

# Rivers, Dams, and Famine: An Environmental History of China

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## Introduction

China's environmental history is, in no small part, a history of rivers. From the loess-laden Yellow River to the expansive Yangtze and the dynamic waters of the Pearl River Delta, waterways have nourished populations, connected markets, and carried the ambitions of states. They have also flooded fields, shifted course without warning, and exposed the limits of human foresight. This book explores how societies have struggled with—yet also depended upon—rivers, tracing the interplay among climate variability, ecological change, and political power from agrarian beginnings to the era of modern mega-projects.

The story begins with climate and terrain. Monsoons and mountains shaped where people could farm, how they moved grain and goods, and which hazards most threatened their survival. Hydraulic interventions—from earthen dikes and polders to canals stitching together distant basins—were never merely technical fixes; they embedded social contracts that bound communities to states through labor, taxation, and accountability for success or failure. When rains failed or came all at once, the consequences rippled through these networks, revealing how vulnerability and resilience were distributed across classes, regions, and regimes.

Across the centuries, environmental change was inseparable from policy. Deforestation to fuel kilns and expand fields increased erosion; sediment-choked channels demanded ever-higher levees; and each “solution” reconfigured risks downstream. Moments of crisis, including devastating famines, were often amplifiers of existing inequalities as much as they were products of meteorology. Yet the same episodes also generated innovations—improved irrigation, new crop regimes, flood-diversion strategies, and institutional reforms—that reshaped the political ecology of entire river basins.

Modern engineering reframed these dynamics on unprecedented scales. Twentieth- and twenty-first-century projects such as Sanmenxia, the Three Gorges Dam, and the South-North Water Transfer promised energy security, flood control, and water for thirsty cities and industries. They also entailed trade-offs: displaced communities, altered sediment and nutrient flows, habitat loss, and the emergence of “hungry water” that scours riverbeds and coasts. In these chapters we examine not only the technical performance of such works but also how they reorganize authority, responsibility, and the meanings of citizenship and consent in the management of common resources.

This book argues that environmental history is most illuminating when it treats rivers as actors in a system of feedbacks linking climate, land, infrastructure, and governance. Rather than seeing disasters as aberrations, we read them as tests of social and institutional design. Rather than celebrating or condemning engineering in the abstract, we assess how particular choices redistribute benefits and burdens—across regions, between city and countryside, and among present and future generations. By placing archives, hydrological data, and local experience into

conversation, we seek a balanced account that neither reduces politics to climate nor imagines technology as destiny.

Finally, the chapters that follow connect China's water past to global concerns about sustainability, disaster history, and resource governance. River management is inseparable from questions of energy transition, food security, biodiversity, and climate adaptation. The legacies of dikes and dams shape coastal fisheries and deltas; forest and soil policies echo in far-off estuaries; and the politics of risk and compensation influence public trust. Understanding how earlier societies navigated scarcity and abundance, centralized ambition and local knowledge, may offer practical insight for a future in which the only constant is change.

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## **Chapter One: Landscapes and Monsoons: China's Hydrological Foundations**

China, a nation of staggering scale and diversity, finds its destiny inextricably linked to water. From the towering peaks of the Himalayas to the fertile eastern plains and the expansive southern coastlines, water in its various forms—rain, rivers, lakes, and glaciers—has sculpted the land and profoundly shaped human civilization. The physical characteristics of this vast land, particularly its dramatic elevation changes and the rhythmic pulse of its monsoon climate, lay the fundamental hydrological groundwork for understanding China's environmental history.

At the heart of China's hydrological story lies the Tibetan Plateau, often referred to as the "Roof of the World." This immense, elevated region, with an average elevation exceeding 4,500 meters, is the source of many of Asia's great rivers, including the Yangtze and the Yellow River. The plateau's vast expanse of permafrost and glaciers acts as a colossal water tower, feeding these vital waterways. Freeze-thaw cycles within this permafrost significantly influence soil moisture, water storage, evaporation, and overall water movement, making the plateau a critical, yet highly sensitive, component of China's water system.

The land descends from these western heights in a series of steps, creating a diverse topography that includes high plateaus, rolling plains, deep river valleys, and broad basins. This dramatic elevation gradient dictates the flow and character of China's rivers, channeling most of them eastward towards the Pacific Ocean. The fertile lowlands and coastal areas of eastern and southern China are where the majority of the country's agriculture and population are concentrated, a direct consequence of the water resources these regions offer.

The Yellow River, known as Huang He, is the second-longest river in China and the sixth-longest river system globally, stretching approximately 5,464 kilometers. Originating in the Bayan Har Mountains on the Tibetan Plateau, it flows generally eastward through nine provinces before emptying into the Bohai Sea. The river gets its characteristic yellow hue and name from the immense amount of silt it carries, particularly from the Loess Plateau. This sediment load, sometimes reaching 3.91 billion tons annually, makes the Yellow River one of the muddiest rivers in the world.

The Yangtze River, or Chang Jiang, is China's longest river and the third-longest in the world, traversing approximately 6,300 kilometers. Its journey begins in the Tanggula Mountains of the Tibetan Plateau and flows eastward, eventually reaching the East China Sea near Shanghai. The Yangtze basin is immense, draining an area of about 1.8 million square kilometers. This vast waterway is not only a crucial source of fresh water but also supports a rich biodiversity, flowing through diverse ecosystems including dense forests, deep valleys, and expansive wetlands.

Another significant waterway in southern China is the Pearl River, though when speaking of "Pearl River" in the context of China, one refers to the Zhujiang, a complex river system that includes the Xi River, Bei River, and Dong River. This system flows into the South China Sea, forming the Pearl River Delta, a highly fertile and densely populated region. While search results mention the Pearl River in the United States, in this context, the focus remains firmly on China's hydrological features.

The distinct regional climates across China are largely governed by the Asian monsoon, a massive seasonal wind reversal. During the summer months, from April to September, warm and humid air masses are drawn in from the Pacific Ocean, resulting in widespread high temperatures and abundant rainfall across much of the country, particularly in the east and south. This summer monsoon is responsible for the majority of China's annual precipitation and is crucial for agriculture. However, it can also bring destructive typhoons and torrential rains to southeastern coastal regions, often leading to severe flooding.

Conversely, from September to April, dry and cold winter monsoons descend from Siberia and the Mongolian Plateau, ushering in cold and dry winters. This seasonal shift creates significant temperature differences between northern and southern China. While eastern China benefits from ample summer rains, the northern and western regions are much drier, often characterized by deserts and semi-deserts. The climate zones range from tropical and subtropical in the far south to subarctic in the far north and alpine in the higher elevations of the Tibetan Plateau, highlighting the immense climatic variation within the country.

These fundamental hydrological foundations—the major river systems fed by the Tibetan Plateau and the overarching influence of the monsoon—have, since ancient times, dictated the patterns of human settlement, the development of agricultural

practices, and the very rhythms of life in China. The interplay between these natural forces and human responses forms the enduring narrative of China's environmental history, a story of adaptation, ingenuity, and sometimes, profound struggle.

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