FROM : 750101.											
NUMBER OF DATUM PAIRS: 145											
22102.	22238.	22379.	22526.	22668.	22793.	22921.	23055.	23179.	23308.	23434.	23551
0.	3003.	4705.	5706.	6807.	11312.	15717.	19020.	23825.	27930.	32534.	39141
23672.	23783.	23893.	24100.	24199.	24289.	24386.	24479.	24573.	24656.	24746.	24836
44747.	52355.	59963.	77983.	87593.	99105.	109816.	120427.	131339.	144353.	156065.	167277
24910.	24975.	25045.	25127.	25204.	25336.	25414.	25490.	25559.	25627.	25707.	25785
181992.	198310.	214026.	227240.	258273.	273589.	287504.	301519.	317436.	333052.	346967.	360481
25924.	26001.	26148.	26282.	26431.	26491.	26555.	26634.	26720.	26849.	26915.	26996
391514.	506430.	435761.	467995.	497026.	514244.	530862.	546376.	557289.	590324.	606141.	619555
27124.	27329.	27457.	27604.	27736.	27876.	27944.	28000.	28174.	28458.	28534.	28771
652390.	700441.	733276.	762807.	795542.	826374.	852291.	860510.	913767.	974831.	989246.	1039220
28905.	29025.	29158.	29269.	29380.	29507.	29681.	29749.	29967.	30145.	30245.	30385
1091755.	1126392.	1158626.	1195266.	1231803.	1265238.	1318595.	1334512.	1407789.	1480645.	1599086.	1530119
30436.	30607.	30770.	31193.	31309.	31434.	31593.	31788.	31856.	31954.	32252.	32509
1549139.	1603096.	1638454.	1808015.	1843951.	1895805.	1931965.	2030047.	2046465.	2085006.	2200928.	2296730
32597.	32714.	32830.	32868.	32957.	33157.	33246.	33347.	33530.	33889.	34078.	34274
2337673.	2373010.	2408348.	2429971.	2470914.	2547695.	2588638.	2627079.	2707564.	2841105.	2920189.	2997971
34459.	34613.	34769.	34928.	35055.	35158.	35284.	35600.	35686.	35742.	35820.	35920
3078657.	3155116.	3220707.	3276466.	3339032.	3376872.	3439739.	3501088.	3622432.	3660551.	3683296.	3751168
36035.	36268.	36375.	36487.	36640.	36792.	36991.	37157.	37260.	37367.	37472.	37695
3787206.	3886912.	3928051.	3989626.	4046581.	4133072.	4211155.	4294743.	4332683.	4399053.	4436593.	4538701
37907.	38034.	38377.	38570.	38897.	38997.	39019.	39182.	39328.	39238.	39685.	40047
4642411.	4704677.	4870252.	4908893.	4954641.	5118915.	5180981.	5265370.	5324332.	5334354.	5593017.	5677806
40229.	40351.	40483.	40621.	40784.	40905.	41080.	41501.	41674.	42158.	42284.	42433
3758291.	3830389.	3911954.	4061449.	6086138.	6149405.	6231592.	6469243.	6551430.	6834430.	6897296.	7012718
42543.	7078788.										

Table 5-8(2) Stage - Discharge Table (Dabong Site)
 (applied since November 29, 1977)

Upper: Water Stage (mm)
 Lower: Discharge (ltr./sec.)

RATING TABLE - STAGE(MM) VERSUS DISCHARGE(LITRES/SEC)

SITE: 5320443.

RATING APPLIES FROM : 771129.

NUMBER OF DATUM PAIRS: 115

22081.	22187.	22297.	22401.	22507.	22611.	22712.	22811.	22908.	23002.	23096.	23189.
0.	1252.	3454.	4555.	6859.	8961.	11164.	13818.	16521.	19825.	22379.	26033.
23279.	23370.	23453.	23533.	23616.	23697.	23770.	23853.	23931.	23999.	24068.	24141.
20738.	33142.	37698.	42456.	48860.	51616.	57223.	61779.	68835.	72943.	79151.	84903.
24208.	24274.	24344.	24414.	24476.	24603.	24666.	24770.	24826.	24931.	24972.	25021.
91367.	92875.	103233.	109843.	116949.	130567.	137676.	153947.	161456.	177227.	187239.	195309.
25664.	25157.	25236.	25317.	25367.	25547.	25642.	25710.	25836.	26003.	26102.	26184.
204902.	222885.	242360.	261786.	270045.	306441.	323964.	344590.	381437.	410225.	427846.	446821.
26245.	26291.	26431.	26544.	26639.	26719.	26822.	26939.	27047.	27135.	27206.	27462.
662448.	477360.	503894.	533632.	551104.	570429.	586950.	616182.	644273.	664892.	701639.	741597.
27541.	27663.	28003.	28242.	28354.	28490.	28728.	29054.	29212.	29341.	29463.	29583.
759719.	789759.	864705.	923179.	953258.	980352.	1038627.	1129443.	1165443.	1210797.	1239533.	1232632.
204875.	30066.	30392.	30534.	30640.	30716.	30916.	30972.	31335.	31969.	31948.	32033.
186645.	1428776.	1522096.	1526263.	1607053.	1641597.	1672667.	1726706.	1356672.	1980092.	2101925.	2155321.
32318.	32555.	32595.	32613.	32696.	32770.	33002.	33135.	33247.	33323.	33336.	33337.
2274505.	2396754.	2414785.	2441769.	2489690.	2538643.	2684860.	2799075.	2895440.	2940507.	2993223.	3007492.
33338.	33424.	33444.	33451.	33495.	33501.	33516.	33558.	33631.	33641.	33645.	33649.
3659352.	3112776.	3124862.	3152677.	3190826.	3204744.	3245396.	3292063.	3361644.	3374861.	3402947.	3415913.
33669.	33671.	33695.	33702.	33718.	33735.	33801.	33801.	33801.	33801.	33801.	33801.
1629030.	3443298.	3496016.	3509483.	3523901.	3591638.	3627283.	3627283.	3627283.	3627283.	3627283.	3627283.

Table 5-9(1) Stage - Discharge Table (Guillemard Bridge)
 (applied since July 1, 1970)

Upper: Water Stage (mm)
 Lower: Discharge (ltr./sec.)

RATING TABLE - STAGE(MM) VERSUS DISCHARGE(LITRES/SEC)

SITE: 5721442.

RATING APPLIES FROM : 700701.

NUMBER OF DATUM PAIRS: 126

7652.	7750.	7845.	7942.	8033.	8130.	8225.	8321.	8402.	8485.	8579
U.	13632.	33528.	53003.	73288.	94762.	115241.	134515.	156150.	179850.	247165
8853.	8997.	9082.	9155.	9223.	9376.	9457.	9526.	9584.	9803.	9862
275253.	325646.	349738.	377645.	406756.	460983.	485457.	515372.	548699.	631213.	663940
9922.	9993.	10079.	10141.	10200.	10262.	10336.	10409.	10597.	10730.	10849
692862.	724371.	756687.	786208.	818933.	851457.	879565.	908074.	1002836.	1030342.	1062665.
10985.	11169.	11258.	11412.	11482.	11546.	11594.	11653.	11783.	11890.	12029.
1188567.	1285317.	1313625.	1412805.	1442117.	1473638.	1509776.	1542501.	1603555.	1670591.	1730018.
12330.	12435.	12493.	12587.	12709.	12867.	12932.	13029.	13148.	13314.	13374.
1893851.	1960322.	1999851.	2074536.	2137979.	2242981.	2273698.	2346176.	2411525.	2514018.	2546944.
13530.	13687.	13800.	13859.	13914.	13970.	14013.	14157.	14242.	14339.	14481
2652748.	2758152.	2826413.	2877408.	2910735.	2944866.	2983215.	3033234.	3170128.	3243207.	3282357.
14370.	14627.	14715.	14816.	14896.	14992.	15078.	15134.	15209.	15299.	15360.
3429922.	3463450.	3539340.	3612420.	3690318.	3764401.	3840394.	3874824.	3955331.	4011021.	4096873.
15336.	15576.	15602.	15667.	15694.	15762.	15807.	15878.	15974.	16045.	16093.
4249858.	4289009.	4352374.	4370119.	4406859.	4491583.	4530331.	4613249.	4685726.	4767238.	4804581.
16211.	16280.	16337.	16385.	16439.	16519.	16688.	16952.	16994.	17174.	17312.
4944038.	5007959.	5087664.	5131029.	5211939.	5292671.	5273496.	5807618.	5845965.	6104353.	6323391.
17387.	17417.	17537.	17643.	17683.	17706.	17720.	17811.	17915.	17940.	17970.
6457303.	6500669.	6725529.	6900012.	6997771.	7062341.	7090727.	7272823.	7504309.	7548679.	7665449.
18013.	18090.	18133.	18161.	18185.	18199.	18199.	18199.	18199.	18199.	18199.
7756798.	7925513.	8069270.	8166241.	8211213.	8260000.	8260000.	8260000.	8260000.	8260000.	8260000.

Table 5-9(2) Stage - Discharge Table (Guillemard Bridge)
 (applied since January 1, 1980)

Upper: Water Stage (mm)
 Lower: Discharge (litr./sec.)

RATING TABLE - STAGE (MM) VERSUS DISCHARGE (LITRES/SEC)													
SITE: 5721442													
RATING APPLIES FROM : 800101													
NUMBER OF DAYTON PAIRS: 123													
6000	6128	6271	6418	6560	6699	6836	6971	7121	7258	7388	7514	7642	
0	4505	6006	6807	7808	10110	12713	15916	18719	22323	26928	31432		
7852	7935	8047	8144	8240	8337	8490	8546	8614	8690	8762	8812		
46748	57959	69071	79281	89992	100103	128331	146450	162366	176381	191696	211216		
8871	8934	8997	9062	9088	9125	9171	9224	9277	9338	9394	9437		
228834	245752	262369	282690	303010	324633	344753	363573	382091	399109	417127	437949		
9483	9564	9625	9728	9765	9840	9894	10004	10044	10141	10248	10430		
458169	500813	517831	556270	577792	621337	639856	676293	697815	736955	774894	855477		
10581	10718	10910	11038	11234	11318	11502	11663	11801	11962	12059	12194		
913236	973798	1052779	1115143	1193123	1235166	1315748	1400435	1460897	1545083	1584524	1674516		
12360	12473	12613	12802	12923	13148	13391	13555	13660	13783	13851	13851		
1758402	1823168	1883029	1941841	2055106	2185239	2267423	2311869	2396355	2462723	2525988	2570534		
13872	13904	14022	14127	14246	14355	14455	14535	14695	14957	14999	1508		
2595660	2618483	2711078	2777765	2870241	2936309	3033808	3104181	3353636	3399583	3449434	3519406		
15214	15365	15461	15535	15717	15830	15901	16028	16157	16225	16369	16564		
3610700	3753348	3852547	3894192	4066565	4158161	4260365	4352059	4443453	4545659	4692108	4943966		
16668	16691	16730	16821	16873	16924	17088	17170	17211	17346	17511	17626		
5039564	5084289	5143370	5241270	5289119	5395328	5652092	5752594	5831615	6008657	6208461	6331287		
17766	17825	18002	18095	18250	18337	18390	18500	18711	18921	18978	19250		
6510571	6640704	6837076	6935466	7137513	7236715	7340922	7465750	7772364	8050349	8097597	8450000		
19500	20000	20550											
8800000	9510000	10400000											

Table 5-9(3) Stage - Discharge Table (Guillemard Bridge)
 (applied since January 1, 1984)

Upper: Water Stage (mm)
 Lower: Discharge (ltr./sec.))

RAISING TABLE - STAGE(MM) VERSUS DISCHARGE(LITRES/SEC)											
SITE: 5721442.											
RATING APPLIES FROM : 840101.											
NUMBER OF DATUM PAIRS: 141											
7590.	7600.	7620.	7630.	7660.	7670.	7680.	7700.	7750.	7760.	7770.	7790
0.	191.	1788.	2612.	5175.	6064.	6966.	8820.	13736.	14769.	15815.	17958
7820.	7870.	7880.	7920.	7940.	7960.	8000.	8010.	8030.	8060.	8090.	8120
21293.	27172.	28397.	33452.	36077.	38765.	44335.	45769.	48632.	53172.	57898.	64210
8160.	8200.	8230.	8260.	8300.	8330.	8380.	8420.	8460.	8500.	8550.	8590
67182.	76036.	81345.	86797.	94292.	100083.	110054.	118320.	126842.	135621.	146956.	156513
8630.	8670.	8710.	8750.	8800.	8840.	8890.	8920.	8970.	9010.	9070.	9120
165927.	175797.	185924.	196308.	209648.	220610.	234672.	243303.	258008.	270360.	286620.	304550
9170.	9240.	9290.	9340.	9400.	9440.	9490.	9530.	9540.	9550.	9630.	9660
320839.	344344.	361618.	379291.	401028.	415841.	434717.	450107.	453997.	457990.	479807.	488196
9720.	9760.	9790.	9840.	9920.	9950.	10010.	10070.	10140.	10220.	10290.	10370
505252.	516830.	525620.	540476.	564781.	574066.	592913.	612130.	635017.	661792.	685762.	713772
10430.	10510.	10590.	10670.	10770.	10870.	10970.	11070.	11160.	11250.	11350.	11440
735213.	764375.	794197.	824677.	863703.	903760.	944866.	936959.	1025742.	1055359.	1110335.	1151731
11540.	11630.	11740.	11860.	11940.	12060.	12160.	12270.	12370.	12500.	12610.	12720
1198633.	1243917.	1295671.	1355841.	1396777.	1459417.	1512751.	1572605.	1628097.	1701775.	1765481.	1830429
12820.	12940.	13070.	13190.	13320.	13420.	13550.	13690.	13790.	13910.	14040.	14190
1890551.	1964059.	2045553.	2121959.	2206609.	2272909.	2360635.	2457057.	2527165.	2627043.	2706935.	2817981
14320.	14480.	14640.	14810.	14980.	15130.	15320.	15470.	15490.	15500.	15690.	15850
2935913.	3018951.	3106623.	3201039.	3440427.	3565889.	3728129.	3858839.	3876441.	3885285.	4020387.	4247629
16130.	16350.	16580.	16670.	16700.	16800.	16910.	17120.	17350.	17610.	17810.	18110
4346707.	4787415.	5021931.	5146617.	5199845.	5295617.	5423083.	5669961.	5945673.	6264047.	6513725.	6896281
18330.	18620.	18870.	19090.	19320.	19360.	19830.	19960.	19990.			
7182793.	7568243.	7907629.	8211723.	8535033.	8878827.	9301387.	9464137.	9508739.			

Table 5-10(2) DAILY RAINFALL DATA DURATION & STATION

DAILY RAINFALL DATA

NO.	Name	1945												
		5	6	7	8	9	10	11	12	1	2	3	4	5
5823077	LADANG CHERANG TULI													
5824079	PASIR PUTEH													
5824080	KG. BERTIS CHERANG RUKU													
5919003	BUKIT KWANG													
5920011	BUKIT TANDA													
5920012	KG. LANDAK													
5921009	IBU BEKALAN TOK UBAN													
5922001	STN. PERTANIAN MELOR													
5923081	TOK AJAM													
6019004	STN. KERETAPI RANTAU PANJANG													
6021010	RUMAH PAN REPEK													
6021013	RUMAH KERAJAN JAP. MERANTI													
6021060	RUMAH PAN SALOR PENGKALAN KUBOR													
6021061	RUMAH PAN PASIR MAS													
6022062	CHABANG TIGA PENDEK													
6023072	TERATAK PULAI													
6024074	BALAI POLIS BACHOK													
6120014	KUALA JAMBU													
6121015	CHABANG AMPAT													
6121066	STN. KERETAPI KG. BERANGAN													
6121067	STN. KERETAPI TUMPAT													
6122064	SEKTOR JFT KOTA BARU													
6122068	STN. KAJICUACA PENGKALAN CHEPA													

(NEB Data)	Name	1945												
		5	6	7	8	9	10	11	12	1	2	3	4	5
x	BATU MELINTANG KEM (CAMP)													
18	LATA JANGGUT, BATU MELINTANG ULU													
20	SEK KEB LALOH ULU													
19	CHEGAR ATS BERTAM													
17	KG. KUALA BETIS													
	JERAM PANJANG													
	KAMPONG LEBIR													
	GUA MUSANG CAMP													
	SUNGEI TERANG													
	BALAI POLIS BATU MELINTANG													
	KAMPONG PENDOK													
	KAMPONG LAMBA													

Note: * shows Rainfall Gauging Station of which Location was confirmed.
 O number in parenthesis shows number of Gauging Station of which data used for the study.
 () Number in parenthesis shows months of observation lack

Table 5-10(5) HOURLY RAINFALL DATA DURATION & STATION

HOURLY RAINFALL DATA

Name	Observed year 1950											
	5	5	5	5	5	5	5	5	5	5	5	5
KAMPONG KUALA BETIS												82.12/16, 83.12/1-3, 84.12/22-26 86.11/28-12/5
CEGAR ATAS												82.12/15-16, 83.12/1-16, 84.12/22-26 86.11/26-12/5
KAMPONG LEBIR												81.11/30-12/5, 82.12/13-16, 83.12/1-16 84.12/22-26, 86.11/26-12/5
JERAM PANJANG												81.11/30-12/3, 82.12/13-16 83.12/1-16, 84.12/22

DAILY DISCHARGE DATA

Name	Observed year 1950											
	5	5	5	5	5	5	5	5	5	5	5	5
SUNGAI TERANG												11-10/512 5, 9, 11/861
SUNGAI NENGGIRI AT CEGAR ATAS												11-9/72 (4-9/73)

MONTHLY MEAN, INSTANTANEOUS MAXIMUM AND MINIMUM FLOWS

Name	Observed year 1950											
	5	5	5	5	5	5	5	5	5	5	5	5
SUNGAI TERANG												11-10/813, 3, 6, 9, 10/861
SUNGAI NENGGIRI AT CEGAR ATAS												

Table 5-11 Correlation Coefficient of Daily Rainfall among Stations

Station No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1		0.069	-0.034	0.045	0.066	-0.040	0.073	0.172	-	0.112	0.089	-	0.135	0.129	0.108	0.169	0.167	0.270	0.095	0.101
2			0.483	0.336	0.315	0.896	0.361	0.446	-	0.219	0.316	-	0.286	0.205	0.369	0.292	0.280	0.258	0.229	0.193
3				0.532	0.431	0.815	0.451	0.714	-	0.150	0.704	-	0.368	0.417	0.511	0.276	0.670	-	0.283	0.249
4					0.421	0.802	0.404	0.406	0.193	0.220	0.357	0.336	0.291	0.196	0.338	0.294	0.292	-	0.373	0.254
5						0.768	0.443	0.539	-	0.278	0.482	-	0.432	0.440	0.362	0.419	0.322	-	0.208	0.358
6							0.688	0.689	-	0.627	0.847	-	0.772	0.886	0.819	0.693	-0.074	-	0.522	0.847
7								0.617	-	0.397	0.501	0.361	0.440	0.507	0.378	0.455	0.169	-	0.294	0.294
8									-	0.447	0.624	-	0.550	0.571	0.499	0.588	0.180	-	0.406	0.325
9										0.246	0.162	0.263	0.365	0.285	-	-	-	-	0.209	0.240
10											0.452	0.235	0.291	0.275	0.354	0.377	0.336	0.260	0.271	0.338
11												-	0.524	0.452	0.492	0.489	0.094	-	0.380	0.785
12													0.230	0.214	-	-	-	-	-	-
13														0.324	0.596	0.588	0.328	0.318	0.342	0.399
14															0.501	0.509	0.228	0.205	0.223	0.432
15																0.592	0.184	-	0.367	0.438
16																	0.156	-	0.235	0.312
17																		0.309	0.292	0.361
18																			0.330	0.469
19																				
20																				

Table 5-12 CORRELATION OF 5-DAY RAINFALL ALONG STATION AND NUMBER OF DATA

The case where data in Rainy Season (Oct., Nov., Dec., and Jan. 4 months) were used. Period where data are existing: from 1947 to 1955, 39 years.

St. No.	x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20											
1	y	1	0.400 (20)	0.493 (7)	-0.158 (8)	0.186 (8)	0.453 (5)	0.038 (17)	0.149 (8)	0.093 (18)	0.210 (17)	0.004 (8)	0.143 (8)	0.413 (7)	0.722 (4)	0.980 (3)	0.341 (3)															
2			2	0.918 (7)	0.918 (8)	0.707 (8)	0.907 (3)	0.851 (5)	0.399 (17)	0.526 (18)	0.473 (17)	0.420 (5)	0.654 (8)	0.917 (7)	0.801 (4)	0.900 (3)	0.829 (3)															
3				3	0.918 (7)	0.918 (8)	0.707 (8)	0.907 (3)	0.851 (5)	0.399 (17)	0.526 (18)	0.420 (5)	0.654 (8)	0.917 (7)	0.801 (4)	0.900 (3)	0.829 (3)															
4					4	0.918 (7)	0.714 (7)	0.389 (7)	0.378 (5)	0.433 (12)	0.877 (35)	0.352 (33)	0.464 (22)	0.779 (35)	0.484 (22)	0.484 (22)	0.819 (7)	0.494 (7)														
5						5	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)														
6							6	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)														
7								7	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)													
8									8	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)												
9										9	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)											
10											10	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)										
11												11	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)									
12													12	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)								
13														13	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)							
14															14	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)						
15																15	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)					
16																	16	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)				
17																		17	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)			
18																			18	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)		
19																				19	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)	
20																					20	0.918 (7)	0.906 (3)	0.868 (5)	0.908 (8)	0.866 (8)	0.949 (8)	0.949 (8)	0.939 (8)	0.752 (8)	0.823 (8)	0.823 (8)

NOTE: A 5-Day Rainfall is calculated by month taking up a period in a month where the Monthly Maximum Daily Rainfall occurred at the middle of the period.

Table 5-13 COEFFICIENT OF INTERPOLATION FORMULA FOR MONTHLY MAXIMUM
5-DAY RAINFALL AT EACH STATION

upper value : a
lower value : b
($R_y = a - R_x + b$)

St. No.	x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
1	1																						
2	2																						
3	3																						
4	4																						
5	5																						
6	6																						
7	7																						
8	8																						
9	9																						
10	10																						
11	11																						
12	12																						
13	13																						
14	14																						
15	15																						
16	16																						
17	17																						
18	18																						
19	19																						
20	20																						

Note) A 5-day Rainfall is calculated by month taking up a period in a month where the Monthly Maximum Daily Rainfall occurred at the middle of the period.

Table 5-14 Coefficients of Correlation Between 5-day Rainfall and Peak Daily Rainfall and Coefficient of Mean Linear Equation.

Station No	Number of Data	Correlation Coefficient γ	Coefficient Mean Linear Equation $R_1 = a \cdot R_5 + b$	
			a	b
2	20	0.802	0.3855	6.4969
4	35	0.954	0.5353	3.4306
5	8	0.988	0.5556	-0.1361
7	8	0.992	0.5943	1.4589
8	5	0.957	0.7296	-5.2974
9	102	0.832	0.4138	9.5974
10	129	0.883	0.3908	9.1281
11	41	0.940	0.5096	9.0961
12	38	0.873	0.4237	7.5496
13	111	0.930	0.4642	1.1577
14	128	0.909	0.4299	12.9952
15	24	0.924	0.4685	9.1423
16	8	0.953	0.5615	6.2695
17	7	0.962	0.5057	-7.0978

* R_1 : Peak daily rainfall (mm / day)

R_5 : 5-day rainfall (mm / 5 days)

Table 5-15 Relation Between 5-Day Rainfall and Peak Rainfall

(Curve of 95% Reliability Zone)

Station No	Coefficient of Curve					
	Equation $(R_1 = aR_5 + b + c \sqrt{dR_5^2 + eR_5 + f})^*$					
	a	b	c	d	e	f
2	0.3855	6.4969	2.101	0.4585×10^{-2}	-0.6886	0.5120×10^2
4	0.5353	3.4306	2.035	0.8626×10^{-3}	-0.1029	0.6024×10^1
5	0.5056	-0.1361	2.447	0.1082×10^{-2}	-0.1734	0.1321×10^2
7	0.5943	1.4589	2.447	0.9863×10^{-3}	-0.1310	0.1025×10^2
8	0.7296	-5.2974	3.182	0.1626×10^{-1}	-0.1792×10^1	0.8909×10^2
9	0.4136	9.5974	1.984	0.7599×10^{-3}	-0.1783	0.1534×10^2
10	0.3908	9.1281	1.979	0.3381×10^{-3}	-0.5805×10^{-1}	0.4950×10^1
11	0.5096	9.0961	2.023	0.8825×10^{-3}	-0.1864	0.2007×10^2
12	0.4237	7.5496	2.028	0.1551×10^{-2}	-0.3077	0.2348×10^2
13	0.4642	1.1577	1.982	0.3098×10^{-3}	-0.8962×10^{-1}	0.1198×10^2
14	0.4299	12.9952	1.979	0.3104×10^{-3}	-0.8641×10^{-1}	0.1036×10^2
15	0.4685	9.1423	2.074	0.1699×10^{-2}	-0.4557	0.4611×10^2
16	0.5615	6.2695	2.447	0.5347×10^{-2}	-0.1420×10^1	0.1800×10^3
17	0.5057	-7.0978	2.571	0.4124×10^{-2}	-0.9710	0.8129×10^2

* R_1 : Peak daily (mm/day) rainfall

R_5 : 5-day (mm/5days) rainfall

Table 5-16 ORDER OF INTERPOLATION FOR MONTHLY
MAXIMUM 5-DAY RAINFALL

Gauging Station used to supplement observation Data	Order of Considered Gauging Stations' Number which have correlation											
	Order 1	2	3	4	5	6	7	8	9	10	11	12
1												
2	4	17	7	13								
3												
4	2	7	11	16	13	10	15	14				
5	13	14	10	7	11	16	15					
6												
7	14	2	5,13	4	8	11	16	10				
8	10	16	11	7								
9	19	20	13	11	14	10						
10	8	5	11	16	7	4	13	15				
11	19	8	7	13	5	4	10	16	14	15	9	
12	14											
13	5	7	16	11	4	15	9	14	10	2		
14	5	7	16	15	11	13	9	4	12	10		
15	16	14	13	5	11	10	4					
16	8	13	14	15	5	4	7	10	11			
17	2											
18												
19	20	11	9									
20	19	9										

Table 5-17 YEARLY MAXIMUM 5-DAY RAINFALL AT EACH STATION

(mm)

St. No. Year	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	20
1947	215.8	149.0	272.9	260.0	107.2	258.8	161.1	356.8	219.0	344.6	*505.2	388.0	433.2	205.5			
48	99.8	74.0	120.1	106.5	70.3	*146.6	95.5	152.3	119.5	151.1	*200.0	186.5	195.0	116.2			
49	193.9	134.8	243.8	230.8	100.2	*272.4	148.6	317.8	200.1	235.4	*447.1	357.7	387.8	188.6			
50	123.0	89.0	150.7	137.3	77.7	*113.6	108.7	193.3	139.4	123.8	*261.2	228.9	242.8	134.1			
51	143.7	102.4	177.8	164.5	84.2	*95.4	120.3	229.6	157.1	198.7	*315.4	266.5	285.1	150.0			
52	107.8	79.2	79.1	65.4	96.6	*236.2	*142.3	132.5	*151.9	225.1	*118.2	129.8	131.2	122.4			
53	157.8	111.5	188.2	174.9	138.7	*166.7	*217.0	194.6	*175.4	184.2	*336.0	280.8	301.2	160.9			
54	119.1	86.5	155.9	142.5	106.0	*162.5	*159.1	146.5	*220.0	184.2	*271.6	236.1	250.9	131.1			
55	63.7	50.7	88.6	74.9	59.4	*213.7	*76.3	77.7	*101.8	206.5	*137.2	143.0	146.0	88.5			
56	100.6	89.3	166.1	148.3	148.8	*221.4	*235.0	152.1	*176.4	*232.4	*283.1	244.1	265.4	116.9			
57	76.0	61.9	110.3	205.0	89.4	*172.0	*129.6	106.4	*127.9	*185.2	*395.8	322.2	179.3	97.9			
58	74.5	60.3	106.9	85.0	100.5	*184.4	*149.3	103.7	58.5	*160.0	*157.3	136.9	174.1	96.8			
59	70.7	56.1	98.3	64.2	156.3	*166.9	*248.3	96.6	*122.4	*146.5	*115.8	128.2	160.8	93.9			
60	78.3	64.5	115.5	80.0	88.7	*208.1	*128.3	110.7	*297.0	*173.4	*147.3	150.0	187.4	99.7			
61	71.4	56.8	99.9	130.4	104.1	*171.5	*155.7	97.9	*302.0	*149.0	*247.6	219.5	163.3	94.4			
62	59.7	43.8	73.3	124.8	75.1	*220.7	*104.1	76.2	131.3	*107.5	*236.4	211.7	122.2	85.4			
63	86.7	73.9	134.7	204.8	119.8	*190.1	*183.6	126.4	183.2	*203.3	*395.4	321.9	216.9	106.2			
64	62.8	47.3	80.5	51.0	80.4	*104.3	*113.5	82.0	83.5	*116.7	*89.6	110.0	133.3	87.8			
65	122.3	113.3	215.2	261.0	84.7	*262.4	121.1	192.2	219.7	*328.9	*507.3	399.5	341.0	133.5			
66	97.4	85.7	158.8	142.5	16.4	*236.4	*0.0	146.1	142.8	*240.9	*271.6	236.1	254.1	174.4			*116.3
67	182.6	180.3	352.0	185.6	148.4	*494.4	234.3	304.1	170.8	*52.4	*357.3	295.5	534.2	179.9			*631.2
68	73.2	58.8	103.9	72.4	46.3	*110.6	52.9	101.2	97.3	*155.3	*132.1	139.5	169.5	95.8			*78.0
69	128.7	120.4	229.8	162.6	16.4	*227.0	*0.0	204.2	155.9	*331.7	*311.6	283.8	363.6	138.5			
70	122.8	113.8	216.3	146.3	161.3	*278.0	*257.3	193.2	145.3	*330.7	*279.2	241.4	342.8	133.9			*162.8
71	253.3	*173.2	197.3	180.1	154.1	*335.3	*244.5	*226.0	137.2	*301.1	254.2	216.4	313.6	234.3			*156.7
72	304.5	*206.3	401.3	377.9	184.7	442.7	*298.7	*303.3	212.1	*619.4	483.8	391.8	628.1	273.7			*205.0
73	218.9	229.2	570.0	541.5	253.2	618.4	*420.3	*438.8	274.0	*882.6	673.6	536.8	888.2	254.0			*566.4
74	59.1	48.0	52.3	39.4	131.4	*235.6	*204.2	*141.8	83.9	*74.7	90.9	91.6	89.8	85.2			*130.3
75	68.0	*118.1	210.8	193.1	86.3	*189.9	*124.0	*157.7	142.1	*322.1	269.4	228.0	334.3	168.7			*145.0
76	50.2	*42.0	115.9	132.6	69.4	149.9	*94.0	111.1	136.4	*174.0	*252.0	*216.0	188.0	78.1			*105.3
77	73.5	82.4	92.2	102.0	161.7	125.4	*258.0	*148.0	116.5	*137.0	*391.0	*281.0	751.4	96.0			*119.2
78	102.9	*76.0	247.3	163.8	140.3	235.4	*220.0	*146.0	156.7	*378.0	*314.0	*321.0	390.5	118.6			*145.6
79	418.5	*280.0	390.2	226.9	212.4	432.9	*348.0	456.0	132.7	*602.0	*240.5	*282.5	610.9	381.4			*427.7
80	92.3	69.2	84.5	70.8	83.5	109.7	*119.0	113.2	96.3	132.1	*129.0	137.3	139.6	110.5			*123.0
81	*162.5	115.2	*118.0	*98.4	101.5	168.4	*151.0	*91.0	127.6	*202.0	*225.0	*277.0	*309.0	164.5			*87.9
82	*196.5	*133.0	*257.0	*255.9	*133.5	231.1	*213.0	*300.0	203.0	*337.5	*456.0	*317.0	*354.5	190.6			
83	*315.0	188.2	241.9	324.7	173.1	280.0	266.0	347.6	237.4	370.7	561.6	254.7	382.3	*286.0			*740.8
84	*104.0	73.2	228.0	328.5	170.2	265.7	*273.0	202.8	263.5	*349.0	*641.5	492.5	350.9	*147.0			*427.8
85	*112.5	77.8	115.3	108.0	89.7	149.2	*130.0	110.6	120.5	*173.0	*203.0	188.6	187.0	126.0			*113.4

Note) * shows actual measured value and others are interpolated values.

Table 5-18 YEARLY MAXIMUM DAILY RAINFALL AT EACH STATION

(Estimated based on the mean curve)

(mm)

St. No. Year 年	2	4	5	7	8	9	10	11	12	13	14	15	16	17	20
1947	89.7	83.2	137.8	156.0	72.9	116.7	72.1	190.9	100.3	151.1	*24.3	135.6	249.5	96.8	
48	45.0	43.0	60.6	64.8	46.0	*34.8	46.4	86.7	58.2	71.3	*46.2	96.5	115.8	51.7	
49	81.2	75.6	123.1	138.6	67.8	*146.1	67.6	171.0	92.3	119.7	*199.4	176.7	224.0	88.3	
50	53.9	51.1	76.1	83.1	51.4	*71.7	51.6	107.6	66.6	58.6	*115.6	116.4	142.6	60.7	
51	61.9	58.2	89.8	99.2	56.1	*81.4	56.1	126.1	74.1	51.6	*134.9	134.0	166.4	68.8	
52	48.1	45.8	39.9	40.3	65.2	*144.8	*109.2	76.6	*80.5	105.6	*61.5	70.0	79.9	54.8	
53	67.3	63.1	95.0	105.4	95.9	*81.6	*124.5	108.3	*81.4	86.7	*146.1	140.7	175.4	74.3	
54	52.4	49.7	78.7	86.1	72.0	*129.5	*108.5	83.8	*107.1	77.4	*167.1	119.8	147.1	59.2	
55	31.1	30.6	44.7	46.0	38.0	*91.5	*45.8	48.7	*38.1	97.0	*76.9	76.1	88.2	37.7	
56	45.3	51.2	89.8	89.6	103.3	*68.3	*63.5	86.6	*139.7	*33.0	*105.2	123.5	155.3	52.0	
57	35.8	36.6	55.6	123.3	59.9	*105.2	*101.6	63.3	*77.1	*88.9	*143.5	160.1	106.9	42.4	
58	35.2	35.7	53.9	52.0	68.0	*83.8	*57.7	61.9	32.3	*79.8	*60.5	82.6	104.0	41.9	
59	33.8	33.5	49.6	39.6	108.7	*97.3	*73.7	58.3	*88.1	*112.5	*80.8	68.2	96.6	40.4	
60	36.7	38.0	58.3	49.0	59.4	*80.0	*50.8	65.5	*114.8	*76.9	*133.3	79.4	111.5	43.3	
61	34.0	33.8	50.4	79.0	70.7	*85.3	*77.0	59.0	*117.3	*40.8	*110.7	112.0	98.0	40.6	
62	29.5	26.9	36.9	75.6	49.5	*210.8	*104.1	47.9	63.2	*40.4	*215.9	108.3	74.9	38.1	
63	39.9	43.0	88.0	123.2	82.1	*88.1	*88.9	73.5	85.2	*112.3	*185.4	160.0	128.1	46.6	
64	30.7	28.8	40.6	31.8	53.4	*51.3	*42.9	50.9	42.9	*57.1	*53.8	60.7	81.1	37.3	
65	53.6	64.1	108.7	156.6	56.5	*76.2	56.5	107.0	100.6	*101.6	*181.4	196.3	197.7	60.4	
66	44.0	49.3	80.2	86.1	6.7	*91.5	*0.0	83.5	68.1	*75.2	*128.0	118.8	148.9	50.8	*73.4
67	76.9	99.9	177.8	111.8	103.0	*228.6	100.7	164.1	78.9	*235.5	*166.6	147.6	306.2	83.9	*283.2
68	34.7	34.9	52.4	44.5	28.5	*36.8	29.8	60.7	48.8	*99.2	*61.3	74.5	101.4	41.3	*28.2
69	56.1	67.9	116.1	98.1	6.7	*106.4	*0.0	113.2	73.6	*165.6	*154.7	132.7	210.4	62.9	
70	53.8	64.3	109.2	88.4	112.4	*137.2	*97.5	107.6	69.1	*129.8	*103.4	122.2	198.8	60.6	*68.6
71	104.1	*71.6	99.6	108.5	107.1	*138.9	*109.7	*104.9	65.7	*96.3	122.3	110.5	182.4	111.4	*44.7
72	123.9	*100.1	202.8	226.0	129.5	192.8	*111.3	*101.1	97.4	*197.9	221.0	192.7	358.9	131.3	*63.5
73	114.0	126.1	288.1	323.3	179.4	253.5	*151.1	*202.9	123.6	*427.2	302.6	260.6	505.0	121.4	*279.4
74	29.4	29.1	26.3	24.9	90.6	*66.5	*55.9	*70.9	43.1	*64.5	52.1	52.1	56.7	36.0	*41.4
75	71.3	*89.9	106.4	116.2	57.7	*88.9	*40.4	*136.9	67.8	*226.1	128.8	116.0	194.0	78.2	*71.1
76	25.8	25.0	58.5	80.3	45.3	*71.6	*50.0	65.7	65.3	*85.5	*98.0	*97.0	111.8	32.4	*43.4
77	34.8	47.5	46.5	62.1	112.7	61.5	*80.0	*95.0	56.9	*90.0	*96.0	*90.0	91.3	41.4	*90.2
78	46.2	*39.0	124.9	98.8	97.1	127.7	*98.0	*78.0	73.9	*159.0	*147.0	*125.0	225.5	52.9	*77.0
79	167.8	*164.0	197.1	76.9	149.7	188.7	*185.5	*288.0	63.8	*384.0	*91.5	*131.5	349.3	175.7	*232.7
80	42.1	40.5	42.6	43.5	55.6	55.0	*48.0	66.8	48.4	62.5	*61.5	73.5	84.7	48.8	*57.2
81	50.0	65.1	*52.0	*63.6	68.8	79.3	*73.0	*43.0	61.6	*122.0	*87.5	*196.0	*224.0	76.1	*46.5
82	*159.5	*86.0	*136.0	*151.0	*105.3	130.1	*102.0	*168.0	93.6	*206.0	*273.0	*171.0	*161.8	89.3	
83	*89.0	104.2	122.2	194.4	121.0	135.5	113.1	183.7	108.1	173.2	254.4	128.5	220.9	*133.0	*292.2
84	*35.0	42.6	115.1	196.7	118.9	119.5	*131.0	112.4	119.2	*205.5	*825.0	239.9	208.9	*89.0	*190.8
85	*73.5	45.1	58.2	65.6	60.1	71.3	*45.0	65.5	58.6	*104.0	*66.5	97.5	111.3	56.6	*50.4

Note) * shows actual measured value and others are interpolated values.

Table 5-19 YEARLY MAXIMUM DAILY RAINFALL AT EACH STATION
(ESTIMATES BASED ON THE UPPER LIMIT CURVE OF 95% RELIABILITY ZONE)

観測所 年 No.	2	4	5	7	8	9	10	11	12	13	14	15	16	17	20
1947	112.3	89.6	154.5	172.0	102.1	125.6	76.2	207.3	111.5	169.5	*241.3	219.5	307.8	116.0	
48	56.1	46.6	67.5	71.4	67.0	*34.8	49.6	93.8	64.2	76.0	*46.2	105.8	141.0	64.3	
49	101.2	81.3	137.7	152.6	95.0	*146.1	71.1	195.3	102.3	125.8	*199.4	197.5	275.0	105.5	
50	86.5	55.0	84.4	91.1	73.4	*71.7	54.8	115.9	73.3	66.4	*115.6	127.9	172.6	73.6	
51	76.3	62.6	99.7	108.8	79.4	*81.4	59.5	136.0	81.5	53.4	*134.9	148.0	201.8	82.5	
52	59.6	49.5	46.0	46.3	91.4	*144.8	109.2	83.3	*80.5	111.1	*61.5	78.1	102.6	67.5	
53	83.2	67.8	105.7	115.6	135.3	*81.6	124.5	116.7	*81.4	91.5	*146.1	155.7	213.1	88.8	
54	64.7	53.6	87.3	94.5	100.8	*129.5	*108.5	90.7	*107.1	82.1	*167.7	131.7	178.1	72.0	
55	41.8	34.1	50.8	52.0	58.2	*91.5	*45.8	55.4	*38.1	102.1	*76.9	84.4	111.0	51.2	
56	56.5	55.2	93.1	98.3	146.2	*68.3	*63.5	93.7	*139.7	*93.0	*105.2	135.0	188.1	64.6	
57	46.4	40.1	62.2	135.5	84.3	*106.2	*101.6	69.8	*77.1	*88.9	*143.5	176.1	131.1	55.5	
58	45.8	39.2	60.4	58.1	95.3	*83.8	*57.7	68.4	39.0	*79.8	*60.5	91.1	127.9	54.9	
59	44.3	37.0	55.9	45.6	154.4	*97.3	*73.7	64.8	*88.1	*12.5	*80.8	77.4	119.8	53.6	
60	47.3	41.5	65.0	55.0	83.7	*80.0	*50.8	72.0	*114.8	*76.9	*133.3	81.7	136.2	56.3	
61	44.6	37.3	56.7	86.7	98.9	*85.3	*77.0	55.5	*117.3	*40.8	*110.7	122.9	121.3	52.8	
62	40.3	30.5	43.1	83.1	71.1	*210.8	*104.1	54.5	69.5	*40.4	*215.9	118.0	97.6	49.8	
63	50.6	46.6	75.5	135.4	115.1	*88.1	*88.9	80.1	94.0	*112.3	*185.4	178.0	155.3	59.4	
64	41.4	32.3	46.7	37.8	73.9	*51.3	*42.9	57.5	48.9	*57.1	*53.8	69.1	103.8	50.9	
65	66.2	68.8	121.1	172.7	79.9	*76.2	59.8	115.3	111.9	*101.6	*181.4	220.4	241.3	73.3	
66	55.1	53.1	89.0	94.5	16.4	*91.5	*0.0	90.5	74.8	*75.2	*128.0	131.7	180.3	63.4	
67	95.5	108.0	200.6	122.7	145.8	*228.6	106.9	177.6	88.1	*235.5	*166.6	163.6	381.5	100.2	
68	45.3	38.4	58.8	50.4	46.3	*36.8	33.1	67.1	54.6	*93.2	*61.5	82.7	125.0	54.5	
69	69.2	72.9	129.6	107.6	16.4	*106.4	*0.0	121.9	81.0	*165.6	*154.7	146.5	257.5	76.0	
70	66.4	69.1	121.8	97.0	159.9	*137.2	*97.5	115.9	76.0	*129.6	*103.4	134.5	242.6	73.5	
71	131.6	*75.6	110.9	119.1	152.0	*136.9	*109.7	*104.9	72.2	*96.3	126.0	121.3	221.9	134.4	
72	158.2	*100.1	229.3	250.7	184.7	211.1	*111.3	*101.1	108.1	*197.9	233.7	216.2	450.4	160.0	
73	144.9	136.8	328.0	350.3	253.2	293.2	*151.1	*202.9	138.8	*427.2	321.7	296.0	642.0	147.2	
74	40.2	32.7	32.8	31.2	127.5	*86.5	*55.9	*70.9	49.0	*64.5	56.5	61.0	80.6	49.7	
75	88.2	*89.9	118.6	127.6	81.4	*88.9	*40.4	*136.9	74.5	*226.1	134.9	127.4	236.6	93.4	
76	37.0	*25.0	65.2	88.1	66.2	76.4	*50.0	72.2	71.9	*35.5	*98.0	*97.0	136.5	46.6	
77	45.4	51.3	52.7	68.6	160.4	65.9	*80.0	*95.0	62.9	*90.0	*96.0	*90.0	114.2	54.6	
78	57.5	*39.0	139.7	108.4	137.0	137.9	*98.0	*78.0	81.4	*159.0	*147.0	*125.0	276.9	65.5	
79	217.8	*164.0	222.8	84.4	212.4	206.5	*185.5	*288.0	70.2	*384.0	*91.5	*131.5	437.8	217.8	
80	52.9	44.0	48.7	49.5	78.8	59.4	*48.0	73.3	54.2	67.1	*61.5	81.7	107.3	61.5	
81	*50.0	59.9	*52.0	*63.6	96.3	84.5	*73.0	*43.0	67.9	*122.0	*87.5	*196.0	*224.0	90.9	
82	*159.5	*86.0	*136.0	*151.0	*105.3	140.5	*102.0	*164.0	103.7	*206.0	*273.0	*171.0	*161.8	106.7	
83	*89.0	112.6	136.6	215.2	172.9	135.4	120.3	199.3	120.6	182.4	269.7	141.6	271.0	*133.0	
84	*36.0	46.2	128.5	217.7	169.7	128.8	*131.0	121.2	133.5	*205.5	*325.0	271.6	255.6	*89.0	
85	*73.5	46.7	64.9	72.4	84.6	76.1	*45.0	71.9	64.7	*104.0	*66.5	106.9	135.9	69.3	

Note) *shows actual measured value and others are interpolated values

TABLE FOR WEIGHT IN THIESSEN METHOD

Catchment Area Divisional area A and Weight W in Thiessen	Divisional Area and Weight in Thiessen Method for Each Catchment Area of Studies Dam Site						Divisional Area and Weight in Thiessen Method for Each Catchment Area of Each Water Level Gauging Station									
	Lebir Dam Upstream Area		Nenggiri Dam Upstream		Nenggiri Dam ~ Dabong Dam		Nenggiri Dam and Downstream of Dabong Dam ~ Guilleward		Tualang Upstream Area		Berlam Upstream Area		Berlam ~ Dabong		Tualang and Downstream of Dabong ~ Guilleward	
	A (km ²)	W	A (km ²)	W	A (km ²)	W	A (km ²)	W	A (km ²)	W	A (km ²)	W	A (km ²)	W	A (km ²)	W
Rainfall Gauging Station																
2	238.1	0.096			261.2	0.070			238.1	0.096			261.2	0.074		
4			27.7	0.007	755.4	0.202					27.7	0.007	755.4	0.214		
5	1795.5	0.726			74.1	0.020			1795.5	0.724			74.1	0.021		
7	146.3	0.059	74.4	0.020	848.9	0.227			146.3	0.059	284.4	0.072	638.4	0.181		
8			1260.0	0.337	84.7	0.023					1260.0	0.319	84.7	0.024		
9			15.8	0.004	547.2	0.146	23.5	0.011			15.8	0.004	547.2	0.155	23.5	0.011
10	5.0	0.002			56.5	0.015	378.8	0.177	5.0	0.002			56.5	0.016	378.8	0.177
11	279.2	0.113					320.6	0.149	285.2	0.115					314.6	0.147
12	9.9	0.004					445.1	0.207	9.9	0.004					445.1	0.208
13					653.1	0.175	115.6	0.054					653.1	0.185	115.6	0.054
14							719.0	0.335							719.0	0.336
15					296.5	0.079							296.5	0.084		
16					31.8	0.008	143.4	0.067					31.8	0.009	143.4	0.067
17			2362.1	0.632	130.6	0.035					2362.1	0.598	130.6	0.037		
Total	2474.0	1.000	3740.0	1.000	3740.0	1.000	2146.0	1.000	2480.0	1.000	3950.0	1.000	3530.0	1.000	2140.0	1.000