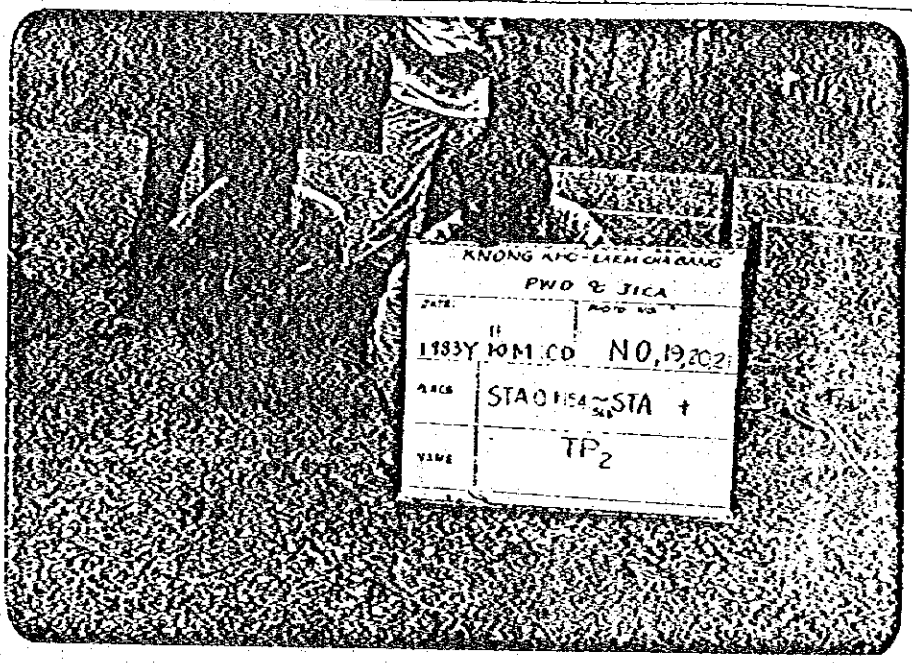
REFERENCE DATA

DESCRIPTION OF POINT

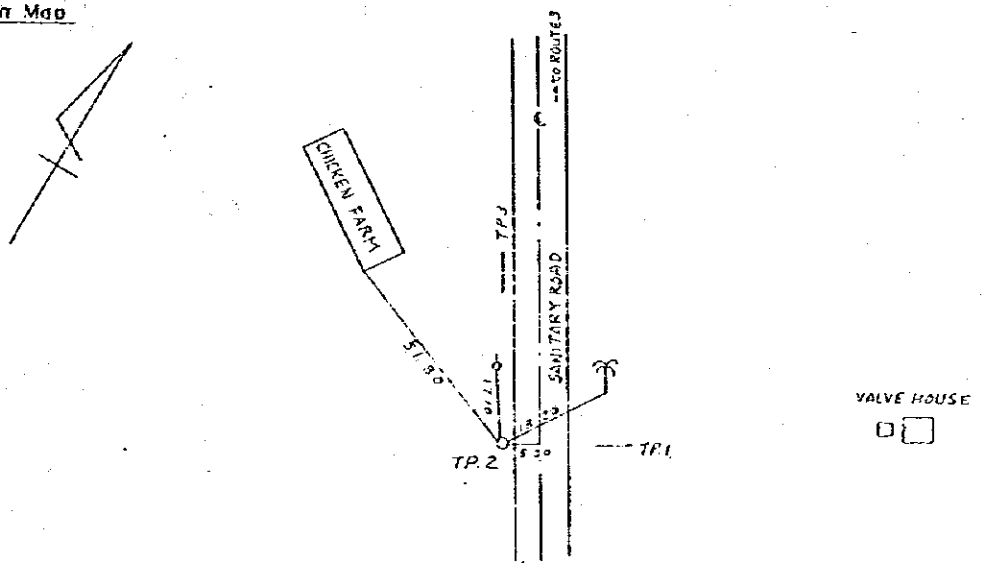
Station: TP 2	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: m 59.024
Northing: 78748.969 m	Easting: 12435.512 m	Grid And Zone:

Photo



In front of NONG KHO DAMSITE, 900m from WAT NONG KHO and total distance of 10KM, from Route 3

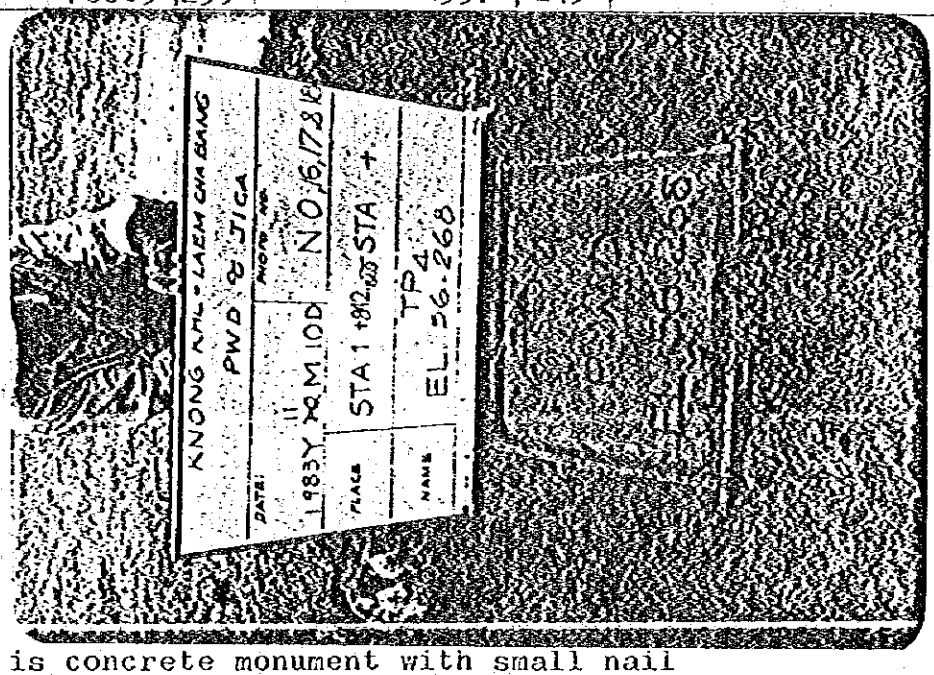
Sketch Map



DESCRIPTION OF POINT

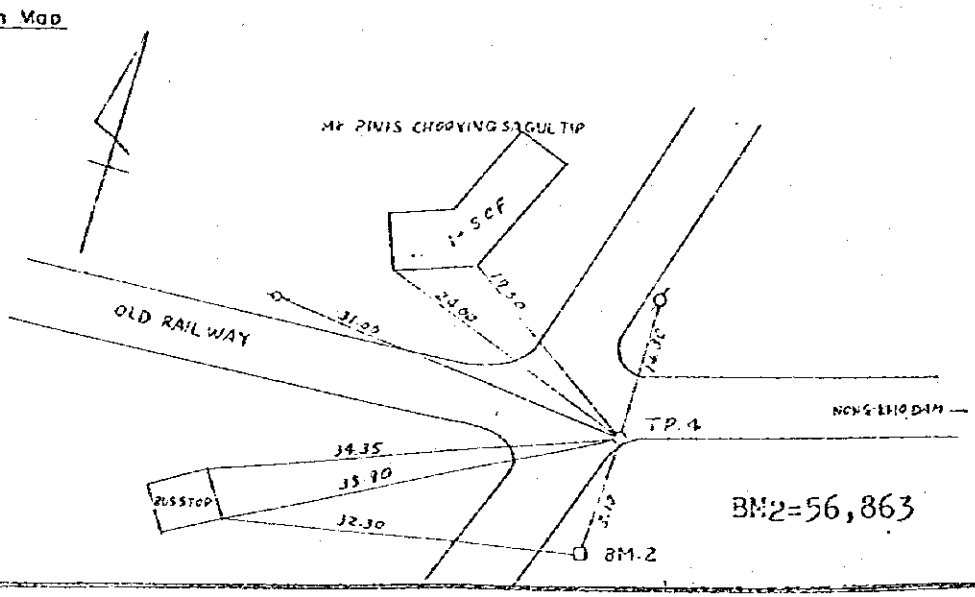
Station:	Type of Mark:	Locality:
TP4	MONUMENT	
Latitude: ° ' "	**Longitude:** ° ' "	**Elevation:** m 56.268
Northing: m 78805.239	**Easting:** m 11337.245	**Grid And Zone:**

Photo



TP4 is concrete monument with small nail
near 1ST intersection of road from NONG-KHO DAM

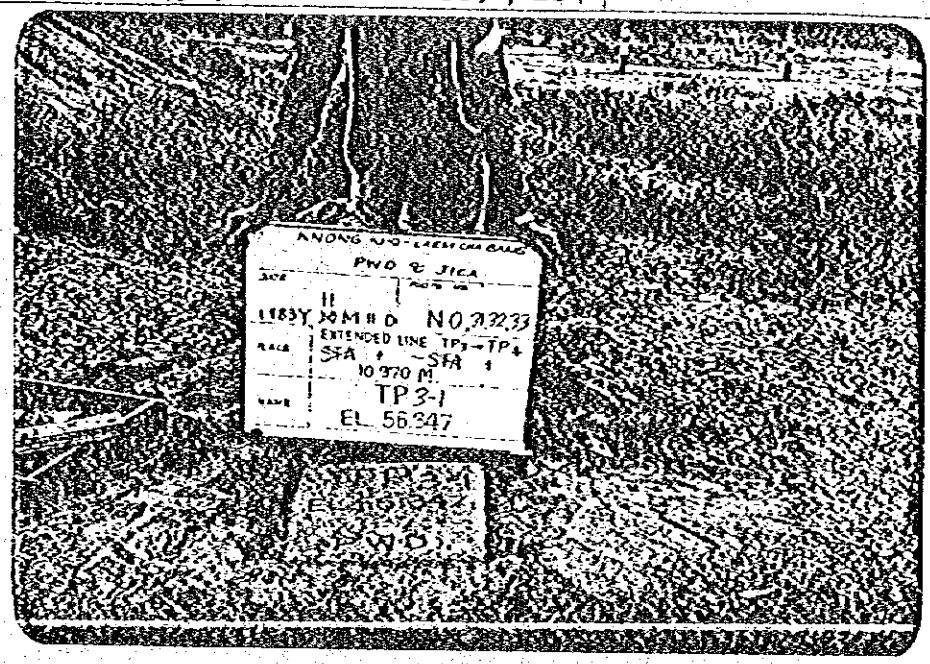
Sketch Map



DESCRIPTION OF POINT

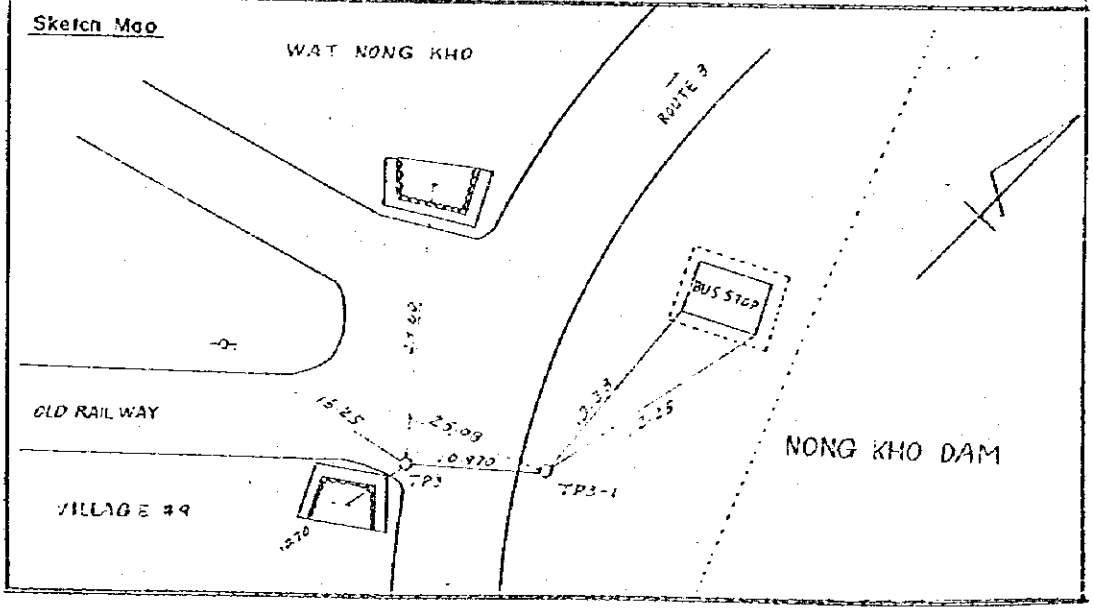
Station:	Type of Mark:	Locality:
TP-3-1	MONUMENT	
Latitude: ° ' "	**Longitude:** ° ' "	**Elevation:** 56.347 m
Northing: 79426.565 m	**Easting:** 11869.164 m	**Grid And Zone:**

Photo



TP3-1 is set by off setting from TP3 in the bearing of TP4 → TP3 =10.970m

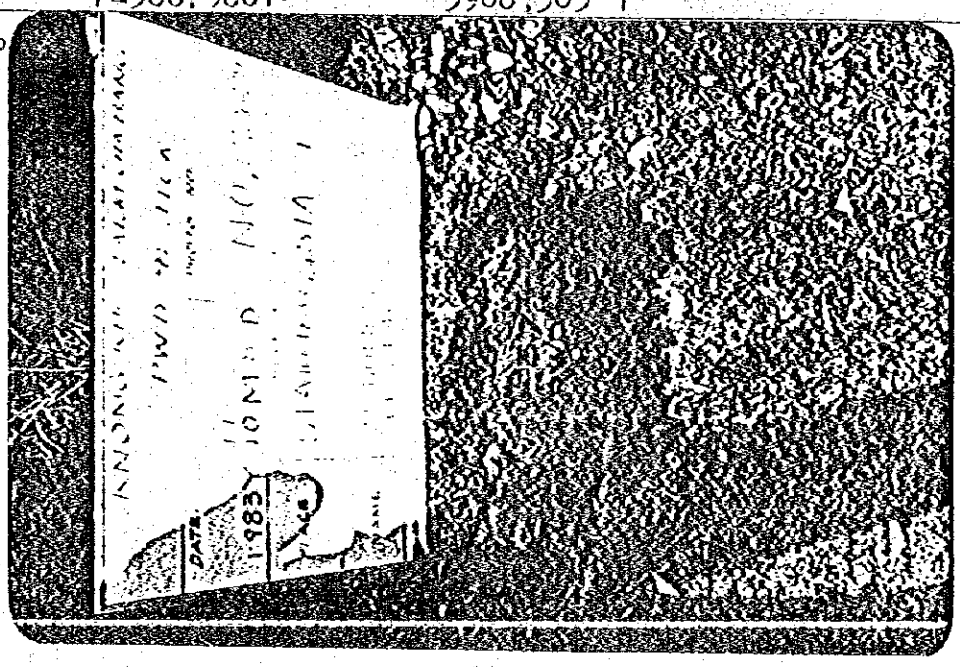
Sketch Map



DESCRIPTION OF POINT

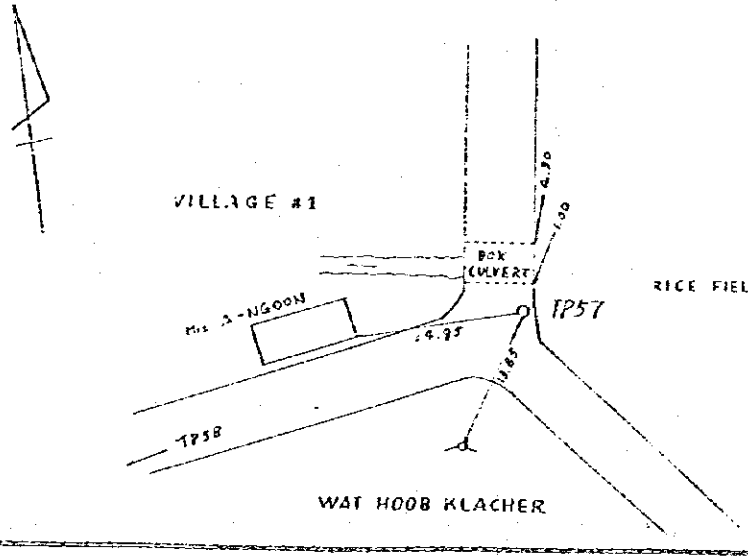
Station: TP 57	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: m 24 , 423
Northing: 74586.580 m	Easting: 5908.305 m	Grid And Zone:

Photo



MONUMENT TP57 is set on South-West part of the box-culvert about 100m from WAT HOOB KRACHER

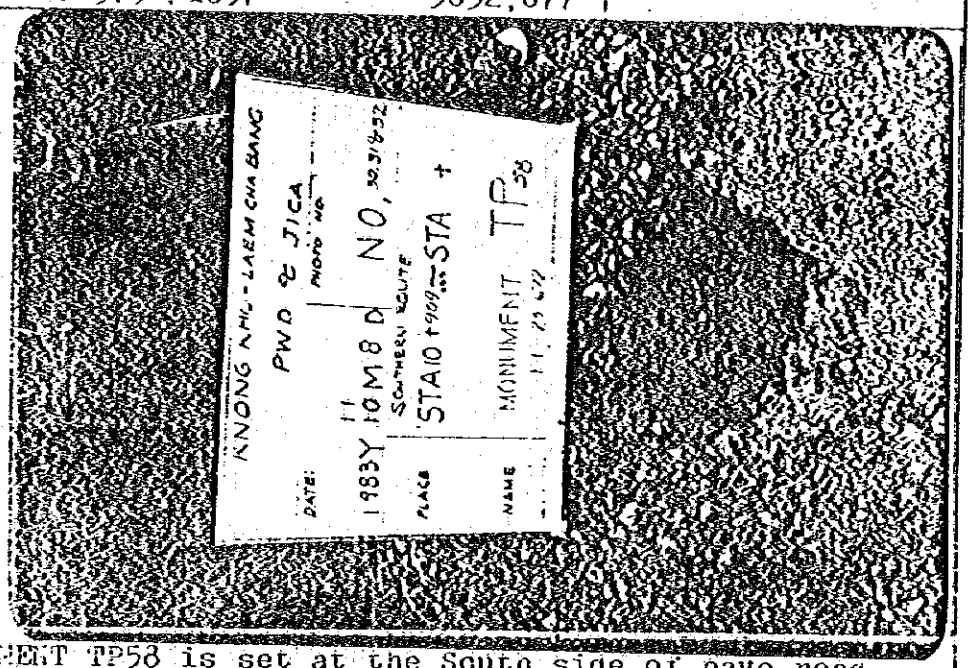
Sketch Map



DESCRIPTION OF POINT

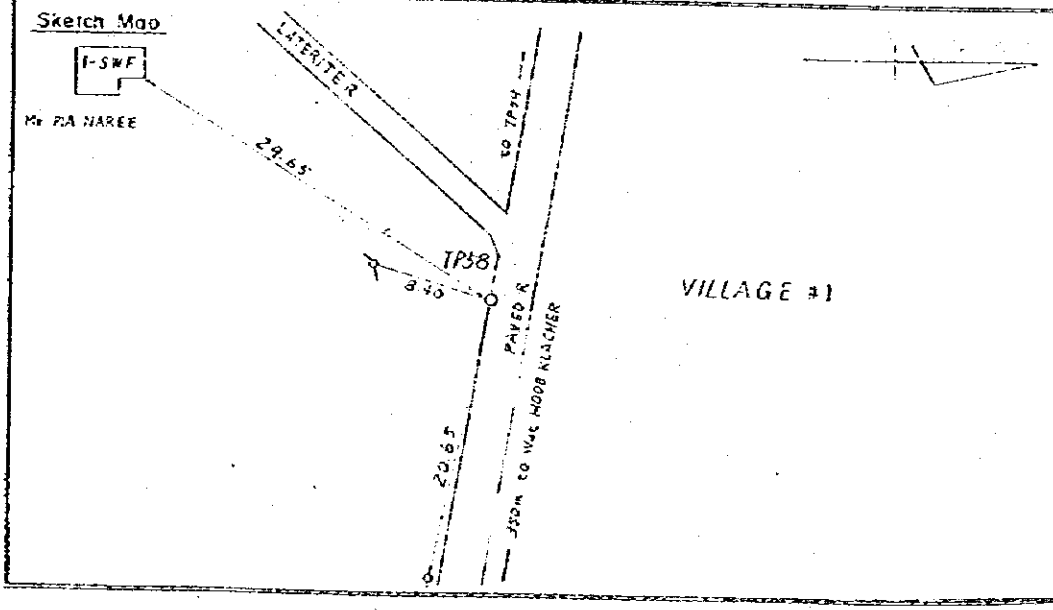
Station: TP 58	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 23 m, 672
Northing: 74579 m, 189	Easting: 5632 m, 677	Grid And Zone:

Photo



MONUMENT TP58 is set at the South side of pave road between village#1 BUENG district and village#5 NONG KHAM district and about 350m west of WAT HOOB KRACHER

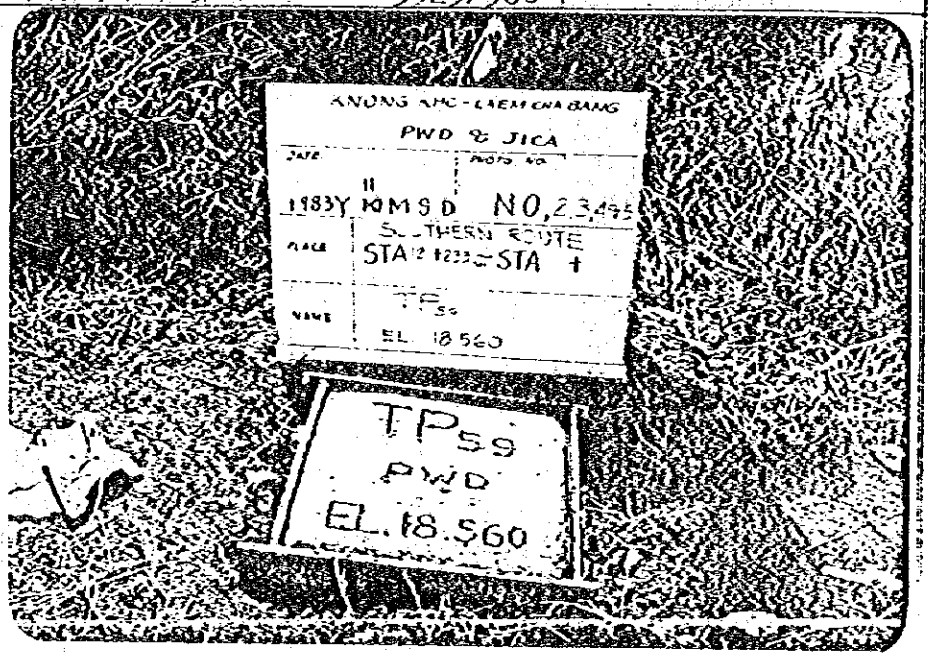
Sketch Map



DESCRIPTION OF POINT

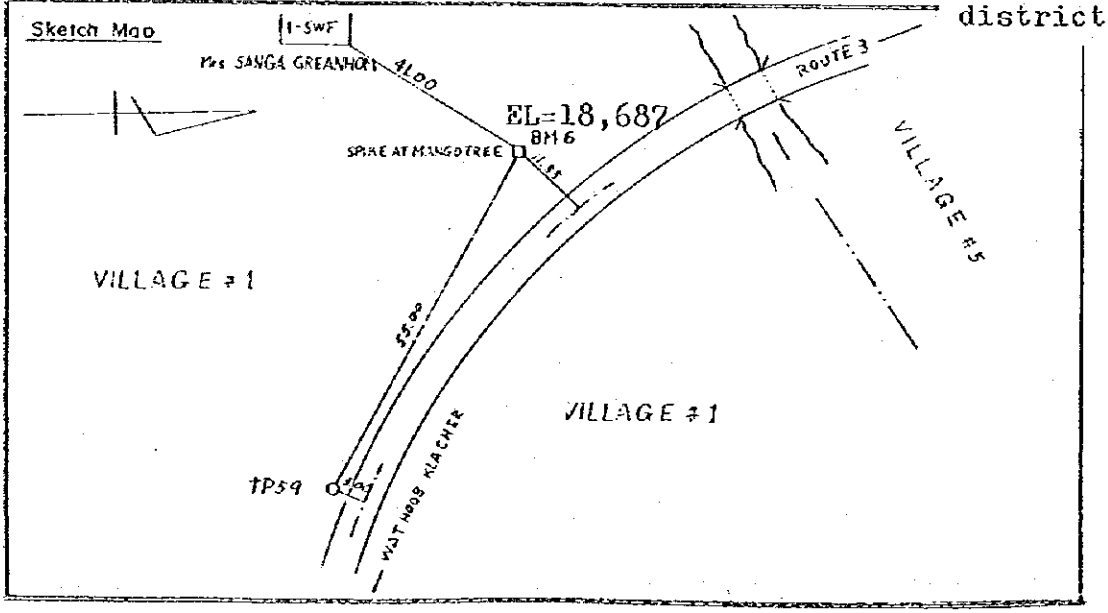
Station: TP 59	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: m 18.560
Northing: 74709 m, 409	Easting: 3925 m, 560	Grid And Zone:

Photo



MONUMENT TP59 is about 260m west of a R,C, bridge crossing the water way, dividing NONG KHAM and BUENG district

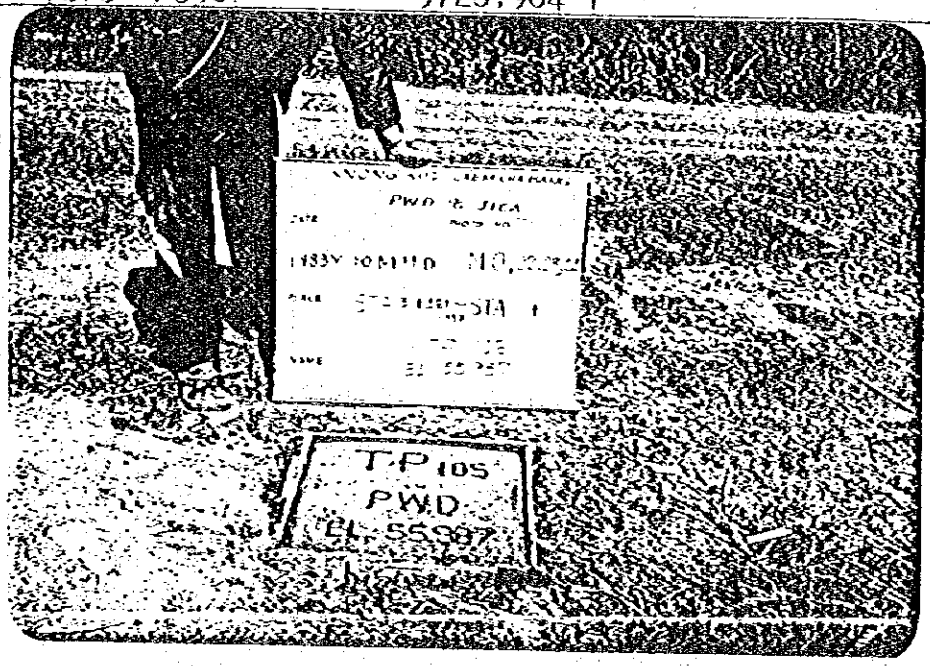
Sketch Map



DESCRIPTION OF POINT

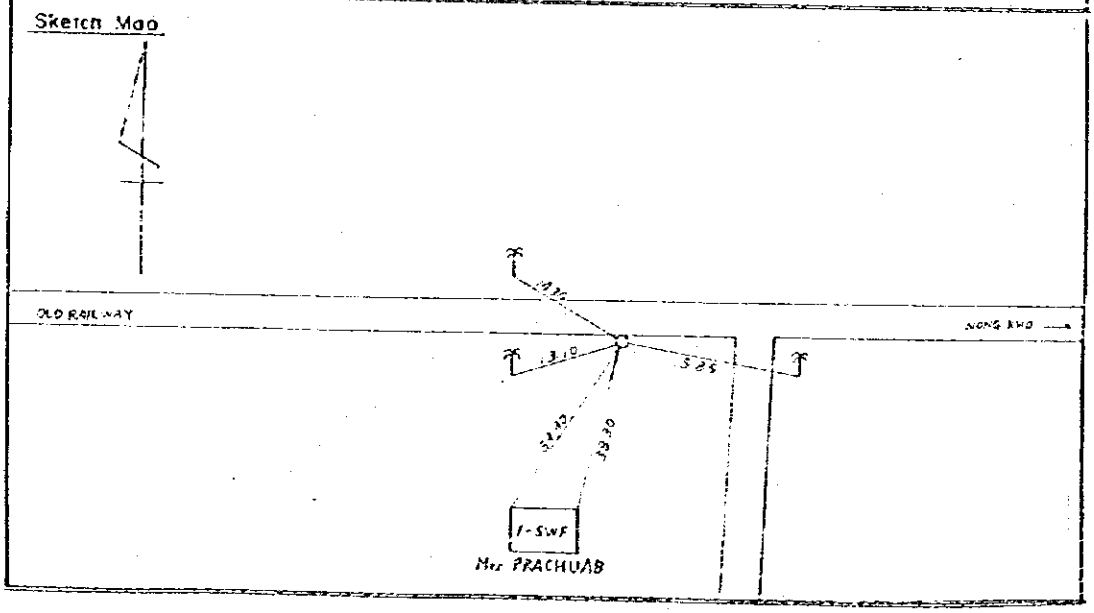
Station:	Type of Mark:	Locality:
TP.105	MONUMENT	
Latitude: ° ' "	**Longitude:** ° ' "	**Elevation:** m
		55.987
Northing:	**Easting:**	**Grid And Zone:**
7876^{m}4.850	9728^{m}.984	

Photo



Monument TP105 is set on the South side of the old railroad; Distance of 3,5KM west of NONG KHO DAM

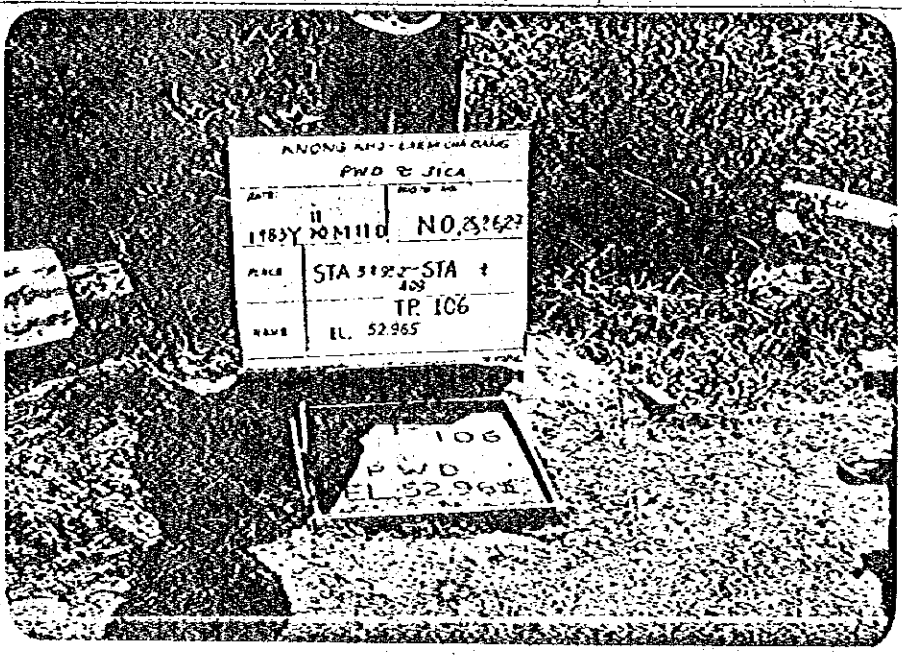
Sketch Map



DESCRIPTION OF POINT

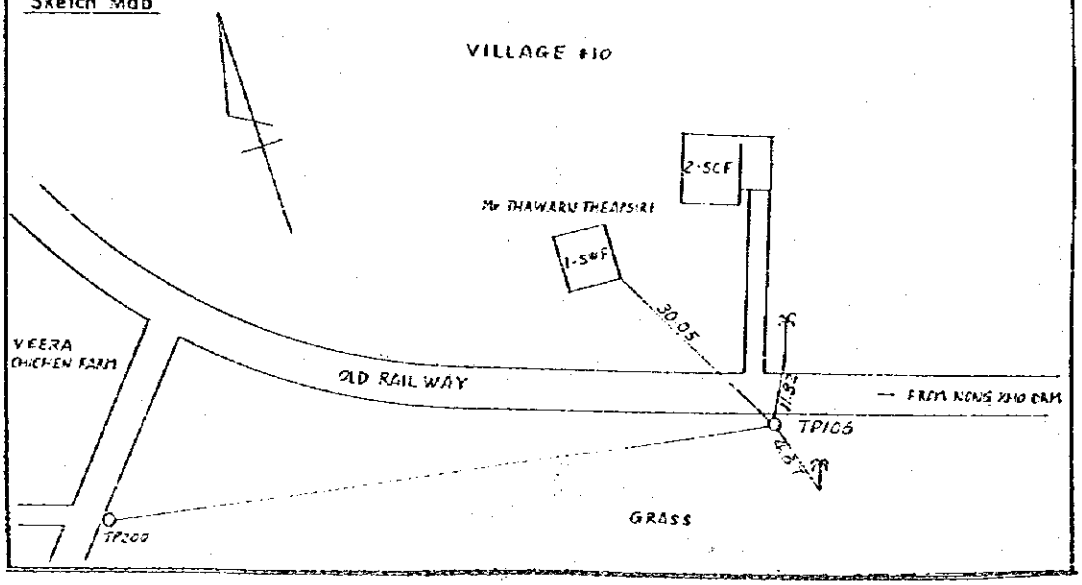
Station:	Type of Mark:	Locality:
TP.106	MONUMENT	
Latitude: ° ' "	**Longitude:** ° ' "	**Elevation:** 52.965 m
Northing: 78787.816 m	**Easting:** 9281.093 m	**Grid And Zone:**

Photo



Monument TP106 is set along old railroad
Distance about 3KM, west of NONG KHO DAM

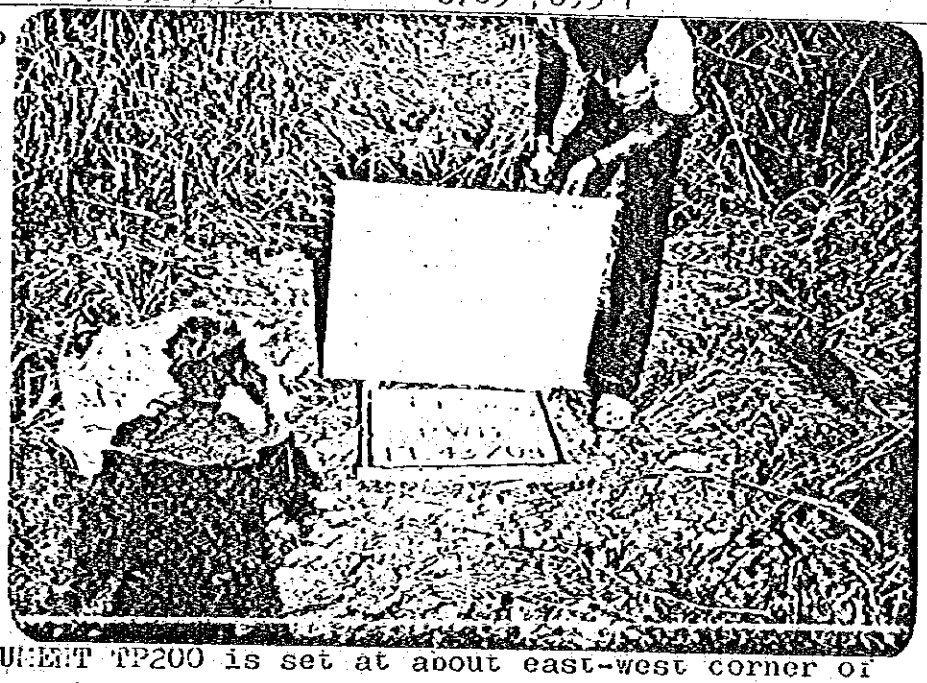
Sketch Map



DESCRIPTION OF POINT

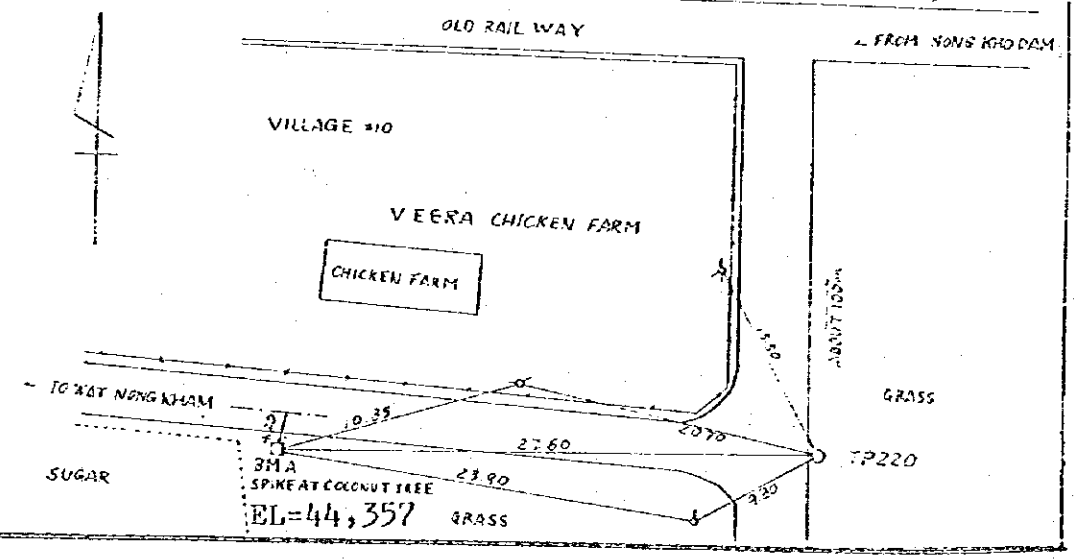
Station: TP200	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 43.^{m}703
Northing: 78638.^{m}054	Easting: 8705.^{m}893	Grid And Zone:

Photo



MONUMENT TP200 is set at about east-west corner of Veera Chicken Farm which is about 4KM in distance along the old railroad from NONG KHO DAM

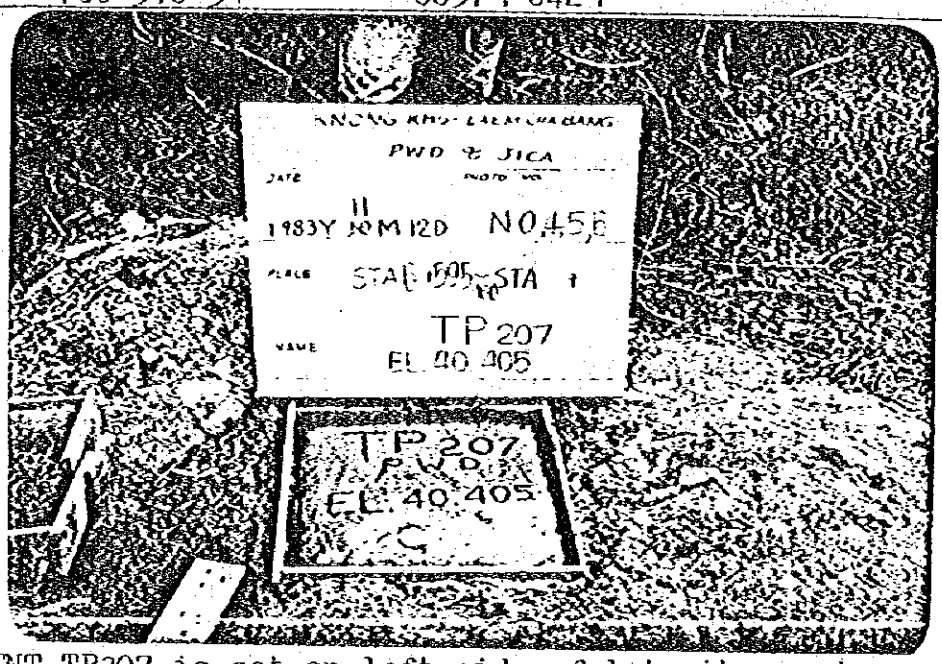
Sketch Map



DESCRIPTION OF POINT

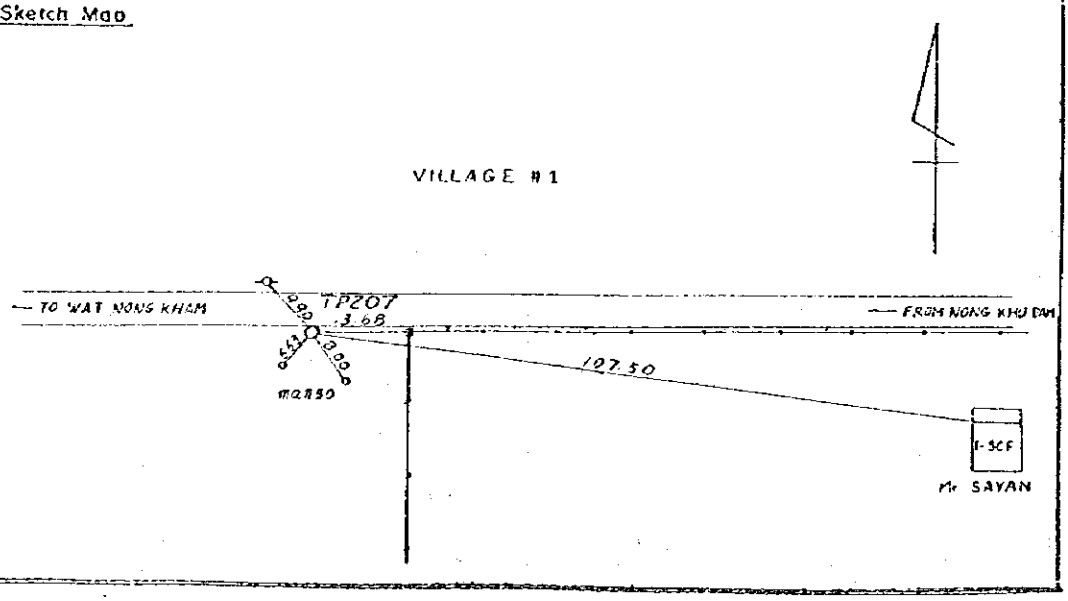
Station: TP 207	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 40.405 m
Northing: 78643.643 m	Easting: 6657.642 m	Grid And Zone:

Photo



MONUMENT TP207 is set on left side of laterite road (old rail road), Distance from TP207 to NONG KHO DAM is about 6KM and 1.3KM to WAT NONG KHO on the west

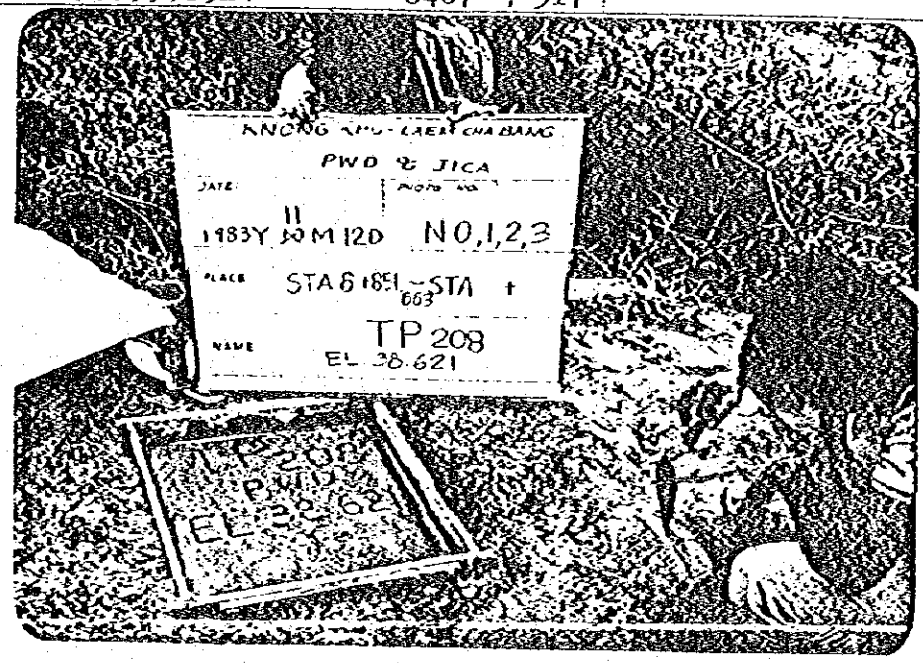
Sketch Map



DESCRIPTION OF POINT

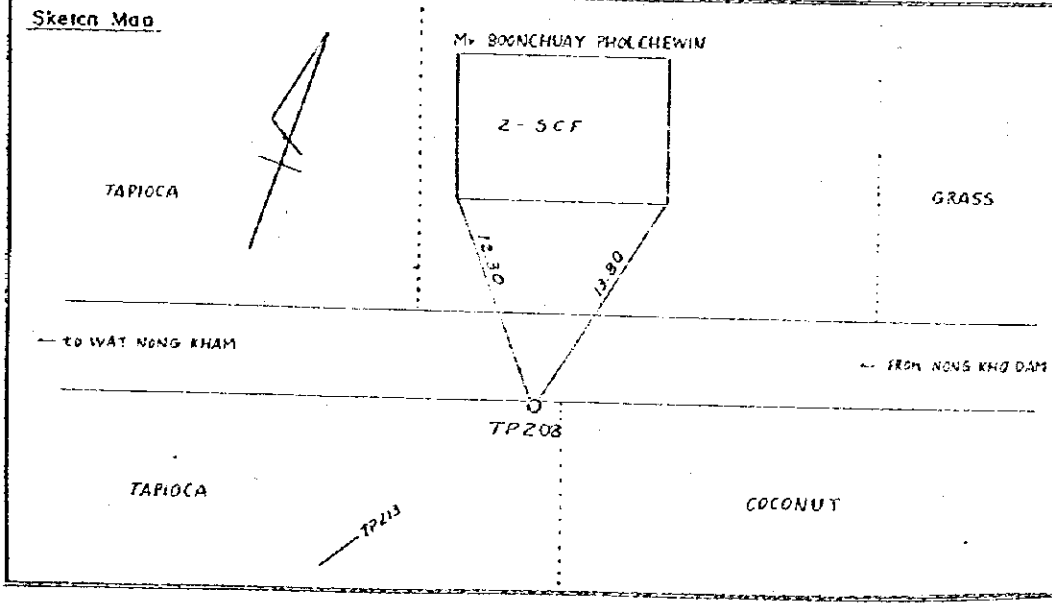
Station: TP 208	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 38 m, 621
Northing: 78699 m, 631	Easting: 6407 m, 317	Grid And Zone:

Photo



MONUMENT TP208 is set on left side of old rail road about 1KM east of WAT NONG KHAM and about 6KM from NONG KHO DAM

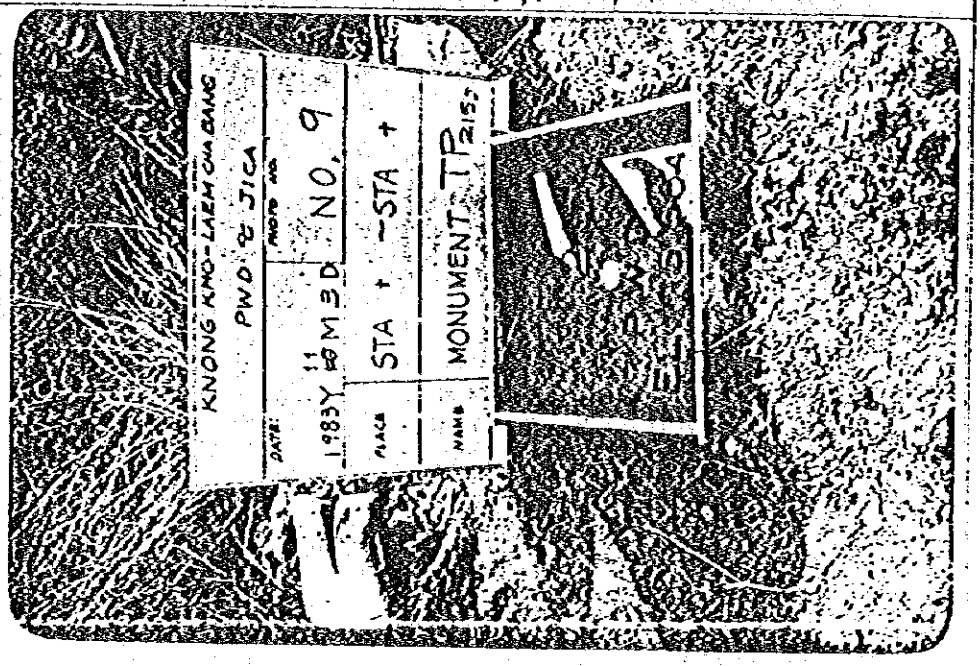
Sketch Map



DESCRIPTION OF POINT

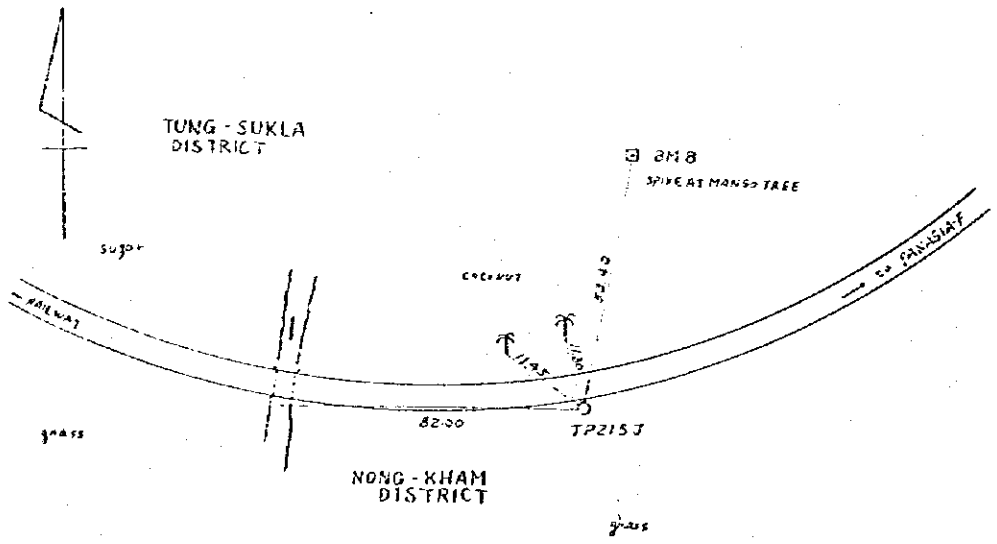
Station: TP.215J	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 15.584 m
Northing: 75138.619 m	Easting: 2769.468 m	Grid And Zone:

Photo



82m east of the boxculvert or water way dividing district of TUNG SUKLA andDISTRICTof NONG KHAM

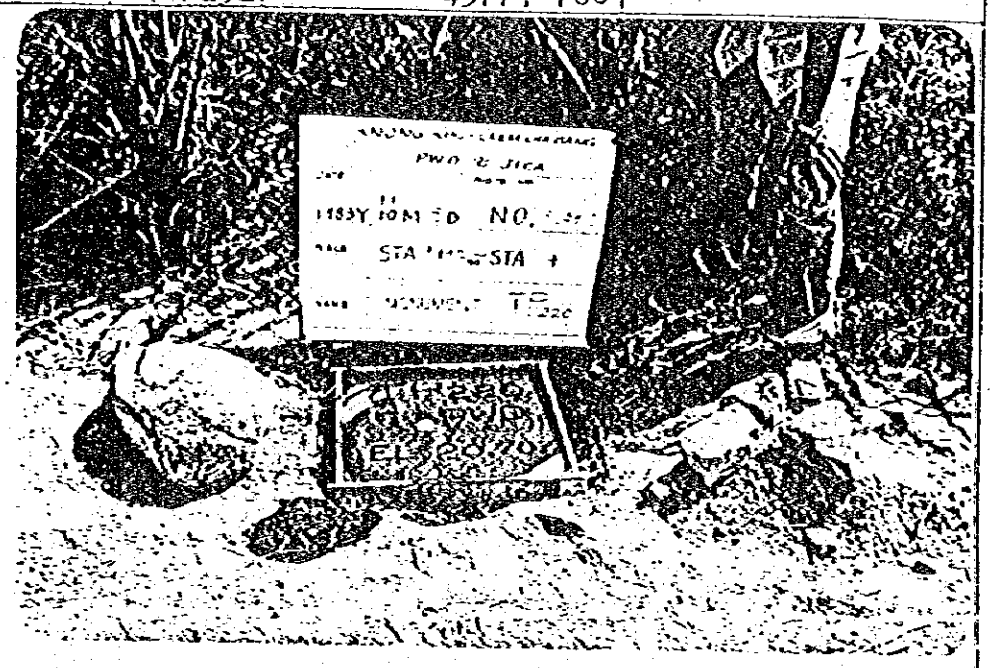
Sketch Map



DESCRIPTION OF POINT

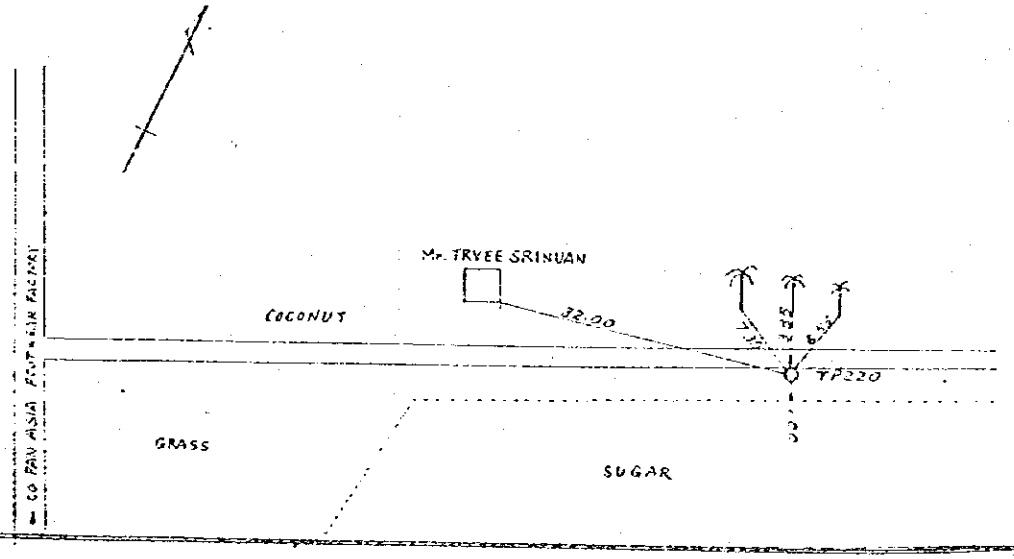
Station: TP 220	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 20 m. 707
Northing: 76914 m. 232	Easting: 4377 m. 760	Grid And Zone:

Photo



MONUMENT TP220 is set on the laterite road about 1,2KM from the PAN ASIA FOOTWEAR FACTORY

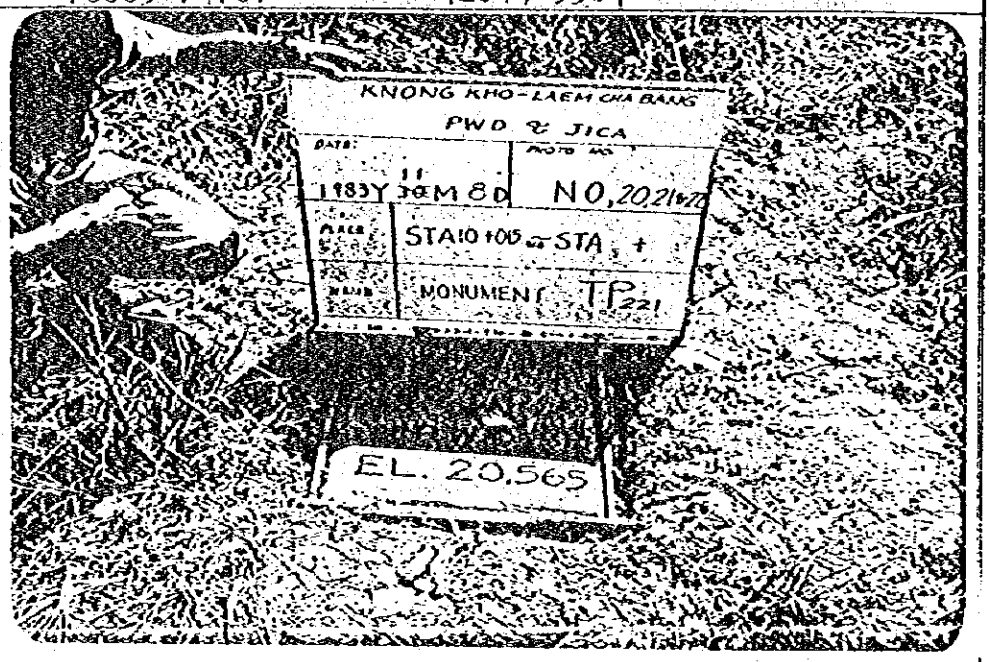
Sketch Map



DESCRIPTION OF POINT

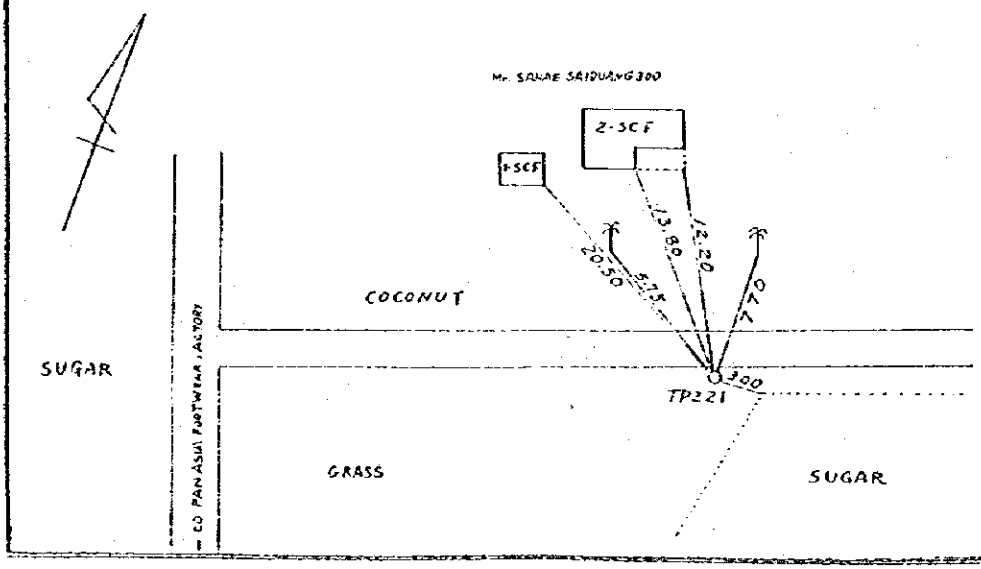
Station: TP 221	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 20 m, 565
Northing: 76865 m, 476	Easting: 4284 m, 938	Grid And Zone:

Photo



MONUMENT TP 221 is set on the laterite road about 800m from the PAN ASIA FOOTWEAR FACTORY

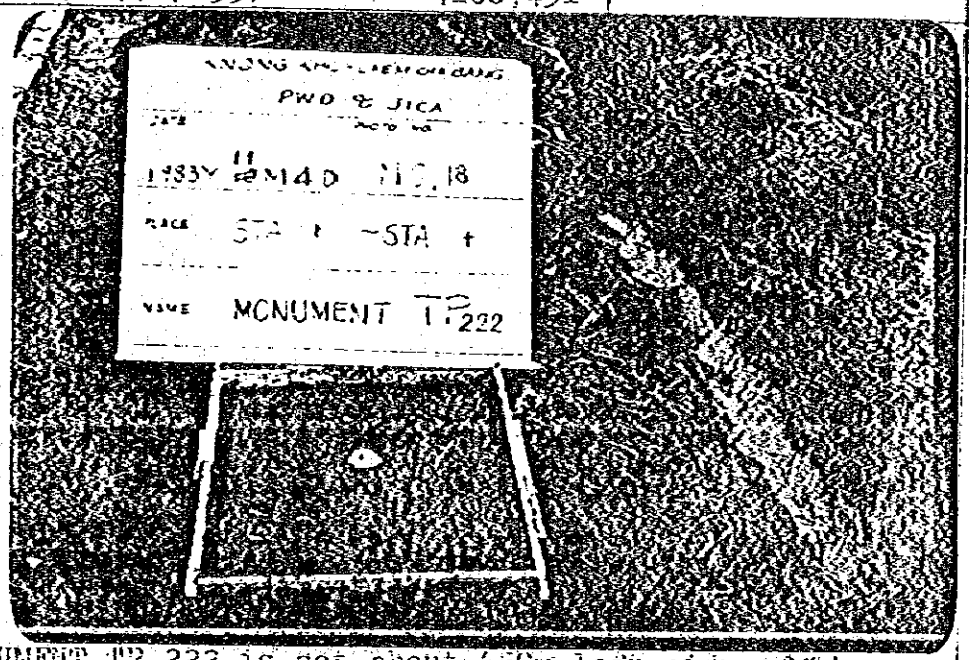
Sketch Map



DESCRIPTION OF POINT

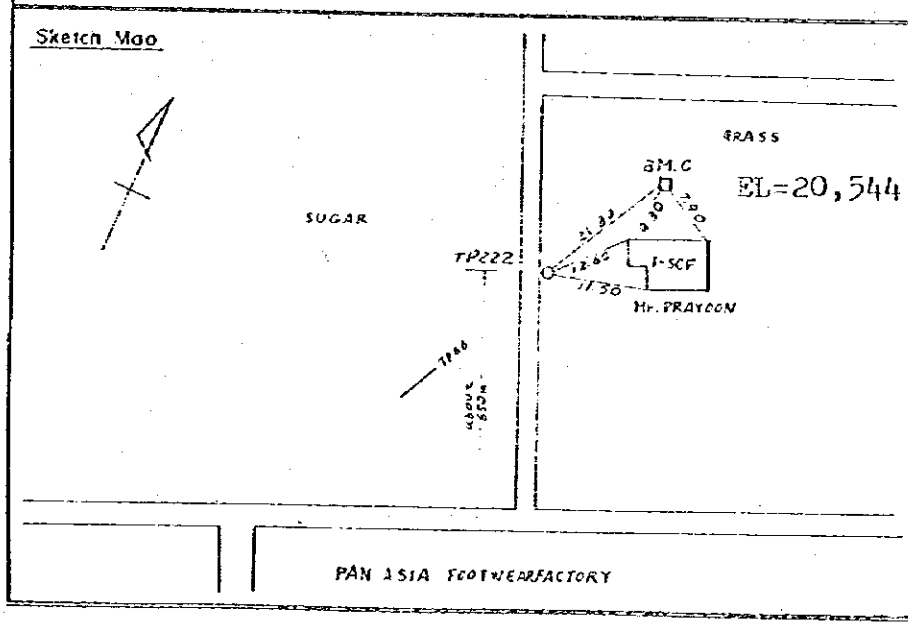
Station: TP 222	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 20.493 m
Northing: 76677.033 m	Easting: 4168.431 m	Grid And Zone:

Photo



MONUMENT TP 222 is set about 650m left side of the laterite road ended at the paved road along the side of PAN ASIA FOOTWEAR FACTORY

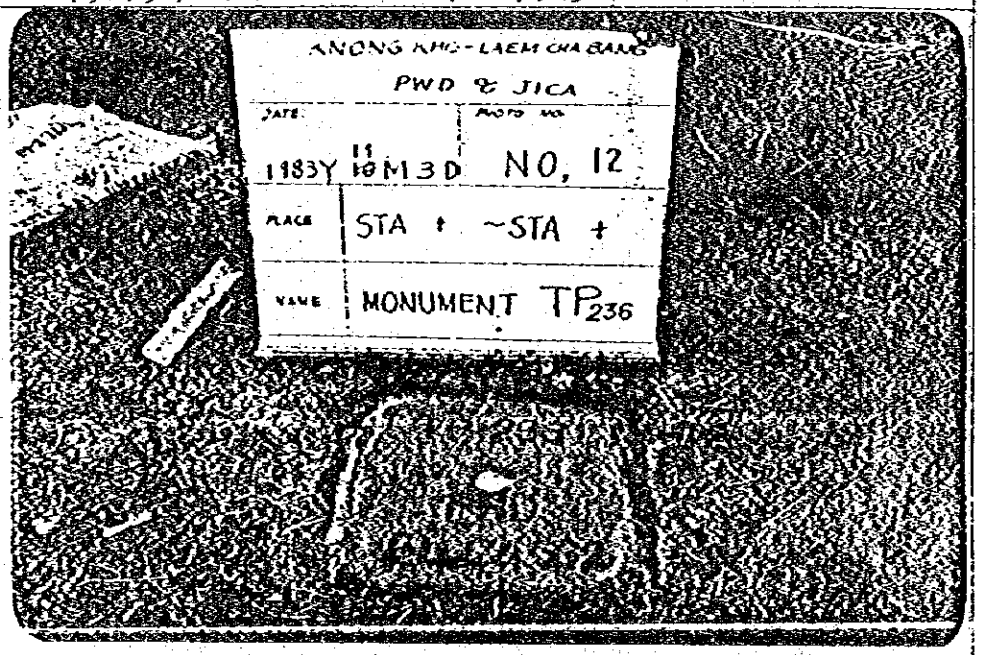
Sketch Map



DESCRIPTION OF POINT

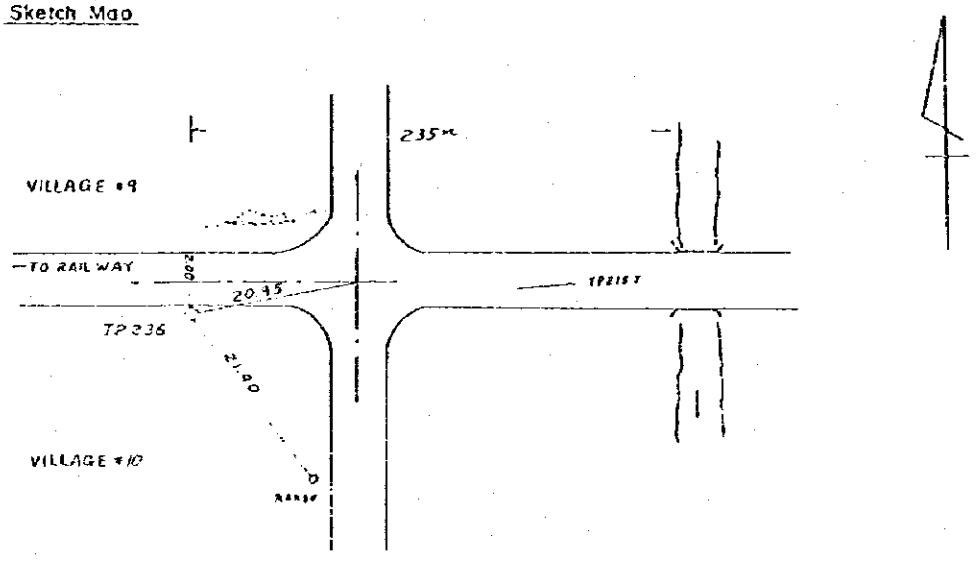
Station: TP,236	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 24.592 m
Northing: 75173.060 m	Easting: 2421.943 m	Grid And Zone:

Photo



MONUMENT TP,236 is set on left side of laterite road dividing village #9 and #10 TUNG SUKLA district and about 235m east of TUNG SUKLA district and NONG KHAN

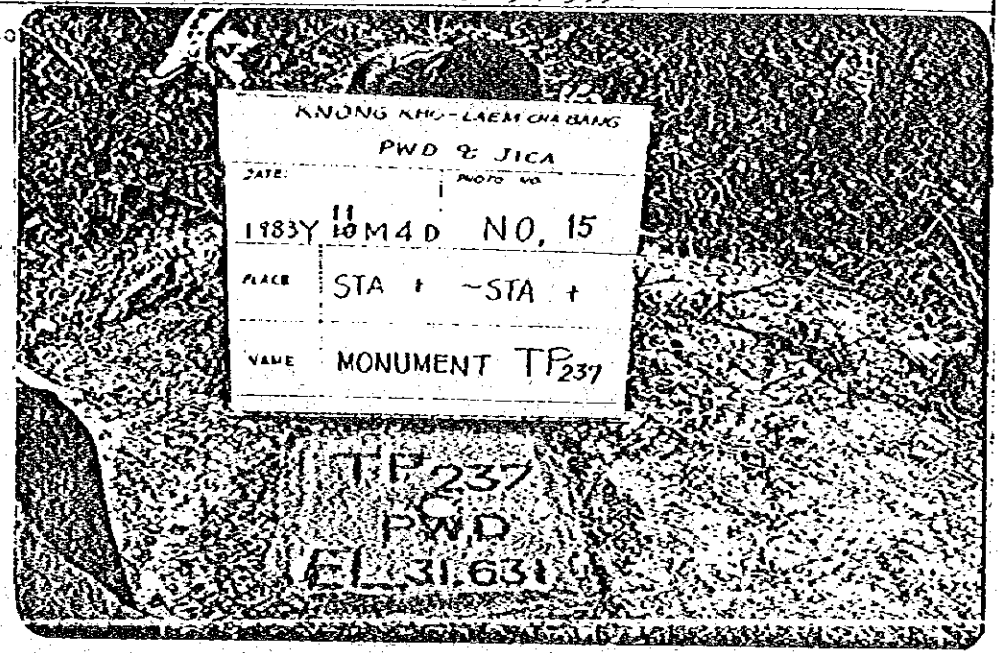
Sketch Map



DESCRIPTION OF POINT

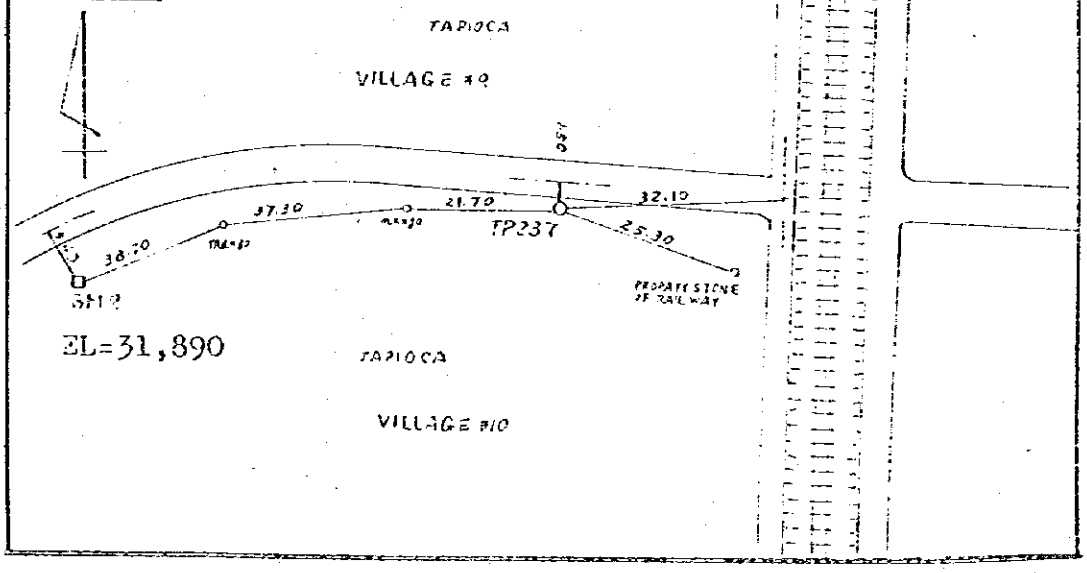
Station: TP,237	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 31 m .631
Northing: 75261 m .767	Easting: 2115 m .395	Grid And Zone:

Photo



TP,237 is set on the left of the laterite road dividing village#9 and #10 TUNG SUKLA district and it is about 32m east of laterite road running parallel with the new railroad

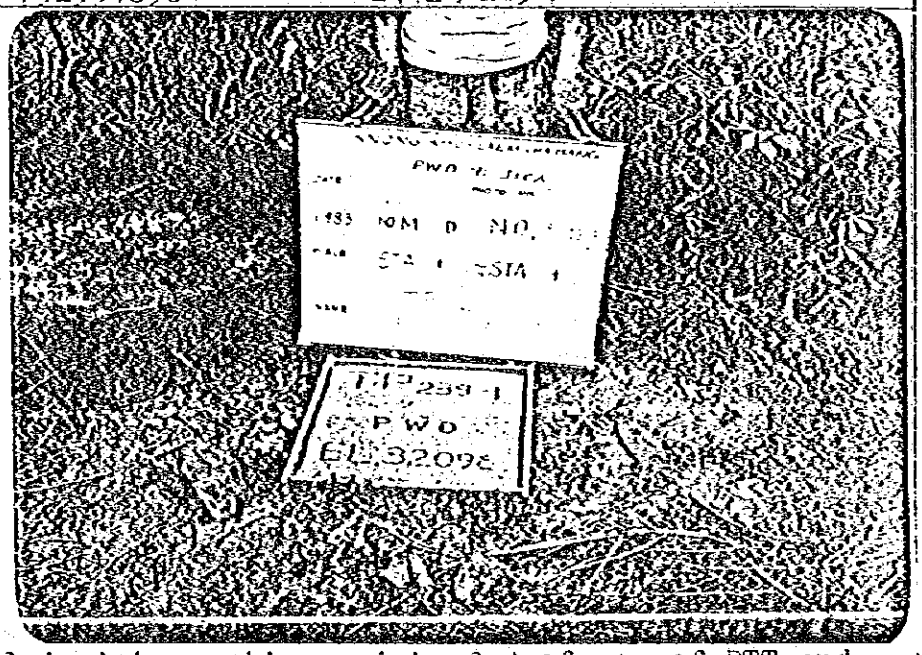
Sketch Map



DESCRIPTION OF POINT

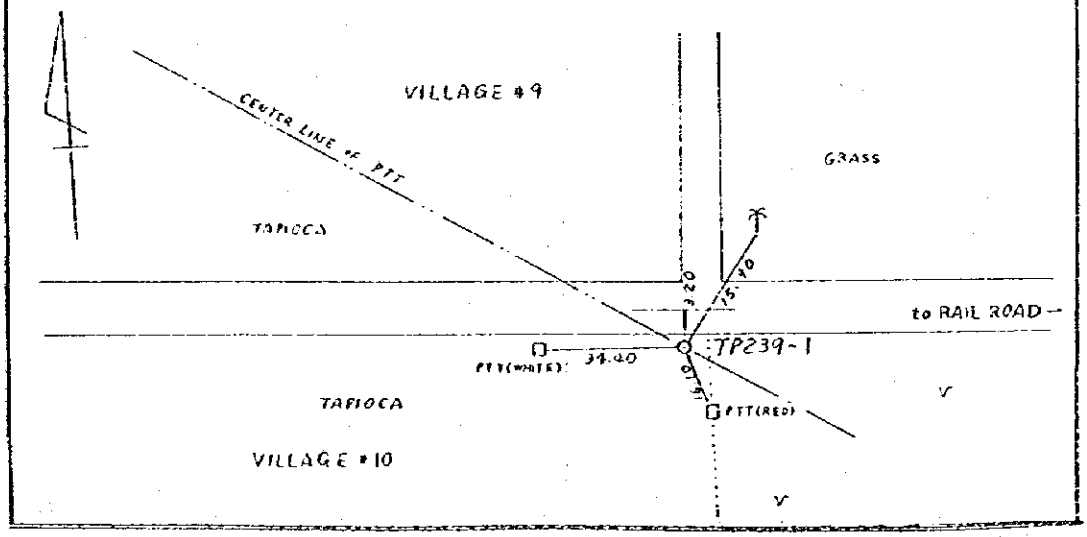
Station: TP239-1	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 32.098 m
Northing: 75159.656 m	Easting: 1442.115 m	Grid And Zone:

Photo



TP239-1 is intersection point of ℄ of row of PTT and surveying line, approximately the place where the laterite road dividing village#9 and #10, TUNG SUKLA district crossing with ROW of PTT

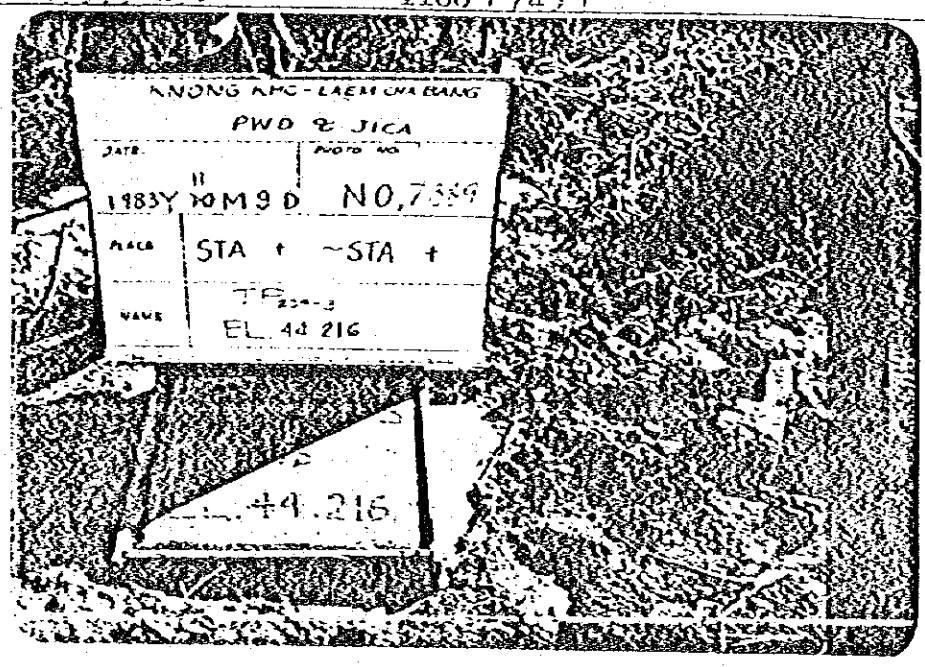
Sketch Map



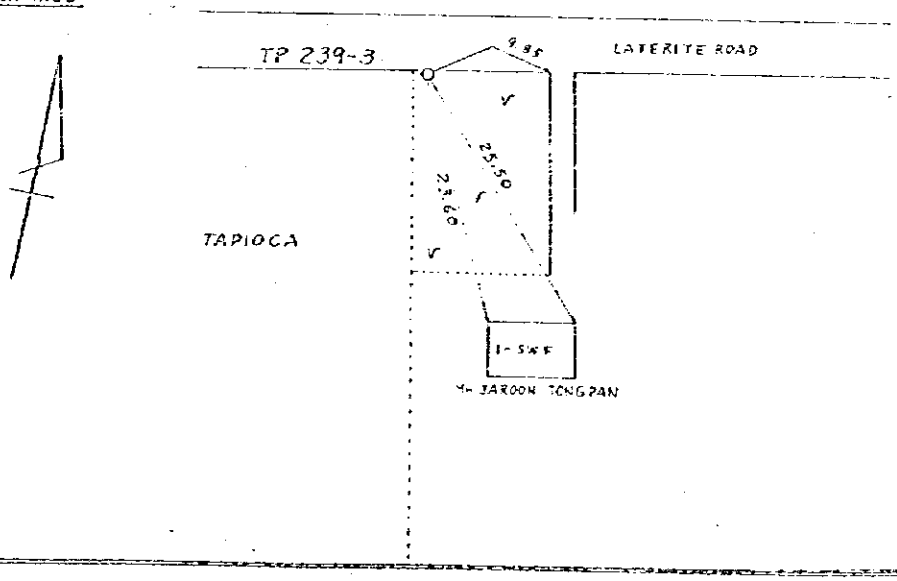
DESCRIPTION OF POINT

Station:	Type of Mark:	Locality:
TP239-3	MONUMENT	
Latitude: ° ' "	**Longitude:** ° ' "	**Elevation:** m
		44.216
Northing: m	**Easting:** m	**Grid And Zone:**
75593.130	1188.743	

Photo



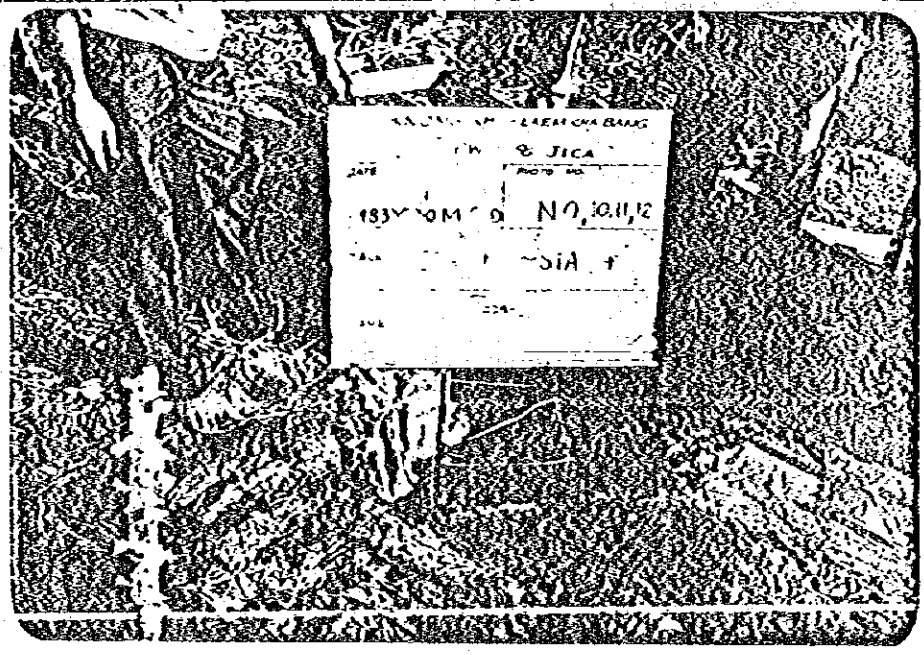
Sketch Map



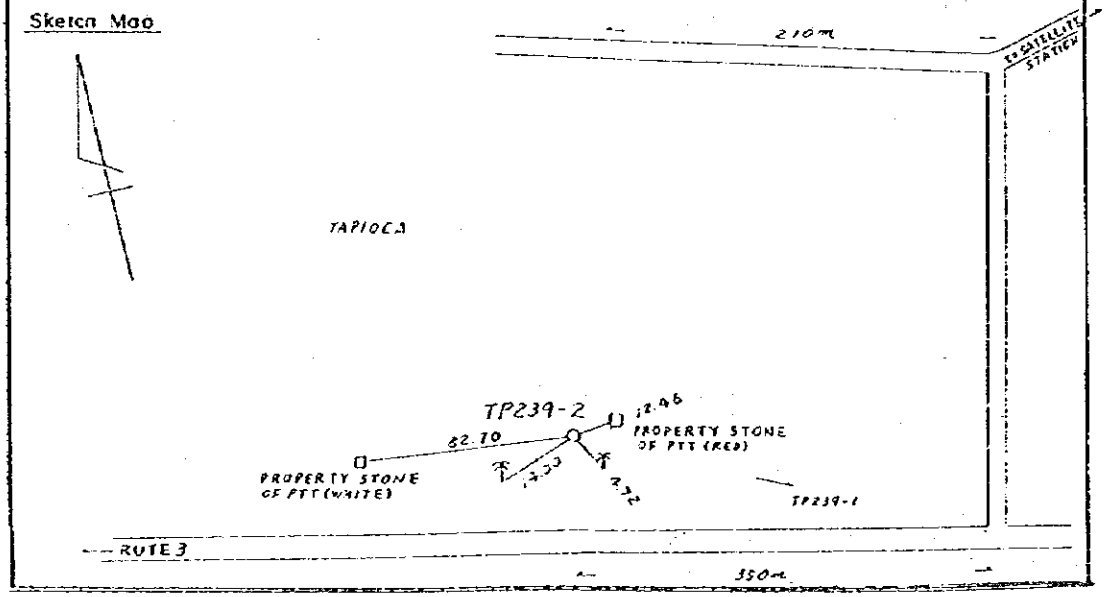
DESCRIPTION OF POINT

Station:	Type of Mark:	Locality:
TP239-2	MONUMENT	
Latitude: ° ' "	Longitude: ° ' "	Elevation: m 41, 489
Northing: m 75240, 109	Easting: m 1106, 394	Grid And Zone:

Photo



Sketch Map



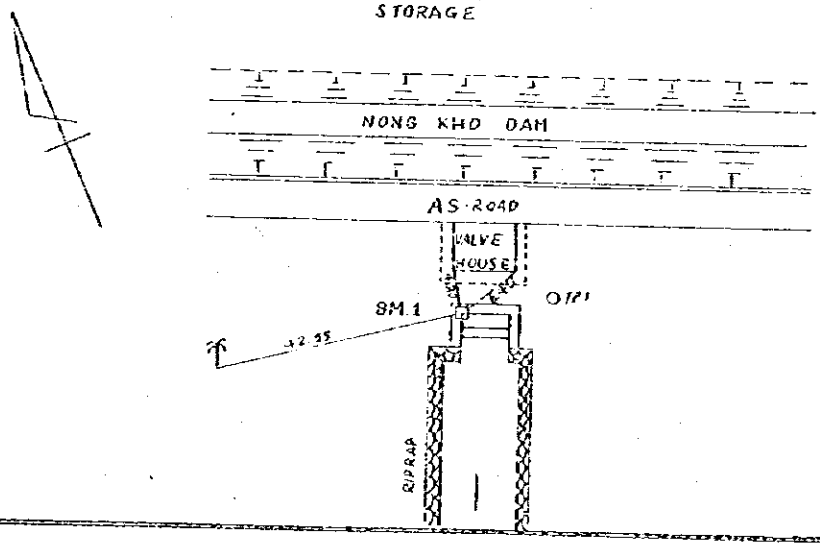
DESCRIPTION OF POINT

Station: BM1	Type of Mark: PAINT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 58.210 m
Northing: m	Easting: m	Grid And Zone:

Photo

BM1 is the corner of concrete outlet of the valve house

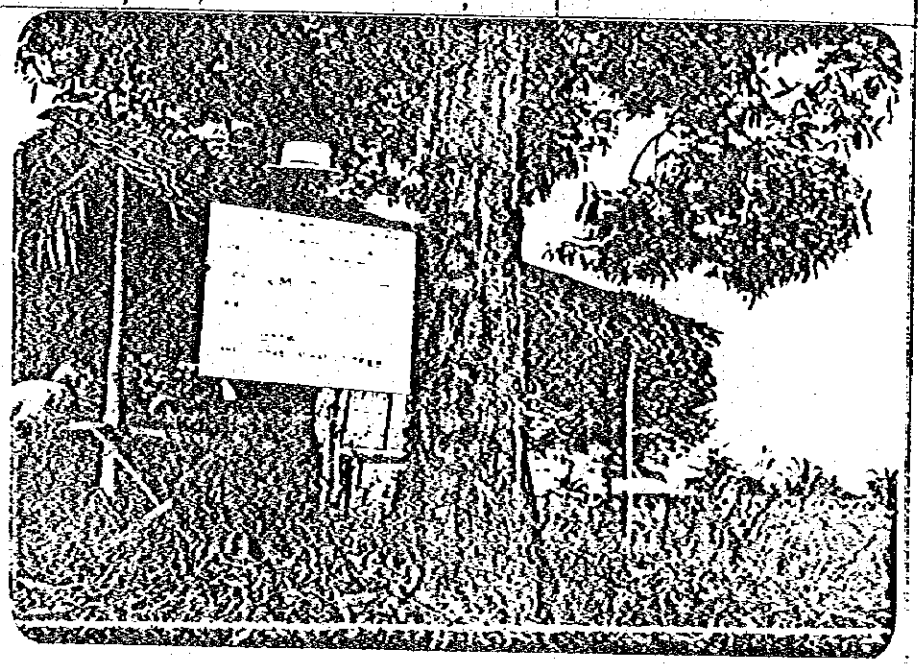
Sketch Map



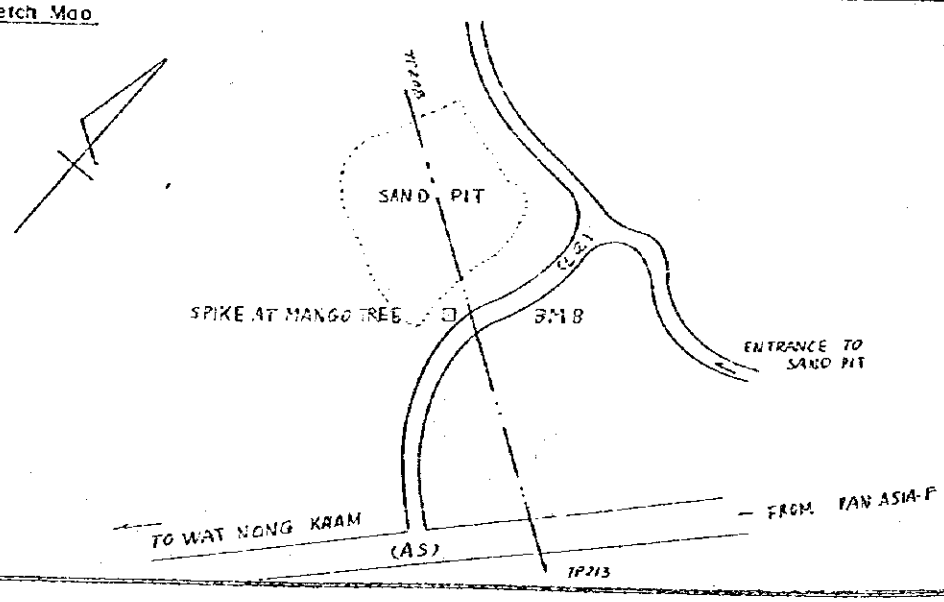
DESCRIPTION OF POINT

Station: BM, B	Type of Mark: SPIKE	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: m 37.608
Northing: m	Easting: m	Grid And Zone:

Photo



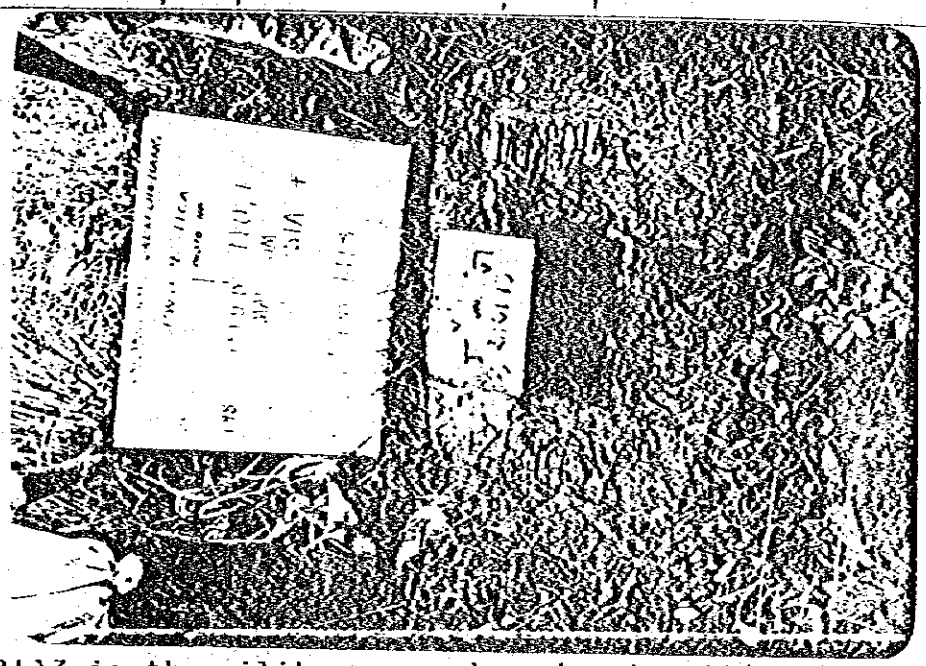
Sketch Map



DESCRIPTION OF POINT

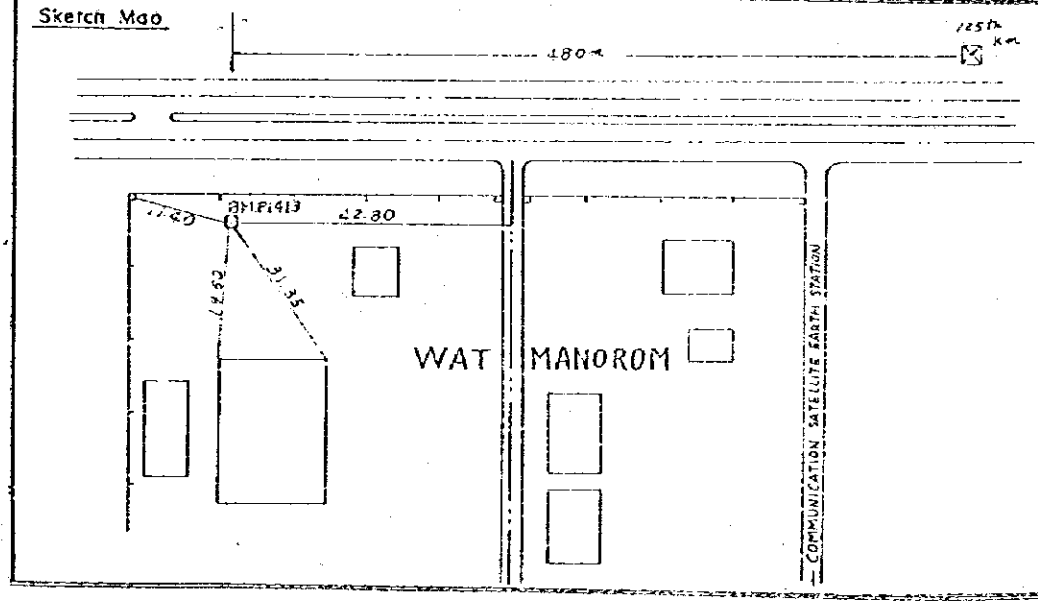
Station: BM,P 1413	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: m 22.379
Northing: m	Easting: m	Grid And Zone:

Photo



BM,P1413 is the military-map-department setting inside (near south-west coner of WAT MANOROOM) distance by KM'post from BANG.KOK is 125.48KM by route3

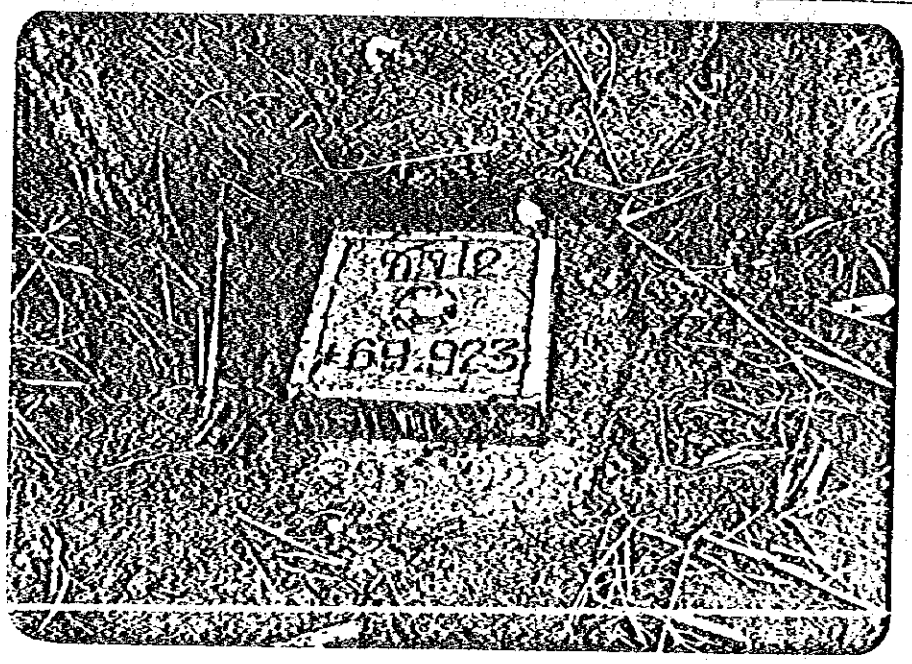
Skerch Map



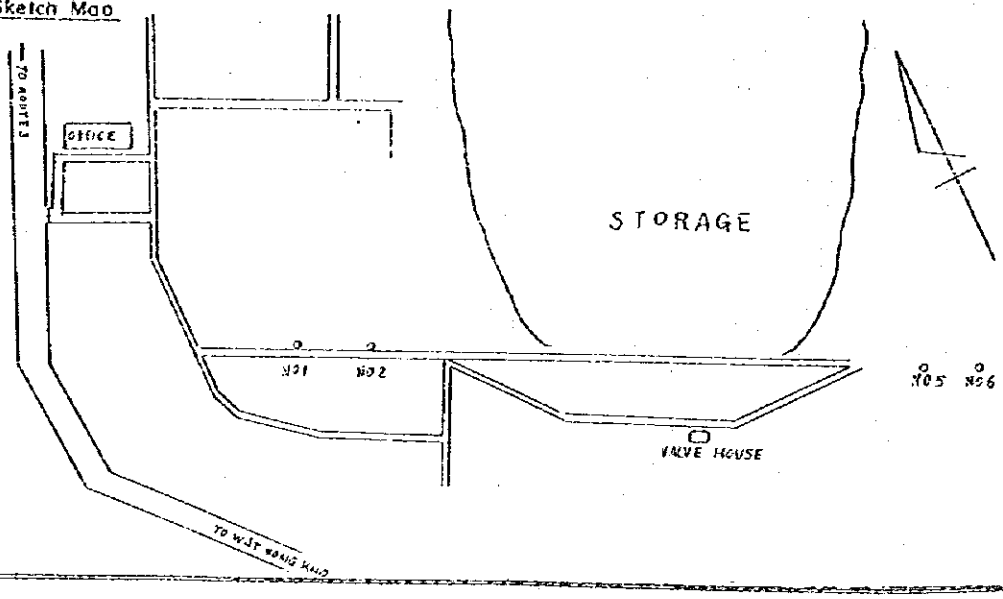
DESCRIPTION OF POINT

Station: BM.NO2	Type of Mark: MONUMENT	Locality:
Latitude: ° ' "	Longitude: ° ' "	Elevation: 69 m,923
Northing: 80122 m,680	Easting: 11502 m,948	Grid And Zone:

Photo



Sketch Map



SUPPORTING REPORT II

HYDROLOGY

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1. INTRODUCTION

The study on hydrology is focused to the following purposes;

(1) To grasp the hydrological condition of the river basin in the Study Area.

(2) To estimate the run-off at the Nong Kho and Map Prachan dams.

(3) To analyze the available water supply capacity from these dams.

(4) To test water quality of the Nong Kho reservoir and the Huai Kong Dai river.

The field study was conducted in cooperation with PWD counterpart and JICA expert during the period from August to November in 1983. The river basins were reconnaissanced to gain acquaintance with condition of the rivers and meteo-hydrological data were collected from various agencies concerned. The hydrological analysis in the field study was further elaborated through a study in Japan and the results were compiled in this Supporting Report.

2. GENERAL HYDROLOGICAL CONDITIONS OVER STUDY AREA

The Study Area extends over Sri Racha and Bang Lamung Districts in Chon Buri Province, which forms a part of Eastern Seaboard Development Area. It is broadly divided in the Khlong Bang Lamung river and Huai Nong Pru riverbasins. The former drains 301 km^2 at estuary and the latter 103 km^2.

The climate over the Study Area is tropical and monsoonal. There are two distinct seasons in a year. Dry season with the northeast monsoon lasts from November to April, while wet season with the southwest monsoon extends from May to October. As seen in isohyetal map in Fig. 1, the Study Area receives approximately 1,300 mm of rainfall annually. More than 80 % of the annual rainfall occurs during the wet season. Climatic features in and around the Study Area is shown in Table 1. The recording period and the location of each gauge station is shown in Figs. 2 and 3 respectively.

There are two multi-purpose dams in the Study Area. One is the Nong Kho dam, which was completed by the RID in 1983, aiming at supplying the industrial and domestic water in and around the Laem Chabang Complex and irrigation water in the Bang Lamung river basin and the flood control. It is located on the Khlong Nong Kho river, a tributary of the Khlong Bang Lamung river, and has a catchment area of 59 km^2. The other dam is the Map Prachan dam. It was built also by the RID in 1979 astride both the Map Prachan and Map Tao Kiat rivers, tributaries of the Huai Nong Pru river. The catchment area at the damsite is 37.9 km^2. The Map Prachan dam is presently meeting the domestic and tourism water demand in Pattaya, supplying the industrial water for a tapioca processing factory and releasing the irrigation water.

According to the RID's document, salient features of both the Nong Kho and Map Prachan dams as well as the Bang Phra dam are as shown in Table 2. The average annual inflows into the Nong Kho and Map Prachan dams are stated to be 16 x 10^6 m^3 and 14 x 10^6 m^3 respectively. However, back data to prove the said figures were hardly made available. The hydrological analysis, therefore, were concentrated to run-off analysis of the both the Khlong Nong Kho and Map Prachan rivers.

3. RUN-OFF ANALYSIS

3.1 General Description

The meteo-hydrological observation in Thailand is chiefly carried out by Meteorological Department (MD) and Royal Irrigation Department (RID). The MD mainly conducts the climatological observation over Thailand. The RID compiles the meteo-hydrological data such as rainfall, evaporation and stream flow for the purposes of irrigation and water resources development projects.

At present, there are two rain gauges, Si Racha and Bang Lamung, in the Study Area. A semi-synoptic climatological station is installed in Bang Phra damsite, which is located adjacent to the Study Area. There is no stream gauge station in the Study Area. In the vicinity of the Study Area, the observed stream records are available at Dok Krai dam in the Khlong Dok Krai river, which founds on the Khlong Nong Kho river.

3.2 Available Data

As mentioned in Section 3.1, no observed hydrological records are available for the Nong Kho and Map Prachan dams. For the purpose of the run-off analysis, the under-listed data are made available from the RID, MD and Hydrograph Department of Royal Thai Navy in Sattahip.

Data	Observatory
Rainfall	Bang Phra dam
Evaporation	Bang Phra dam, Chon Buri, U-Tapao
Reservoir operation record	Bang Phra dam, Map Prachan dam

In order to estimate the run-offs at the Nong Kho and Map Prachan damsites, run-off analysis was initially elaborated for the Bang Phra damsite by means of simulation of reservoir operation. For this purpose, data so far collected were carefully studied for their accuracy and adequacy. The followings are found out through the study:

(1) It has been clarified through the reservoir operation records that the evaporation records of the Bang Phra dam after July, 1981 have not been observed properly. It appears that an observer has not been acquainted himself with evaporation observation. In the run-off analysis, monthly evaporations during a period from July, 1981 to August, 1983 were assumed to be the same with the average monthly evaporation. Table 3 shows the monthly evaporations from open water surface, which is being obtained from the monthly pan evaporation multiplied by a evaporation coefficient of 0.7.

(2) Rainfalls of the Bang Phra dam recorded in the meteorological note are more reliable than those noted in the reservoir operation record. Table 4 presents the monthly rainfalls at the Bang Phra dam.

(3) The reservoir operation records of Map Prachan dam are not sufficient enough for run-off analysis because of a short length of record.

3.3 Simulation of Bang Phra Reservoir Operation

In order to estimate the inflow into the Bang Phra reservoir, simulation of reservoir operation was performed by means of the water balance method based on the actual reservoir operation records, evapoation and rainfall records and stage-storage-area curve of the Bang Phra reservoir. The water balance is expressed by the following equation.

$$\frac{dV}{dt} = I + R - O - E$$

where, dV; differential in reservoir storage at time "dt"
dt; time interval
I ; inflow into reservoir
R ; rainfall directly fallen on reservoir
O ; outflow from reservoir
E ; evaporation from reservoir

It was assumed that 25% of rainfall was regarded as inflow and the others were direct rainfall fallen on reservoir. The stage-storage-area curve of the Bang Phra reservoir is as shown in Fig. 4.

Run-offs at the Bang Phra damsite were calculated by means of the above reservoir simulation at 10-day interval from water year 1968 to 1982 as presented in Table 5. The simulated monthly run-offs of the Bang Phra damsite were compared with the observed monthly run-offs at the Dok Krai damsite in order to examine accuracy of the simulated run-offs. As shown in Fig. 5, there exists fairly good correlation between the simulated run-offs at the Bang Phra dam and the obvserved run-offs at the Dok Krai dam. The monthly run-offs of both damsites are presented in Tables 6 and 7.

3.4 Run-offs at Nong Kho and Map Prachan Damsites

The run-offs of the Nong Kho and Map Prachan damsites were derived from those of the Bang Phra damsite in proportion of catchment areas. The estimated monthly run-offs of the both damsites are shown in Tables 8 and 9.

4. DRAFT RATE ANALYSIS

The net draft rate means the rate of withdrawal of water from reservoir for intended purposes. In case of the Nong Kho and Map Prachan dams, the net draft rate consists of the domestic and industrial water supply and the river maintenance flow and will therefore be constant throughout the year. Since storage volume of the Nong Kho and Map Prachan dams have been given, the net draft is corresponding to annual water supply capcity.

Either graphic or arithmetic procedures are applied to compute the net draft rate. In the present study, the arithmetic procedures as applied in Section 3.3 was also employed in the draw down period including droughtest year, although the graphic procedure (mass-curve technique) was adopted for 15 years from 1968 to 1982 to find the above draw down period.

The stage-storage-area curves of the Nong Kho and Map Prachan reservoirs are shown in Figs. 6 and 7 respectively.

The simulation results of the Nong Kho and Map Prachan reservoirs are presented in Tables 10 and 11 respectively. As shown in Figs. 8 and 9, the net draft rate is 0.44 m^3/s or 13.9 x 10^6 m^3/yr for the Nong Kho dam and 0.31 m^3/s or 9.8 x 10^6 m^3/yr for the Map Prachan dam, for the standard drought year.

5. WATER QUALITY ANALYSIS

The RID has been conducting periodically the water quality tests of the Bang Phra, Map Prachan, Ban Bung and Phlu Ta Luang reservoirs in the eastern seaboard. The test results in the Map Prachan reservoir are shown in Table 12 and are cited and in Fig. 10.

Water samplings and water quality tests were conducted periodically throughout the field investigation period by the Study Team in collaboration with the PWD's laboratory. The purpose is to testify the usefulness of water in the Nong Kho reservoir and the Huai Kong Dai river as industrial and domestic water source. The results are summarized in Table 13.

It appears that there are some doubts about test results; in particular, in relations between total solids and total hardness and between non-carbonate hardness and concentrations of "Mg" and "SO_4", relation between value of bacterial test and total nitrogen and value of COD. It is therefore strongly advisable to continue further water quality test in the Nong Kho reservoir with more graded-up laboratory testing.

As far as water influent to the Nong Kho reservoir is concerned, it is classified into class 2 in the light of NEB's water quality criteria of fresh surface water. This class is defined as good quality water source and can be used for consumption and supply after general treatment, conservation of aquatic life with regard to fishery, agriculture, recreation, etc. Assuming that the results of bacterial tests are correct, pre-chlorination is required for the water treatment process. Pre-chlorination process is effective for destroying pathogenic bacteria, algae, oxidizing nitogen compounds, microorganisms, ferrus ion etc.

At present, there are no any particular pollutant sources in the watersheds of the Nong Kho dam and the Huai Kong Dai river. Probable source of pollution in future is deemed to be poultry farms and human waste. Sewage from these sources are being disposed by pit latrines. It is foreseeable that amount of sewage would increase largely in future due to expansion of economic activities and growth of population. It is advisable to monitor the water quality carefully and to establish appropriate measure for watershed management for conservation of the water resources and quality.

TABLES

Table 1 SUMMARY OF CLIMATE

(Recorded at Chon Buri Observatory, except evaporation and rainfall)

Climatological Features	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual	Data Source
Air Temperature (°c)														(1)
Mean	25.9	27.4	28.8	29.6	29.3	28.9	28.6	28.3	27.9	27.3	26.7	25.8	27.9	
Mean Max.	31.3	32.1	33.2	34.1	33.3	32.5	31.9	31.6	31.2	31.3	31.1	31.0	32.0	
Mean Min.	20.1	22.4	24.2	25.4	25.4	25.5	25.0	24.9	24.4	23.8	22.1	20.3	23.6	
Extreme Max.	36.2	36.6	37.0	38.0	37.8	37.1	35.5	34.7	34.4	34.8	35.2	36.1	38.0	
Extreme Min.	9.9	16.5	17.5	20.4	21.2	21.0	20.5	20.9	20.6	18.2	14.2	12.0	9.9	
Relative Humidity (%)														(1)
Mean	67.0	71.0	71.0	71.0	75.0	75.0	75.0	76.0	80.0	80.0	73.0	66.0	73.0	
Mean Max.	85.0	88.2	87.8	87.6	88.8	87.6	88.5	90.0	92.3	93.0	89.5	85.1	88.6	
Mean Min.	52.0	56.2	56.6	56.7	60.8	61.8	62.9	64.0	67.1	66.7	57.2	50.1	59.3	
Extreme Min.	20.0	25.0	23.0	29.0	32.0	42.0	43.0	45.0	46.0	42.0	29.0	22.0	20.0	
Wind Velocity (km/hr)	11.9	13.0	13.2	11.9	10.9	13.2	12.2	12.0	9.8	9.3	11.5	12.2	11.7	(1)
Cloud Cover (Oktas)	3.9	3.8	4.0	4.7	6.1	6.5	6.7	6.9	6.7	5.8	4.5	3.6	5.2	(1)
Evaporation (mm) (Bang Phra)	72.8	75.0	100.0	110.4	110.6	100.7	99.7	93.9	80.9	89.8	82.6	80.7	1,097	(2)
Rainfall (mm)														(2)
Chon Buri	13.9	23.3	34.1	77.6	158.8	119.4	152.2	162.4	295.2	210.9	53.9	6.0	1,310	
Bang Phra	15.9	38.7	53.1	125.1	149.9	122.6	117.8	137.9	269.2	202.5	51.5	14.3	1,299	
Si Racha	11.1	31.4	38.7	88.3	150.6	110.8	113.6	131.7	257.7	218.1	51.3	13.7	1,217	
Bang Lamung	10.4	36.9	48.7	102.6	158.6	89.6	94.5	113.6	220.1	252.7	61.5	9.3	1,198	

Data Source : (1) Climatological Data of Thailand, 25-Year Period (1951 - 1975), MD
(2) RID

Table 2 SALIENT FEATURES OF DAMS

Description		Nong Kho	Map Prachan	Bang Phra
1. Hydrology				
Name of river		Khlong Nong Kho	Map Prachan	Huai Sukhrip
Catchment area	km^2	59	37.9	123
Average annual inflow	10^6 m^3/yr	21.8	13.9	45.4
2. Reservoir				
Gross storage capacity	10^6 m^3	26.0	17.0	120.0
Surcharge capacity	10^6 m^3	7.0	2.2	10.0
Active storage capacity	10^6 m^3	18.0	14.0	104.0
Dead storage capacity	10^6 m^3	1.0	0.8	6.0
Flood water level	El. m	66.5	45.7	30.6
High water level	El. m	65.0	45.0	30.0
Low water level	El. m	57.5	36.0	18.8
Reservoir surface area at H.W.L.	km^2	4.4	2.8	15.8
3. Dam				
Type		Earth fill	Earth fill	Earth fill
Height	m	17.0	17.0	24.0
Crest elevation	El. m	68.0	47.0	31.5
Crest length	m	1,985	2,060	1,720

Data Source: RID

Table 3 MONTHLY EVAPORATION AT BANG PHRA DAMSITE

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Annual
1968	117.7	127.5	141.3	139.6	135.0	91.7	93.4	96.2	100.3	82.6	79.0	108.3	1,313
1969	130.7	129.5	113.5	93.5	82.0	(84.4)	98.3	87.4	88.7	(104.0)	83.3	(116.1)	1,211
1970	113.5	(120.9)	(97.4)	105.3	83.9	77.2	(74.4)	85.9	70.1	58.8	73.1	93.4	1,054
1971	112.6	101.2	99.2	91.0	90.8	87.7	80.7	76.4	89.6	57.5	76.5	101.1	1,064
1972	101.4	147.7	102.8	112.8	(107.0)	(69.4)	(96.7)	(81.3)	72.8	80.0	81.8	97.3	1,151
1973	(127.9)	93.0	85.3	88.8	107.6	(72.9)	(93.5)	66.6	64.3	(54.6)	65.0	(82.3)	1,001
1974	(93.8)	(88.0)	90.0	91.5	78.0	(85.6)	(83.9)	78.5	77.1	63.1	85.3	104.3	1,019
1975	109.3	(92.5)	89.1	88.9	(83.3)	(77.0)	96.8	107.9	62.4	57.3	(70.8)	(99.1)	1,034
1976	(111.7)	(95.9)	(119.8)	(112.4)	95.9	(98.9)	(78.3)	(50.6)	96.0	101.8	75.2	(86.5)	1,123
1977	(102.5)	101.1	108.5	91.5	88.2	74.7	(83.2)	75.7	88.3	78.5	55.2	90.6	1,038
1978	(95.8)	(96.1)	89.8	(81.1)	80.6	(73.7)	95.1	93.4	84.9	75.0	80.2	115.8	1,062
1979	(100.2)	118.2	82.9	86.7	85.5	(61.7)	102.5	99.3	76.8	77.4	79.3	107.2	1,078
1980	(123.2)	133.6	(98.0)	(112.7)	103.4	(96.5)	(90.9)	74.0	77.5	55.5	70.3	98.6	1,134
1981	(105.4)	(102.6)	92.1	99.7*	93.9	80.9	89.8	82.6	80.7	72.8	75.0	100.0	1,076
1982	110.4	110.6	100.7	99.7	93.9	80.9	89.8	82.6	80.7	72.8	75.0	100.0	1,097
Average	110.4	110.6	100.7	99.7	93.9	80.9	89.8	82.6	80.7	72.8	75.0	100.0	1,097

Data Source: RID

Note: * Figures from Jul. 1981 onward are adopted from monthly mean evaporation for 13-year period from Apr. 1968 to Jun. 1981.
The figures in parenthesis are corrected.

Table 4 MONTHLY RAINFALL AT BANG PHRA DAMSITE

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Annual
1968	151.4	165.1	215.3	48.6	154.9	197.1	202.5	39.8	1.9	120.8	0	106.4	1,404
1969	40.4	247.5	23.1	69.7	178.3	347.7	111.8	11.8	0	4.9	50.8	35.7	1,122
1970	112.2	159.9	226.6	64.8	146.2	220.6	225.8	81.2	141.4	0	30.8	34.3	1,444
1971	197.2	205.2	106.2	95.6	288.6	276.9	139.1	14.4	4.8	0	24.0	55.1	1,407
1972	91.6	18.6	134.1	59.6	63.8	318.9	145.0	171.2	13.0	5.4	1.8	76.0	1,099
1973	4.6	152.1	97.3	94.0	179.5	230.0	155.8	47.6	11.9	12.3	0	81.4	1,067
1974	189.6	148.0	45.4	94.3	155.5	203.6	600.3	62.7	1.5	62.9	13.9	14.7	1,592
1975	75.0	130.6	39.7	97.1	246.7	248.9	109.6	50.7	0	0	80.9	59.5	1,139
1976	83.6	118.4	83.1	132.4	226.4	397.9	380.7	43.7	1.3	7.7	32.3	19.8	1,527
1977	105.0	190.9	110.8	80.3	57.6	203.5	200.3	26.4	0	15.8	171.7	0	1,162
1978	128.4	188.3	164.9	290.8	61.9	315.8	118.4	0	0	0	0	0	1,269
1979	162.9	44.4	104.7	90.1	100.8	308.9	37.0	0	0	0	102.3	39.1	990
1980	129.8	112.4	238.1	191.6	99.5	295.4	202.4	53.7	0	9.4	40.5	102.7	1,476
1981	341.4	252.3	64.4	157.2	57.9	316.5	193.9	75.0	0	0	31.8	121.7	1,612
1982	63.4	115.2	184.9	201.3	51.5	156.4	215.1	93.6	38.0	0	0	49.4	1,169
Average	125.1	149.9	122.6	117.8	137.9	269.2	202.5	51.5	14.3	15.9	38.7	53.1	1,299

Data Source: RID

Table 5 RESERVOIR OPERATION OF BANG PHRA DAM (1968 - 1982)

RESERVOIR OPERATION OF BANG PHRA DAM

1968 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	20.57	39.10	0.15	0.34	0.23
11	20.49	64.20	0.35	0.27	0.22
21	20.49	47.60	1.72	0.20	0.23
MONTHLY		151.40	0.74	0.27	0.23
5					
1	20.75	165.10	2.22	0.20	0.26
11	21.16	0.00	1.55	0.44	0.28
21	21.20	0.00	0.61	0.64	0.28
MONTHLY		165.10	1.43	0.43	0.27
6					
1	21.23	125.20	2.12	0.51	0.32
11	21.51	12.30	1.38	0.55	0.35
21	21.69	77.30	1.32	0.77	0.35
MONTHLY		215.30	1.77	0.54	0.34
7					
1	21.78	30.70	0.83	0.66	0.34
11	21.78	10.00	0.49	0.69	0.34
21	21.71	7.90	0.31	0.65	0.33
MONTHLY		48.60	0.53	0.67	0.34
8					
1	21.61	79.10	1.49	0.55	0.32
11	21.75	22.00	0.78	0.58	0.33
21	21.75	53.80	0.43	1.07	0.32
MONTHLY		154.90	0.86	0.74	0.33
9					
1	21.64	19.90	0.47	0.61	0.23
11	21.69	66.40	2.13	1.00	0.23
21	21.78	110.80	7.30	6.55	0.24
MONTHLY		197.10	3.30	2.71	0.23
10					
1	21.95	92.90	7.12	6.80	0.24
11	22.04	53.30	7.85	7.36	0.24
21	22.11	49.30	6.98	7.45	0.24
MONTHLY		202.50	7.30	7.21	0.24
11					
1	22.05	31.40	3.80	3.01	0.25
11	22.05	8.40	1.19	1.53	0.25
21	21.98	0.00	0.59	0.69	0.25
MONTHLY		39.80	1.62	1.75	0.25
12					
1	21.93	0.00	0.34	0.41	0.25
11	21.88	0.60	0.44	0.39	0.25
21	21.85	1.90	0.28	0.39	0.25
MONTHLY		1.90	0.35	0.39	0.25
1					
1	21.79	42.40	0.28	0.32	0.28
11	21.78	72.30	0.95	0.33	0.28
21	21.88	4.90	0.63	0.34	0.21
MONTHLY		120.30	0.59	0.33	0.28
2					
1	21.89	0.00	0.28	0.39	0.22
11	21.81	0.00	0.17	0.33	0.21
21	21.74	0.00	0.11	0.34	0.21
MONTHLY		0.00	0.17	0.35	0.21
3					
1	21.66	0.00	0.18	0.46	0.26
11	21.55	101.00	1.91	0.21	0.26
21	21.69	5.40	0.18	0.44	0.26
MONTHLY		106.40	0.45	0.37	0.26

1969 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	21.59	35.60	0.61	0.22	0.32
11	21.62	4.80	0.30	0.44	0.32
21	21.54	0.00	0.29	0.42	0.31
MONTHLY		40.40	0.40	0.36	0.32
5					
1	21.46	12.30	0.16	0.45	0.29
11	21.37	84.00	1.20	0.25	0.29
21	21.52	143.60	1.47	0.26	0.30
MONTHLY		247.50	0.96	0.32	0.30
6					
1	21.77	9.50	2.54	1.95	0.30
11	21.95	2.60	0.41	0.76	0.29
21	21.86	11.00	1.60	4.52	0.28
MONTHLY		23.10	1.52	2.11	0.29
7					
1	21.36	16.10	0.29	1.93	0.20
11	21.00	35.20	0.15	0.93	0.19
21	20.87	18.40	0.22	0.76	0.19
MONTHLY		69.70	0.22	1.16	0.19
8					
1	20.74	57.20	0.28	0.59	0.16
11	20.69	52.90	1.25	0.52	0.16
21	20.83	68.20	2.30	0.53	0.18
MONTHLY		178.30	1.49	0.54	0.17
9					
1	21.24	147.30	11.84	6.33	0.21
11	22.03	168.40	18.65	17.98	0.22
21	22.21	31.40	6.30	7.15	0.22
MONTHLY		347.70	12.26	10.69	0.22
10					
1	22.10	20.30	5.84	5.95	0.25
11	22.07	45.20	4.64	4.74	0.25
21	22.06	46.30	5.26	5.19	0.25
MONTHLY		111.80	5.25	5.29	0.25
11					
1	22.07	11.80	2.89	3.06	0.23
11	22.03	0.00	0.83	0.91	0.23
21	21.99	0.00	0.42	0.81	0.23
MONTHLY		11.80	1.38	1.59	0.23
12					
1	21.98	0.00	0.22	0.88	0.22
11	21.76	0.00	0.11	0.48	0.21
21	21.67	0.00	0.28	0.39	0.21
MONTHLY		0.00	0.21	0.58	0.21
1					
1	21.61	0.00	0.24	0.37	0.24
11	21.55	4.90	0.20	0.36	0.24
21	21.49	0.00	0.15	0.56	0.24
MONTHLY		4.90	0.19	0.43	0.24
2					
1	21.37	0.00	0.12	0.37	0.21
11	21.27	50.80	0.39	0.24	0.20
21	21.29	0.00	0.16	0.57	0.20
MONTHLY		50.80	0.23	0.38	0.20
3					
1	21.20	0.00	0.10	0.54	0.25
11	21.07	0.30	0.07	0.52	0.24
21	20.93	35.70	0.29	0.34	0.24
MONTHLY		35.70	0.16	0.46	0.24

Note; W.L. : El.m
RAIN : mm
INFLOW : m^3/s
OUTFLOW: m^3/s
EVAPO : m^3/s

RESERVOIR OPERATION OF BANG PHRA DAM

1978 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	20.38	76.40	0.69	0.34	0.24
11	20.98	0.00	0.12	0.59	0.24
21	20.86	35.80	0.92	0.38	0.24
MONTHLY		112.20	0.57	0.48	0.24
5					
1	20.94	27.10	0.17	0.48	0.25
11	20.86	94.30	0.90	0.46	0.25
21	20.97	38.50	0.86	0.43	0.25
MONTHLY		159.90	0.65	0.46	0.25
6					
1	21.03	104.90	3.47	0.31	0.22
11	21.53	17.90	0.94	0.45	0.24
21	21.58	103.80	1.32	0.55	0.24
MONTHLY		226.60	1.91	0.44	0.23
7					
1	21.74	42.10	1.17	0.53	0.26
11	21.93	11.10	0.68	0.54	0.26
21	21.82	11.60	0.43	0.61	0.26
MONTHLY		64.80	0.75	0.56	0.26
8					
1	21.76	57.00	3.51	0.69	0.20
11	21.75	30.00	0.41	0.69	0.20
21	21.69	59.20	0.76	0.60	0.20
MONTHLY		146.20	0.56	0.66	0.20
9					
1	21.73	2.60	0.28	0.73	0.19
11	21.64	127.00	1.70	0.76	0.19
21	21.85	91.00	1.75	0.79	0.20
MONTHLY		220.60	1.24	0.76	0.19
10					
1	22.03	99.30	6.41	6.17	0.19
11	22.11	110.30	9.01	9.73	0.19
21	22.08	15.70	2.75	3.08	0.19
MONTHLY		225.30	5.95	6.22	0.19
11					
1	22.02	0.00	0.65	0.93	0.22
11	21.95	0.00	0.52	0.39	0.22
21	21.85	81.20	0.38	0.84	0.22
MONTHLY		81.20	0.52	0.92	0.22
12					
1	21.91	98.50	2.88	1.55	0.19
11	22.05	28.90	3.90	4.45	0.18
21	22.03	14.10	1.65	1.69	0.18
MONTHLY		141.40	2.77	2.41	0.18
1					
1	22.01	0.00	0.18	0.37	0.15
11	21.93	0.00	0.18	0.47	0.15
21	21.91	0.00	0.22	0.58	0.15
MONTHLY		0.00	0.29	0.48	0.15
2					
1	21.83	0.00	0.22	0.57	0.20
11	21.75	5.10	0.07	0.57	0.19
21	21.65	25.70	1.02	0.57	0.19
MONTHLY		30.80	0.39	0.57	0.20
3					
1	21.78	0.00	0.18	0.58	0.22
11	21.61	34.30	0.17	0.64	0.22
21	21.51	0.00	0.16	0.78	0.21
MONTHLY		34.30	0.17	0.64	0.22

1971 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	21.37	3.30	0.88	3.78	0.26
11	21.29	176.60	1.62	0.54	0.26
21	21.44	20.60	1.26	0.47	0.27
MONTHLY		197.20	0.99	0.57	0.26
5					
1	21.53	37.30	1.46	0.53	0.24
11	21.66	64.70	1.23	0.59	0.24
21	21.77	192.60	3.07	1.32	0.25
MONTHLY		295.20	1.96	0.83	0.24
6					
1	22.08	4.10	2.87	2.48	0.26
11	22.01	65.20	3.20	3.17	0.26
21	22.03	36.90	1.83	1.84	0.26
MONTHLY		106.20	2.39	2.47	0.26
7					
1	22.03	69.90	2.03	2.45	0.23
11	22.00	11.50	0.57	0.87	0.23
21	21.93	15.20	0.44	0.86	0.23
MONTHLY		95.60	1.00	1.38	0.23
8					
1	21.84	7.80	0.33	0.75	0.22
11	21.72	77.50	0.89	0.90	0.22
21	21.75	204.10	9.42	5.87	0.23
MONTHLY		288.60	3.74	2.97	0.22
9					
1	22.25	36.40	7.72	9.16	0.24
11	22.37	107.30	10.43	9.69	0.24
21	22.22	133.20	16.50	17.20	0.24
MONTHLY		276.90	11.57	11.95	0.24
10					
1	22.23	61.30	10.33	9.93	0.21
11	22.39	54.40	12.03	13.37	0.21
21	22.15	22.90	5.50	6.81	0.21
MONTHLY		139.10	9.17	9.65	0.21
11					
1	22.07	14.40	3.30	3.51	0.20
11	22.03	0.00	0.85	1.02	0.20
21	21.98	0.00	0.56	0.92	0.20
MONTHLY		14.40	1.57	1.82	0.20
12					
1	21.90	0.00	0.50	0.69	0.22
11	21.84	0.00	0.17	0.50	0.22
21	21.76	4.80	0.35	0.45	0.22
MONTHLY		4.80	0.34	0.54	0.22
1					
1	21.71	0.00	0.07	0.53	0.14
11	21.62	0.00	0.06	0.52	0.13
21	21.51	0.00	0.01	0.59	0.13
MONTHLY		0.00	0.05	0.55	0.13
2					
1	21.37	15.70	0.35	0.49	0.18
11	21.34	8.30	0.31	0.38	0.18
21	21.30	0.00	0.18	0.49	0.18
MONTHLY		24.00	0.26	0.42	0.18
3					
1	21.22	0.00	0.04	0.49	0.22
11	21.09	3.60	0.11	0.49	0.21
21	20.98	51.50	0.28	0.41	0.21
MONTHLY		55.10	0.15	0.46	0.21

RESERVOIR OPERATION OF BANG PHRA DAM

1972 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	20.93	63.30	0.73	0.34	0.22
11	21.01	19.10	1.38	0.36	0.22
21	21.11	10.20	0.89	0.37	0.22
MONTHLY		91.60	0.71	0.36	0.22
5					
1	21.93	0.00	0.85	0.51	0.31
11	20.90	6.00	0.92	0.41	0.30
21	20.75	12.60	0.87	0.48	0.29
MONTHLY		18.60	0.85	0.47	0.30
6					
1	20.57	49.50	0.87	0.29	0.20
11	20.50	33.00	0.56	0.52	0.20
21	20.45	50.80	0.84	0.49	0.19
MONTHLY		134.10	0.16	0.43	0.20
7					
1	20.32	10.20	0.85	0.57	0.20
11	20.17	41.30	0.14	0.57	0.19
21	20.03	7.60	0.20	0.62	0.18
MONTHLY		59.60	0.13	0.59	0.19
8					
1	19.84	14.50	0.13	0.66	0.17
11	19.63	23.30	0.84	0.60	0.16
21	19.51	26.00	0.84	0.56	0.15
MONTHLY		63.80	0.87	0.60	0.16
9					
1	19.31	164.30	4.28	0.41	0.14
11	20.23	124.60	3.92	0.33	0.13
21	20.92	39.00	0.17	0.36	0.16
MONTHLY		318.90	5.46	0.37	0.14
10					
1	22.05	90.70	6.92	6.49	0.25
11	22.14	43.90	12.17	11.69	0.25
21	22.20	11.30	5.32	6.23	0.25
MONTHLY		145.80	8.95	8.08	0.25
11					
1	22.05	77.30	6.51	6.19	0.22
11	22.12	72.20	7.11	7.41	0.22
21	22.11	21.70	3.46	4.02	0.22
MONTHLY		171.20	5.69	5.87	0.22
12					
1	22.03	13.00	2.55	2.04	0.19
11	22.08	0.00	2.19	2.49	0.19
21	22.02	0.00	0.71	0.66	0.19
MONTHLY		13.00	1.78	1.69	0.19
1					
1	22.00	0.00	0.34	0.47	0.20
11	21.95	5.40	0.30	0.59	0.20
21	21.89	0.00	0.23	0.45	0.20
MONTHLY		5.40	0.32	0.50	0.20
2					
1	21.80	1.80	0.23	0.50	0.22
11	21.69	0.00	0.24	0.47	0.22
21	21.61	0.00	0.12	0.47	0.21
MONTHLY		1.80	0.20	0.51	0.22
3					
1	21.52	2.70	0.96	0.59	0.22
11	21.39	40.10	0.72	0.44	0.22
21	21.41	33.20	0.42	0.46	0.22
MONTHLY		76.00	0.60	0.49	0.22

1973 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	21.38	1.60	0.11	0.59	0.30
11	21.25	0.00	0.05	0.63	0.29
21	21.09	3.00	0.12	0.59	0.28
MONTHLY		4.60	0.09	0.57	0.29
5					
1	20.96	79.10	0.52	0.48	0.19
11	20.97	11.50	0.12	0.47	0.19
21	20.87	61.50	0.70	0.41	0.19
MONTHLY		152.10	0.45	0.45	0.19
6					
1	20.93	60.30	0.90	0.39	0.18
11	21.03	37.00	0.19	0.53	0.18
21	20.95	0.00	0.16	0.76	0.18
MONTHLY		97.30	0.42	0.56	0.18
7					
1	20.81	25.40	0.88	0.89	0.17
11	20.65	69.20	0.43	0.75	0.17
21	20.68	3.40	0.15	0.84	0.17
MONTHLY		94.80	0.22	0.83	0.17
8					
1	20.43	115.90	2.30	0.64	0.20
11	20.77	37.10	1.11	0.77	0.22
21	20.82	26.50	0.63	0.79	0.21
MONTHLY		179.50	1.32	0.74	0.21
9					
1	20.77	16.30	0.60	0.76	0.15
11	20.73	54.00	2.49	0.75	0.15
21	21.04	159.70	5.95	0.51	0.18
MONTHLY		230.00	3.01	0.67	0.16
10					
1	21.92	123.90	8.93	7.26	0.24
11	22.29	0.20	5.98	6.38	0.24
21	22.06	31.90	1.35	2.32	0.24
MONTHLY		155.80	5.50	5.38	0.24
11					
1	22.00	13.50	0.58	0.76	0.17
11	21.86	34.10	0.53	0.65	0.17
21	21.95	0.00	0.45	0.55	0.17
MONTHLY		47.60	0.54	0.65	0.17
12					
1	21.91	11.90	0.48	0.51	0.16
11	21.89	0.00	0.06	0.47	0.16
21	21.79	0.00	0.01	0.57	0.15
MONTHLY		11.90	0.18	0.52	0.16
1					
1	21.68	0.00	0.07	0.64	0.13
11	21.49	0.00	0.00	0.53	0.12
21	21.39	12.30	0.33	0.47	0.12
MONTHLY		12.30	0.14	0.54	0.12
2					
1	21.34	0.00	0.17	0.58	0.16
11	21.22	0.00	0.16	0.52	0.16
21	21.10	0.00	0.12	0.49	0.15
MONTHLY		0.00	0.15	0.53	0.16
3					
1	21.00	3.50	0.09	0.48	0.17
11	20.83	48.70	0.43	0.48	0.17
21	20.87	29.20	0.28	0.50	0.17
MONTHLY		81.40	0.27	0.49	0.17

RESERVOIR OPERATION OF BANG PHRA DAM

1974 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	20.80	19.40	0.86	0.44	0.19
11	20.84	57.80	0.94	0.47	0.20
21	20.93	112.40	2.19	0.36	0.21
MONTHLY		189.60	1.33	0.42	0.20
5					
1	21.25	17.70	1.25	0.37	0.20
11	21.36	109.10	1.91	0.48	0.20
21	21.63	21.20	0.75	0.32	0.21
MONTHLY		148.00	1.29	0.36	0.20
6					
1	21.68	33.50	0.28	0.50	0.22
11	21.62	7.20	0.27	0.33	0.22
21	21.55	4.70	0.22	0.61	0.21
MONTHLY		45.40	0.26	0.55	0.22
7					
1	21.43	19.10	0.18	0.89	0.21
11	21.29	0.00	0.06	1.06	0.20
21	21.06	75.20	0.44	0.64	0.19
MONTHLY		94.30	0.23	0.86	0.20
8					
1	20.87	35.50	0.37	0.37	0.16
11	20.79	47.30	0.63	0.31	0.16
21	20.85	72.20	1.80	0.45	0.16
MONTHLY		155.50	0.68	0.38	0.16
9					
1	20.98	16.30	0.56	0.61	0.18
11	20.95	96.60	2.14	0.75	0.18
21	21.20	99.70	5.89	0.38	0.21
MONTHLY		283.60	2.60	0.55	0.19
10					
1	21.93	324.60	14.47	0.29	0.22
11	23.81	211.20	21.44	0.29	0.31
21	25.91	64.50	6.57	0.31	0.37
MONTHLY		600.30	13.91	0.29	0.30
11					
1	26.44	39.30	3.23	0.31	0.37
11	26.69	23.40	1.85	0.33	0.37
21	26.79	0.00	0.88	0.51	0.37
MONTHLY		62.70	2.15	0.38	0.37
12					
1	26.73	1.50	1.22	0.67	0.36
11	26.80	0.00	0.34	0.35	0.36
21	26.75	0.00	0.28	0.54	0.35
MONTHLY		1.50	0.60	0.52	0.36
1					
1	26.63	0.00	0.32	0.47	0.29
11	26.62	62.90	2.54	0.48	0.29
21	26.79	0.00	0.40	0.47	0.29
MONTHLY		62.90	1.06	0.47	0.29
2					
1	26.74	0.00	0.69	1.22	0.43
11	26.66	0.00	0.29	0.62	0.43
21	26.58	13.90	0.94	1.00	0.43
MONTHLY		13.90	0.59	0.94	0.43
3					
1	26.54	14.70	0.57	0.55	0.47
11	26.50	0.00	0.59	1.07	0.47
21	26.42	0.00	0.37	0.69	0.46
MONTHLY		14.70	0.50	0.77	0.47

1975 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	26.34	39.10	1.75	0.62	0.50
11	26.41	0.00	0.38	0.96	0.50
21	26.32	35.90	0.74	0.32	0.50
MONTHLY		75.00	0.95	0.80	0.50
5					
1	26.29	88.30	0.69	0.52	0.41
11	26.32	3.20	0.68	0.98	0.41
21	26.25	39.10	0.12	0.51	0.40
MONTHLY		130.60	0.48	0.66	0.41
6					
1	26.08	30.30	0.40	0.83	0.40
11	25.94	0.00	0.15	0.75	0.39
21	25.80	9.40	0.14	1.01	0.39
MONTHLY		39.70	0.18	0.86	0.39
7					
1	25.68	15.80	0.13	1.02	0.37
11	25.54	60.80	0.46	0.75	0.36
21	25.52	20.50	0.61	0.31	0.36
MONTHLY		97.10	0.41	0.86	0.36
8					
1	25.48	35.80	0.10	0.90	0.34
11	25.49	134.30	1.99	0.72	0.34
21	25.59	76.80	1.83	0.72	0.34
MONTHLY		246.70	1.04	0.78	0.34
9					
1	25.64	38.50	0.89	0.62	0.33
11	25.66	91.20	1.75	0.45	0.33
21	25.82	127.20	9.15	0.47	0.34
MONTHLY		248.90	3.60	0.51	0.34
10					
1	26.47	38.70	4.15	0.58	0.44
11	26.73	10.50	2.99	0.71	0.45
21	26.87	60.40	1.48	0.74	0.45
MONTHLY		109.60	2.83	0.66	0.45
11					
1	26.94	45.10	1.46	0.62	0.52
11	27.12	5.60	2.06	0.62	0.53
21	27.10	0.00	0.44	0.56	0.53
MONTHLY		50.70	1.99	0.60	0.53
12					
1	27.11	0.00	0.85	0.47	0.38
11	27.11	0.00	0.15	0.48	0.38
21	27.03	0.00	0.16	0.68	0.29
MONTHLY		0.00	0.38	0.52	0.29
1					
1	26.91	0.00	0.36	0.63	0.27
11	26.86	0.00	0.13	0.62	0.27
21	26.77	0.00	0.13	0.92	0.26
MONTHLY		0.00	0.20	0.73	0.26
2					
1	26.66	80.90	0.95	0.31	0.35
11	26.73	0.00	0.44	0.62	0.35
21	26.67	0.00	0.09	0.62	0.34
MONTHLY		80.90	0.51	0.52	0.35
3					
1	26.58	33.10	0.46	0.57	0.45
11	26.54	0.00	0.14	1.09	0.45
21	26.42	26.40	0.19	0.83	0.44
MONTHLY		59.50	0.26	0.83	0.44

RESERVOIR OPERATION OF BANG PHRA DAM

1976 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	26.33	12.70	0.49	0.81	0.51
11	26.27	0.00	0.17	0.84	0.51
21	26.16	71.40	0.63	0.68	0.50
MONTHLY		83.60	0.48	0.78	0.51
5					
1	26.16	21.20	0.51	0.48	0.42
11	26.05	10.40	0.24	0.91	0.41
21	25.92	36.30	0.33	0.40	0.41
MONTHLY		118.40	0.36	0.59	0.41
6					
1	25.88	76.60	0.60	0.32	0.53
11	25.91	0.00	0.10	0.47	0.52
21	25.81	6.50	0.18	0.97	0.52
MONTHLY		83.10	0.29	0.59	0.52
7					
1	25.67	33.00	0.55	1.02	0.47
11	25.59	25.30	0.27	0.96	0.46
21	25.47	73.30	0.20	0.79	0.46
MONTHLY		132.40	0.33	0.92	0.46
8					
1	25.42	0.20	0.33	0.90	0.39
11	25.29	67.50	0.93	0.39	0.38
21	25.29	158.90	1.47	0.63	0.39
MONTHLY		226.40	0.93	0.80	0.39
9					
1	25.46	239.60	10.74	0.41	0.44
11	26.43	146.80	13.21	1.37	0.48
21	27.31	12.50	0.16	1.21	0.49
MONTHLY		397.90	8.93	0.99	0.47
10					
1	26.98	98.10	2.84	5.90	0.36
11	26.81	75.60	3.31	7.36	0.36
21	26.55	207.00	7.07	8.43	0.35
MONTHLY		380.70	4.49	7.27	0.36
11					
1	26.45	41.50	5.36	18.35	0.23
11	26.07	2.20	2.65	11.11	0.22
21	25.27	0.00	0.46	10.69	0.20
MONTHLY		43.70	2.62	10.71	0.22
12					
1	24.28	0.00	0.67	7.18	0.32
11	23.51	0.00	0.31	3.28	0.30
21	23.07	1.30	0.31	0.54	0.29
MONTHLY		1.30	0.43	3.56	0.30
1					
1	23.00	0.00	0.47	0.83	0.30
11	22.80	0.00	0.20	0.92	0.30
21	22.75	7.70	0.20	0.59	0.29
MONTHLY		7.70	0.32	0.78	0.30
2					
1	22.63	32.30	0.49	1.09	0.24
11	22.52	0.00	0.13	0.69	0.23
21	22.38	0.00	0.27	0.59	0.22
MONTHLY		32.30	0.30	0.77	0.23
3					
1	22.26	9.40	0.23	0.61	0.23
11	22.14	0.00	0.08	0.71	0.22
21	21.99	10.40	0.88	0.60	0.22
MONTHLY		19.80	0.13	0.64	0.22

1977 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	21.84	38.30	0.51	0.78	0.26
11	21.73	60.70	1.09	0.59	0.26
21	21.80	6.80	0.08	0.75	0.25
MONTHLY		105.80	0.56	0.71	0.26
5					
1	21.59	64.60	0.27	0.64	0.23
11	21.49	54.50	0.27	0.49	0.23
21	21.46	71.80	0.45	0.45	0.23
MONTHLY		190.90	0.34	0.50	0.23
6					
1	21.46	17.80	0.23	0.51	0.26
11	21.38	20.50	0.87	0.52	0.25
21	21.25	73.30	0.99	0.51	0.24
MONTHLY		110.80	0.45	0.51	0.25
7					
1	21.27	5.50	0.20	0.76	0.20
11	21.15	4.30	0.06	0.96	0.19
21	20.96	78.50	0.41	0.71	0.19
MONTHLY		88.30	0.23	0.88	0.19
8					
1	20.82	24.80	0.54	0.81	0.18
11	20.65	0.00	0.14	1.02	0.17
21	20.62	32.70	0.17	0.84	0.17
MONTHLY		57.60	0.28	0.89	0.17
9					
1	20.46	41.40	0.15	0.88	0.14
11	20.28	31.10	0.37	0.42	0.14
21	20.25	31.00	0.67	0.49	0.14
MONTHLY		203.50	0.40	0.54	0.14
10					
1	20.27	110.00	1.38	0.32	0.15
11	20.59	63.20	1.38	2.35	0.16
21	20.79	27.10	0.85	0.55	0.16
MONTHLY		200.30	1.36	0.41	0.16
11					
1	20.82	22.80	0.32	0.61	0.16
11	20.74	0.00	0.08	0.56	0.15
21	20.60	4.40	0.10	0.70	0.15
MONTHLY		26.40	0.17	0.63	0.15
12					
1	20.44	0.00	0.34	0.49	0.16
11	20.30	0.00	0.34	0.32	0.15
21	20.18	0.00	0.14	0.36	0.15
MONTHLY		0.00	0.08	0.41	0.15
1					
1	20.10	3.10	0.01	0.26	0.13
11	19.96	5.50	0.02	0.36	0.13
21	19.83	7.20	0.06	0.35	0.12
MONTHLY		15.80	0.03	0.36	0.13
2					
1	19.69	85.10	1.15	0.36	0.10
11	19.93	9.10	0.27	0.37	0.10
21	19.85	77.50	1.15	0.32	0.10
MONTHLY		171.70	0.83	0.35	0.10
3					
1	20.04	0.00	0.15	0.36	0.15
11	19.94	0.00	0.13	0.36	0.14
21	19.81	0.00	0.15	0.36	0.14
MONTHLY		0.00	0.14	0.36	0.14

RESERVOIR OPERATION OF 3896 PARA DAM

1978 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	19.68	11.30	0.38	0.37	0.15
11	19.58	33.70	0.59	0.36	0.15
21	19.52	83.40	0.72	0.52	0.15
MONTHLY		128.40	0.50	0.35	0.15
5					
1	19.65	36.60	0.80	0.32	0.15
11	19.76	124.20	3.66	0.34	0.16
21	20.47	5.80	1.29	0.35	0.18
MONTHLY		188.30	1.90	0.34	0.17
6					
1	20.62	0.00	1.53	0.57	0.17
11	20.55	153.90	3.71	0.46	0.18
21	21.05	11.00	1.70	0.52	0.20
MONTHLY		164.90	2.31	0.52	0.18
7					
1	21.36	58.20	2.37	0.51	0.17
11	21.21	61.60	1.92	0.63	0.17
21	21.89	179.00	7.00	0.49	0.19
MONTHLY		298.80	3.87	0.52	0.18
8					
1	22.19	28.60	1.72	0.55	0.21
11	22.33	23.90	0.89	0.74	0.22
21	22.34	9.40	0.28	0.84	0.22
MONTHLY		61.90	0.94	0.72	0.22
9					
1	22.23	53.30	1.09	0.65	0.20
11	22.38	211.90	4.94	0.55	0.21
21	22.98	50.00	4.43	0.32	0.24
MONTHLY		315.30	3.49	0.51	0.22
10					
1	23.44	46.30	2.67	0.48	0.31
11	23.69	42.60	2.59	0.49	0.32
21	23.91	27.50	1.30	0.41	0.33
MONTHLY		118.40	2.13	0.43	0.32
11					
1	24.00	0.00	1.26	0.62	0.33
11	24.01	0.00	0.74	0.59	0.33
21	23.99	0.00	0.18	0.59	0.33
MONTHLY		0.00	0.66	0.60	0.33
12					
1	23.91	0.00	0.00	0.53	0.29
11	23.81	0.00	0.00	0.61	0.28
21	23.70	0.00	0.00	0.75	0.28
MONTHLY		0.00	0.00	0.63	0.29
1					
1	23.55	0.00	0.11	0.70	0.24
11	23.41	0.00	0.16	0.84	0.24
21	23.26	0.00	0.00	0.63	0.23
MONTHLY		0.00	0.10	0.72	0.23
2					
1	23.10	0.00	0.41	0.87	0.27
11	23.00	0.00	0.79	0.66	0.26
21	22.90	0.00	0.29	0.63	0.26
MONTHLY		0.00	0.51	0.73	0.27
3					
1	22.82	0.00	0.13	0.84	0.34
11	22.75	0.00	0.00	0.89	0.33
21	22.58	0.00	0.00	0.99	0.32
MONTHLY		0.00	0.07	0.91	0.33

1979 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	22.36	0.00	0.87	0.69	0.28
11	22.18	26.40	0.91	0.76	0.27
21	22.04	136.50	0.88	0.42	0.27
MONTHLY		162.90	0.42	0.63	0.27
5					
1	22.12	10.30	0.33	0.49	0.31
11	22.05	13.30	0.15	0.42	0.30
21	21.96	20.80	0.15	0.42	0.30
MONTHLY		44.40	0.20	0.44	0.30
6					
1	21.84	13.40	0.86	0.86	0.21
11	21.67	76.60	1.90	0.59	0.21
21	21.75	15.70	0.64	0.81	0.21
MONTHLY		104.70	0.87	0.75	0.21
7					
1	21.63	27.20	0.32	0.78	0.20
11	21.48	48.50	1.02	0.76	0.20
21	21.47	14.40	0.27	0.83	0.20
MONTHLY		90.10	0.53	0.79	0.20
8					
1	21.24	12.40	0.44	0.81	0.19
11	21.10	2.60	0.81	1.42	0.18
21	20.92	85.80	1.55	0.49	0.17
MONTHLY		100.80	0.78	0.77	0.18
9					
1	21.20	24.20	1.23	0.43	0.13
11	21.11	157.30	1.88	0.51	0.14
21	21.43	46.70	1.27	0.34	0.15
MONTHLY		228.20	1.46	0.37	0.14
10					
1	21.58	1.70	0.78	0.38	0.24
11	21.59	0.00	0.04	0.80	0.24
21	21.31	35.30	1.46	0.65	0.23
MONTHLY		37.00	0.76	0.61	0.23
11					
1	21.35	0.00	0.18	0.41	0.23
11	21.24	0.00	0.17	0.61	0.22
21	21.01	0.00	0.21	0.31	0.21
MONTHLY		0.00	0.19	0.44	0.22
12					
1	20.95	0.00	0.02	0.35	0.16
11	20.85	0.00	0.00	0.34	0.15
21	20.72	0.00	0.01	0.33	0.15
MONTHLY		0.00	0.02	0.34	0.15
1					
1	20.62	0.00	0.03	0.33	0.15
11	20.50	0.00	0.05	0.38	0.14
21	20.36	0.00	0.04	0.38	0.14
MONTHLY		0.00	0.04	0.38	0.14
2					
1	20.25	30.10	0.13	0.32	0.15
11	20.14	52.50	0.11	0.37	0.14
21	20.05	19.70	0.20	0.32	0.14
MONTHLY		102.30	0.15	0.34	0.14
3					
1	20.01	0.00	0.13	0.36	0.17
11	19.96	22.30	0.12	0.32	0.17
21	19.79	16.30	0.05	0.32	0.17
MONTHLY		39.10	0.10	0.33	0.17

RESERVOIR OPERATION OF BANG PHRA DAM

1980 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	19.67	43.20	0.10	0.33	0.19
11	19.57	85.30	2.58	0.32	0.20
21	20.10	0.00	0.11	0.32	0.21
MONTHLY		129.80	0.93	0.32	0.20
5					
1	20.02	4.20	0.08	0.34	0.22
11	19.87	2.70	0.10	0.32	0.21
21	19.77	100.50	0.17	0.32	0.21
MONTHLY		112.40	0.12	0.33	0.21
6					
1	19.75	67.40	0.82	0.33	0.16
11	19.97	121.60	3.24	0.32	0.18
21	20.48	47.10	1.48	0.32	0.19
MONTHLY		238.10	1.82	0.32	0.18
7					
1	20.67	21.30	0.74	0.40	0.22
11	20.70	11.90	0.32	0.69	0.23
21	20.53	158.40	3.03	0.41	0.22
MONTHLY		191.60	1.42	0.50	0.22
8					
1	21.03	25.80	1.03	0.38	0.22
11	21.08	11.70	0.39	0.77	0.21
21	20.98	62.40	1.07	0.32	0.22
MONTHLY		99.50	1.08	0.49	0.22
9					
1	21.11	158.40	3.53	0.40	0.22
11	21.62	43.50	3.53	0.33	0.25
21	22.07	93.50	3.17	0.32	0.26
MONTHLY		295.40	3.41	0.35	0.24
10					
1	22.46	54.50	3.06	0.32	0.26
11	22.81	101.40	6.58	0.32	0.27
21	23.55	46.50	6.89	0.32	0.31
MONTHLY		202.40	5.24	0.32	0.28
11					
1	24.21	53.70	2.44	0.32	0.27
11	24.43	0.00	0.73	0.45	0.28
21	24.43	0.00	0.48	0.43	0.28
MONTHLY		53.70	1.22	0.40	0.28
12					
1	24.40	0.00	0.34	0.37	0.29
11	24.35	0.00	0.21	0.51	0.43
21	24.27	0.00	0.11	0.61	0.27
MONTHLY		0.00	0.22	0.50	0.28
1					
1	24.15	0.00	0.13	0.51	0.19
11	24.04	0.00	0.13	0.60	0.19
21	23.93	9.40	0.13	0.59	0.19
MONTHLY		9.40	0.13	0.57	0.19
2					
1	23.80	40.50	1.89	0.42	0.26
11	23.83	0.00	0.85	0.62	0.26
21	23.69	0.00	0.32	0.55	0.26
MONTHLY		40.50	0.58	0.53	0.26
3					
1	23.63	58.40	0.64	0.40	0.32
11	23.65	39.50	0.49	0.56	0.32
21	23.61	4.80	0.24	0.60	0.32
MONTHLY		102.70	0.45	0.52	0.32

1981 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	23.49	2.10	0.73	0.65	0.35
11	23.42	208.70	5.19	0.33	0.37
21	24.07	130.60	4.75	0.34	0.39
MONTHLY		341.40	3.56	0.44	0.37
5					
1	24.56	23.30	2.18	0.34	0.38
11	24.92	19.30	0.75	0.38	0.39
21	24.73	208.60	5.58	0.33	0.40
MONTHLY		252.30	2.92	0.35	0.39
6					
1	25.38	25.20	1.67	0.55	0.39
11	25.45	3.30	0.55	0.85	0.39
21	25.37	35.90	0.73	1.53	0.38
MONTHLY		64.40	0.99	0.66	0.39
7					
1	25.37	33.80	0.62	0.81	0.40
11	25.38	59.40	0.66	0.58	0.40
21	25.32	64.00	1.48	0.48	0.40
MONTHLY		157.20	0.94	0.59	0.40
8					
1	25.42	33.80	1.05	0.42	0.38
11	25.46	24.00	0.99	0.61	0.38
21	25.48	0.00	0.26	0.94	0.38
MONTHLY		57.80	0.75	0.67	0.38
9					
1	25.36	21.50	0.76	0.35	0.34
11	25.32	209.50	5.78	0.40	0.34
21	25.75	85.50	7.40	0.34	0.36
MONTHLY		316.50	3.98	0.56	0.35
10					
1	26.31	19.60	1.79	0.61	0.40
11	26.37	85.00	2.41	0.48	0.40
21	26.54	89.30	1.83	0.53	0.41
MONTHLY		193.90	2.80	0.54	0.40
11					
1	26.67	22.80	1.35	0.48	0.39
11	26.75	27.50	1.64	0.47	0.39
21	26.81	24.70	1.75	0.38	0.40
MONTHLY		75.00	1.78	0.44	0.39
12					
1	26.88	0.00	0.58	0.46	0.38
11	26.85	0.00	0.33	0.46	0.37
21	26.79	0.20	0.46	0.44	0.37
MONTHLY		0.20	0.46	0.45	0.37
1					
1	26.74	0.00	0.49	0.83	0.33
11	26.69	0.20	0.28	0.62	0.33
21	26.61	0.00	0.46	0.72	0.33
MONTHLY		0.20	0.27	0.73	0.33
2					
1	26.51	31.80	0.24	0.77	0.37
11	26.44	0.00	0.92	0.78	0.37
21	26.34	0.00	0.80	0.47	0.37
MONTHLY		31.80	0.89	0.69	0.37
3					
1	26.26	0.00	0.89	0.73	0.44
11	26.16	0.20	0.21	0.91	0.43
21	26.34	121.70	0.93	0.68	0.43
MONTHLY		121.70	0.43	0.74	0.43

RESERVOIR OPERATION OF BANG PHRA DAM

1982 DATE	W.L.	RAIN	INFLOW	OUTFLOW	EVAPO.
4					
1	26.89	0.00	0.47	0.65	0.49
11	26.80	60.40	1.88	0.75	0.49
21	26.88	3.00	0.29	0.57	0.49
MONTHLY		63.40	0.88	0.63	0.49
5					
1	26.81	0.00	0.25	0.75	0.47
11	25.92	66.10	0.51	0.47	0.47
21	25.92	49.10	1.59	0.47	0.47
MONTHLY		115.20	0.81	0.54	0.47
6					
1	26.82	115.00	0.84	0.35	0.45
11	26.89	37.20	2.58	0.48	0.45
21	26.18	32.79	1.89	0.67	0.45
MONTHLY		184.99	1.44	0.49	0.45
7					
1	26.18	87.90	0.83	0.83	0.43
11	26.29	87.50	3.43	0.43	0.44
21	26.44	25.98	1.82	0.64	0.45
MONTHLY		201.38	1.74	0.63	0.44
8					
1	26.44	11.20	0.23	0.79	0.42
11	26.37	19.30	0.58	0.67	0.42
21	26.33	21.00	0.64	0.83	0.42
MONTHLY		51.50	0.46	0.77	0.42
9					
1	26.29	20.80	0.81	0.44	0.37
11	26.28	30.70	2.10	0.43	0.37
21	26.37	104.90	1.16	0.60	0.37
MONTHLY		156.40	1.36	0.49	0.37
10					
1	26.40	64.70	2.33	0.32	0.40
11	26.55	15.20	0.75	0.58	0.41
21	26.53	135.20	3.99	0.47	0.41
MONTHLY		215.10	2.38	0.46	0.41
11					
1	26.86	46.40	2.59	0.32	0.40
11	27.01	16.00	1.62	0.48	0.40
21	27.04	30.30	2.22	0.43	0.40
MONTHLY		93.60	2.15	0.41	0.40
12					
1	27.12	38.90	1.53	0.42	0.39
11	27.17	0.00	0.41	0.57	0.38
21	27.10	0.00	0.21	0.57	0.38
MONTHLY		38.90	0.70	0.52	0.38
1					
1	26.98	0.00	0.00	0.73	0.34
11	26.85	0.00	0.00	0.75	0.34
21	26.74	0.00	0.00	0.72	0.33
MONTHLY		0.00	0.00	0.74	0.34
2					
1	26.58	0.00	0.19	0.54	0.38
11	26.49	0.00	0.11	0.79	0.37
21	26.36	0.00	0.00	0.53	0.37
MONTHLY		0.00	0.11	0.63	0.37
3					
1	26.27	49.40	3.71	0.49	0.44
11	26.49	0.00	0.88	0.68	0.45
21	26.37	0.00	0.45	0.73	0.44
MONTHLY		49.40	1.38	0.64	0.44

Table 6 MONTHLY RUN-OFF AT BANG PHRA DAMSITE

(Unit: m^3/s)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Mean
1968	0.74	1.43	1.77	0.54	0.86	3.30	7.31	1.62	0.35	0.59	0.16	0.45	1.60
1969	0.40	0.96	1.52	0.22	1.49	12.26	5.25	1.38	0.21	0.20	0.23	0.16	2.02
1970	0.58	0.65	1.91	0.75	0.57	1.24	5.95	0.52	2.77	0.29	0.40	0.17	1.33
1971	0.99	1.96	2.38	0.99	3.74	11.57	9.16	1.57	0.34	0.05	0.26	0.15	2.76
1972	0.71	0.05	0.16	0.13	0.07	5.46	8.05	5.69	1.78	0.31	0.20	0.40	1.92
1973	0.09	0.45	0.42	0.22	1.32	3.01	5.50	0.54	0.18	0.14	0.15	0.27	1.03
1974	1.31	1.29	0.26	0.23	0.68	2.60	13.92	2.15	0.60	1.06	0.59	0.51	2.12
1975	0.96	0.48	0.10	0.41	1.04	3.60	2.83	1.99	0.38	0.20	0.51	0.26	1.06
1976	0.40	0.36	0.29	0.34	0.93	8.04	4.49	2.62	0.43	0.31	0.30	0.13	1.55
1977	0.56	0.33	0.45	0.23	0.28	0.40	1.35	0.17	0.08	0.03	0.84	0.14	0.40
1978	0.50	1.90	2.31	3.87	0.94	3.49	2.13	0.66	0.04	0.10	0.51	0.07	1.38
1979	0.42	0.21	0.87	0.53	0.70	1.46	0.76	0.19	0.02	0.04	0.14	0.10	0.45
1980	0.93	0.12	1.82	1.42	1.00	3.41	5.24	1.22	0.22	0.13	0.50	0.45	1.37
1981	3.56	2.92	0.98	0.94	0.75	3.98	2.00	1.78	0.46	0.27	0.09	0.43	1.51
1982	0.88	0.81	1.44	1.74	0.46	1.36	2.38	2.14	0.70	0.00	0.11	1.38	1.12
Average	0.87	0.93	1.11	0.84	0.99	4.35	5.09	1.62	0.57	0.25	0.33	0.34	1.44

River System : Huai Sukhrip

Catchment Area: 123 km^2

Table 7 MONTHLY RUN-OFF AT DOK KRAI DAMSITE'

(Catchment Area : 291 km^2)

(Unit: m^3/s)

Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Annual
1968	2.08	7.52	9.05	5.10	3.16	3.46	9.03	5.53	1.60	1.54	0.66	0.70	4.12
1969	0.28	1.41	2.43	1.59	1.97	6.41	8.27	7.17	2.05	1.03	2.15	0.66	2.95
1970	1.69	8.14	5.93	2.36	1.77	2.42	6.81	2.09	10.77	2.63	1.28	1.27	3.93
1971	1.89	2.33	1.54	0.51	1.06	4.41	8.95	4.32	1.51	0.75	1.00	0.63	2.41
1972	5.41	0.99	0.91	0.25	0.08	14.02	18.33	8.15	2.92	1.03	1.08	1.38	4.55
1973	0.57	3.33	4.07	3.83	3.98	6.61	9.37	4.74	1.83	0.90	0.70	0.88	3.40
1974	3.70	3.45	1.43	0.99	1.94	5.76	13.49	7.42	2.44	1.86	1.55	1.14	3.76
1975	1.17	3.09	3.66	1.27	1.55	2.80	15.48	8.30	3.50	0.93	1.00	0.88	3.64
1976	1.60	3.43	0.66	0.30	6.04	5.08	8.18	9.05	2.51	1.07	0.83	0.41	3.26
1977	1.40	2.69	1.03	2.31	1.82	1.22	11.50	2.91	0.73	0.61	0.97	0.50	2.31
1978	1.49	5.29	2.22	3.56	2.29	4.16	7.45	3.65	0.93	0.65	0.46	0.25	2.70
1979	0.34	0.98	2.07	0.37	0.56	3.76	2.29	0.68	0.62	0.19	1.13	0.40	1.12
1980	0.46	0.65	3.40	1.26	1.61	1.73	12.82	6.23	1.66	0.39	1.70	1.41	2.78
1981	2.60	7.45	3.17	2.26	2.55	5.00	8.15	11.86	4.00	1.19	0.65	0.98	4.16
Average	1.76	3.63	2.97	1.85	2.17	4.77	10.01	5.86	2.65	1.06	1.08	0.82	3.22

Table 8 MONTHLY RUN-OFF AT NONG KHO DAMSITE

(Unit: m^3/s)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Mean
1968	0.35	0.69	0.85	0.26	0.41	1.58	3.50	0.78	0.17	0.28	0.08	0.21	0.77
1969	0.19	0.46	0.73	0.11	0.71	5.88	2.52	0.66	0.10	0.09	0.11	0.08	0.97
1970	0.28	0.31	0.92	0.36	0.27	0.60	2.85	0.25	1.33	0.14	0.19	0.08	0.64
1971	0.47	0.94	1.14	0.48	1.79	5.55	4.40	0.75	0.16	0.02	0.12	0.07	1.32
1972	0.34	0.02	0.08	0.06	0.03	2.62	3.86	2.73	0.85	0.15	0.10	0.19	0.92
1973	0.04	0.22	0.20	0.10	0.63	1.45	2.64	0.26	0.09	0.07	0.07	0.13	0.50
1974	0.64	0.62	0.12	0.11	0.32	1.25	6.67	1.03	0.29	0.51	0.28	0.24	1.02
1975	0.46	0.23	0.05	0.20	0.50	1.73	1.36	0.95	0.18	0.10	0.24	0.13	0.51
1976	0.19	0.17	0.14	0.16	0.45	3.85	2.15	1.26	0.20	0.15	0.14	0.06	0.74
1977	0.27	0.16	0.22	0.11	0.13	0.19	0.65	0.08	0.04	0.01	0.40	0.07	0.19
1978	0.24	0.91	1.11	1.86	0.45	1.67	1.02	0.32	0.02	0.05	0.25	0.03	0.66
1979	0.20	0.10	0.42	0.25	0.33	0.70	0.36	0.09	0.01	0.02	0.07	0.05	0.22
1980	0.45	0.06	0.87	0.68	0.48	1.64	2.52	0.58	0.10	0.06	0.24	0.22	0.66
1981	1.71	1.40	0.47	0.45	0.36	1.91	0.96	0.85	0.22	0.13	0.04	0.20	0.73
1982	0.42	0.39	0.69	0.83	0.22	0.65	1.14	1.03	0.34	0.00	0.05	0.66	0.54
Average	0.42	0.45	0.53	0.40	0.47	2.08	2.44	0.77	0.27	0.12	0.16	0.16	0.69

River System : Khlong Bang Lamung
Catchment Area: 59 km^2
Note : Estimated from those at Bang Phra Damsite.

Table 9 MONTHLY RUNOFF AT MAP PRACHAN DAMSITE

(Unit: m^3/s)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Mean
1968	0.23	0.44	0.55	0.17	0.26	1.02	2.25	0.50	0.11	0.18	0.05	0.14	0.48
1969	0.12	0.30	0.47	0.07	0.46	3.78	1.62	0.43	0.06	0.06	0.07	0.05	0.61
1970	0.18	0.20	0.59	0.23	0.17	0.38	1.83	0.16	0.85	0.09	0.12	0.05	0.40
1971	0.30	0.60	0.73	0.31	1.15	3.57	2.82	0.48	0.10	0.01	0.08	0.05	0.83
1972	0.22	0.01	0.05	0.04	0.02	1.68	2.48	1.75	0.55	0.10	0.06	0.12	0.58
1973	0.03	0.14	0.13	0.07	0.41	0.93	1.70	0.17	0.05	0.04	0.05	0.08	0.31
1974	0.41	0.40	0.08	0.07	0.21	0.80	4.29	0.66	0.19	0.33	0.18	0.16	0.64
1975	0.29	0.15	0.03	0.13	0.32	1.11	0.87	0.61	0.12	0.06	0.16	0.08	0.32
1976	0.12	0.11	0.09	0.10	0.29	2.48	1.38	0.81	0.13	0.10	0.09	0.04	0.47
1977	0.17	0.10	0.14	0.07	0.09	0.12	0.42	0.05	0.02	0.01	0.26	0.04	0.12
1978	0.15	0.58	0.71	1.19	0.29	1.07	0.66	0.20	0.01	0.03	0.16	0.02	0.41
1979	0.13	0.06	0.27	0.16	0.21	0.45	0.23	0.06	0.01	0.01	0.04	0.03	0.14
1980	0.29	0.04	0.56	0.44	0.31	1.05	1.62	0.37	0.07	0.04	0.15	0.14	0.41
1981	1.10	0.90	0.30	0.29	0.23	1.23	0.62	0.55	0.14	0.08	0.03	0.13	0.46
1982	0.27	0.25	0.44	0.53	0.14	0.42	0.73	0.66	0.22	0.00	0.03	0.43	0.34
Average	0.27	0.29	0.34	0.26	0.30	1.34	1.57	0.50	0.18	0.08	0.10	0.10	0.44

River System : Huai Nong Pru
Catchment Area: 37.9 km^2
Note : Estimated from those at Bang Phra Damsite.

Table 10 RESERVOIR OPERATION OF NONG KHO DAM

DATE	W.L. (m)	AREA (km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1976							
11							
10	65.80	4.39	19.1	2.57	0.16	0.44	0.09
20	65.80	4.39	19.1	0.98	0.01	0.44	0.09
30	65.80	4.39	19.1	0.22	0.00	0.44	0.09
12							
10	64.94	4.36	18.8	0.32	0.00	0.44	0.16
20	64.88	4.33	18.6	0.15	0.00	0.44	0.15
31	64.79	4.28	18.2	0.15	0.00	0.44	0.15
1977							
1							
10	64.69	4.22	17.8	0.23	0.00	0.44	0.16
20	64.61	4.18	17.5	0.13	0.00	0.44	0.16
31	64.51	4.13	17.1	0.10	0.02	0.44	0.16
2							
10	64.48	4.07	16.6	0.24	0.11	0.44	0.12
20	64.35	4.05	16.4	0.06	0.00	0.44	0.12
29	64.25	3.99	16.0	0.13	0.00	0.44	0.12
3							
10	64.17	3.95	15.7	0.11	0.03	0.44	0.13
20	64.08	3.90	15.3	0.04	0.00	0.44	0.13
31	63.97	3.84	14.9	0.04	0.03	0.44	0.12
4							
10	63.85	3.78	14.4	0.24	0.13	0.44	0.15
20	63.80	3.75	14.2	0.52	0.20	0.44	0.15
30	63.82	3.76	14.3	0.04	0.02	0.44	0.15
5							
10	63.72	3.71	13.8	0.13	0.21	0.44	0.14
20	63.66	3.68	13.6	0.13	0.17	0.44	0.14
31	63.60	3.65	13.4	0.22	0.21	0.44	0.14
6							
10	63.57	3.63	13.3	0.14	0.05	0.44	0.15
20	63.48	3.58	12.9	0.03	0.06	0.44	0.15
30	63.35	3.51	12.5	0.47	0.22	0.44	0.15
7							
10	63.37	3.52	12.6	0.10	0.02	0.44	0.12
20	63.27	3.46	12.2	0.03	0.01	0.44	0.12
31	63.14	3.39	11.8	0.20	0.19	0.44	0.12
8							
10	63.07	3.36	11.6	0.26	0.07	0.44	0.11
20	63.03	3.33	11.4	0.07	0.00	0.44	0.11
31	62.90	3.25	11.0	0.08	0.08	0.44	0.11
9							
10	62.78	3.18	10.6	0.07	0.11	0.44	0.09
20	62.68	3.12	10.3	0.18	0.22	0.44	0.09
30	62.64	3.10	10.2	0.32	0.22	0.44	0.09
10							
10	62.64	3.10	10.2	0.90	0.30	0.44	0.18
20	62.83	3.21	10.8	0.66	0.18	0.44	0.10
31	62.91	3.26	11.0	0.41	0.07	0.44	0.10
11							
10	62.90	3.25	11.0	0.15	0.06	0.44	0.09
20	62.81	3.20	10.7	0.04	0.00	0.44	0.09
30	62.67	3.11	10.3	0.05	0.01	0.44	0.09
12							
10	62.53	3.03	9.9	0.02	0.00	0.44	0.10
20	62.33	2.95	9.4	0.02	0.00	0.44	0.10
31	62.23	2.86	9.0	0.07	0.00	0.44	0.09

DATE	W.L. (m)	AREA (km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1978							
1							
10	62.09	2.77	8.5	0.00	0.01	0.44	0.08
20	61.93	2.68	8.1	0.01	0.01	0.44	0.08
31	61.76	2.58	7.7	0.03	0.01	0.44	0.07
2							
10	61.59	2.48	7.2	0.55	0.13	0.44	0.06
20	61.66	2.52	7.4	0.13	0.02	0.44	0.06
28	61.56	2.46	7.1	0.55	0.21	0.44	0.06
3							
10	61.62	2.50	7.3	0.07	0.00	0.44	0.08
20	61.48	2.42	6.9	0.06	0.00	0.44	0.08
31	61.32	2.33	6.5	0.07	0.00	0.44	0.08
4							
10	61.16	2.23	6.1	0.13	0.02	0.44	0.08
20	61.05	2.17	5.8	0.19	0.04	0.44	0.08
30	60.94	2.11	5.6	0.35	0.17	0.44	0.08
5							
10	60.94	2.11	5.6	0.33	0.07	0.44	0.08
20	60.91	2.09	5.5	1.76	0.28	0.44	0.08
31	61.43	2.39	6.8	0.62	0.01	0.44	0.09
6							
10	61.47	2.41	6.9	0.73	0.00	0.44	0.08
20	61.54	2.45	7.1	1.78	0.35	0.44	0.09
30	62.06	2.76	8.5	0.82	0.03	0.44	0.10
7							
10	62.15	2.81	8.8	1.14	0.13	0.44	0.09
20	62.36	2.93	9.4	0.92	0.16	0.44	0.09
31	62.52	3.03	9.9	3.36	0.47	0.44	0.10
8							
10	63.49	3.59	13.8	0.83	0.89	0.44	0.11
20	63.58	3.63	13.3	0.43	0.08	0.44	0.11
31	63.57	3.63	13.3	0.13	0.03	0.44	0.11
9							
10	63.47	3.58	12.9	0.52	0.17	0.44	0.10
20	63.50	3.59	13.0	2.37	0.69	0.44	0.11
30	64.04	3.88	15.2	2.12	0.17	0.44	0.11
10							
10	64.41	4.08	16.7	1.28	0.17	0.44	0.15
20	64.68	4.18	17.5	1.20	0.16	0.44	0.15
31	64.76	4.26	18.1	0.62	0.09	0.44	0.15
11							
10	64.79	4.28	18.2	0.51	0.00	0.44	0.15
20	64.78	4.27	18.2	0.35	0.00	0.44	0.15
30	64.72	4.24	18.0	0.09	0.00	0.44	0.15
12							
10	64.62	4.19	17.5	0.00	0.00	0.44	0.13
20	64.50	4.12	17.0	0.01	0.00	0.44	0.13
31	64.38	4.06	16.5	0.04	0.00	0.44	0.13

DATE	W.L. (m)	AREA (km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1979							
1							
10	64.26	4.00	16.0	0.05	0.00	0.44	0.11
20	64.15	3.94	15.6	0.09	0.00	0.44	0.11
31	64.05	3.89	15.2	0.02	0.00	0.44	0.11
2							
10	63.93	3.82	14.7	0.20	0.03	0.44	0.13
20	63.85	3.78	14.4	0.38	0.00	0.44	0.12
28	63.81	3.76	14.2	0.14	0.00	0.44	0.12
3							
10	63.74	3.72	13.9	0.06	0.00	0.44	0.16
20	63.62	3.65	13.5	0.04	0.00	0.44	0.16
31	63.50	3.59	13.0	0.00	0.00	0.44	0.15
4							
10	63.33	3.50	12.4	0.03	0.00	0.44	0.13
20	63.20	3.42	12.0	0.15	0.00	0.44	0.13
30	63.11	3.37	11.7	0.42	0.40	0.44	0.13
5							
10	63.16	3.40	11.9	0.16	0.03	0.44	0.15
20	63.07	3.35	11.5	0.07	0.04	0.44	0.15
31	62.94	3.28	11.1	0.07	0.05	0.44	0.14
6							
10	62.80	3.19	10.7	0.03	0.04	0.44	0.10
20	62.66	3.11	10.3	0.91	0.21	0.44	0.10
30	62.82	3.20	10.8	0.31	0.04	0.44	0.10
7							
10	62.77	3.17	10.6	0.15	0.07	0.44	0.10
20	62.63	3.12	10.3	0.49	0.13	0.44	0.10
31	62.70	3.13	10.4	0.13	0.04	0.44	0.10
8							
10	62.53	3.07	10.0	0.21	0.03	0.44	0.10
20	62.50	3.01	9.8	0.00	0.01	0.44	0.09
31	62.35	2.93	9.3	0.74	0.20	0.44	0.09
9							
10	62.47	3.00	9.7	0.59	0.19	0.44	0.07
20	62.55	3.05	10.0	0.98	0.43	0.44	0.07
30	62.78	3.18	10.7	0.61	0.22	0.44	0.03
10							
10	62.87	3.24	10.9	0.34	0.00	0.44	0.12
20	62.82	3.20	10.7	0.02	0.00	0.44	0.12
31	62.66	3.11	10.3	0.70	0.09	0.44	0.12
11							
10	62.73	3.15	10.5	0.09	0.00	0.44	0.12
20	62.60	3.07	10.1	0.08	0.00	0.44	0.12
30	62.46	2.99	9.7	0.10	0.00	0.44	0.11
12							
10	62.33	2.91	9.3	0.01	0.00	0.44	0.08
20	62.18	2.83	8.8	0.00	0.00	0.44	0.08
31	62.03	2.74	8.4	0.02	0.00	0.44	0.08

DATE	W.L. (m)	AREA (km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1980							
1							
10	61.95	2.64	7.9	0.01	0.00	0.44	0.07
20	61.69	2.54	7.5	0.02	0.00	0.44	0.07
31	61.53	2.44	7.1	0.02	0.00	0.44	0.07
2							
10	61.35	2.34	6.6	0.06	0.06	0.44	0.08
20	61.22	2.27	6.3	0.05	0.10	0.44	0.07
28	61.10	2.20	5.9	0.10	0.05	0.44	0.07
3							
10	61.00	2.14	5.7	0.06	0.00	0.44	0.03
20	60.79	2.03	5.3	0.06	0.04	0.44	0.08
31	60.60	1.93	4.9	0.02	0.02	0.44	0.07
4							
10	60.36	1.80	4.5	0.05	0.07	0.44	0.08
20	60.18	1.70	4.1	1.24	0.13	0.44	0.09
30	60.56	1.90	4.9	0.05	0.00	0.44	0.07
5							
10	60.35	1.79	4.4	0.04	0.01	0.44	0.09
20	60.13	1.68	4.0	0.05	0.01	0.44	0.08
31	59.92	1.57	3.6	0.08	0.12	0.44	0.08
6							
10	59.77	1.50	3.3	0.39	0.09	0.44	0.06
20	59.77	1.50	3.3	1.55	0.17	0.44	0.06
30	60.30	1.77	4.4	0.67	0.07	0.44	0.07
7							
10	60.41	1.83	4.6	0.35	0.03	0.44	0.08
20	60.36	1.80	4.5	0.15	0.02	0.44	0.07
31	60.21	1.72	4.2	1.45	0.23	0.44	0.08
8							
10	60.78	2.02	5.3	0.49	0.05	0.44	0.08
20	60.79	2.03	5.3	0.43	0.02	0.44	0.08
31	60.77	2.02	5.3	0.51	0.10	0.44	0.08
9							
10	60.81	2.04	5.3	1.69	0.38	0.44	0.08
20	61.35	2.34	6.6	1.69	0.09	0.44	0.09
30	61.76	2.58	7.7	1.52	0.22	0.44	0.10
10							
10	62.14	2.80	8.7	1.47	0.14	0.44	0.10
20	62.45	2.98	9.7	3.12	0.28	0.44	0.11
31	63.24	3.44	12.1	2.92	0.13	0.44	0.12
11							
10	63.87	3.79	14.5	1.17	0.18	0.44	0.11
20	64.04	3.88	15.2	0.35	0.00	0.44	0.11
30	64.01	3.86	15.0	0.23	0.00	0.44	0.11
12							
10	63.94	3.83	14.7	0.16	0.00	0.44	0.11
20	63.85	3.78	14.4	0.10	0.00	0.44	0.11
31	63.75	3.73	14.0	0.05	0.00	0.44	0.11

DATE	W.L. (m)	AREA (km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1981							
1							
10	63.64	3.66	13.5	0.06	0.00	0.44	0.08
20	63.54	3.61	13.1	0.06	0.00	0.44	0.07
31	63.43	3.55	12.8	0.06	0.03	0.44	0.07
2							
10	63.31	3.49	12.4	0.52	0.12	0.44	0.10
20	63.33	3.50	12.4	0.02	0.00	0.44	0.10
29	63.21	3.43	12.0	0.15	0.00	0.44	0.10
3							
10	63.12	3.38	11.7	0.31	0.17	0.44	0.12
20	63.10	3.37	11.6	0.24	0.11	0.44	0.12
31	63.05	3.34	11.4	0.12	0.01	0.44	0.12
4							
10	62.91	3.26	11.0	0.35	0.01	0.44	0.13
20	62.85	3.22	10.8	2.49	0.62	0.44	0.14
30	63.50	3.59	13.0	2.28	0.42	0.44	0.15
5							
10	63.96	3.84	14.9	1.65	0.08	0.44	0.15
20	64.07	3.90	15.3	0.35	0.07	0.44	0.15
31	64.04	3.88	15.2	2.63	0.67	0.44	0.16
6							
10	64.68	4.22	17.3	0.80	0.09	0.44	0.15
20	64.74	4.25	18.0	0.26	0.01	0.44	0.15
30	64.68	4.22	17.8	0.35	0.13	0.44	0.15
7							
10	64.66	4.21	17.7	0.30	0.12	0.44	0.16
20	64.62	4.19	17.5	0.32	0.22	0.44	0.16
31	64.61	4.18	17.5	0.71	0.21	0.44	0.16
8							
10	64.67	4.22	17.3	0.50	0.12	0.44	0.15
20	64.68	4.22	17.3	0.47	0.09	0.44	0.15
31	64.68	4.22	17.3	0.12	0.00	0.44	0.15
9							
10	64.58	4.17	17.4	0.36	0.03	0.44	0.13
20	64.55	4.15	17.2	1.81	0.78	0.44	0.13
30	64.97	4.37	19.0	3.55	0.33	0.44	0.14
10							
10	65.00	4.39	19.1	0.36	0.07	0.44	0.15
20	65.00	4.39	19.1	1.16	0.32	0.44	0.15
31	65.00	4.39	19.1	0.88	0.31	0.44	0.15
11							
10	65.00	4.39	19.1	0.94	0.09	0.44	0.14
20	65.00	4.39	19.1	0.79	0.10	0.44	0.14
30	65.00	4.39	19.1	0.84	0.09	0.44	0.14
12							
10	65.00	4.39	19.1	0.28	0.00	0.44	0.13
20	64.94	4.36	18.8	0.16	0.00	0.44	0.13
31	64.85	4.31	18.5	0.22	0.00	0.44	0.13

DATE	W.L. (m)	AREA (km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP (cms
1982							
1							
10	64.77	4.27	18.2	0.24	0.00	0.44	0.12
20	64.71	4.23	17.9	0.13	0.00	0.44	0.11
31	64.62	4.19	17.5	0.03	0.00	0.44	0.11
2							
10	64.58	4.12	17.0	0.12	0.11	0.44	0.13
20	64.43	4.09	16.7	0.01	0.00	0.44	0.13
28	64.31	4.02	16.2	0.00	0.00	0.44	0.12
3							
10	64.21	3.97	15.9	0.04	0.00	0.44	0.15
20	64.10	3.91	15.4	0.10	0.00	0.44	0.15
31	64.00	3.86	15.0	0.45	0.37	0.44	0.14
4							
10	64.04	3.88	15.2	0.23	0.00	0.44	0.16
20	63.97	3.84	14.9	0.90	0.20	0.44	0.16
30	64.07	3.90	15.3	0.14	0.01	0.44	0.16
5							
10	63.98	3.85	14.9	0.12	0.00	0.44	0.16
20	63.88	3.79	14.5	0.24	0.22	0.44	0.16
31	63.85	3.78	14.4	0.76	0.15	0.44	0.16
6							
10	63.91	3.81	14.7	0.48	0.38	0.44	0.15
20	63.96	3.84	14.8	1.14	0.13	0.44	0.15
30	64.10	3.91	15.4	0.52	0.11	0.44	0.15
7							
10	64.11	3.92	15.5	0.40	0.30	0.44	0.15
20	64.13	3.93	15.6	1.65	0.30	0.44	0.15
31	64.42	4.08	16.7	0.49	0.08	0.44	0.15
8							
10	64.42	4.08	16.7	0.11	0.04	0.44	0.14
20	64.33	4.03	16.3	0.24	0.07	0.44	0.14
31	64.27	4.00	16.1	0.31	0.07	0.44	0.14
9							
10	64.22	3.98	15.9	0.39	0.07	0.44	0.12
20	64.20	3.97	15.8	1.01	0.11	0.44	0.12
30	64.31	4.03	16.3	0.56	0.37	0.44	0.13

Table 11 RESERVOIR OPERATION OF MAP PRACHAN DAM

DATE	W.L. (m)	AREA (km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1976							
11							
10	45.00	2.83	14.8	1.65	0.10	0.31	0.06
20	45.00	2.83	14.8	0.63	0.01	0.31	0.06
30	45.00	2.83	14.8	0.14	0.00	0.31	0.06
12							
10	44.94	2.81	14.6	0.21	0.00	0.31	0.10
20	44.88	2.79	14.4	0.10	0.00	0.31	0.10
31	44.79	2.75	14.2	0.10	0.00	0.31	0.10
1977							
1							
10	44.69	2.72	13.9	0.14	0.00	0.31	0.10
20	44.62	2.69	13.6	0.09	0.00	0.31	0.10
31	44.52	2.66	13.4	0.06	0.02	0.31	0.10
2							
10	44.42	2.62	13.0	0.15	0.07	0.31	0.08
20	44.37	2.60	12.9	0.04	0.00	0.31	0.08
28	44.27	2.57	12.6	0.00	0.00	0.31	0.08
3							
10	44.20	2.54	12.4	0.07	0.02	0.31	0.08
20	44.11	2.51	12.1	0.02	0.00	0.31	0.08
31	44.00	2.47	11.8	0.02	0.02	0.31	0.08
4							
10	43.85	2.42	11.5	0.16	0.08	0.31	0.10
20	43.78	2.40	11.3	0.34	0.13	0.31	0.09
30	43.80	2.40	11.4	0.02	0.01	0.31	0.09
5							
10	43.65	2.36	11.1	0.08	0.13	0.31	0.09
20	43.58	2.33	10.9	0.03	0.11	0.31	0.09
31	43.49	2.30	10.7	0.14	0.13	0.31	0.09
6							
10	43.44	2.28	10.6	0.09	0.03	0.31	0.09
20	43.32	2.25	10.4	0.02	0.04	0.31	0.09
30	43.18	2.20	10.1	0.31	0.14	0.31	0.09
7							
10	43.19	2.20	10.1	0.06	0.01	0.31	0.07
20	43.07	2.16	9.8	0.02	0.01	0.31	0.07
31	42.92	2.12	9.5	0.13	0.12	0.31	0.07
8							
10	42.85	2.10	9.4	0.17	0.05	0.31	0.07
20	42.78	2.08	9.2	0.04	0.00	0.31	0.07
31	42.63	2.03	9.0	0.05	0.05	0.31	0.07
9							
10	42.51	2.00	8.7	0.05	0.07	0.31	0.06
20	42.40	1.97	8.5	0.11	0.14	0.31	0.06
30	42.35	1.95	8.4	0.21	0.14	0.31	0.06
10							
10	42.34	1.95	8.4	0.58	0.19	0.31	0.06
20	42.50	2.00	8.7	0.43	0.11	0.31	0.06
31	42.57	2.02	8.9	0.26	0.04	0.31	0.06
11							
10	42.55	2.01	8.8	0.10	0.04	0.31	0.06
20	42.45	1.98	8.6	0.02	0.00	0.31	0.06
30	42.38	1.94	8.3	0.03	0.01	0.31	0.06
12							
10	42.16	1.90	8.0	0.01	0.00	0.31	0.06
20	42.00	1.85	7.7	0.01	0.00	0.31	0.06
31	41.83	1.80	7.4	0.04	0.00	0.31	0.06

DATE	W.L. (m)	AREA (Km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1978							
1							
10	41.66	1.75	7.1	0.00	0.00	0.31	0.05
20	41.49	1.71	6.8	0.01	0.01	0.31	0.05
31	41.32	1.66	6.5	0.02	0.01	0.31	0.05
2							
10	41.15	1.61	6.2	0.35	0.12	0.31	0.04
20	41.20	1.63	6.3	0.08	0.01	0.31	0.04
28	41.09	1.60	6.1	0.35	0.13	0.31	0.04
3							
10	41.14	1.61	6.2	0.05	0.00	0.31	0.05
20	40.99	1.57	5.9	0.04	0.00	0.31	0.05
31	40.80	1.53	5.6	0.05	0.00	0.31	0.05
4							
10	40.60	1.48	5.3	0.12	0.01	0.31	0.05
20	40.47	1.45	5.1	0.12	0.03	0.31	0.05
30	40.35	1.43	4.9	0.22	0.12	0.31	0.05
5							
10	40.33	1.42	4.9	0.25	0.05	0.31	0.05
20	40.29	1.41	4.8	1.13	0.19	0.31	0.05
31	40.33	1.53	5.7	0.40	0.01	0.31	0.06
6							
10	40.86	1.54	5.7	0.47	0.00	0.31	0.05
20	40.92	1.55	5.8	1.14	0.22	0.31	0.06
30	41.41	1.68	6.6	0.52	0.02	0.31	0.06
7							
10	41.49	1.71	6.8	0.73	0.03	0.31	0.05
20	41.71	1.77	7.2	0.59	0.10	0.31	0.05
31	41.86	1.81	7.5	2.16	0.28	0.31	0.06
8							
10	42.85	2.10	9.4	0.53	0.05	0.31	0.06
20	42.95	2.12	9.6	0.27	0.04	0.31	0.06
31	42.93	2.12	9.5	0.09	0.02	0.31	0.06
9							
10	42.88	2.08	9.3	0.34	0.10	0.31	0.06
20	42.82	2.09	9.3	1.52	0.40	0.31	0.06
30	43.47	2.29	10.7	1.37	0.10	0.31	0.07
10							
10	43.92	2.44	11.6	0.82	0.10	0.31	0.09
20	44.09	2.50	12.1	0.77	0.10	0.31	0.09
31	44.23	2.55	12.5	0.40	0.06	0.31	0.09
11							
10	44.24	2.56	12.5	0.33	0.00	0.31	0.09
20	44.23	2.55	12.5	0.23	0.00	0.31	0.09
30	44.18	2.53	12.3	0.06	0.00	0.31	0.09
12							
10	44.08	2.50	12.0	0.00	0.00	0.31	0.08
20	43.95	2.45	11.7	0.01	0.00	0.31	0.08
31	43.80	2.40	11.4	0.02	0.00	0.31	0.08

DATE	W.L. (m)	AREA (km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1979							
1							
10	43.63	2.35	11.0	0.03	0.00	0.31	0.07
20	43.49	2.30	10.7	0.05	0.00	0.31	0.06
31	43.36	2.26	10.4	0.01	0.00	0.31	0.06
2							
10	43.20	2.20	10.1	0.13	0.00	0.31	0.07
20	43.09	2.17	9.9	0.24	0.00	0.31	0.07
28	43.03	2.15	9.8	0.09	0.00	0.31	0.07
3							
10	42.93	2.12	9.6	0.04	0.00	0.31	0.07
20	42.78	2.08	9.3	0.02	0.00	0.31	0.09
31	42.62	2.03	8.9	0.00	0.00	0.31	0.09
4							
10	42.43	1.97	8.6	0.02	0.00	0.31	0.08
20	42.27	1.93	8.2	0.10	0.04	0.31	0.07
30	42.17	1.90	8.0	0.27	0.23	0.31	0.07
5							
10	42.21	1.91	8.1	0.10	0.02	0.31	0.08
20	42.10	1.88	7.9	0.05	0.02	0.31	0.08
31	41.95	1.84	7.6	0.05	0.03	0.31	0.08
6							
10	41.78	1.79	7.3	0.02	0.02	0.31	0.06
20	41.63	1.75	7.0	0.59	0.12	0.31	0.06
30	41.78	1.79	7.3	0.20	0.02	0.31	0.06
7							
10	41.72	1.77	7.2	0.10	0.04	0.31	0.06
20	41.61	1.74	7.0	0.31	0.07	0.31	0.06
31	41.61	1.74	7.0	0.03	0.02	0.31	0.06
8							
10	41.48	1.70	6.8	0.14	0.02	0.31	0.05
20	41.38	1.68	6.6	0.00	0.00	0.31	0.05
31	41.21	1.63	6.3	0.48	0.11	0.31	0.05
9							
10	41.32	1.66	6.5	0.38	0.11	0.31	0.04
20	41.39	1.68	6.6	0.58	0.23	0.31	0.04
30	41.61	1.74	7.0	0.39	0.12	0.31	0.04
10							
10	41.68	1.76	7.1	0.22	0.00	0.31	0.07
20	41.62	1.74	7.0	0.01	0.00	0.31	0.07
31	41.44	1.69	6.7	0.45	0.05	0.31	0.07
11							
10	41.58	1.71	6.8	0.06	0.00	0.31	0.06
20	41.35	1.67	6.5	0.05	0.00	0.31	0.06
30	41.20	1.63	6.3	0.06	0.00	0.31	0.06
12							
10	41.05	1.58	6.0	0.01	0.00	0.31	0.04
20	40.86	1.54	5.7	0.00	0.00	0.31	0.04
31	40.66	1.49	5.4	0.01	0.00	0.31	0.04

DATE	W.L. (m)	AREA (km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1980							
1							
10	40.44	1.45	5.1	0.01	0.00	0.31	0.04
20	40.24	1.40	4.8	0.02	0.00	0.31	0.04
31	40.05	1.36	4.5	0.01	0.00	0.31	0.04
2							
10	39.78	1.30	4.2	0.04	0.03	0.31	0.04
20	39.56	1.25	3.9	0.03	0.06	0.31	0.04
29	39.36	1.21	3.7	0.06	0.02	0.31	0.04
3							
10	39.17	1.17	3.5	0.04	0.00	0.31	0.05
20	38.92	1.11	3.2	0.04	0.02	0.31	0.04
31	38.69	1.06	3.0	0.02	0.01	0.31	0.04
4							
10	38.41	1.00	2.7	0.03	0.04	0.31	0.05
20	38.19	0.94	2.4	0.79	0.07	0.31	0.05
30	38.58	1.03	2.8	0.03	0.00	0.31	0.05
5							
10	38.33	0.98	2.6	0.02	0.00	0.31	0.05
20	38.08	0.92	2.3	0.03	0.01	0.31	0.04
31	37.76	0.85	2.0	0.05	0.07	0.31	0.04
6							
10	37.48	0.80	1.8	0.25	0.05	0.31	0.03
20	37.44	0.79	1.7	1.00	0.09	0.31	0.03
30	38.17	0.94	2.4	0.43	0.04	0.31	0.04
7							
10	38.27	0.96	2.5	0.23	0.02	0.31	0.04
20	38.20	0.95	2.4	0.10	0.01	0.31	0.04
31	38.01	0.90	2.2	0.93	0.12	0.31	0.04
8							
10	38.61	1.04	2.9	0.32	0.02	0.31	0.04
20	38.61	1.04	2.9	0.27	0.01	0.31	0.04
31	38.56	1.03	2.8	0.33	0.05	0.31	0.04
9							
10	38.58	1.03	2.8	1.09	0.15	0.31	0.04
20	39.27	1.19	3.6	1.09	0.05	0.31	0.05
30	39.38	1.32	4.3	0.98	0.11	0.31	0.05
10							
10	40.33	1.42	4.9	0.94	0.07	0.31	0.05
20	40.71	1.51	5.5	2.00	0.14	0.31	0.06
31	41.61	1.74	7.0	1.88	0.07	0.31	0.06
11							
10	42.40	1.97	8.5	0.75	0.09	0.31	0.06
20	42.60	2.03	8.9	0.22	0.08	0.31	0.06
30	42.55	2.01	8.8	0.15	0.00	0.31	0.06
12							
10	42.45	1.98	8.6	0.10	0.00	0.31	0.06
20	42.34	1.95	8.4	0.06	0.00	0.31	0.06
31	42.21	1.91	8.1	0.03	0.00	0.31	0.05

DATE	N.L. (m)	AREA (Km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1981							
1							
10	42.85	1.87	7.8	0.04	0.00	0.31	0.04
20	41.91	1.83	7.5	0.04	0.00	0.31	0.04
31	41.77	1.78	7.3	0.04	0.01	0.31	0.04
2							
10	41.61	1.74	7.0	0.34	0.06	0.31	0.05
20	41.62	1.74	7.0	0.02	0.00	0.31	0.05
28	41.46	1.70	6.7	0.10	0.00	0.31	0.05
3							
10	41.36	1.67	6.5	0.20	0.00	0.31	0.06
20	41.32	1.66	6.5	0.15	0.06	0.31	0.06
31	41.24	1.64	6.3	0.07	0.01	0.31	0.06
4							
10	41.09	1.59	6.1	0.22	0.00	0.31	0.06
20	41.02	1.58	5.9	1.60	0.30	0.31	0.07
30	41.74	1.78	7.2	1.46	0.21	0.31	0.08
5							
10	42.32	1.94	8.4	0.67	0.04	0.31	0.08
20	42.46	1.98	8.6	0.22	0.03	0.31	0.08
31	42.42	1.97	8.5	1.72	0.34	0.31	0.08
6							
10	43.20	2.20	10.1	0.51	0.05	0.31	0.08
20	43.27	2.23	10.3	0.17	0.01	0.31	0.08
30	43.19	2.20	10.1	0.22	0.07	0.31	0.08
7							
10	43.15	2.19	10.0	0.19	0.06	0.31	0.08
20	43.09	2.17	9.9	0.20	0.11	0.31	0.08
31	43.06	2.16	9.8	0.46	0.11	0.31	0.08
8							
10	43.13	2.18	10.0	0.32	0.06	0.31	0.08
20	43.13	2.18	10.0	0.31	0.05	0.31	0.08
31	43.13	2.18	10.0	0.08	0.00	0.31	0.08
9							
10	42.99	2.14	9.7	0.23	0.04	0.31	0.07
20	42.94	2.12	9.6	1.16	0.40	0.31	0.07
30	43.43	2.28	10.6	2.28	0.18	0.31	0.08
10							
10	44.20	2.54	12.4	0.55	0.04	0.31	0.09
20	44.25	2.56	12.6	0.74	0.19	0.31	0.09
31	44.41	2.62	13.0	0.56	0.19	0.31	0.09
11							
10	44.52	2.66	13.4	0.60	0.05	0.31	0.09
20	44.59	2.68	13.6	0.51	0.06	0.31	0.09
30	44.64	2.70	13.7	0.54	0.06	0.31	0.09
12							
10	44.70	2.72	13.9	0.18	0.00	0.31	0.08
20	44.65	2.70	13.7	0.10	0.00	0.31	0.08
31	44.56	2.67	13.5	0.14	0.00	0.31	0.08

DATE	N.L. (m)	AREA (Km2)	VOLUME (mcm)	INFLOW (cms)	RAIN (cms)	DRAFT (cms)	EVAP. (cms)
1982							
1							
10	44.48	2.64	13.2	0.15	0.00	0.31	0.07
20	44.42	2.62	13.0	0.09	0.00	0.31	0.07
31	44.33	2.59	12.8	0.02	0.00	0.31	0.07
2							
10	44.22	2.55	12.4	0.07	0.07	0.31	0.08
20	44.15	2.52	12.2	0.01	0.00	0.31	0.08
28	44.04	2.48	11.9	0.00	0.00	0.31	0.08
3							
10	43.93	2.45	11.6	0.03	0.00	0.31	0.09
20	43.77	2.40	11.3	0.06	0.00	0.31	0.09
31	43.64	2.35	11.0	0.29	0.23	0.31	0.09
4							
10	43.68	2.36	11.1	0.14	0.00	0.31	0.10
20	43.58	2.33	10.9	0.58	0.12	0.31	0.10
30	43.69	2.37	11.2	0.09	0.01	0.31	0.10
5							
10	43.57	2.33	10.9	0.08	0.00	0.31	0.10
20	43.43	2.28	10.6	0.16	0.13	0.31	0.09
31	43.39	2.27	10.5	0.49	0.09	0.31	0.09
6							
10	43.46	2.29	10.7	0.26	0.23	0.31	0.09
20	43.50	2.30	10.7	0.73	0.08	0.31	0.09
30	43.66	2.36	11.1	0.34	0.07	0.31	0.09
7							
10	43.66	2.36	11.1	0.26	0.18	0.31	0.09
20	43.68	2.36	11.1	1.06	0.18	0.31	0.09
31	44.02	2.48	11.9	0.31	0.05	0.31	0.09
8							
10	44.01	2.47	11.8	0.07	0.02	0.31	0.09
20	43.89	2.43	11.6	0.15	0.04	0.31	0.08
31	43.81	2.41	11.4	0.20	0.04	0.31	0.08
9							
10	43.74	2.38	11.2	0.25	0.04	0.31	0.07
20	43.78	2.37	11.2	0.65	0.06	0.31	0.07
30	43.83	2.41	11.4	0.36	0.22	0.31	0.08
10							
10	43.91	2.44	11.6	0.72	0.14	0.31	0.08
20	44.07	2.49	12.0	0.23	0.03	0.31	0.08
31	44.04	2.48	11.9	1.20	0.27	0.31	0.09
11							
10	44.37	2.60	12.9	0.80	0.11	0.31	0.09
20	44.52	2.66	13.4	0.50	0.04	0.31	0.08
30	44.56	2.67	13.5	0.68	0.07	0.31	0.09
12							
10	44.66	2.71	13.8	0.47	0.09	0.31	0.08
20	44.71	2.73	13.9	0.13	0.00	0.31	0.08
31	44.64	2.70	13.7	0.06	0.00	0.31	0.08
1983							
1							
10	44.54	2.66	13.4	0.00	0.00	0.31	0.07
20	44.43	2.62	13.1	0.00	0.00	0.31	0.07
31	44.32	2.58	12.7	0.00	0.00	0.31	0.07
2							
10	44.20	2.54	12.4	0.06	0.00	0.31	0.08
20	44.10	2.51	12.1	0.03	0.00	0.31	0.08
28	44.00	2.47	11.8	0.00	0.00	0.31	0.08
3							
10	43.87	2.43	11.5	1.14	0.11	0.31	0.09
20	44.15	2.52	12.3	0.02	0.00	0.31	0.09
31	44.05	2.49	11.9	0.14	0.00	0.31	0.09

Table 12 WATER QUALITY ANALYSIS OF MAP PRACHAN RESERVOIR

No.	Date	PH	ECx10^6 at 25°C	Turbidity	Concentration (ppm)									SSP	SAR	RSC meq/l	Alk. (ppm)	TH. (ppm)
					Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3					
1.	18/06/80	7.1	100	25	5	3	11	-	0	34	12	11	-	52	1.0	0.11	28	22
2.	18/06/80	7.3	100	25	13	4	8	-	0	64	12	11	-	25	0.5	0.02	52	51
3.	16/07/80	7.4	130	25	14	3	10	-	0	57	5	22	-	31	0.6	0	49	46
4.	16/07/80	7.4	120	25	10	3	8	-	0	47	5	18	-	33	0.6	0.01	38	38
5.	08/80	7.4	120	25	13	3	6	-	0	49	5	13	-	22	0.4	0	43	40
6.	08/80	7.4	110	25	10	4	6	-	0	46	6	14	-	24	0.4	0	40	38
7.	17/09/80	7.2	120	25	10	3	7	-	0	49	7	10	-	28	0.5	0.05	40	38
8.	17/09/80	7.0	120	25	10	3	7	-	0	44	8	12	-	29	0.5	0	36	37
9.	20/10/80	6.9	120		11	3	7	-	0	44	6	10	-	27	0.5	0	39	36
10.	20/10/80	6.9	120		12	2	7	-	0	46	7	13	-	29	0.5	0	38	37
11.	18/11/80	7.2	100	25	10	3	7	-	0	43	6	10	-	28	0.5	0	38	35
12.	18/11/80	7.4	100	25	10	2	6	-	0	41	5	11	-	26	0.4	0	36	34
13.	12/80	7.2	130	25	11	3	7	-	0	48	6	7	-	30	0.5	0.03	37	39
14.	12/80	7.2	130	25	10	3	7	-	0	48	8	9	-	31	0.5	0.07	36	39
15.	21/01/81	7.3	130	25	8	3	12	-	0	44	11	13	-	44	0.9	0.08	32	36
16.	21/01/81	7.3	130	25	9	2	12	-	0	44	12	12	-	44	0.9	0.06	33	36
17.	17/02/81	7.0	120		10	4	9	-	0	57	8	10	-	32	0.6	0.10	41	46
18.	17/02/81	7.0	120		11	3	8	-	0	55	9	12	-	32	0.6	0.11	39	45
19.	18/03/81	8.0	130	25	11	4	7	-	0	54	5	4	-	26	0.5	0.03		
20.	18/03/81	7.3	120	25	12	4	6	-	0	59	5	4	-	23	0.4	0		
21.	22/04/81	6.7	110	25	11	3	11	-	0	55	3	10	-	36	0.7	0.09		
22.	22/04/81	6.7	120	25	12	4	7	-	0	55	5	11	-	26	0.5	0		
23.	20/05/81	6.9	120	25	12	4	6	-	0	57	5	11	-	21	0.4	0		
24.	20/05/81	6.5	120	25	10	6	6	-	0	57	6	2	-	22	0.4	0		
25.	24/06/81	6.7	120	25	11	3	11	-	0	32	9	25	-	37	0.7	0		
26.	24/06/81	7.0	110	25	12	3	9	-	0	37	10	23	-	32	0.6	0		
27.	23/07/81	7.2	160		14	6	10	-	0	51	12	22	-	27	0.6	0		
28.	23/07/81	7.4	160		13	7	9	-	0	68	12	19	-	23	0.5	0		
29.	13/08/81	6.5	120		12	3	5	-	0	51	5	1	-	20	0.3	0		
30.	13/08/81	6.8	120		11	4	7	-	0	62	4	4	-	25	0.5	0.09		
31.	23/09/81	6.9	140		13	8	8	-	0	64	12	17	-	21	0.4	0		
32.	23/09/81	7.0	138		13	8	8	-	0	62	11	14	-	22	0.5	0		
33.	21/10/81	6.6	80		8	3	6	-	-	36	8	3	-	28	0.4	0		
34.	21/10/81	6.6	81		9	2	5	-	-	37	8	5	-	27	0.4	0		
35.	25/11/81	6.8	81		8	2	5	-	0	35	6	2	-	29	0.4	0.02		
36.	25/11/81	6.5	82		9	1	5	-	0	35	6	2	-	29	0.4	0.04		
37.	20/01/82	7.1	130		7	4	13	-	0	43	11	8	-	44	0.9	0		
38.	20/01/82	7.1	130		7	4	12	-	0	43	11	9	-	45	0.9	0.04		
39.	20/05/82	7.6	120										0.40					
40.	23/09/82	7.3	100		9	2	6	-	0	46	6	1	0.01	30	0.5	0.12	37	31
41.	20/01/83	8.1	92		8	3	5	-	0	43	5	2	0.58				35	31

Data Source: RID

Table 13 RESULTS OF WATER QUALITY ANALYSIS

Water Sample	Unit	1	2	3	4	5	6
River/Reservoir		Huai Yai	K. Bang Lamung Khlong	Huai Sael	Nong Kho Res.	Huai Sael	Nong Kho Res.
Sampling point		Chock krapurok	Bang Lamung	Chom Phon	Dam	Chom Phon	Dam
Date of Sampling		Sep. 26, '83	Sep. 26, '83	Oct. 25, '83	Oct. 25, '83	Nov. 15, '83	Nov. 15, '83
Physical Analysis							
True color	Pt units	15	14	9	16	9	31
Odour		Unobjection-able	Unobjection-able	Unobjection-able	Objection-able	Unobjection-able	Objection-able
Turbidity in Silica units	FTU	17	39	66	39	18	17
pH Value	pH	6.9	7.1	7.4	6.9	7.4	6.7
EC at 25°C	mmho/cm	100	100	98	95	106	106
Chemical Analysis							
Total solids	mg/l	145	170	273	124	267	141
Suspended solids	mg/l	20	49	26	25	35	15
Dissolved solids	mg/l	125	121	247	99	232	126
Total hardness ($CaCO_3$)	mg/l	54	56	58	68	380	540
Carbonate hardness ($CaCO_3$)	mg/l	32	44	36	44	36	52
Non-carbonate hardness ($CaCO_3$)	mg/l	22	12	22	24	344	488
Nitrogen (total)	mg/l	-	-	0.84	1.0	0.84	1.5
Nitrogen (organic)	mg/l	-	-	0.56	0.72	0.73	1.3
Nitrogen (ammonia)	mg/l	-	-	0.28	0.28	0.11	0.17
Nitrate, expressed as nitrogen	mg/l	-	-	0.10	Nil	0.40	Trace
Nitrite, expressed as nitrogen	mg/l	-	-	0.02	0.01	0.01	0.01
Total alkalinity	mg/l	-	-	36	44	36	52
Total acidity	mg/l	-	-	3.0	15	4.0	10
Phosphorus (phosphate)	mg/l	-	-	0.20	0.25	0.24	0.26
Chloride	mg/l	16	12	-	-	-	-
Iron (Fe)	mg/l	1.7	1.6	1.6	1.7	1.3	3.8
Chromium (Cr)	mg/l	-	-	0.005	0.004	-	-
Zinc (Zn)	mg/l	0.21	0.21	0.22	0.28	0.15	0.14
Magnesium (Mg)	mg/l	2.8	2.4	2.8	2.8	3.3	2.8
Sulfate $(SO)_4$	mg/l	Nil	Nil	Trace	Nil	3.0	Nil
Fluoride (F)	mg/l	0.20	0.20	-	-	-	-
Dissolved oxygen (DO)	mg/l	-	-	7.3	0.90	6.6	1.3
Chemical oxygen demand (COD)	mg/l	-	-	15	68	13	74
Biochemical oxygen demand (BOD at 20°C)	mg/l	-	-	0.8	6.0	1.6	5.6
Biological Analysis							
Bacterial Count per ml	MPN	-	-	75,200	9,300	57,700	8,600
Bacteria Coli. Group per 100 ml	MPN	-	-	24,000	7,900	35,000	54,000
E. Coli. per ml	MPN	-	-	13,000	1,300	28,000	7,500

FIGURES

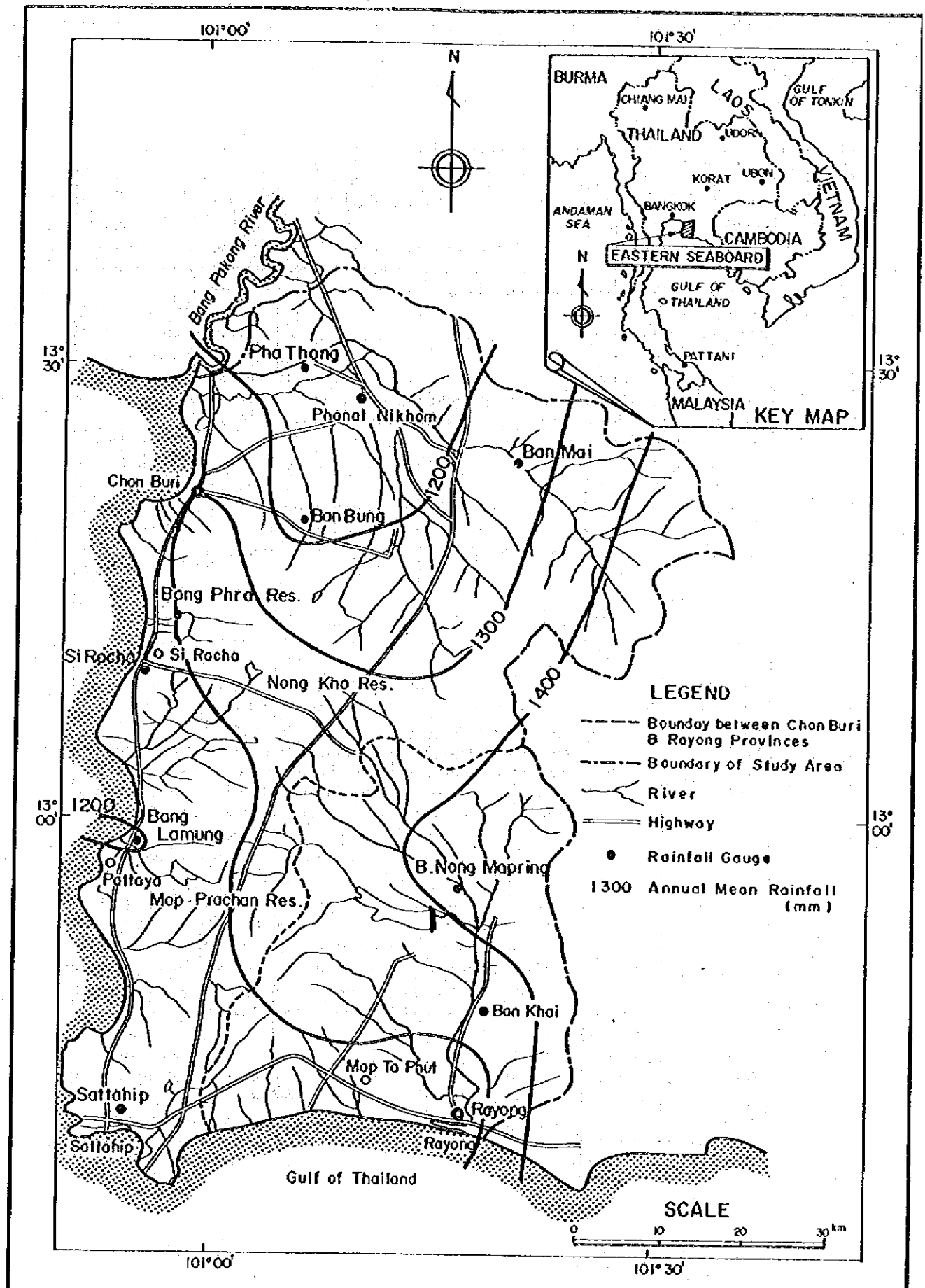

Fig.1 Isohyetal Map

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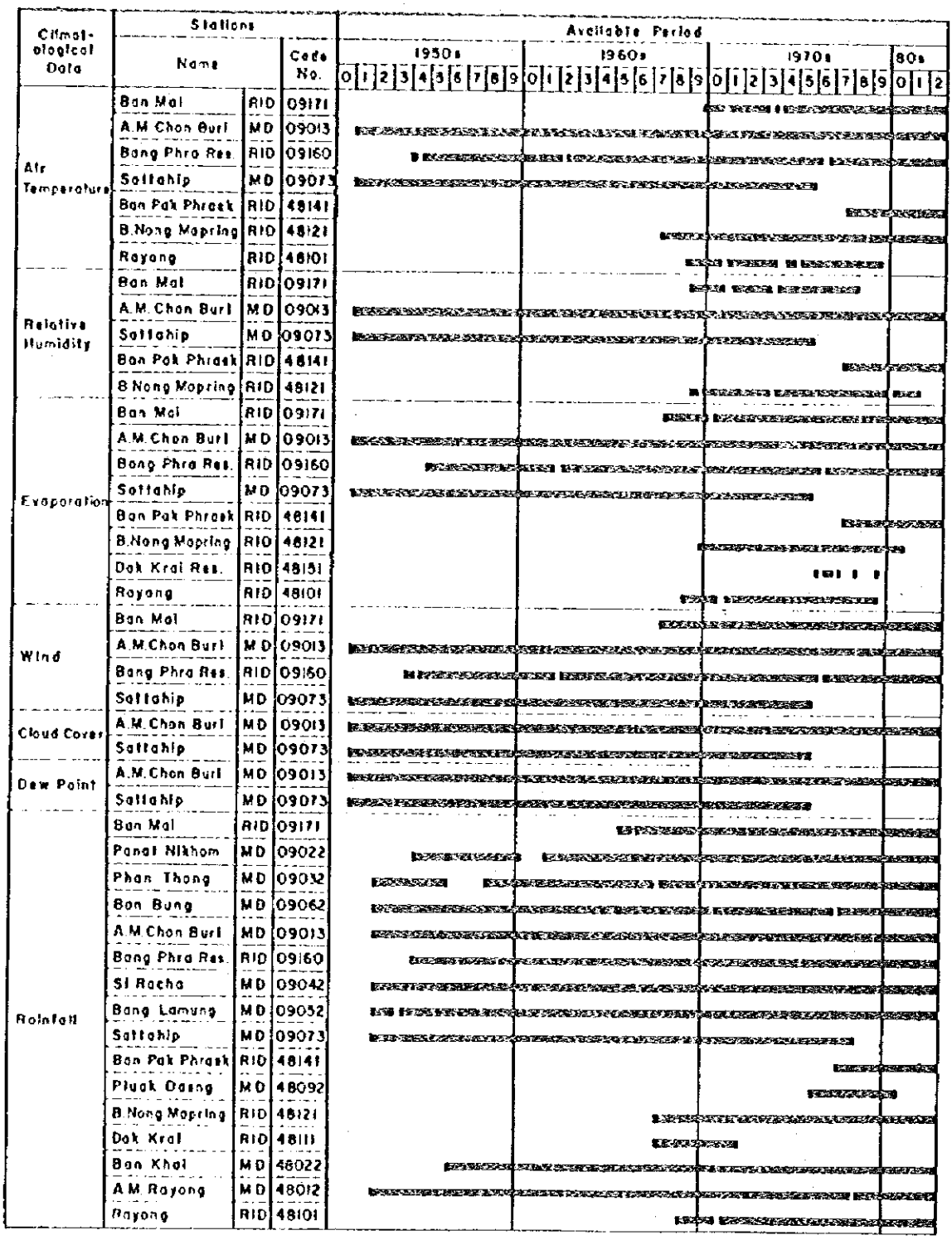

Fig. 2 List of Meteo-hydrological Gauging Station

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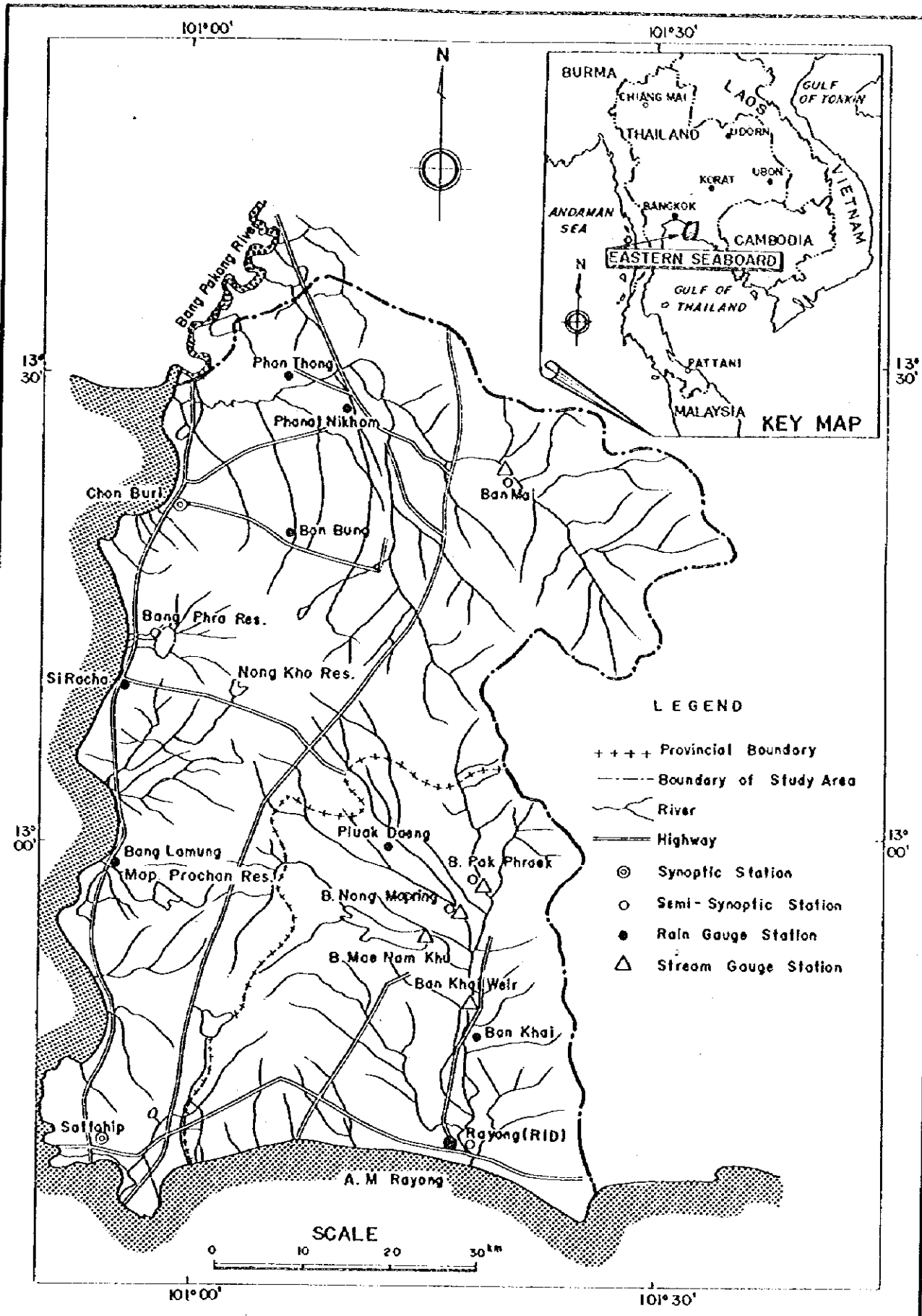

Fig. 3 Location Map of Meteo-hydrological Gauging Stations

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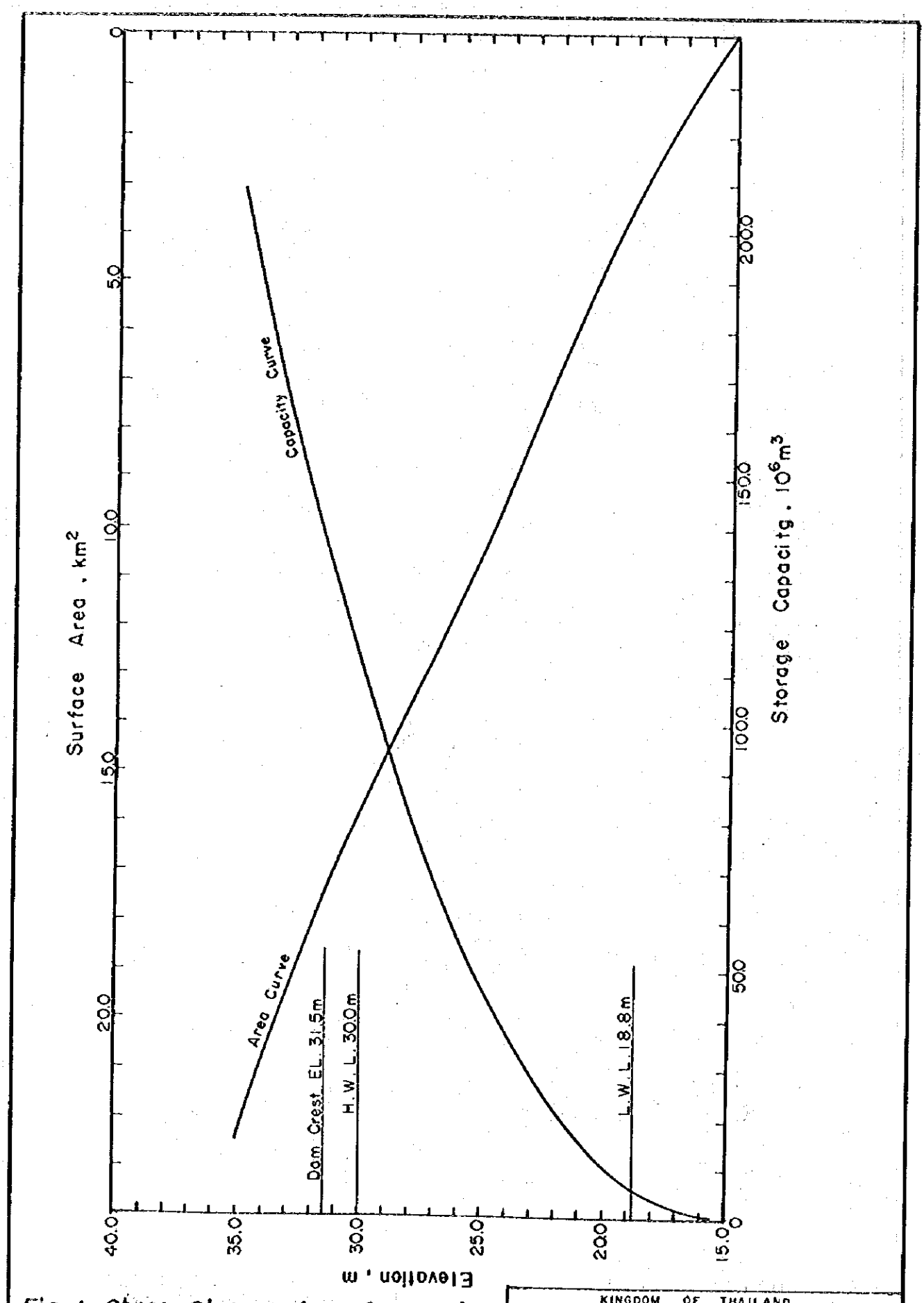

Fig. 4 Stage-Storage-Area Curve of Bang Phra Reservoir

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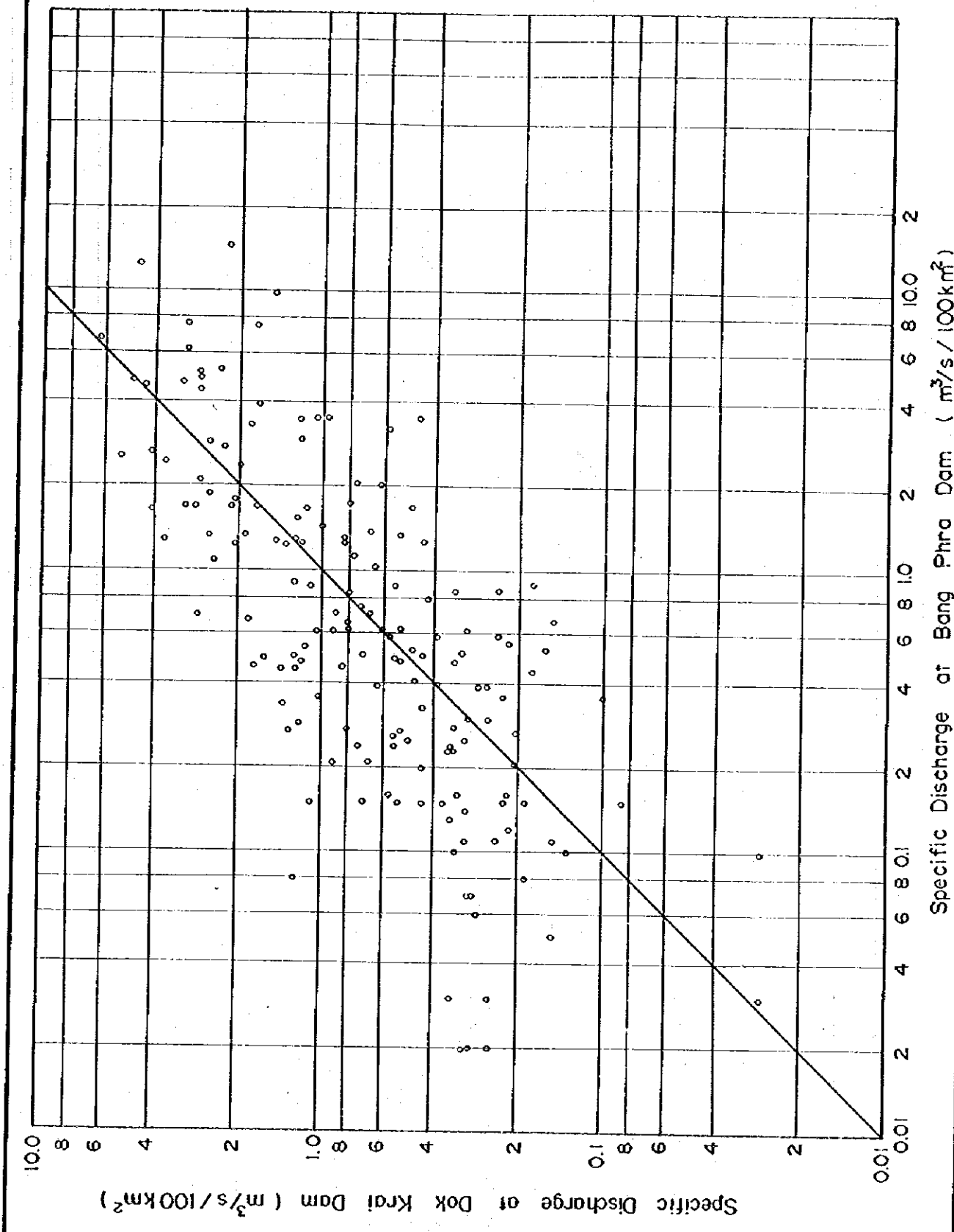

Fig. 5 Monthly Run-off Correlation of Bang Phra Dam and Dok Krai Dam

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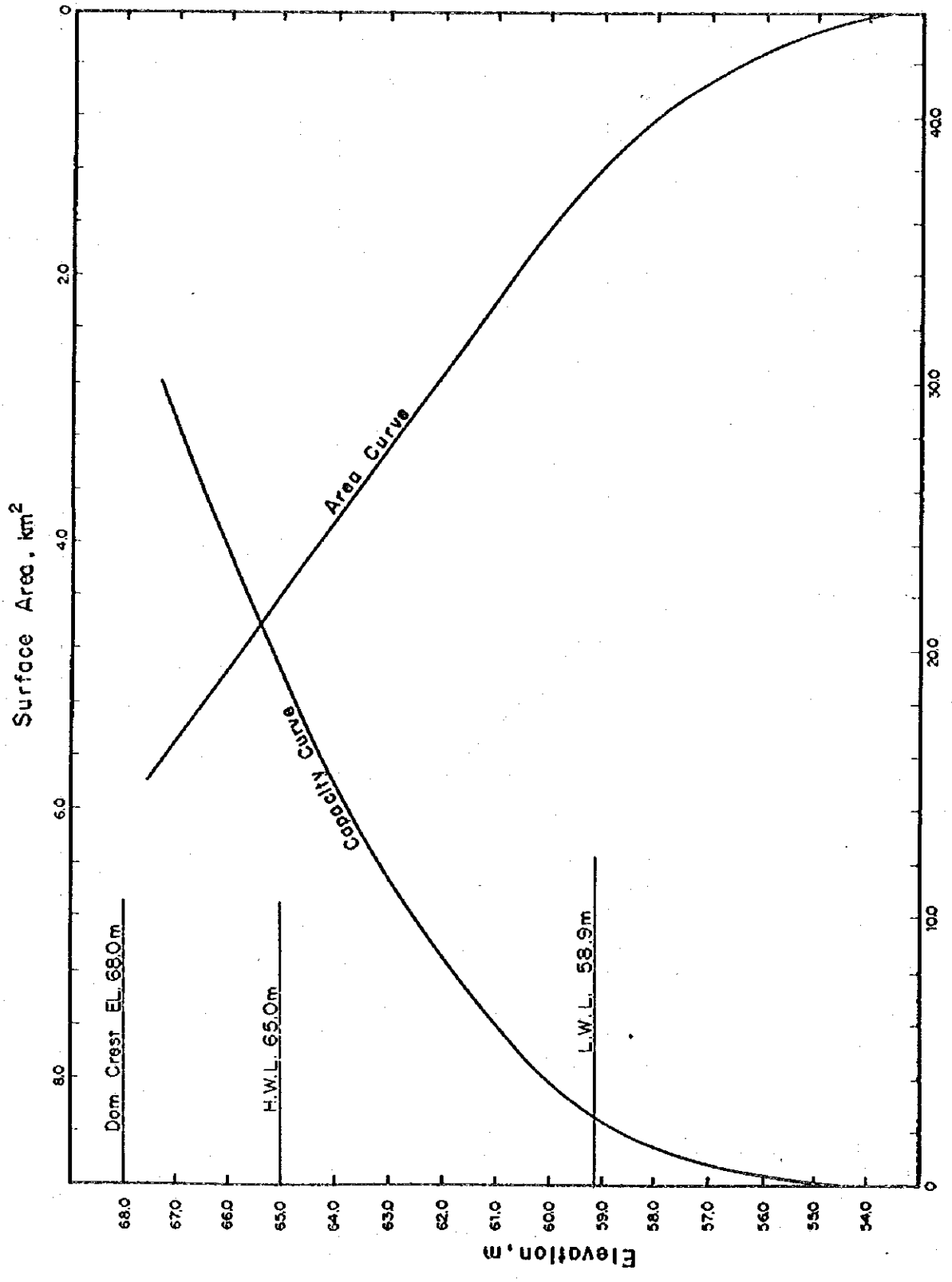

Fig. 6 Stage-Storage-Area Curve of Nong Kho Reservoir

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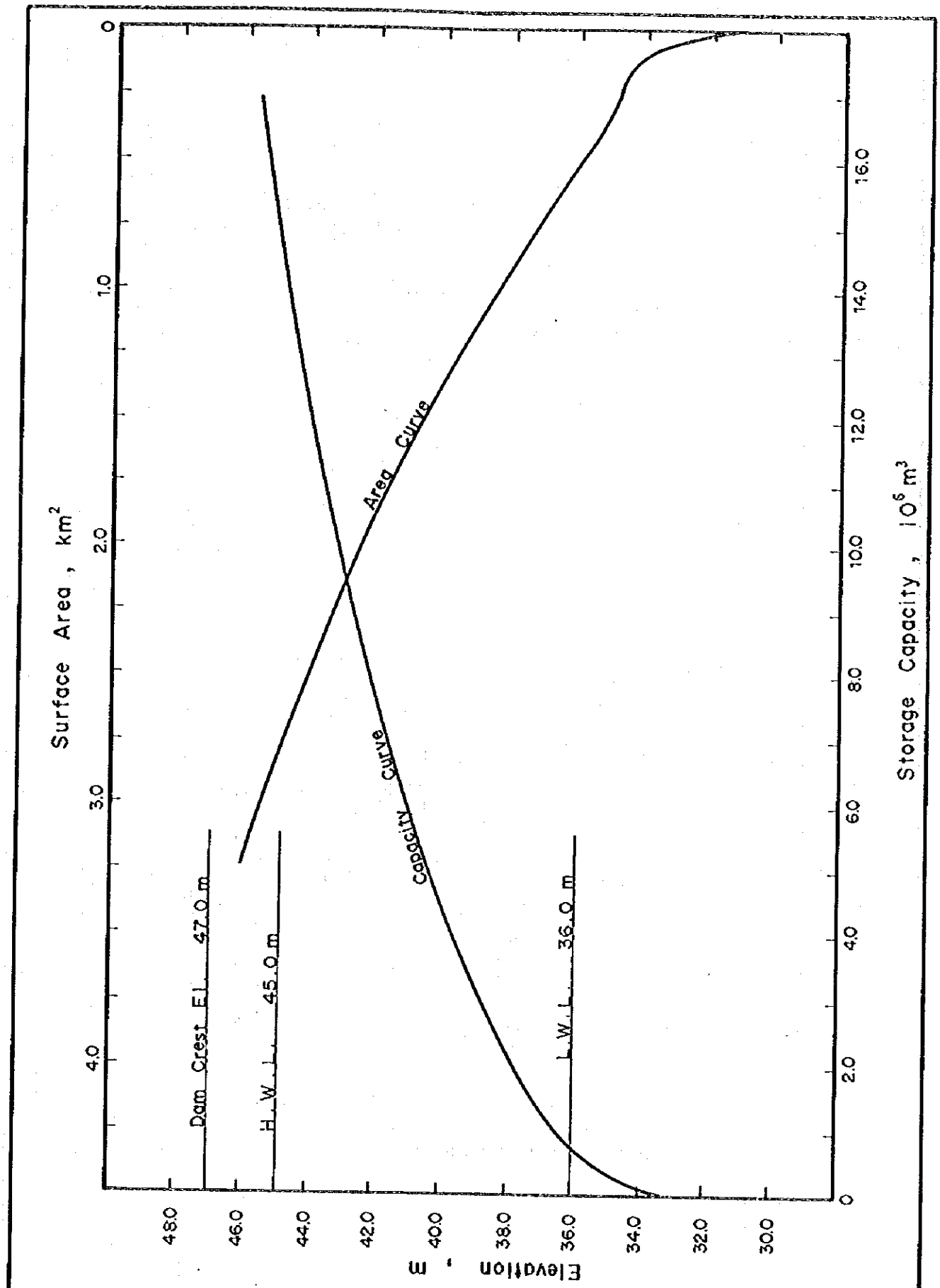

Fig.7 Stage-Storage-Area Curve of Map Prachan Reservoir

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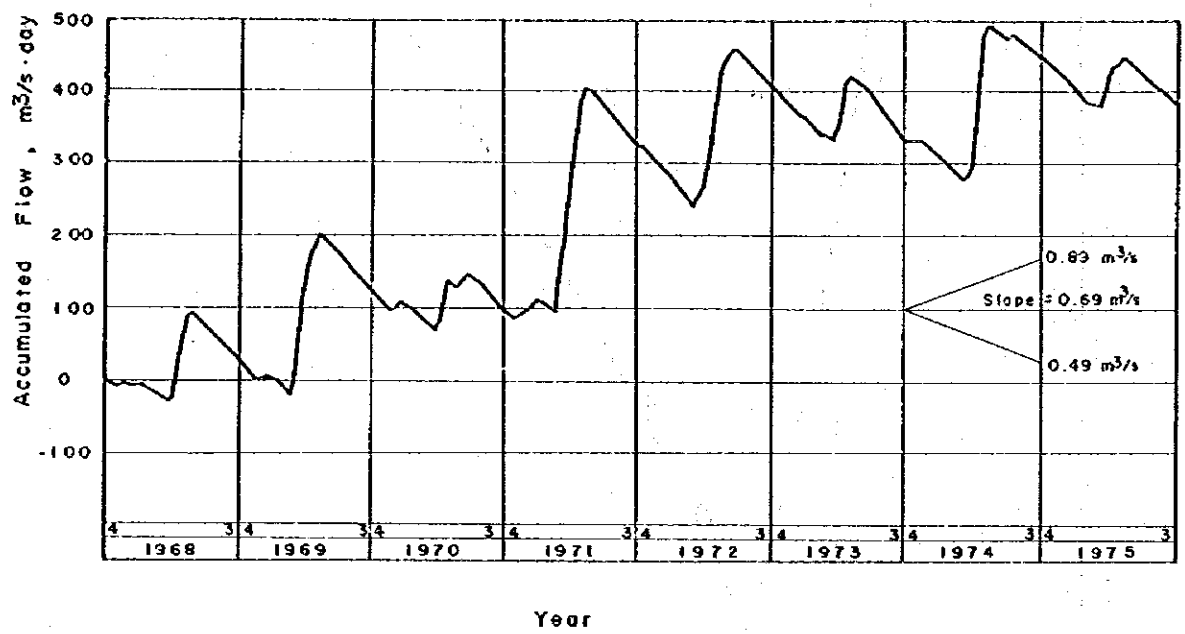

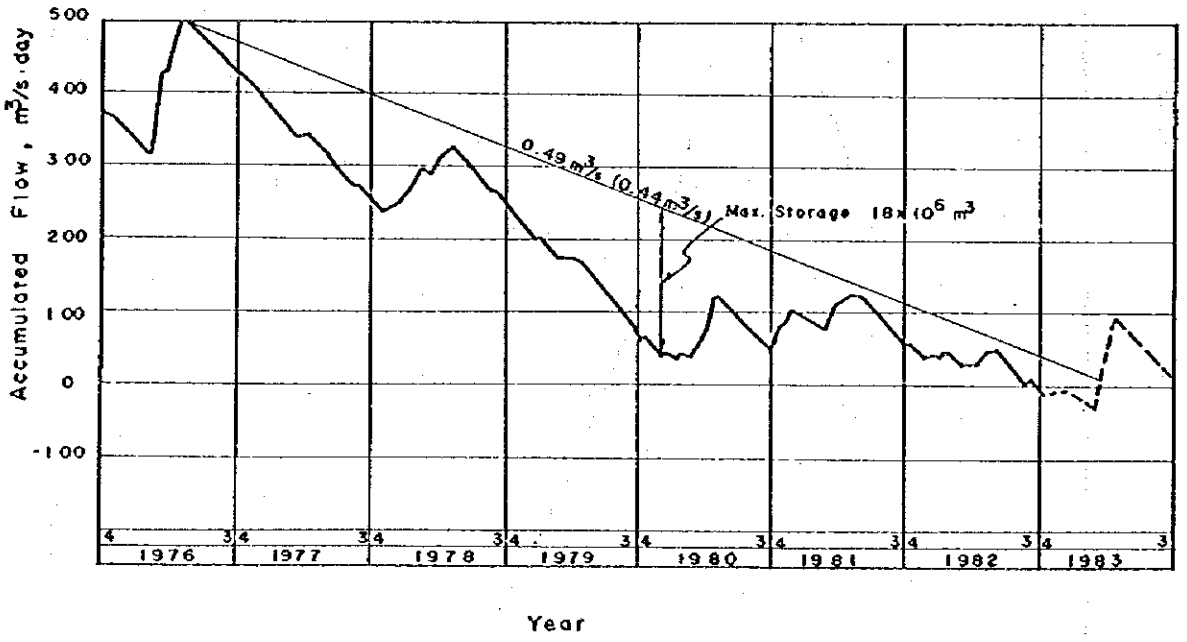

Note : Draft rate with and without parenthesis indicates net and gross respectively.

Fig. 8 Mass Curve of Nong Kho Reservoir

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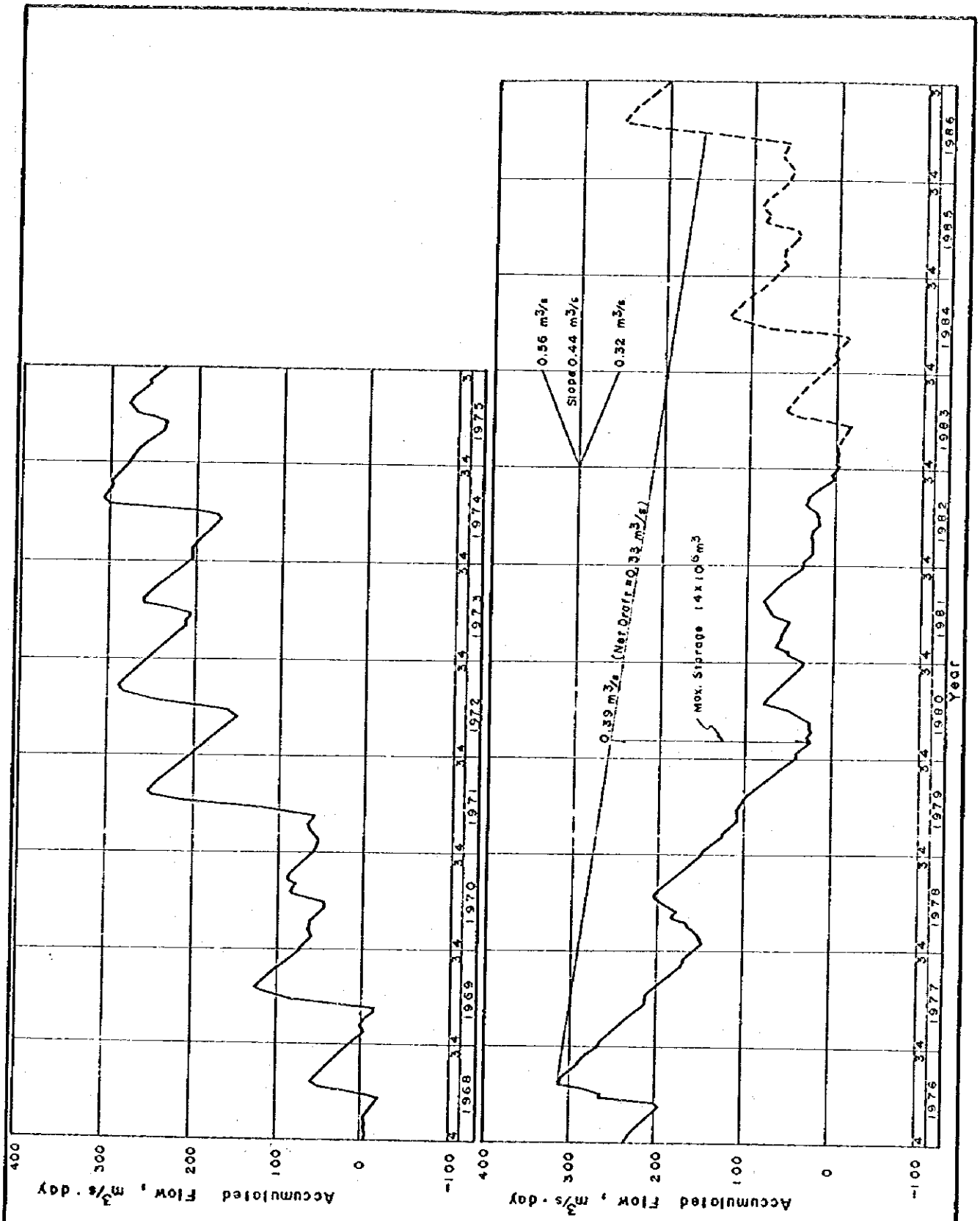

Fig. 9 Mass Curve of Map Prachan Reservoir

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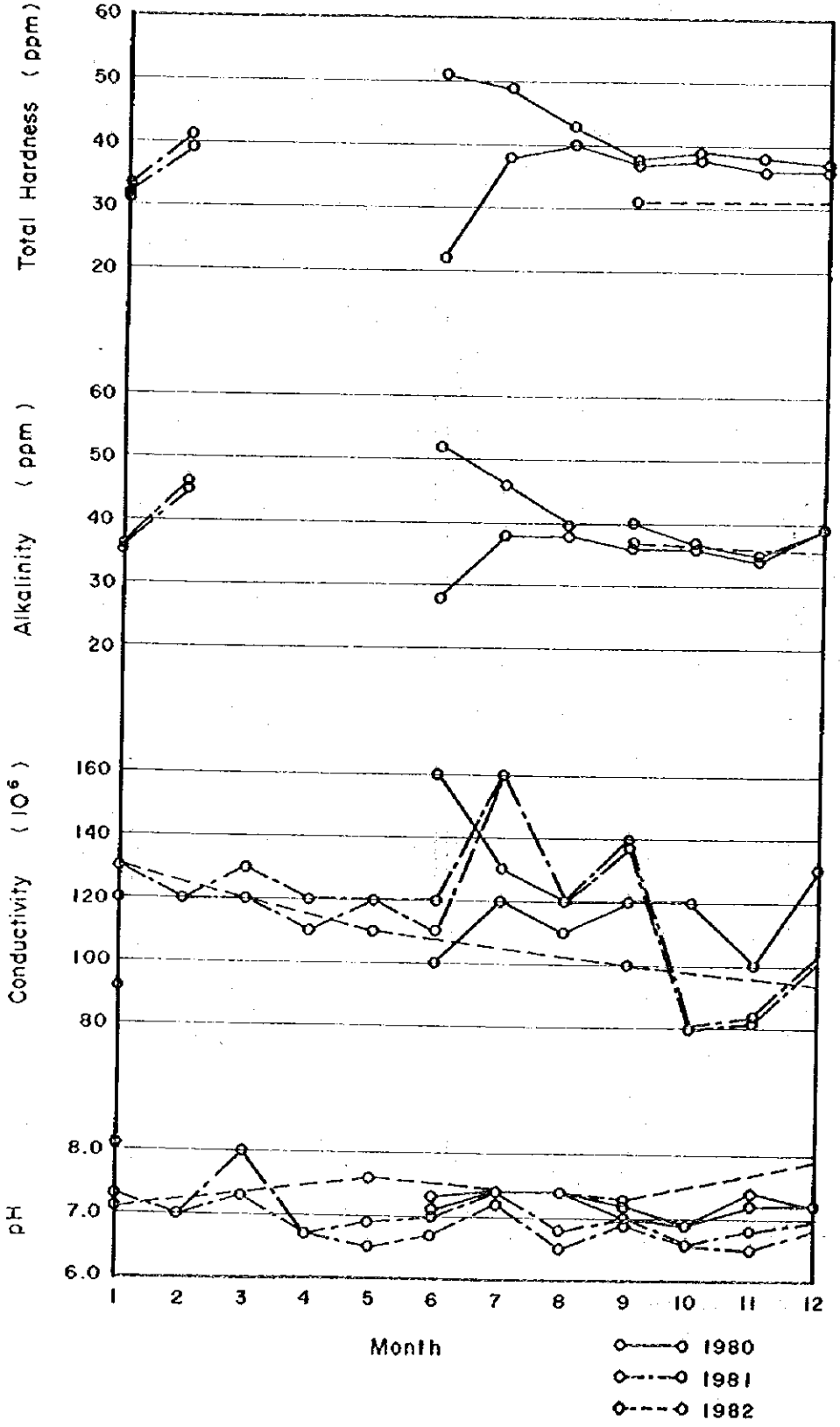

Fig. 10 Water Quality Analysis of Map Prachan Reservoir

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SUPPORTING REPORT III

GEOLOGY AND SOIL MECHANICS

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1. INTRODUCTION

Geological and soil mechanical investigations for the feasibility study of the Nong Kho - Laem Chabang Water Pipeline Project were performed from 1 October to 15 November, 1983, during which both field investigation and laboratory test were carried out.

Three alternative routes of the pipeline were studied, that is, north route, south route and middle route. The north route having been discarded from economical viewpiont, the field investigations were made for the south and middle routes, with more stress on the middle route. The investigation work consists of sub-surface exploration, material survey and laboratory test.

The middle route was investigated by means of core drilling, hand auger boring and test pitting. The core drilling was made at ten spots spaced at 1.5 km to 2.0 km and mainly at the sites of important structures of intake, river crossing and railway crossing. Geological condition betwen those core drilling spots was examined with hand auger boring and test pits. The south route was investigated only with test pitting.

The spots of the investigations are shown in Fig. 1. Location of material survey is indicated in Fig. 2.

2. SCOPE OF INVESTIGATION

2.1 Sub-surface Exploration

As shown in Table 1, the sub-surface exploration comprises the following items.

Items	Quantities
Core drilling	10 holes, 83.85 m in total length
Hand auger boring	8 holes, 17.30 m in total length
Test pitting	14 pits, 30.00 m in total length

It should be noted that core is obtained by a sampler, which is used for a standard penetration test. No core tube was available in the PWD. In the core boreholes, standard penetration test was conducted at one meter intervals in depth up to the depth of 3 m and at 1.5 m intervals in the deeper zone, in order to take sample and to examine the strength of soil. The taken samples were kept in polythene bags or plastic bottles.

In the hand auger boreholes and the test pits, sampling was made for every 25 cm in depth. After observation and recording, some of those samples were selected for laboratory test.

In-situ strength of soil layers was checked with a cone penetrometer at every location of the core drilling, the hand auger boring and the test pitting. Groundwater table was measured and recorded in all the above locations after the exploration work.

2.2 Material Survey

The material survey was made to locate source of sand for fine aggregate of concrete. It was found that local contractors borrows the materials from coastal sand deposit nearby Rayong. Sampling for laboratory test was made there.

2.3 Laboratory Test

The laboratory test was performed for the disturbed samples from the sub-surface exploration of the pipeline route and the disturbed samples from the material survey. The former samples are of top soil and residual soil formed by intensive weathering of granite bedrock, which are supposed to be foundation of the pipeline. The latter is sand of the coastal deposit for concrete aggregate.

Items and number of samples of the laboratory tests are as follows:

Test item	Foundation soil	Sand for concrete
Specific gravity	19 samples	3 samples
Particle size distribution	19	3
Moisture content	19	3
PH test	35	3
NaCl content	-	3

3. TOPOGRAPHIC AND GEOLOGICAL CONDITIONS

3.1 Topographic Condition

The proposed pipeline routes, both middle and south routes, are laid out on a flat plane with a little undulation, descending with very mild gradient from the Nong Kho dam at El. 60 m up to the Huai Lek river crossing at El. 15 m and then ascending less mildly up to the receiving well at El. 37 m. The route is divided into the middle and south alternatives between Nong Kho dam and the Huai Lek river. The distance is approximately 12.7 km along the middle route and 14 km along the south route from Nong Kho dam to the Huai Lek river, while it is only about 1.8 km from the Huai Lek river to the receiving well.

The terrain in the surroundings is cultivated land. Vegitation is mainly of cassava and palm in the higher parts than El. 25 m and on the mild slopes. Low flat land is utilized for paddy field and sugarcane field.

3.2 Geological Condition

Geological conditions of the pipeline routes are as shown in Figs. 3 and 4. Bedrock is granite in the entire project area, and is classified into (i) completely weathered zone, (ii) highly weathered zone and (iii) slightly weathered zone.

The completely weathered zone is approximately 3 m in thickness, including top soil, and is composed mainly of sand or sandy oil. The highly weathered zone, underlying the completely weathered zone, tends to be thick in relatively high land and thin in relatively low land, consisting dominantly of sandy soil with high clay content. The slightly weathered zone, the lowermost of the three zones, still retains texture of granite, and is often sampled as rock fragments with clayey material.