Reconsidering the Indus Waters Treaty

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I. INTRODUCTION

The first sentence of the 1960 Indus Waters Treaty states the intention of treaty parties India and Pakistan to "attain[] the most complete and satisfactory utilisation of the waters of the Indus system."[1] To that end, India and Pakistan dispensed with the customary international norms governing the sharing of international river waters

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1. Indus Waters Treaty, India-Pak., pmbl., Sept. 19, 1960, 419 U.N.T.S., *available at* http://treaties.un.org/doc/Publication/UNTs/Volume%20419/volume-419-I-6032-English.pdf. The "waters of the Indus system" are divided by the treaty into the "Eastern Rivers"—which include the Sutlej, Beas, and Ravi—and the "Western Rivers"—which include the Indus, Jhelum, and Chenab. *Id.* art. I(5).

and partitioned the rights to the rivers of the Indus basin between themselves.[2] The Indus Waters Treaty has proven to be resilient—surviving a half-century of tumultuous political relations and multiple armed conflicts between India and Pakistan. Both the treaty and its model for water sharing, in light of its durability, have been praised by political commentators for their "wisdom and far-sightedness."[3]

This Article examines whether the water-sharing regime established by the treaty optimally utilizes the waters of the Indus system and whether the treaty regime is still appropriate given the changes in the demand, uses, and politics of water in India and Pakistan over the past five decades.[4] This Article sketches the preliminary contours of what a revised water-sharing arrangement between India and Pakistan should look like. Using the model of integrated basin development from the Indo-Nepalese Mahakali River Treaty as a starting point, this Article proposes a jointly administered water-sharing regime that emphasizes efficient utilization and development of the Indus basin, the use of water cooperation as a confidence-building measure to facilitate the peace process in Kashmir, and the need to tailor any water-sharing regime to the particular needs of India and Pakistan.

II. THE INDUS WATERS TREATY

A. From Partition to the Bargaining Table

Disputes over the Indus waters predate the independence of the subcontinent from British Rule. Even within British India, disagreements between the provinces of Punjab and Sindh—which had agrarian

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2. *Id.* art. II(1) pmbl. ("All the waters of the Eastern Rivers shall be available for the unrestricted use of India . . . ."); *id.* art III(1) ("Pakistan shall receive for unrestricted use all those waters of the Western Rivers which India is under obligation to let flow under the provisions of Paragraph (2).").

3. Surya P. Subedi, *Hydro-Diplomacy in South Asia: The Conclusion of the Mahakali and Ganges River Treaties*, 93 AM. J. INT'L L. 953, 953 (1999). For a discussion of popular and scholarly praise for the treaty, see *infra* notes 48-54 and accompanying text.

4. This Article joins a growing chorus in South Asia calling for a change in how the water rights to the Indus basin rivers are administered. Although there is much discontent with the current regime in both countries—in the public, media, and government—this Article takes up the debate advanced by South Asian water experts B.G. Verghese and Ramaswamy R. Iyer, both of whom have called for a departure from the current regime. *See, e.g.*, B.G. Verghese, *It's Time for Indus-II*, TRIBUNE (Chandigarh, India), May 26, 2005, *available at* http://www.tribuneindia.com/2005/20050526/edit.htm#4; Ramaswamy R. Iyer, *Indus Treaty: A Different View*, 11 ECON. & POL'Y WKLY. 3144 (2005). While both scholars have suggested the mechanism for change—renegotiation within the existing framework for Verghese, and an entirely new regime for Iyer—this Article attempts to supply the vision of what an end-state arrangement should look like.

economies and a high demand for irrigation[5]—led to the establishment of formal dispute resolution commissions.[6] Due to the heavy variability of water availability in the Indus basin and the necessity of irrigated agriculture in the semiarid climate, Punjab and Sindh created irrigation canals and infrastructure along the Sutlej and Indus rivers, because the terrain rendered it the most cost-effective location.[7] The provincial government of Sindh was concerned that Punjabi irrigation works on the Sutlej would disrupt the water inflow to the Indus, thus undermining Sindhi irrigation.[8] This dispute led to the formation of two commissions: the 1935 Anderson Commission and the 1941 Rau Commission.[9] Before the provinces could reach a final agreement, the subcontinent was partitioned in 1947.[10] The resulting international boundary between India and Pakistan was drawn through the state of Punjab.[11] As a result, the irrigation infrastructure created by the provinces was decapitated: the "headworks (structures controlling water flow) [were now] in upstream India, and the dependent canals in downstream Pakistan."[12] This problem was compounded by the increased stakes: equitable division of the Indus waters now implicated the agricultural lifelines of the incipient nations.

In the immediate aftermath of the subcontinent's partition, the governments of East and West Punjab, now part of India and Pakistan, respectively, signed temporary agreements in order to maintain the supply of water to Pakistani irrigation works.[13] However, the agreements expired on March 31, 1948, and East Punjab shut off the flow of water to Pakistan the following day, threatening the Pakistani winter harvest.[14] Scholars have argued that the 1948 water stoppage triggered the Pakistani realization of its weak bargaining position vis-à-vis India, which controlled the flow of water as the upper riparian.[15] Pakistan responded to the stoppage by attempting to secure both short-term and long-term access to water. First, Pakistani Prime Minister Liaquat Ali Khan appealed to India's Prime Minister Jawaharlal Nehru to personally

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5. Undala Z. Alam, *Questioning the Water Wars Rationale: A Case Study of the Indus Waters Treaty*, 4 GEO. J. 341, 342 (2002).
6. *Id.*
7. *Id.*
8. *Id.* at 350 n.4.
9. *Id.*
10. *Id.*
11. *Id.* at 342.
12. *Id.*
13. *Id.* at 343.
14. *Id.*
15. *See* ELLI LOUKA, INTERNATIONAL ENVIRONMENTAL LAW: FAIRNESS, EFFECTIVENESS, AND WORLD ORDER 212 (2006); Alam, *supra* note 5, at 342.

ensure "immediate restoration of the water supply."[16] Second, Pakistan proposed an inter-dominion conference, which resulted in the 1948 Delhi Agreement under which both states agreed to recognize and respect the other's need for water from the Sutlej while establishing a framework to continue negotiations.[17]

The compromise brokered by the Delhi Agreement quickly began to disintegrate. Undala Alam cataloged the litany of grievances that led to the unraveling of the 1948 agreement:

> Over the next three years [after the Delhi Agreement] bilateral attempts to resolve the Sutlej River dispute failed, including Pakistan's proposal to submit the dispute to the International Court of Justice (ICJ) which India refused. The Sutlej River dispute was heightened by differing interpretations of the Delhi Agreement and the resultant water use allowed to India and Pakistan. . . . India's refusal to submit the case to the ICJ stemmed from a 'feeling that a purely legal evaluation of the situation would favor Pakistan.' Pakistan believed that India was unwilling to 'test its unilateral interpretation' of the Delhi Agreement which it saw as allowing it to diminish water to Pakistan.[18]

Due to India and Pakistan's inability to find any common ground regarding an equitable division of the Sutlej, the Delhi Agreement did nothing more than merely "acknowledge there was a dispute in which both sides had legitimate claims."[19] Pakistan continued to fear that India would abuse its status as the upper riparian. This fear led Pakistan to materially breach the terms of the Delhi Agreement, with regard to reimbursements, in order to protest the agreement.[20] India, unwilling to allow its construction plans on the Sutlej to be derailed, continued to insist its water works were legal under the agreement and that Pakistan lacked the authority to unilaterally terminate the Delhi Agreement.[21]

Both countries had applied to the World Bank for funding to construct irrigation projects on the Sutlej; unable to proceed while the dispute was pending, the Bank offered to mediate the dispute.[22] The

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16. Alam, *supra* note 5, at 343.

17. *See* Inter-Dominion Agreement on the Canal Water Dispute Between East and West Punjab, India-Pak., 794 U.N.T.S. 45, May 4. 1948, *available at* http://untreaty.un.org/unts/1_60000/2/12/00002552.pdf.

18. Alam, *supra* note 5, at 343. For a more detailed discussion of the failure of the 1948 Delhi Agreement, see Undala Z. Alam, Water Rationality: Mediating the Indus Waters Treaty (Sept. 1998) (unpublished Ph.D. dissertation, University of Durham), *available at* http://www.transboundarywaters.orst.edu/publications/abst_docs/related_research/Alam1998.pdf.

19. Alam, *supra* note 18, at 62.

20. *Id.*

21. *Id.*

22. *Id.*

World Bank's 1951 offer came against the backdrop of failed bilateral diplomacy. "The Pakistanis feared losing water . . . . The Indians feared having to limit the development . . . . [Both] feared having insufficient water . . . . [Negotiations were] haunted by what would be lost by each side, and not what stood to be gained by mutual cooperation."[23] There is no scholarly consensus on what brought India—the upper riparian—to agree to negotiate a compromise agreement. Much of the scholarly work on the Indus Waters Treaty suggests that the financial incentive—nearly $1 billion through the Indus Basin Development Fund—was a carrot that both India and Pakistan, in need of massive irrigation projects to meet agricultural demand, could not pass up.[24] However, other scholars have rejected a financial explanation, instead suggesting that the pressures of securing a consistent water supply[25] or preventing further challenges to ongoing construction projects on the Indus[26] motivated the countries to submit to World Bank mediation.

B. The Agreement: Negotiation and Terms

India and Pakistan accepted the World Bank's offer to mediate the treaty negotiations in 1951, and the discussions began in 1952 in Washington, D.C.[27] In offering its "good offices" to facilitate agreement, scholars have observed that the World Bank made two assumptions: "that the Indus river basin provided sufficient water for India and Pakistan [and] that the negotiations would put aside past grievances and retain a technical rather than a political focus."[28] As discussed in Part III, subsequent developments have shown these assumptions to be incorrect: the evolution in demand for water in both countries has rendered the Indus basin insufficient, while the technical aspects of the treaty have intermingled with the politics of the subcontinent in ways the negotiating parties could not have envisioned.

The first year of the negotiations was largely spent on fact-finding trips to the Indus basin, after which delegations from each side submitted

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23. *Id.* at 62-63.

24. *See, e.g.*, Asit K. Biswas, *Indus Waters Treaty: The Negotiating Process*, 17 WATER INT'L 201 (1992); Syeds Kirmani, *Water, Peace and Conflict Management: The Experience of the Indus and Mekong River Basins*, 15 WATER INT'L 200 (1990); Mikiyasu Nakayama, *Successes and Failures of International Organizations in Dealing with International Waters*, 13 INT'L J. OF WATER RES. DEV. 367 (1997).

25. Alam, *supra* note 5, at 346-47 (discussing the "water rationality" explanation).

26. Ramaswamy R. Iyer, Centre for Policy Research, Indus Treaty: A Different View 13 (2005), *available at* http://www.cprindia.org/papersupload/1215244080-Iyer_IndusTreaty.pdf.

27. Alam, *supra* note 5, at 344.

28. *Id.*

a proposed water-sharing arrangement.[29] Taking both plans into account, the World Bank released its compromise proposal—known as the 1954 Plan—which partitioned the Indus basin between the two parties.[30] Under the World Bank's proposal, India would receive exclusive rights to the three eastern rivers—the Sutlej, Beas, and Ravi, which constitute approximately twenty percent of the Indus waters—while Pakistan would receive the nonexclusive rights (India was allowed limited access for nonconsumptive uses) to the three western rivers—the Chenab, Jhelum, and the Indus, which constitute the remaining eighty percent.[31] Pakistan, fearing its water allocation would be inadequate, rejected the 1954 Plan which led the World Bank to propose a 1956 amendment that guaranteed Pakistan storage facilities on the western rivers.[32] From 1956 to 1958, India and Pakistan held a series of negotiations on short-term agreements to govern water allocation until a plenary agreement was reached, as well as to resolve issues related to the 1956 amendment.[33]

In 1958, the first President of Pakistan, Iskander Mirza, was sacked in a coup d'état by Ayub Khan, who immediately agreed to the World Bank's 1954 proposal and 1956 amendment; two years later the treaty was signed by both parties.[34] The final agreement granted Pakistan the rights over the western rivers, with minor exceptions for Indian nonconsumptive use; India received nearly parallel rights on the eastern rivers.[35] India was obligated to contribute £62 million to Pakistan over a ten-year period, primarily to help build the dams, canals, barrages, and tube wells, as required by the treaty.[36] The treaty contained provisions for data exchange, future cooperation, and the establishment of a Permanent Indus Commission to facilitate cooperation and serve as the first line dispute resolution mechanism.[37] In the event that the commissioners failed to resolve the dispute, the treaty provided for a "neutral expert" and, ultimately, a Court of Arbitration.[38]

This water-sharing model, in the view of some scholars, is most notable for its "abandonment of customary international norms governing internationally shared rivers. In particular, [the Treaty]

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29. *Id.*
30. *Id.* at 344-45.
31. *Id.* at 344. For the eventual codification of this arrangement, see Indus Waters Treaty, *supra* note 1, arts. II(1), III(1).
32. Alam, *supra* note 5, at 344.
33. *Id.*
34. *Id.*
35. Indus Waters Treaty, *supra* note 1, arts. II-III.
36. *Id.* art. V.
37. *Id.*
38. *Id.* arts. VIII-IX.

discarded the norms protecting the downstream country's traditional uses of the river waters, in place of which it offered geo-physical partition of the river system itself."[39] This model of physically dividing the rights to international river water "was conceivable only in the unique geographic and political circumstances of the Indus basin."[40] India's former Water Resources Secretary Ramaswamy Iyer has referred to the partitioning of water rights as a "coda to the partitioning of the land [in 1947],"[41] while Professor Robert Wirsing has labeled the division the "unfinished business" of the subcontinent's partition.[42] As discussed in Part III, while a "partition" of water may have been politically expedient given the bilateral relations in the 1950s, it has proven inadequate to address the demand faced by the Indus basin today—the inefficiencies and opportunity costs created by the model itself render it antiquated.

While the motivations for India to negotiate despite its superior bargaining position as the upper riparian have been discussed,[43] India's consent to a treaty that ostensibly favors Pakistan based on the percentage of water allocated (Pakistan's eighty to India's twenty)[44] is even more curious. The simplest explanation is that the raw percentage of water rights means little, because the location, quality, and flow are the factors that make certain tracts desirable, especially for India, which relies on hydroelectric power to supply its northern grid.[45] A more important factor, however, was that India's ability to earn exclusive rights over the eastern rivers—in effect, to have its international law obligations waived—was attractive enough to merit giving up its claim to eighty percent of the Indus basin waters. Iyer observes that during the negotiations for the Indus Treaty, India had been working on canal projects to reroute waters from the eastern rivers to Rajasthan for irrigation purposes; at least one major canal project was already in progress.[46] Without exclusive rights to the eastern rivers, "Pakistan would have had the usual lower-riparian rights over these rivers [under customary international law], and would have had to be consulted about these projects—and . . . would surely have raised objections. The

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39. ROBERT G. WIRSING & CHRISTOPHER JASPARRO, ASIA-PACIFIC CTR. FOR SEC. STUDIES, SPOTLIGHT ON INDUS RIVER DIPLOMACY: INDIA, PAKISTAN, AND THE BAGLIHAR DAM DISPUTE (May 2006), *available at* http://www.apcss.org/Publications/APSSS/IndusRiverDiplomacy.Wirsing.Jasparro.pdf.

40. *Id.*

41. Iyer, *supra* note 26, at 15.

42. *Id.*; WIRSING & JASPARRO, *supra* note 39.

43. *See supra* notes 24-26 and accompanying text.

44. Alam, *supra* note 5, at 344.

45. WIRSING & JASPARRO, *supra* note 39.

46. Iyer, *supra* note 26, at 13.

projects might not have come up at all, or might have had to be substantially smaller."[47] Thus, the treaty arrangement provided legal cover to India's projects while removing its largest obstacle—Pakistani complaints grounded in international law. While India did lose control over the western rivers, the future status of those rivers was shrouded in doubt because they all flow through the disputed territory of Kashmir. Thus, the treaty allowed India to gain exclusive control over rivers that flow through its territory, while mitigating the costs of future conflict in Kashmir.

C. Resilience and Disputes

The resilience of the Indus Waters Treaty has often led it to be declared the most successful cooperative venture between India and Pakistan. The treaty has earned international praise for governing the division of the Indus waters for a half-century, through multiple wars and deteriorations in bilateral relations.[48] Scholars have observed unexpected fidelity to the treaty obligations by both states—so much that "even when at war with each other, they have respected the sanctity of the Treaty and not attacked any facilities involved in sharing and distributing the waters of the river."[49] While heightened military tension, particularly in the aftermath of the Pakistani-sponsored attack on the Indian Parliament in 2001, has led to a groundswell of support within India to abrogate the Treaty, the Indian government has resisted the politicization of the issue.[50] Both states have used existing dispute resolution mechanisms—such as the Permanent Indus Commission—to resolve any doubt about their commitment.[51] The treaty has been praised for the "wisdom and far-sightedness" of the negotiations;[52] its emphasis on "hard" legalization, specifically its creation of obligations, use of delegation, and insistence on precision;[53] and its role as a confidence-building measure against the backdrop of the ongoing Indo-Pakistani peace process.[54]

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47. *Id.*

48. *Id.* at 3.

49. Subedi, *supra* note 3, at 953; *see also* Alam, *supra* note 5, at 349-50 (discussing water cooperation in the face of opposition to the treaty).

50. Alam, *supra* note 5, at 344.

51. *Id.*

52. Subedi, *supra* note 3, at 953.

53. Sandeep Gopalan, *From Darfur to Sinai to Kashmir: Ethno-Religious Conflicts and Legalization*, 55 BUFFALO L. REV. 403, 415 (2007).

54. James Kraska, *Sustainable Development Is Security: The Role of Transboundary River Agreements as a Confidence Building Measure (CBM) in South Asia*, 28 YALE J. INT'L L. 465, 485 (2003).

The treaty regime has survived both exogenous threats—wars, politicized calls for abrogation, and political instability—as well as endogenous threats—such as disputes over the treaty's terms and obligations. Threats in the latter category most often arise from Pakistani objections to Indian construction on the western rivers.[55] Scholars disagree on whether the Pakistani objections—which have been lodged all twenty-seven times India has proposed construction—are motivated by a genuine fear that India is abridging its treaty obligations, or the political concern that the projects will benefit Kashmir, earning India goodwill within the state.[56] The most recent dispute involved Pakistani objections to Indian construction on the Baglihar Dam, a 150-meter-tall dam on the Chenab with an expected capacity of 900 million watts.[57] Pakistan objected to the size of the dam's storage capacity, power intake tunnels, and spillways.[58] The failure of two formal rounds of negotiation led Pakistan to invoke the arbitration provisions of the treaty and, for the first time in its history, the appointment of a "neutral expert."[59] Raymond Lafitte, a Swiss engineer and dam expert, was appointed in 2005[60] and submitted his report in early 2007.[61] While both countries have claimed the report as a victory, Lafitte rendered a split decision, upholding certain Pakistani objections, concerning the storage capacity and intake tunnels, but denying others, including those concerning the spillways.[62]

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55. *See* WIRSING & JASPARRO, *supra* note 39,

56. *See id.* at n.4 (citing B.G. Verghese, *Fuss over Indus—I: India's Rights Are Set Out in the Treaty*, TRIBUNE (Chandigahr, India), May 25, 2005, *available at* http://www.tribuneindia.com/2005/20050525/edit.htm#4); Iyer, *supra* note 26, at 12.

57. Salman M.A. Salman, *The Baglihat Difference and Its Resolution Process—Triumph for the Indus Waters Treaty?*, 10 WATER POL'Y 105, 110 (2008).

58. WIRSING & JASPARRO, *supra* note 39.

59. *Id.*

60. Press Release, Dale Lautenbach, World Bank, World Bank Names Neutral Expert on Baglihar (May 10, 2005), *available at* http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/0,,contentMDK:20485918~pagePK:146736~piPK:146830~theSitePK:223547,00.html.

61. Press Release, Erik Nova, World Bank, Bhglihar Decision To Be Released to India and Pakistan on Monday, February 12, 2007 (Feb. 8, 2007), *available at* http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:21213306~pagePK:34370~piPK:34424~theSitePK:4607,00.html.

62. RAYMOND LAFITTE, BAGLIHAR HYDROELECTRIC PLANT: EXPERT DETERMINATION ON POINTS OF DIFFERENCE REFERRED BY THE GOVERNMENT OF PAKISTAN UNDER THE PROVISIONS OF THE INDUS WATERS TREATY 13, 19 (2007), *available at* http://www.pakistan.gov.pk/ministries/water-power-ministry/media/SUBMISSION-BHP/10/6Summary.pdf; *see also* Anwar Iqbal & Khaleeq Kiani, *World Bank's Baglihar Verdict May Not End Dispute*, DAWN (Karachi, Pak.), Feb. 10, 2007, *available at* http://www.dawn.com/2007/02/10/top5.htm; Amit Baruah, *Baglihar: Pakistan's Demand Rejected*, HINDU (Chennai, India), June 21, 2005, *available at* http://www.hindu.com/2005/06/21/stories/2005062105511400.htm.

III. GROWING DISCONTENT

The Indus Waters Treaty, while a prudent short-term solution to Pakistan's water needs and India's construction interests in 1960, is now antiquated both in its specific terms and broader approach to water sharing. Calls for change—whether it be renegotiation, abrogation, or an entirely new framework—have grown common in South Asia, particularly in India and Indian-administered Kashmir. Given the drastic changes in the uses, demand, and politics of water in the subcontinent, the Indus Waters Treaty is failing the needs of both states while also imposing negative externalities on the political and ecological health of Kashmir. This Article argues that the current model is both misguided and insufficient as a water-sharing regime in South Asia. Specifically, the treaty regime suffers from three key infirmities: (1) it is inadequate in light of the growing demand for water, (2) its model for water sharing is premised on faulty political assumptions, and (3) it fails to facilitate the joint development of the Indus basin and the Kashmiri peace process.[63]

While this Article's critique of the Indus Waters Treaty and its proposed replacement model are specific to the water and politics of South Asia, the water-sharing issues implicated by this Article are of broader importance. Water experts estimate that nearly 150 countries rely on shared international waters for secure access to a fresh water supply.[64] While the concept of resource wars—or in this case, water conflict—is not new, global trends suggesting vast increases in demand for fresh water have resulted in an increased risk of hostility and conflict between states sharing a fresh water supply.[65] Greater attention to the structure of water-sharing agreements is warranted, lest the warning of scholars that "unless more progress is made in negotiation cooperative arrangements, growing scarcity combined with rising population will produce an increasingly unstable environment" be ignored.[66]

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63. *See* Indus Waters Treaty, *supra* note 1.

64. Aaron T. Wolf et al., *International River Basins of the World*, 15 INT'L J. WATER RES. DEV. 387, 392 (1999).

65. Stephen Leahy, *Thirstier World More Likely To See More Violence*, INTER-PRESS SERVICE, Mar. 16, 2007, http://ipsnews.net/print.asp?idnews=36963; John Vidal, *Cost of Water Shortage: Civil Unrest, Mass Migration and Economic Collapse*, GUARDIAN, Aug. 17, 2006, at 25, *available at* http://www.guardian.co.uk/environment/2006/aug/17/water.internationalnews.

66. MICHAEL KLARE, RESOURCE WARS: THE NEW LANDSCAPE OF GLOBAL CONFLICT 147 (2001).

A. An Antiquated Approach to Demand

The Indus Waters Treaty addresses the problem of supply by partitioning the Indus river basin between India and Pakistan, but is agnostic with regard to managing the respective demands of each country. The treaty seeks to "settle with one stroke" the water-sharing dilemma in South Asia, as opposed to a more comprehensive and flexible agreement designed to anticipate and adjust to changing water conditions.[67] While the treaty was an effective solution to the immediate problems facing the subcontinent—Pakistan's fear of water stoppage and India's desire to continue using water from the eastern rivers for irrigating Rajasthan—by assuring both countries of a short-term supply, it failed to protect, or even consider, their evolving long-term interests. This problem is not unique to South Asia: despite the fact that "increasing demand from all riparians is raising critical doubt about the continuation of every water-sharing" regime, riparian agreements across the globe—including those on the Zambezi, Okavango, Limpopo, Mekong, Jordan, Mahakali, Ganges, Nile, Euphrates, and Tigris—have "only tried to address the supply side."[68] One of the underlying assumptions upon which the Indus Waters Treaty was predicated was the World Bank's belief that "the Indus basin had enough water for both countries."[69] However, the population trajectory and multiplying uses for water in South Asia have fundamentally changed the demand of water, rendering the treaty's core assumption obsolete.

The water crisis in South Asia is not isolated, but part of a global shortage of water in the face of rising demand. The United Nations estimates that only three percent of the global water supply is fresh, and less than one percent is actually accessible; more than two-thirds of the world's fresh water is frozen while a majority of the unfrozen fresh water is underground in soil and aquifers.[70] Experts estimate that one-third of the global population—two billion people—already lack adequate access to water, while the demand for water, primarily the result of agricultural demands, is increasing at a rate even higher than population growth.[71]

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67. WIRSING & JASPARRO, *supra* note 39.

68. ERIN BLANKENSHIP, KASHMIRI WATER: GOOD ENOUGH FOR PEACE? 9, http://www.pugwash.org/reports/rc/sa/kashmirwaterpeace.pdf (last visited Apr. 23, 2008).

69. Alam, *supra* note 5, at 344.

70. Sandra L. Postel, Gretchen C. Daily & Paul R. Ehrlich, *Human Appropriation of Renewable Fresh Water*, 271 SCIENCE 785 (1996).

71. Blankenship, *supra* note 68, at 2 ("Currently 2 billion people do not have enough water for even basic needs, approximately one third of the world's population. Increasing demands from exploding populations is exacerbated as these societies become more affluent and developed because as such they tend to use more water. While the world's population doubled

The statistical trends in South Asia for both population growth and consumption growth are cause for concern. Studies have projected that, compared to population statistics at the turn of the twenty-first century, India's population will have increased nearly sixty percent, while Pakistan's population size will have swelled almost a staggering 150% by 2050.[72] The statistic that speaks more directly to the antiquated nature of the Indus Waters Treaty is that by 2025, India's population is expected to be three times greater, and Pakistan's population is expected to be more than six times greater, than as of the treaty's signing in 1960.[73]

Similarly, the baseline demand for water in South Asia, primarily driven by energy and agricultural needs, is inherently high given the ecological and geographic attributes of the basin, but has also been growing at a rate that places both India and Pakistan at the World Bank's "water stress" point.[74] First, the Indus basin is primarily an agrarian economy—given its semiarid climate, sufficient irrigation is crucial to maintain agricultural viability.[75] Second, the difficulties of providing adequate irrigation are compounded by the "large seasonal and annual variability" of the Indus basin; while the aggregate annual water runoff is high, variability and inconsistency in water flow throughout the year requires considerable irrigation works and water storage.[76] In addition to the agricultural demands and variability, the heat, population growth, need for potable water, and hydroelectric power projects all burden South Asia's limited water supply.

Despite the water allocation under the Indus Waters Treaty, neither country's water profile is stable. India has seen its per capita availability of water drop sixty percent since signing the treaty, from 5000 to 1800 cubic meters per person, which is a reduction that will be repeated over the next half-century.[77] Many Indian states are already below the World Bank's "water stress" limit per person per year, and some of those are

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between 1950 and 1990, global water use increased by 300 percent . . . . '[W]ater usage has increased by six times in the past 100 years and will double again by 2050, driven mainly by irrigation demands of agriculture.'" (quoting Frank Rijsberman, Dir., Int'l Water Mgmt. Inst.)).

72. WORLD RES. INST., *Anticipated Population Growth in Selected Countries of the Jordan, Tigris-Euphrates, and Indus River Basins*, *in* WORLD RESOURCES 1998-99: ENVIRONMENTAL CHANGE AND HUMAN HEALTH 244 (1998).

73. *See* KLARE, *supra* note 66, at 187; Blankenship, *supra* note 68, at 4.

74. WIRSING & JASPARRO, *supra* note 39.

75. Alam, *supra* note 5, at 342.

76. *Id.*; *see also* FOOD & AGRIC. ORG., IRRIGATION IN THE NEAR EAST REGION WATER REPORT 9 (1997).

77. SUNDEEP WASLEKAR, THE FINAL SETTLEMENT: RESTRUCTURING INDIA-PAKISTAN RELATIONS 54-62 (2005).

approaching the "water scarce" threshold.[78] States in the northern plains of India, such as Punjab and Haryana, as well as the Deccan plains, such as Karnataka and Tamil Nadu, have seen water levels drop at an annual rate of five percent or higher, which has led to internal disputes about water sharing and allocation outside of the Indus basin.[79] Pakistan, as it was prior to the negotiation of the treaty, finds itself in a dire situation with respect to water supply. With a national average of twelve hundred cubic meters per person (or even lower according to other studies),[80] groundwater loss documented throughout the country,[81] and an inability to fill its two largest water reservoirs,[82] Pakistan's national per-capita-availability-of-water statistics show a country fast approaching the water stress point. For a country that depends on the Indus basin for ninety percent of its irrigation needs[83] and is already facing a massive food and grain shortage, the inadequate water supply, which is compounded by the fact that high levels of water silt in the Indus are rendering stored water useless,[84] threatens to undermine the backbone of the Pakistani economy.[85] Experts predict that, at the very least, "Pakistani farmers may be forced to change to higher yielding earlier maturating crops, modify their sowing patterns, and employ micro irrigation in coming years to mitigate shortages—all of which will entail higher costs."[86]

The Indus Waters Treaty was not designed to respond to rapidly increasing demand and the looming South Asian water crisis. The treaty was designed on the assumption that the Indus waters were sufficient to supply the region and operates with a sole focus on equitably dividing the rights to the water supply among the antagonistic states. The "partitioning" of Indus waters, which was blind to the future demand and politics of water, represents an early-twentieth-century response to a decidedly twenty-first-century problem. Under the treaty's model, the prudence of division with regard to efficiency, productivity, cooperation,

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78. Blankenship, *supra* note 68, at 4.

79. *Nor Any Drop To Drink: Water in India*, ECONOMIST, Aug. 24, 2002, at 49.

80. Subrahmanyam Sridhar, The Indus Waters Treaty, http://www.bharat-rakshak.com/SRR/Volume13/sridhar.html (last visited Feb. 12, 2009) ("Pakistan faces one of the severest water shortages in the world as seen in its' per capita availability of water per annum fall from 5300 m^3 in 1951 to less than 1100 m^3 today. This figure is alarming given that it is below the internationally recommended level of 1500 m^3 and precariously close to the critical 1000 m^3 level.").

81. WASLEKAR, *supra* note 77, at 54-62.

82. Sridhar, *supra* note 80.

83. ASHOK SWAIN, MANAGING WATER CONFLICT: ASIA, AFRICA AND THE MIDDLE EAST 46 (2004).

84. Blankenship, *supra* note 68, at 4.

85. Sridhar, *supra* note 80.

86. *Id.*

and joint development of the basin in order to maximize its water potential is not considered. The treaty regime offers no flexibility to account for increasing demand, limited supply, emergency droughts, systemic water shortage, or any variation in conditions.[87] In spite of the treaty's guarantee of water access, both states are facing severe water shortages under the current regime: Pakistan's agricultural output is threatened, while India has been forced to look beyond its borders for energy, despite 15,000 MW of untapped hydroelectric potential on the western rivers.[88] If the treaty's purported goal of "attaining the most complete and satisfactory utilisation of the waters of the Indus system"[89] is to be realized, the rigid division enforced by the treaty must be abandoned in favor of an arrangement that facilitates greater cooperation and seeks the most efficient use of the Indus waters. Clearly, the Indus Waters Treaty has proven inadequate to meet the current needs of India and Pakistan, much less the future ones.

B. A Political Miscalculation

Much like the Indus Waters Treaty's assumptions about water demand, the political assumptions held by the negotiators have grown outdated. While political stability and levels of rapprochement cannot be quantified like water levels and agricultural data, the evolving relationship between India and Pakistan makes a new treaty regime both possible and desirable. Given the developing bilateral relationship between the two countries, the model adopted by the Indus Waters Treaty—that of partitioning a limited resource between two antagonistic states with the primary purpose of avoiding conflict—is no longer sufficient. The treaty was designed to manage the relationship between two insipient, insecure, and antagonistic states. India and Pakistan, while a far cry from being staunch allies, have come to embrace their inevitable interdependence to the extent that cooperation for mutual benefit is politically viable in both countries.[90] This Subpart highlights the ways in

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87. Some commentators have suggested that the constant and minor Pakistani objections to any Indian construction on the rivers, as well as the lack of Pakistani cooperation, "are partly to force India to amend the [treaty] to accommodate the emerging patterns of water use in Pakistan[,] such as water sharing during periods of shortage—a situation not envisaged in the treaty." *See id.*

88. Blankenship, *supra* note 68, at 8.

89. Indus Waters Treaty, *supra* note 1.

90. *E.g.*, Embassy of India, India Pakistan Dialogue: Economic & Commercial Cooperation (Nov. 10, 1998), http://www.indianembassy.org/South_Asia/Pakistan/indpak(commerce).htm.

which the Indus Waters Treaty is politically imprudent, both in its design and execution.

1. Overstated Antagonism

The treaty's model assumes an overstated level of antagonism between India and Pakistan. The Indus Waters Treaty is designed to "settle with one stroke" any controversy over the allocation of the Indus waters.[91] It sets aside discussion of how to best jointly utilize the waters, cooperate over development and sharing, or optimally respect lower riparian rights—instead bluntly dividing and distributing exclusive rights. The only interaction that the treaty envisions between the two countries is, tellingly, dispute resolution, for which the treaty establishes an elaborate mechanism of commissioners, neutral experts, and mediation. Relations between India and Pakistan at present and the prospects for conflict and cooperation are markedly different than they were at the signing of the treaty. There are a number of factors that have driven this evolution, including public opinion, an increasing military disparity, globalization and the recognition of economic interdependence, and nuclear proliferation along with the increased costs of war. The relevant changes, however, are not these theoretical developments but the tangible changes they have produced on the ground.

The last few years have witnessed a radical departure from the conventional narrative of Indo-Pakistani antagonism. While relations between the South Asian states are still burdened by mutual suspicion and mutually exclusive interests, political space to facilitate cooperation has developed. This fundamental change is rooted in the post-Kargil War diplomatic overtures between the two countries; while the 2001 Agra summit failed to make much headway, the efforts of Prime Minister Vajpayee (until losing power in 2004) and President Musharraf, to cease hostilities and seek reconciliation, altered the political landscape.[92] Both countries were able to take measured yet historic steps—cooperating over bus and train transportation links, hosting "cricket diplomacy," negotiating a potential Iran-Pakistan-India natural gas pipeline, collaborating in the aftermath of the 2005 earthquake, and putting together working groups on issues such as the Siachen Glacier dispute.[93]

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91. WIRSING & JASPARRO, *supra* note 39.

92. B. RAMIN, S. ASIA ANALYSIS GROUP, MUSHARRAF AFTER AGRA: TWO HALOS (July 2001), *available at* http://www.southasiaanalysis.org/papers3/paper282.html.

93. Teresita Schaffer, *India and Pakistan—Still Moving Forward*, SOUTH ASIA MONITOR (Ctr. for Strategic and Int'l Studies, D.C.), Oct. 3, 2005, at 1-2.

Most relevant to the future of the Indus Waters Treaty has been the evolution of the conflict over Kashmir. First, both countries have backed down from their historical and absolutist positions. India, while still unwilling to negotiate without the precondition that independence is off the table, has publicly admitted that Kashmir is a disputed territory and has commenced negotiations with both Pakistan and the Kashmiri separatist leadership to find a political solution.[94] Pakistan's about-face has been even starker, with President Musharraf declaring that Pakistan was renouncing its claim to Kashmiri accession and would accept a demilitarized Kashmir that was still nominally governed by India.[95]

Second, there appears to be growing consensus, both in India and Pakistan, and confirmed by Musharraf's proposal, that of all the potential political configurations for Kashmir, complete accession to Pakistan is unviable.[96] Given India's strength at the negotiating table as the status quo power, and Kashmir's relatively weak economic and political prospects as an independent state, the most likely outcome—if there is any change—appears to be greater autonomy within the Indian Union or some form of joint sovereignty. The prospect of change in Kashmir's political status have long undermined efforts to develop the region, particularly its hydroelectric power, as India has been averse to investing in a region that it may "lose" to a neighboring rival, while Pakistan has attempted to block any development project that would enable India to win the "hearts and minds" of Kashmiris.[97] As elaborated below, the reduced prospect of Kashmir leaving the Indian Union, much less acceding to Pakistan, has created space for cooperation between the two countries over joint-hydroelectric projects.[98]

Salman Salman, lead counsel to the World Bank, has described the evolution of the treaty's model as a series of compromises resulting from the inability of India and Pakistan to reach agreement.[99]

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94. MINISTRY OF EXTERNAL AFFAIRS, GOV'T OF INDIA, KASHMIR: THE TRUE STORY: THE JAMMU AND KASHMIR ISSUE (2004).

95. BBC News, Row over Musharraf Kashmir Plan, Jan. 8, 2007, http://news.bbc.co.uk/2/hi/south_asia/4592690.stm; CNN, Musharraf Seeks Kashmir Peace Plan, Dec. 5, 2006, http://www.cnn.com/2006/WORLD/asiapcf/12/05/kashmir.musharraf/index.html; *see also* Scott Baldauf, *India and Pakistan Balk at Bold Kashmir Peace Plan*, CHRISTIAN SCI. MONITOR, Oct. 29, 2004, at 7.

96. Sultan Shahin, *Resolving Kashmir with a Musharraf Model*, ASIA TIMES ONLINE, Oct. 29, 2004, http://atimes01.atimes.com/atimes/South_Asia/FJ29Df01.html.

97. WIRSING & JASPARRO, *supra* note 39, at n.4 (citing Verghese, *supra* note 54) (discussing the motives underlying repeated Pakistani objections to Indian development on the Indus rivers); Iyer, *supra* note 26, at 12.

98. *See infra* notes 126-127 and accompanying text.

99. Salman, *supra* note 57, at 105.

> The initial proposal of the World Bank to have the Indus irrigation scheme administered as one unit by the two parties, irrespective of the new borders drawn as a result of the partitioning of the sub-continent, was turned down by both parties, after a short period of discussion. Similarly, the attempts of the two parties and the Bank to divide the waters of the rivers, rather than the rivers themselves, failed to produce an acceptable formula. After repeated attempts, this approach was also abandoned. The only solution which emerged as viable was the division of the six rivers between the two parties . . . .[100]

Given the changes in South Asian politics over the last half century, perhaps a renewed attempt to move back up the spectrum towards cooperation is possible. Even where the two countries lack the desire to collaborate, the political climate and confrontation over Kashmir has reached a point where both states work together when mutual benefit and necessity make cooperation politically viable—for example, assuaging international fears over Kashmir, deescalating border tension, jumpstarting the peace process, and resuming trade and transportation links.[101] Given the growing demand in both countries for energy and irrigation, water could be the next frontier of cooperation that has been made politically palatable by necessity.

2. Underestimated Antagonism

The treaty's design, paradoxically, also underestimates the level of antagonism between the two countries, particularly Pakistan's fear of Indian control over its water supply. The Indus Waters Treaty guarantees India the right to "nonconsumptive" use of water from the western rivers,[102] but Pakistan "has made it virtually impossible for India to exploit effectively the nonconsumptive uses, the production of hydropower in particular."[103] First, Pakistan has consistently objected to proposed Indian construction plans on the western rivers, irrespective of the magnitude or type of project. "[O]n virtually every one of the 27 occasions since signing of the [Indus Water Treaty] when India has passed information to Pakistan, in accord with treaty provisions, on planned withdrawals or construction on the western rivers, Pakistan has raised objections."[104] Second, this Pakistani obstructionism is likely motivated by a fear caused by the treaty's failure to protect the rights of

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100. *Id.*
101. Schaffer, *supra* note 93, at 1-2.
102. Indus Waters Treaty, *supra* note 1, art. III(2).
103. WIRSING & JASPARRO, *supra* note 39.
104. *Id.* at 8 n.4 (citing Verghese, *supra* note 54).

the lower riparian. By displacing the traditional international law requirements of equitable use, the treaty removes any recourse Pakistan may have under international law to Indian interference with water flow. Thus, Pakistan must use—and, in the estimation of many Indian experts, has abused—the formal objection mechanism established under the treaty.[105]

Finally, because the design of the treaty only requires a one-time quid pro quo—the division of rivers at the time of signing—and not a continuing compromise, the status quo power in any given dispute lacks an incentive to cooperate. For example, because India no longer has any stake in pleasing Pakistan beyond the minimal threshold needed to avoid abrogation, it has an incentive to constantly push the boundaries of acceptable behavior allowed by the treaty because Pakistan has no real leverage besides the invocation of a slow dispute resolution process. As a result, Pakistani officials have often encountered the Indian negotiating strategy whereby India "proceed[s] with construction plans, even when aware that the plans might well violate the treaty, so that Pakistan, confronted eventually with *fait accompli*, would have no choice but to cut its losses and accept an unfavorable compromise settlement."[106] This treaty design is easily contrasted with one in which India and Pakistan jointly share and administer a river basin based on their specialized expertise, each dependent on the other for good-faith use of water and a share in the energy production. In this hypothetical case, as Part IV will further explore, both countries have a stake in, and leverage over, the water practices of the other.

3. Exacerbated by Politics

The Indus Waters Treaty has come under heightened scrutiny in both countries, as the issue of water sharing has become increasingly politicized.[107] While cataloging the full litany of grievances against the treaty is outside the scope of this Article, it suffices to say that Pakistani allegations of inequity and Indian calls for abrogation are common among politicians, scholars, and journalists.[108] The treaty has become a scapegoat for the water crisis created by the decreasing water table: internal states have begun competing with each other and calling for changes to national water policy, including Punjab, Haryana, and

105. *Id.*
106. WIRSING & JASPARRO, *supra* note 39.
107. *Id.* at 3.
108. Iyer, *supra* note 26, at 3-5.

Rajasthan in India, and Sindh, Balochistan, and Punjab in Pakistan.[109] This dissatisfaction with the treaty, compounded in times of bilateral tension, is primarily driven by two attributes of the treaty.

First, there exists a mutual perception that the treaty's terms are asymmetric. Paradoxically, both India, which feels that it gave up its claim to eighty percent of the Indus waters,[110] and Pakistan, which feels that it gave up more than it received under the treaty and remains in a state of virtual blackmail given India's right to nonconsumptive use,[111] perceive the treaty to be inequitable. Second, the treaty's approach of division, which required the partitioning of rivers while guaranteeing India the right to nonconsumptive uses on the western rivers, has created a permanent adversarial situation. The Indian government perceives the treaty to enable Pakistan to interfere and delay its dam projects: the Salal Hydroelectric Project took over a decade to overcome Pakistani objections, while progress on the Kishenganga and Wullar dams has been stalled for nearly ten and twenty-five years, respectively.[112] The Pakistani government, on the other hand, faces the "endlessly frustrating and ultimately futile task of guarding its water resources against Indian poaching" enabled by India's right to tap the western rivers for nonconsumptive uses.[113]

While the Indus Waters Treaty met the short-term concerns of India and Pakistan in 1960 and earned international praise for its novelty and resilience, water scarcity in South Asia has exacerbated the dissatisfaction with the treaty within South Asia. The transformation of the treaty into a scapegoat by both countries is not entirely deserved. After all, the waters of the Indus are simply insufficient to meet the expanding agricultural and energy needs. Indian pursuit of water-sharing agreements with Nepal and Bangladesh, interest in the U.S.-Indian Civil Nuclear Deal, as well as overtures to Iran over a natural gas pipeline, signal increasing acceptance of this reality. Still, there remains space within the Indus basin to extract the full irrigation and energy potential of its waters—a potential that the current treaty regime fails to optimally utilize.

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109. SWAIN, *supra* note 83, at 49; *see also* Blankenship, *supra* note 68, at 6.
110. Iyer, *supra* note 26, at 7.
111. WIRSING & JASPARRO, *supra* note 39.
112. Iyer, *supra* note 26, at 3-4.
113. WIRSING & JASPARRO, *supra* note 39.

C. Opportunity Costs

The Indus Waters Treaty establishes a particular model for water sharing under which the rights to entire rivers are divided amongst the parties. The arrangement requires an absolute division without any flexibility or contemplation of sharing the benefits of the water—the treaty irrigation or hydropower regime apportions the right to water without attention to possible synergies between the countries or the potential to optimize production. Some scholars have praised the rigid structure of the treaty, arguing that the "hard legalization" of terms that are high in precision and obligation has contributed to the durability of the treaty in light of fluctuations in bilateral ties.[114] However, the model implemented by the treaty has come with costs, most notably with regard to lost opportunities for energy development and facilitation of the Indo-Pakistani peace process.

1. Energy Development

Although India's current per capita energy consumption lags far behind countries like the United States and China, the trajectory of its population growth calls for at least a 100% increase in energy demand by 2020; this increased demand compounds the energy dilemma faced by a country already in the midst of massive energy shortages.[115] India has increasingly turned to energy sources outside its borders, including natural gas in Iran[116] and nuclear energy cooperation with the United States.[117] Despite these forays into the international energy market, India

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114. Gopalan, *supra* note 53, at 409-15.

115. Mubarak Zeb Khan, *Energy Crisis Forces India To Join Iran Gas Pipeline Project*, DAWN (Karachi, Pak.), Apr. 26, 2008, *available at* http://www.dawn.com/2008/04/26/top1.htm; Anil K. Malhotra, India Faces an Unprecedented Energy Crisis (June 20, 2005), http://www.gasandoil.com/goc/news/nts52796.htm; Elizabeth Mills, *Averting an Energy Crisis in South Asia*, ASIA TIMES, Sept. 14, 2006, *available at* http://www.atimes.com/atimes/South_Asia/HI14Df01.html; R.K. Pachauri, *India Heading for a Major Energy Crisis*, TRIBUNE (Chandigarh, India), Oct. 2, 2005, *available at* http://www.tribuneindia.com/2005/20051002/edit.htm#2; Somini Sengupta, *Electricity Crisis Hobbles an India Eager To Ascend*, N.Y. TIMES, May 21, 2007, at A1.

116. Khan, *supra* note 115.

117. For a discussion of the 2006 agreement, see Jim VandeHei & Dafna Linzer, *U.S., India Reach Deal on Nuclear Cooperation*, WASH. POST, Mar. 3, 2006, at A01. For further detail about the fate of the deal, see Robin Wright & Rama Lakshmi, *Nuclear Deal with India May Be Near Collapse*, WASH. POST, Oct. 16, 2007, at A01 (detailing Indian internal opposition to the nuclear deal). For the most recent update at the time of writing, see Hindustan Times, *US Does Not Consider Nuclear Dead "Dead,"* Apr. 30, 2008, http://www.hindustantimes.com/StoryPage/StoryPage.aspx?SectionName=NLetter&id=5c35b6c0-217e-479d-8087-1c0efe72329e&&Headline=Us+does+not+consider+nuclear+deal+dead (noting White House optimism

retains untapped sources of energy within its borders—particularly hydroelectric potential in Indian-administered Kashmir on rivers that the Indus Waters Treaty reserves for Pakistan.[118]

The Indus Waters Treaty has been described as a "chokehold" on the development and progress of the Indus basin, particularly the region of Kashmir, on both the Indian and Pakistani sides of the Line of Control.[119] The three rivers that pass through Kashmir—the Indus, Chenab, and Jhelum—are allocated to Pakistan under the treaty; India retains a limited storage capacity of 3.6 million acre feet and the right to irrigate 120,000 hectares of land.[120] As a result of the treaty's obstruction of development in the Indus basin, the region's growth and development has been stunted:[121]

> [The treaty's] restrictions act as a chokehold on Kashmir's capacity for progress. As far as irrigation goes, while about 80 percent of Pakistan's cultivated areas are irrigated, Kashmir has only been able to do about 10 percent. In Pakistani Kashmir only 13 percent of the land is under farming, but provides the livelihood for close to 84 percent of the households. Of its enormous hydroelectricity potential estimated at around 15,000 MW, Kashmir has been able to harness *barely 10 percent*, a critical barrier to the area's growth. Over 90 percent of Kashmir's capacity comes from hydroelectric plants. There is little scope for any other forms of power generation in the state since there are few feasible sites for plants and the area's difficult topography makes the transport of raw materials complicated and costly. Further, each of the state's power projects begun and currently under construction has become controversial due to the competing agendas of the parent states. As India and Pakistan battle over the legalities of the technical engineering and the Treaty details for each proposed dam, spillway, and plant, Kashmir waits.[122]

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surrounding international approval of the deal, but downplaying the deal-breaking role of domestic opposition within India).

118. Blankenship, *supra* note 68, at 8.

119. *Id.*

120. *Id.*

121. *See* WASLEKAR, *supra* note 77, at 62-73 (discussing the impact of the Indus Waters Treaty on the disparity in agricultural production).

122. Blankenship, *supra* note 68, at 8 (emphasis added). While Blankenship identifies 15,000 MW as Kashmir's annual hydroelectric capacity, *id.* (citing Daniel Nelson, Water War Warning as Tension Escalates in Kashmir, Common Dreams News Center (May 21, 2002), http://www.commondreams.org/ headlines02/0521-07.htm), others have estimated the potential at an even higher level. For example, Shafat Sultan of the Jammu & Kashmir Energy Development Agency cites 20,000 MW as the state's hydroelectric energy capacity. SHAFAT SULTAN, JAMMU & KASHMIR ENERGY DEV. AGENCY, DEVELOPMENT OF SMALL HYDRO POWER IN JAMMU AND KASHMIR (INDIA), http://www.inshp.org/conclusion/apr2006/Development%20of%20Small%20Hydro%20Power%20in%20Jammu%20and%20Kashmir.pdf (last visited Apr. 30, 2008). This Article uses the more commonly found Blankenship number, but recognizes that precisely

This development of the Indus basin, by allowing India to optimally utilize the water flow on the western rivers, improves India's energy situation in two respects: first, it provides India with an aggregate gain in energy supply; second, at the very least, it allows Kashmir to develop a self-sustaining energy source instead of relying on the already over-burdened northern energy grid, freeing up resources for other energy-starved Indian states.[123]

The development of Kashmiri hydropower potential, whether under the Indus Waters Treaty or a new regime, is inexorably linked with the politics of South Asia. As previously mentioned, changes in the political consensus over Kashmir—in particular, the decreasing likelihood that Indian-administered Kashmir will gain independence or merge with Pakistan—have created an opening for energy development.[124] If this assessment of the political consensus over Kashmir is accurate, then the treaty may be currently preventing the "most complete and satisfactory utilization" of the Indus Waters.[125] For example, experts have long agreed that Indian-administered Kashmir has an annual hydroelectric potential of at least 15,000 MW, but India's neglect of Kashmir, in addition to Pakistan's exclusive rights to the western rivers, has prevented any development to tap the potential.[126] The conventional understanding of this impasse is that the reluctance of both countries to facilitate development of Kashmir's energy potential is rooted in Pakistan's territorial claims to Kashmir. India's aversion to investing in Kashmir results from the fear that a political solution may "cost" them Kashmir, along with anything they invested in the state. Pakistan's refusal to cooperate with energy development on the western rivers is alleged to be motivated by fear that Indian development would help win the "hearts and minds" of Kashmiris and undercut support for accession to Pakistan

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identifying energy potential is an inherently difficult task and that the energy potential could be higher than current estimations. *See id.*

123. In spite of its natural hydroelectric potential, the state of Jammu and Kashmir has been "one of the biggest overdrawers of power in the northern grid." INDIAN POWER MINISTRY, RATIONALE FOR JAMMU & KASHMIR STATE POWER SECTOR SCORING 7, *available at* http://powermin.nic.in/reports/pdf/jammu%20&%20kashmir.pdf (last visited Feb. 10, 2009). The northern grid is shared by a number of Indian States, including energy-starved Delhi, Uttar Pradesh, Jammu and Kashmir, Punjab, and Haryana—because the states do not have any developed internal energy capacity, overdrawing continues to be a problem and leads to massive shortages. *See, e.g.*, Smriti Kak Ramachandran, *Discoms To Ensure Grid Discipline Now*, HINDU (Chennai, India), Apr. 26, 2008, *available at* http://www.hindu.com/2008/04/26/stories/2008042653890400.htm.

124. *See supra* notes 95-98 and accompanying text.

125. Indus Waters Treaty, *supra* note 1, pmbl.

126. *See, e.g.*, Blankenship, *supra* note 68, at 8.

within the state.[127] If, however, the prospects of Kashmir acceding to Pakistan, or even leaving the Indian Union, are greatly reduced with the tacit approval of both countries, neither the Indian nor Pakistani objections to developing Kashmir's energy capacity—to the potential benefit of both countries—remains grounded in political reality.

2. The Peace Process

As is to be expected from neighboring rivals, the interests of India and Pakistan often conflict. The area where their interests have the greatest overlap is domestic, where both countries face the threat of poverty, underdevelopment, and the threat from religious extremism. But domestic difficulties rarely lend themselves to international cooperation and the two states, for the most part, have different allies, no military cooperation, no structured trade cooperation, no established pattern of political cooperation, nor a domestic political climate that is lenient to peace overtures. Given this state of affairs, water cooperation is a unique opportunity—along with natural disaster relief—where each state's national interest overlaps in an area where collaboration is possible. The structure of the Indus Waters Treaty blocks the realization of this potential to cooperate by imposing a model that is designed to minimize opportunities to cooperate and has had the effect of locking the countries into an adversarial relationship.

The treaty's model was appropriate for its time and context—creating a politically viable solution to a sensitive issue between antagonistic neighbors in order to avoid war or an agricultural calamity in the short-term. The solution brokered by the World Bank was designed to peacefully settle the question of the Indus waters.[128] It did so in the only prudent and politically viable manner at the time: by obviating the need for cooperation or reliance between the countries.[129] Iyer has countered praise of the Indus Waters Treaty's resilience by arguing that it should not come as a surprise.[130] After all, the treaty never required the two countries to cooperate or agree on anything.[131]

> [T]he water-sharing under the Treaty was . . . a simple division of the rivers, with no continuous water-sharing on the same river. The Treaty itself was doubtless the resolution of a conflict, but once the Treaty was signed, there

127. Verghese, *supra* note 97; *see also* Iyer, *supra* note 26, at 12; WIRSING & JASPARRO, *supra* note 39, at n.4.

128. Alam, *supra* note 5, at 344.

129. Iyer, *supra* note 26, at 5.

130. *Id.*

131. *Id.*

> was nothing much thereafter to "operate." The high praise of the [Indus Water Treaty] as a successful instance of conflict-resolution seems somewhat exaggerated. Echoing E.M. Forster on democracy, one might say that two cheers are quite enough for the [Indus Water Treaty], and that three cheers are not called for.[132]

Iyer's argument does not go far enough. The treaty not only undercuts the opportunity for both countries to cooperate over an integrated water-sharing system, but it also exacerbates the fragile bilateral relationship by placing both countries into an adversarial water relationship. Neither country has a stake or reliance in the other country's use of the Indus waters—thus, both countries have sought to protect their interests by testing the limits of the treaty's terms. As discussed *supra*, Pakistan has been compelled to remain constantly vigilant of Indian abuse of its nonconsumptive uses and construction projects; India has been forced to delay public water projects for years in the face of objections motivated by Pakistani paranoia.[133]

This adversarial water relationship, the result of a treaty that forecloses the possibility of joint development, has politicized the Indus Waters Treaty and made water a sticking point in Indo-Pakistani relations. The destabilizing impact of the treaty on the bilateral relationship goes beyond resource sharing to exacerbate a conflict that water could have helped resolve: Kashmir. In fairness to the treaty, Kashmir was largely only a bilateral dispute between Delhi and Islamabad at the time, and the conflict that erupted in 1989—a foreign-funded yet indigenous insurgency between Srinagar and Delhi—was not foreseeable. Still, the Indus Waters Treaty has exacerbated the internal conflict over Kashmir by stirring anti-Indian sentiment and stunting economic development. The Kashmiri grievances against the treaty are well-documented: the treaty's restrictions on Indian use of the western rivers "make[s] it virtually impossible for [Jammu and Kashmir] to derive any benefits by way of irrigation, hydroelectric power, navigation," or other benefits from water that flows through the state.[134] As a result, the state of Jammu and Kashmir has been "stuck in a development rut that is largely responsible for the lack of stability and security that could play a critical role in the conflict's resolution."[135] The hostility within Kashmir towards the treaty is not latent: the state government has regularly

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132. *Id.*
133. *See* WIRSING & JASPARRO, *supra* note 39, at n.4.
134. WIRSING & JASPARRO, *supra* note 39.
135. Blankenship, *supra* note 68, at 7.

complained and occasionally called for its abrogation; a "feeling [that] is shared by the people, media, [and] academics" of Kashmir.[136]

IV. AN ALTERNATIVE MODEL

What should a revised water-sharing arrangement between India and Pakistan look like? It is illuminating to revisit the original aspirations of the World Bank in agreeing to mediate negotiations over the treaty—the Bank "had expressed the hope that India and Pakistan would agree to the integrated development on the Indus basin through some form of a joint management system."[137] Indeed, in light of the criticisms advanced in Part III, movement towards a more collaborative and integrated development model is warranted. There is much debate within the academic and policy communities over what the ideal water-sharing regime in South Asia would look like; "[u]nderlying all arguments, however, is the insistence of integrated planning, development, and management, of looking at the basin's water as a shared resource vital to a cooperative future rather than state by state interpretations."[138] Because nearly 150 countries rely on shared international water systems for fresh water access, many of them having less than cordial relations with the other riparian,[139] the importance of successful models for joint administration and integration of shared waters extends beyond the borders of South Asia.

A. A Proximate Model: The Mahakali River Treaty

There has been considerable theoretical praise for integrated basin development models. Reports and findings like the European Union's Water Framework Directive, which "emphasizes that the best model to manage river water is according to the natural geographical and hydrological unit, instead of according to the administrative or political boundaries," are common.[140] However, examples of the empirical success of integrated water-sharing models between hostile nations are as rare as academic praise for integrated basin development is common. Still, India and Pakistan do not have to look beyond the subcontinent for a model that relies on an integrated basin approach and joint

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136. Iyer, *supra* note 26, at 4.

137. SWAIN, *supra* note 83, at 48; *see also* Salman, *supra* note 99, at 105.

138. Blankenship, *supra* note 68, at 10; *see, e.g.*, KAISER BENGALI, THE POLITICS OF MANAGING WATER (2003); SWAIN, *supra* note 83, at 170-77; Albert Lepawsky, *International Development of Rivers Resources*, 39 INT'L AFFAIRS 533, 534 (1963).

139. Wolf, *supra* note 64, at 389.

140. Blankenship, *supra* note 68, at 10.

administration: the 1996 Mahakali River Treaty between Nepal and India.[141] The obvious error in analogizing Indo-Nepalese and Indo-Pakistani cooperation is that the latter is uniquely limited by history and mutual antagonism; however, India and Nepal have had vexed bilateral relations with a particularly antagonistic relationship with regard to water, making the analogy more apt than it may first appear.

The rivers shared by India and Nepal, similar to the immense water potential of the Indus basin, are estimated to have a hydroelectric potential of 83,000 MW, only 531 MW of which was being harnessed prior to the Mahakali Treaty.[142] The proposed Karnali dam—construction on which has been delayed nearly eighteen years as a result of public interest litigation in India over the constitutionality of the contracting process—is expected to have the second-highest hydroelectric capacity of any dam in the world.[143] However, establishing cooperation over the shared rivers was difficult given the tumultuous history of Indo-Nepalese water relations—primarily the result of Nepalese perceptions that India had already compelled Nepal into signing two inequitable treaties in the 1950s.

In 1954, the two countries signed the Kosi Agreement, which provided for the harnessing of hydroelectric power and irrigation and floor control, but in a manner that was "mainly for India."[144] There is academic consensus that the Nepalese negotiating team was not sophisticated or well-versed with water issues—in contrast with the team that represented Nepal in negotiating the Mahakali treaty—which

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141. Some scholars have suggested that the 1996 Ganges River Treaty between India and Bangladesh, may also be a useful model for prospective Indo-Pakistani cooperation. *See* Treaty on Sharing of the Ganga/Ganges Waters at Farakka, Bangl.-India, Dec. 12, 1996, 36 I.L.M. 523 (1997). However, the model is less relevant given the relationship between the treaty negotiation process and bilateral relations. Unlike the Indo-Pakistani or Indo-Nepali case where the treaty is meant to cement ties in the absence of healthy cooperation, the Ganges River Treaty, instead of serving as a confidence building measure, required the development of a stronger bilateral relationship before it could be negotiated. Further, the model of the treaty effectively defers a number of the substantive decisions by relying on vague language—"optimum utilization," "fair and just solution[s]," etc—instead of specifying precise obligations. *Id.* Finally, the treaty is not meant to be a permanent and plenary water cooperation framework—rather just a means to mitigate the water shortage issues that arise during the nonmonsoon months, particularly from March to May.

142. Subedi, *supra* note 3, at 953.

143. *Id.* at 954.

144. *Id.* at 954 n.7. For text of the treaty, see Kosi Agreement, India-Nepal, Apr. 25, 1954, *reprinted in* FOOD & AGRIC. ORG. OF THE U.N., TREATIES CONCERNING THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES: ASIA 60 (1995), *available at* http://www.fav.org/legal/legstud/1s55-ef.pdf.

resulted in the costs imposed on Nepal by the treaty to be high.[145] Analysis of the treaty's impact by development experts suggests that "the significant social costs [to Nepal] due to submergence of the land behind the barrages and the rehabilitation of the displaced population, coupled with the economic costs of the natural resources involved in erecting the monumental structures," was quite significant.[146] Five years later the two countries signed the Gandak Agreement to facilitate barrage construction in Nepal to generate energy, irrigation, and flood control downstream in India.[147] As a result of the agreements, the conventional understanding in Nepal was that "India was keen to exploit Nepal's hydropower potential to its advantage," which was evidenced by the two agreements "under which India secured disproportionate benefits to Nepal's detriment."[148]

In response to this perception, Nepal amended its national constitution in 1990 to require that no treaty regarding water resources could be signed without a super-majority vote by the Parliament;[149] the 1996 Mahakali River Treaty was thus negotiated in a more equitable manner by a Nepalese government vigilant about protecting its water rights. The Mahakali River Treaty has been hailed as the "most ambitious and comprehensive water cooperation treaty in the troubled history of Indo-Nepalese relations."[150] It is based on an integrated model, whereby India and Nepal equally divide the costs and benefits of any construction designed to deliver irrigation and hydroelectric power benefits.[151] The treaty has a number of attributes that cooperation in the Indus basin should emulate.

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145. SALMAN M.A. SALMAN ET AL., CONFLICT AND COOPERATION ON SOUTH ASIA'S INTERNATIONAL RIVERS: A LEGAL PERSPECTIVE 95 (2002) ("Confusion and incompleteness continue to exist, which is primarily due to the lack of experience on the Nepalese side in dealing with issues of water, as well as the unclear position of international law at the time of the negotiations of the Agreement. But the weaknesses resulting from the lack of experience, in the course of time, improved substantially, and during the period that followed, Nepal maintained a very cautious approach. This relatively grown maturity will be noticed in the context of negotiations of a Treaty in connection with the Mahakali River . . . .").

146. VICTOR POCHAT, DAM AND DEVELOPMENT PROJECT: INTERNATIONAL POLICY IN SHARED RIVER BASINS 66 (2006), *available at* http://www.unep.org/dams/files/compendium/report_interrivers.pdf.

147. For text of the agreement, see Gandak Agreement, India-Nepal, Dec. 4, 1959, *reprinted in* UNITED NATIONS, LEGISLATIVE TEXTS AND TREATY PROVISIONS CONCERNING THE UTILIZATION OF INTERNATIONAL RIVERS FOR OTHER PURPOSES THAN NAVIGATION 295 (1963).

148. Subedi, *supra* note 3, at 954.

149. CONST. OF NEPAL art. 126 (1990), *available at* http://www.supremecourt.gov.np/main.php?d=lawmaterial&f=constitution.

150. Subedi, *supra* note 3, at 955.

151. *Id.*

First, instead of focusing on the aggregate waters of the basin, the Mahakali Treaty envisions cooperation on a single river.[152] In the context of the Indus basin, water experts have called this the "second-best solution"—subordinate only to complete integration—noting that water sharing "on each of the six rivers constituting the system" remains technically feasible and would have created a less adversarial water-sharing environment.[153]

Second, the Mahakali treaty is designed with the specific needs and uses of the two countries in mind. It envisions specific projects—the Sarada Barrage, Tanakpur Barrage, and Pancheshwar Dam project—as well as specific purposes of water storage—hydroelectric generation, storing monsoon runoff for irrigation, and providing a buffer against flooding. Thus, unlike the Indus Waters Treaty which proposes a wholesale division of waters irrespective of synergies or the relative strengths and needs of the countries, the Mahakali Treaty assigns responsibilities—and benefits, as discussed later—based on the capacity of each country.[154]

Third, the treaty recognizes the importance of preserving the ecosystem by including explicit obligations on both countries to maintain the long-term stability of water supply. For example, article 1 of the treaty requires India to maintain a minimum water flow of 350 cusecs below the Sarada Barrage to "maintain and preserve the ecosystem of the Mahakali."[155]

The fourth relevant attribute of the treaty is that the collaborative costs imposed on India and Nepal under the terms of the treaty, are required to take on unilateral obligations solely for the benefit of the other country. This not only creates an endogenous confidence-building measure in the treaty, but also ensures that both states have leverage over the other and, in theory, have an incentive to observe the terms of the treaty in good faith, because their benefit is conditioned on performance by the other side. For example, article 2 requires Nepal to turn over nearly three hectares of land, despite retaining the ultimate sovereign rights, to India in order to facilitate the construction of the Tanakpur Bridge.[156] Similarly, India undertook numerous obligations to ensure

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152. Treaty Concerning the Integrated Development of the Mahakali River art. 1, India-Nepal, Feb. 12, 1996, 36 I.L.M. 531, 533.

153. Iyer, *supra* note 26, at 6.

154. *See* Treaty Concerning the Integrated Development of the Mahakali River, *supra* note 152, at 534-37.

155. *Id.* at 534.

156. *Id.* at 535. While this treaty requirement was technically a retroactive grant of consent to the Indian construction at Tanakpur, it nonetheless serves a valuable symbolic function

Nepal is guaranteed its share of water: (1) India absorbed the cost of building a head regulator and waterways at the Tanakpur Barrage in order to ensure that Nepal is provided the water guaranteed by the treaty;[157] (2) India agreed to construct "a 132-kilovolt transmission line from the Tankpur power station to the border" in order to secure Nepal's energy supply;[158] and (3) irrespective of the water flow, India agreed to guarantee Nepal a free-of-cost continuous energy supply of 70,000,000 kilowatt-hours in exchange for facilitating India's construction on the river.[159]

Fifth, while the Indus Waters Treaty has been praised for its elaborate dispute resolution mechanism, the Mahakali Treaty seeks to head off disputes by requiring cooperation over issues of potential disagreement in the first instance.[160] Whereas the primary source of dissatisfaction with the Indus Waters Treaty, on both the Indian and Pakistani sides, has been the inevitable antagonism surrounding dam projects on the western rivers, the Mahakali Treaty offers a different model: requiring major dam projects, in particular the Pancheshwar Multipurpose Project, to be implemented in accordance with a jointly prepared report.[161] Admittedly, this model does not resolve the substantive differences that undermine projects under the Indus Waters Treaty: the objections will only prevent the creation of a joint report instead of holding up construction after a plan has already been established.[162] Still, the Mahakali model forces both sides to give good faith consideration to objections because a jointly approved plan is a prerequisite to development. Further, by requiring development to be a collaborative process, the treaty mitigates the danger of misinformation with regard to the intent of the country proposing the project.

Sixth, article 5 of the Mahakali Treaty declares a presumption in favor of Nepal's water needs.[163] It provides that the "[w]ater requirements of Nepal shall be given prime consideration in the utilization of the waters of the Mahakali River."[164] This provision, presumably a

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and still requires joint administration of the land tract. *See* Dipak Gyawali & Ajaya Dixit, *The Manakali Impasse and Indo-Nepal Water Conflict*, *in* PEACE PROCESSES AND PEACE ACCORDS 262 (Samir Kumar Das ed., 2005) (recounting the process of Indian construction and political sentiment in Nepal during the treaty negotiation process).

157. *Id.* at 534; Subedi, *supra* note 3, at 955.

158. Subedi, *supra* note 3, at 955.

159. Treaty Concerning the Integrated Development of the Mahakali River, *supra* note 155, at 535.

160. *Id.* at 537.

161. *Id.*

162. *See id.*

163. *Id.* at 539.

164. *Id.* at 539.

concession to those within Nepal still suspicious of Indian motivations, is a generous recognition that "Nepal, one of the poorest countries in the world, with no other known significant natural resources, [could use] development of its water resources" as a means to better its economic condition.[165] India has the flexibility of granting Nepal the presumptive use over water because India's geographic size provides it with multiple access points to fresh water supply, including rivers shared with Pakistan and Bangladesh.[166] Given India's access to the Kosi, Gandak, Mahakali, and Ganges rivers, perhaps granting Pakistan a similar presumption, in light of the essential nature of the Indus waters to the viability of Pakistani's agrarian economy, could reassure Pakistan of India's intentions in negotiating a new water-sharing agreement.

While the Mahakali Treaty is interesting as a model, in practice it has not worked as envisioned. The joint approval requirement for projects on the river has delayed the implementation of the treaty. Critics of the treaty regime have called it "slow," "suspended," and "virtually defunct;"[167] in other areas, however, the treaty has made considerable progress in administrating water sharing and facilitating cooperation. This Article does not offer a normative endorsement or defense of the Mahakali Treaty—the treaty has, in part, been a victim of a number of disputes unique to the Indo-Nepalese relationship. The foregoing discussion was intended to simply draw out the ways in which a water-sharing agreement that emphasizes cooperation, mutual investment, and joint development can be envisioned and actualized into the form of a bilateral treaty—as well as highlight that the treaty's terms that are worthy of praise can be easily analogized and implemented in the context of the Indus basin.

B. Joint and Integrated Development of the Indus Basin

The infirmities of the Indus Waters Treaty can be mitigated, in part, by a water-sharing regime that emphasizes joint development and integrated basin management. Such a model would replace the current adversarial structure of the treaty with one that encourages cooperation between India and Pakistan. This Subpart seeks to address two attributes of a new water-sharing model for South Asia: first, the approach that the

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165. Subedi, *supra* note 3, at 957.

166. *See* Abu Raihan M. Khalid, *The Interlinking of Rivers Project in India and International Water Law: An Overview*, 3 CHINESE J. INT'L L. 553, 567 (2004) (listing India's agreements for freshwater access).

167. *See, e.g.*, *id.* at 956.

new model should take; and second, the specific features and terms it should have.

1. A New Regime: In Theory

This Subpart seeks to sketch the theoretical parameters of a new approach to water sharing in the Indus Basin. Any new water-sharing treaty should have two goals: first, to ensure that India and Pakistan jointly administer an integrated basin approach; and second, to serve as a confidence-building measure in encouraging cooperation and rapprochement between the two countries. The current regime does neither—instead foreclosing the possibility of joint basin development through a literal partition of the basin waters and minimizing the opportunity for collaboration where it might otherwise be both desirable and necessary.

Integrated and joint development, while difficult to design and implement, is conceptually simple. An integrated model requires the management of river water to be conducted "according to the natural geographical and hydrological unit, instead of according to the administrative or political boundaries," thus ensuring the Indus basin, and not the specific river allocation given to each country, will be the basic unit of development.[168] Joint development requires "shifting from a primary focus on the allocation of water, to a wider focus on sharing the benefits derived from the use of water."[169] This joint arrangement facilitates optimal utilization of the waters:

> The comparative advantages of each of the riparian states, derived from differences in typography, climate, or other resource endowment, could be used effectively to generate synergies. For example, one riparian state may be better endowed to use the shared river for power generation, whereas another riparian state may have better soil, climate, and infrastructure for irrigation. This optimization of the use of the shared river results in wider benefits shared by all the riparian states.[170]

This type of benefit-sharing arrangement, seeking to maximize synergies between two countries, is not entirely novel: the Mahakali Treaty embodies the core precepts of the model, while US-Canadian cooperation over the Columbia River emulates the model in a context without antagonistic relations.[171] There is similar room within the Indus

168. Blankenship, *supra* note 68, at 10.

169. Salman M.A. Salman, *Dams, International Rivers, and Riparian States: An Analysis of the Recommendations of the World Commission on Dams*, 16 AM. U. INT'L L. REV. 1477, 1489 (2001) (emphasis added).

170. *Id.*

171. *See id.* at 1490.

basin to fully tap the potential of its waters; the growing academic consensus on the Indus Waters Treaty suggests that the assertion that "[t]he 1960 Treaty has served its purpose but leaves behind a possibly large untapped potential in the upper catchments of the three western rivers that are allocated to Pakistan but are under Indian control" is correct.[172]

The second conceptual goal of a new water-sharing regime in South Asia should be to use water cooperation as a confidence building mechanism to alleviate tension and combat misinformation, while also actively strengthening bilateral relations. Converting management of the Indus basin into a more collaborative process has great potential, because "[t]he very process of reaching accommodation and developing bilateral resource and environmental mechanisms for cooperation creates a stabilizing and more transparent atmosphere. Negotiation widens political participation, builds political stability, and spreads confidence between the basin states."[173] The security benefits of water cooperation have long "gone unrecognized."[174] Water cooperation has been considered the "domain of resource economists, water technicians and specialists, and environmental activists, lawyers, and scholars, rather than those with a focus on arms control, defense policy, and international security."[175] The centrality of water to the antagonism between India and Pakistan makes it a suitable context in which to bridge this gap. The question of how to implement the proposed changes to South Asian water sharing is politically complex. There are two broad schools of thought, each championed by one of the two most prolific water experts in India. B.G. Verghese, former Information Advisor to the Prime Minister of India, has advocated that a new understanding—"Indus-II"—should be constructed on the foundation of the current Indus Waters Treaty by using article 12, which provides for modifications and future cooperation.[176] His colleague, Iyer, argues that the fundamental model of the Indus Waters Treaty, to partition the basin, is not salvageable and that a new treaty is needed.[177] Iyer argues there is no substantive difference between the two positions because article 12, upon which Verghese relies, merely provides that the treaty "may from time to time be modified by a duly ratified treaty concluded for that purpose between the

172. Verghese, *supra* note 4.
173. Kraska, *supra* note 54, at 467.
174. *Id.*
175. *Id.*
176. Verghese, *supra* note 4.
177. Iyer, *supra* note 26, at 15-16.

two Governments,"[178] which is effectively the same thing as requiring an entirely new treaty.[179]

The question of "how to get from here to there" is difficult to answer normatively because it turns on the prevailing political climate at the time that the change is being considered. The strength of the Indo-Pakistani relationship, public opinion, and the level of dissatisfaction with the treaty will all dictate whether a new treaty can be negotiated, and consequently, what form a revised agreement will take. A vital component of any renegotiation effort in the Indus basin is international oversight and mediation. At the very minimum, international involvement may provide the political cover needed for each country to engage in good-faith negotiations over the costs and burdens of a new regime. Further, neutral international involvement may, just like the original 1960 treaty, be needed to provide funding for specific undertakings and add credibility to the dispute resolution mechanism.

The question of form, however, is secondary to the substance of the treaty, which must emphasize a joint and integrated basin approach to development. The Indus Waters Treaty is ridden with both conceptual and practical flaws that have been exposed by the changing water politics of South Asia. Part IV.B.2 concludes that this Article's proposed changes to the water-sharing regime between India and Pakistan are not only normatively desirable, but that the increasing water demand and dissatisfaction with the current treaty will render the changes politically necessary in the near future.

2. A New Regime: In Practice

The infirmities of the Indus Waters Treaty discussed in Part III—an obsolete approach to water demand, significant political miscalculations, and opportunity costs with regard to development and the peace process—can be remedied under an updated and thoughtfully designed water-sharing regime. This Subpart, using both the negative attributes of the current regime and the positive attributes of the Mahakali regime as a departing point for its analysis, seeks to identify the core components that should form the basis of a prudent and practicable water-sharing regime in South Asia.

First, there must be an explicit understanding—between the governments, or reflected in the treaty text—that in light of the exponentially growing population and demand for water, India and

178. Indus Waters Treaty, *supra* note 1, art. XII.

179. Iyer, *supra* note 26, at 15-16.

Pakistan must look to other sources to meet their needs. For India, this may require looking to ensure that it has working agreements in place with Nepal and Bangladesh in order to fully tap the potential of its shared rivers with those countries, including the Ganges and the Mahakali. There is particular room to expand water cooperation between India and Bangladesh, which is governed only by the 1996 Ganges River Treaty.[180] The treaty was negotiated with a specific and limited purpose: to address the water demand from January through May, when run-off from the mountains and rainfall is low. The text of the agreement is narrowly drafted to address the seasonal variation in water supply, explicitly noting that it should not be read to "affect[] the rights and entitlements of either country," nor as "establishing any general principles of law or precedent."[181] The treaty, which has been called an "inadequate" agreement,[182] should be expanded to facilitate more comprehensive cooperation over the Ganges waters. For example, the current regime only governs for a few months of the year, lacks any provision for judicial settlement of disputes, and inefficiently makes no provision for the scenario that water supply falls short or exceeds the expected flow as calculated in charts annexed to the treaty.[183]

Pakistan, whose water storage abilities on the Indus are drastically reduced by the basin's high-silt levels,[184] should consider investing more resources in silt-treatment and water-quality measures.[185] A strategy to enhance water quality is imperative for Pakistan, as experts predict that it may suffer a fifty percent loss in its water storage capacity by 2010 as a result of silt in the Indus waters. Given the subcontinent's tremendous salt water access and predictions of an acute water shortage in South Asia, both countries should take preemptive action by investing more resources into desalination technology and infrastructure. While expensive and inefficient, sustained research and development into broad-based desalination—perhaps with international funding under the

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180. Treaty on Sharing of the Ganga/Ganges Waters at Farakka, *supra* note 141, at 523.

181. *Id.*

182. *See, e.g.*, UMESH PARAJULI ET AL., WATER AND SECURITY IN SOUTH ASIA PROJECT REPORTS, VOLUME 3: WATER SHARING CONFLICTS BETWEEN COUNTRIES AND APPROACHES TO RESOLVING THEM, at i, *available at* http://www.ippan.org.np/library/scandoc/MISC-003.pdf (last visited Mar. 12, 2009); M. Anwarul Haq, *30-Year Historic Water Treaty*, DAILY STAR (Dhaka, Bangl.), Dec. 13, 1996, at 1.

183. Subedi, *supra* note 3, at 959-61.

184. Blankenship, *supra* note 68, at 4.

185. For discussion of the need to emphasize water quality in joint basin development, see Meredith Giordano, *Managing the Quality of International Rivers: Global Principles and Basin Practice*, 43 NAT. RES. J. 111 (2003).

terms of a new treaty—may be necessary to mitigate a water supply crunch resulting from high demand.

Second, given the increasing proportion of Indus waters that are used for hydroelectric power generation, cooperation over the basin should be broadened to include energy cooperation. In order to sustain its current level of economic growth, recent studies suggest India must annually add approximately thirty gigawatts of electric capacity.[186] That rate, which would triple India's existing capacity over the next decade, far exceeds India's current annual electricity growth rate which hovers around four gigawatts of fresh capacity.[187] Because finding alternate sources of energy could free up valuable water resources, both countries, particularly India, should work to ensure greater energy supply from other sources. As previously discussed, India has done so—pursuing nuclear energy cooperation with the United States and new natural gas and oil relationships in Southeast Asia, the Middle East, and Africa.[188]

Pakistan has a role to play in facilitating Indian access to new energy sources—one of the major untapped sources of energy available to India is Iran's natural gas reserve. India and Pakistan have been in negotiations over an Iran-Pakistan-India natural gas pipeline which, despite U.S. objections, has been moving forward.[189] The pipeline would link Iran, and the second-largest proven reserve of natural gas in the world, with energy-starved India.[190] Despite a natural convergence of energy interests and healthy bilateral ties, transportation complications have limited Iranian energy to less than a tenth of India's energy imports.[191] While Pakistan has offered its cooperation to a natural gas pipeline in principle, negotiations over security for the pipeline in Pakistani territory and the amount of the transit fee have remained inconclusive.[192] Pakistani cooperation in facilitating the pipeline should be part of a broader energy agreement between the two countries and

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186. Joe Leahy, *India Warned on Power Capacity*, FINANCIAL TIMES (London), June 4, 2008, at 12 (discussing McKinsey study).

187. *Id.*

188. *See supra* notes 115-117 and accompanying text.

189. For a discussion of the natural gas pipeline and Indo-Iranian cooperation, see C. Christine Fair, *India and Iran: New Delhi's Balancing Act*, WASH. Q., Summer 2007, at 145.

190. *Id.* at 145.

191. *See Edgy India Mulls Iran Threats*, EXPRESS INDIA (Mumbai), May 18, 2006, *available at* http://www.expressindia.com/fullstory.php?newsid=55491.

192. *See, e.g.*, Zafar Bhutta, *Iran To Mediate To End IPI Gas Pipeline Transit Fee Deadlock*, DAILY TIMES (Pak.), June 3, 2008, *available at* http://www.dailytimes.com.pk/default.asp?page=2008%5C06%5C04%5Cstory_4-6-2008_pg7_1 (noting outstanding disagreements between India and Pakistan over structuring of the transit fee).

could be a valuable negotiating chip for Pakistan in compelling Indian cooperation during renegotiation of the water-sharing agreement.

Third, the new water-sharing agreement should pursue joint basin development in a manner that takes advantage of the synergies and comparative advantages of each country. In order to do so, as discussed *supra*, the basin must be developed as an integrated whole—with India and Pakistan, recognizing their mutual interest in the waters, each having a stake in all the rivers, not simply those that were allocated to them under the 1960 arrangement. The Mahakali Treaty provides an example of how synergy in a water-sharing agreement is realized: first, because of India's advantage and experience in barrage construction, Nepal willingly ceded its territory for Indian construction; second, India took on the burden of building key infrastructure, such as transmission lines and head regulators, because of its greater comparative competence and guaranteed Nepal an uninterrupted supply of the resulting energy.[193] Similarly, given India's advantage and experience in harnessing hydropower, Pakistani support and financial assistance for Indian hydropower projects, from which they would receive a share of energy or profit, could be a valuable synergy. In addition, geographic proximity suggests that Pakistani irrigation works are a better means to supply water to Rajasthan and elsewhere in the Indian plains, instead of the current Indian diversions from the eastern rivers.

Fourth, a new water-sharing regime should be cognizant of the importance of developing Kashmir—both on the Indian and Pakistani sides of the Line of Control. Given the previously discussed political developments in Kashmir, which have made any change in its ultimate sovereignty unlikely, both countries have little to fear from expending their resources in the region[194]—and much to gain if development can bring a greater measure of stability. Experts have argued that changing the water-sharing regime in South Asia

> so that sustainable development is integrated throughout [Kashmir] would greatly improve the hydroelectricity sector's potential, improve irrigation facilities and regulations which would in turn boost agricultural growth, give rise to employment opportunities, help attract private investment, and in general pave the way for a healthy industrialization of the state. Agreement on a joint development strategy for the Indus Waters Basin that would implement sustainable projects would thus be a major contribution

193. Treaty Concerning the Integrated Development of the Mahakali River, *supra* note 155, at 536-37.

194. *See supra* notes 95-98 and accompanying text.

> to economic growth, which according to multiple sources is a top priority in securing peace for the region.[195]

The inability to counter growing discontent and political consciousness in the state with greater economic opportunity has often been cited as a major impetus of violence in Kashmir.[196] Encouraging industrial growth and attracting investment would directly address that failure. The Indus Waters Treaty has not only been a missed opportunity to facilitate a resolution in Kashmir, but has also exacerbated anti-Indian sentiment within the region by creating the perception that India is looting Kashmir's natural resources without reinvesting it into the development of the state.[197] While the treaty negotiators could not have predicted the trajectory of the Kashmir conflict in 1960, a new water-sharing regime should be designed to mitigate instability in Kashmir—both by encouraging cooperation between the two governments and addressing the economic grievances of Kashmiri citizens.

Fifth, any new water-sharing regime should be tailored to the specific needs of India and Pakistan. The Mahakali Treaty recognized that India and Nepal's need for water extended beyond agricultural irrigation to hydropower generation and flood prevention, and accordingly included provisions designed to address those needs.[198] The Indus Waters Treaty, on the other hand, divides the Indus basin without regard to whether a more differentiated or nuanced division may better serve the interests of the two countries. There are three sets of interests in the distribution and use of the Indus waters: India's, Pakistan's, and the collective interest of the two countries in preserving their water resources. India's primary interest in the waters of the Indus basin is to ensure a consistent supply for irrigation and hydropower generation; this Article has already discussed how a new agreement can be tailored to meet India's energy concerns. Further, as the status quo power, India may be reluctant to negotiate its position of strength away; as previously discussed, international mediation may mitigate India's concerns by providing political cover, while substantive Pakistani cooperation—through a deal on the Iranian natural gas pipeline or otherwise—could entice India to the negotiating table.

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195. Blankenship, *supra* note 68, at 8.

196. Sumit Ganguly, *Explaining the Kashmir Insurgency: Political Mobilization and Institutional Decay*, 21 INT'L SECURITY, 76 (1996).

197. Abdul Ruff, The Current Indian Policy in Kashmir (June 1, 2008), http://www.globalpolitician.com/24819-india_kashmir.

198. Treaty Concerning the Integrated Development of the Mahakali River, *supra* note 155, at 538.

Pakistan's primary interest in negotiating a new water-sharing agreement is transparent: to obtain stronger assurances of a minimum water flow to insulate its economy against the risk of runoff variability and the effect of Indian construction. As previously discussed, the primary source of Pakistan's dissatisfaction with the Indus Waters Treaty, and impetus for its perpetual objections to India construction projects, is the fear that India's nonconsumptive water use will threaten its flow in an emergency shortage.[199] Some form of guarantee—whether modeled after the Mahakali Treaty's minimum flow guarantee for Nepal or India's agreement to respect the presumption for Nepalese use of water[200]—could assuage Pakistan's fears about a water-sharing arrangement with India. Another option in drafting the treaty is to extend the short-term emergency provisions of the Indus Waters Treaty in perpetuity. Article 10 imposed obligations on India and the World Bank to ensure water, materials, and equipment were provided to Pakistan during the transition decade after the signing of the agreement;[201] while these terms elapsed in 1970, a similar but extended provision could mitigate Pakistan's concerns over sufficient access to water by providing it with a safety net.

In addition to the particular interests of India and Pakistan, any new water-sharing regime should, as does the Mahakali Treaty, recognize the joint need to preserve the ecosystem.[202] Both countries have an interest in sustaining the health of their most important natural resource. Fresh water access and supply has also become increasingly linked with other issues facing both countries, including the effects of climate change and the resolution of the conflict in Kashmir. Any renegotiation of the water relationship between the two countries should, to the extent that is politically feasible, be a broader omnibus package that addresses the linkages between energy, environment, and security issues.

The Indus Waters Treaty also falls short of involving all the relevant parties in the Indus basin. China and Afghanistan, excluded from the treaty negotiations, are riparian states on the Indus rivers. Both the Indus and Sutlej Rivers originate in the Chinese-controlled Tibetan plateau, while the major tributaries of the Indus used for Pakistani irrigation originate in Afghanistan; experts estimate that nearly fifteen percent of the basin falls outside of Indian and Pakistan control.[203] The upstream

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199. Sridhar, *supra* note 80.

200. Treaty Concerning the Integrated Development of the Mahakali River, *supra* note 155.

201. Indus Waters Treaty, *supra* note 1, art. X.

202. *See supra* note 155 and accompanying text.

203. Salman, *supra* note 99, at 108.

access of China and Afghanistan to rivers that are vital to India's hydroelectric and Pakistan's irrigation needs makes dialogue between all four countries over water issues imperative. The answer to India's concern with adequate water run-off and Pakistan's concern with adequate flow may not solely lie in bilateral cooperation, but could require a regional approach.

Sixth, a new water-sharing arrangement should have more robust mechanisms for facilitating cooperation. Unlike the current regime which can be characterized as "one-shot" cooperation[204]—where the countries come together to reach an agreement but implementation occurs without interaction—greater cooperation and more opportunities for interaction have the potential to build trust and facilitate a reduction in tensions by eliminating misinformation. While the current regime contemplates cooperation through the Permanent Indus Commission, these measures are designed to only facilitate cooperation when a dispute has already risen. As discussed below, an alternate approach would be to use water cooperation as a means of avoiding the cause of disagreements, such as misinformation, uncertainty of intent, and perceptions of hostility.

Commander James Kraska has argued that confidence-building measures "are strongest when they are designed to advance both procedural and substantive compliance by parties to the agreement."[205] The Indus Waters Treaty grades out low on both metrics: while it has elements of both—data sharing (procedural) and stipulations on water use (substantive)—neither promotes significant interaction or collaboration between the two countries because "once the Treaty was signed, there was nothing much thereafter to 'operate.'"[206] In this respect, an area in which to improve a new water-sharing regime is to enhance the verification mechanism. Experts have suggested that modeling water-sharing treaties on arms control agreements may enhance their potential as confidence building mechanisms.[207] To this end, replacing the discretionary and ad hoc verification mechanism of the Indus Waters Treaty with a more institutionalized and permissive system—similar to the "legalized espionage" permitted by some arms control treaties—may

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204. *See* Andrew T. Guzman, *Saving Customary International Law*, 27 MICH. J. INT'L L. 115, 133-34 (2005).

205. Kraska, *supra* note 54, at 475.

206. Iyer, *supra* note 26, at 5.

207. Kraska, *supra* note 54, at 473.

help build trust through frequent corroboration, while also allaying fears about intentions through greater transparency.[208]

Seventh, a new water-sharing regime must strike the proper balance between national autonomy and adequate safeguards. The Indus Waters Treaty permits, much to Pakistan's chagrin, the proverbial fox to guard the henhouse by allowing India, the upper riparian, to extract nonconsumptive use of the waters that flow through its territory. In the alternative, a joint and integrated model would partially allay Pakistan's concerns by giving them access to the entire basin, and not only the limited lifeline they currently have on the western rivers. Although greater safeguards and transparency would help alleviate Pakistani suspicions of Indian abuse of its upper riparian status, a new regime should not be overzealous in protecting the lower riparian to the extent that red tape can stall construction and development of the basin the way Pakistani objections have paralyzed Indian dam projects. The Mahakali Treaty provides an illuminating example of how too many safeguards within a jointly administered plan can undermine development: the joint project report requirement, under which prior consent from both states is needed before projects are initiated, has stalled construction to the point that observers have declared the construction provision of the treaty to be defunct.[209] The assurances proposed above—including a minimum guaranteed flow to Pakistan, a presumption in favor of Pakistan use, and strong verification mechanisms—can help mitigate Pakistani fears of Indian intent, and thus obviate the need for intrusive safeguards that may run the risk of stalling the development of projects on the Indus waters.

Finally, any bilateral water-sharing agreement requires an effective dispute resolution mechanism. This is one of the few areas in which any major departure from the Indus Waters Treaty is unwarranted. The dispute resolution mechanism in the 1960 treaty—which provides for multilayered review process consisting of a permanent commission, appointed neutral experts, and a court of arbitration[210]—has effectively responded to disputes that have triggered the formal review process.[211] The multiple levels of recourse have proven adequate, as no dispute over the last half-century has reached to the stage where a court of arbitration was needed. Further, the international involvement, through the World

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208. For more detailed discussion of what such measures may look like, including aerial over-flights, on-site inspection, remote sensing, and broadcast of unencrypted images, see *id.*

209. *See supra* note 167 and accompanying text.

210. *See supra* note 38 and accompanying text.

211. For detailed discussion of the resolution of the Baglihar Dam dispute by the Permanent Indus Commission and an appointed Neutral Expert, *see* Salman, *supra* note 99, at 107.

Bank, in facilitating the resolution of conflicts and appointing adjudicators has lent credibility to the neutrality of the process.[212]

Given the cost and time required to resolve disputes through any formal process—for example, the Baglihar resolution took over two years after the World Bank's involvement was requested[213]—it may be prudent to expand the Permanent Indus Commission to have an odd number of commissioners. While each country currently selects one commissioner to serve as a representative, adding a third neutral international commissioner, either from the World Bank or an outside expert, would allow to disputes to be resolved at the first level of review with a stamp of international neutrality. This would also mitigate any bargaining power disparities inherent to the bilateral relationship; India's leverage as the status quo power may influence Pakistan, but not a neutral international commissioner. The costs of adding an additional commissioner to the Permanent Indus Commission are minimal because it is only active when a dispute is brought before it. The cost and temporal advantages of enabling the first-level dispute resolution body to make a final determination are significant; each state would still retain the right to appeal the decision to another neutral expert and, subsequently, a court of arbitration.[214]

The dispute resolution mechanism established by the Indus Waters Treaty has otherwise functioned effectively, weathering numerous disputes related to construction on the Indus rivers and compelling compliance with its decisions by both states.[215] Although the review process is intended to be an apolitical exercise of scientific and engineering expertise, the dispute resolution process, whether knowingly or not, has deftly navigated the political terrain of Indo-Pakistani politics. The ultimate decision in the Baglihar dispute, for example, effectively split the difference between each side and allowed both countries to save face; the World Bank representatives noted that "[t]he response from both India and Pakistan . . . was positive. Both countries claimed victory and highlighted the areas of the decision which they believed responded positively to their claims."[216] The language of the final judgment in the

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212. Nirupama Subramanian, *Verdict Has To Be Within the Scope of Indus Treaty*, HINDU (Chennai, India), Dec. 12, 2006, *available at* http://www.thehindu.com/2006/12/12/stories/2006121202901300.htm.

213. *2007 Saw India's Win over Pakistan on the Baglihar Dam Issues*, ECON. TIMES, Dec. 27, 2007, *available at* http://www.economictimes.indiatimes.com/PoliticsNation/2007_saw_Indias_win_over_Pakistan_on_the_Baglihar_dam_issue_/articleshow/2654491.cms.

214. Indus Waters Treaty, *supra* note 1, arts. VIII-IX.

215. Iyer, *supra* note 26, at 3.

216. Salman, *supra* note 99, at 115.

Baglihar matter explicitly emphasized the political neutrality of the decision; the appointed expert stated that "[he] considers that his decision has not been rendered against one or the other Party. His opinion is that, in fact, specific Parties emerge successfully . . . the Authors of the Treaty. The Treaty is the successful document."[217] This prudent recognition of the politics of adjudicating disputes, while transparent, demonstrates the flexibility of the treaty regime in navigating the boundary between the scientific and political aspects of water cooperation.

If the other recommendations for structuring a new water-sharing regime proposed by this Article are adopted, the dispute resolution mechanism, even if not specifically altered, will be affected. First, integrated development will decrease the number of disputes that arise from suspicion and fear of water projects being pursued by the other country. One of the important attributes of integrated development is the sharing of benefits and pursuit of synergy—this approach ensures that each country has a stake in the projects of the other.[218] For example, if Pakistan is guaranteed a minimum water flow, has a more robust information-sharing and verification regime at its disposal, is responsible for the cost-effective supply of water to India's agricultural needs in Rajasthan, or stands to gain a share of energy from any Indian hydroelectric project, Pakistan will certainly feel less apprehensive of India's upstream use of water on the western rivers. After all, Pakistan will have more complete information over Indian intentions, greater leverage over India through its control of the irrigation flow, and a stake in the success of the Indian project. Second, dialogue over disagreements will occur much earlier in the life of a project if the new regime requires joint approval of projects, or implements a more comprehensive verification regime. This lowers the stakes of any disagreement because the project can be modified far before it becomes a fait accompli.

The dispute resolution mechanism in the original 1960 agreement is one of the few provisions that remains suitable for adoption into a revised water-sharing regime.[219] It has received considerable praise, both on account of its theoretical design and actual track record in resolving disagreement between India and Pakistan. It has proven capable of addressing the merits of complaints while remaining conscious of the delicate politics of Indo-Pakistani relations. The key to any mediation between two antagonistic states is the existence of a neutral mediator—both in perception and substance. The World Bank and international

217. LAFITTE, *supra* note 62, at 20.
218. KLARE, *supra* note 66, at 185.
219. Indus Waters Treaty, *supra* note 1, art. IX.

community have served that role for the last half-century and should continue in that capacity under a new regime.

V. CONCLUSION

The Indus Waters Treaty served a valuable short-term purpose: it preempted conflict over the Indus basin by guaranteeing Pakistan the irrigation flow it required and assured India the ability to proceed with its canal and water projects without legal or political challenge. However, for reasons that the negotiators of the treaty could not envision—changes in Indo-Pakistani relations, an accelerating demand for water, and a host of new uses for the Indus waters—the treaty has grown outdated. The obsolete nature of the treaty's model does not simply make it a less efficient option, but also fundamentally inadequate to deal with the changing water politics in South Asia. In addition, the treaty's attempt at a one-shot solution against a backdrop of vexed bilateral relations has had significant opportunity costs—most notably, preventing cooperation over water from serving as a confidence building measure between India and Pakistan. The problem of international water sharing is neither academic nor limited to South Asia: the statistics of supply and demand make clear that conflict over water resources will be inevitable in the twenty-first century. With nearly 150 countries relying on shared waters for their fresh water supply,[220] it is imperative to recognize the advantages of integrated basin development. Academics have long extolled the virtues of integrated joint development, but politics—particularly between antagonistic states—have kept it off the table. The growing demand for water, however, which implicates the viability and stability of entire countries and economies, particularly in South Asia, may be the change in circumstance needed to make this model of water sharing politically viable.

220. Wolf, *supra* note 64, at 389.