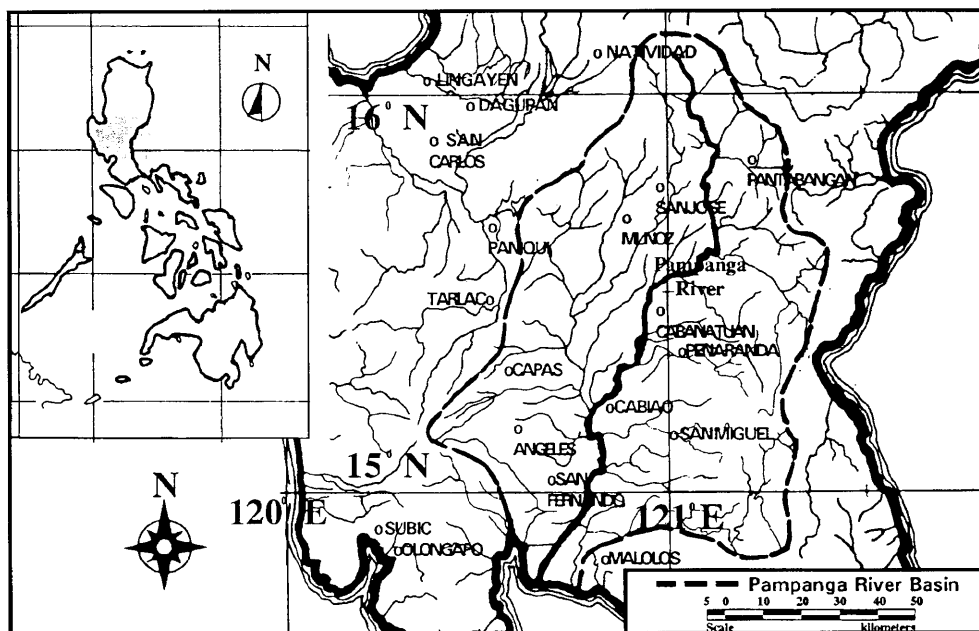


Ilog Pampanga

Map of River



Philippines Water Data (1972), NWRB, Philippines

Table of Basic Data

Name: Pampanga River		Serial No.: Philippines-2
Location: Central Luzon, Philippines	N 14° 49' ~ 16° 10'	E 120° 18' ~ 121° 15'
Area: 9 759 km ²	Length of main stream: 270 km	
Origin: Caraballo Mountain (1 200 m)	Highest point: Caraballo Mountain (1 200 m)	
Outlet: China Sea	Lowest point: River mouth (0 m)	
Main geological features: Undifferentiated volcanic rock		
Main tributaries: Coronel River (740 km ²), Penaranda River (512 km ²), Pantabangan River (244 km ²) and Rio Chico River (1 573 km ²)		
Main lakes: None		
Main reservoirs: Pantabangan Reservoir (3 000 x 10 ⁶ m ³ , 1974) and Angat Dam and Reservoir (1 030 x 10 ⁶ m ³ , 1967)		
Mean annual precipitation: 2 067 mm (1951~1975) (basin average)		
Mean annual runoff: 691.5 m ³ /s (1946~1979)		
Population: 4 458 348 (1990)	Main cities: Angeles, Cabanatuan, San Jose	
Land use: Forest (40%), Grassland (33%), Agricultural land (24%), Wetlands (3%) (1983)		

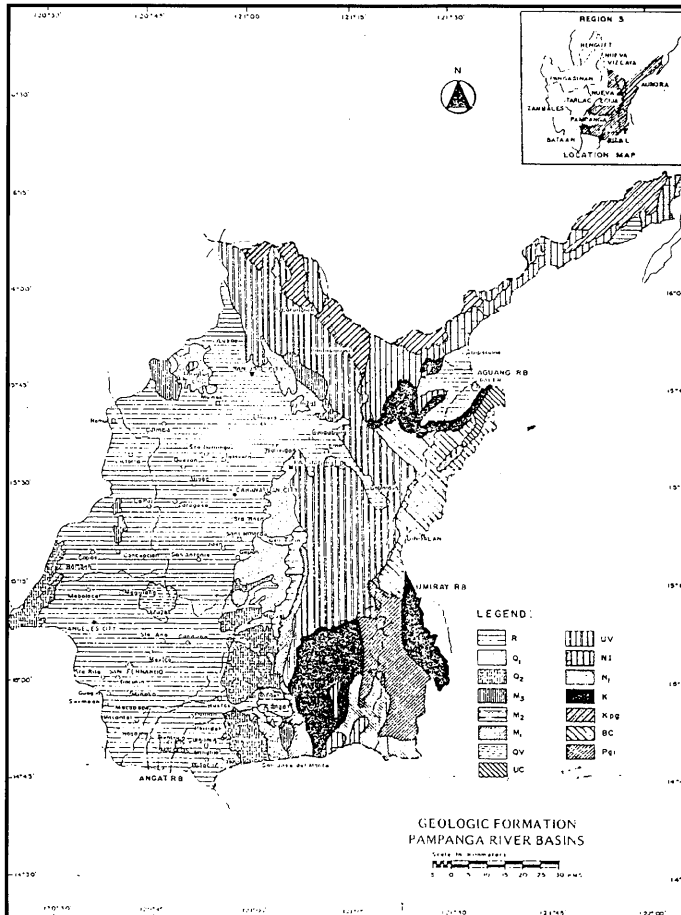
1. General Description

The Pampanga River Basin is located in the eastern part of Central Luzon. It covers an area of 9 759 km² and embraces all or parts of the provinces of Quezon, Bulacan, Rizal, Tarlac, Nueva Vizcaya, Pampanga, and Nueva Ecija. It is bounded on the south by Manila Bay, on the east by the Sierra Madre Mountain, on the north by the Caraballo Mountain, on the south-west by the Agno River basin and on the west and south-west by the Zambales Mountains. The valley floor, which constitute about 40 percent of the basin proper, is relatively flat and is mainly cultivated for rice and diversified crop production. A distinctive physical feature in the central part of the basin is Mount Arayat which rises over a thousand meters above the surrounding area.

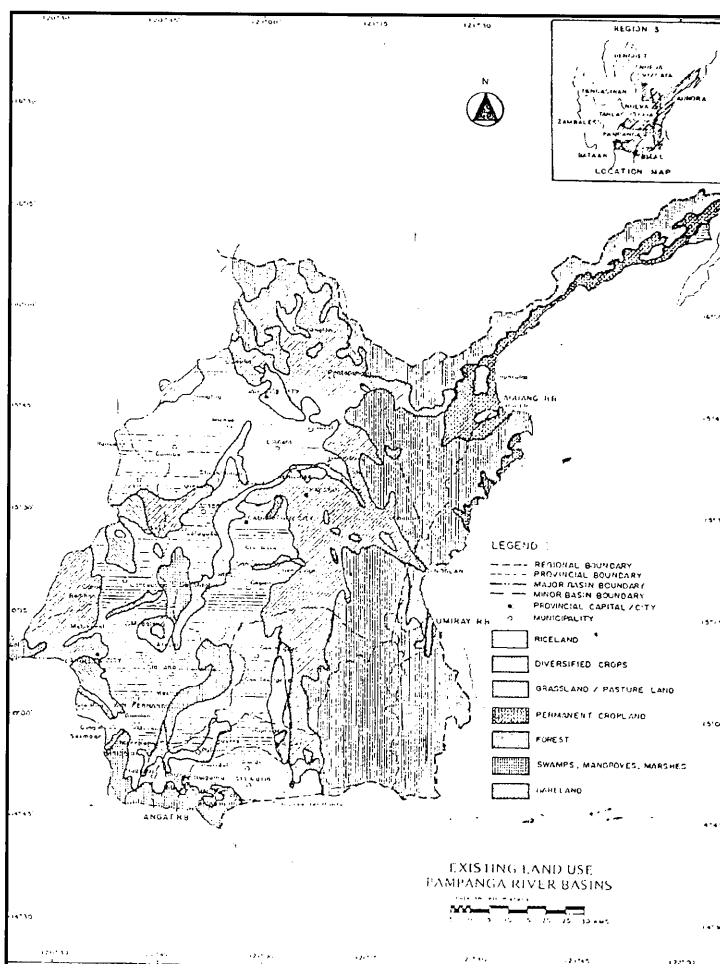
The Pampanga River, which is the principal drainageway for the eastern and southern parts of the basin, is formed by the Carranglan and Pantabangan Rivers in the Caraballo Mountains. The river branches into several tributaries forming the famous Pampanga Delta, which is characterised by its low elevation above mean sea level, lack of general gradient and the periodic intrusion of sea tides, thus resulting in periodic floods in the basin. Principal tributaries of the Pampanga River include the Penaranda, Coronel and Pantabangan Rivers on the eastern side of the basin and the Rio Chico from the west.

2. Geographical Information

2.1 Geological Map



2.2 Land Use Map



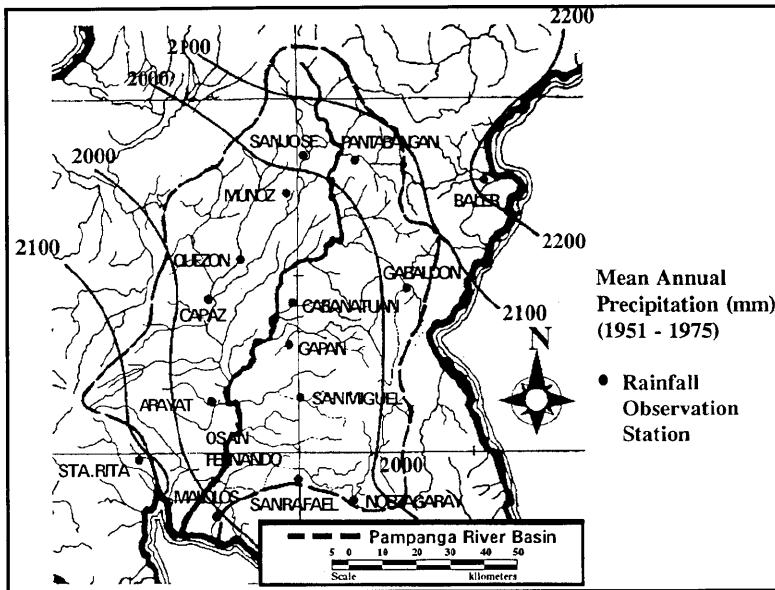
2.3 Characteristics of the River and the Main Tributaries

No.	Name of river	Length [km] Catchment area [km ²]	Highest peak [m] Lowest point [m]	Cities Population (1990)	Land use [%] (1983)
1	Pampanga (Main river)	270 9 759	1 200 -----	4 458 348	DC (2) F (40)
2	Pantabangan (Tributary)	25 244	926 -----	197 163	G (33) P (21)
3	Penaranda (Tributary)	52 512	1 037 -----	361 442	TF (1) W (3)
4	Coronel (Tributary)	51 740	500 -----	148 171	
5	Rio Chico (Tributary)	100 1 573	838 -----	374 962	

DC: Diversified crops F: Forest G: Grassland P: Paddy field TF: Tree farms W: Wetland

3. Climatological Information

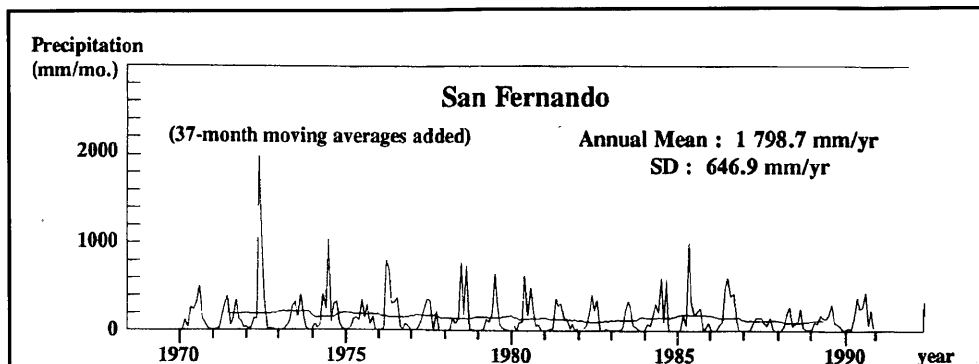
3.1 Annual Isohyetal Map and Observation Stations



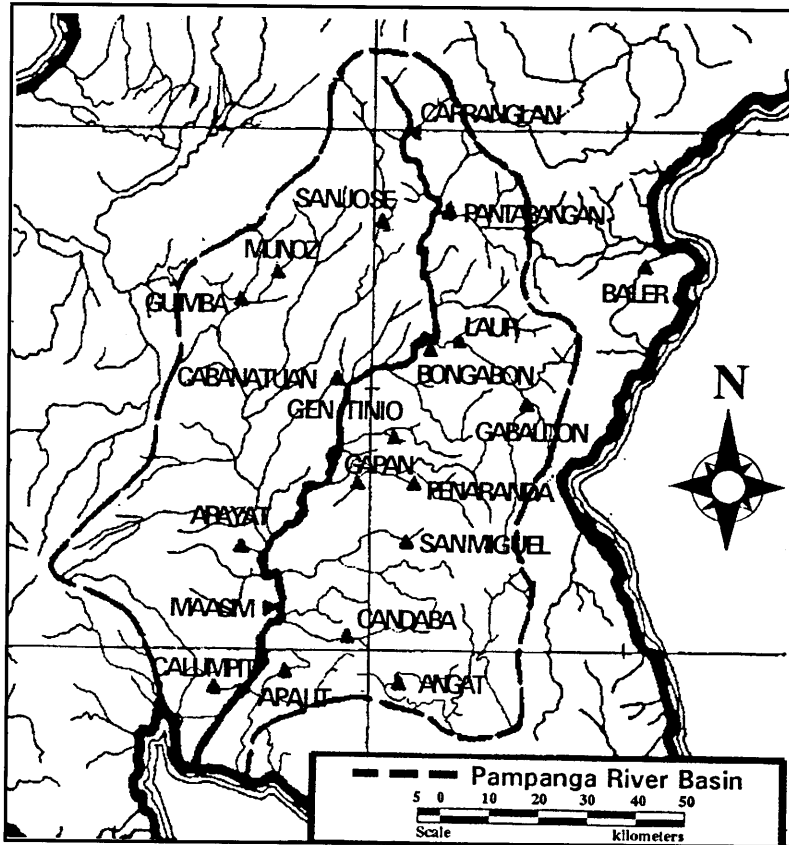
3.3 Monthly Climate Data

Observation item	Observation station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Period for the mean
Temperature [°C]	Munoz	25.2	25.8	27.0	28.4	28.7	28.1	27.3	27.1	27.1	26.8	25.6	25.3	26.9	1966~1972
Precipitation[mm]	Cabanatuan	7.3	5.3	12.0	34.2	150.4	255.0	268.3	380.4	285.7	129.1	114.9	41.2	1 683.8	1951~1975
Evaporation [mm]	Munoz	180	190	230	252	167	145	119	93	105	122	129	172	1 904	1974~1980
Solar radiation [MJ/m ² /d]	Munoz	14.6	18.2	20.3	20.9	16.4	15.5	13.1	12.4	14.1	13.7	14.3	14.0	15.6	1966~1972

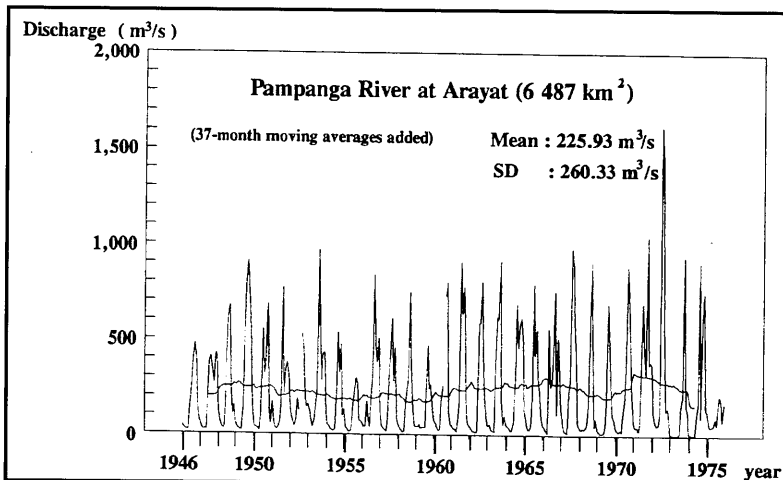
3.4 Long-term Variation of Monthly Precipitation



4. Hydrological Information
 4.1 Map of Streamflow Observation Stations



4.3 Long-term Variation of Monthly Discharge

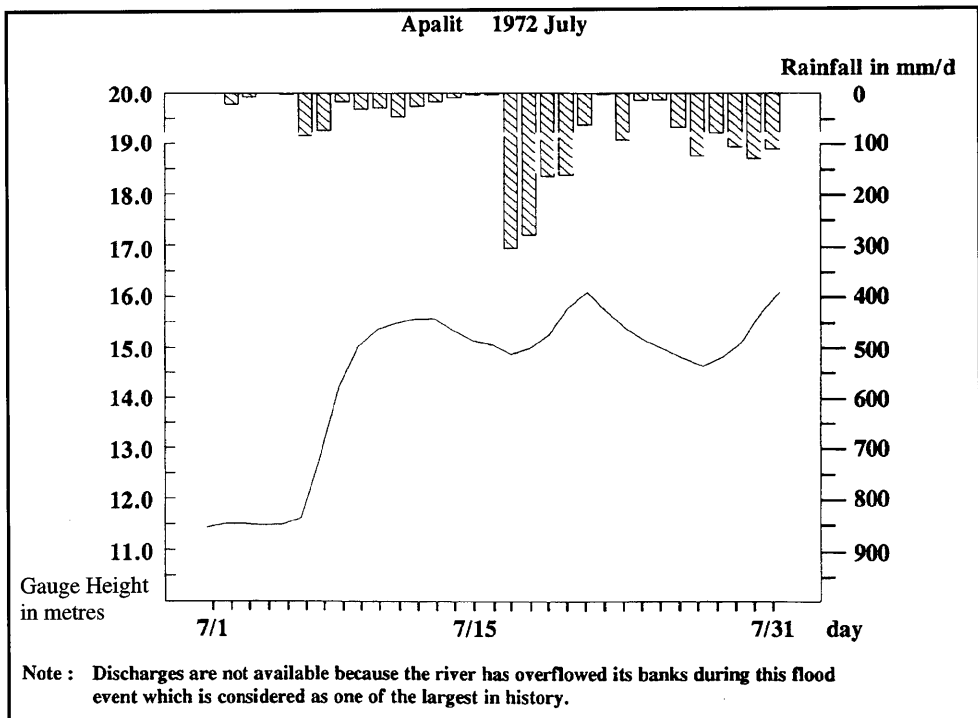


4.6 Annual Maximum and Minimum Discharges

At Arayat [6 487 km²]

Year	Maximum		Minimum		Year	Maximum		Minimum	
	Date	[m ³ /s]	Month	[m ³ /s]		Date	[m ³ /s]	Month	[m ³ /s]
1946	9.12	2 140	4	12.0	1963	7.30	1 550	5	15.0
1947	10.08	2 460	5	11.6	1964	12.17	1 318	5	17.5
1948	8.26	2 245	5	18.8	1965	7.16	1 700	4	22.0
1949	10.05	1 421	5	15.5	1966	5.22	1 840	4	8.8
1950	10.05	1 530	5	11.5	1967	8.20	1 456	5	10.6
1951	8.17	1 450	5	20.7	1968	9.01	1 833	11	14.8
1952	9.01	3 880	7	27.0	1969	8.10	1 514	5	8.9
1953	8.23	1 576	4	30.8	1970	9.03	1 539	6	15.5
1954	11.11	1 440	5	15.5	1971	10.14	2 302	4	19.0
1955	9.25	1 022	4	12.8	1972	7.20	2 722	5	34.4
1956	9.27	1 142	4	20.0	1973	10.18	3 558	4	3.1
1957	11.15	1 784	5	15.0	1974	8.18	4 542	4	4.4
1958	9.11	1 157	4	10.0	1975	12.21	1 147	11	31.3
1959	11.19	1 177	2	23.6	1976	5.26	4 735	3	4.3
1960	8.17	2 372	4	16.0	1977				
1961	7.08	1 435	5	12.5	1978	11.13	431	11	69.0
1962	7.23	2 316	5	11.7	1979	8.18	2 024	2	20.6

4.7 Hyetographs and Hydrographs of Major Floods



5. Water Resources

5.1 General Description

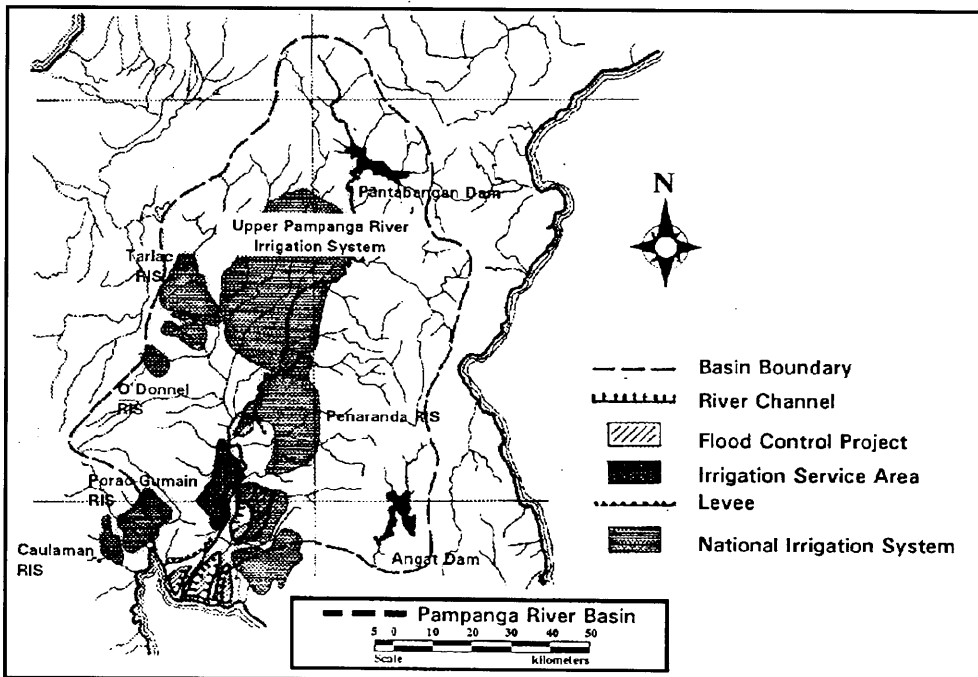
The Pampanga River Basin is one of the major paddy producers in the whole Philippines. The demand for agriculture in the basin is primarily dictated by irrigation of agricultural land integrated with multi-purpose dams, direct use of domestic, municipal, industrial and for economic activities.

In the Pampanga Basins, there are two major multi-purpose reservoirs already in operation. These are the Pantabangan and the Angat multi-purpose reservoirs. The Pantabangan Dam was built primarily to control, regulate and utilize the seasonal flows of the Pampanga River and its tributaries for year-round irrigation of rice and diversified crops, domestic and industrial water supply and generation of hydro-electric power. The reservoir is capable of irrigating 77,000 hectares of land.

The Angat Multipurpose reservoir is capable of supplying water to irrigate about 30,000 hectares of land in Bulacan. Its flood control function is incidental which is capable of storing about $220 \times 10^6 \text{ m}^3$ of flood waters. The dam is also the main source of domestic water supply for the Metro Manila area.

The water resources of the basin consist mainly of rainfall, surface runoff and groundwater. Climatic conditions in the area show a distinct wet and dry season and fairly uniform temperature. The months of January to April are generally dry and the rainy season occurs from May to December. Rainfall is usually intense in May and through October with August generally the month of heaviest rainfall. Annual rainfall over the basin varies from about 2000 mm in the central part to over 4000 mm in the northeastern part.

5.2 Map of Water Resources Systems



7. References

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