PowerPoint Series on Geography of China (4) – The Rivers of China

Personal, Social and Humanities Education Section
Curriculum Development Institute, Education Bureau
Notes to Teachers – The learning & teaching of the rivers of China and its linkages with the Geography curricula

1) Junior Secondary Geography: When teaching the module "The Trouble of Water — Too much and too Little" in the Geography Curriculum Guide (Secondary 1-3) (2011), teachers should also teach this PowerPoint, so that students can have a basic understanding of the rivers in China.
2) Senior Secondary Geography: When teaching the module – “Managing Rivers and Coastal Environments: A continuing challenge” in the *Geography Curriculum and Assessment Guide (Secondary 4-6) (2017)*, teachers should also teach this PowerPoint & the PowerPoint (5) (i.e. the case of Chang Jiang) in this series as an example. In this way, students can then have a deeper understanding on the general conditions of rivers in China and their related fluvial landform features (especially Chang Jiang).
CHARACTERISTICS OF RIVERS IN CHINA

• China is a country with many rivers and lakes.
• Two prominent features of the rivers in China are their large number and the long distances over which they flow.
• There are tens of thousands of rivers in China, with a total length of 420,000km, of which there are more than 20 rivers with more than 1,000km in length.
• There are more than 50,000 rivers with drainage area over 100km², more than 1,580 rivers with drainage area over 1,000 km², and 79 rivers with drainage area over 10,000km² in China.
• Among the longest rivers in the world, Chang Jiang (6,300 km) and Huang He (5,464 km) rank third and fifth, respectively.
• In addition, China's Lancang River and Heilongjiang River are also among the ten longest rivers in the world.
• The average annual total runoff of rivers in China is 2,711.5 billion m³, accounting for 5.8% of the global river runoff and is ranking sixth in the world.
• Although rivers in China are abundant in water volume, their water volume varies over the year with seasons and is prone to flooding in summer.
• In addition, the general trend of river runoff in China is decreasing from the southeast coast to the northwest inland.
According to factors such as precipitation and runoff, China can be divided into five regions (Figure 1):

1) **Abundant zone**: Annual precipitation of this zone is more than 1,600mm and annual runoff depth is greater than 900mm

2) **Relatively abundant zone**: Annual precipitation of this zone is about 800-1,600mm with annual runoff depth of about 200-900mm

3) **Intermediate zone**: Annual precipitation of this zone is about 400-800mm with annual runoff depth of about 50-200mm.
4) **Shortage zone**: Annual precipitation of this zone is about 200-400mm with annual runoff depth of about 10-50mm.

5) **Deficit zone**: Annual precipitation of this zone is less than 200mm with annual runoff depth of less than 10mm.

According to Figure 1, teachers may ask students to describe the distribution pattern of the five zones of China classified by factors such as precipitation and runoff.
Figure 1 Distribution map of precipitation and runoff in China
(Source: P.126 of the book “Learning the Geography of China through Reading (Part 1): The physical environment” published by the Education Bureau (Hong Kong) in 2013.)

*No data for Nan Hai Islands*
THE ENORHEIC ZONE AND EXORHEIC ZONE OF RIVERS IN CHINA

- Rivers where river water eventually flows into oceans are called **exorheic rivers** (coastal rivers), and their catchment areas are called **exorheic basins**.
- On the contrary, if rivers cannot flow into oceans eventually (or disappear in the desert, or flow into inland lakes), they are called **endorheic rivers** (inland rivers). They are mostly located in deserts and other areas where evaporation is strong, so the amount of river water is small, the number of rivers is few and their distance of flow is short. The catchment areas of these rivers are called **endorheic basins**.
• The exorheic zone and endorheic zone of rivers in China can be seen in Figure 2, and most of the rivers of China in the exorheic zone flow into the Pacific Ocean and Indian Ocean respectively.
Figure 2 The exorheic zone and endorheic zone of rivers in China
(Source: P.129 of the book “Learning the Geography of China through Reading (Part 1): The physical environment” published by the Education Bureau (Hong Kong) in 2013.)
THE DISTRIBUTION OF RIVERS IN CHINA

• The distribution of river systems in China is uneven. The vast majority of rivers are distributed in the exorheic basins in the southeast, and there are relatively few rivers in the inland drainage basins (Figure 3). The difference in climate between different regions is the main reason for this situation.

• The main water source of rivers in the exorheic zone of China is precipitation, and the amount of water is relatively abundant. From upstream to downstream of a river, many tributaries flow in which increase the water volume and the density of the river network.
According to Figure 3, teachers may invite students to indicate the names and locations of major rivers in China from south to north and east to west.

Glacial snowmelt water is the major source of water for rivers in the endorheic zone. In general, the water volume of these rivers is small, and their number of tributaries is also small. As a result, the water volume decreases continuously from the upstream to the downstream of the rivers in this zone. Drying up of the rivers may occur with change of seasons.
Figure 3 The river basins and drainage networks in China
(Source: P.129 of the book “Learning the Geography of China through Reading (Part 1): The physical environment” published by the Education Bureau (Hong Kong) in 2013.)
• In comparison, the rivers in South China and those in North China have the following significant differences:

1) Rivers in South China have more water.
2) River flows in North China fluctuate dramatically between high and low flow seasons, causing severe floods. On the contrary, seasonal variations in river flows in South China are small and floods there normally rise and fall slowly.
3) The sediment content of the rivers in North China is much higher than that of rivers in South China, e.g. the sediment content of Huang He is the highest in the world, with an annual mean sediment content of 37.7kg/m³.

4) Rivers in North China often freeze up in winter but this is not the case for rivers in South China.
• **Rivers in the Northeast China** are different from the rivers in the South and North China. Their water volume is higher than rivers of North China, but it is not as high as rivers in South China. In addition, both the rivers in Northeast and South China have less sands / sediment content.

• The humus content in the river water in Northeast China is generally very high, and the water color is darker. Therefore, names of rivers in Northeast China include "black dragon" and "duck green".

• Freezing can be found in both the rivers of Northeast and North China.
REFERENCE:

❖ ‘Chapter 4  Rivers & Lakes (CHEN Yongqin)’ in the educational package “Learning the Geography of China through Reading (Part 1): The physical environment” published by the Education Bureau (Hong Kong) in 2013.

Further reading:
After teaching this PowerPoint, teachers may encourage their students to read the above reference materials. Teachers and students can use their Hong Kong Education City (HKEdCity) accounts to download the e-book version of the above materials for free from the “Hong Kong Reading City" of the HKEdCity website.