Learning and Teaching Resource Package Related to the Geography of China

Topic 2 Changing Population

(Junior Secondary Worksheet)

Theme: Population Distribution

Pre-lesson task

In this lesson, we will study the major characteristics of population distribution in our country. Read the population density map and discuss the following questions.

Knowledge box 2.1

Population density refers to the measurement of the number of population in a given area, typically expressed as the number of population per unit of land area. It is a measure of how crowded or densely populated an area is. Population density is calculated by dividing the total population of a given area by its total land area. This index helps to understand the distribution of people within a specific geographic location.

The formula for population density is:

Population Density = Total Population / Total Land Area

The unit of population density is typically expressed as persons per square kilometer (or square mile, depending on the country). For example, the population density of Hong Kong was 6740 per square kilometer in 2022. It means on average, there were approximately 6740 individuals living in each square kilometer of land in Hong Kong. This indicates a high population density, suggesting that Hong Kong is a densely populated area with a large number of people residing in a relatively small land area.

(a) Refer to Figure 2.1, what are the spatial differences in population distribution in our country?

[Hint: The population is unevenly distributed, leading to significant spatial differences in population density. There are more population in the east and less population in the west.

Eastern coastal area of our country: These areas are the most densely populated. Cities like Shanghai, Beijing, and Tianjin are located there. This region is our country 's economic powerhouse, with bustling industries, trade, and services sectors. The fertile plains, such as the

North China Plain and the Yangtze River Delta, are also densely populated due to intensive agriculture.

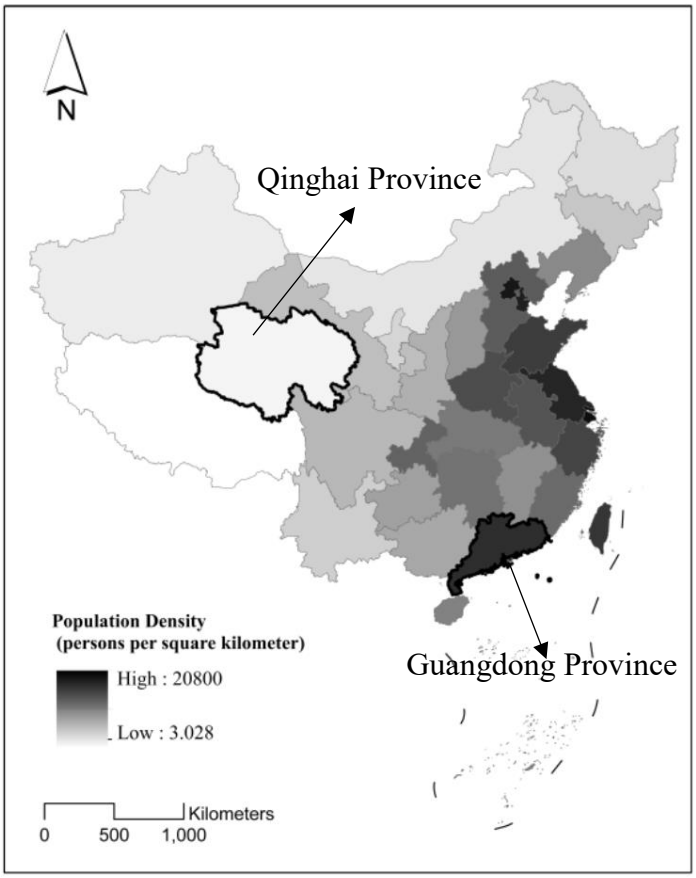
Central part of China: This region, which includes the provinces of Hubei and Hunan, also has significant population density. The Chang Jiang flows through this region, providing fertile soil for agriculture. The region is also home to several rapidly developing cities, like Wuhan and Changsha.

Western part of our country: The western region of our country, such as Xizang, Xinjiang, Qinghai and Gansu, is sparsely populated. The harsh physical conditions, such as the cold desert of the Taklamakan, the high-altitude Qinghai-Tibet Plateau, and the Gobi Desert, make it less suitable for large-scale human habitation. However, there are pockets of population around oases and river valleys.

Northeastern part of our country: This regions known for its heavy industries and vast farmlands. Cities like Shenyang, Harbin and Dalian are located here. It has a moderate population distribution. Because of the declining heavy industries, the population declined in Northeast China.

Southern part of our country: The southern region, which includes Guangdong, Fujian and Hainan, is densely populated along the coast and river valleys. This region is known for its manufacturing industries and export-oriented economy. The Zhujiang Delta, including cities like Guangzhou and Shenzhen, is one of the most densely populated urban areas in the world.]

Figure 2.1 Population density of our country in 2020



Source: China Statistical Yearbook, 2020

Note: The population density of Guangdong Province and Qinghai Provincie in 2020 was 708 people per square kilometer and 8.5 people per square kilometer, respectively.

In-class learning and teaching

Learning objectives:

- To describe the general pattern of population distribution in our country.
- To explain the physical factors affecting population distribution in our country.
- To understand the importance of the population-related issues and acknowledge them as major challenges that our country needs to address.

Lesson 1: Characteristics of population distribution in our country

Watch Topic 2 Changing Population Video (Junior). Read the following excerpt of an article published in the People's Daily in 2015 and discuss the following questions.

Other relevant videos:

"View China from Clear Water and Green Mountains" The Hu Huan Yong Line (「綠水青山看中國」胡煥庸線), 0:00-0:54	https://tv.cctv.com/2017/10/11/VIDEcy4zpbMkWVoEcLN0yyH9171011.shtml (Chinese version only)
Learning and Teaching Series on "Geography of China" (Junior Secondary): Population, 0:00-5:25	https://emm.edcity.hk/media/1_7z5ii0gl

Knowledge box 2.2

"During his visit to the human habitat science research exhibition at the National Museum of China on November 27, 2014, (former) Premier Li Keqiang referred to the Hu Huanyong Line on the map. He highlighted that 94 percent of our country 's population resides in the eastern 43 percent of the country's land*. However, he emphasised the need for urbanisation in the central and western regions as well. As a vast, multi-ethnic nation, we must investigate ways to challenge this trend. Moreover, we must pursue integrated planning and coordinated development, ensuring that the benefits of modernisation are accessible to people in the central and western regions of the country."

"On the map of China, a diagonal line runs at a 45-degree angle from the Heihe in Heilongjiang province to Tengchong in Yunnan Province. This line, proposed by geographer Hu Huanyong in 1935, serves as a demarcation line for our country's population density and is often referred to as the Hu Huanyong Line (or Hu Line). In the 1930s, the area southeast of this line was home to 96% of the population, despite only comprising 36% of the land*, while the northwest held just 4% of the population, yet accounted for 64% of the land. Remarkably, even after 80 years of urbanisation and numerous population shifts, this diagonal line's significance in terms of population distribution remains the same. Geographers from the Chinese Academy of Sciences discovered that, as per data from the fifth population census in 2000, the southeastern part of the line still housed 94.1 percent of the country's total population, while the northwestern part accounted for 5.9 percent."

*The percentage of land area is different because tht total land area is different in the 1930s and at present.

Excerpts from People's Daily, 8 January 2015, p.16, http://politics.people.com.cn/n/2015/0108/c1001-26352046.html

(a) What is the geographical location of the Hu Huanyong Line? Please roughly draw the Hu Huanyong Line on the provided map of China below (Figure 2.2).

Figure 2.2 Map of China for identifying the Hu Huanyong Line

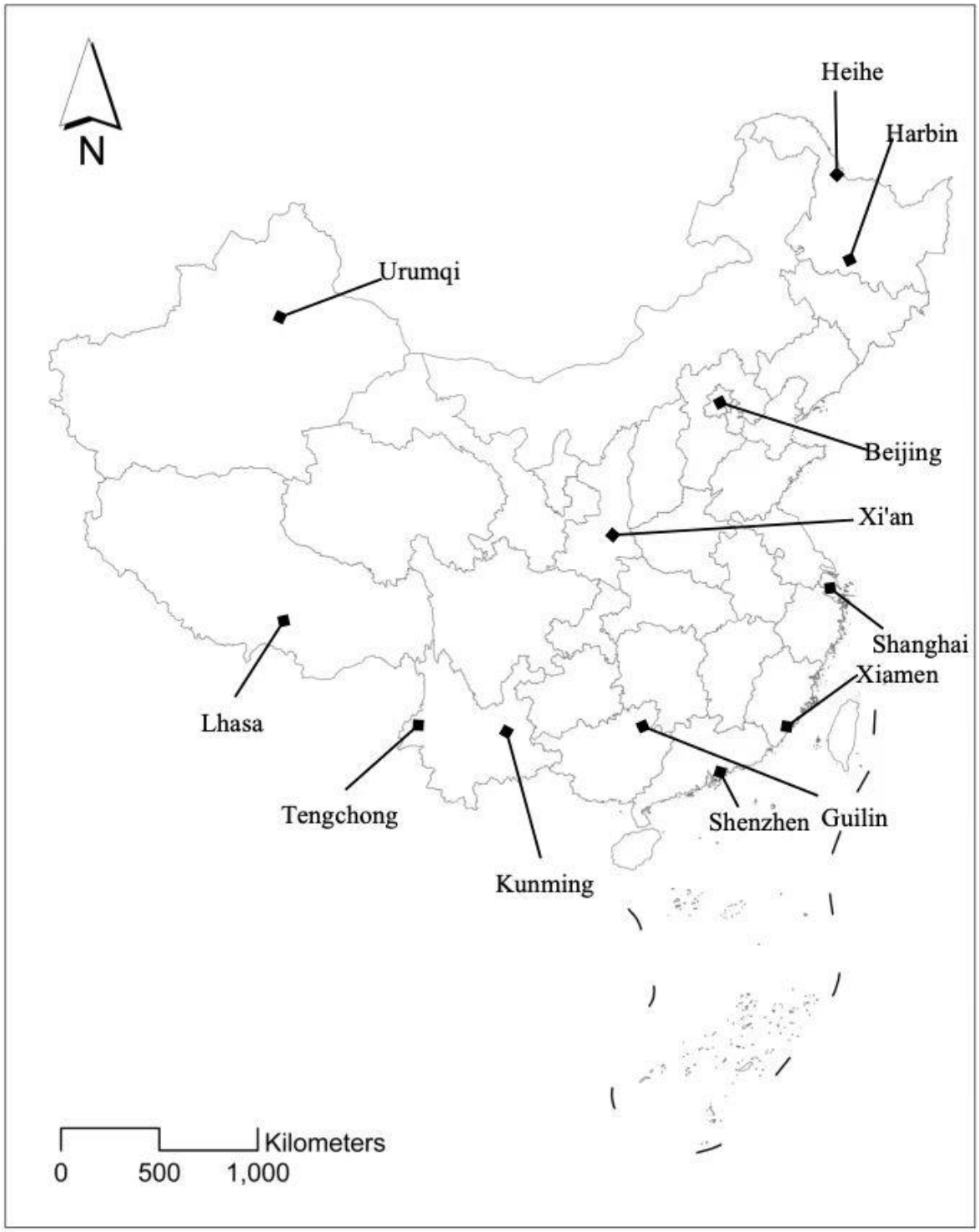
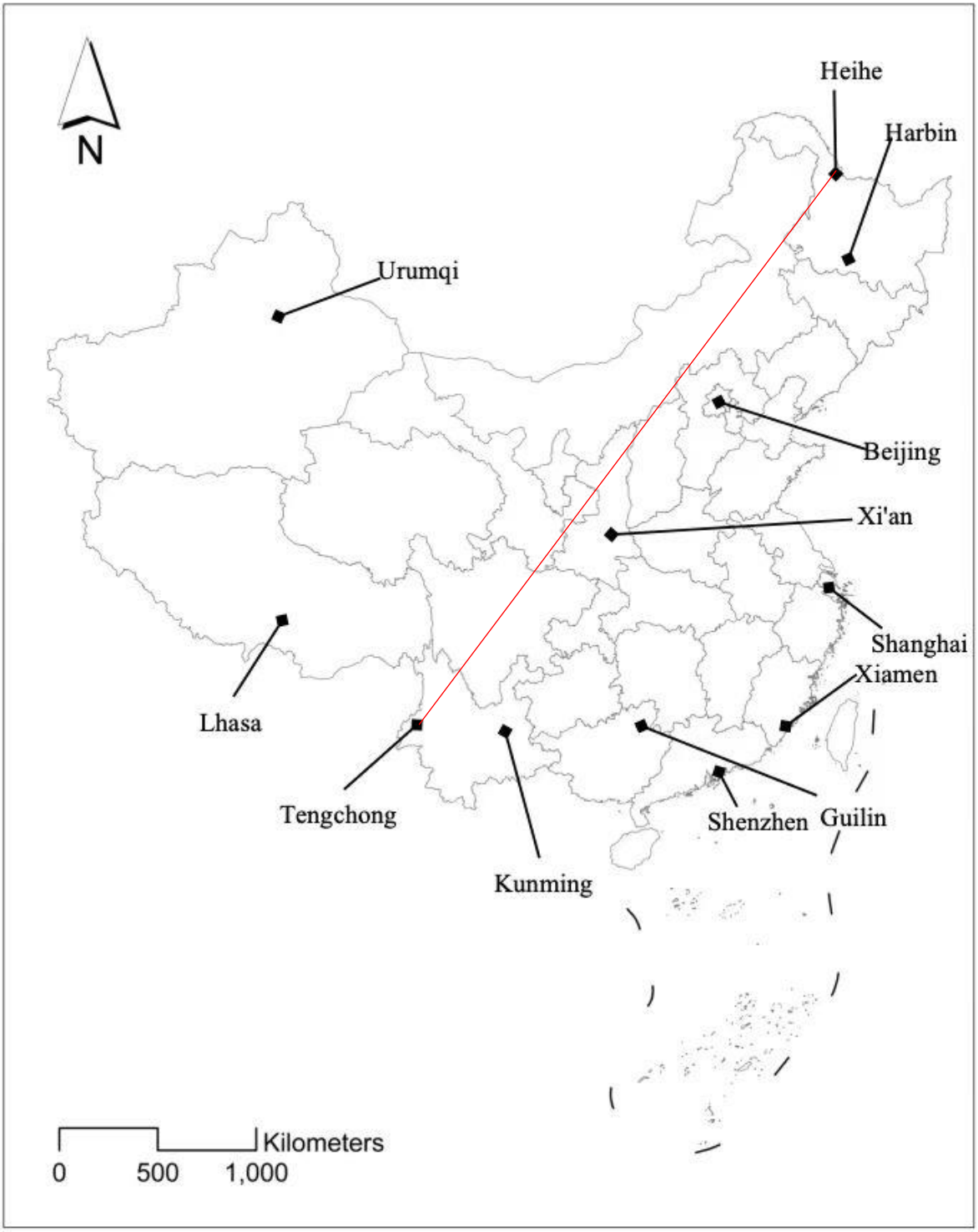


Figure 2.2 Map of China for identifying the Hu Huanyong Line

[Hint]



(b) Is the Hu Huanyong Line an official border that we can observe physically?

[Hint: No. The Hu Huanyong Line is an imaginary line that separates our country's western and eastern regions based on population density. The line divides our country into two regions based on population density: East and West. The line starts from the mouth of the Heihe in the northeast and extends southwestward to the eastern part of the Qinghai-Tibet Plateau.

The Hu Huanyong Line is arguably the most consequential feature of our country's geography, with demographic, economic, and cultural implications for the country's past, present, and future. However, it is not an official border and is not marked on any official maps of our country. Therefore, it cannot be observed physically.]

(c) How can the Hu Huanyong Line divide the population in our country?

[Hint: The Hu Huanyong Line is a geographical demarcation line in our country. It was first drawn by demographer Hu Huanyong in 1935 to illustrate the uneven distribution of our country's population. The area to the northwest of the line comprises more than half of our country's territory but only 6% of its population, while the area to the southeast of the line contains 94% of the population on just 43% of the land. This basic pattern of our country's population distribution is still used today and is of great practical significance.

To the southeast of the Hu Huanyong Line, the population density is generally higher, with more densely populated areas such as the North China Plain, Yangtze River Delta, and Zhujiang Delta. These regions are characterised by fertile land, favorable climate, and historically more developed economies.

To the northwest of the line, the population density is generally lower, with sparsely populated areas such as the Gobi Desert, Qinghai-Tibet Plateau, and Nei Mongol. These regions are characterised by harsher climates, rugged terrain, and a less developed economy.

The Hu Huanyong Line is often used as a reference to analyse the regional differences in population distribution and economic development within our country.]

Lesson 2: Physical factors affecting population distribution in our country

Guangdong Province and Qinghai Province are selected as example to understand how the physical factors affect population distribution in our country.

With reference to Figure 2.1 and Figure 2.3 & 2.4, circle the characteristics of the two provinces in Table 2.1 and discuss the following questions.

Table 2.1 Comparison between Guangdong and Qinghai Province

	A. Guangdong Province	**B. Qinghai Province**
Location in China	Eastern / Western	Eastern / Western
Population Density	High / Low	High / Low
Temperature	Warm / Cold	Warm / Cold
Precipitation	High / Low	High / Low
Relief	High / Low	High / Low

[Hint:]

	A. Guangdong Province	**B. Qinghai Province**
Location in China	Eastern	Western
Population Density	High	Low
Temperature	Warm	Cold
Precipitation	High	Low
Relief	Low	High

(a) What are the impacts of climate on population distribution in our country? Discuss it by using the given data of Guangdong and Qinghai Province in Figure 2.3 and 2.4.

[Hint:

(1) Temperature:

Guangdong Province: The average daily minimum temperature in Guangdong ranges from 10°C to 28°C, while the average daily maximum temperature ranges from 19°C to 34°C. The mild and warm temperatures of Guangdong support agricultural activities and make the region attractive for human habitation. The favorable climate contributes to a higher population density in cities like Guangzhou and Shenzhen.

Qinghai Province: Qinghai experiences colder temperatures compared to Guangdong. The average daily minimum temperature ranges from -16°C to 12°C, and the average daily maximum temperature ranges from 2°C to 21°C. The colder temperatures in Qinghai, particularly during winter, limit agricultural productivity and make living conditions more challenging. As a result, the population density in Qinghai is generally lower compared to Guangdong.

(2) Precipitation:

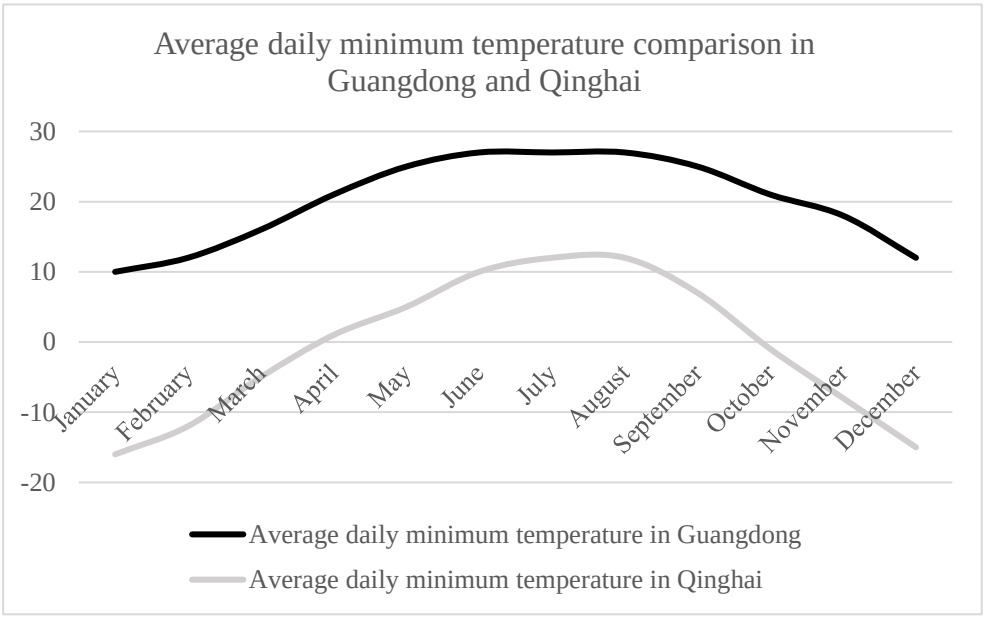
Guangdong Province: Guangdong receives abundant rainfall, with an average annual precipitation ranging from 1,500 to 2,500 mm / over 800 mm (Guangdong is categorised in the group of places with precipitaiton >800 mm as shown in Figure 2.4). The availability of water resources and favorable precipitation patterns in Guangdong support agricultural development and contribute to a higher population density.

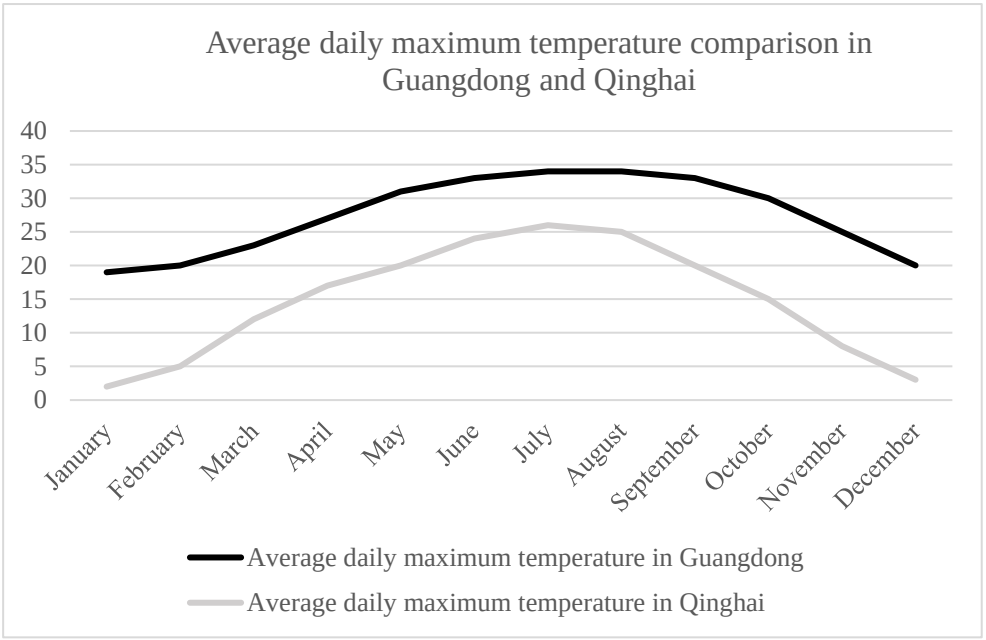
Qinghai Province: Qinghai has a drier climate compared to Guangdong, with average annual precipitation ranging from 200 to 500 mm (Qinghai spans across regions with precipitation levels ranging from 0-200mm, 200-400mm, and 400-800mm as shown in Figure 2.4) . Moreover, precipitation is unevenly distributed, and certain areas, such as the Qaidam Basin, experience extreme aridity. The drier climate and limited precipitation in Qinghai pose challenges for agriculture and limit the availability of water resources. This, along with the colder temperatures, affects agricultural productivity and human settlement, resulting in lower population densities.

(3) Conclusion:

The milder temperatures and abundant rainfall in Guangdong Province create a more favorable climate for agriculture and human habitation, leading to higher population densities. In contrast, the colder temperatures and drier conditions in Qinghai Province limit agricultural potential and water resources, resulting in lower population densities. Climate plays a significant role in shaping population distribution patterns by influencing agricultural productivity and the overall livability of an area.]

Figure 2.3 Comparison of daily average minimum and maximum temperatures in Guangdong Province and Qinghai Province

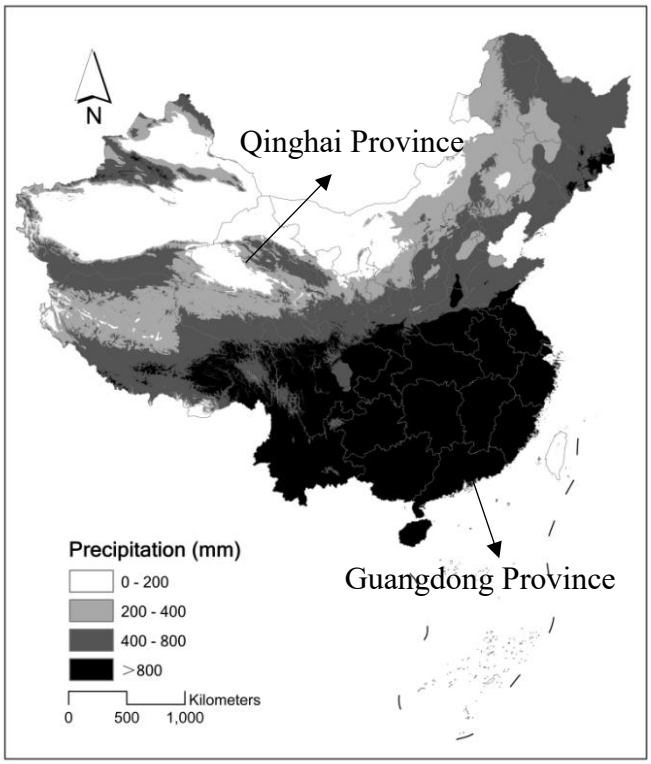




Source: China weather website

https://www.tianqi.com/qiwen/city_guangdong/; https://www.tianqi.com/qiwen/city_qinghai/

Figure 2.4 Average annual precipitation distribution map in our country in 2020



Source: Resource and Environment Science Data Platform, 2020

https://www.resdc.cn/data.aspx?DATAID=230

(b) What are the impacts of relief on population distribution in our country? Discuss it by using the given data of Guangdong and Qinghai Province in Figure 2.5.

[Hint:

(1) Guangdong Province

Guangdong Province has a relatively low-lying and flat terrain, with the Zhujiang Delta being the dominant feature. It consists of fertile plains, river systems, and a coastline with numerous bays and estuaries. The flat relief of Guangdong, coupled with its favorable climate and abundant water resources, has facilitated agricultural activities and economic development. It has attracted a significant population, leading to high population densities in cities like Guangzhou and Shenzhen.

(2) Qinghai Province:

Qinghai Province is characterised by diverse relief features, including high mountains, plateaus, and basins. It encompasses parts of the Qinghai-Tibet Plateau, Kunlun Mountains, Qilian Mountains and the Qaidam Basin. The rugged and varied relief of Qinghai poses challenges for human settlement and agricultural activities. Higher altitude areas, such as the Qinghai-Tibet Plateau, have extreme climates and limited agricultural potential, resulting in

lower population densities. The Qaidam Basin, although relatively flat, has arid conditions. As a result, the population density in Qinghai is generally lower compared to Guangdong.

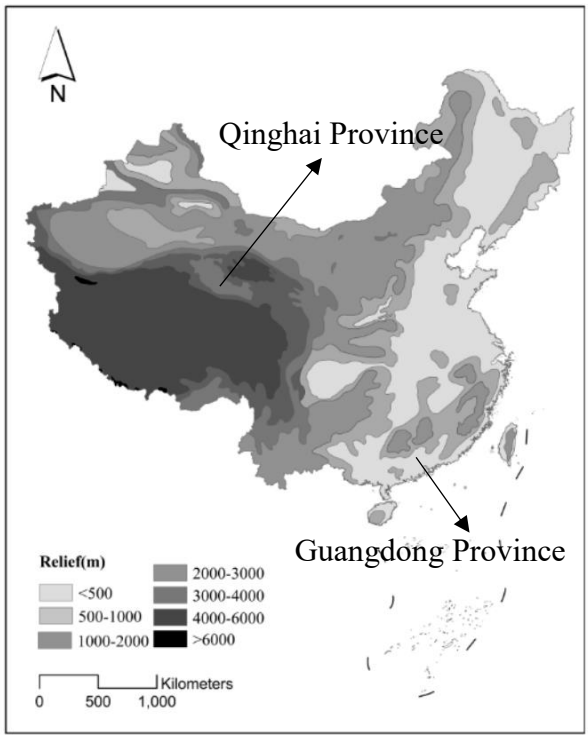
(3) Conclusion:

The relief in our country varies greatly from east to west. The eastern part of oure country is characterised by low-lying plains and river deltas, while the western region is dominated by highlands and plateaus. The eastern region includes the fertile plains of Huang He, Chang Jiang and Zhujiang, which are home to a significant portion of our country's population. These areas are densely populated and economically significant, as they provide fertile land for agriculture and are important centers for trade and transportation.

These plains gradually rise into hills and plateaus as you move westward. The western region includes the Qinghai-Tibet Plateau, often referred to as the "Roof of the World", and the Himalayan Mountain range, which includes Mount Everest, the highest peak in the world. These highlands and plateaus are sparsely populated due to their extreme climates and challenging terrain.

It's important to note that relief is just one of the factors influencing population distribution. Other factors, such as climate, economic opportunities, infrastructure, and government policies, also play significant roles in shaping population patterns in a region.]

Figure 2.5 The relief of our country



Source: Resource and Environment Science Data Platform, 2020

(https://www.resdc.cn/data.aspx?DATAID=124)

Post-lesson task

The year 2015 marked the 80th anniversary of the discovery of the Hu Huanyong Line. Scholars used the 2010 census data to verify the line's accuracy and found that the proportion of the population living west of the line was about 5.6%, which has remined relatively constant since the 1930s. This finding indicates that the Hu Huanyong Line has remained remarkably stable over time.

(a) The Hu Huanyong Line was proposed almost 90 years ago, and it remains unchanged to this day. Why does it remain unchanged?

[Hint: The Hu Huanyong Line, proposed almost 90 years ago, remains unchanged to this day. This stability can be attributed to a variety of factors, including physical factors and natural barriers, historical migration patterns and government policies on population distribution.

(1) Physical factors: The Hu Huanyong Line serves as an imaginary boundary dividing our country into two regions with contrasting population densities. It closely aligns with the boundary between the second and third steps of our country's relief, indicating that relief plays a significant role in determining the line's placement. Additionally, the line is situated near the 400 mm isoyhet, suggesting that climatic conditions also contribute to its stability.

Relief and climate directly influence the distribution of agriculture, which in turn affects population patterns. The southeast, where arable farming predominates, tends to have higher land productivity compared to the northwest, where pastoral farming dominates. This disparity in land productivity results in differences in population carrying capacity between these regions.

(2) Natural barriers: The Hu Huanyong Line closely aligns with the boundary between the second and third steps of our country's relief. The presence of the Himalayas and Qinghai-Tibet Plateau in the first step acts as physical barriers, making it difficult for population movements to cross from one side of the line to the other. This natural obstacle has contributed to the line's stability over time.

(3) Historical migration patterns: People tend to migrate within their own regions, leading to a continuation of population concentrations on either side of the line. This historical trend has further reinforced the line's stability.

(4) Government policies: The Chinese government has implemented measures to control and regulate population movements, particularly through initiatives aimed at promoting economic development in specific regions. These policies have reinforced the existing population patterns along the Hu Huanyong Line, ensuring its stability.]

(b) There are debates on the potential impacts of migration on population distribution in our country. Can migration alter the uneven population distribution in our country?

To promote the development of western China, various measures and policies can be adopted to encourage population migration from east to west.

Most of the western region is restricted by natural conditions and is not suitable for large-scale immigration. It is important to develop education to enhance the qualities of population.

[Hint: Yes/no.

(1) The positive impacts of migration on promoting balance in population distribution: This proactive approach of migration encouragement aims to address the existing population disparities and promote balanced population distribution across our country.

One effective measure is to establish attractive incentives for individuals and families to relocate to the western regions. These incentives can include financial assistance, tax benefits, employment opportunities, and improved access to education and healthcare. By offering tangible benefits, the government can encourage migration and alleviate the concerns individuals may have about moving to less developed areas.

Furthermore, infrastructure development plays a crucial role in facilitating population migration. Enhancing transportation networks, such as building new highways, railways, and airports, can improve connectivity between the eastern and western regions. This not only facilitates the movement of people but also promotes trade, investment, and overall economic development in the western areas.

Additionally, promoting the establishment of industries and job opportunities in the western regions can attract migrants seeking employment. By focusing on the development of key sectors such as manufacturing, technology, agriculture, and tourism, the government can create a conducive environment for economic growth and job creation. This, in turn, will incentivize population migration to the western regions.

It is important to note that successful population migration requires comprehensive planning and coordination between various government departments and stakeholders. Adequate provisions for housing, education, healthcare, and social services must be made to accommodate the influx of migrants and ensure their smooth integration into the local communities.

(2) Constraints of accommodate large-scale population migration in the West: The western region is characterised by mountainous and hilly terrain, which makes it difficult to establish

infrastructure and support a large population. Moreover, the western region often has limited access to essential resources such as water, arable land, and energy. It also experiences extreme weather conditions, including hot summers, cold winters, and limited rainfall. These terrain, water source and climate can pose challenges for agriculture, water availability, and overall livability, making it less suitable for accommodating a large influx of people. Furthermore, the western region is home to unique and fragile ecosystems, including grasslands, deserts, and mountain ranges. Large-scale population migration can put additional pressure on these ecosystems, leading to environmental degradation and loss of biodiversity.]