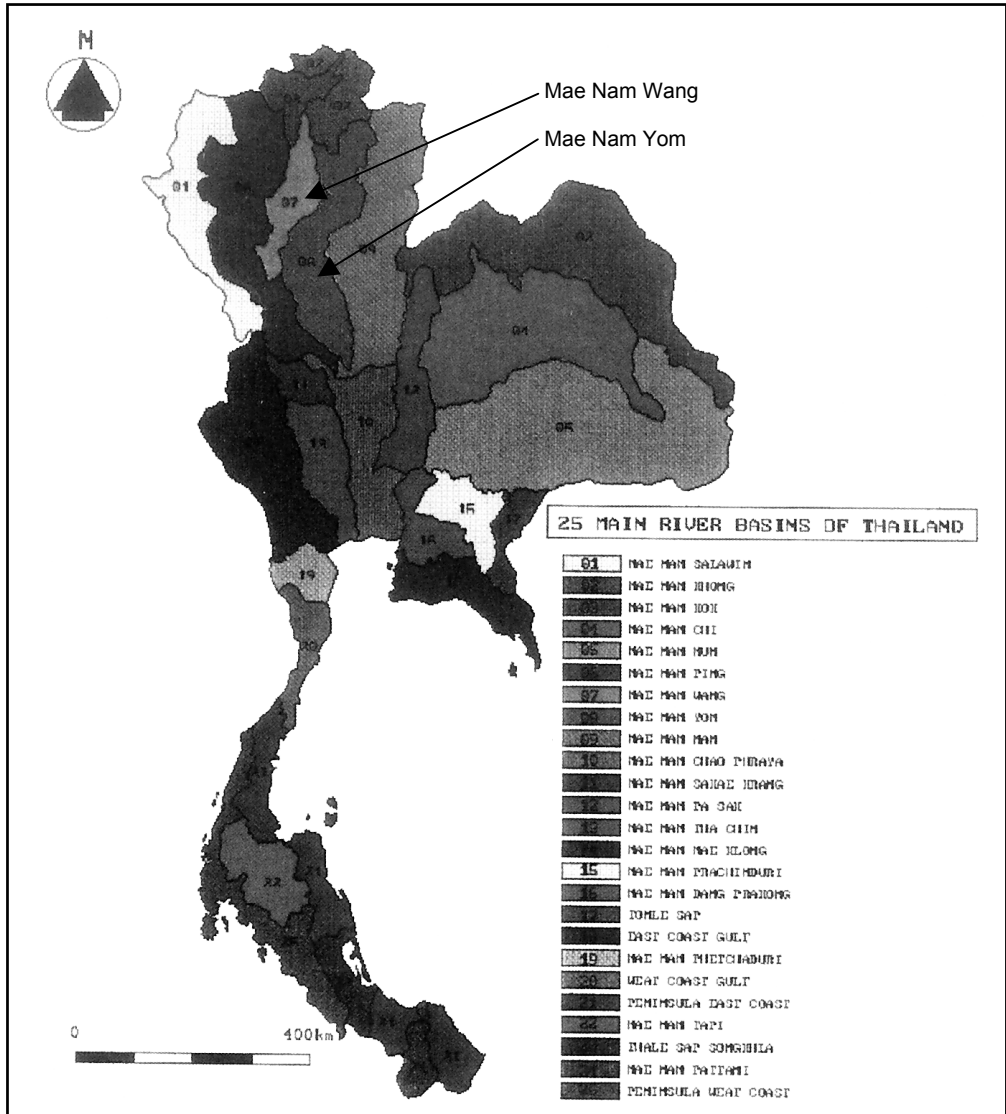


Thailand

Thailand-4: Mae Nam Yom

Thailand-5: Mae Nam Wang



Introduction

Thailand is situated in the tropical monsoon zone of Southeast Asia and covers an area of 513 115 km² from latitudes 5° 30' N to 21° 00' N and longitudes 97° 00' E to 105° 30' E. The country is bordered on the west and northwest by Myanmar, on the northeast and east by People's Democratic Republic of Lao, on the southeast by Cambodia and the Gulf of Thailand, and on the south by Malaysia. Thailand has maximum dimensions of about 2 500 km from north to south and 1 250 km from east to west with a coast line of approximately 1 840 km along the Gulf of Thailand and 865 km along the Indian Ocean. The topographic features of Thailand comprise of three main types of landform: highlands, plains and plateaus. Highlands include several mountain ranges covered with forest extending from the northern part to the southern peninsula through the entire western length of the north - south direction. The coastal area east of the Gulf of Thailand is another part of the highlands. The central part of the country is occupied by an extensive alluvial plain, while the northeastern region is formed by the undulated plateau. Thailand is a warm and semi-humid tropical country. The climate is monsoonal, marked by a pronounced rainy season lasting from about May to September and relatively dry season for the remainder of the year. The monsoon season rainfall is around 90 percent of the annual rainfall. The mean annual precipitation is 1 400 mm varying from 1 100 mm in the northeast plateau to over 1 800 mm in the south peninsula. The population in 1996 has been approximately 60 million.

The two rivers catalogued in this volume are the Yom River and Mae Nam Wang which are tributaries of the Chao Phraya River. The Yom River flows southward and joins the Ping River at Nakhon Sawan where the Chao Phraya River is formed. It has a catchment area of 23 616 km² and the basin, according to the Watershed Quality Classification Measure, is classified into 6 classes: 1A (18.0 %); 1B (1.0 %); 2 (13.0 %); 3 (11.0 %); 4 (10.0 %); and 5 (47.0 %)¹⁾. The Mae Nam Wang flows south-westward to join the Ping River in Tak Province and merges with Nan River to form the Chao Phraya River. The Mae Nam Wang is 440 km long and has a catchment area of 10 791 km².

- ¹⁾ 1A: Protected or conservation forest and headwater, usually located at high elevation with very steep slopes. These areas must remain permanently covered;
1B: Similar in physical and environmental features as 1A, but have been cleared into agricultural area by villagers. This area required special soil conservation and protection measures and if possible should be reforested;
2: Commercial forest;
3: Fruit-tree plantation;
4: Upland farming;
5: Lowland farming.

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Mae Nam Yom

Map of River

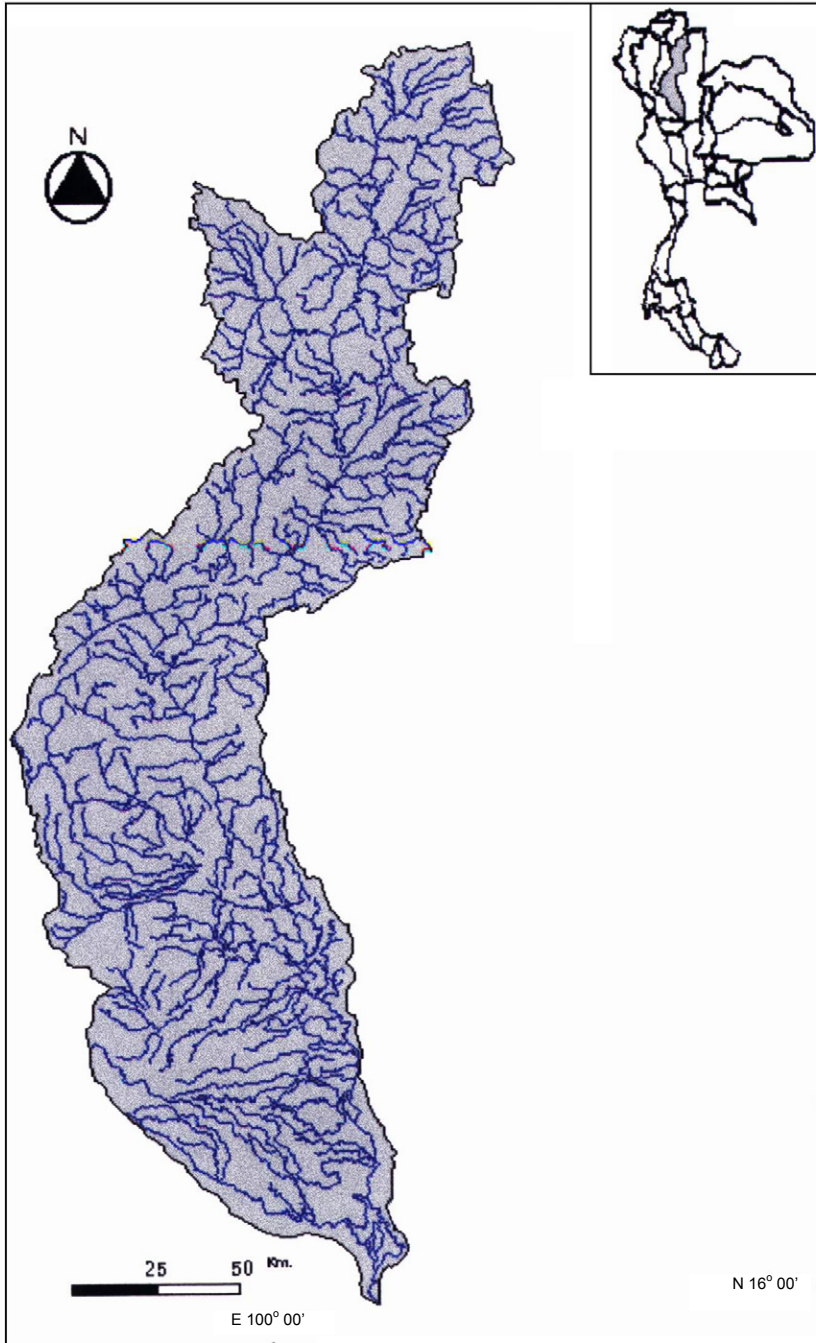


Table of Basic Data

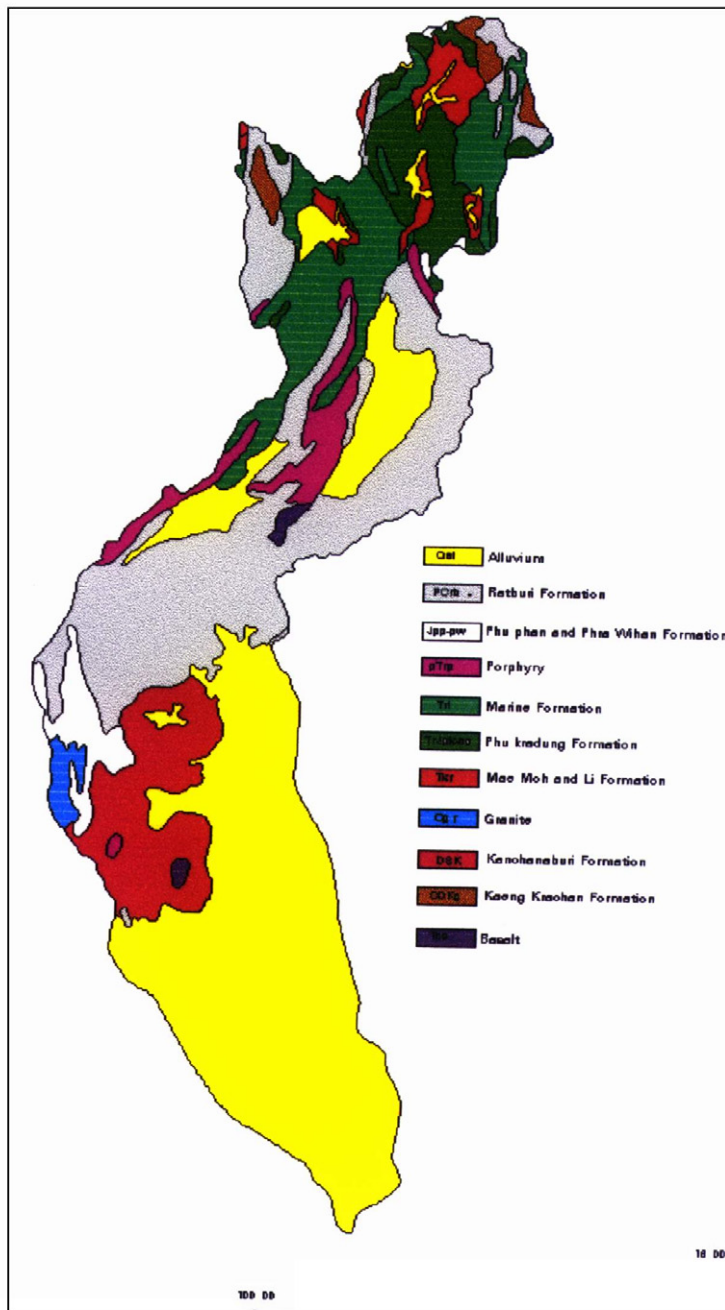
Name: Mae Nam Yom		Serial No.: Thailand-4
Location: Northern part of Thailand	N 15° 45' 35" ~ 19° 25' 24"	E 99° 16' 34" ~ 100° 40' 51"
Area: 23 616 km ²	Length of main stream: 700 km	
Origin: Mt.Phi Pannam	Highest point: Pong District, Pha Yao Province (1 916 m)	
Outlet: Nam River	Lowest point: River mouth (0 m)	
Main geological features: Pre-cambrian to Paleozoic; Granite, Gneiss, Limestone		
Main tributaries: Nam Kuan River (852 km ²), Nam Phee River (1 094 km ²), Nam Ngao River (1 800 km ²), Nam Mae Mok (1 313 km ²), Nam Mae Rumpham (966 km ²), Lower Yom River (11 287 km ²)		
Main lakes: None		
Main reservoir: Mae Mok Reservoir (96 x 10 ⁶ m ³ , 1993), Tha Pare Reservoir (68 x 10 ⁶ m ³ , 1993)		
Mean annual precipitation: 1 087.6 mm		
Mean annual runoff: 40.1 m ³ /s at Srisatchanalai District, Sukhothai Province (1952-1995)		
Population: 2 568 211 (1995)	Main cities: Prae, Sukhothai, Pichit, Phisanulok	
Land use: Forest 57.3 %, Agriculture & urban area 33.7 %, Water resource 9.0 %.		

1. General Description

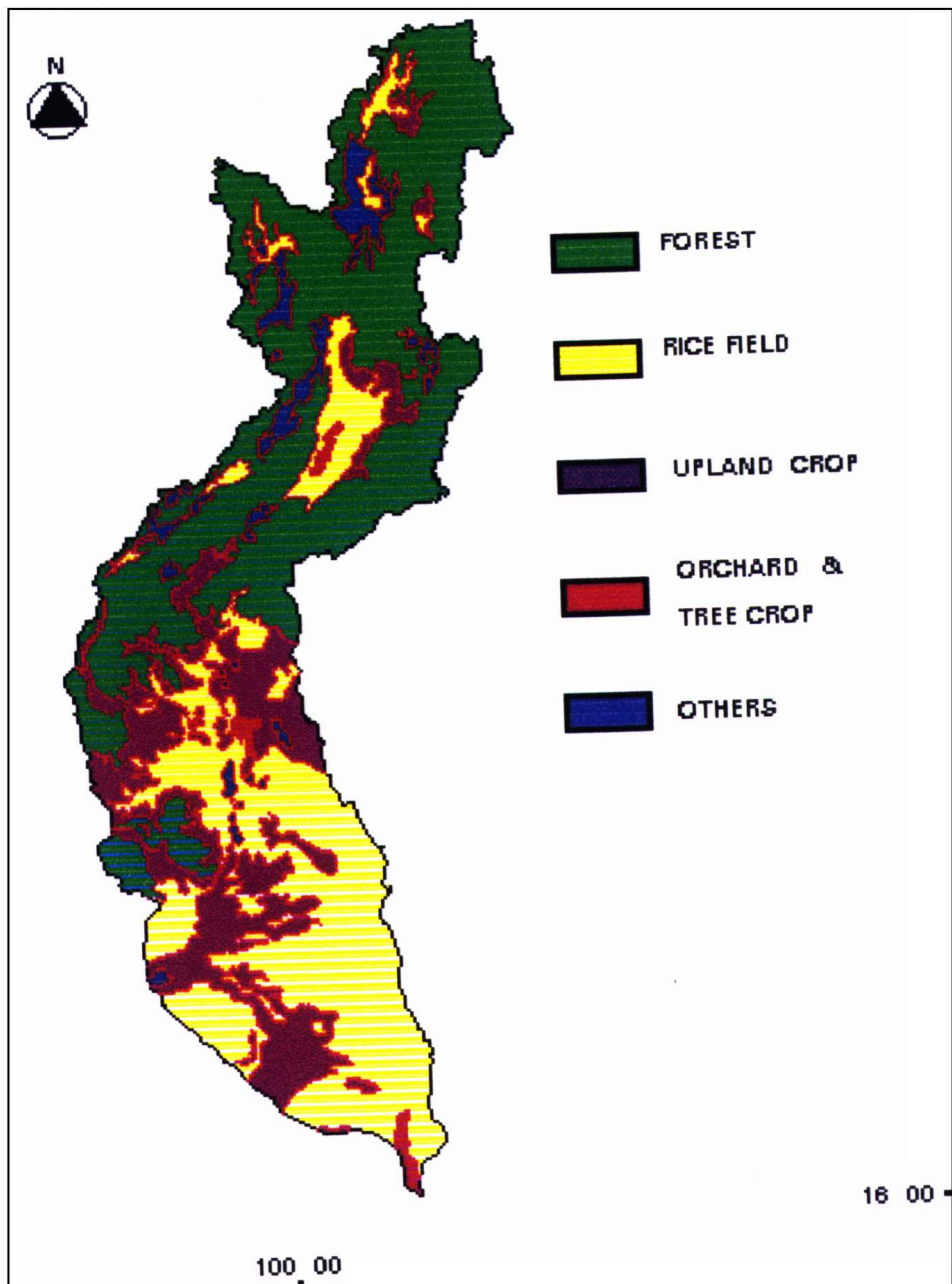
Yom River originated from Phi Pannam Mountain at Pong District, Pha Yao Province in the northern part of Thailand. It flows southwards, and joins the Nan and the Ping rivers at Nakhon Sawan Province where the Chao Phraya River is formed. The river is 700 km long and its catchment area is 23 616 km². The average annual precipitation is 1 087.6 mm, and the average discharge during the period 1952~1995 at Srisatchanalai District, Sukhothai Province (station code: 01 08 12 05) has been 40.1 m³/s. The Mae Mok Reservoir, built in 1993, is the largest existing reservoir of this basin.

2. Geographical Informations

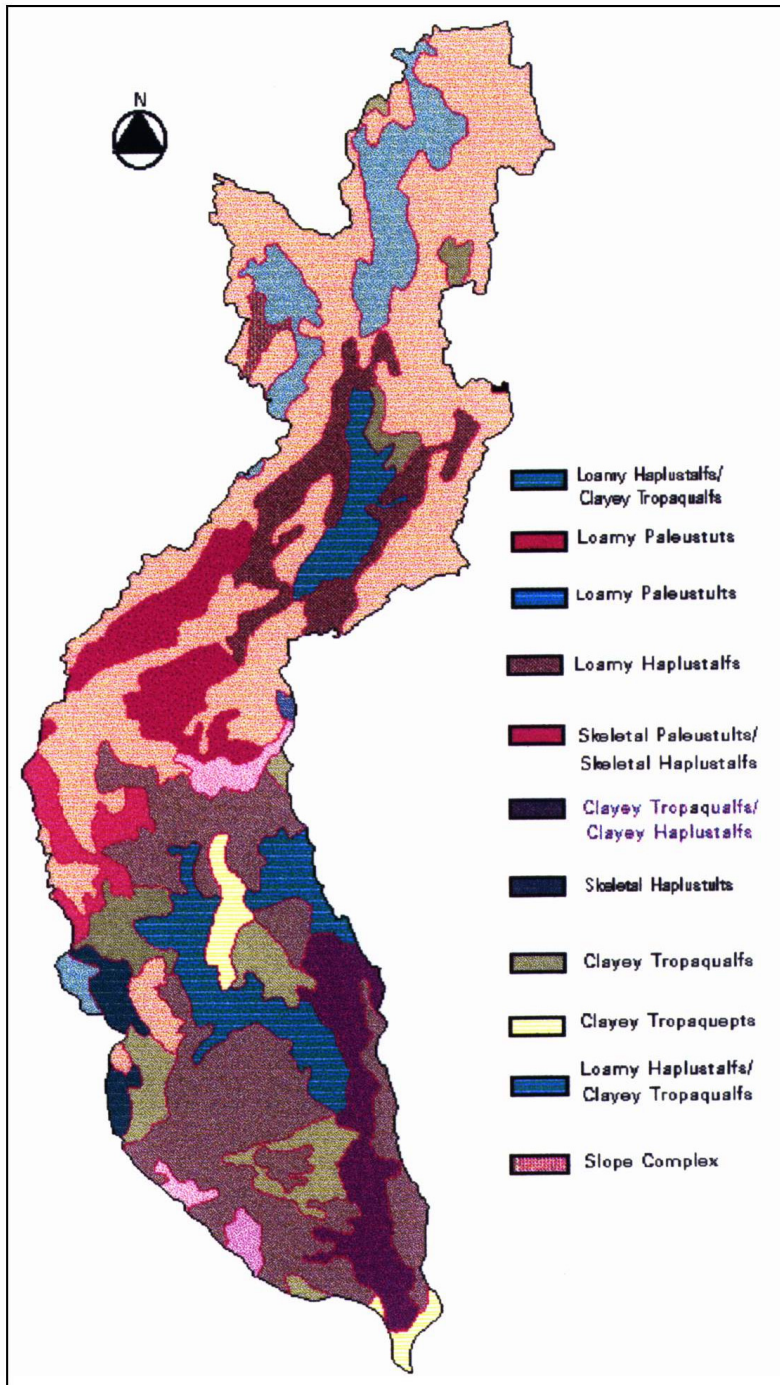
2.1. Geological Map



2.2. Land-use Map



2.3. Soil map

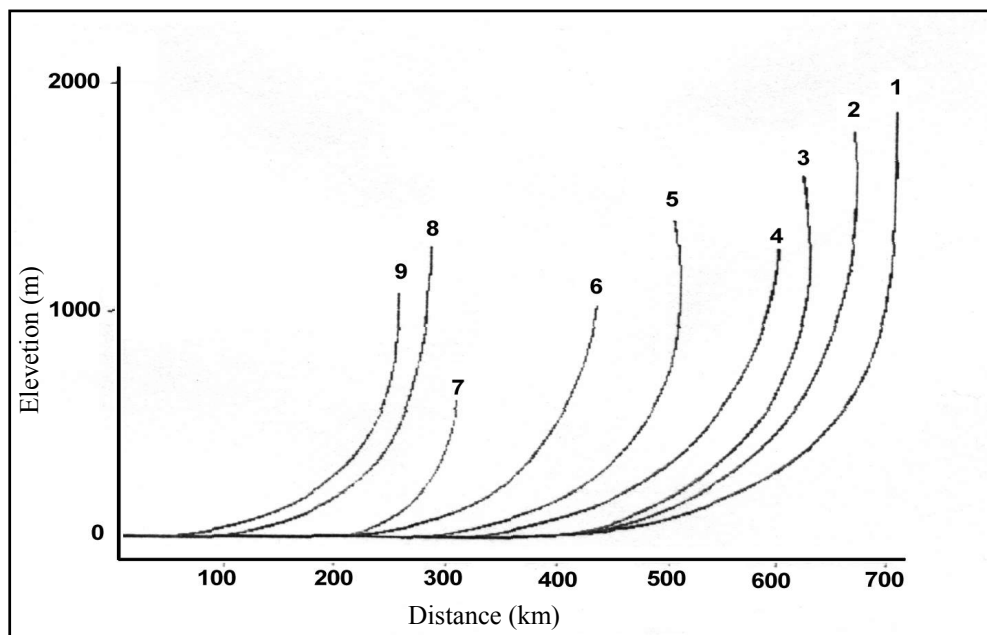


2.4. Characteristic of River and Main Tributaries

	Name of river	Length [km] Catchment area [km ²]	Highest peak [m] Lowest point [m]	Cities Population (1995)	Land-use ¹⁾ [%] (1994)
1.	Yom (Main River)	550 23 616	1 916	Phrae; Sukhothai 517 038; 622 968	A & U (33.7) F (57.3) W (9.0)
2.	Upper Yom	50 2 029	1 916	Pong District, Nan Province	
3.	Nam Kuan (Tributary)	65 852	Doi Langka; 1 693 -	Nan	
4.	Nam Phee (Tributary)	55 1 094	1 423	Pha Yao	
5.	Nam Ngao (Tributary)	80 1 800	1 267	Phrae	
6.	Nam Kum Mee (Tributary)	65 571	Doi Sam Sao; 1 309 -	Phrae	
7.	Nam Mae Tha (Tributary)	50 506	Doi Luang; 1 032 -	Phrae	
8.	Nam Mae Sin (Tributary)	42 610	Mont Pha Tai; 710 -	Phrae	
9.	Nam Mae Mok (Tributary)	115 1 313	Doi Chom Poo; 1 285 -	Sukhothai	
10.	Nam Mae Rumphan (Tributary)	120 966	Doi Ta Chi; 1 028 -	Dan Lan Huoy District, Sukhothai Province	
11.	Lower Yom	320 11 287	- -	Sam Ngao, Pho Thala, Ban Rakum District, Sukhothai Province	

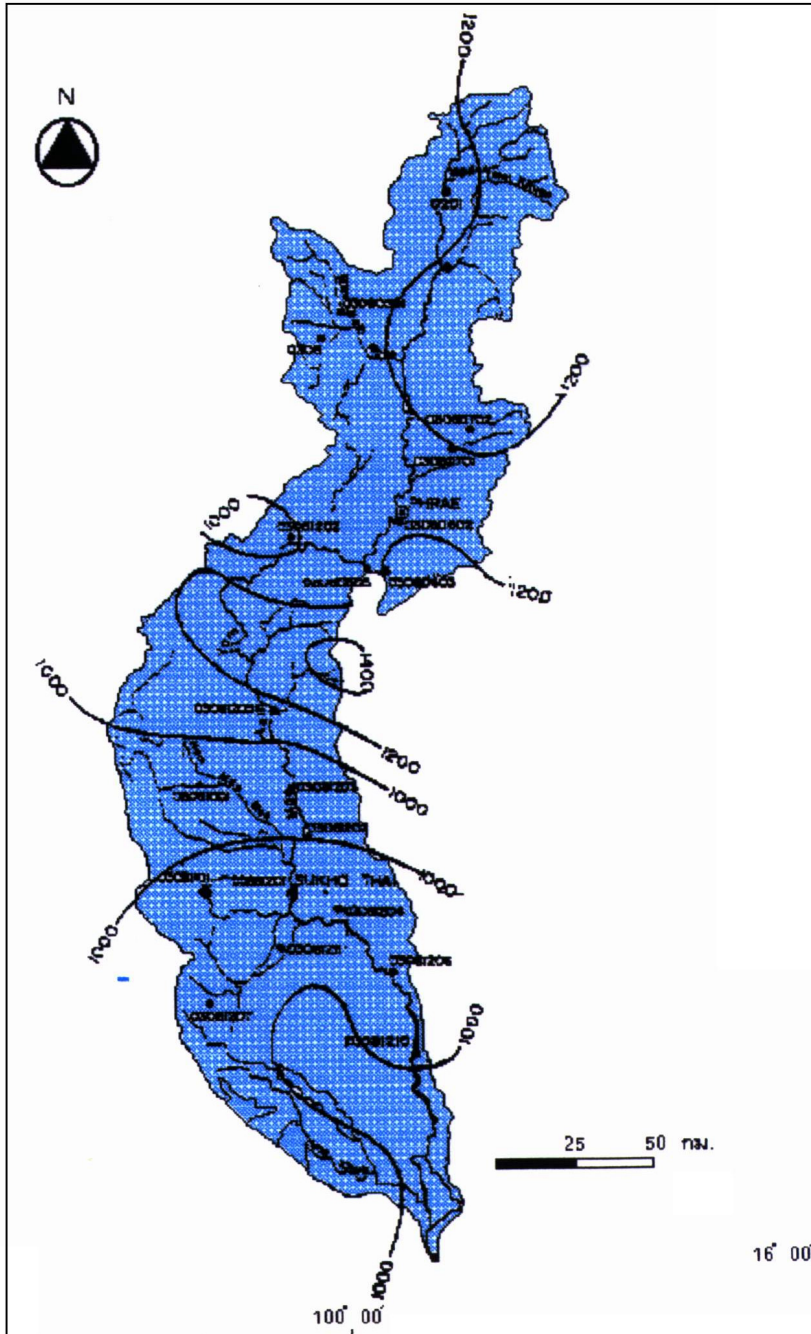
1) A: agriculture; U: urban; F: forest; W: water resources

2.5. Longitudinal Profiles



3. Climatological Information

3.1. Annual Isohyetal Map and Observation Stations



3.2. List of Meteorological Observation Stations

Station No.	Station name	Location	Observation period	Mean annual precipitation [mm]	Observation items ¹⁾
03080201	Pong	N 19°08'22" E 100° 16' 37"	1976~present	1 174.4	P(S)
03080401	Chiang Moong	N 18° 52' 10" E 100° 18' 23"	1977-present	1 075.9	P(S)
03080502	Hoi Thak	N 18° 40' 00" E 99° 55' 00"	1976~present	1 199.4	P(S)
03080601	Soong Ment	N 18° 03' 00" E 100° 06' 52"	1976~present	992.3	P(S)
03080602	Phrae	N 18° 10' 00" E 100° 10' 00"	1952-present	1 087.8	P(S)
03080605	Dang chai	N 17° 58' 56" E 100° 03' 17"	1976~present	1 155.2	P(S)
03081201	Sukhothai	N 17° 00' 20" E 99° 49' 35"	1976~present	1 093.0	P(S)
03081202	Long	N 19° 04' 27" E 99° 50' 08"	1976~present	981.3	P(S)
03081203	Sawankhaloak	N 17° 18' 56" E 99° 50' 25"	1976~present	942.5	P(S)
03081204	Khong Khai Lart	N 16° 57' 05" E 99° 58' 48"	1976~present	1 230.2	P(S)
03081205	Srisatchanalai	N 17° 30' 5" E 99° 45' 50"	1976~present	989.3	P(S)
03081206	Bang Ra Kum	N 16° 45' 22" E 100° 07' 15"	1976~present	1 010.3	P(S)
03081207	Prang Kha Tai	N 16° 39' 50" E 99° 35' 30"	1976~present	1 154.0	P(S)
03081210	Sam Ngam	N 16° 30' 30" E 100° 12' 25"	1976~present	1 063.5	P(S)
03081211	Kreereemat	N 16° 49' 57" E 99° 48' 20"	1976~present	1 179.0	P(S)
03081212	Sri Sumrong	N 17° 10' 00" E 99° 52' 00"	1976~present	1 180.4	P(S)

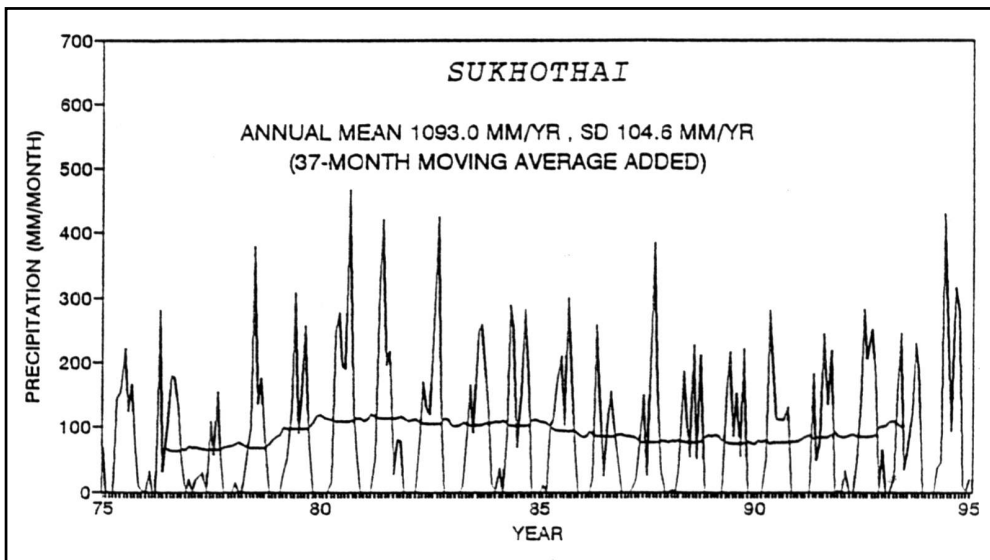
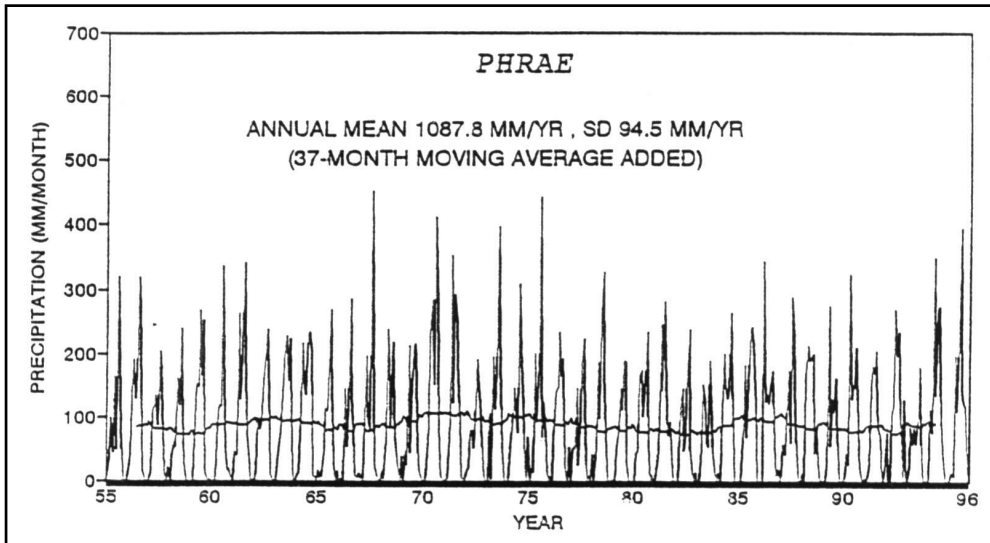
1) P(S): Precipitation from standard rain gauge

3.3. Monthly Climatic Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Period of the mean
1	22.5	24.9	28.3	30.6	29.4	28.4	27.9	27.5	27.3	26.7	24.8	22.3	26.7	1952~1995
2	7.3	8.3	24.9	67.8	168.7	125.2	146.9	234.9	192.4	87.3	18.5	5.6	1 087.8	1952~1995
3	110.6	128.3	188.4	213.5	195.4	155.1	147.3	138.7	131.2	125.1	109.7	104.0	1 747.3	1952~1995

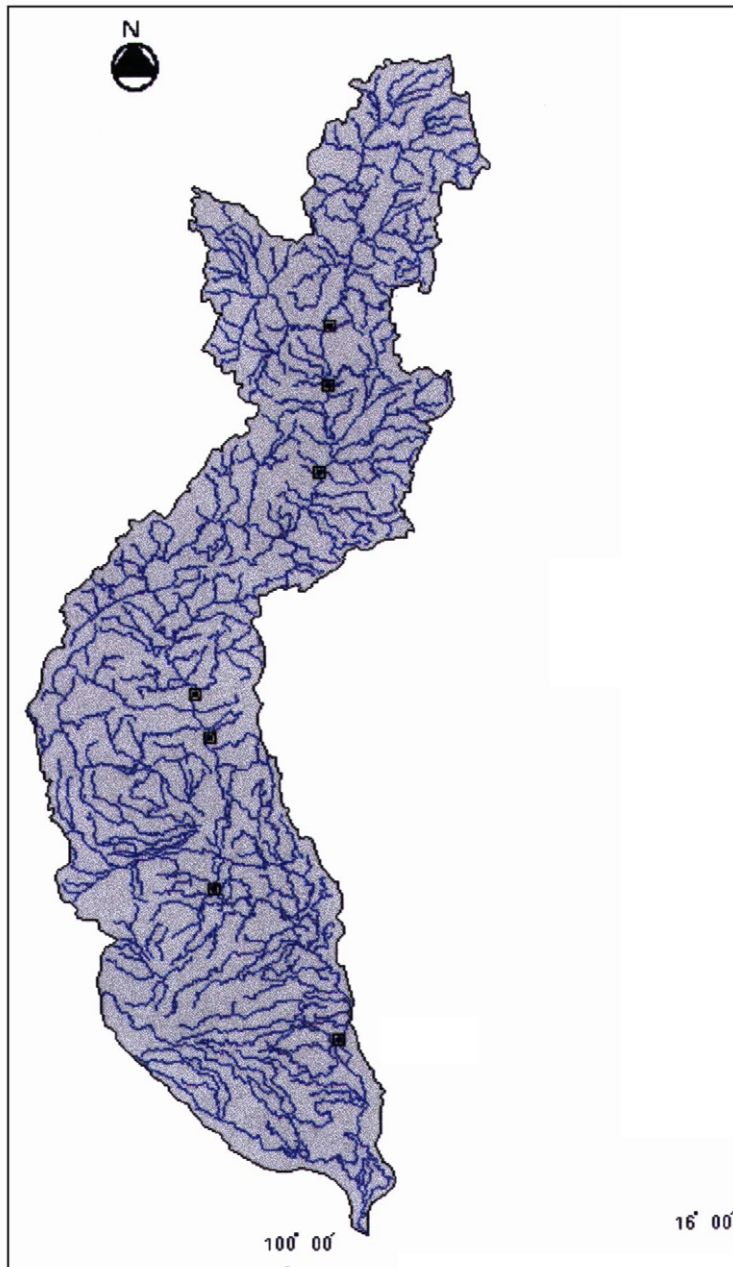
1: Temperature [°C]
2: Precipitation [mm]
3: Evaporation [mm]

3.4. Long-term Variation of Monthly Precipitation Series



4. Hydrological Information

4.1. Map of Streamflow Observation Stations



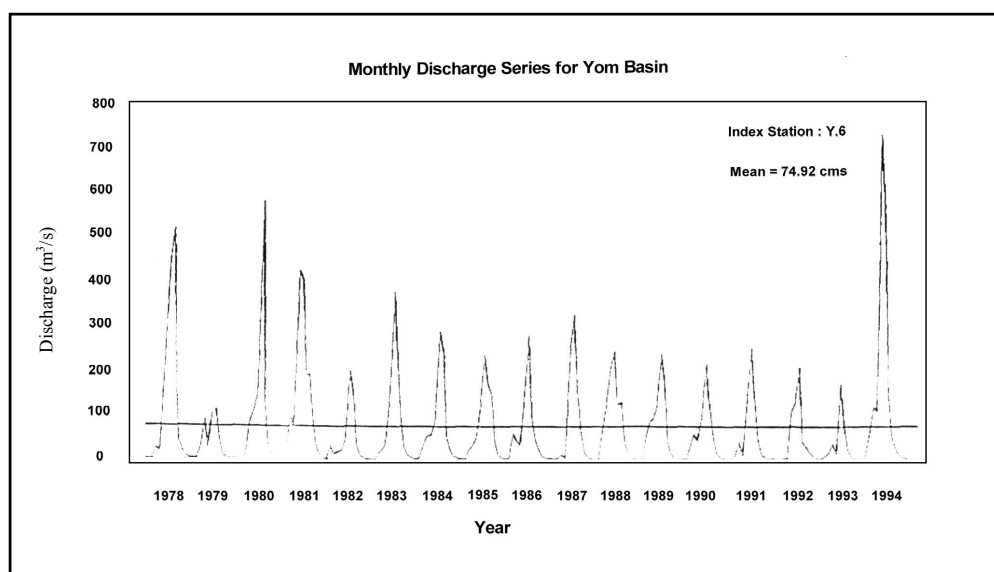
4.2. List of Hydrological Observation Stations

No.	Station	Location	Catchment area [km ²]	Observation period	Observation items ¹ (frequency)
01080503	Ngao District Lumpang Province	N 18° 42' 53" E 99° 57' 40"	96	1983~present	Q(H1)
01080607	Muang District Phrae Province	N 18° 07' 59" E 100° 07' 41"	7 624	1979~present	Q(H1)
01081002	Thung District Sukhothai Province	N 17° 19' 45" E 99° 27' 42"	785	1979~present	Q(H1)
01081203	Muang District Sukhothai Province	N 17° 00' 18" E 99° 49' 31"	17 731	1950~present	Q(H1)
01081209	Srisatchanalai District Sukhothai Province	N 17° 35' 42" E 99° 42' 59"	12 131	1967~present	Q(H1)
01081212	Sam Ngam District Phichit Province	N 16° 30' 50" E 100° 12' 40"	21 415	1967~present	Q(H1)

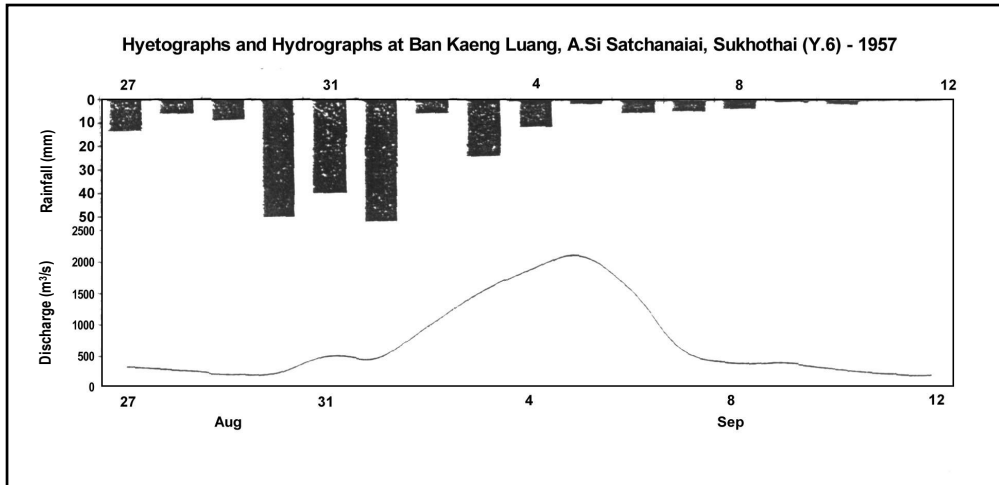
No.	Q [m ³ /s]	Qmax* [m ³ /s]	Qmax** [m ³ /s]	Qmin [m ³ /s]	Q/A [m ³ /s/100 km ²]	Qmax/A [m ³ /s/100 km ²]
01080604	19.2	1 817	664	1.82	0.25	23.8
01081601	40.1	3 112	1 278	1.19	0.32	24.5
01080201	23.1	3 000	923	1.34	0.43	55.5
01081701	3.31	386	171	0.00	0.42	49.17

H1: Waterlevel at recording chart
 Q: Mean annual discharge
 Qmax*: Maximum discharge
 Qmax**: Mean annual maximum discharge
 Qmin: Mean annual minimum discharge

4.3. Long-term Variation of Monthly Discharge Series



4.4. Hyetographs and Hydrographs of Major Floods



5. Water Resources

5.1. General Description

The Yom River basin is divided into 11 sub-basins. Most parts of the headwaters of its sub-basins are mountainous whereas the lower parts are mostly agricultural areas and cities. The water resources of the river is utilized mainly for paddy irrigation. At present there are 244 irrigation projects in the area providing irrigation water to an area of 152 390 ha.

The Mae Mok Reservoir is the existing largest impounding reservoir in the basin. It has a gross capacity of $96 \times 10^6 \text{ m}^3$.

Flooding in the basin usually occurs in the lower part during the period from July to September which is also the typhoon season. The month of September has the highest frequency of flood occurrences with the provinces Phitsanulok and Nakhon Sawan affected most.

5.3. List of Major Reservoirs

Name of river	Name of reservoir	Catchment area [km ²]	Gross capacity [10 ⁶ m ³]	Effective capacity [10 ⁶ m ³]	Purpose ¹⁾	Year of completion
Yom	Mae Mok	-	96	-	A, F, W	1993
	Tha Pare	-	68	-	A, F, W	1993
	Mae Song	-	65.8	-	A, F, W	1993

¹⁾ A: Agriculture, F: Flood control, W: Municipal water supply

5.4. Major Flood Experiences

Station	Catchment area [km ²]	Peak Run-off		Date	Period of data
		[m ³ /s]	[m ³ /s/100 km ²]		
01080604	7 624	2 244	29.4	1/9/95	1979-present
01080607	5 410	3 556	65.7	1/9/95	1972-present
01081002	785	386	49.2	7/9/80	1979-present
01081205	12 658	3 112	24.6	12/9/61	1952-present
01081209	12 131	4 060	33.5	1/9/73	1964-present

5.5. Groundwater and Water Quality

Groundwater

Province	Quantities (No. of wells)	Qualities
Phrae	860	Most wells in the upper part of the basin are safe for drinking; only some wells have high level of Fe and hard water. In the lower part of the basin, wells have high level of Fe and Mn, but most wells provide safe drinking water.
Sukhothai	1 020	
Phichit	443	
Total	2 323	

River Water Quality

Place and Year	pH	BOD [mg/l]	Coliforms [MPN/100 ml]
Upper Yom River, 1990	7.8 – 8.0	1.5 – 4.4	No data
Lower Yom River, 1991	8.0 – 8.9	0.1 – 3.0	800 – 7 900

6. Socio-cultural Characteristics

Yom river basin lies next to the Nan river basin with high mountain ridge inbetween. Many hilltribes live in the high altitude headwater areas of of the basin. Most of them used hill slope lands for field crop cultivation, which lead to soil erosion during the rainy season. They have their own culture, dialects, traditions and beliefs, but most can understand Thai language quite well. Ethnic Thais are living in the plain of the basin on both sides of the Nan River and tributaries. They do agricultural practices and speak the northern Thai dialect. The famous Water Festival, sometimes known as the

Thesakarn Songkran or Thai New Year Celebration, is a primitive water related tradition, which, according to the lunar calendar is celebrated on the 13th of April. The people here are conservative, religiousness and prefer peaceful life.

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