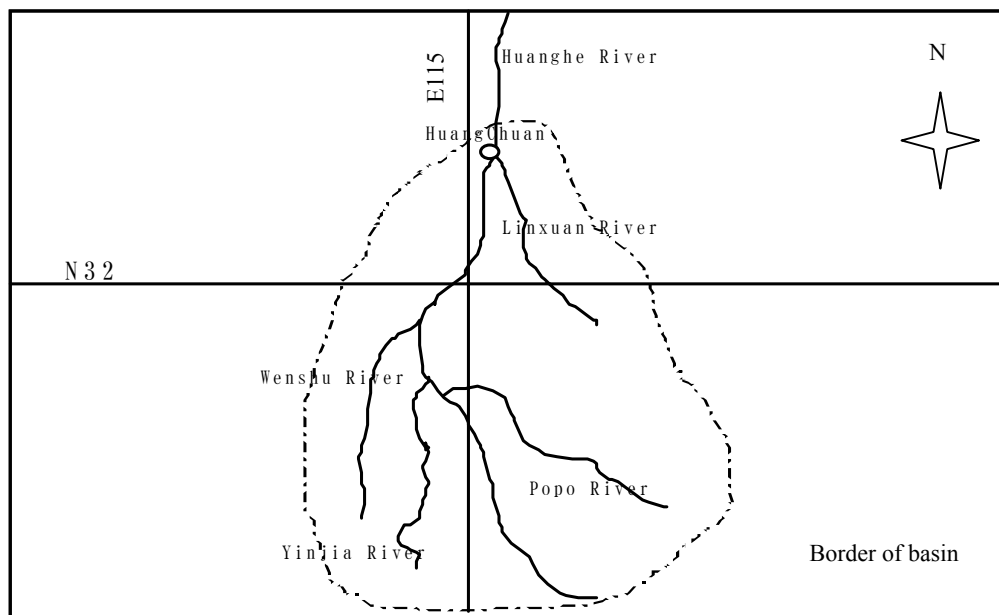


## Huanghe

### Map of River



### Table of basic Data

<b>Name:</b> Huanghe (in Huaihe basin)		<b>Serial No.:</b> China-5
<b>Location:</b> Henan Province, North China	N 31°30'~32°10'	E 114°40'~115°10'
<b>Area:</b> 2 400 km <sup>2</sup>	<b>Length of main stream:</b> 140 km	
<b>Origin:</b> Wanzishan (1 011 m)	<b>Highest point:</b> Mt. Huangmaojian (1 011 m)	
<b>Outlet:</b> Huaihe	<b>Lowest point:</b> confluence (31.30 m)	
<b>Main geological features:</b> Gravel rock, Biorite rock, Granite rock, Quartzite rock, Shale rock.		
<b>Main tributaries:</b> Yingjia River (325 km <sup>2</sup> ), Popo River (265 km <sup>2</sup> ), Wenshu River (95 km <sup>2</sup> ), Linxuan River (331 km <sup>2</sup> )		
<b>Main lakes:</b> None		
<b>Main reservoirs:</b> Pohe (258x10 <sup>6</sup> m <sup>3</sup> ), Xiangshan (85.7x10 <sup>6</sup> m <sup>3</sup> )		
<b>Mean annual precipitation:</b> 1 200 mm (basin average)		
<b>Mean annual runoff:</b> 11.3 m <sup>3</sup> /s at Huangchuan (2 050 km <sup>2</sup> )		
<b>Population:</b> --	<b>Main cities:</b> Xinxian, Guangshan, Huangchuan	
<b>Land use:</b> Forest (40 %), Cultivated area (24.6 %), Others (35.4 %)		

## 1. General Description

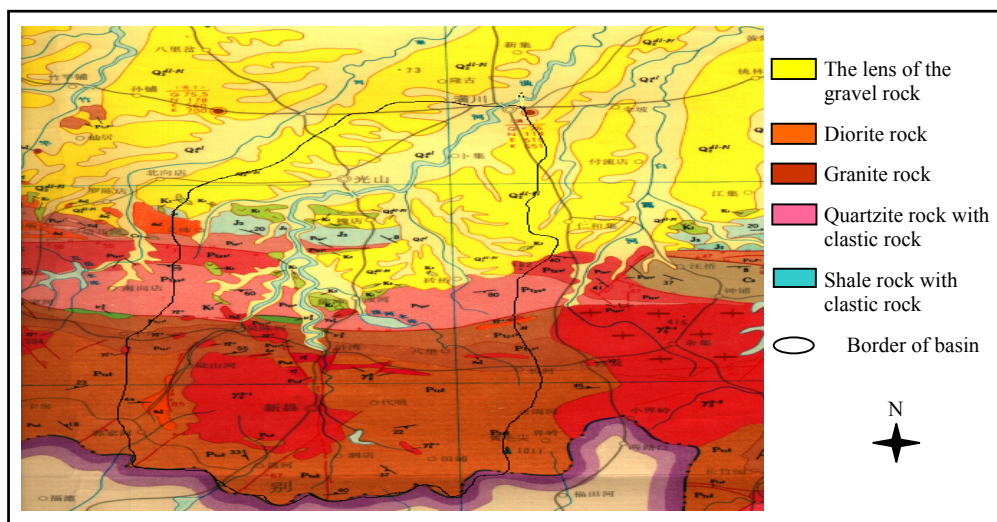
Huanghe is located in the Henan province, it crosses the Xinxian, Guangshan and Huangchuan counties. It is one of larger tributaries in the upstream parts of Huaihe. The main river originates from Dabieshan. The general direction of Huanghe is from south to north. The outlet is at Xintai in Huaihe. The catchment area of the basin is 2 400 km<sup>2</sup> and the length of the main river is 140 km. The annual precipitation for the basin is 1 200mm, and the annual discharge at Huangchuan is 11.3 m<sup>3</sup>/s. The main crop is rice in the river basin where large rice fields can be found along the midstream and downstream.

One large reservoir, named Pohe, has been completed in the main tributary for flood control and irrigation.

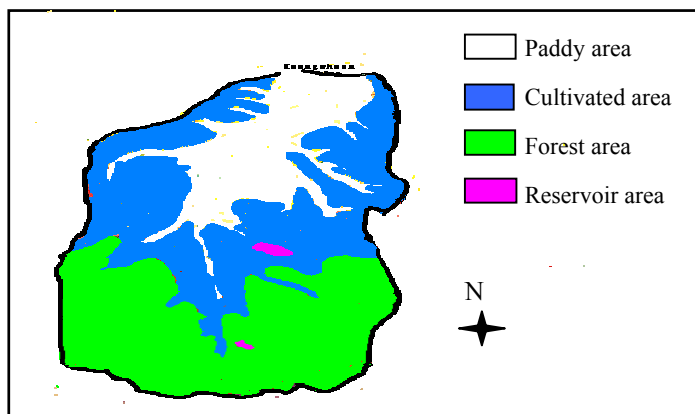
The Henan is an important agricultural province in China, the climate is warm and humid, and in most parts of the catchment, crops can be planted in all four seasons.

## 2. Geographical Information

### 2.1. Geological Map



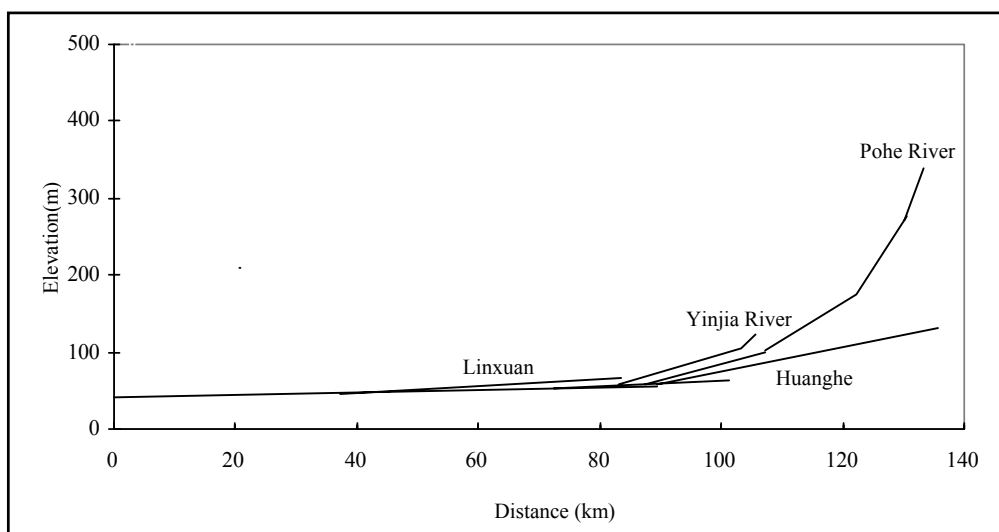
## 2.2. Land use Map



## 2.3. Characteristics of River and Main Tributaries

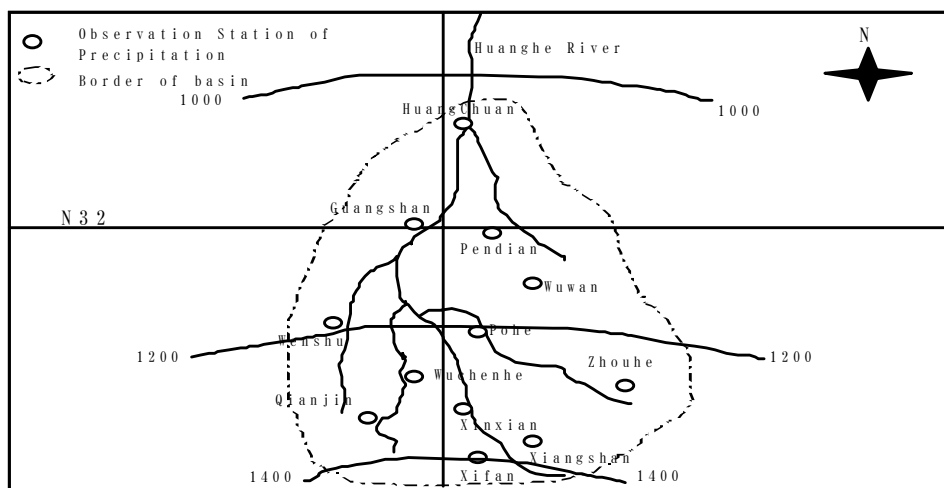
No.	Name of river	Length [km] Catchment area [km <sup>2</sup> ]	Highest peak [m] Lowest point [m]	Cities Population	Land use
1	<b>Huanghe</b> (Main river)	140 2 400	Wanzishan 1 011 Xintai 31.30	Huangchuan	Forest (40%) Cultivated area (24.6%) Others (35.4%)
2	<b>Yinjia river</b> (Tributary)	45 325			
3	<b>Popo river</b> (Tributary)	58 265	Wanzishan 1 011		
4	<b>Wenshu river</b> (Tributary)	30 95			
5	<b>Linxuan river</b> (Tributary)	31 331			

## 2.4. Longitudinal Profiles



### 3. Climatological Information

#### 3.1. Mean Annual Isohyetal Map and Observation Stations



#### 3.2. List of Meteorological Observation Stations

Station	Elevation [m]	Location	Observed period	Mean annual precipitation [mm]	Observation Items
Huangchuan	42.0	N329° 09' E115° 02'	1971~1980	1362.0	P,T
Xinxian	91.9	N31° 38' E114° 51'	1971~1980	1043.9	P,T

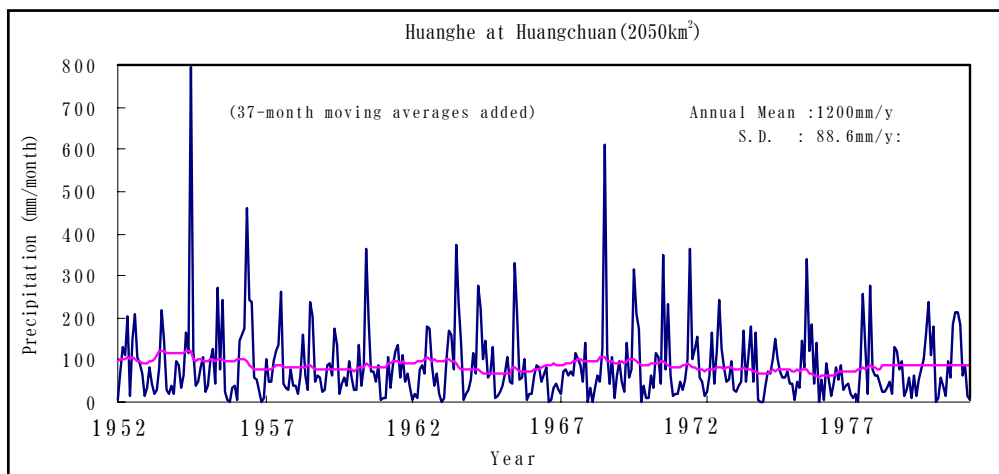
P: Precipitation T: Temperature

#### 3.3. Monthly Climate Data

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Period
P	32.1	44.5	68.9	101.9	109.1	141.6	218.6	122.6	79.6	51.0	47.3	26.7	1043.9	1952-1980
T	1.9	3.8	9.3	15.3	20.1	24.9	27.8	26.9	21.5	15.9	10.0	4.2	15.1	1957-1980

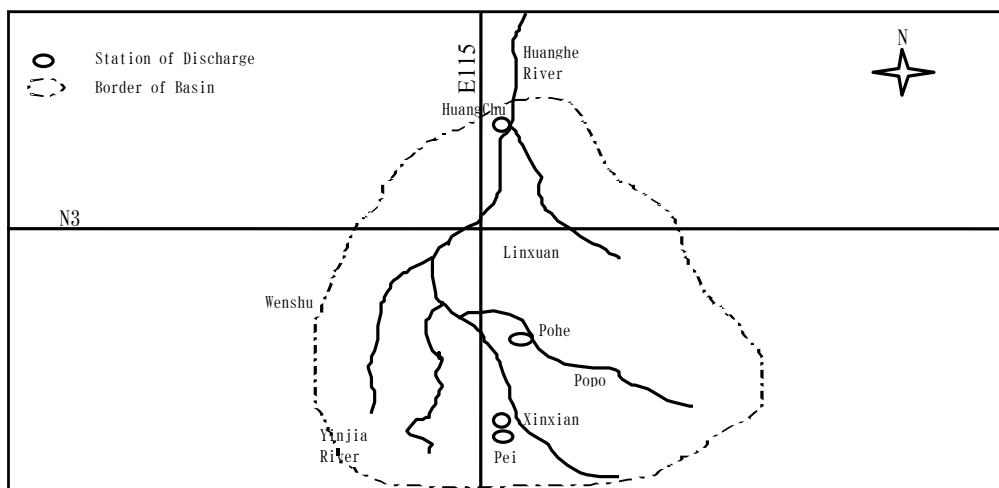
P: Precipitation T: temperature

### 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

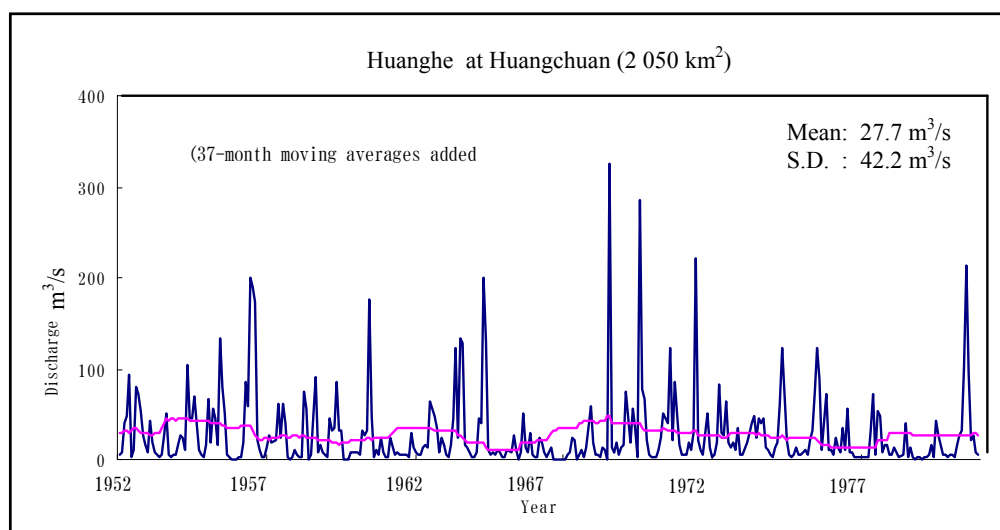
No.	Station	Location	Catchment Area [km <sup>2</sup> ]	Observation period	Observation items
1	Xinxian	114°52'~31°37'	274	1966~Present	H2,Q
2	Huangchuan	115°03'~32°08'	2 050	1951~Present	H2,Q
3	Peihe	114°51'~31°37'	17.9	1982~Present	Q
4	Pohe	114°35'~31°47'	221	1970~Present	H2,Q

No.	$\overline{Q}^1$ [m <sup>3</sup> /s]	$\overline{Qmax}^2$ [m <sup>3</sup> /s]	$\overline{Qmin}^3$ [m <sup>3</sup> /s]	$\overline{Q/A}$ [m <sup>3</sup> /s/100 km <sup>2</sup> ]	$\overline{Qmax/A}$ [m <sup>3</sup> /s/100 km <sup>2</sup> ]	Period of statistics
2	27.7	67.0	6.53	1.35	3.27	1951~1980

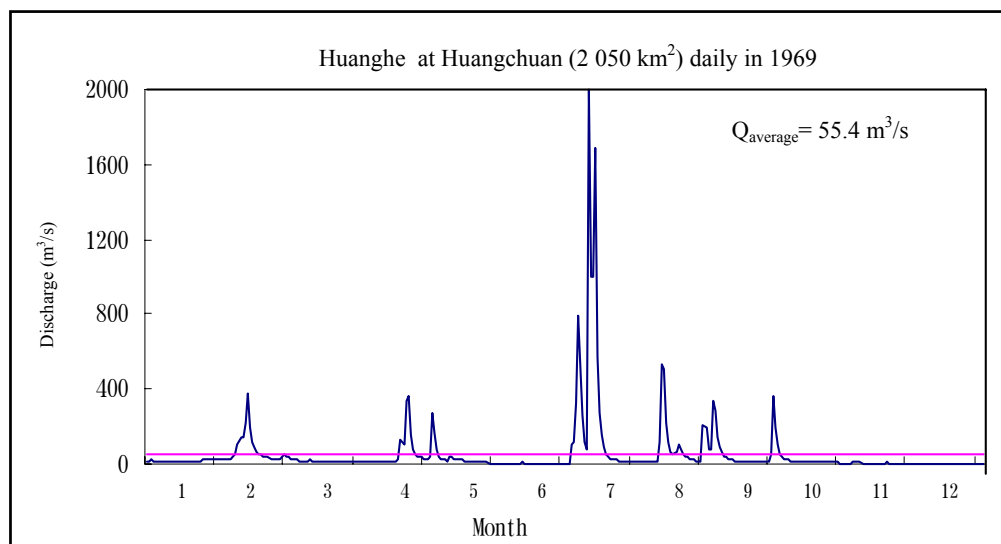
H2-water level, Q-discharge

1) Mean annual discharge 2) Mean annual maximum discharge 3) Mean annual minimum discharge

## 4.3. Long-term Variation of Monthly Discharge



#### 4.4. Annual Pattern of Discharge

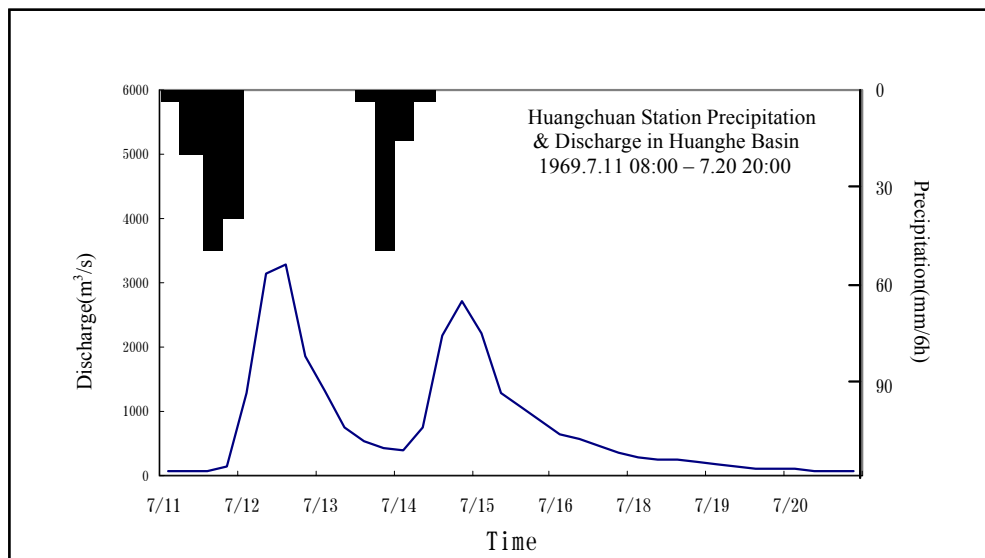


#### 4.5. Annual Maximum and Minimum Discharges

At Huangchuan (2 050 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]
1952	8.25	888	6.29	1.4	1967	11.28	524	6.11	0
1953	8.20	608	12.20	0	1968	7.16	3330	6.1	0
1954	7.28	1650	11.24	1.09	1969	7.12	3500	7.2	0.14
1955	6.26	1130	6.16	0.5	1970	7.20	1750	5.27	0.56
1956	6.29	1420	3.13	0.93	1971	6.11	2210	7.23	1.05
1957	7.31	740	10.18	0	1972	3.30	775	6.12	0.024
1958	8.16	1080	6.7	0	1973	4.17	364	6.9	0.025
1959	5.4	514	9.8	0.18	1974	5.19	1120	8.28	0.95
1960	6.26	1850	8.21	2.42	1975	7.6	932	6.19	0.5
1961	11.21	173	9.29	0.168	1976	7.15	1070	12.27	1.09
1962	7.10	695	3.31	1.32	1977	7.19	942	3.9	0
1963	7.12	1780	3.4	1.76	1978	6.27	304	4.28	0
1964	4.6	1200	7.19	0.034	1979	9.6	418	5.30	0
1965	8.5	625	7.5	0.009	1980	7.18	3140	5.10	0.24
1966	2.28	316	8.18	0					

#### 4.6. Hyetographs and Hydrographs of Major Floods



## 5. Water Resources

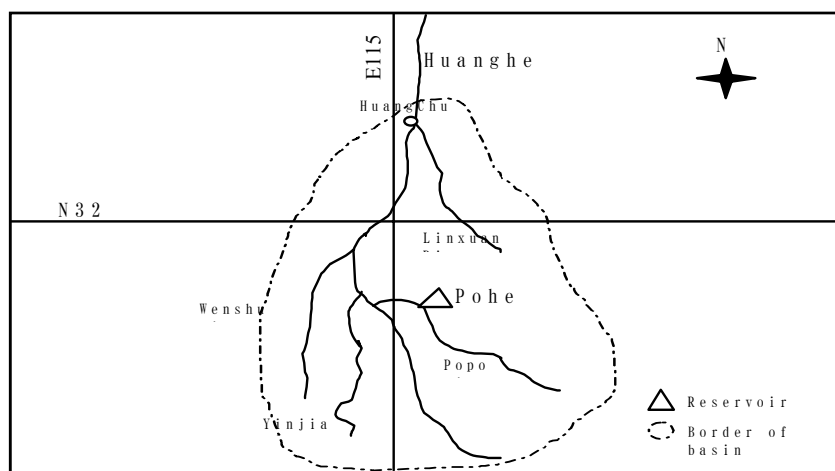
### 5.1. General Description

The Huanghe is a tributary of Huaihe in Henan Province. The river Originates from the south and flows towards the north, joins Huaihe at Xintai and out into the Huanghai. The slope of river bed is very steep with speedy flow in all the stream. There is one reservoir, primarily built for irrigation and flood control.

The precipitation distribution in the basin is closely related to the climate called “Meiyu”, which means “plum rain”. The dominant rainfall is from June to July, and it covers the entire basin. The groundwater distribution in the basin is highly related to rainfall and runoff. In 1969, there was one major flood in Huanghe, and at the Huangchuan station (2 050 km<sup>2</sup>) the peak flood discharge was 3 500 m<sup>3</sup>/s that occurred on July 12.



## 5.2. Map of Water Resources Systems



## 5.3. List of Major Water Resources Facilities

Major Reservoirs

Name of River	Name of dam (reservoir)	Catchment Area [km <sup>2</sup> ]	Gross capacity [10 <sup>6</sup> m <sup>3</sup> ]	Effective capacity [10 <sup>6</sup> m <sup>3</sup> ]	Purpose <sup>1</sup>	Year of completion
Popo	Pohe	222	258	124	A,F,P	1970

A: Agricultural use F: Flood control P: Hydro-power

## 5.4. Major Floods

Major Floods at Huangchuan (catchment area 2 050 km<sup>2</sup>)

Date	Peak discharge [m <sup>3</sup> /s]	Rainfall [mm] Duration	Meteorological cause	Major damages (Districts affected)
1968.7.16	3 330	553.1 7.11~7.20	Frontal	Huangchuan etc.
1969.7.12	3 500	184.6 7.11~7.20	Frontal	Huangchuan etc.
1980.7.18	3 140	143.4 7.7~7.20	Frontal	Huangchuan etc.

## 6. Socio-cultural Characteristics

The Dabieshan is a famous Chinese revolution base, located in the southern part of the Huanghe basin. Consequently, many historical monuments exist in Henan province, e.g. in Songshan and Foliushan, and also there were many famous historical temples. Parts of this area open to tourists. Henan is an important cultural province.

## **7. References, Databooks and Bibliography**

China Bookstore Press, (1992): China Historical Floods.

Huaihe River Commission, (1988): Hydrological Information Handbooks for Control Floods.