

Pahang River

Map of River



Table of Basic Data

Name: Pahang River		Serial No. : Malaysia-5
Location: Lubok Paku	N 2° 48' 45" - 3° 40' 24"	E 101° 16' 31" - 103° 29' 34"
Catchment Area: 25,600km ²	Length of main stream: 440 km	
Origin: Mt. Tahan (2,187 m)	Highest point: Mt. Tahan (2,187 m)	
Outlet: South China Sea	Lowest point: River mouth (0 m)	
Main geological features: Shale, Mudstone, Limestone and rocks		
Main tributaries: Tembeling river (5,050 km ²), Jelai river (7,320 km ²)		
Main reservoirs: Southern Abu Bakar Dam of TNB, Chini Lake and Bera Lake		
Mean annual precipitation: 2,170 (1971 - 2002)		
Mean annual runoff: 596 m ³ /s @ Lubok Paku (1973 - 2002)		
Population: 1,000,000	Main cities: Kuantan	
Land use: Virgin jungle, Rubber, Paddy, Oil palm, Other agricultural crops, Urban		

1. General Description

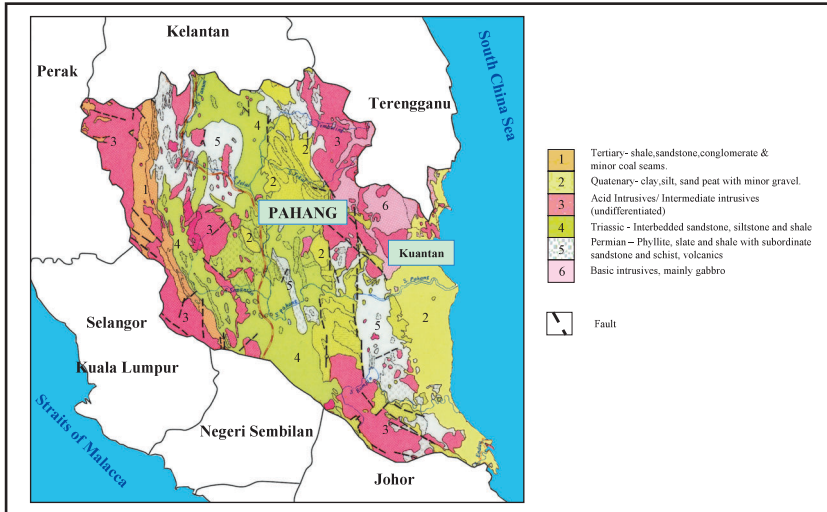
The Pahang River basin is located in the eastern part of Peninsular Malaysia between latitude N 2° 48' 45" and N 3° 40' 24" and between longitude E 101° 16' 31" and E 103° 29' 34". The maximum length and breadth of the catchment are 205 km and 236 km respectively. The river is about 440 km long and drains an area of 29,300 km² of which 27,000 km² lies within Pahang (which is about 75% of the State) and 2,300 km² is located in Negeri Sembilan. It is divided into the Jelai and Tembeling rivers which meet at the confluence near Kuala Tembeling at about 304 km from the river mouth in the central north. Jelai River originates from the Central Mountain Range while Tembeling River has its origin at the Besar Mountain Range. The Pahang river system begins to flow in the south east and south directions from the north passing along such major towns as Kuala Lipis, Jerantut and Temerloh, finally turning eastward at Mengkarak in the central south flowing through Pekan town near the coast before discharging into the South China Sea.

The main highland areas situated within the basin are the Central Mountain Range along its western side and the East Coast Range in the north-east between Kuantan River and the Tembeling River. These upland areas are highly dissected and generally range from 1,000 m to 1,500 m in elevation with some peaks reaching more than 2,000 m. The topography is less rugged towards the main drainage lines in the central part of the basin, where most of the land is below an elevation of 75 m and consists of low hills. The mountainous areas are covered with virgin jungle while rubber, oil palm and some paddy are planted in the undulating terrains and lowlands. The eastern coastal plain is 30 to 40 km wide in the vicinity of the Pahang River. The coastal plain is flat and mostly swampy. Granite is found in the mountainous terrains in the east and west. The granitic soil in this region consists of fine to coarse sand and clay. Its depth seldom exceeds about half a metre except in areas where intense weathering has taken place and the soil layer can be as deep as 9 m. In the central portion of the catchment lies a wide valley where quartzite, schist, shale stone and limestone are the predominant rock types. This area, especially along the larger rivers such as Pahang River and Tembeling River is mainly covered with alluvium which varies from less than 1 m to more than 18 m in depth.

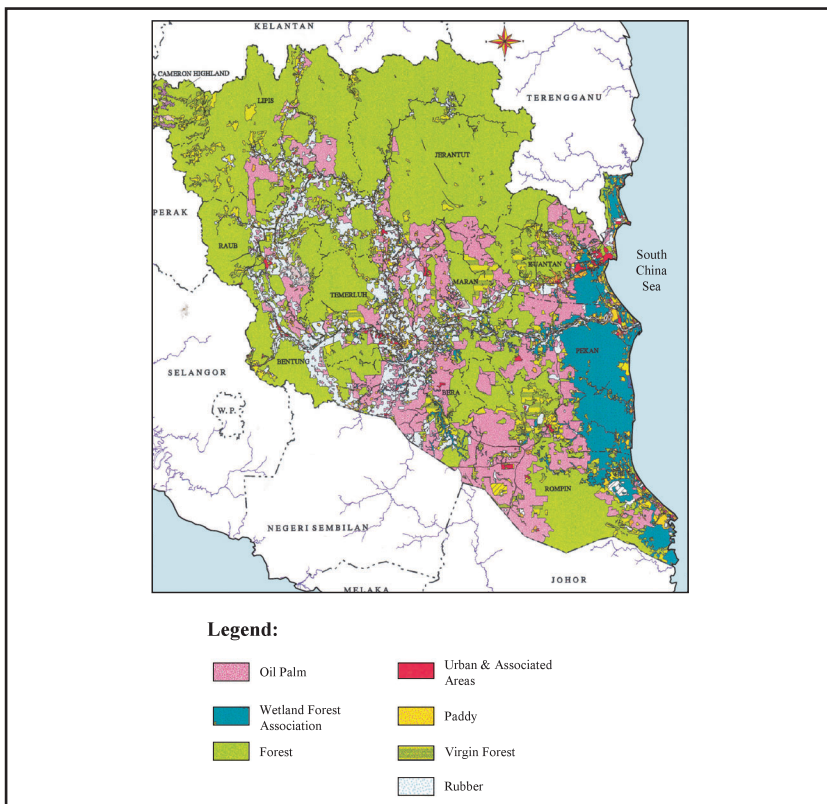
The basin has an annual rainfall of about 2,170 mm, a large proportion of which occurs during the North-East Monsoon between mid October and mid January. The mean annual temperature at Kuantan is 26.4°C with mean relative humidity of 86%. The mean flow of Pahang River measured at Lubok Paku is 596 m³/s.

2. Geographical Information

2.1 Geological Map



2.2 Land Use Map



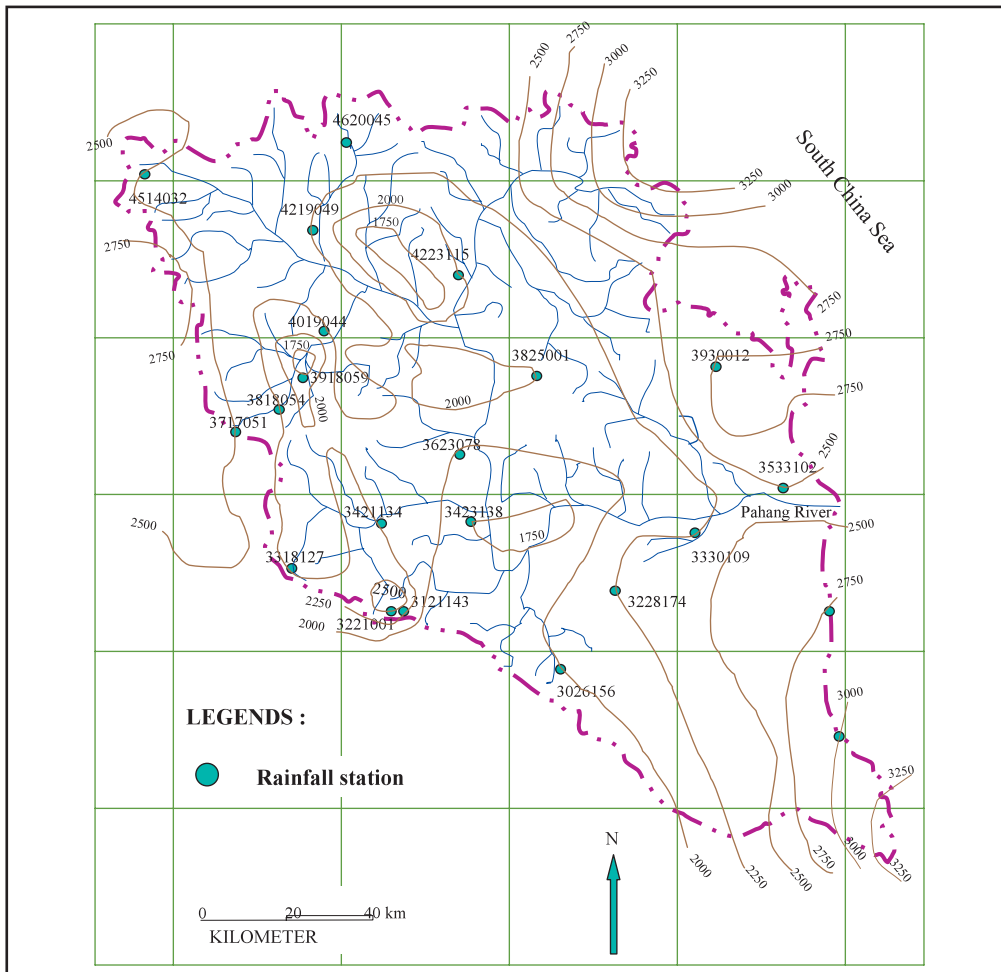
2.3 Characteristics of River and Main Tributaries

No.	Name of river	Length [km] Catchment area [km ²]	Highest peak [m] Lowest point [m]	Land use [%] (1997)
1	Pahang River (Main river)	440 27,000	Mt. Tahan (2,187 m) River mouth (0 m)	F (73.2), U (0.1), L (10), OP (4), R (10), P (2.2), A (0.5)
2	Jelai River (Tributary)	156 7,320	Mt Siku (1,916 m)	F (85), OP (2), R (4), L (9).
3	Tembeling River (Tributary)	153 5,050	Mt. Besar (790 m)	F (66), OP (12), R (13), L (9)

A: Other agricultural field (vegetable, grass) F: Forest L: Lake, River, Marsh P: Paddy field U: Urban R: Rubber OP: Oil Palm.

3. Climatological Information

3.1 Annual Isohyetal Map and Observation Stations



3.2 List of Meteorological Observation Stations

No. ¹⁾	Station	Elevation [m]	Location	Observation period	Mean annual precipitation [mm]	Observation items ²⁾
4514033	Brinchang Mountain, CHighlands	-	N 04° 31' 00" E 101° 23' 00"	1954 - 1999 (Man) 1975 - present (Auto)	2697 (1954 - 1999) 2328 (1975 - 2003)	(P) SM (P) PAT
4219049	Kg. Telang	-	N 04° 14' 55" E 101° 57' 50"	1962 - 1998	2336 (1962 - 1998)	(P) SM
4620045	Merapoh	-	N 04° 40' 40" E 102° 00' 30"	1949 - 1999	2445 (1949 - 1999)	(P) SM
4223115	Kg. Merting	-	N 04° 14' 35" E 102° 23' 00"	1949 - 1977 (Man) 1970 - present (Auto)	2345 (1971 - 1996) 2300 (1970 - 2003)	(P) SM (P) PA
4019044	Ulu Atok	-	N 04° 03' 35" E 101° 56' 10"	1969 - present	1500 (1969 - 2003)	(P) SM
3918059	Kg. Dong Raub	-	N 03° 54' 20" E 101° 53' 40"	1947 - present	2000 (1947 - 2003)	(P) SM
3818054	Stor JPS Raub	-	N 03° 48' 20" E 101° 50' 50"	1948 - 1980 (Man) 1970 - present (Auto)	2000 (1948 - 1980) 2000 (1970 - 2003)	(P) SM (P) PA
3717051	Bukit Fraser	-	N 03° 42' 50" E 101° 44' 05"	1947 - 1987	2500 (1947 - 1987)	(P) SM
3825001	Lemb. Ujian Sg. Tekan 1	-	N 03° 53' 50" E 102° 32' 05"	1975 - 1994	2000 (1975 - 1994)	(P) PA
3930012	Sg. Lembing PCCL Mill	-	N 03° 55' 00" E 103° 02' 10"	1970 - present	2500 (1970 - 2003)	(P) PA
3318127	Janda Baik	-	N 03° 19' 35" E 101° 51' 45"	1954 - present	2000 (1954- 2003)	(P) SM
3421134	Ldg. Sg. Kawang	-	N 03° 28' 00" E 102° 08' 35"	1947 - present	2100 (1947 - 2003)	(P) SM
3623078	Ldg. Sg. Tekal	-	N 03° 39' 20" E 102° 22' 00"	1947 - present	2050 (1947 - 2003)	(P) SM
3423138	JKR Mentakab	-	N 03° 29' 00" E 102° 21' 05"	1966 - present	1900 (1966 - 2003)	(P) SM
3533102	Rumah Pam Pahang Tua, Pekan	-	N 03° 33' 40" E 103° 21' 25"	1948 - present	2800 (1948 - 2003)	(P) SM
3221001	JKR Kg. Manchis	-	N 03° 12' 10" E 102° 19' 45"	1965 - present	2200 (1965 - 2003)	(P) SM
3121143	Simpang Pelangai	-	N 03° 10' 30" E 102° 11' 50"	1975 - present	2500 (1970 - 2003)	(P) PA
3026156	Pos Iskandar	-	N 03° 01' 40" E 102° 39' 30"	1970 - present	1800 (1970 - 2003)	(P) PA
3228174	Sg. Cababg Kanan	-	N 03° 17' 55" E 102° 49' 20"	1977 - present	2100 (1977 - 2003)	(P) PA
3330109	Kg. Batu Gong	-	N 03° 23' 25" E 103° 01' 35"	1974 - present	2300 (1974 - 2003)	(P) PA

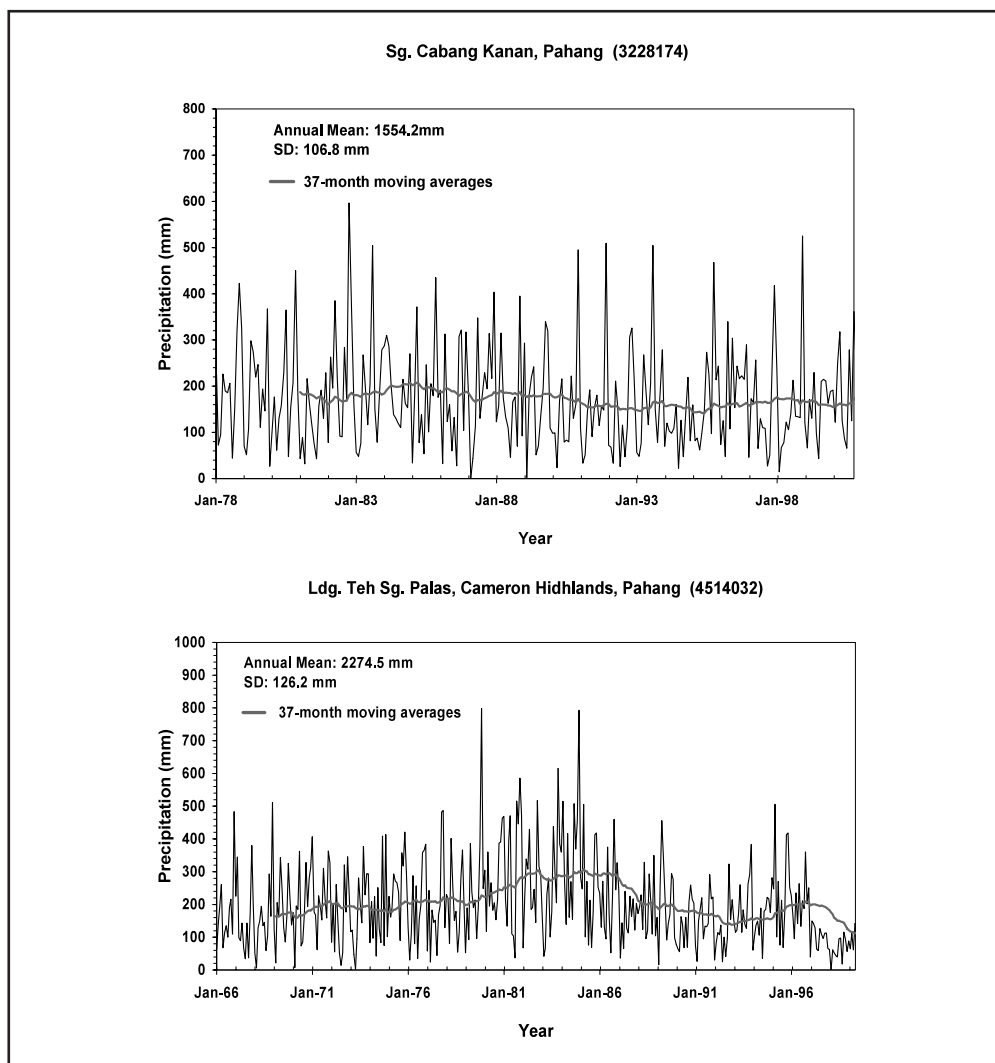
1) Serial number used by Department of Irrigation and Drainage, Malaysia.

2) (P): Precipitation, SM: Secondary Manual, PAT: Primary Auto telemetric, PAET: Primary auto, evaporation and telemetric , SA: Secondary Auto, SAT: Secondary auto telemetric, PA: Primary Auto

3.3 Monthly Climate Data

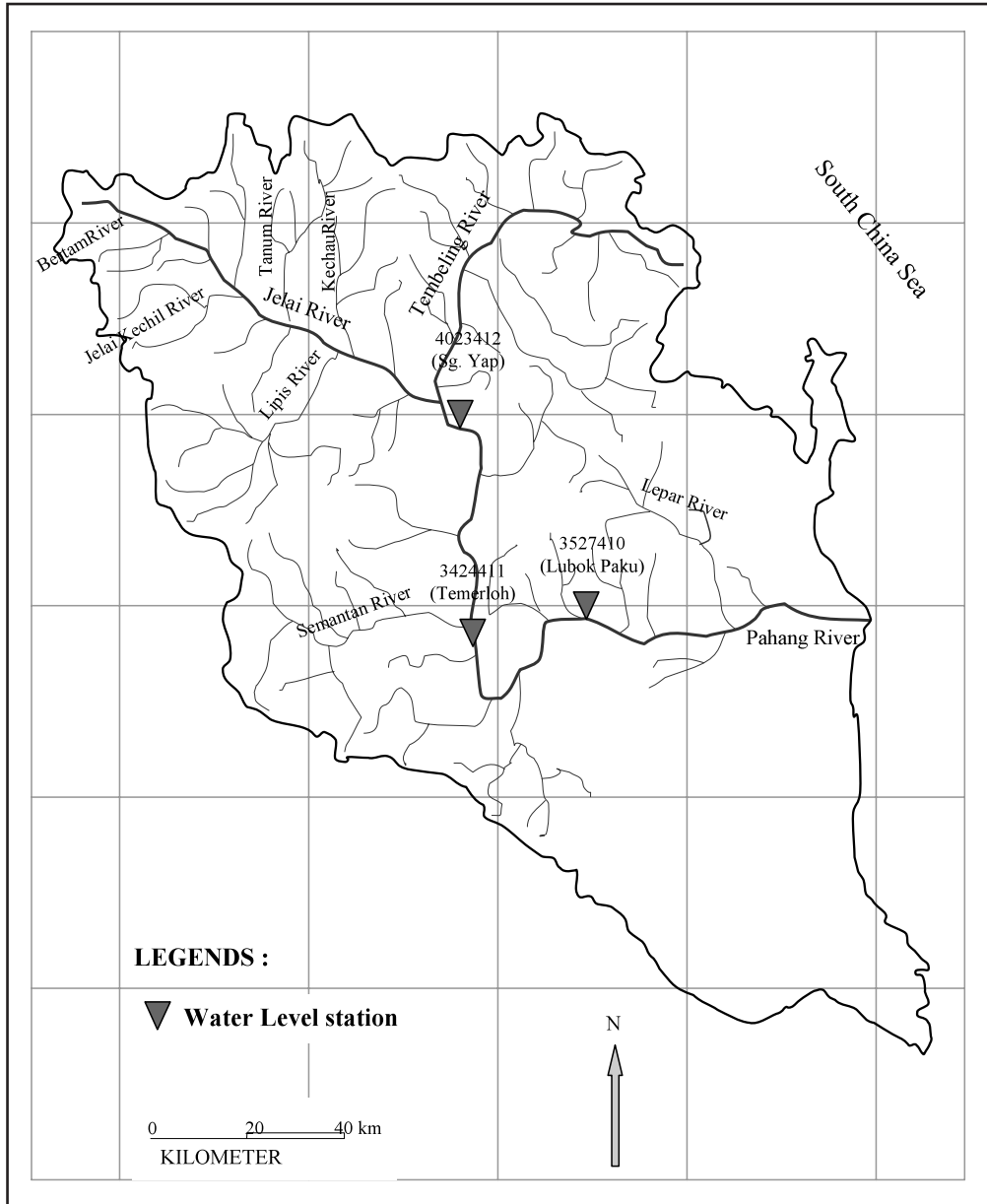
Observation item	Observation station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Period for the mean
Temperature [°C]	Kuantan	25.4	25.8	26.5	28.1	27.7	27.2	27	26.8	26.7	26	25.8	26.8	26.8	1968 - 2003
Precipitation [mm]	Ldg. Jeram, Kuantan	376.5	191.1	201.1	153.6	179.9	144.1	134.3	168.2	218.6	253.6	424.1	593.5	2,984.5	1930 - 2003
Evaporation [mm]	Pekan	159.5	148.1	179.4	165.4	170.3	159.3	160.7	168.9	162.5	143.6	137.0	108.0	1,862.7	1962 - 2003
Duration of sunshine [hr]	Kuantan	7.1	8.1	8.4	8.8	7.9	7.0	7.0	6.8	6.5	5.9	4.6	4.8	6.9	1968 - 1997

3.4 Long-term Variation of Monthly Precipitation



4. Hydrological Information

4.1 Map of Streamflow Observation Stations



4.2 List of Hydrological Observation Stations

No. *	Station	Location	Catchment area (A) [km ²]	Observation period	Observation items ¹⁾ (frequency)
3527410	Lubok Paku	N 03° 30' 45" E 102° 45' 30"	25,600	1973 - present	WL/Q (A), SS(Wk), WQ (Wk)
3424411	Temerloh	N 03° 26' 40" E 102° 23' 45"	19,000	1963 - present	WL/Q (A), SS(Wk), WQ (Wk)
4023412	Sg. Yap	N 04° 01' 55" E 102° 19' 30"	13,200	1972 - present	WL (A)

No. *	\bar{Q} ²⁾ [m ³ /s]	Qmax ³⁾ [m ³ /s]	\bar{Q} max ⁴⁾ [m ³ /s]	\bar{Q} min ⁵⁾ [m ³ /s]	Q/A [m ³ /s/100km ²]	Qmax/A [m ³ /s/100km ²]	Period of statistics
3527410	718.7	6,318	2,657	187	2.81	24.68	1973 - 2003
4023412	292.8	6,377	2,681	73	2.22	48.31	1972 - 2003

*: Serial number used by Dept. of Irrigation and Drainage Malaysia.

1) Q: Discharge; WQ: Water quality; WL: Water Level;

D: Daily manual; A: Automatic Wk: 2 weekly.

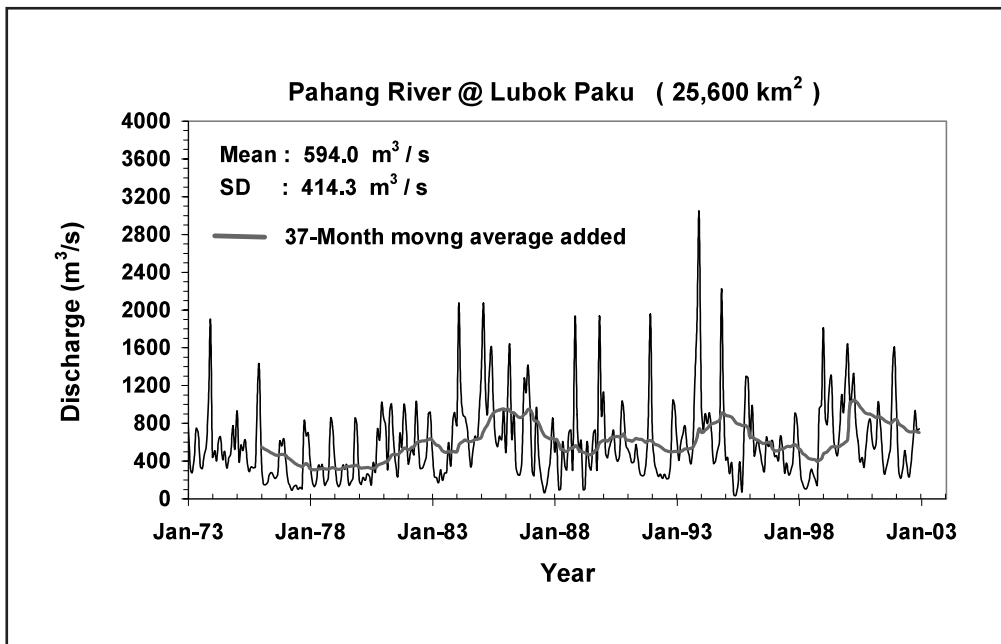
2) Mean annual discharge

3) Maximum discharge

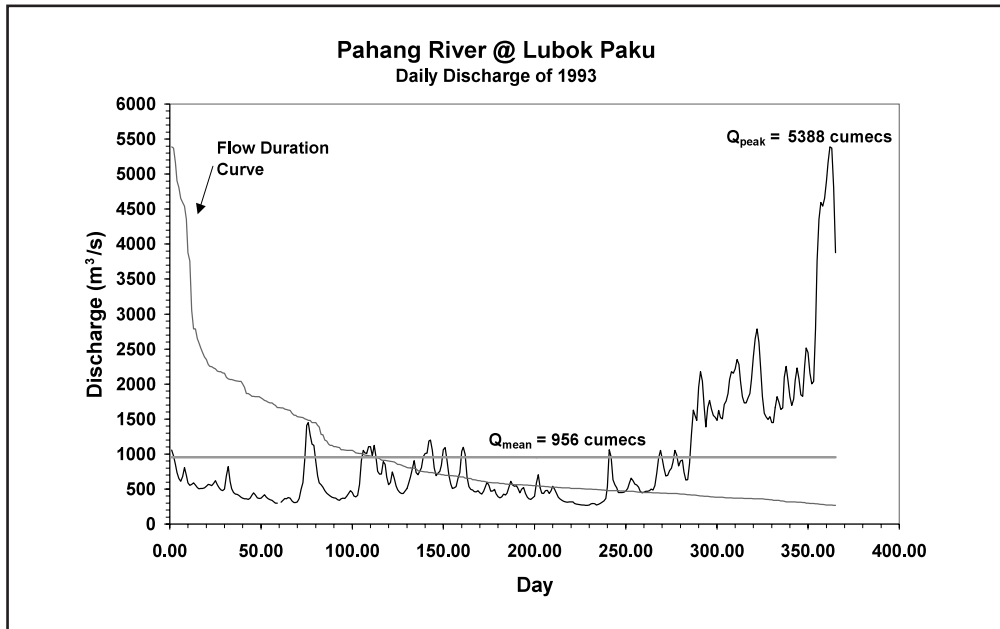
4) Mean maximum discharge

5) Mean minimum discharge

4.3 Long-term Variation of Monthly Discharge



4.4 Annual Pattern of Discharge

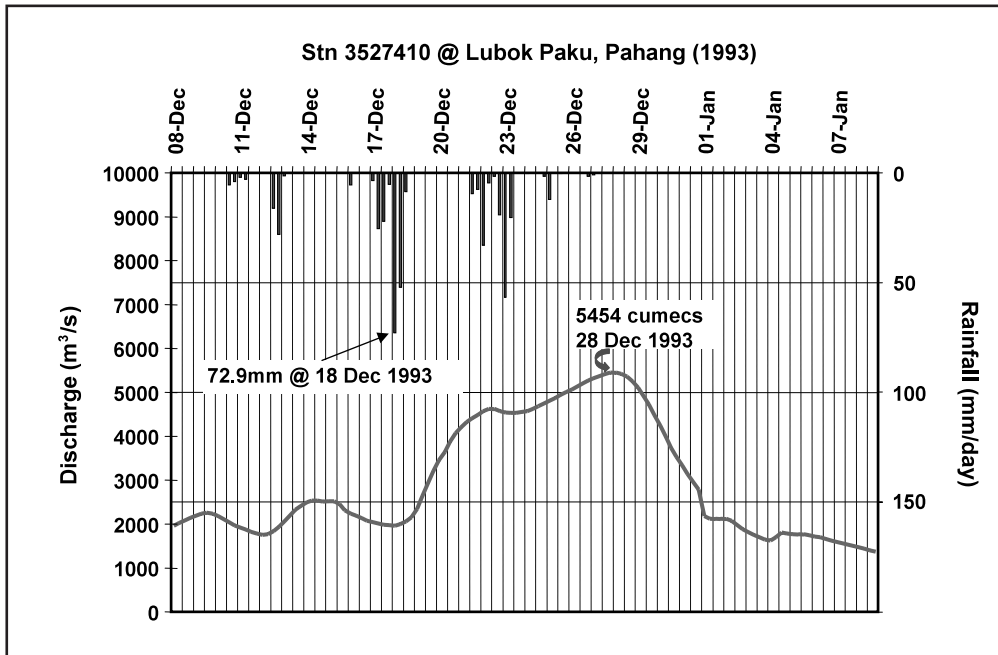


4.5 Annual Maximum and Minimum Discharges

Year	Maximum ¹⁾		Minimum ²⁾		Year	Maximum ¹⁾		Minimum ²⁾	
	Date	[m ³ /s]	Month	[m ³ /s]		Date	[m ³ /s]	Month	[m ³ /s]
1973	13/12	4,167.0	3	198.6	1989	01/11	1,860.1	3	344.5
1974	01/05	1,184.2	8	190.0	1990	20/12	3,685.7	3	218.3
1975	01/12	3,697.0	10	170.3	1991	15/12	4,011.9	9	179.0
1976	31/12	1,447.8	8	87.5	1992	15/11	2,432.7	9	291.8
1977	10	1,449.1	9	63.5	1993	27/12	5,465.1	8	267.6
1978	09/12	1,795.1	3	88.4	1994	11	2,690.2	8	311.8
1979	01/12	4,216.0	8	75.3	1995	21/08	1,687.3	4	165.7
1980	12/12	1,795.4	7	98.8	1996	17/10	2,088.7	11	187.7
1981	11	1,100.7	2	194.7	1997	19/12	1,450.1	8	206.1
1982	12	2,706.9	8	167.3	1998	31/12	4,023.4	4	131.5
1983	18/06	247.9	4	52.1	1999	12	2,006.4	8	359.2
1984	02	2,982.5	8	197.2	2000	09/01	3,187.2	9	260.2
1985	03	2,196.7	9	86.2	2001	27/12	3,975.7	7	251.4
1986	03	2,452.9	2	151.2	2002	01	2,292.9	3	155.4
1987	10	2,791.5	4	162.4	2003	20/02	969.3	6	175.6
1988	26/11	6317.8	10	296.4					

1), 2) Instantaneous observation by recording charts

4.6 Hyetographs and Hydrographs of Major Floods



5. Water Resources

5.1 General Description

Unlike Kelantan River in the northern state which meets the irrigation demand of four major granary (paddy) areas totalling more than 30,000 Ha, Pahang River, via the effort of DID Malaysia, provides water only to numerous small scale paddy irrigation schemes. For instance, in Lipis River basin there are 26 extraction points along the river drawing a total of 290 million litres per day (mld) of water during paddy planting season. Similarly, water are drawn from Jelai, Triang, Lepar and the lower reaches of Pahang main river for irrigating the paddy fields. A number of these paddy cultivation schemes have been operating since the 1930's. Total amount of water extracted from more than 70 locations for these small paddy irrigation schemes stands at about 750 mld or 8.7 cumecs which represents only a small fraction of the available water from the Pahang River. Water from Pahang River also supports the needs of other agricultural activities such as rubber and oil palm plantations. In contrast, due to extensive farming activities water scarcity is being experienced in the headwaters of the Bertam and Telum rivers in the Cameron Highlands (in the north-western mountain range) that stands at more than 1600 m above sea level. This is the most important highland fresh vegetable producing area of the country and is also an important vegetable source for the people of the neighbouring country - Singapore. The highlands are also home to some of the largest tea plantations in the country which have been operating since the British colonial time.

In addition, Pahang River delivers more than 120 mld of water, via the Public Works Department to meet the demand of domestic and industrial sectors, particularly in urban regions.

5.2 Major Floods and Droughts

No major drought has been experienced in Pahang River basin in the past.

Major Floods

Date	Water level [m]	Meteorological al cause	Dead and missing	Major damages [Districts affected]
23.12.99	3.089m @ Pekan	Heavy rainfall	-	village and roads were flooded and damages.
04.01.99	2.3m @ Temerloh @ Sg. Yap @Lubok Paku	Heavy rainfall	4 died	3,082 people were evacuated, roads, bridge side drain and culvert were flooded and damages. Damages cost RM3,191,200.00.
01.01.99	68.5m @ Sg Yap	Heavy rainfall	-	500 people were evacuated.
30.12.95	31.74 @Temerloh	Heavy rainfall	-	664 people were evacuated.
17.11.94	26.00 @ Sg Yap 30.90 @ Temerloh	Heavy rainfall	-	3 people were evacuated 10 people were evacuated
27.12.93	33.37m @ Temerloh	Heavy rainfall	-	233 people were evacuated, road and structural damages RM178,665.00.

6. Socio-cultural Characteristics

The State of Pahang belongs to Eastern Region and is one of the eleven States in Peninsular Malaysia. The State of Pahang, normally divided into North and South Pahang, is composed of ten Districts. Kuantan is the capital of Pahang situated near the mouth of Kuantan River which is not part of the Pahang River basin. It is the development centre of North Pahang. Major towns found in the Pahang River basin include Pekan, Marang, Temerloh, Jerantut, Kuala Lipis, Raub and Bentung. According to historical records Kuala Lipis was once the administrative center of the Pahang Sultanate empire. Raub has the commercially lucrative gold mining industry of the country while Bentung was one of the major tin producing towns in the 1960's till the 1980's. A number of nationally and internationally well-known recreation and tourist destinations are found in the Pahang River basin. Taman Negara or the National Park of Mt Tahan is a national heritage area where tens of thousands of tourists from inside the country and abroad trek the virgin jungle of Mt Tahan enjoying the fascinating bio-diversity and nature's wonders each year. The basin also houses the three most popular highland resorts, namely Cameron Highlands, Fraser's Hill and Genting Highlands where temperatures of 18° C to 22° C during the day are the norm. They are the perfect getaway destinations for city dwellers from the bustling and burning heat of urban areas in the lower altitudes.

In addition, the only two natural lakes in Peninsula Malaysia are found in the Pahang River basin. They are Chini Lake and Bera Lake. Tasik (Lake) Chini, consisting of a series of 12 lakes, is located about 100 km south west of Kuantan town, and is formed from the natural damming of a river valley. Legend has it that within the deep water of Tasik Chini lies an ancient kingdom that once ruled the areas around the lakes. The story told by the local indigenous tribes, such as the Jakun, is that during the imminent advancement by the powerful Khmer regime in the early 5th century the ancient city of gold was deliberately flooded to avoid invasion. To this date, this mysterious underwater city of an ancient kingdom remains elusive from mankind. The Jakun people still live off the land around the lakes; hunting, gathering jungle produce, fishing and carrying out some agricultural activities. Tasik Bera or Bera Lake is situated at about 80 km south-west of Tasik Chini. This natural freshwater lake system is 35 km long and 20 km wide and is much larger than Tasik Chini. It drains northward to join the main trunk of Pahang River via the Bera River. Tasik Bera is a swampy wetland that is not only home to a diverse range of fauna and flora, but also sustains the livelihood of the Semelai, the aboriginal inhabitants of the area. It has been protected under an international treaty - the Ramsar Convention, which allows traditional and wise use of the area to continue. Tasik Bera Ramsar site was declared in

November 1994. Like Tasik Chini is a sanctuary habitat for hundreds of bird, mammal and fish species including some endangered species such as tiger, tapir and elephant.

The population of Pahang is 1,000,000 as recorded in 1993. Malays are the majority ethnic group followed by Chinese who largely live in the urban areas. The major economic activities in Pahang are tourism, timber harvesting and forest products, mining and agriculture. Agriculture consists mainly of the cultivation of paddy, rubber, oil palm and cocoa plantations. Fishing (fresh water) and livestock farming are important occupations found in this area too.