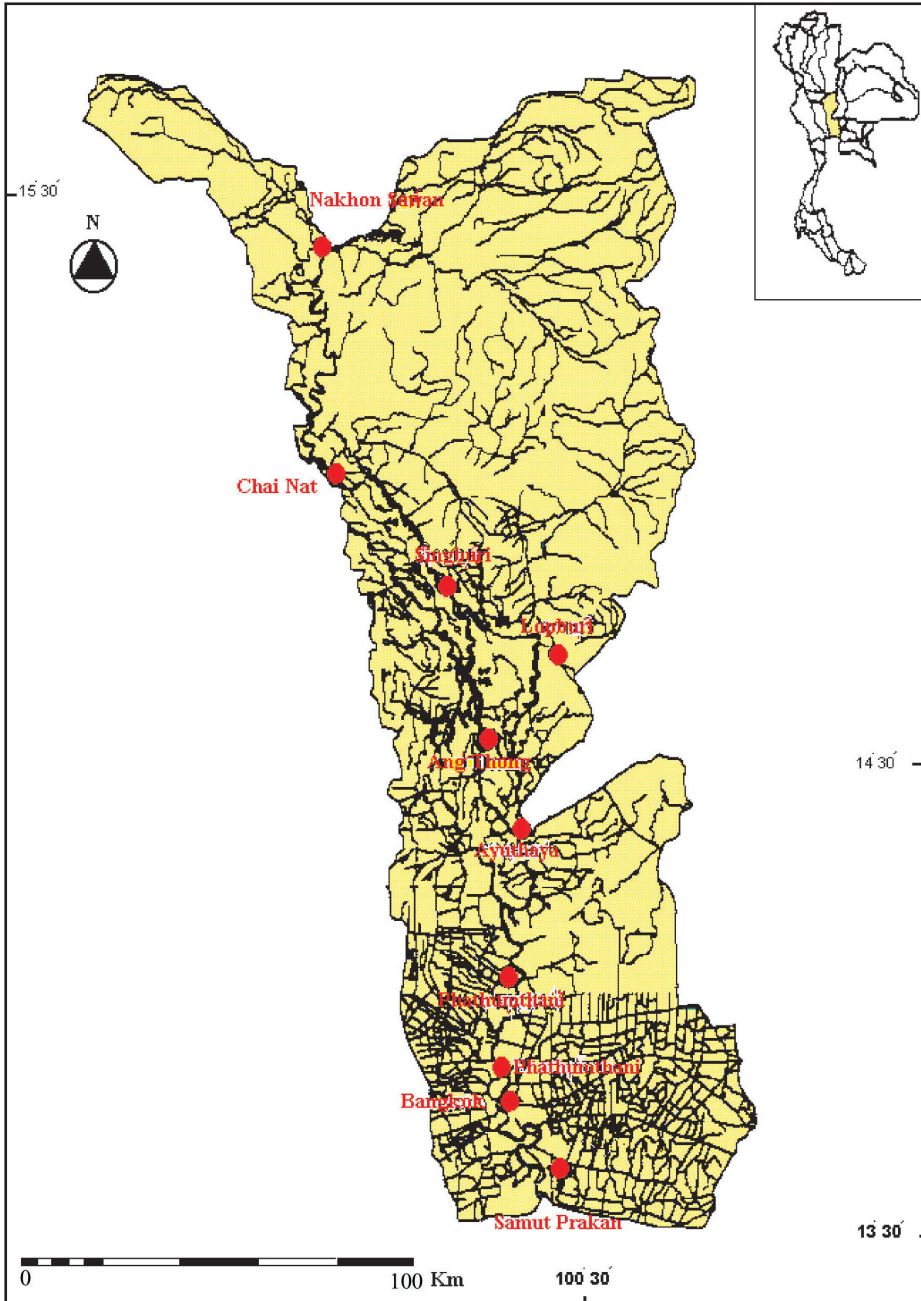


# Chao Phraya River

Map of River



## Table of Basic Data

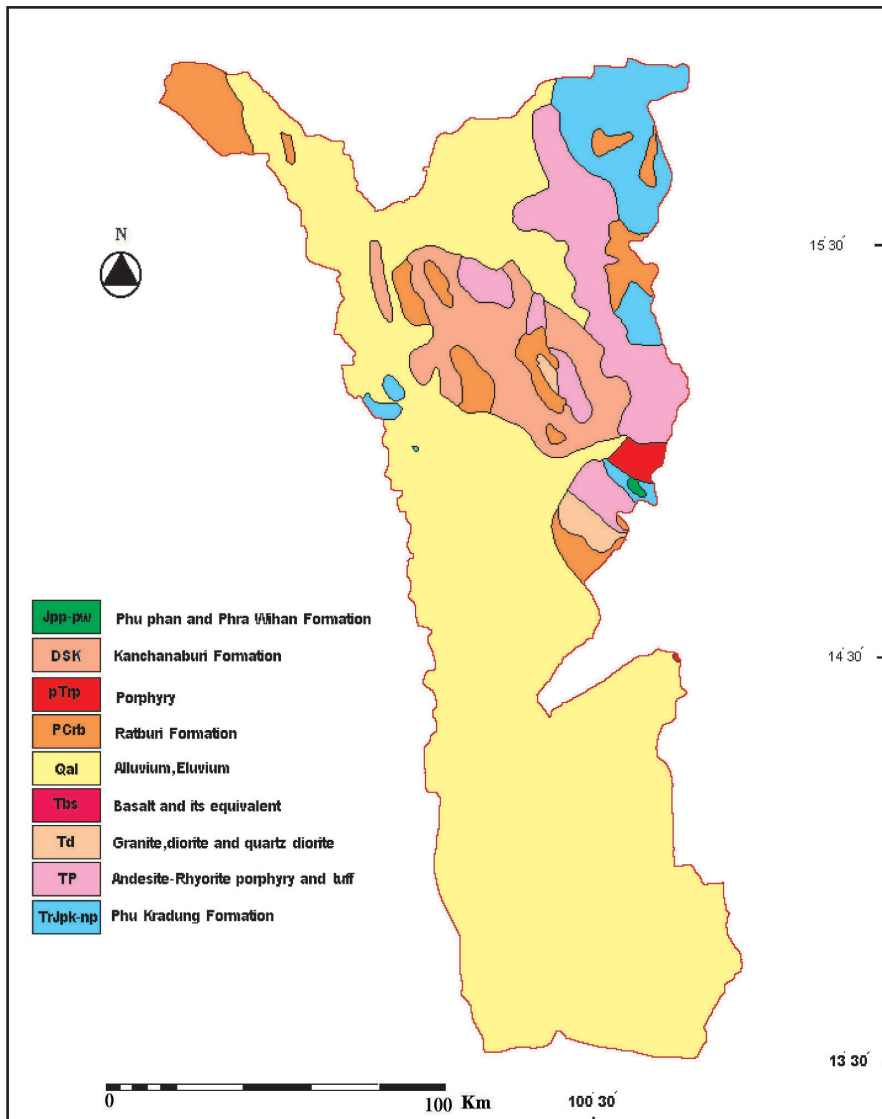
<b>Name:</b> Chao Praya river		<b>Serial No. :</b> Thailand-10
<b>Location:</b> Central part of Thailand	N 13° 29' 18" ~ 16° 02' 54"	E 99° 31' 06" ~ 101° 01' 30"
<b>Area:</b> 21,725 km <sup>2</sup>	<b>Length of Main stream:</b> 712 km	
<b>Origin:</b> Pak Nam Pho District, Nakhon Sawan Province	<b>Highest point:</b> 284 m	
<b>Outlet:</b> Gulf of Thailand	<b>Lowest point:</b> 0 m	
<b>Main geological features:</b> Phu Kradung and Phra Wihan Formation, Rattburi Formation, Alluvium, Eluvium, Kanchanaburi Formation, Marine Formation, Andesite-Rhyorite, Porphyry and Tuff, Bassalt		
<b>Main Tributaries:</b> Main Chao Phraya river (21,725 km <sup>2</sup> ), Bung Boraphet (4,902 km <sup>2</sup> )		
<b>Main Lake:</b> None		
<b>Main Reservoir:</b> Chao Phraya Dam (1957)		
<b>Mean annual Precipitation:</b> 1,487.3 mm.		
<b>Mean Annual Runoff:</b> 117.0 m <sup>3</sup> /s at Sang Khla Buri District, Chainat Province		
<b>Population:</b> 11,710,968 (1998)	<b>Main Cities:</b> Bangkok, Nakhon Phathom, Ayutthaya, Samut Prakan, Ang Thong, Singburi, Lopburi, Chai Nat, Pathum Thani, Non Thaburi, Nakhon Sawan, Phet Chaboon, Samut Sakhon	
<b>Land use:</b> Forest 2.1 %, Agriculture & urban area 92.7 %, Water resource 5.2 %		

### 1. General Description

The origin of the Chao Phraya River is the confluence of the Ping, Wang, Yom and Nan rivers about 200 km north of Bangkok. From Nakhon Sawan, the river flows through the central plain passing Bangkok toward the Gulf of Thailand. At Ayutthaya about 55 km North of Bangkok, the Chao Phraya river is joined by the Pasak river which rises in the divide between the central alluvial plain and the North-east plateau. The Lower Chao Phraya river basin starts from Nakhon Sawan and has a drainage area of 21,725 km<sup>2</sup> the average annual precipitation is 1,487.3 mm and the average discharge at Sang Khla Buri District, Chainat Province has been 117.0 m<sup>3</sup>/s. Chao Phraya reservoir built in 1957 is the largest existing reservoir in this basin.

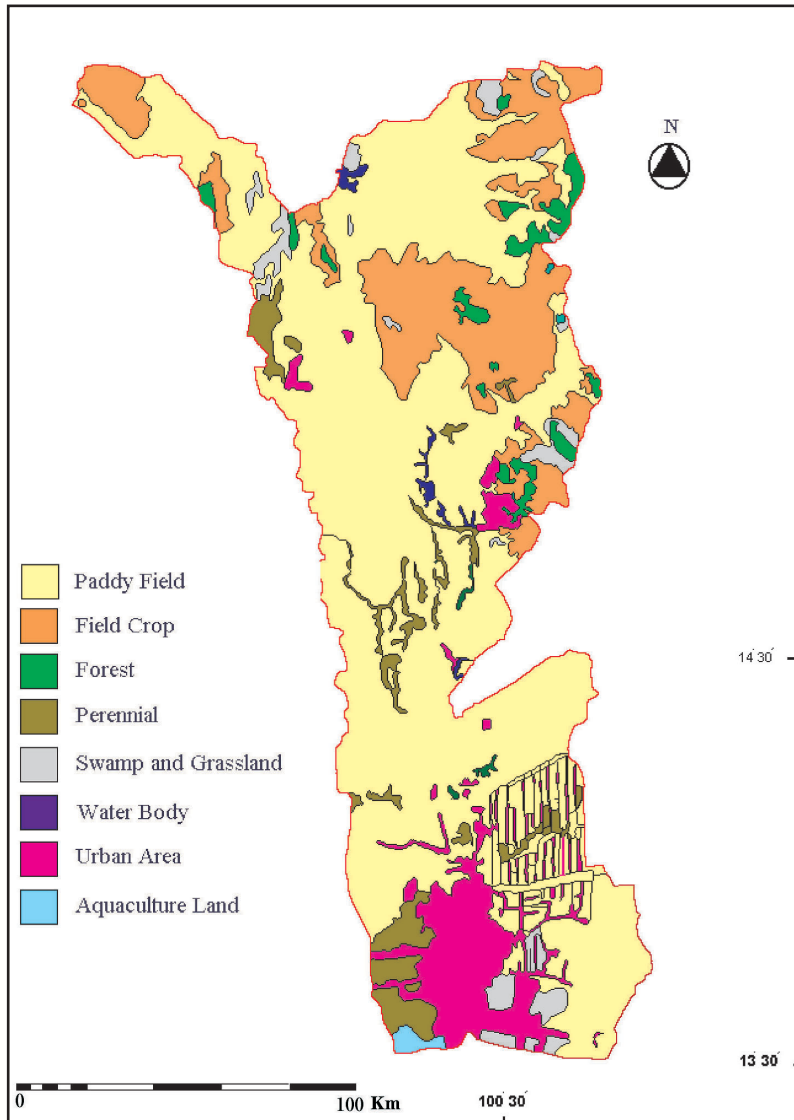
## 2. Geographical Information

### 2.1 Geological Map



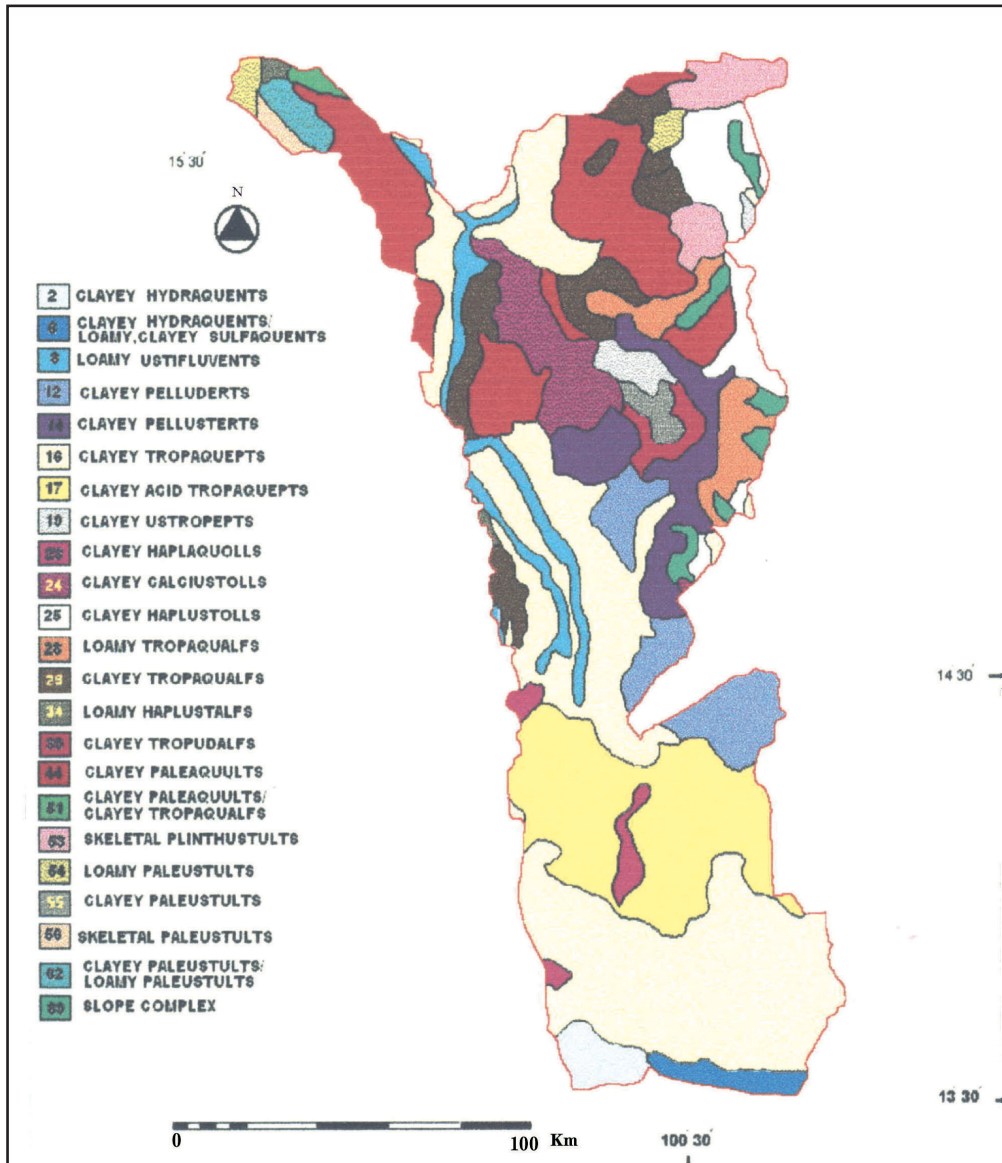
Source: Geological Map of Thailand  
 : Jumchet C. and Javanaphet, 1969, Department of Mineral Resource

2.2 Land-use Map



Source: Landuse Map of Central of Thailand, 1998  
 Landuse Planning Division  
 Department of Land Development

2.3 Soil Map

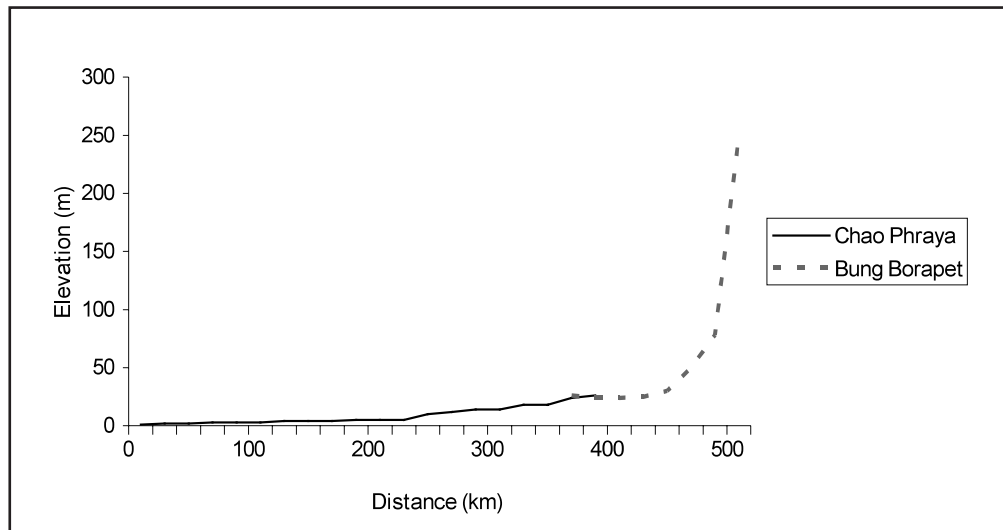


Source: General Soil Map of Thailand, 1972.  
Soil Survey Division, Department of Land Development.

2.4 Characteristic of River and Main Tributaries

No.	Name of River	Length (km) Catchment area (km <sup>2</sup> )	Highest Peak (m)	Cities	Land-Use [%] (1994)
1	<b>Chao Phraya</b> (Main River)	374 21,725	-	Bangkok, Samut Sakhon, Nakhon Phathom, Samut Prakan, , Ang Thong, Singburi, Lopburi, Chai Nat, Pathum Thani, Non Thaburi, Nakhon Sawan,	Forest (2.1 %), Agriculture & Urban Area (92.7 %), Water Resources (5.2 %)
2	<b>Bung Boraphet</b>	126 4,902	-	(Phaisari, Nong Bua, Phayuhakhiri, Thatako District) Nakhon Sawan Province (Chai Dan District) Phet Chaboon Province	

2.5 Longitudinal Profiles





### 3. Climatological Information

#### 3.1 Annual Isohyetal Map and Observation Stations



### 3.2 List of Meteorological Observation Station

Station No.	Station Name	Location	Observation period	Mean annual Precipitation (mm)	Observation items <sup>1)</sup>
03100201	Tha Ta Ko	N 15° 38' 25" E 100° 29' 12"	1975 - 2002	1,074.1	P (S)
03100202	Nong Bua	N 15° 51' 47" E 100° 32' 50"	1975 - 2002	1,027.9	P (S)
03100203	Muang, Nakhon Sawan	N 15° 39' 55" E 100° 08' 43"	1975 - 2002	1,068.2	P (S)
03100204	Phai Sari	N 15° 35' 41" E 100° 39' 39"	1975 - 2002	1,051.4	P (S)
01100312	Royal Irrigation Department, Bangkok	N 13° 47' 14" E 100° 30' 56"	1952 - 1996	1,459.9	P (S)
01100328	Pho Thong	N 14° 38' 31" E 100° 17' 42"	1975 - 2002	909.2	P (S)
03100301	Tha Wang	N 14° 48' 00" E 100° 37' 00"	1975 - 2002	886.6	P (S)
03100303	Kok Phra	N 15° 33' 19" E 100° 04' 35"	1975 - 2002	948.9	P (S)
03100309	Muang, Singburi	N 14° 53' 12" E 100° 24' 29"	1975 - 2002	979.5	P (S)
03100313	Muang, Ang Thong	N 14° 35' 14" E 100° 27' 22"	1975 - 2002	1,113.7	P (S)
03100319	Ayutthaya	N 14° 21' 49" E 100° 34' 34"	1952 - 1996	1,035.0	P (S)
03100334	Muang, Pha Thumthani	N 14° 01' 04" E 100° 32' 11"	1978 - 2002	933.4	P (S)
03100343	Muang, Nonthaburi	N 13° 50' 21" E 100° 29' 45"	1975 - 1999	1,059.8	P (S)
03100351	Muang, Samut Prakan	N 13° 36' 00" E 100° 35' 59"	1956 - 2002	1,247.4	P (S)

1) P(S) : Precipitation from standard rain gauge

### 3.3 Monthly Climatic Data

Station: 03100360 Bang Na, Bangkok

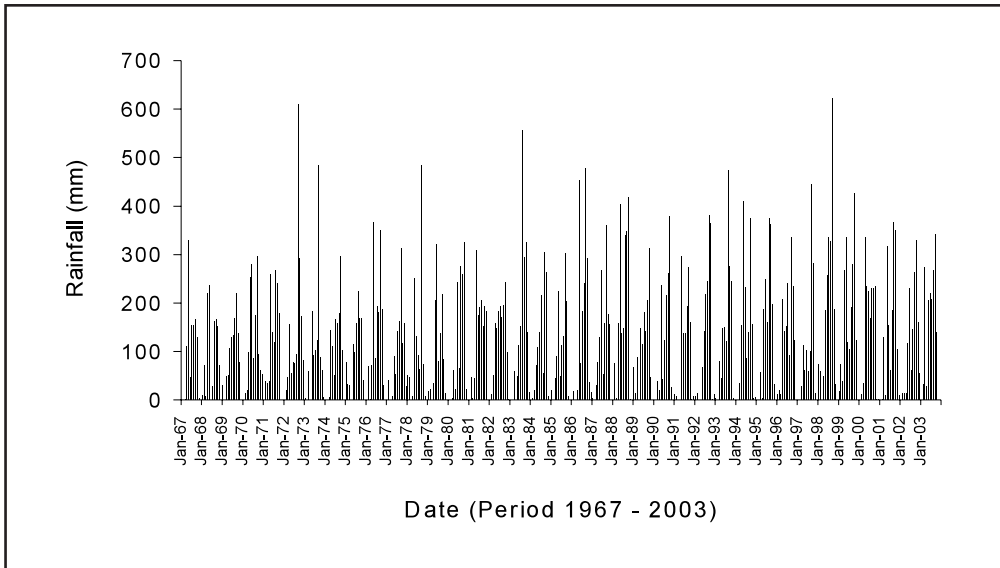
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Period of the mean
1	26.2	27.5	28.9	29.9	29.5	28.9	28.5	28.2	27.9	27.6	27.0	25.7	28.0	1966 ~ 1996
2	8.1	18.8	29.3	63.3	212.6	157.1	156.8	205.1	331.5	250.0	44.9	9.8	1,487.3	1966 ~ 1996
3	138.7	145.4	188.3	191.3	173.3	154.5	152.2	152.3	132.9	127.7	127.6	135.4	1,819.6	1966 ~ 1996

1 : Temperature [°C]  
2 : Precipitation [mm]  
3 : Evaporation [mm]

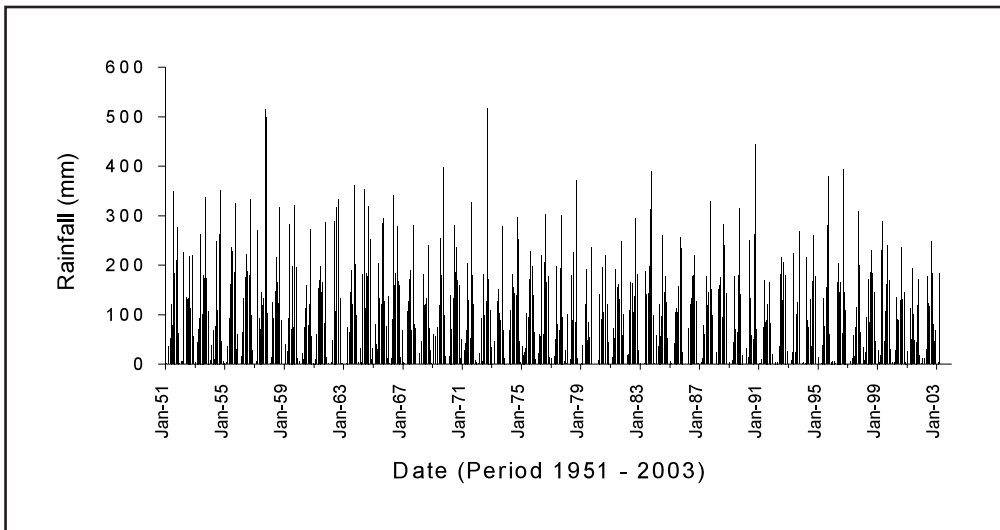


### 3.4 Long-term Variation of Monthly Precipitation Series

Station: 03100360 Meteorological Department, Bang Na, Bangkok



Station: 03100301 Amphoe Muang, Lopburi Province



## 4. Hydrological Information

### 4.1 Map of Streamflow Observation Stations



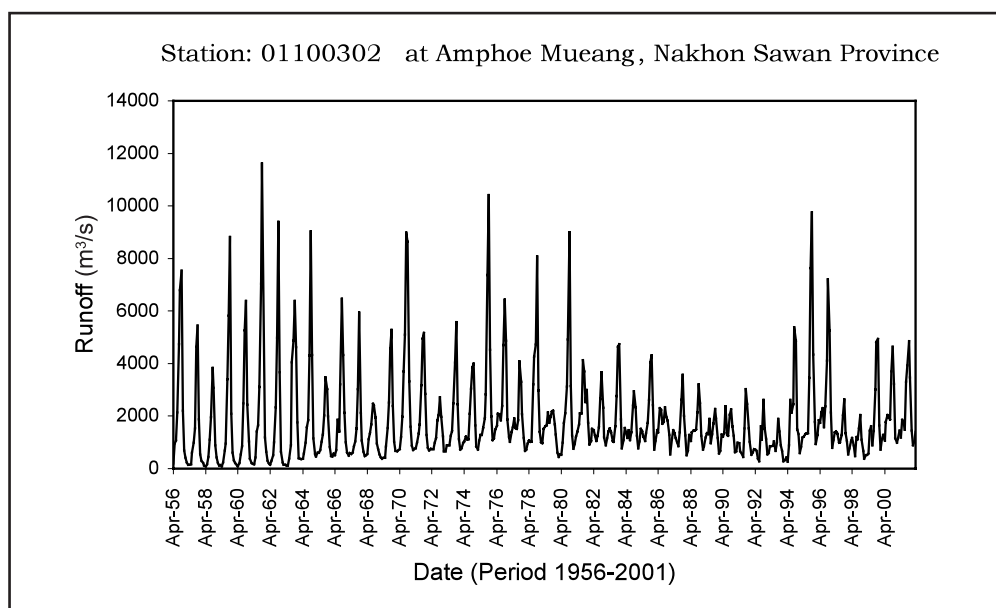
## 4.2 List of Hydrological Observation Stations

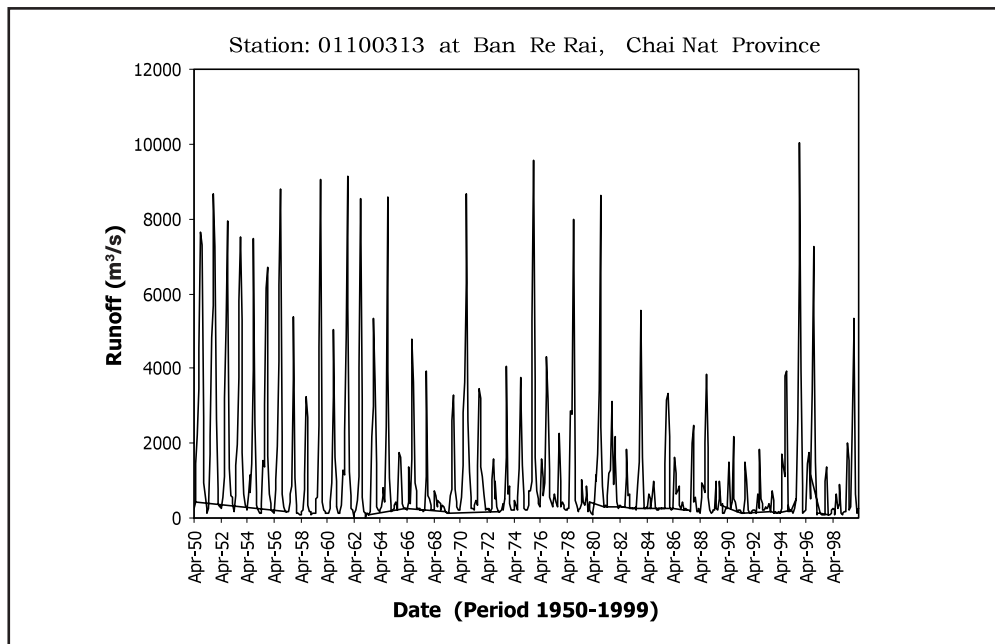
No.	Station	Location	Catchment area [km <sup>2</sup> ]	Observation period	Observation items <sup>1)</sup>
01100302	Muang District, Nakhon Sawan Province	N 15° 40' 15" E 100° 06' 45"	110,569	1950 - present	Q (H1)
01100307	Huai Kot District, U-Thai Thani Province	N 14° 35' 05" E 100° 27' 12"	219	1983 - present	Q (H1)
01100313	Sanphaya District, Chai Nat province	N 15° 09' 57" E 100° 11' 32"	120,693	1971 - present	Q (H1)

No.	$\bar{Q}$ <sup>2)</sup> [m <sup>3</sup> /s]	Qmax <sup>3)</sup> [m <sup>3</sup> /s]	$\bar{Q}$ max <sup>4)</sup> [m <sup>3</sup> /s]	$\bar{Q}$ min <sup>5)</sup> [m <sup>3</sup> /s]	$\bar{Q}/A$ [m <sup>3</sup> /s/100km <sup>2</sup> ]	Qmax/A [m <sup>3</sup> /s/100km <sup>2</sup> ]
01100302	705.2	4,820	2,440	150	0.64	4.36
01100313	460.89	4,538	2,359	49.3	0.38	3.76

- 1) H1 : Water level at recording chart  
 2)  $\bar{Q}$  : Mean annual discharge  
 3) Qmax : Maximum discharge  
 4)  $\bar{Q}$ max : Mean annual maximum Discharge  
 5)  $\bar{Q}$ min : Mean annual minimum Discharge  
 Period : 1956-2001

## 4.3 Long-term Variation of Monthly Discharge Series



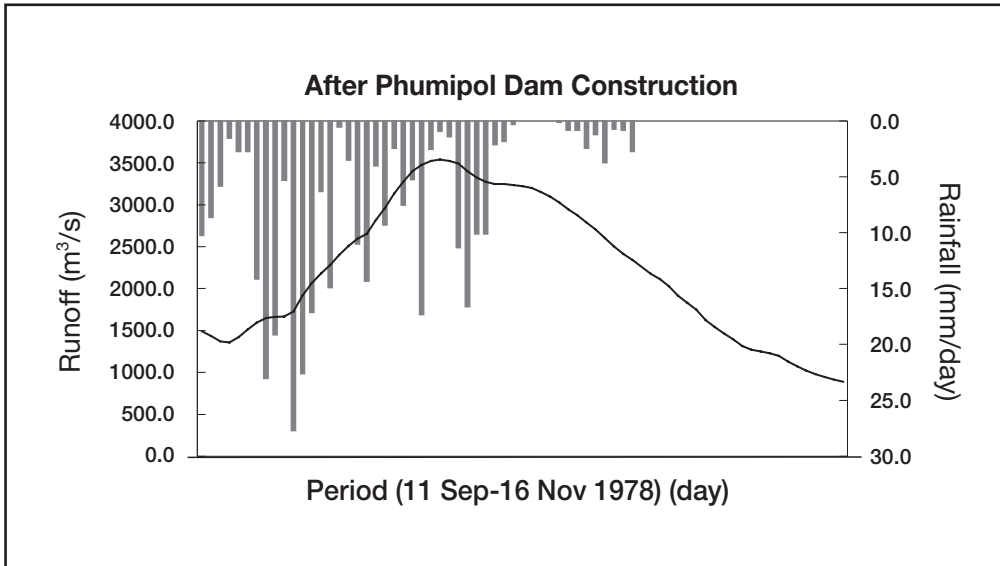
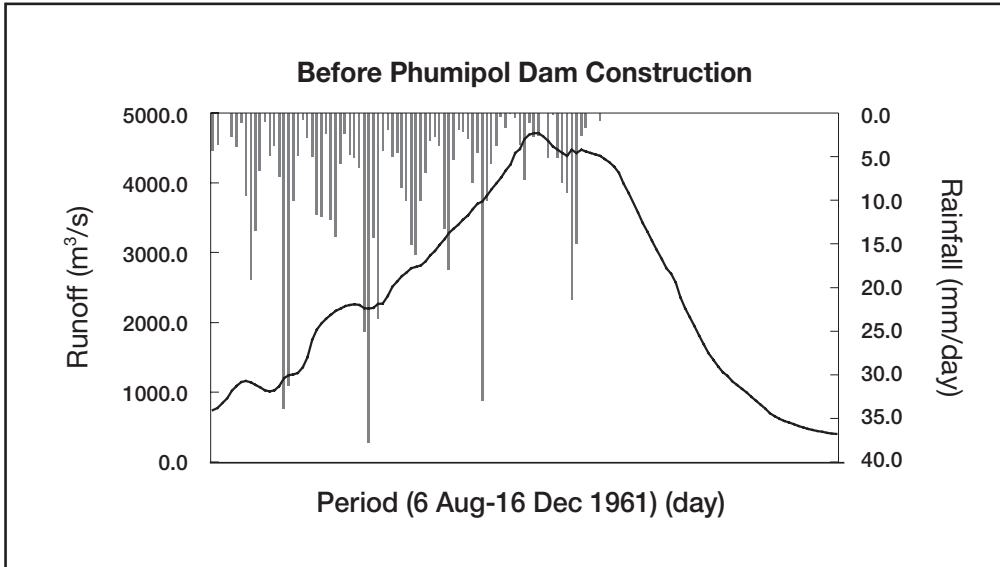


#### 4.4 Annual Maximum and Minimum Discharge

Station: 01100302 Muang District, Nakhon Sawan Province (110,569 km<sup>2</sup>)

Year	Maximum		Minimum		Year	Maximum		Minimum	
	Date	m <sup>3</sup> /s	Date	m <sup>3</sup> /s		Date	m <sup>3</sup> /s	Date	m <sup>3</sup> /s
1960	10 - 26	2,601	5 - 08	19.00	1979	10.01	1,412	2 - 23	113.00
1961	10 - 13	4,712	4 - 2	45.00	1980	10.09	4,350	4 - 18	151.00
1962	10 - 18	3,825	4 - 17	39.00	1981	8.18	1,663	1 - 15	260.00
1963	10 - 12	2,959	5 - 23	32.00	1982	10.10	1,600	1 - 02	250.00
1964	10 - 11	3,825	4 - 15	134.00	1983	10.22	2,290	7 - 01	250.00
1965	10 - 02	1,540	1 - 27	131.00	1984	10.27	1,260	1 - 05	195.00
1966	9 - 24	2,930	5 - 15	161.00	1985	10.28	2,142	1 - 15	216.00
1967	10 - 08	2,768	5 - 01	138.00	1986	5.13	1,471	1 - 15	134.00
1968	9 - 21	1,271	2 - 21	125.00	1987	10.12	1,652	1 - 09	144.00
1969	9 - 28	2,827	5 - 09	125.00	1988	10.25	1,916	1 - 07	183.00
1970	9 - 30	4,420	4 - 02	204.00	1989	10.23	1,458	1 - 06	145.00
1971	10 - 09	2,370	3 - 09	213.00	1990	6.11	1,158	1 - 18	179.00
1972	10 - 08	1,310	1 - 05	183.00	1991	9.07	1,440	7 - 20	94.00
1973	10 - 05	2,600	1 - 05	186.00	1992	10.21	1,401	7 - 18	71.00
1974	11 - 09	1,930	2 - 13	231.00	1993	9.29	1,070	1 - 21	83.00
1975	10 - 17	4,355	1 - 17	345.00	1994	10.03	2,539	4 - 15	52.00
1976	10 - 11	2,618	2 - 24	307.00	1995	9.30	4,280	1 - 06	153.00
1977	9 - 27	1,977	1 - 29	178.00	1996	10.20	3,011	1 - 16	215.00
1978	10 - 08	3,539	6 - 08	246.00	1997	10.10	1,318	1 - 08	114.00

4.5 Hyetographs and Hydrographs of Major Floods



## 4.6 Major Peak Discharge Experiences

No.	Drainage Area (km <sup>2</sup> )	Discharge		Date	Period
		m <sup>3</sup> /s	m <sup>3</sup> /s/km <sup>2</sup>		
01100302	110,569	4,820	0.044	10/1/1995	1950 - 1997
01100313	120,693	4,538	0.038	10/5/1995	1971 - 1997

## 4.7 Water Quality

Point	Year	pH	DO (mg/l)	BOD (mg/l)	Coliform (MPN/100 ml)
Upper Chao Phraya River	1997	-	6.4	1.2	20,000
Middle Chao Phraya River		-	4.1	1.5	2,000
Lower Chao Phraya River		-	0.5	3.1	46,000
Chao Phraya River Muang District, Chainat Province	1999	7.0	10.2	-	-
Chumsang District, Nakhonsawan Province		7.0	8.3	-	-
Supunburi River A.Muang,Supunburee		6.7	6.1	-	-

## 5. Water Resources

### 5.1 General Description

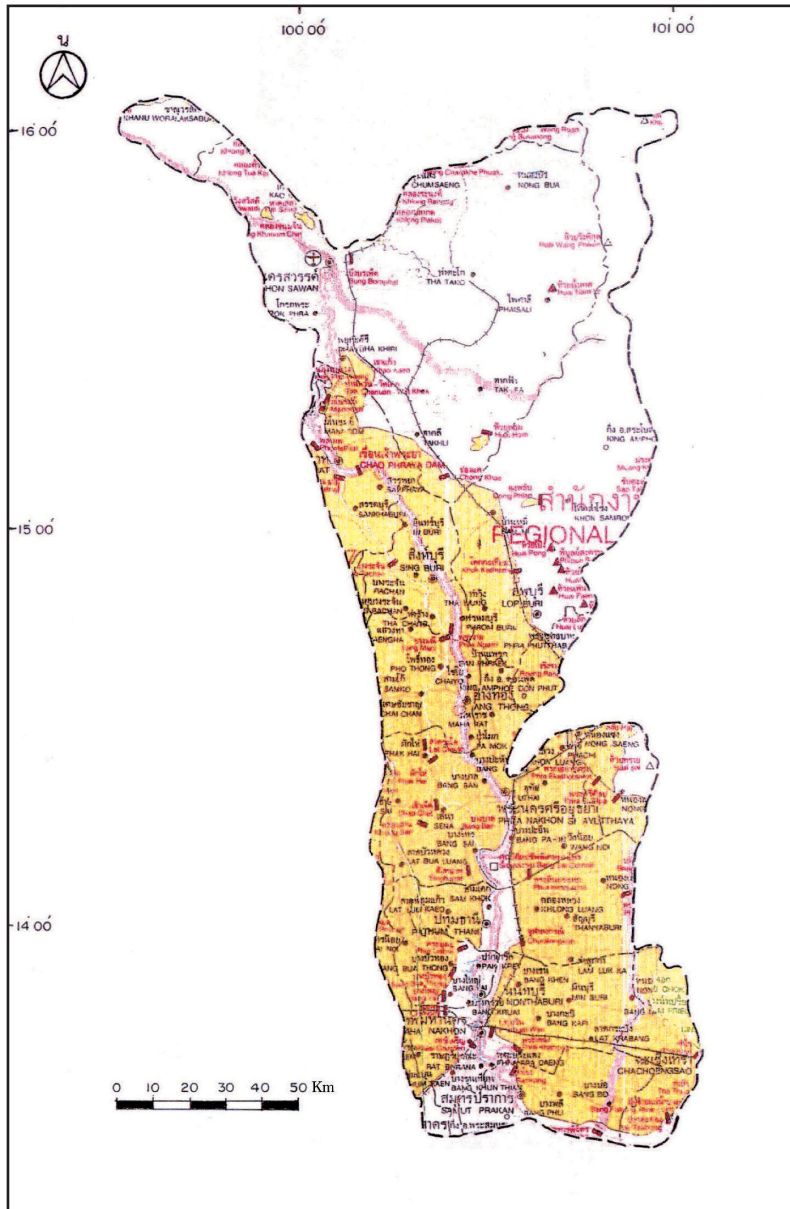
The Chao Phraya River Basin is divided into 2 sub-basins. The water level in Chao Phraya River is greatly influenced by the operation of three main dams built in the basin, namely :

- Bhumipol dam on Ping River and Sirikit dam on the Nan River for the reaches downstream from the dams to Nakhon Sawan Province.
- Chao Phraya Dam on the Chao Phraya River from the reach from Chatnat Province to Ang Thong province.

Flood plains which are fertile for rice cultivation exist on both sides of the Chao Phraya River in the central plain covering an area of 1 million hectares.

Flooding in the basin usually occurs during the typhoon season i.e. from July to September.

## 5.2 Map of Water Resources Systems



### 5.3 List of Major Reservoirs

The flows of Chao Phraya River Basin are greatly influenced by the operation of two main dams built in the Ping River basin (Bhumiphol Dam) and Nan river Basin (Sirikit Dam). Chao Phraya Dam was built for irrigation and flood control purposes.



## 6. Socio-cultural Characteristics

The confluence of the Ping, Wang, Yom and Nan rivers at Nakhon Sawan Province is the beginning of Chao Phraya River. Siltation of these four rivers has enriched this river basin making Chao Phraya River basin the most fertile plain of the country. Inhabitants of this river basin earn their living from agricultural production of rice, vegetables and other major economic crops. Water related festivals are Songkhran water festival and the flower float festival. Inhabitants of this river basin are peace loving and very proud of their inherited cultures. The capital city, Bangkok, is located in this basin thus contributing to higher economic and social development than in other river basins.

## 7. References

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- Meteorological Department, (2001): Climatological Data of Thailand. 1951-2001.
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