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Rivers in Contention:
Is There a Water War in South Asia's Future?

by

Robert G. Wirsing

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Rivers in Contention: Is There a Water War in South Asia's Future?

Robert G. Wirsing¹

INTRODUCTION

The subject of resource wars has generated substantial published commentary in recent years. Some of this commentary has been written in the cursory and overstated language common in much of the popular media. But some of it has been scholarly in content and, regardless of viewpoint, often persuasive. One of the more recent examples of this latter kind surfaced as a debate in back-to-back issues in late 2007 and early 2008 of *The National Interest*, one of America's livelier but still serious journals of opinion. The debate featured an article by Stanford Law School professor David G. Victor, provocatively titled "What Resource Wars?", along with a number of articles by Victor's critics, including Michael T. Klare and Thomas Homer-Dixon.² Victor launched the debate by labeling as "bunk" most of the arguments circulating about the imminence of a spate of "resource wars". "Classic resource wars", he maintained,

are good material for Hollywood screenwriters. They rarely occur in the real world. To be sure, resource money can magnify and prolong some conflicts, but the root causes of those hostilities usually lie elsewhere. Fixing them requires focusing on the underlying institutions that govern how resources are used and largely determine whether stress explodes into violence. When conflicts do arise, the weak link isn't a dearth in resources but a dearth in governance.

¹ Dr. Robert G. Wirsing is a Professor in the College of Security Studies at the Asia-Pacific Center for Security Studies in Honolulu, Hawaii. Since August 2008, he is a Visiting Professor at Georgetown University's School of Foreign Service at Qatar (SFS-Q).

His primary research interests focus on the contemporary politics, international relations, and defense and security issues of South Asia. He can be contacted at wirsingr@apcss.org.

² David G. Victor, 'What Resource Wars?', *The National Interest online*, 12 November 2007, at: <http://www.nationalinterest.org/PrinterFriendly.aspx?id=16020>, sighted on 28 February 2008; and Thomas Homer-Dixon, 'Straw Man in the Wind', Michael T. Klare, 'Clearing the Air', Sherri W. Goodman & Paul J. Kern, 'Bad Tidings', and David G. Victor, 'Smoke and Mirrors', *The National Interest online*, 2 January 2008, at: <http://www.nationalinterest.org/PrinterFriendly.aspx?id=16522>, sighted on 24 March 2008.

Victor's critics advanced sturdy arguments of their own. "No serious scholar of this issue", wrote Homer-Dixon, for instance,

says that resource stress causes violence *by itself*; almost none asserts that the causal links between resource stress and violence are direct; and very few argue that interstate war is the most likely outcome. Resource stresses are security dangers, though they are one among many. They will not be the only cause of conflict, but they will add to the risk of war.³

Clear from a reading of the *National Interest* and other commentaries is that the water wars sub-set of resource wars, while admittedly less prominent in public discourse than the more notorious category of energy wars, has steadily been gaining ground. Egged on, no doubt, by the publication recently of widely praised reports highlighting the potential threats to national security arising from climate change,⁴ resource war advocates have been quick to highlight the connection between security and water scarcity. Witness, for instance, the response Victor received from Homer-Dixon to Victor's dismissive claim that "serious thinking about climate change must recognize that the 'hard' security threats that are supposedly lurking are mostly a ruse".⁵ "By weakening rural economies, boosting unemployment and dislocating peoples lives", Homer-Dixon shot back,

global warming will increase the frustrations and anger of hundreds of millions of people in vulnerable countries. Especially in Africa, but also in some parts of Asia and Latin America, climate changes will undermine already frail governments—and make challenges from violent groups more likely—by reducing government revenues, increasing the economic clout of rent-seeking elites, overwhelming bureaucracies with problems and revealing how incapable these governments are of helping their citizens. We've learned in recent years that this kind of societal failure can have consequences around the world and that great powers can't always isolate themselves from these consequences. So climate change could readily produce 'hard security threats' by any reasonable definition of the phrase.⁶

There is clearly room for disagreement about the current "hardness" of security threats emanating from global warming in general or water scarcity in particular. While there appears to be something akin to a global consensus that water insecurity is at the least a potential breeding ground both for domestic unrest and also for interstate tension, the strength of the link between water insecurity and

³ Homer-Dixon, 'Straw Man in the Wind'.

⁴ See, for instance: *Climate Change 2007: Synthesis Report*, Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Geneva: IPCC, 2008); *National Security & the Threat of Climate Change*, Report of the Military Advisory Board, 2007, at: <http://www.securityandclimate.cna.org/report/National%20Security%20and%20the%20Threat%20of%20Climate%20Change.pdf>, sighted on 4 April 2008; and *Madrid Declaration on Environment and Security*, Ministerial Council of the Organization for Security & Co-operation in Europe (OSCE), 30 November 2007, at: http://www.osce.org/documents/mcs/2007/12/28657_en.pdf, sighted on 4 April 2008.

⁵ Victor, 'What Resource Wars?'

⁶ Homer-Dixon, 'Straw Man in the Wind'.

interstate conflict is obviously contested.⁷ This writer's view is that South Asia has already witnessed interstate warfare heavily influenced by river resource rivalry. It is also this writer's view that this region's emerging crisis of water scarcity is pushing its more heavily populated states—India, Pakistan, Bangladesh—to seek water security primarily through unilateral action; that the arrival on the scene of a very powerful new contestant for some of the same water resources—China—adds immeasurably to the region's problem of working out fair water resource shares; that regional, basin-wide river resource cooperation—in spite of near unanimity among water professionals that it has become a pressing, even inescapable, requirement in South Asia—currently has extremely thin prospects; and, finally, that the South Asian states' worsening hydrological circumstances virtually ensure not only water security's rising importance among vital national interests but at the same time diminished capacity to ensure this interest's satisfaction. By any reckoning, these forces seem bound to bring South Asia ever closer to the prospect of, if not water war itself, at least water resource-aggravated war.

These propositions are dealt with in this paper in response to four questions. These questions are:

- What is the magnitude of the South Asian region's water resource problem?
- To what extent has water resource rivalry acted in past decades as an interstate conflict-multiplier in the South Asian region?
- How great today is the importance of the interstate dimension of the South Asian region's mounting problem of water resource scarcity?
- Looking to the future, what is the potential of existing legal and institutional frameworks, bilateral and multilateral, for facilitating heightened regional cooperation in regard to water security and for mitigating conflict over water resources in South Asia?

⁷ Perhaps the most influential statement of the thesis that international waterways have far more often bred cooperation rather than conflict is Aaron T. Wolf, 'Conflict and Cooperation along International Waterways', *Water Policy*, v. I, n. 2 (1998): 251-265. For a sampling of voices emphasizing the potential for conflict over water, see: Joyce R. Starr, 'Water Wars', *Foreign Policy*, v. 82 (Spring 1991): 17-36; Patrick McLoughlin, 'Scientists Say Risk of Water Wars Rising', *Reuters News Service*, 23 August 2004, at: <http://www.planetark.com/dailynewsstory.cfm/newsid/26728/story.htm>, sighted on 12 November 2007; Russell Smith, 'Africa's Potential Water Wars', *BBC News Online*, 15 November 1999, at: <http://www.news.bbc.co.uk/2/hi/africa/454926.stm>, sighted on 12 November 2007; Diane Raines Ward, *Water Wars: Drought, Flood, Folly and the Politics of Thirst* (Riverhead, 2002); Chietigj Bajpae, 'Asia's Coming Water Wars', *Power and Interest News Report* (PINR), 22 August 2006, at: http://www.pinr.com/report.php?ac=view_report&report_id=545&language_id=1, sighted on 12 November 2007; and Vandana Shiva, *Water Wars: Privatization, Pollution, and Profit* (South End Press, 2002).

WHAT IS THE MAGNITUDE OF THE SOUTH ASIAN REGION'S WATER RESOURCE PROBLEM?

Were the scale of a region's water security to be measured strictly in terms of water's natural abundance in the region, South Asia would of course receive among the highest scores on the planet. It is watered by three of the world's largest and most renowned rivers—the Indus, Ganges, and Brahmaputra. It is washed in prodigious annual monsoon rains. And it is rimmed along its northern perimeter by the world's loftiest mountain ranges, whose snow-covered peaks and vast glaciers store what might seem an inexhaustible supply of fresh water. Unfortunately, water security is measured not simply by water availability but by water availability per capita, an equation encompassing all the many uses humans make of water.⁸

A disturbing picture emerges when South Asia's water security is surveyed in terms of per capita availability. The evidence is overwhelming, in fact, that there is now a marked decline in renewable per capita fresh water availability in the region as a whole, and that in large parts of the region the decline has attained immediately threatening dimensions.

To begin, it is clear that India, in spite of its richness in water resources, faces an acute crisis of water availability. Demographers expect it to reach a population of about 1.6 billion by 2050. Apart from its soaring population, its water supply is coming under escalating pressures due to its rapidly growing economy, changing life styles, high levels of pollution, unrestrained pumping of groundwater, critical shortage of storage capacity, conspicuous waste and notorious mismanagement of water resources. India's domestic, agricultural and industrial sectors used about 829 billion cubic meters of water in 2006. With demand expected to double by 2050, it is likely to exceed the 1.4 trillion cubic meters of available water—meaning that India is drifting swiftly towards a situation of water stress.⁹ Climate change could relieve the problem by producing a water bonus from heightened glacial melt; but the relief, if it came at all, would likely be temporary and would likely be countered by other less desirable products of climate change, including more erratic and unpredictable weather. At the moment, in any event, none of the 35 Indian cities with populations greater than one million distributes water for more than a few hours per day; and even in the capital, New Delhi, 27 per cent of homes receive tap water for less than 3 hours per day.¹⁰ Per capita availability of renewable water resources in India has declined by roughly 60 per cent over the last half-century or so,¹¹ and the current rate of decline, apparent in Table 1, indicates that the next half-century is likely to witness an equally precipitous drop.

⁸ For purposes of this essay, river resources are defined broadly to include water for navigation, fisheries, irrigation, hydroelectric power generation, ecological balance and biodiversity, domestic and industrial uses. Hydropower qualifies also, of course, as an *energy* resource.

⁹ Nina Brooks, 'Imminent Water Crisis in India', *World's Biggest Problems*, Arlington Institute, August 2007, at: <http://www.arlingtoninstitute.org/wbp/global-water-crisis/606>, sighted on 25 September 2007.

¹⁰ Somini Sengupta, 'In Teeming India, Water Crisis Means Dry Pipes and Foul Sludge', *The New York Times*, 29 September 2006, at: <http://www.nytimes.com/2006/09/29/world/asia/29water.html?pagewanted=print>, sighted on 4 May 2008.

¹¹ Taufiq A. Siddiqi and Shirin Tahir-Kheli, project coordinators, *Water Demand-Supply Gaps in South Asia and Approaches to Closing the Gaps*, v. 1, Project on Water and Security in South Asia (Honolulu: Global Environment and Energy in the 21st Century, 2003), Table 4, p. 18.

John Briscoe, for many years the World Bank's Senior Water Specialist in India, warned bluntly in a report drafted in 2005 that India's water supply circumstances, examined from almost any angle, were clearly precarious and bound to worsen. Reflecting on statistics presented in a 1999 Indian National Commission on Water assessment of water availability, Briscoe commented: "these figures are a stark and unequivocal portrayal of a country about to enter an era of severe water scarcity".¹²

Table 1: India. Total Renewable Water Resources Per Capita (m3/per capita/year)

1988-1992	1993-1997	1998-2002	2003-2007	2050 (est)
2,146	1,955	1,799	1,719	1,403

Sources: United Nations Food & Agriculture Organization, Aquastat Database, at: <http://www.fao.org/nr/water/aquastat/data/query/results.html>; and National Institute of Hydrology *Water Resources of India*, at: <http://www.nih.ernet.in/water.htm>, sighted on 19 April 2008.

Turning to Bangladesh, it would not appear, at first glance anyway, a likely candidate for water scarcity. It shares 57 rivers with neighboring states India and Myanmar, 8 of them major rivers (the Brahmaputra the largest of them); and these rivers deliver a huge quantum of water to it. However, being a small and generally very flat deltaic country, it has minimal water storage capacity. That fact results in severe seasonal water scarcity, which is become more and threatening as the rivers flowing in across its borders gradually diminish as extractions increase in the upper riparian states.

Bangladesh is relatively unique among nations in that its borders enclose only 7 per cent of the so-called GBM basin, a huge drainage area formed by the Ganges, Brahmaputra, and Meghna rivers, which join together in Bangladesh before flowing into the Bay of Bengal. This means that Bangladesh is unusually dependent for assured water supply on the upper riparian states—India and China in particular (Nepal and Bhutan to a much lesser extent). Bangladesh is expected to reach a population by 2050 of about 280 million. It would then be the sixth most populous country on earth. At the moment, Bangladesh's water supply is internationally protected by only one bilateral treaty—the Ganges Water Sharing Treaty concluded with India in 1996. That treaty, though considered by many a generally reasonable compromise agreement, applies to only one barrage (the Farakka) on only one river (the Ganges) shared by the two countries; and it is due to expire, unless renewed, in 2026. About the size of Arkansas,

When it comes to looming water scarcity, there can be little doubt that Pakistan can claim top honors in the region. It is one of the world's most arid countries, dependent for most of its fresh water supplies on the waters of one major river system. It continues to record one of the world's highest rates of annual population growth, and its urban population is exploding. As a consequence, per capita water availability in Pakistan, according to one recent estimate, slipped from 5,000 cubic meters per annum in 1951, a few years after the country's founding, to 1,100 cubic meters per annum in 2006.

¹² John Briscoe, *India's Water Economy: Bracing for a Turbulent Future*, draft of 25 June 2005 (New Delhi: The World Bank, 5 October 2005), p. 31, at: <http://go.worldbank.org/QPUTPV5530>, sighted on 19 April 2008.

According to internationally recognized standards, Pakistan is today one of the most water stressed countries on earth: severe water shortages are now a starkly apparent fact of life. With the country expected to have a population in 2010 of 173 million, it is certain that by that date it will have moved significantly closer to the internationally recognized “water scarcity” limit of 1,000 cubic meters of fresh water availability per capita per year, an alarming figure that is projected in some estimates to dip even farther—to less than 700 cubic meters per capita by 2025, when Pakistan’s population is expected to reach 221 million.¹³ The unpleasant fact of the matter, according to a recently published and immensely disturbing World Wildlife Foundation (WWF) report on Pakistan’s water crisis, is that “Pakistan is already one of the most water-stressed countries in the world, a situation which is going to degrade into outright water scarcity”.¹⁴

The cited WWF report paints an extraordinarily grim portrait of Pakistan’s water pathologies. Included among them are: serious deterioration in groundwater quantity and quality in almost all urban centers, severe depletion and drying up of water sources in many areas due to uncontrolled extraction of groundwater and extended dry periods, huge daily discharge of raw sewage to surface water bodies, steep decline in the quality of drinking water, a mounting problem of arsenic contamination of groundwater, and alarming spread of water-borne diseases. The WWF report concludes: “water use practices in [Pakistan] fall far short of the required minimum for water conservation and water quality. In simple terms, Pakistan’s water is drying up, and what little remains is heavily polluted”.¹⁵

The magnitude of South Asia’s water resource problems is undeniably great. That said, one should not leap to the conclusion that water war is therefore imminent in the region. There are obvious antidotes available to deter that eventuality. For one thing, regional governments have all developed, or are in

¹³ Figures given in the *Pakistan Strategic Country Environmental Assessment Report 2006*, cited in *Pakistan’s Waters at Risk*, Special Report (Lahore: World Wildlife Foundation, February 2007), p. 1. For no less alarming accounts of Pakistan’s water predicament, see the World Bank report *Water Economy: Running Dry*, Report No. 34081-PK (Washington, DC: World Bank, 14 November 2005); and Asian Development Bank, ‘Country Paper: Pakistan’, *Asian Water Development Outlook 2007* (Tokyo: Asia-Pacific Water Forum, 2007). It is well to keep in mind that figures given about a country’s water availability are estimates, and as such they are not necessarily reliable. The above-cited 2007 ADB report, for instance, states that Pakistan is ‘nearly at the water scarcity threshold of 1,000 cubic meters/person/year’ (p. 3), but only a few pages later (p. 13) gives the figure of water availability as 1,420. Perhaps we may take as most authoritative a recent Pakistan government statement that ‘Pakistan’s current supply of water is just a little over 1000 [cubic meters] per person and that puts Pakistan in the category of ‘high stress’ countries’. *Economic Survey of Pakistan 2006-07*, p. 248, at: <http://www.accountancy.com.pk>, sighted on 14 April 2008.

¹⁴ *Pakistan’s Waters at Risk*, p. 1. Pakistanis (all South Asians, in fact) can today draw equally dismal inferences from two reports by blue ribbon panels released in mid-2007—one by the prestigious Intergovernmental Panel on Climate Change, *Climate Change 2007: Impacts, Adaptation and Vulnerability*, Summary for Policymakers, 13 April 2007, at: <http://www.ipcc.ch>, sighted on 4 April 2008; the other by the Military Advisory Board, a panel of senior retired American admirals and generals, *National Security and the Threat of Climate Change* (Alexandria, VA: CAN Corporation, April 2007), especially pp. 24-27, at: <http://www.SecurityAndClimate.cna.org>, sighted on 4 April 2008. Both of these reports make a number of especially worrisome predictions about the likely impact of climate change on the South Asian region.

¹⁵ *Pakistan’s Waters at Risk*, p. 23.

process of developing, national water policies designed to mitigate these problems. Intensified efforts at water conservation alone offer promising results. If governments achieve some success with these policies, the threat of water war could be vanquished. Success is far from guaranteed, however, as will become apparent as the discussion proceeds. It turns now to the historical record and asks what has been the relationship in the past between water resource rivalry and interstate conflict.

TO WHAT EXTENT HAS WATER RESOURCE RIVALRY ACTED IN PAST DECADES AS AN INTERSTATE CONFLICT-MULTIPLIER IN THE SOUTH ASIAN REGION?

Whenever scholarly inquiry has turned to the subject of the Subcontinent's partitioning into two separate countries in 1947, the importance of partition's impact on the waters of the Indus river has almost invariably been highlighted. This could hardly have been otherwise given the immense importance of the waters of six rivers of the Indus system (Indus, Jhelum, Chenab, Ravi, Beas, Sutlej) to the irrigation-dependent agriculture of both Indian and Pakistani Punjab. Partition gave India complete de facto control of the river Beas as well as control of the headwaters of the Ravi and Sutlej. The other three rivers (Indus, Chenab, Jhelum) either flowed from or through the state of Jammu and Kashmir before flowing into Pakistan. In this circumstance, the matter of Kashmir's political fate—whether to be in the possession of India or Pakistan—was a matter that could readily seal the fate as well of the Indus basin's lower riparian, Pakistan. There is abundant testimony that Pakistan's leaders at that time were fully conscious of their new country's vulnerability on this count—and of its far-reaching security implications.

In Josef Korbel's illuminating treatment of the consequences of partition, for instance, he describes the "intense fear" of Pakistani authorities over the Indian army's approach in May 1948 to Pakistan's border with the state of Jammu and Kashmir, a development they believed might result in the end of Pakistan's independence. Their fear, he explained, had multiple grounds, but Pakistan's water security unquestionably stood high among them. Had India's armed forces been able to occupy the lower waters of the three rivers transiting Kashmir on their way to Pakistan (Indus, Jhelum, Chenab), Korbel wrote, India would have been placed "in a position to strangle Pakistan economically". This "economic threat", he said, "was highly important in the minds of the Pakistani leaders.... The occupation of these rivers and their dams by the Indian army and the eventual diversion of their waters through canals would have meant Pakistan's quick economic death".¹⁶ A member of the United Nation's Commission on India and Pakistan (UNCIP) that secured the cease-fire between India and Pakistan that took effect on 1 January 1949, Korbel had the unique opportunity to visit India, Pakistan, and Kashmir and to confer with their leaders while the first Kashmir war was still in progress. The Commission, he observed, "listened sympathetically" to the Pakistani explanation for the Pakistan government's order to its army to move to Kashmir in May 1948. In the end, however, considering Pakistan's action in violation of international law, the Commission voted unanimously for a resolution calling for the complete withdrawal of Pakistani forces from Kashmir.¹⁷

¹⁶ Josef Korbel, *Danger in Kashmir*, revised edition (Princeton: Princeton University Press, 1966), p. 139.

¹⁷ Korbel, *Danger in Kashmir*, p. 140.

Pakistan's leaders were of course not the only ones apprehensive about losing control of waters flowing from the state of Jammu and Kashmir. While Pakistan's West Punjab was unquestionably the most dependent historically on these waters, India's East Punjab was also heavily dependent on them—and anticipated far greater dependence as its own agricultural plans evolved. "For either India or Pakistan to hold all of the State", the British historian Alastair Lamb has observed,

was to create a threat to the water supply, and thus to the economic viability and chances of prosperity, of whichever side did not control the State.... [T]he fact was that in the event the State of Jammu & Kashmir was *de facto* partitioned as a result of the October 1947 crisis and its sequel, not of course in the best possible way, but efficiently enough to give Pakistan some control over Kashmiri waters, which surely contributed enormously to Pakistan's viability in the critical first years of its life.¹⁸

In spite of the transparent political importance of the Indus system waters in the immediate post-partition period, control of those waters was never alone among the drivers of the first war between India and Pakistan. The partition plan hatched by the departing British was itself a fertile source of controversy and quarreling between India and Pakistan; and the manner in which the plan was implemented, to the everlasting discredit of those who oversaw it, was anything but smooth and peaceful. Even without the Indus waters question, in other words, India and Pakistan had plenty to fight about.

Nevertheless, squabbling over the Indus waters has been unmistakably conspicuous among the *casus belli*. And this has been the case right from the beginning.

It might have been mere coincidence, of course, but the entry of a division of regular Pakistani troops across the border into the state of Jammu and Kashmir in early May 1948—an act making official the state of belligerence between India and Pakistan only nine months after independence—came almost exactly one month after the provincial government of Indian East Punjab, on 1 April 1948, stopped the flow of water moving through its territory to feed irrigation canals in especially fertile agricultural lands in Pakistan's West Punjab. The promising Standstill Agreement hammered out in December 1947 between the Chief Engineers from East and West Punjab in regard to post-partition passage of waters from India to the Upper Bari Doab and Divalpur canals in Pakistan had expired on 31 March; and the East Punjab authorities, not having received notification from Pakistani officials of an intent to enter into new negotiations, were technically within their rights to close the Ferozepur headworks, shutting off the flow of water. The East Punjab authorities, let it be said, were understandably every bit as anxious to stake a claim to the waters of the three eastern rivers of the Indus system as were Pakistani authorities to ensure the historic water rights of the lower riparian. Politically, of course, the East Punjab action—coming at a critical moment in the planting cycle—could not have been more provocative or poorly timed. It is not unreasonable to think that the passage of Pakistani troops eastward, coming as it did hard on the heels of India's stoppage of water's passage westward, had more

¹⁸ Alastair Lamb, *Birth of a Tragedy: Kashmir 1947* (Hertingfordbury: Roxford Books, 1994), p. 169.

than a little to do with Pakistani desires to throw up a defensive shield in Kashmir to protect Pakistan's river resource flanks.¹⁹

If anything, this notion—that it is not Kashmir as such but Kashmir's water that lies at the heart of the Kashmir conflict²⁰ and of India-Pakistan hostility in general—has been gaining supporters in recent years, and from both sides of the border.

One publication that gave this notion not only striking centrality but also respectability was the book *The Final Settlement: Restructuring India-Pakistan Relations*, brought out in 2005 by the Mumbai-based Strategic Foresight Group (SFG). Authored by the SFG's President Sundeep Waslekar, the book avoided most of the usual stereotypes associated with Indian accounts of India-Pakistan relations. And it struck an especially innovative, not to say despairing, note when it came to the matter of water resources and their conflict-inducing properties. From Waslekar's point of view, the 1960 Indus Waters Treaty (IWT) that was eventually hammered out between India and Pakistan is today a very weak barrier against intensified conflict over water resources; it was only a matter of time, he said, before the occurrence of a water war moved from distant possibility to immediate reality. I quote here from an earlier comment I and a colleague made on this book:

In a chapter entitled "Water" and with the subtitle "The Secret," *The Final Settlement* holds that water has been central to the Kashmir dispute from the beginning, that the public debate over Kashmir—focused on lofty goals of self-determination and human rights (and not on Islamabad's self-interest in water security)—has always been discreetly steered away from this fundamental fact, and that Pakistan's mounting water insecurity virtually ensures a still deeper and volatile nexus between water and Kashmir in coming years. The book cites as evidence frequent unofficial Pakistani expressions of interest in recent years in a so-called Chenab formula of conflict resolution, according to which Jammu and Kashmir would be further partitioned, with Pakistan being granted the Kashmir Valley and a substantial (and Muslim majority) portion of Jammu, enough to give it command of the Chenab river. The Chenab, in *The Final Settlement's* view, is the ultimate prize, possession of which by Pakistan would virtually end its water woes: with the 1960 treaty effectively terminated, Pakistan would be able to develop the Chenab's potential to the maximum, not only in terms of storage dams for irrigation but also for hydroelectric power and flood control. This, according to the book, has in recent years been the latent objective of Pakistani diplomatic and political activity relating to Kashmir.

Most disturbing, from *The Final Settlement's* perspective, is that what Pakistanis feel they must have, Indians will never give up. The Chenab river is clearly not for sale. This could have dire consequences....²¹

¹⁹ The details of this water stoppage episode are narrated in N. D. Gulhati, *Indus Waters Treaty: An Exercise in International Mediation* (Bombay: Allied Publishers, 1973); and Undala Z. Alam, *Water Rationality: Mediating the Indus Waters Treaty*, unpublished doctoral dissertation, submitted to the Department of Geography, University of Durham, UK, in September 1998.

²⁰ Samuel Baid, "Not Kashmir but Kashmir's Water Is the Core Issue for Pakistan", *Greater Kashmir*, 28 March 2005, at: http://www.strategicforesight.com/sfgnews_106.htm, sighted on 26 April 2008.

²¹ Robert G. Wirsing and Christopher Jasparro, "River Rivalry: Water Disputes, Resource Insecurity and Diplomatic Deadlock in South Asia", *Water Policy*, v. 9, n. 3 (May 2007):

A Pakistani writer, Nasrullah M. Mirza, has recently given voice to very similar sentiments. Originally contained in a doctoral dissertation accomplished at the University of Heidelberg,²² his thesis has been summarized more recently in a paper entitled “Water, War, and Peace: Linkages and Scenarios in India-Pakistan Relations”. This paper, like the dissertation, forcefully challenges standard explanations (what Mirza refers to as “the only projected ongoing cause”) of the Kashmir conflict—namely

the idea of *conflicting ideologies*: on the one hand India is seeking to maintain its “secular outlook” and negate the very rationale behind the creation of Pakistan, the “two-nation theory”, by retaining control over a Muslim majority state, Jammu and Kashmir (J&K), while on the other hand Pakistan is fighting for the region’s “liberation” from the Indian “yoke”, aiming for its integration with it.²³

Mirza explicitly offers his study as reinforcement for “the belief of geopoliticians that competition over, and control of, vital resources—be they oil, materials for warfare, or minerals—is the main cause of conflict between states, and adds substance to that belief by attributing equal significance to the territorial control of freshwater resources between riparian nations”²⁴. He contends that “the IWT did not eliminate the root-cause of Indo-Pakistan conflict over Kashmir: the issue of control over the hydro-strategic territory”; and that “peace between India and Pakistan is inconceivable without giving due consideration to the geographical imperatives of the [Indus river system]”.²⁵ Drawing upon his doctoral dissertation’s detailed narration of Indian and Pakistani military strategies and maneuvers in the 1947-1949 war, Mirza concludes

that the geographical dimensions of superimposed boundaries and disputed territories (such as surface features or relative locations) have played a major role in triggering water-related conflicts between India and Pakistan. If India had not succeeded in acquiring the Madhopur and Ferozepur headworks—the former also constituting the only land-link (from Indian side) to J&K, the crucial linkage of water and the Kashmir dispute would not have ensued. Even if the Radcliffe boundary award [in 1947] had been able to maintain a balance in allocating the control of the river headworks to both India and Pakistan, the chances of a water dispute would have been minimal since each country would have been in a position to counter-balance a unilateral closure of the headworks undertaken by the other party. The ... Kashmir conflict is a product of many factors, but ... the hydro-strategic nature of its territory can be identified as a major cause. Access to water resources played a significant role in the division of British Punjab and enabled India to use water as strategic, economic and socio-psychological weapon in the 1948 Indo-Pakistan war over Kashmir. India’s actions instilled enormous fear into the

231-251.

²² Nasrullah M. Mirza, *Water, War & Peace Linkages: Case of Pakistan-India Relations*, unpublished doctoral dissertation, University of Heidelberg, 2007. Mirza’s study is currently being prepared for commercial publication under the title *Water, War & India-Pakistan Relations*.

²³ Nasrullah M. Mirza, “Water, War, and Peace: Linkages and Scenarios in India-Pakistan Relations”, Working Paper No. 37, *Heidelberg Papers in South Asian and Comparative Politics* (South Asia Institute, University of Heidelberg, February 2008), p. 2.

²⁴ Mirza, “Water, War, and Peace”, p. 14.

²⁵ Mirza, “Water, War, and Peace”, pp. 12-13.

Pakistani public, as did [the] statement that [India] perceives itself vulnerable until the J&K territory is firmly in Indian hands. This has been of great detriment to the trust Pakistan can ever have towards India regarding its river water life-line, should it ever opt to relinquish its claims over Kashmir territory. India's abandonment of Kashmir would result in the loss of its upper riparian status and its enormous real-political capacity to intimidate, economically strangulate and threaten the very survival of Pakistan....

[I]n combination with other factors, the *surface features* and the *relative location* of the Kashmir territory, home to the catchment areas of all the rivers in the [Indus river system], encouraged India to capture Kashmir in October 1947. Retaliation by Pakistan in May 1948 was not a coincidence, but was aimed at safeguarding its life-line. In other words, the complex nature of the Kashmir and Indus disputes is rooted in the geographic characteristics of the territory. The Indian obduracy in maintaining control over Kashmir, and Pakistan's efforts to "liberate" the area, are intimately connected with the nature of the territory. The anticipation of the Indian leadership that the annexure of the Muslim majority state of Kashmir would destroy the very rationale of Pakistan and the basis of two-nation theory has proved an ideal ploy to maintain control of the real resource.²⁶

Indian readers of Mirza's account of the India-Pakistan conflict over Kashmir will no doubt bristle at his interpretation of events and attribution of motives; and some professional conflict analysts may see in his arguments an unacceptably high dose of hydro-strategic reductionism. But the methodical examination in Mirza's works of the wartime terrain in the immediate post-partition era offers, for this writer at least, the most compelling argument to date of water's importance in India-Pakistan relations and, moreover, of its determining role in the onset of interstate war.

This is not the place to undertake an exhaustive inquiry into the exact extent to which control of rivers figured as a focus of military strategy and tactics in all four India-Pakistan wars. That it loomed large in the first war I consider a settled matter. Thus, I conclude this section with the observation that water resource rivalry did indeed act in past decades as a significant interstate conflict-multiplier in the South Asian region.

HOW GREAT TODAY IS THE IMPORTANCE OF THE INTERSTATE DIMENSION OF THE SOUTH ASIAN REGION'S MOUNTING PROBLEM OF WATER RESOURCE SCARCITY?

It is widely acknowledged that water now occupies a lofty position among the South Asian region's sources of *domestic* strife. It provokes squabbling between rich and poor neighborhoods in big cities, between urban and rural users, and between water-short provinces. "Battles over the water supply have become so common [in India]", writes Michael Specter, "that Priya Ranjan Dasmunshi, the Minister of Water Resources, sometimes describes himself as the Minister of Water Conflicts".²⁷ Chronic and at times violent feuding over Indus waters in Pakistan between the Punjab and two of the smaller provinces, Sindh and the North West

²⁶ Mirza, 'Water, War, and Peace', p. 10.

²⁷ Michael Specter, 'The Last Drop: Confronting the Possibility of a Global Catastrophe', *The New Yorker*, 23 October 2006, at: http://www.newyorker.com/archive/2006/10/23/061023fa_fact1?printable=true, sighted on 26 April 2008.

Frontier Province, has stalled construction of major dams for decades in spite of the country's dangerously insufficient water storage capacity. In one of his periodic televised addresses to the nation in 2003, President Pervez Musharraf devoted the entire 50 minutes to the country's growing water crisis and pleaded with his audience, in order to avoid future havoc, to help in overcoming provincial differences.²⁸

Let it be understood up front, therefore, that the South Asian region's water resource problems are far from being simply an *international* matter. On the contrary, even if international cooperation in regard to river resources were today exemplary in the region, the principal water-consuming nations of India, Pakistan, and Bangladesh would still be facing acute water dilemmas. These fall under three headings: (1) the *scale* of national river resource problems, requirements and plans; (2) the *inefficiencies* associated with irrigation uses of water resources; and (3) the *mismanagement* of water resource decision-making. I have dealt in detail with these three species of troublesome domestic water circumstances in an earlier essay and will not tarry over them now. Suffice it here to note that I conceded in that essay that "*intra-state* circumstances are at least as crucial as *inter-state* circumstances in thwarting the region's progress towards a more cooperative model of interstate river resource management—or, to put it more positively, that the success achieved by each of the co-riparian countries in addressing these three not always recognized or acknowledged categories of domestic determinants is no less important to regional cooperation in regard to water resources than is the overcoming of handicaps inherent in the quite obviously conflictive pattern of regional interstate relations".²⁹

Having granted the importance of the domestic dimension of South Asian water resource problems, we must hasten now to set forth the no less important interstate dimension of these problems. This dimension's importance can also be categorized most simply in a threefold manner.

The first and most fundamental interstate problem stems from the South Asian region's *logic-defying political geography*—the grotesquely incongruous mismatch between the region's political and its water resource endowments. Simply put, the demand for water resources cannot be supplied entirely—in some instances, not even mostly—within the confines of established national borders. This starkly asymmetrical pattern in the region's water demand and supply calculus arises in the first place, of course, because of the religious identity- and not water resource-based drawing of international boundaries that attended partition in 1947. Who was to control the head-works of the rivers feeding the Punjab's vast canal-irrigated lands was, as we've already observed, a major issue between India and Pakistan right from the start; and it clearly influenced boundary delimitation. Resolution of this issue did not come, however, until the IWT was signed in 1960; and, as was argued above, more than a few observers view the novel "division of the rivers" formula endorsed by the treaty as ultimately unsustainable. Further complication comes, of course, from the fact that the territory from or through which most of the rivers of the Indus system flow is the disputed territory of Jammu and Kashmir, an

²⁸ Zaffar Abbas, 'Musharraf Wades into Water Conflict', *BBC News*, 13 September 2003, at: http://www.newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk/2/hi/south_asia/310690, sighted on 26 April 2008.

²⁹ Robert G. Wirsing, 'Hydro-Politics in South Asia: The Domestic Roots of Interstate River Rivalry', *Asian Affairs*, v. 34, n. 1 (Spring 2007): 4.

uncomfortable fact that obviously blurs considerably the question of river water ownership.

The most grotesque incongruity, of course, lies on the eastern side of the Subcontinent, where Bangladesh, the size of Arkansas, finds itself in the unenviable position of being a delta for the trans-boundary GBM river system without enjoying command of the system's catchment areas. Thus, what uses India and the other co-riparian states make of the water resources found in their shares of the international basin inevitably hold consequences, potentially life-threatening consequences, for Bangladesh. Like it or not, the future water security of Bangladesh, one of the poorest, most densely populated, and politically weakest countries on the planet, will be decided to a very large extent not in Dhaka but in the capitals of five upper riparian states, India and China foremost among them.

The second interstate problem may be termed the *imperative of unilateralism*. By this is meant the virtually unavoidable preference of national leaders to pursue national water resource security, whenever possible, in their own low-risk terms, free of the time- and money-absorbing complications of international bargaining—in short, unilaterally. This is especially true of upper riparian states, like India, where there is an inherited geographic advantage and obvious capacity for “creating facts” in regard to river resources by, for instance, increasing water extraction upriver of a neighboring country. But the imperative of unilateralism typically drives the actions also of lower riparian states like Bangladesh and—relative to Nepal—even India.³⁰

Nothing better highlights India's fact-creating inclination and capacity than its construction of a barrage on the Ganges river at Farakka, a site about 11 miles west of the India-Bangladesh border. Launched in 1961 when Bangladesh was still a part of Pakistan and commissioned in 1975 following the successful secession of Bangladesh from Pakistan, the Farakka barrage was designed to divert waters from the Ganges southward to the Hooghly river primarily to aid desilting of the port of Calcutta. No serious inter-governmental discussion about the project was ever undertaken prior to Bangladesh's achievement of independence in 1971; and it took the Indian and Bangladesh governments from then until the signing of the Ganges Treaty in 1996³¹ to work out a mutually acceptable formula in regard to sharing of the Ganges waters at Farakka. Even today, the Farakka barrage looms large in many Bangladeshi minds, fairly or not, as the single most conspicuous symbol of their bigger neighbor's “bullying” tactics and indifference to lower-riparian water needs.³²

India's diversion of Ganges waters to the Hooghly river at the Farakka barrage has unquestionably had a number of unfortunate downstream effects. These include reduced navigability of the Ganges (called the Padma once it crosses the Bangladesh border), decline in fisheries and reduced availability of fresh water

³⁰ For a discussion of the seemingly baffling deadlock that has been reached between energy-short India and hydro-power rich Nepal, see Wirsing and Jasparró, ‘River Rivalry’: 246-250.

³¹ The 1996 agreement was formally designated the Treaty Between the Government of the Republic of India and the Government of the People's Republic of Bangladesh on Sharing of the Ganga/Ganges Waters at Farakka.

³² For an overview of the diplomatic history of the Ganges river in India-Bangladesh relations, see S. M. A. Salman and K. Uprety, *Conflict and Cooperation on South Asia's International Rivers: A Legal Perspective* (Washington, DC: The World Bank, 2002), pp. 125-191.

supply for dry season agricultural irrigation in Bangladesh's southwestern districts. Though very difficult to measure, the barrage at Farakka additionally bears some portion of responsibility for the steady deterioration of Bangladesh's vast coastal mangrove forest—the Sundarbans. Sober studies of the Sundarbans have made it abundantly clear that any substantial reduction in freshwater inflows into Bangladesh in the dry season would place in great jeopardy the delicate balance of fresh and salt water, as well as blends of nutrients, that maintain the Sundarbans' unique, commercially valuable and wildlife rich forest ecosystem.³³ Apparently, the Farakka barrage was constructed without any regard for its probable downstream consequences, least of all as these might affect the Sundarbans. Even if the barrage builders had any serious reservations of their own, the chances that these would have an impact on the design and operation of the barrage were practically non-existent. There simply did not exist then and there does not exist now an international GBM river basin organization, or a basin-wide water management plan, or any established forum where such a plan could be developed. Then as now, unilateralism was the rule.

Exemplifying the strong compulsion of national leaders, regardless of whether they lead an upper or lower riparian state, to plunge ahead with river development plans on a shared interstate river absent any agreement settling the matter of water entitlement, is the decades-long contention of India and Bangladesh over the Teesta river. Flowing southward from its Himalayan headwaters first through the Indian states of Sikkim and West Bengal, and then through Bangladesh until it joins the Brahmaputra river, the Teesta, in volume of water, ranks as the fourth most important river serving Bangladesh. Both India and Bangladesh have today major, multiphase irrigation projects underway on respective sides of the border. The Teesta, both sides acknowledge, hasn't enough water in it to satisfy simultaneously the anticipated project requirements of both the upper and lower riparian state. But that unpleasant fact has not slowed things down. It is not hard to see why. Even half completed, these projects have already worked readily visible agricultural miracles on both sides of the border. Both sides plunge ahead with their plans, hoping to replicate the miracles. Their governments may perhaps be forgiven if they attach highest priority to the satisfaction of their own citizens, the ones who hold the leaders' political fortunes in their hands. The Indian side does not want to be saddled with an agreement that seriously undercuts development objectives that seem indispensable to West Bengal's political leadership; and the Bangladesh side, acutely conscious of India's inescapable upper riparian ability to divert Teesta waters at will, understandably sees no benefit to be gained from suspending its own development plans pending an agreement with India. And there the matter still stands.³⁴

As important to the water security of Bangladesh as are the waters of the Ganges and the Teesta, they fall well short of the Brahmaputra—in regard to the waters of which India has been nursing plans for a water extraction initiative of huge dimensions. This is the so-called River Linking Project (RLP).

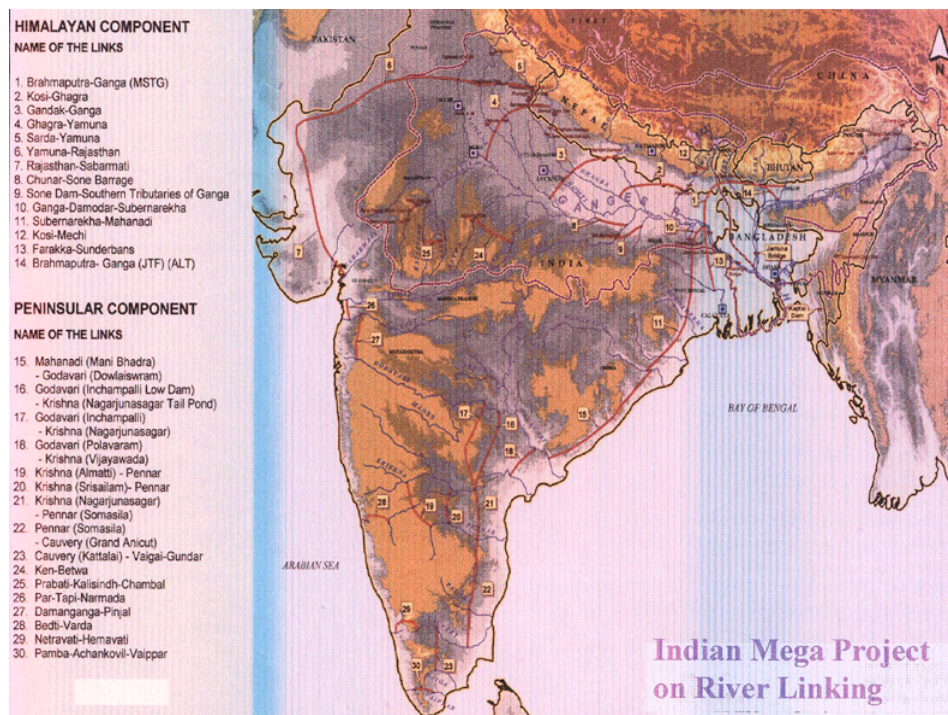
³³ See, for instance, M. Monirul Mirza (ed.), *Ganges Water Diversion: Environmental Effects and Implications* (New York: Springer-Verlag, 2004).

³⁴ The reasons for the impasse over the Teesta are explored in further detail in Wirsing and Jaspardo, 'River Rivalry': 235-238.

India's River Linking Project. Long talked about but only converted into a major governmental commitment at the start of the present decade, India's RLP had, from the Bangladesh point of view, an especially menacing character. Its scale—including unprecedented construction of river-linking and irrigation canals, with anticipated costs well over US\$100 billion dollars—was massive. As described by its proponents, its Himalayan (northern) component [see figure 1] was expected to draw upon what were, from the Indian perspective, the “surplus” waters of the Brahmaputra river in order to relieve the water scarcity of drought-afflicted portions of India in the west and south. Since the Brahmaputra supplies about two-thirds of Bangladesh's water requirements and, moreover, is considered by Bangladeshis to be already dangerously low in the dry season, this spectacular plan for inter-basin transfer of water resources inevitably rung alarm bells all over the lower riparian's land. The RLP's northern component has apparently been placed on hold; but as India's water crisis unfolds, it may not remain there.

Unfortunately, India's RLP is not the only alarming development in regard to the Brahmaputra for Dhaka to be anxious about, for India's are not the only eyes on the resources of that river.

Figure 1. India's River Linking Project (RLP)



The third and last problem we need to consider under the heading of interstate dimension is *the likely addition of major new contestants to the existing list of rivals for South Asian water resources*. Afghanistan, for one, is developing plans for expanded agricultural irrigation and hydroelectric power generation. Naturally, its extraction of water from the Indus river's westernmost tributaries, the 435 mile long Kabul river in particular, would reduce the quantum of water available in Pakistan.³⁵ It is China, however, that arouses greatest anxiety when the list of potential new contestants is examined. Indeed, it is China's increasing interest in the water resources of the Tibetan plateau—and, in particular, the fresh water and hydropower potential of the mighty Brahmaputra river—that is at the heart of this third problem.

China and the Brahmaputra river. A news item in *The Times of India* reported on 9 September 2007 that Indian and Chinese officials were to meet later that month to begin discussions "aimed at allaying Indian concerns that Beijing had designs on rivers like the Brahmaputra". New Delhi, the article stated,

had relayed its concern to Beijing in 2006 [in response to] Chinese reports that China intended to dam rivers like Yarlung Tsangpo (known as Brahmaputra) and divert its waters to [China's] arid north-east. Although China officially denied such an intention, Indian officials had said the reports continued to abound inside China, including a proposed construction timeline beginning 2009.³⁶

New Delhi's anxieties over China's river diversion plans had been prompted a few years earlier by Beijing's announced plans to undertake a massive scheme—the South-North Water Diversion Project (SNWDP)—to divert water from the water-surplus southern parts of the country to severely water-scarce regions in the northeast and northwest. The largest such project ever attempted by any country, the SNWDP was formally launched and construction begun in 2003. Indian fears were heightened at about that time by accumulating reports that the project's third phase, scheduled to begin in 2009 or 2010, might include a mammoth hydroelectric power and diversion project on the Brahmaputra river at the Great Bend—the point where the river turns south through the Himalayas, transits the world's longest canyon, then enters onto the Assamese plain in India's northeast, then crosses into Bangladesh before emptying finally into the Bay of Bengal. For India and Bangladesh, the Brahmaputra, the world's fifth largest river, is a hugely important source of water. Bangladesh currently depends on it for as much as two-thirds of its river water requirements. India, too, depends heavily on the Brahmaputra, whose drainage basin extends into six Indian states (Arunachal Pradesh, Assam, Meghalaya, Nagaland, Sikkim, and West Bengal). The Brahmaputra holds roughly 30% of India's total water resource potential as well as 44.4% of its total hydroelectric power potential. As already discussed, India has its own highly ambitious plans for the Brahmaputra—the massive RLP. Indian

³⁵ The government of Afghanistan's plans for greater utilization of the waters of the Kabul river clearly worry Pakistan's water planners. See, for instance, Fida Hussain, 'Afghanistan to Utilize Kabul River Water if KBD [Kalabagh Dam] Not Built', *Daily Times*, 26 January 2006, at: http://www.dailytimes.com.pk/print.asp?page=2006/01/26/story_26-1-2006_pg7_39, sighted on 3 May 2008.

³⁶ Indrani Bagchi, 'China Agrees to Discuss River-Sharing', *The Times of India*, 9 September 2007, at: <http://www.timesofindia.indiatimes.com/articleshow/msid-2351389.prtpage-1.cms>, sighted on 3 May 2008.

commentators were more and more calling attention to the potential jeopardy to these plans posed by China's own cavernous appetite for water.³⁷

China's appetite for water arises from a number of factors, including the "usual suspects" of vastly increased domestic and industrial use, inefficient use of water resources, pollution, and climate change. While it possesses the fourth largest fresh water reserves in the world, China, by virtue of its population, has one of the lowest per capita water holdings of any nation.³⁸ Beijing's own estimate indicates that by 2030, when China's population may have reached 1.6 billion, water availability would be only 1700 cubic meters per capita per year—a figure falling beneath the "water stress" level recognized internationally as the start of severe water shortage.³⁹ Water shortages are now present in at least 60 per cent of China's 660 cities, and 110 of them face extreme shortages. As much as 90 per cent of Chinese cities suffers from water pollution; and as many as 500 million rural Chinese do not have access to safe drinking water. Official estimates reveal that 53 per cent of major waterways, half of all lakes, and more than one third of all ground (subsurface) water are unfit for human consumption.⁴⁰

China north of the Yangtse river has by far the most extreme water shortage. While it contains about 44.4 per cent of China's population, 59.2 per cent of its farmland, and accounts for about 43.4 per cent of China's GDP, northern China holds only 14.7 per cent of the entire country's water resources. The greatest water scarcity is found in three basins of northern China—the Huanghe (Yellow), Huaihe and Haihe rivers. Holding 39.4 per cent of the farmland, 34.7 per cent of the population, and contributing 32.4 per cent of GDP, this region has only 7.7 per cent of the nation's water supply. This fact accounts, no doubt, for Chairman Mao having reportedly commented in 1952 that since the south had a lot of water, the north could "borrow" a little of it. His thought, it is widely suggested, was the original inspiration for today's SNWDP.⁴¹

China's South-North Water Diversion Project. China's SNWDP has been envisioned in three geographic parts—the Eastern, Middle, and Western routes. The Western route is divided into two sub-parts—the Western and the Greater Western routes. It is the Greater Western route, which might extract waters from as

³⁷ See, for example, Brahma Chellaney, 'China Aims for Bigger Share of South Asia's Water Lifeline', *The Japan Times*, 2 July 2007, reprinted in *YaleGlobal Online*, at: <http://www.yaleglobal.yale.edu/display.article?id=9377>, sighted on 20 September 2007; and M. S. Menon, 'China Aggressive on Tibetan Rivers', *The Tribune*, 26 December 2007, at: <http://www.tribuneindia.com/2007/20071226/edit.htm#8>, sighted on 3 May 2008.

³⁸ Nathan Nankivell, 'The National Security Implications of China's Emerging Water Crisis', *China Brief* (The Jamestown Foundation), v. 5, n. 17, 2 August 2005, at: http://www.jamestown.org/print_friendly.php?volume_id=408&issue_id=3422&article_id, sighted on 13 September 2007.

³⁹ Ministry of Water Resources, Government of China, *Basic Readiness of Preparation Work for South-to-North Water Transfer Project* (14 November 2000), at: <http://www.nsb.gov.cn/nsbd/news/j20011120.htm>, sighted on 25 September 2007.

⁴⁰ Nankivell, 'The National Security Implications of China's Emerging Water Crisis'. See also Jim Yardley, 'Beneath Booming Cities, China's Future Is Drying Up', *The New York Times*, 28 September 2007, at: <http://www.nytimes.com/2007/09/28/world/asia/28water.html?pagewanted=print>, sighted on 27 September 2007.

⁴¹ James E. Nickum, 'The Status of the South to North Water Transfer Plans in China', United Nations Development Program report, 2006, at: http://www.hdr.undp.org/en/reports/global/hdr2006/papers/james_nickum_china_water_transfer.pdf, sighted on 4 May 2008.

far south on the Tibetan Plateau as the Brahmaputra, that directly concerns the lower riparian states, India and Bangladesh.

The Project has also been envisioned in three construction phases. Construction on Phase 1, focused on the Eastern (and most northerly) route, began in 2003. Work on Phase 2, the Middle route, started in 2005. In this phase, water was to be diverted from China's greatest river, the Yangtze, to the water-starved Yellow river in the northeast and to the capital city Beijing. Work on both of these phases is expected to be finished by 2020, if not sooner. Work on Phase 3, the Western and Greater Western routes, was set to begin in 2009 or 2010. This phase, which entailed overcoming major engineering and climatic challenges, was to bring 4 billion cubic meters of water each year from three tributaries of the Yangtze—the Tongtian, Yalong, and Dadu rivers—nearly 500 kilometers across the Bayankala mountains and then on to northwest China. Work on this phase was contemplated to extend to mid-century.

When finished, the entire Project was expected to divert from 38 to 48 billion cubic meters of water annually from the south to the north. Estimated costs were staggering. Millions of Chinese would have to be relocated. The government claimed that the Project would benefit 300 million Chinese.⁴²

Now that the Chinese are beginning to gaze thirstily in the direction of the abundant river resources of the Tibetan Plateau, in particular the waters of the Brahmaputra, the question naturally arises whether the river holds enough water to meet the needs simultaneously of all the co-riparian states. The question defies an easy answer. The three largest countries sharing the Brahmaputra—China, India, and Bangladesh—had a combined estimated population in 2007 of 2.6 billion. Respectively, their populations were 1.321 billion, 1.129 billion, and 150 million—the first, second, and seventh most populous countries in the world. And their populations were growing rapidly. All three were confronting staggering problems of water scarcity, flooding, and water pollution. The economic futures of all three were heavily contingent upon their capacity to resolve mounting problems of water scarcity along with water quality. For all three of them, the waters of the Brahmaputra river either already were central to their river resource planning (Bangladesh, India)—or soon might be (China).

An obvious additional question facing all three countries was whether the Brahmaputra river was fated to become a source of increasing contention and conflict between and among them. This question brings us finally to the matter of interstate cooperation in regard to water security.

⁴² 'South-North Water Diversion Project to Benefit 300 Million Chinese', *People's Daily Online*, 26 December 2001, at: http://www.english.people.com.cn/200112/26/print20011226_87477.html, sighted on 13 September 2007.

LOOKING TO THE FUTURE, WHAT IS THE POTENTIAL OF EXISTING LEGAL AND INSTITUTIONAL FRAMEWORKS, BILATERAL AND MULTILATERAL, FOR FACILITATING HEIGHTENED REGIONAL COOPERATION IN REGARD TO WATER SECURITY AND FOR MITIGATING CONFLICT OVER WATER RESOURCES IN SOUTH ASIA?

At whichever level one examines South Asia's existing legal and institutional water resource infrastructure, the prospects for heightened cooperation, as for conflict mitigation, fall well short of what anyone would call robust. This is not because frameworks for cooperative endeavors do not exist. On the contrary, fairly stout frameworks do exist, in the form both of major interstate treaties—the 1996 Ganges Treaty between India and Bangladesh, for one, the 1960 Indus Waters Treaty between India and Pakistan for another—and of well established joint river resource institutions—the Indus Waters Commission (IWC), for instance, born of the IWT, and the Joint River Commission (JRC) that has linked Bangladesh and India ever since it was founded in 1972 soon after Bangladesh secured its independence from Pakistan. Neither is it because there are presently no developments in the region trending in a positive (cooperative) direction. While South Asia, home to the largely ineffectual South Asian Association for Regional Cooperation (SAARC), is clearly not in the running for top honors in the category of regional cooperation, there are ample signs that the region's principal co-riparian states have at least one eye fixed on opportunities for mutually beneficial interstate cooperation. A surprisingly long-lasting ceasefire on the Line of Control dividing Indian- and Pakistani-controlled sectors of Jammu and Kashmir is one such sign. Other very recent signs include the resumption on 14 April 2008—after an interval of over 40 years—of passenger train service between Calcutta in India and the capital of Bangladesh, Dhaka,⁴³ and the arresting remark by Iranian President Mahmoud Ahmadinejad on 29 April 2008, following a meeting in New Delhi with Indian Prime Minister Manmohan Singh, that agreement on a final draft of the long postponed \$7.4 billion Iran-Pakistan-India (IPI) natural gas pipeline project was expected within 45 days.⁴⁴

These seemingly positive developments and others like them clearly disallow the casting of prospects for heightened water resource cooperation entirely or even largely in pessimistic terms. However, they have to be seen not only against the transparent frailty of existing legal and institutional frameworks for cooperation but also against a larger lineup of regional developments that appear to be trending in a negative (non-cooperative) direction.

As for the frailty of existing legal and institutional frameworks, notice has already been called both to the mounting criticism directed at the IWT, especially but not solely from the Pakistan side, and also to the pronounced weaknesses of the Ganges Treaty, its expiry in 2026 unless extended not necessarily the worst of them. The IWT, we observed, contains a number of loopholes that the region's changing water and energy circumstances appear likely to dilate. That possibility

⁴³ 'Dhaka-Calcutta Train Link Resumes', *BBC News*, 14 April 2008, at: http://www.newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk/2/hi/south_asia/7345724, sighted on 8 May 2008.

⁴⁴ 'IPI Gas Pipeline to Be Finalized in 45 Days: Iran', *indiaserver.com*, 30 April 2008, at: <http://www.india-server.com/news/ipi-gas-pipeline-to-be-finalized-in-45-677.html>, sighted on 8 May 2008.

would seem bound to vitiate the treaty's continuing capacity to contain conflict over the Indus waters. And the Ganges Treaty, whatever may be its intrinsic merits, applies to but one of 54 shared rivers, as mentioned above, and no successor treaties are yet in sight. The joint institutions designed to encourage river resource cooperation continue to function; but Pakistan's ill-fated resort to the IWT's arbitration provisions over the Baglihar dam suggests that the IWC may not have the vitality on its own to confront successfully water sharing disagreements likely to arise between India and Pakistan in coming years. As for the JRC, which was meant to supply a venue for continued India-Bangladesh talks over the many major unsettled water-sharing issues between them, I have written elsewhere of its extremely modest accomplishments.⁴⁵

Far graver in magnitude, in any event, than these frailties in existing legal and institutional frameworks are a number of political and strategic developments in the region that appear either to be concentrating government attention mainly on regime survival or, even worse perhaps, to be reinforcing longstanding interstate animosities and distrust. Patently shaky and crisis-prone governments in Pakistan and Bangladesh, two of the three major co-riparian states, are representative of the regime survival problem; the sharply intensifying and partly energy-driven rivalry between India and Pakistan for influence in Afghanistan and the larger Asian Middle East exemplifies the problem of continuing distrust and animosity. In the conclusion to another writing, I observed:

that the positive changes going on in regard to Kashmir provide no guarantee at all that a positive transformation of the [India-Pakistan] relationship as a whole is in the cards. This paper maintained instead that the change now in progress in India-Pakistan relations is entirely compatible with a future as turbulent and inclined to conflict as ever in the past. This paradoxical circumstance was explained as a product of the bilateral relationship's other drivers, foremost among them the rapidly mounting regional rivalry over natural resources, specifically over energy and river water resources. These drivers, I said, were insufficiently counterbalanced by existing cooperative tendencies, neither in regard to energy and water resources themselves nor in regard to regional integration and economic trade.⁴⁶

When these sorts of political and strategic developments in the region are considered alongside steady enlargement of the region's conventional and nuclear weapons stockpiles as well as the divisive pressures exerted on the region by great power rivalries, it is clear that the road to heightened regional cooperation in regard to water security and for mitigating conflict over water resources in South Asia is bound to be long and bumpy.

⁴⁵ Wirsing and Jaspardo, 'River Rivalry', pp. 235-238.

⁴⁶ Robert Wirsing, 'The Progress of Détente in India-Pakistan Relations: New Chapter or Strategic Charade?' in *Pakistan in Regional & Global Politics*, Jetly, editor (London: Routledge, forthcoming 2008). See also my article 'In India's Lengthening Shadow: The US-Pakistan Strategic Alliance & the War in Afghanistan', *Asian Affairs*, v. 34, n. 3 (Fall 2007): 151-172.

CONCLUSION

So is there a water war in South Asia's future? A recent article in *The Economist*, bearing the provocative title "Rivers and Conflict: Streams of Blood, or Streams of Peace", would lead one to think not. The article questions the plausibility of "the idea of countries marching to battle to get water, or to defend it, ..."; and it ridicules the notion that water-scarce nations trapped on the weaker side of an asymmetrical power relationship are going to take up arms to increase their share of water. Focused mainly on Africa's many contested rivers, the article's sole mention of South Asia is to congratulate it for the robustness of the Indus river pact between India and Pakistan. The article is by no means, however, altogether optimistic. It concedes that "the doom-mongers do have a point", namely that "drought, desertification and food shortage are among the factors that foment conflict within states by tipping some areas, at least, into social collapse". It also concedes that "conflicts of interest over water can certainly poison inter-state relations, even when an imbalance of power is so great that the aggrieved party could never consider using force". It highlights a mounting annual death toll from battles over water in parts of Africa, and it anticipates that changing climatic conditions may well "put the toll into the tens of thousands". In the end, while acknowledging that such grim forecasts do not "add up to a real war between proper armies", the article concludes that "a thirsty planet is unlikely to be a stable and peaceful one".⁴⁷

The question of water war's future likelihood in South Asia defies an easy answer, and I am not able to answer it in terms a great deal more definite than those used in *The Economist* article. From all that's been said in this essay, however, one should certainly gather that I am not optimistic on this count. Rapidly growing pressures on the region's water resources clearly increase the potential for serious interstate confrontations. So far, there are few signs that the region's governments are gearing up sufficiently to deter them. It may comfort some to think that the advent of super-weapons and globalization rules out interstate war for any reason, water included. For myself, however, the words of *Der Spiegel*'s senior correspondent Gabor Steingart in his recent book *The War for Wealth* are more persuasive. Dismissing as fallacy the notion that "globalization is a great work of peace", Steingart writes:

Despite the international flow of goods and intensive interdependence in commerce, the risk of armed conflicts has certainly not diminished. The rise of Asia is accompanied by intense nervousness on the continent itself. Asia's newly acquired economic strength has boosted the Asians' self-confidence and intensified their mutual mistrust. Economic imbalance—both within and between nations—has incredibly explosive potential. Asia is experiencing the rebirth of nationalism all across the continent.⁴⁸

⁴⁷ 'Rivers and Conflict: Streams of Blood, or Streams of Peace', *Economist.com*, 5 May 2008, at: http://www.economist.com/world/international/displaystory.cfm?story_id=11293778, sighted on 9 May 2008.

⁴⁸ Gabor Steingart, *The War for Wealth: The True Story of Globalization, or Why the Flat World Is Broken* (New York: McGraw-Hill, 2008), p. 17.

Increased basin-wide cooperation over water resources is one possible—and, indeed, highly desirable—outcome of the developments we've been considering. Realistically speaking, however, it is important to acknowledge that a perhaps equally possible outcome, however undesirable and whatever may be the mixture of conflict drivers, is water war.

BIBLIOGRAPHY

- Abbas, Zaffar. 'Musharraf Wades into Water Conflict', *BBC News*, 13 September 2003, at: http://www.newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk/2/hi/south_asia/310690, sighted on 26 April 2008.
- Alam, Undala Z. *Water Rationality: Mediating the Indus Waters Treaty*, unpublished doctoral dissertation, submitted to the Department of Geography, University of Durham, UK, in September 1998.
- Alastair Lamb, *Birth of a Tragedy: Kashmir 1947* (Hertingfordbury: Roxford Books, 1994), p. 169.
- Bagchi, Indrani. 'China Agrees to Discuss River-Sharing', *The Times of India*, 9 September 2007, at: <http://www.timesofindia.indiatimes.com/articleshow/msid-2351389,prtpage-1.cms>, sighted on 3 May 2008.
- Baid, Samuel. 'Not Kashmir but Kashmir's Water Is the Core Issue for Pakistan', *Greater Kashmir*, 28 March 2005, at: http://www.strategicforesight.com/sfgnews_106.htm, sighted on 26 April 2008.
- Bajpae, Chietigi. 'Asia's Coming Water Wars', *Power and Interest News Report* (PINR), 22 August 2006, at: http://www.pinr.com/report.php?ac=view_report&report_id=545&language_id=1, sighted on 12 November 2007.
- Briscoe, John. *India's Water Economy: Bracing for a Turbulent Future*, draft of 25 June 2005 (New Delhi: The World Bank, 5 October 2005), p. 31, at: <http://go.worldbank.org/QPUTPV5530>, sighted on 19 April 2008.
- Brooks, Nina. 'Imminent Water Crisis in India', *World's Biggest Problems*, Arlington Institute, August 2007, at: <http://www.arlingtoninstitute.org/wbp/global-water-crisis/606>, sighted on 25 September 2007.
- Chellaney, Brahma. 'China Aims for Bigger Share of South Asia's Water Lifeline', *The Japan Times*, 2 July 2007, reprinted in *YaleGlobal Online*, at: <http://www.yaleglobal.yale.edu/display.article?id=9377>, sighted on 20 September 2007.
- Fida, Hussain. 'Afghanistan to Utilize Kabul River Water if KBD [Kalabagh Dam] Not Built', *Daily Times*, 26 January 2006, at: http://www.dailytimes.com.pk/print.asp?page=2006/01/26/story_26-1-2006_pg7_39, sighted on 3 May 2008.
- Gulhati, N. D.. *Indus Waters Treaty: An Exercise in International Mediation* (Bombay: Allied Publishers, 1973).
- Korbel, Josef. *Danger in Kashmir*, revised edition (Princeton: Princeton University Press, 1966), p. 139.
- McLoughlin, Patrick. 'Scientists Say Risk of Water Wars Rising', *Reuters News Service*, 23 August 2004, at: <http://www.planetark.com/dailynewsstory.cfm/newsid/26728/story.htm>, sighted on 12 November 2007.

- Menon, M. S. 'China Aggressive on Tibetan Rivers', *The Tribune*, 26 December 2007, at: <http://www.tribuneindia.com/2007/20071226/edit.htm#8>, sighted on 3 May 2008.
- Mirza, Nasrullah M. 'Water, War, and Peace: Linkages and Scenarios in India-Pakistan Relations', Working Paper No. 37, *Heidelberg Papers in South Asian and Comparative Politics* (South Asia Institute, University of Heidelberg, February 2008), p. 2.
- Mirza, M. Monirul. (ed.), *Ganges Water Diversion: Environmental Effects and Implications* (New York: Springer-Verlag, 2004).
- Nankivell, Nathan. 'The National Security Implications of China's Emerging Water Crisis', *China Brief* (The Jamestown Foundation), v. 5, n. 17, 2 August 2005, at: http://www.jamestown.org/print_friendly.php?volume_id=408&issue_id=3422&article_id, sighted on 13 September 2007.
- Nickum, James E. 'The Status of the South to North Water Transfer Plans in China', United Nations Development Program report, 2006, at: http://www.hdr.undp.org/en/reports/global/hdr2006/papers/james_nickum_china_water_transfer.pdf, sighted on 4 May 2008.
- Salman, S. M. A. and K. Uprety, *Conflict and Cooperation on South Asia's International Rivers: A Legal Perspective* (Washington, DC: The World Bank, 2002), pp. 125-191.
- Sengupta, Somini. 'In Teeming India, Water Crisis Means Dry Pipes and Foul Sludge', *The New York Times*, 29 September 2006, at: <http://www.nytimes.com/2006/09/29/world/asia/29water.html?pagewanted=print>, sighted on 4 May 2008.
- Smith, Russell. 'Africa's Potential Water Wars', *BBC News Online*, 15 November 1999, at: <http://www.news.bbc.co.uk/2/hi/africa/454926.stm>, sighted on 12 November 2007.
- Specter, Michael. 'The Last Drop: Confronting the Possibility of a Global Catastrophe', *The New Yorker*, 23 October 2006, at: http://www.newyorker.com/archive/2006/10/23/061023fa_fact1?printable=true, sighted on 26 April 2008.
- Starr, Joyce R. 'Water Wars', *Foreign Policy*, v. 82 (Spring 1991): 17-36.
- Steingart, Gabor. *The War for Wealth: The True Story of Globalization, or Why the Flat World Is Broken* (New York: McGraw-Hill, 2008), p. 17.
- Taufiq A. Siddiqi and Shirin Tahir-Kheli, *Water Demand-Supply Gaps in South Asia and Approaches to Closing the Gaps*, v. 1, Project on Water and Security in South Asia (Honolulu: Global Environment and Energy in the 21st Century, 2003), Table 4, p. 18.
- Vandana Shiva, *Water Wars: Privatization, Pollution, and Profit* (South End Press, 2002).

- Victor, David G. 'What Resource Wars?', *The National Interest online*, 12 November 2007, at: <http://www.nationalinterest.org/PrinterFriendly.aspx?id=16020>, sighted on 28 February 2008.
- Victor, David G. 'Smoke and Mirrors', *The National Interest online*, 2 January 2008, at: <http://www.nationalinterest.org/PrinterFriendly.aspx?id=16522>, sighted on 24 March 2008.
- Ward, Diane Raines. *Water Wars: Drought, Flood, Folly and the Politics of Thirst* (Riverhead, 2002).
- Wirsing, Robert G. 'The Progress of Détente in India-Pakistan Relations: New Chapter or Strategic Charade?' in *Pakistan in Regional & Global Politics*, Jetly, editor (London: Routledge, forthcoming 2008).
- Wirsing, Robert G. 'In India's Lengthening Shadow: The US-Pakistan Strategic Alliance & the War in Afghanistan', *Asian Affairs*, v. 34, n. 3 (Fall 2007): 151-172.
- Wirsing Robert G. and Christopher Jasparro, 'River Rivalry: Water Disputes, Resource Insecurity and Diplomatic Deadlock in South Asia', *Water Policy*, v. 9, n. 3 (May 2007): 231-251.
- Wirsing, Robert G. 'Hydro-Politics in South Asia: The Domestic Roots of Interstate River Rivalry', *Asian Affairs*, v. 34, n. 1 (Spring 2007): 4.
- Wolf, Aaron T. 'Conflict and Cooperation along International Waterways', *Water Policy*, v. I, n. 2 (1998): 251-265.
- Yardley, Jim. 'Beneath Booming Cities, China's Future Is Drying Up', *The New York Times*, 28 September 2007, at: <http://www.nytimes.com/2007/09/28/world/asia/28water.html?pagewanted=print>, sighted on 27 September 2007.

REPORTS/NEWSPAPERS

- Asian Development Bank, 'Country Paper: Pakistan', *Asian Water Development Outlook 2007* (Tokyo: Asia-Pacific Water Forum, 2007).
- Climate Change 2007: Synthesis Report*, Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Geneva: IPCC, 2008).
- Climate Change 2007: Impacts, Adaptation and Vulnerability*, Summary for Policymakers, 13 April 2007, at: <http://www.ipcc.ch>, sighted on 4 April 2008.
- 'Dhaka-Calcutta Train Link Resumes', *BBC News*, 14 April 2008, at: http://www.newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk/2/hi/south_asia/7345724, sighted on 8 May 2008.
- Economic Survey of Pakistan 2006-07*, p. 248, at: <http://www.accountancy.com.pk>, sighted on 14 April 2008.

'IPI Gas Pipeline to Be Finalized in 45 Days: Iran', *indiaserver.com*, 30 April 2008, at: <http://www.india-server.com/news/ipi-gas-pipeline-to-be-finalized-in-45-677.html>, sighted on 8 May 2008.

Madrid Declaration on Environment and Security, Ministerial Council of the Organization for Security & Co-operation in Europe (OSCE), 30 November 2007, at: http://www.osce.org/documents/mcs/2007/12/28657_en.pdf, sighted on 4 April 2008.

Ministry of Water Resources, Government of China, *Basic Readiness of Preparation Work for South-to-North Water Transfer Project* (14 November 2000), at: <http://www.nsb.gov.cn/nsbd/news/j20011120.htm>, sighted on 25 September 2007.

National Security and the Threat of Climate Change (Alexandria, VA: CAN Corporation, April 2007), pp. 24-27, at: <http://www.SecurityAndClimate.cna.org>, sighted on 4 April 2008.

National Security & the Threat of Climate Change, Report of the Military Advisory Board, 2007, at: <http://www.securityandclimate.cna.org/report/National%20Security%20and%20the%20Threat%20of%20Climate%20Change.pdf>, sighted on 4 April 2008.

Pakistan Strategic Country Environmental Assessment Report 2006, cited in *Pakistan's Waters at Risk*, Special Report (Lahore: World Wildlife Foundation, February 2007), p. 1. 'Rivers and Conflict: Streams of Blood, or Streams of Peace', *Economist.com*, 5 May 2008, at: http://www.economist.com/world/international/displaystory.cfm?story_id=11293778, sighted on 9 May 2008.

'South-North Water Diversion Project to Benefit 300 Million Chinese', *People's Daily Online*, 26 December 2001, at: http://www.english.people.com.cn/200112/26/print20011226_87477.html, sighted on 13 September 2007.

World Bank report *Water Economy: Running Dry*, Report No. 34081-PK (Washington, DC: World Bank, 14 November 2005).