

CHINA KNOWLEDGE SERIES

AN OUTLINE OF CHINA'S PHYSICAL GEOGRAPHY

Compiled by REN MEI'E
YANG RENZHANG and BAO HAOSHENG



FOREIGN LANGUAGES PRESS · BEIJING

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Bao Haosheng was born in 1932 in Changshu City, Jiangsu Province. After graduating from the geography department of Nanjing University in 1956, he taught physical geography there. Under the guidance of Professor Ren Mei'e he surveyed the physical geography and regional geomorphology of Yunnan and Guizhou provinces. Many of his writings were published, and he was promoted to lecturer in 1964. In 1979 he was selected by the Ministry of Education, after a competitive examination, to study karstology under the famous geomorphologist Dr. J. N. Jennings of the Australian National University. He returned home at the end of 1981. In 1983 he was promoted to associate professor. Currently he is head of the natural resources teaching and research section of the geography department of Nanjing University, specializing in research on natural resources, regional physical geography and karstology.

PREFACE

The People's Republic of China is one of the largest countries in the world. It is also a country with the largest population. China's economic development and ever-increasing contacts between the Chinese and other peoples have made it a matter of importance to publish a scientific account of China's physical geography, one that will enhance foreign readers' understanding of China and promote academic exchange in the field of geography. Publication of this book was inspired by the founder of China's geographic studies, the late Professor Zhu Kezhen, former vice-president of the Chinese Academy of Sciences, who had mentioned this urgent need many times.

China's physical conditions are diverse. The years since the founding of New China in 1949 have seen a rapid development in geographical research and survey, and geographical and geological materials and data on Tibet, Qinghai, Xinjiang and Yunnan, where they were scarce or even nonexistent before Liberation, have been accumulated. In the course of our teaching and research over the past years we have left our footprints everywhere except Tibet and have made long-term surveys, particularly in Yunnan, Guizhou, Qaidam and Inner Mongolia. The present book was compiled from reports of our practical surveys and analysis of a great wealth of documents and materials. The views presented in the book, which are entirely our own, may not agree completely with those in other works, but we think our views are closer to objective reality. Comments and suggestions from readers are welcome.

This English edition was translated from the Chinese

PREFACE

edition published in August 1979. The original version was left basically intact, with only some necessary alterations of a few data as well as some additions and deletions. As a result of the swift development of China's economy and detailed geographical surveys since 1979 some material in the book needs to be revised or added.

Ren Mei'e
April 27, 1984
Nanjing University

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Part One **GENERAL DESCRIPTION**

Chapter I

INTRODUCTION

1. Area, Position and Territory

China is situated in the eastern and central part of Asia, on the west coast of the Pacific Ocean. The third largest country in the world, next to the Soviet Union and Canada, it has a territory of 9.6 million square kilometres — one-fifteenth of the land area of the world, or one-fourth that of Asia.

China's territory extends more than 5,500 kilometres from north to south. Starting from the central line of the Heilong River near Mohe in the north, it stretches to the Zengmu Reef on the southern fringe of the Nansha Islands in the South China Sea. Due to differences in latitude, the solar incident angle and subsequent lengths of day and night differ. The solar incident angle in Guangzhou in the south, for instance, has about 30 degrees difference from that in Mohe in the north. The shortest day on Hainan Island in the south is 11 hours and 2 minutes, and the longest is 13 hours and 14 minutes; while in places near Mohe these days are about 7 hours and 17 hours respectively.

From west to east, China's territory extends over 5,200 kilometres, starting from the Pamirs in the Xinjiang Uygur Autonomous Region and reaching the confluence of the Heilong and Wusuli rivers in Heilongjiang Province. The time difference from west to east is more than four hours, so that while it is about noontime along the Songhua River in northeast China, it is still early morning in the Pamirs.

China has a land frontier of over 20,000 kilometres. It borders Korea in the northeast; the Soviet Union and Mongolia in the north; Viet Nam in the south; and Afghanistan, Pakistan, India, Nepal, Bhutan, Burma and Laos in the west and southwest.

China's coastline extends from the mouth of the Yalu River in the north to the mouth of the Beilun River on the China-Viet Nam border in the south. This is a distance of more than 18,000 kilometres. Across the sea, China faces Japan, the Philippines, Malaysia, Brunei, etc.

Besides the Bohai Sea, an inland sea of China, the China mainland adjoins three sea areas which are, from north to south, the Yellow Sea, the East China Sea and the South China Sea. With the exception of the South China Sea, which has the features and depth of an ocean basin, the other seas are mostly shallow continental shelves, providing favourable conditions for the development of marine agriculture. The extensive continental shelves also contain rich oil deposits that are of great significance to China's national economy. East of Taiwan Island, there is a steep continental slope that stretches into the Pacific Ocean, to a depth of more than 4,000 metres.

China has more than 5,000 coastal islands, 85 per cent of which are scattered in the coastal waters south of the Hangzhou Bay and in the South China Sea. With an area of 36,000 square kilometres, Taiwan is China's biggest island. This is followed by Hainan Island, with an area of 32,200 square kilometres. The Diaoyu and other offshore islands in the northeast of Taiwan Province are China's easternmost islands while the Nansha Islands are its southernmost group.

A vast territory, considerable differences in latitude and longitude (more than 49 and 60 degrees, respectively) and its being in the eastern part of the Eurasian Continent, next to the Pacific Ocean — all these features contribute to China's unique physical geography.

2. General Characteristics of China's Physical Geography

The general characteristics of China's physical geography are as follows:

1) Owing to the differences in latitude from north to south, China's extensive territory straddles the frigid-temperate, temperate, warm-temperate, subtropical, tropical and equatorial zones. The warm-temperate and subtropical zones combine to account for the biggest percentage (over 30 per cent) of its total area while the tropical zone makes up about 8 per cent. From the coast in the east to the hinterland in the west, there is a gradual transition from humid and semi-humid regions to semi-arid and arid regions, with the humid regions composing about 30 per cent of the country's total land area. An adequate supply of heat and water, and the excellent relationship between these two in most parts of the country, provide favourable conditions for agricultural development. The types of vegetation and soils are distributed in relation to natural zones from north to south.

2) Situated in the eastern part of Eurasia, on the west coast of the Pacific Ocean, China has a climate which is strongly affected by monsoons, with marked changes of high and low pressures in winter and summer. The monsoons greatly affect the atmospheric movement in East Asia. And, unlike areas in the same latitudes in other countries, many of which have turned into deserts and arid steppes, China's subtropical regions are well-known agricultural areas, suitable for the growth of rice. This is because summer monsoon brings enough rainfall in the high-temperature season to form hot and humid weather. The alternating monsoons and their southward and northward movement have played an important role in the formation and evolution of China's natural landscape. The differences between the east and west areas of China, as well as the gradual changes in nat-

ural zones from north to south in the eastern regions, are to a large extent influenced by the monsoon.

3) China has an extremely complicated topography, with mountains and plateaus occupying a large part of its land surface. The Tibetan Plateau, containing a number of big mountain ranges and often called the "Roof of the World", towers in the west. It includes Mt. Qomolangma, located on the China-Nepal border. This rises 8,848 metres above sea level, and is the world's highest peak. Northwestern China is an arid region where high mountains alternate with huge basins that include the Turpan Depression, which is well below sea level, and the Taklimakan Desert, one of the biggest in the world. Eastern China has broad alluvial plains and many medium and low mountains and hills. The mountains in different horizontal natural zones have varying structures of vertical landscape zones, which add to the complexity and variety of China's natural conditions. The Tibetan Plateau, which stands 4,500 metres above sea level and accounts for almost a quarter of the country's land area, disrupts to a great extent the horizontal natural zone structure found in the rest of China. In studying China's physical geography and the agricultural patterns of its various regions, it is imperative to take into full account the topographical conditions.

4) The economic activities of the Chinese people through the ages, have brought about profound changes to the landscape. In the plains and hilly areas of eastern China, the natural forests were long ago destroyed or have been replaced, in some places, by tree farms and fruit trees. Only in mountainous areas can one find small patches of secondary forests. Vast plains have become cultivated land, and terraced fields have been opened in hilly areas for agriculture. On the vast desert basins of northwestern China, irrigation networks and oases have been built using river water fed by melting snow from the high mountains. Natural grasslands have been used to develop animal husbandry on the Inner Mongolia and Qinghai-Tibet plateaus, as well as in many

mountainous areas. In their thousands of years of productive activities, the Chinese labouring people have ceaselessly remoulded nature and accumulated a wealth of experience in its utilization and transformation. Since Liberation in 1949, large-scale afforestation, water and soil conservation, irrigation projects and other activities have changed the feature of the country. Nature is now increasingly at the service of the people.

Chapter II

LANDFORM

1. Basic Contours of China's Landform

Mountains and plateaus occupy a large part of the land of China. Areas exceeding 500 metres above sea level account for 84 per cent of its land surface while those below 500 metres make up only 16 per cent (Table 1).

Table 1. China's Territory in Terms of Elevation

Elevation (in metres)	<500	500-1,000	1,000-2,000	2,000-5,000	>5,000
Percentages in total area	16	19	28	18	19

China's landform has five basic types: mountains, plateaus, hills, basins and plains. The highest mountains, those exceeding 5,000 metres, are snow-covered all year round and contain glaciers. Most of the high mountains, i.e., those from 5,000 to 3,500 metres above sea level, have no permanent snow covers or glaciers, but are strongly affected by frost-cracking and retain the marks of former glacial landforms. Medium mountains, of 3,500 to 1,000 metres in elevation, generally have steep slopes and deep valleys. The low mountains are below 1,000 metres. In the warm humid climate of eastern China, chemical weathering has an obvious effect on such mountains and, with strong erosion by running water, the