

WATER RESOURCES ALLOCATION, MULTIPLE WATER TREATIES IN SOUTH ASIA AND COUNTRIES' OBLIGATIONS

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Abstract

South Asia is home to some of the world's most intricate transboundary river systems, including the Indus, Ganges, Brahmaputra, and Mahakali, shared among eight nations. As population growth, rapid industrialization, and climate change intensify pressure on freshwater resources, the legal architecture governing water allocation has emerged as a critical determinant of regional peace and sustainable development. This article examines the foundational principles of international water law as applied in South Asia, provides a comprehensive analysis of major water-sharing treaties — particularly the Indus Waters Treaty (1960), the Ganges Water Treaty (1996), and the Mahakali Treaty (1996) — and evaluates the legal obligations these agreements impose on signatory states. The article further identifies structural deficiencies in the existing treaty frameworks, including gaps in environmental flow requirements, inadequate dispute resolution mechanisms, and the absence of climate adaptation provisions. It concludes by arguing that South Asian states must move toward modernized, multilateral water governance grounded in the principles of equitable utilization, the no-harm rule, and shared sovereignty, in order to avert a future defined by water conflict.

Keywords: *Transboundary water law, Indus Waters Treaty, Ganges Water Treaty, water allocation, South Asia, riparian obligations, international environmental law, water diplomacy.*

INTRODUCTION

Water is increasingly recognized not merely as a natural resource but as a strategic asset with profound implications for national security, economic development, and regional stability. Nowhere is this more evident than in South Asia, where major river systems traverse international boundaries, linking the fates of nations that often share complex historical and political relationships. The region is home to approximately 1.9 billion people — roughly one-quarter of humanity — the majority of whom depend directly or indirectly on shared river basins for agriculture, drinking water, and energy generation.

The legal framework governing the allocation of these shared waters is multifaceted. It draws from customary international law, bilateral treaty regimes, and emerging principles of international environmental law. Yet despite the presence of several landmark agreements, South Asia's water governance landscape remains fragmented, contested, and ill-equipped to handle the mounting pressures of the twenty-first century. Climate change is altering glacial and monsoon patterns, threatening the reliability of water flows that treaties negotiated decades ago had assumed would remain stable.

This article proceeds in five main parts. Following this introduction, Part II situates South Asian water law within the broader framework of international water law, examining foundational principles such as equitable utilization, the no-harm rule, and the obligation to cooperate. Part III analyzes the three most significant water treaties in the region — the Indus Waters Treaty (1960), the Ganges Water Treaty (1996), and the Mahakali Treaty (1996) — assessing both their substantive allocation provisions and their mechanisms for dispute resolution. Part IV critically evaluates the legal obligations of signatory states, including areas of compliance and persistent gaps. Part V offers conclusions and recommendations for a more resilient and equitable regional water governance regime.

INTERNATIONAL WATER LAW: FOUNDATIONAL PRINCIPLES AND THEIR APPLICATION IN SOUTH ASIA

1. The Principle of Equitable and Reasonable Utilization

The principle of equitable and reasonable utilization is the cornerstone of modern international watercourse law. Codified in Article 5 of the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses (1997 UN Watercourses Convention), this principle holds that all riparian states are entitled to a fair and reasonable share of the waters of an international watercourse, taking into account factors such as the geographic conditions of the basin, the social and economic needs of each state, the existing and potential uses of the watercourse, and the effects of the use on other watercourse states.

In South Asia, the application of this principle has been uneven. The Indus Waters Treaty represents a relatively straightforward allocation model, dividing the six rivers of the Indus Basin between India and Pakistan along geographical lines. However, critics argue that the treaty's rigid allocation formula fails to incorporate the adaptive and contextual considerations that true equitable utilization demands. The Ganges Water Treaty, by contrast, incorporates a more dynamic sharing mechanism based on actual flow data, making it a closer approximation to the principle's intent — though it too has attracted criticism for systematically disadvantaging Bangladesh during periods of low flow.

2. The No-Harm Rule

Complementing the principle of equitable utilization is the customary international law obligation that states not cause significant harm to other watercourse states. This no-harm rule, reflected in Article 7 of the 1997 Convention, requires that riparian states exercise due diligence in preventing, reducing, and controlling activities within their jurisdiction that could cause transboundary harm. The rule creates a procedural obligation of conduct rather than an absolute result: states are not strictly liable for harm caused, but must demonstrate that they have taken all reasonable measures to prevent it.

The tension between the no-harm rule and equitable utilization has been a persistent source of contention in South Asia. Upstream states — particularly India and China in the case of the Brahmaputra — assert broad developmental rights to harness river systems through dam construction, irrigation diversions, and hydropower generation. Downstream states — Bangladesh, Pakistan, and Nepal — invoke the no-harm rule to resist unilateral upstream infrastructure projects that reduce flows or alter seasonal water availability. This upstream-downstream asymmetry has not been resolved by any comprehensive multilateral agreement and remains a fundamental structural tension in South Asian water diplomacy.

3. The Obligation to Cooperate and Exchange Information

A third foundational principle relevant to South Asia is the obligation of riparian states to cooperate in good faith and to exchange hydrological data and information. Articles 8 and 9 of the 1997 UN Convention establish this duty as a cornerstone of equitable water management. Without timely and accurate data on water flows, sediment loads, and water quality, downstream states cannot adequately plan water use or respond to flood events, and treaty-based allocation mechanisms cannot function effectively.

South Asia has a troubled record on hydrological data sharing. India has periodically suspended data sharing with Pakistan during periods of political tension, a practice that has raised serious questions about compliance with both treaty obligations and broader customary international law duties. The Ganges and Brahmaputra basins also suffer from significant data deficiencies, with China — a major upstream riparian on the Brahmaputra — operating outside any formal data-sharing agreement with downstream states India and Bangladesh. Strengthening information exchange obligations is therefore a precondition for any meaningful reform of the regional water governance framework.

MAJOR WATER TREATIES IN SOUTH ASIA: STRUCTURE, SCOPE, AND MECHANISMS

1. The Indus Waters Treaty (1960)

The Indus Waters Treaty, signed on September 19, 1960, between India and Pakistan with the World Bank acting as a neutral facilitator, stands as one of the most enduring bilateral

water agreements in history. Concluded against the backdrop of Partition and its attendant territorial and resource disputes, the Treaty allocated the three eastern rivers — the Ravi, Beas, and Sutlej — to India, while the three western rivers — the Indus, Jhelum, and Chenab — were allocated primarily to Pakistan. This geographical division, unique in international water law for its comprehensive partition of a river basin rather than joint management of it, has allowed the Treaty to survive multiple wars and diplomatic crises between the two countries.

The Treaty's substantive provisions are detailed in its Annexures, which govern the conditions under which India may undertake works on the western rivers, including hydroelectric projects, irrigation storage, and flood protection works. India is permitted to construct 'run-of-river' hydroelectric facilities on the western rivers, provided these do not significantly alter the natural flow of water into Pakistan. It is these provisions that have given rise to the most significant disputes under the Treaty in recent decades, most notably the Baglihar Dam controversy (2005–2007) and the ongoing Kishanganga arbitration.

The Treaty establishes the Permanent Indus Commission, a bilateral body comprising one commissioner from each country, charged with periodic meetings, site inspections, and the exchange of hydrological data. Where disputes cannot be resolved through the Commission, the Treaty provides for escalating dispute resolution mechanisms: first, resolution by the two governments; second, reference to a Neutral Expert for technical differences; and third, arbitration before a Court of Arbitration. This tiered mechanism has proven functional in resolving technical disputes but has been tested by the increasing use of arbitral proceedings, which India contests on jurisdictional grounds.

Despite its longevity, the Indus Waters Treaty faces mounting criticism for its inadequacy in addressing contemporary challenges. The Treaty contains no provisions for environmental flows, no obligations regarding water quality, and no mechanism for addressing the impacts of climate change on glacial melt and monsoon variability. India's growing infrastructure ambitions on the western rivers and Pakistan's downstream dependence create a structural asymmetry that the Treaty's fixed allocation formula was not designed to mediate dynamically. Both countries have indicated willingness to revisit parts of the Treaty, but comprehensive renegotiation remains politically fraught.

2. The Ganges Water Treaty (1996)

The Treaty on Sharing of the Ganges Waters at Farakka, signed between India and Bangladesh on December 12, 1996, governs the allocation of Ganges waters at the Farakka Barrage during the dry season from January 1 to May 31 each year. The Treaty emerged after decades of dispute following India's construction of the Farakka Barrage in 1975, which

Bangladesh argued dramatically reduced dry-season flows into its territory, damaging agriculture, navigation, and ecosystems in the southwest of the country.

The Treaty's allocation formula is structured around historical flow data at the Farakka point. When the measured flow exceeds 75,000 cusecs, India and Bangladesh each receive 40,000 cusecs, with the remainder flowing freely. When the flow is between 70,000 and 75,000 cusecs, Bangladesh receives 35,000 cusecs and India receives the remainder. When the flow falls below 70,000 cusecs, the two countries share the water equally. The Treaty further provides that each country will receive a guaranteed minimum of 35,000 cusecs during alternating ten-day periods throughout the dry season.

The Treaty is notable for incorporating an equity principle linked to measured flow rather than fixed volumetric allocation, which represents a methodological advance over the Indus model. However, its practical implementation has been deeply contested. Bangladesh has consistently argued that India does not always honor its sharing obligations during periods of peak scarcity, and that India's upstream diversions — beyond the Farakka point — further reduce the total water available for sharing. The Joint Rivers Commission, the bilateral body established to monitor implementation, has been criticized for lacking enforcement authority and transparent reporting mechanisms.

A further structural limitation of the 1996 Treaty is its exclusive bilateral character: it does not involve Nepal, whose territory encompasses the headwaters of most Ganges tributaries and whose water storage and release decisions profoundly affect downstream availability. Any durable solution to Ganges water scarcity would likely require a trilateral or basin-wide agreement encompassing Nepal, India, and Bangladesh — a political objective that has thus far proved unattainable.

3. The Mahakali Treaty (1996)

The Treaty Concerning the Integrated Development of the Mahakali River (also known as the Sarada or Sharda River), signed between Nepal and India on February 12, 1996, represents one of the few attempts in South Asian water diplomacy to adopt an integrated river basin development approach. The Treaty covers three projects on the Mahakali River: the existing Sarada Barrage (Indian project), the existing Tanakpur Barrage (Indian project with agreed water allocations to Nepal), and the proposed Pancheshwar Multipurpose Project — the Treaty's centerpiece — designed as a high dam with enormous hydroelectric and irrigation potential.

The Treaty's foundational principle is that Nepal and India are equal partners in the integrated development of the Mahakali River, and that Nepal is entitled to equal shares of the power and water produced by any future joint projects. The Pancheshwar Development Authority was envisaged as the institutional mechanism to implement this partnership.

However, the Authority has never become fully operational, and the Pancheshwar project itself has remained unbuilt for nearly three decades due to persistent disagreements between the two countries over the detailed project report, cost-sharing arrangements, and the downstream impact on Indian irrigation.

The Mahakali Treaty is significant for its articulation of the principle of equal partnership between an upstream smaller state (Nepal) and a more powerful downstream state (India), a principle that cuts against the usual power asymmetries of South Asian water diplomacy. Nepal's insistence on equitable benefit-sharing has influenced subsequent discourse on water governance in the region. However, the Treaty's unfulfilled promises have also generated domestic political opposition in Nepal, where successive governments have been criticized for conceding too much to India in the Treaty's ancillary provisions regarding Tanakpur.

COUNTRIES' OBLIGATIONS UNDER SOUTH ASIAN WATER TREATIES

1. Treaty-Based Obligations: Compliance and Enforcement

The legal obligations of South Asian states under existing water treaties can be categorized into substantive and procedural categories. Substantive obligations include the duty to release or maintain agreed volumes or proportions of water at specified measurement points, to refrain from constructing upstream works that would alter natural flows beyond treaty-permitted thresholds, and to provide compensation or mitigation for harm caused by permitted works. Procedural obligations include the duty to notify the treaty partner of planned works on shared rivers, to exchange hydrological data at agreed intervals, and to engage in good faith consultations before undertaking significant new infrastructure projects.

Compliance with these obligations has been inconsistent across the region. India, as the most powerful and often upstream riparian state, has generally adhered to the formal allocation provisions of its treaties but has been criticized for procedural non-compliance — particularly in relation to the timely notification of new dam projects and the regular exchange of hydrological data. Pakistan has raised formal objections under the Indus Waters Treaty's dispute resolution mechanisms on multiple occasions, invoking the Neutral Expert and Court of Arbitration processes. Bangladesh has relied primarily on diplomatic channels rather than formal legal proceedings to press its Ganges allocation grievances, in part due to the Treaty's lack of a robust enforcement mechanism.

2. Obligations Under Customary International Law

Beyond treaty-based obligations, South Asian states are also bound by rules of customary international law governing shared freshwater resources. These include the duty of equitable utilization, the no-harm rule, and the obligation to cooperate — discussed in Part II above — as well as the emerging principle of sustainable development, which requires states to integrate environmental considerations into water resource management decisions.

The obligation to conduct environmental impact assessments (EIAs) before undertaking major projects on shared watercourses has gained increasing recognition in international jurisprudence, most notably in the International Court of Justice's 2010 judgment in the Pulp Mills case (Argentina v. Uruguay), which confirmed the customary law status of the EIA obligation in transboundary environmental contexts. South Asian states have not uniformly incorporated this obligation into their bilateral water treaty frameworks, creating a significant gap between international legal standards and regional practice. The construction of large dams — from India's projects on the western Indus tributaries to China's cascade of dams on the upper Brahmaputra — has proceeded in the absence of bilateral or multilateral EIA processes, undermining the procedural rights of downstream states.

3. Climate Change and Evolving Obligations

Climate change is rapidly emerging as the most significant driver of uncertainty in South Asian water governance. The Himalayan cryosphere — the glaciers and snowfields that feed the region's major rivers — is shrinking at an accelerating rate, with projections suggesting that many glaciers could lose the majority of their mass by the end of this century. This transformation will dramatically alter the seasonal timing and long-term volume of river flows, rendering the fixed allocation formulas of existing treaties increasingly unrealistic.

International climate law, and in particular the Paris Agreement's framework of nationally determined contributions and loss-and-damage mechanisms, creates an emerging obligation for states to incorporate climate adaptation considerations into transboundary resource management agreements. South Asian water treaties, negotiated in an era of relative hydrological stability, contain no climate adaptation clauses and no provisions for treaty revision in response to changed hydrological conditions. This constitutes a significant legal and governance gap. The doctrine of changed circumstances (*rebus sic stantibus*), recognized in Article 62 of the Vienna Convention on the Law of Treaties, may in principle provide a legal basis for renegotiating treaty provisions rendered obsolete by climate change, but its invocation in the water treaty context remains politically and legally complex.

4. Environmental Flow Obligations

A particularly significant gap in South Asian water law is the absence of mandatory environmental flow provisions in existing treaties. Environmental flows — the quantities, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems — are recognized internationally as essential to the long-term health of river systems and the communities that depend on them. The Sundarbans mangrove delta, shared by India and Bangladesh at the mouth of the Ganges-Brahmaputra system, has suffered severe ecological degradation as a result of reduced freshwater inflows, threatening one of the world's most biodiverse ecosystems and the livelihoods of millions of people.

Neither the Indus Waters Treaty nor the Ganges Water Treaty contains provisions for minimum environmental flows, reflecting the era in which they were negotiated — a period in which international environmental law had not yet developed the concept. The Mahakali Treaty similarly lacks environmental flow provisions. Incorporating science-based environmental flow requirements into existing and future water agreements represents one of the most urgent legal reform priorities for South Asian water governance.

CONCLUSION AND RECOMMENDATIONS

The water treaties of South Asia represent significant diplomatic achievements, forged often under conditions of acute political tension and reflecting the limits of what was politically possible at the time of their conclusion. The Indus Waters Treaty in particular stands as a testament to the potential of international law to provide durable frameworks for resource sharing even between adversarial states. Nevertheless, the analysis presented in this article demonstrates that the existing treaty architecture is increasingly inadequate to the challenges of the twenty-first century.

Three broad sets of recommendations emerge from this analysis. First, existing treaties should be modernized to incorporate environmental flow provisions, hydrological data sharing obligations with clear timelines and verification mechanisms, and climate adaptation clauses that allow for periodic treaty review in response to demonstrated changes in basin hydrology. The 1997 UN Watercourses Convention, though not yet ratified by India, Pakistan, or Bangladesh, provides a useful normative baseline for such modernization efforts.

Second, the region urgently needs stronger multilateral and basin-wide governance mechanisms. The bilateral character of existing agreements means that third-country riparians — most critically Nepal in the Ganges basin and China in the Brahmaputra basin — operate outside the treaty framework, making effective basin-wide coordination impossible. A regional water governance body, perhaps modeled on the Mekong River Commission in Southeast Asia, could provide a platform for data sharing, joint infrastructure planning, and collaborative dispute resolution across the region's major basins.

Third, states must develop more robust legal mechanisms for resolving disputes arising from new infrastructure projects on shared rivers. The proliferation of dam construction across the region — driven by growing energy demand and hydropower potential — is generating an increasing number of transboundary disputes for which existing mechanisms are poorly suited. Mandatory pre-notification requirements, joint environmental impact assessment processes, and binding third-party arbitration with clear jurisdictional rules would significantly strengthen the regional legal framework.

Ultimately, the sustainable management of South Asia's shared water resources requires both legal innovation and political will. The principles of international water law — equitable

utilization, no harm, and the duty to cooperate — provide a sound normative foundation. The challenge for South Asian states is to translate these principles into institutional arrangements and treaty provisions capable of governing water allocation in an era of climate uncertainty, population growth, and intensifying geopolitical competition. The stakes — measured in agricultural livelihoods, ecological integrity, and regional peace — could not be higher.

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