



THE BATTLES OF YESTERDAY WERE  
FOUGHT OVER LAND. THOSE OF TODAY  
ARE OVER ENERGY. BUT THE BATTLES  
OF TOMORROW MAY BE OVER WATER.  
NOWHERE IS THAT DANGER GREATER  
THAN IN WATER-DISTRESSED ASIA.

Water stress is set to become Asia's defining crisis of the twenty-first century, creating obstacles to continued rapid economic growth, stoking interstate tensions over shared resources, exacerbating long-time territorial disputes, and imposing further hardships on the poor. Asia is home to many of the world's great rivers and lakes, but its huge population and exploding economic and agricultural demand for water make it the most water-scarce continent on a per capita basis. Many of Asia's water sources cross national boundaries, and as less and less water is available, international tensions will rise. The potential for conflict is further underscored by China's unrivaled global status as the source of transboundary river flows to the largest number of countries, ranging from India and Vietnam to Russia and Kazakhstan; yet a fast-rising China has declined to enter into water-sharing or cooperative treaties with these states, even as it taps the resources of international rivers.

(CONTINUED ON BACK FLAP)

Water



# WATER

ASIA'S NEW BATTLEGROUND

Brahma Chellaney



PUSTAKA PERDANA



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# Introduction

## *Water Tensions in Boom Times*

**A**sia faces a daunting water crisis that threatens its economic and political rise and environmental sustainability. Water has emerged as a source of increasing competition and underlying discord between many Asian states

striving for greater economic growth. Asia has been booming largely because it enjoys peace and stability. But the recrudescence of Cold War-era territorial disputes—with the renewed revanchism tied to resource interests—has underscored the looming dangers. Various developments are indeed highlighting the linkage between water and peace. Water scarcity is set to become Asia's defining crisis by midcentury, creating obstacles in its path of continued rapid economic growth and stoking new interstate tensions over shared basin resources. Water, of course, is not the only resource that Asia's rapid economic rise has brought under growing pressure. But it is the most critical one, for which there is no substitute.

Asia already is at the center of the global water challenges. Although home to three-fifths of the human population, Asia, the world's fastest-developing continent, has less freshwater per capita than any other continent. To make matters worse, Asia's water efficiency and productivity levels are among the lowest in the world. Yet the uneven availability of water within several Asian nations has given rise to grand but environmentally questionable ideas—from China's Great Western Route to divert river waters from the Tibetan Plateau to its parched north and South Korea's politically divisive four-rivers project, to India's now-stalled proposal to link up its important rivers and Jordan's plan to save the dying Dead Sea by bringing water from the Red Sea through a 178-kilometer-long canal, which is also to serve as a source for desalinated drinking water.

This book, by innovatively looking at water and security issues across Asia, seeks to fill a void in the literature: There are many good studies of subregional water issues in Asia (including in Southeast Asia, China, Central Asia, South Asia, and the Middle East), but none specifically focus on the larger Asian water picture in the context of peace and security. This is the first wide-ranging study of water and peace that examines Asia in its totality and employs this broader framework to thematically focus on critical issues and countries. The book highlights the long-term security

## 2 — Introduction

implications of the new tensions over the resources of transnational aquifers like al-Disi and international rivers such as the Amu Darya, Syr Darya, Brahmaputra, Mekong, Salween, Indus, Jordan, Tigris-Euphrates, Irtysh-Illy, and Amur. It also brings out the unique triple role of Tibet as Asia's water repository, water supplier, and rainmaker, thereby underscoring the centrality of the Tibetan Plateau on the Asian water map. It offers concrete policy suggestions on how the intensifying competition and discord on transnational water resources in Asia can be prevented from flaring into open confrontation and war. In this sense, it is a pioneering study of Asia's murky water politics and the attendant security challenges.

As an interdisciplinary study written for scholars, policymakers, serving officers, upper-level students, and the educated general public, this book blends materials from geopolitics, sustainable science, hydrology, environmental studies, geology, international law, and international relations to present a holistic picture of the security implications of the growing water stress in Asia, the world's largest and most densely populated continent. By signifying the interconnectedness of the various fields dealing with resource issues, it aims to be useful across a wide range of disciplines in the social sciences, humanities, and natural sciences. In addition to being the first comprehensive study of the larger geostrategic dimensions of Asian water issues, the book seeks to bring out the lessons that other continents can draw from Asia's experiences so as to avert similar resource, environmental, and security challenges.

At a time when water is becoming increasingly tied to security across much of the world, the linkage between water and peace is particularly striking in Asia, where the per capita availability of freshwater is less than half the world average. A number of important Asian economies, especially the fastest growing, are already water stressed. These realities, along with strained inter-riparian relations and the absence of an Asian security architecture, call attention to the risks of water conflicts. Managing interstate and even intrastate water disputes in Asia is likely to become increasingly challenging.

Several disputed or occupied territories at the heart of geopolitical tensions in Asia—ranging from Kashmir and Tibet to the Golan Heights and the West Bank—are strategically valued because of their water wealth and advantageous location. China's newly assertive territorial claim to Arunachal Pradesh (or "Southern Tibet," as it has been called since 2006) has been made with an eye on that remote Indian state's rich water resources. Some other Asian regions that are roiled by separatist unrest—Kyrgyzstan's southern Uzbek-influenced Fergana Valley and Turkey's Kurdish southeast, for example—are also water rich and strategically located.

A number of rivers, including several of Asia's biggest, flow from Chinese-held territory to neighboring countries, where they serve as lifelines. China, in fact, has the distinction of being the source of cross-border river flows to the largest number of countries, ranging from Russia and Kazakhstan to India and Vietnam. No other country in the world matches China's position as a multidirectional, transboundary water provider. But, significantly, the important international rivers in China all

originate in ethnic-minority homelands, some of which are racked by separatist movements. The traditional homelands of ethnic minorities, extending from the Tibetan Plateau and Xinjiang to Inner Mongolia and Manchuria, actually span three-fifths of the landmass of the People's Republic of China, although minority communities make up only 9 percent of its total population. Given that the focus of China's dam building and other water diversions is moving from internal rivers to international rivers, megaprojects now are increasingly concentrated in the resource-rich minority homelands, which is triggering new tensions along ethnic fault lines over displacement and submergence issues and is fueling deeper resentment in these poorer regions.

More broadly, as Yemen and Afghanistan illustrate, the battle lines of internal wars tend to follow the lines of watercourses. Intrastate water disputes are endemic in much of Asia, and this book analyzes those situations where domestic discord is grave. The study reveals that, whereas intracountry water conflicts are serious and exact significant costs, the intercountry disputes and geopolitical competition over transboundary basin resources actually pose a greater threat to peace and stability in a continent already troubled by festering territorial and resource disputes.

In Asia, it has usually taken years of efforts to establish water institutions or mechanisms, including the Permanent Indus Commission, the Mekong River Commission, and the Israeli-Palestinian Joint Water Committee for the West Bank. Because water has proven to be a deeply contentious and divisive issue, the tendency is often to defer or delay finding ways to resolve water disputes. The 1996 Ganges Water Treaty, arising from the dispute over the building of India's downstream Farakka Barrage, took nearly as long to emerge as its stated duration—three decades—though it is renewable by joint Bangladeshi and Indian consent. In the Israeli-Palestinian context, the water issue indeed has been put off to the “final status” negotiations, along with other knotty problems like Jerusalem's future, Israeli settlements, and the right of Palestinian refugees to return. And in the Jordan-Israel case, water was taken up so belatedly in the shaping of a peace deal, as the two sides dragged out the negotiations, that the eventual accord on water arrangements was spelled out in Annex II of the 1994 Peace Treaty.

Water increasingly is becoming a precious commodity whose control is at the core of several raging conflicts in Asia. Asia's water woes have been exacerbated by rapidly expanding economies, surging populations, rising per capita consumption levels, and continuing rural-to-urban migration. The water crisis now haunting the continent is the bitter fruit of unsustainable practices and a gross mismanagement of basin resources. And it has been accentuated by the rapid spread of irrigated farming and high water-consuming industries and by a growing middle class that not only uses water-guzzling comforts such as washing machines and dishwashers but is also eating more meat, which is notoriously water-intensive to produce.

The threats to Asia's sustainable water supply are intensifying even as demand for water is soaring. Yet Asia continues to live beyond its means—overexploiting

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resources while hoping to postpone the day of reckoning. The geostrategic factors that have raised the specter of water wars are being reinforced by the growing water stress arising from the human-induced degradation of watersheds, water-courses, coastal ecosystems, and the broader environment, which is reflected in shrinking forests and wetlands and increasing water pollution. Such developments undermine hydrological and climatic stability and foster a cycle of chronic flooding and droughts.

Indeed, Asia awaits a future made hotter and drier by climate and human-made environmental change. Its unslakable thirst for water now faces the likelihood that an already-limited supply will decrease sharply if climate change projections prove right. Asia is expected to bear the greatest water-related effects of global warming. The Himalayan snowmelt and glacier melt that feed Asia's great rivers are likely to be treacherously accelerated by global warming. And given Asia's vast, densely populated coastal areas, it is expected to become more vulnerable to water-related disasters, whose frequency could increase due to the climate-change-driven rise of ocean levels and surface temperatures. Seawater intrusion, accelerated by recklessly excessive groundwater extraction, is already affecting the availability of freshwater supplies in some coastal cities. The upstream construction of multiple giant dams and other water diversions, for their part, are causing a retreat of Asia's eleven heavily populated megadeltas that are fed and formed by rivers originating on the Tibetan Plateau. These megadeltas—home to megacities like Bangkok, Calcutta, Dhaka, Guangzhou, Karachi, Shanghai, and Tianjin—are, in several cases, also Asia's economic boom zones.

Asia is a huge continent, with a number of different regions and subregions. Although this book covers virtually the whole of Asia, it focuses its in-depth discussions on the most-populous regions, which are the scene of sharpening hydropolitics. These are also the regions where the geopolitical risks of greater conflict are especially serious, with a bearing on the larger Asian and international security and the world economy. This study details the struggle for water in eastern, southern, and southeastern Asia. China and India, for example, are home to 37 percent of the world's population but have to make do with 10.8 percent of its water. These two giants have experienced steep declines in per capita water availability since 1980, although the water situation in India is far more ominous. Actually, the entire contiguous belt from India to Israel—a region that includes Pakistan, Uzbekistan, Iran, Iraq, Syria, Jordan, and Saudi Arabia—has the dubious distinction of being racked by both serious water distress and pressing security challenges.

The book unfolds with Asia's big picture in chapter 1, which examines the continent's unique water challenges in the context of geostrategic trends and power shifts. Those shifts have made Asia the axle of global geopolitical change, with Asian policies and challenges shaping the international security and economic environment. Yet Asia has also morphed into the most likely flashpoint for water wars, a concern underscored by efforts of some countries to exploit their riparian position or dominance.

In chapter 2 the book turns to the securitization of water at a time when Asia is beginning to confront serious constraints on natural resources. The chapter analyzes specific cases—from Singapore’s efforts to reduce its dependency on water imports from Malaysia to the grating hydropolitics involving the five former Soviet republics of Central Asia—but its longest sections deal with the manner in which harmful legacies have shaped the water and environmental crises in China and India. With rising grain prices haunting the world, it also discusses the implications of water shortages on Asia’s ability to feed itself.

Chapter 3 bares the unique role that the Tibetan Plateau plays in Asia’s hydrological and weather cycles, including in supplying river waters, bringing on the annual Asian monsoons, and aiding climatic stability. It then examines the effects of human-made environmental change (through deforestation, the elimination of grasslands, the introduction of Western-style agriculture, and giant hydroengineering projects) and demographic transformation (brought about by a state-sponsored “Go West” Han migration campaign) on this special biogeographic region, which has the world’s largest concentration of tall mountains and greatest diversity of ecological zones, extending from arctic to subtropical. Given that China has gerrymandered Tibet by hiving off large parts of it, the terms “Tibet” and “Tibetan” in the book have been used in a broad ethnographic sense to refer to the entire Tibetan Plateau and to the resources and people native to this land. The chapter details the Great South-North Water Transfer Project, the world’s biggest hydraulic initiative, and the plans for megaprojects on international rivers originating on the plateau.

Chapter 4 offers an exhaustive case study of the international political and environmental implications of the Chinese plans to divert the Brahmaputra River’s waters, including by building the world’s biggest dam next to a disputed, heavily militarized border with India. The greatest burden of such a diversion would actually fall on impoverished Bangladesh, which is located farthest downstream. Several factors have whetted China’s drive to increasingly tap the resources of the Brahmaputra and other large, fast-flowing international rivers like the Mekong and the Salween, including an officially drawn link between water and national security, the dominance of engineers in the top echelons of power, the rise of water nationalism at a time of increasing water stress, a calculated hydroengineering policy focus on minority homelands because dam building has reached virtual saturation levels in the Han heartland, newly laid infrastructure facilitating greater dam building in the ethnic regions, the country’s emergence as the world’s largest builder of dams and dominant exporter of hydropower equipment, and the state-run hydropower industry’s growing clout.

The next two chapters examine the broader Asian challenges to forestall or manage water conflicts. Whereas chapter 5 deals with intrastate water discord, chapter 6 focuses on inter country issues, including the links between territorial and resource disputes. The analysis of intrastate conflicts highlights how ambitious supply-side approaches, although intended to mitigate spatial imbalances in

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resource distribution within countries, can instigate new water disputes between provinces or communities by launching major dam and other diversion projects.

With the help of case studies focused on four very different countries—each with its peculiar internal challenges—the intracountry analysis seeks to subtly underline the imperative to move from purely supply-side approaches to demand-side options that emphasize water conservation and quality as much as quantity. Even on the supply side, it has become necessary to embrace nontraditional measures, from recycling of water to rainwater capture. The examination of intercountry disputes—while highlighting the disputes between China and its neighbors, Israel and its neighbors, and India and its neighbors—underscores the need to invest in institutionalized basinwide cooperation on shared resources to help underpin Asian peace and stability.

The concluding chapter 7 sums up the major test Asia confronts with respect to freshwater—a test whose outcome will shape not only Asia's water future but also its economic and political future. Institutionalized cooperation among basin states needs to be anchored in a careful balance between rights and responsibilities. Appendix A gives a tabular rundown on interstate freshwater agreements in Asia since the start of the decolonization process, and appendix B gives Web links to key Asian water treaties. In a continent where several major territorial disputes rage, the depiction of political boundaries remains a touchy matter. The text and maps in the book reflect boundaries in actual control, and national claims thus are mentioned where necessary.

This book lays out in detail the policy implications of the growing water stress and competition in Asia. Asia's likely emergence as a major food importer, for example, will deepen the international food crisis and squeeze low-income countries, such as those in Africa. Also, given that Asia has the fastest-growing economies and the fastest-rising demand for food, its water shortages will only worsen without major efficiency gains in use. Yet before water efficiency and productivity standards can be raised significantly, the internal challenges in many countries are likely to be exacerbated.

Intrastate water conflicts thus far have proven more damaging and violent than intercountry water disputes in Asia. But as the book brings out, the dangers of greater water conflict between nations are growing. China, with its hold over Asia's greatest transnational water resources, has made the control and manipulation of natural river flows a fulcrum of its power and economic progress, spurring intensifying concern among downstream nations. While China promotes multilateralism on the world stage, it has given the cold shoulder to multilateral cooperation among basin nations—as symbolized, for example, by the Mekong River Commission—and rebuffed efforts by co-riparian states to seek institutionalized water-sharing arrangements with it. The alternative to rules-based riparian cooperation is an arbitrary system as defined and led by it. Sharpening geopolitical competition over water resources also characterizes the situations in Southern and Central Asia, the Near East, and the Arabian Peninsula.

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Let me be clear: Even without any shots being fired, transboundary water disputes have become a source of underlying tensions between nations, and they have thus fueled mistrust and soured relationships in Asia. This is a reminder that once water becomes a political and diplomatic battleground, it begins to exact geopolitical costs insidiously, in ways not very different from the legacy of an armed action. Water wars are very damaging to regional stability and cooperation, whether they are waged with or without the resort to force. So make no mistake: There are real and present dangers in Asia.

The book thus stresses the importance of developing cooperative institutional mechanisms between and within states. Three strategies are specifically recommended. The first is to build Asian norms and rules that cover transboundary water resources. The second is to develop inclusive basin organizations encompassing transnational rivers, lakes, and aquifers in order to manage the water competition. And the third is to develop integrated planning to promote sustainable practices, conservation, water quality, and an augmentation of water supplies through nontraditional sources.

Asia needs preventive diplomacy geared toward forestalling water wars. Only regional collaborative mechanisms can help mitigate the risks that arise from the rush to dam transboundary rivers, overexploit aquifers that straddle international borders, or create a hydroengineering infrastructure upstream to support the use of water as an asymmetric political tool. If water is not to draw new battle lines between Asian states, there is no alternative to wise basin resource management that follows institutional norms and means. Water is thus a key test of whether Asian leaders have it within their power and capacity to forge cooperative relations that benefit their peoples, basins, and continent. Much is at stake in Asia, and it also has a bearing on the rest of the world. In fact, what Asia confronts today, the other continents are likely to face tomorrow.

# *One*

## Asia

### *Global Water Crisis Hub*

**A**sia is at the center of the global water security challenges at a time when water is poised to outstrip oil as the world's scarcest vital resource.<sup>1</sup> Water—closely tied to food, energy, and climate change—has gone from

being an economic issue to becoming a security issue. Asia stands out because it has experienced the world's most rapid growth in freshwater withdrawals from rivers, lakes, and underground aquifers during the past century.<sup>2</sup> Nothing better illustrates Asia's centrality in the global challenges today than the fact—highlighted by several United Nations agencies—that the world's most-populous and fastest-developing continent has less freshwater per person than any other region in the world.

Indeed, Asia's per capita freshwater availability is less than half the global average.<sup>3</sup> Yet, according to one UN report, Asia continues to draw on tomorrow's water to meet today's needs.<sup>4</sup> Worse still, Asia has one of the lowest levels of water efficiency and productivity in the world. Water scarcity now affects more than two-fifths of the people on Earth, but by 2025, two-thirds of the global population is likely to be living in water-scarce or water-stressed conditions.<sup>5</sup> And the majority of the world's people living in water-related despair will be in Asia.

#### INTRODUCTION

Water played a central role in the rise and decline of the earliest civilizations. But now history is potentially coming full circle: The rise and fall of powers in Asia could be influenced by water in much the same way that oil in the past century played a key role in determining the ascent or decline of states. The looming struggle over water resources in Asia, home to 60.5 percent of the global population as

of 2008, has been underscored by the rapid spread of irrigated farming and water-intensive industries and a growing middle class that is eating more meat (whose production is almost ten times more water intensive than plant-based calories and proteins) and using water-guzzling, energy-hogging home appliances like dishwashers and washing machines.<sup>6</sup>

Some of the world's fastest-growing economies—China, India, South Korea, and Vietnam, for example—are at or near water-stressed conditions. Because aquifers are being drained to dangerously low levels, a number of cities in Asia that rely on groundwater face the specter of running out of water in the coming years. Sanaa, Yemen's capital, and Quetta, in Pakistan, are two of the most prominent such cases, and Beijing must increasingly depend on water transfers from elsewhere. In an ever-deeper search for water, millions of pump-operated wells threaten to suck Asia's subterranean reserves dry, even as the continent confronts river depletion.

#### ***Defining Water Shortage, Stress, Scarcity, and Insecurity***

The four terms widely used in the international discourse on water—water shortage, water stress, water scarcity, and water insecurity—remain the subject of debate themselves. “Water shortage” refers to an absolute deficiency where the level of available water cannot meet basic societal and economic needs. The actual quantity determining a per capita minimum will vary from place to place, depending on the environment. “Water stress,” as a term, was popularized by the Swedish hydrologist, Malin Falkenmark, who in 1989 developed the Water Stress Index, which divided the volume of available freshwater resources in a country with its population. By factoring in water requirements for food self-sufficiency, the index treated countries with 1,666 cubic meters of water availability per capita annually or less as water stressed. Countries with less than 1,000 cubic meters of water per capita were said to be chronically water stressed, or in a state of water scarcity.<sup>7</sup>

In reality, the distinction between water shortage and water stress/scarcity really hinges on national demand as a consequence of the level of agricultural and industrial development: Water shortage is more likely to characterize the situation in an underdeveloped country with low industrial and irrigation utilization, whereas another nation with similar climatic conditions, population size, and water-resources availability but with large-scale irrigation and high industrialization would be faced with water stress or scarcity. One much-respected international agency, the Food and Agriculture Organization of the United Nations, views internal renewable water availability of less than 2,000 cubic meters (m<sup>3</sup>) per person per year as an indicator of water scarcity, with a figure below 1,000 m<sup>3</sup> per inhabitant per year signifying acute scarcity and a serious constraint on socioeconomic development and environmental protection.

An aggregated per capita benchmark offers a useful comparative tool, but qualitative determination can be as important as quantitative measurement. After all,

SECURITY STUDIES / CURRENT AFFAIRS

"*Water: Asia's New Battleground* is a pioneering, comprehensive, and insightful analysis that provides also the strategies for a solution. This is a timely and enlightening book since, as Professor Chellaney demonstrates, 'what Asia confronts today, the other continents are likely to face tomorrow.'"

—YOON YOUNG-KWAN, professor of international relations at Seoul National University and former foreign minister of Korea

"We're all familiar with conflicts over territory in places like Tibet and Kashmir, but Brahma Chellaney persuasively argues that the most precious resource in these disputes is not land, but water. In a world where nearly one billion people lack access to clean water, Chellaney shows how today's economic growth could lead to tomorrow's 'water wars.' With his policy prescriptions, he also gives us a way to stop these conflicts before they begin. This is a vital book for anybody interested in diplomacy and conflict in the twenty-first century."

—STANLEY A. WEISS, founding chairman, Business Executives for National Security

"The dominant conflict in geopolitics in this century is the scramble for energy, raw materials, and water. Brahma Chellaney is the first to publish an in-depth analysis of potential challenges and conflicts resulting from the scarcity of water in Asia. His book is particularly important to understand the impact and indeed risks in an era of a growing tendency, which one meanwhile can call resource imperialism."

—FRIEDBERT PFLUGER, director, European Centre for Energy and Resource Security, King's College London

"A well-written, thoroughly researched, and carefully analyzed book on a crucial subject matter. It is impressive for the richness and depth of the chapters, the interdisciplinary nature of the project and the marrying of materials from geopolitics, environmental studies, and geology. It contains a wealth of information on the complex dynamics involving water in the current and emerging Asian political and economic landscape. The book shows Chellaney's thorough knowledge of the region, its intricacies, and its long history of connectivity in terms of water sharing."

—T. V. PAUL, James McGill Professor of International Relations, McGill University



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