"Judging by recent political statements from Pakistan, water issues are being pitched politically and couched increasingly in the language of security vis-à-vis India. . .and for Pakistan hydropower is its second source of electricity."
Uttam Kumar Sinha

"The potential for environmental factors to stoke conflict between the nuclear armed states of India and Pakistan is a concern. These two historical enemies have repeatedly fought across their international frontier and have yet to resolve their territorial dispute over Kashmir. Further, a longstanding dispute over cross-border water resource sharing between India and Pakistan has resurfaced, possibly exacerbating existing tensions between the two states."
US Congressional Research Service Report, August 2010

Water resources are tied to the trajectory of economic growth in an intricate way. They are linked to food production, energy security and climate issues. In fact, in many ways, the entire gamut of future human security challenges hinges on how water resources are to be managed. A number of reports often indicate that the 'water bubbles' which sustained much of the growth in the past are in many parts of the world 'bursting'. Clearly water scarcity has serious consequences not only for human well-being but also for regional security and stability.

Indus basin

Of the many river systems in the world, the mighty Indus with its tributaries is of striking and unmatched importance. The Indus basin has the largest irrigated area on any one river system. It is comprised of the main river Indus and its major tributaries: the Kabul, Swat, and Khurram from the west and the Jhelum, Chenab, Ravi, Beas, and Sutlej from the east. There are three distinct physical features of the basin that must be noted. First, the Greater Himalayan ranges, with their lofty peaks, snow, and glaciers form a natural storehouse from which the rivers draw perennial supplies of water. The impact of climate change on the glaciers is therefore critical to the future flows in the rivers.

Second, given the physiography of the Lesser Himalayas and the Shivalik hills or range, they have great potential as a source for development of hydroelectricity. This is because the rivers of the Indus system receive all their waters only in the upper parts of their mountainous catchments and have maximum flow when emerging from the foothills.

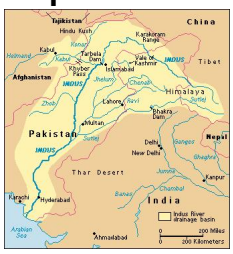
Third, the basin also covers Tibet from where the Indus and Sutlej originate and Afghanistan from where the Kabul begins. China is or provides the ultra-upper riparian (river banks) and,

given the capacity and capability it has to harness or divert the waters of the Indus and Sutlej, China can change the hydrological dynamics of the basin. Comparatively, Afghanistan is less significant as an upper riparian given the political instability in that country, but it remains an important aspect of this basin system. A Study on the Hydroelectric Schemes by the Central Electricity Authority of India suggests that the Indus basin has a potential capacity of 19,988 MW at 60% load factor, which is the highest in India. In Pakistan, hydropower is the second largest source of electricity, contributing 33.1% of total power generation. While Pakistan's hydroelectric generation potential is estimated to be 46,000 MW, only 14% has been exploited. Unlike India, Pakistan is a one-river-basin country and all of its hydroelectric power projects come from the Indus.

Table 1: Indus Basin

Total Basin Area	1170838 km²
Annual Available Water	224 billion metric³
Country	Basin Area (Km²)
Pakistan	632,954
India	374,887
China	86,432
Afghanistan	76,542

Map 1



The Map shows the 3 eastern rivers (Ravi Sutlej Beas) partitioned to India and 3 western rivers (Indus, Jhelum, Chenab) to Pakistan under the Indus Water Treaty

India and Pakistan: water sharing and historical pains

Water issues between India and Pakistan are historically constructed, emotionally charged, and politically divisive. Although water is technically not a 'core issue' between the two, differences over the use of the rivers in recent years have the potential to derail any peacemaking efforts. It is not too difficult to imagine why. With an exponential growth in population and with agriculture as the pivot of economy, demand for water for irrigation and electricity generation is straining the distributive arrangements that were settled by the Indus

Water Treaty (IWT) in 1960. The distributive arrangements refer to the distribution and utilization of the six rivers in the Indus basin: Indus, Jhelum, Chenab, Ravi, Sutlej, and Beas.

The partition of the rivers was an inevitable outcome of the partition of undivided India in 1947, as the political boundary was drawn right across the Indus basin. The partition changed the entire hydrography of the subcontinent—from being one political unit to two riparian states. The water issue therefore was no longer a domestic one. After eight years of discussion and negotiation, the IWT was signed. Water sharing was precisely designed to deescalate the tension over sharing the rivers for irrigation and hydropower. (For a detailed account of the negotiations, see Niranjan D. Gulhati, The Indus Waters Treaty: An Exercise in International Mediation, Allied Publishers: Bombay, 1973; Aloys Arthur Michel, The Indus Rivers: A Study of the Effects of Partition, Yale University Press: New Haven, 1967; Scott Barrett, "Conflict and Cooperation in Managing International Water Resources", Policy Research Working Paper 1303, The World Bank, May 1994; and Bashir A Malik, Indus Water Treaty in Retrospect, Brite Books, Lahore, 2005). That the treaty has survived hostility over the past 50 years deserves cheers, but only two cheers. The fact that the "fairness" of the treaty is today being questioned, from both sides, suggests that the distinction and separation between the 'functional' and 'political' aspects of the IWT have come under stress.

It is often said that an international treaty that gives one party all that it wants cannot be a good treaty. The IWT, like many treaties, was a compromise with both sides conceding from their earlier intractable positions. The treaty, at least in letter, settled the water sharing issue, but the perception remains unsettled. Therefore it is important to revisit the claims and counter assertions raised during the period of negotiations between 1952 to 1960 to understand how the water debate is framed today, with its impact on energy generation in both states tomorrow.

Before the IWT was signed, both India and Pakistan were unable to agree on the technical aspects of allocation or the distribution of water. The World Bank as a consultative actor worked on evolving a sharing formula that kept aside questions of historic rights or allocations. The idea was how best to utilize the waters of the Indus basin through joint development. While India agreed to a new framework of allocation, Pakistan felt strongly that its share of waters should be based on pre-partition distribution, taking into account its current and future water needs. Pakistan relentlessly articulated its lower riparian vulnerability, fearing that its part of divided Punjab could turn into a desert. In order to give traction to the negotiating process and a decisive push towards final settlement, the World Bank proposed the partitioning of the Indus river system into three eastern rivers (Sutlej, Beas and Ravi) to India and three western rivers (Indus, Jhelum and Chenab) to Pakistan. Importantly, canals and storage dams were to be constructed to divert waters from the western rivers and replace the eastern rivers supply lost by Pakistan.

As mentioned earlier, a settled treaty does not necessarily mean that differences in perceptions have been settled. There is probably no other issue that sparks misperception and mistrust as water does, and, in the context of India and Pakistan, emotions dangerously run high. In spite of the fact that the IWT genuinely safeguards Pakistan's riparian concerns, angst and anger continues to reverberate in Pakistan even today. There is a deep feeling that the partition of the Indus basin gave a certain physical capacity to India to cut-off vital irrigation water to Pakistan. As a lower riparian, Pakistan continues to link water as a lifeline issue and questions the fairness of the treaty. This finds active space in Pakistani politics, and its linkage to the Kashmir issue implies that any future peaceful settlement with India would have to still consider water distribution of the Indus system. For Pakistan water issues remain an unfinished business. For India, the treaty is done and dusted, and any grievances have to be addressed through the Permanent Indus Commission (PIC), a mechanism developed under the IWT to resolve disputes.

Another question frequently asked on the division of the rivers, is why India allowed the western rivers to go exclusively to Pakistan except for certain nominal and specified uses by India? Often India's magnanimity and generosity are projected while answering this. It is possible that India did not want to be seen as an unconcerned and unreasonable upper riparian. India also paid about 62 million pounds sterling for new construction works in Pakistan, while the World Bank and the US along with other aid-giving countries mobilized the rest. Goodwill aside, India was equally pragmatic in its approach to sharing the rivers. It needed exclusive rights over the eastern rivers for the construction of the Bhakra Nangal dam and the Rajasthan Canal, both of which were crucial to India's development programs. Otherwise, Pakistan could have raised lower riparian restrictions and thwarted India's plans. Ramaswamy Iyer , former Secretary to the Government of India in the Ministry of Water Resources says that "…the price paid for this was a substantial sacrifice of rights over the western rivers. The difficulties that this would lead to in due course, and the discontent that this would cause in Jammu & Kashmir, were perhaps not anticipated."

Current dynamics of water, energy and security

Judging by recent political statements from Pakistan, water issues are being pitched politically and couched increasingly in the language of security vis-à-vis India. Pakistan's motivations are not too difficult to decipher. First, in order to keep the enmity with India as its foremost policy issue, water becomes the existential driver. It pays political dividends for the Pakistani establishment to focus its lens on India being the upper riparian "aggressor", "stealing" the waters of the Indus system, and a country with "malevolent" intentions. So when President Asif Ali Zardari's article in *The Washington Post* on January 28, 2009 warned: "The water crisis in Pakistan is directly linked to relations with India. Its resolution could prevent an environmental catastrophe in South Asia, but failure to do so could fuel the fires of discontent that may lead to

extremism and terrorism", or when Sardar Aseff Ali, a former Foreign Minister and presently the Prime Minister's adviser on education, says that "water is a sensitive issue and if India continues to deny Pakistan its due share, it can lead to a war between the two countries," the purpose is to whip up anti-Indian sentiments.

Water is an emotive issue. It is a mobilizing factor and, unfortunately, even those who argue for cordial existence with India are unlikely to take an objective view. More importantly, by aggressively accusing India of "stealing" the waters, the current establishment is trying to absolve itself of its questionable water management policies and the inter-provincial water dispute between Punjab and Sindh. Projecting water as a flashpoint directly benefits the political-military class by drawing international attention. Pakistan's articulation of its lower riparian concerns tends to get a sympathetic international audience. Not surprisingly, water experts like John Briscoe, who is currently Gordon McKay Professor of Environmental Engineering at Harvard University, speak more from the lower riparian perspective, often but not intentionally ignoring the upper riparian accommodation. Briscoe's article "War and Peace on the Indus" published in South Asian Idea puts the onus on India, being the regional hegemon, to show restraint on the Indus basin, ignoring the fact that India has been far more accommodating than any upper riparian in the world. Clearly, Pakistan wants to re-frame a new set of lower-upper riparian dynamics by articulating its 'water rights' under the provisions of the treaty and asking India for explanation. It is an effort to put India on the defensive.

The way ahead

Notwithstanding the bellicose tones and the projecting of water as a flashpoint, there is far greater value to sharing the benefits of water, and that needs to be structured in the bilateral relations. Both India and Pakistan are in need of energy. For Pakistan hydropower is its second largest source of electricity. In spite of the hydrological gradient that favors rapid flow of waters, particularly in the northern region, hydropower generation in Pakistan has been hampered by administrative problems, aging infrastructure, and significant inter-provincial rivalry. Dams and storages for multipurpose uses are politically sensitive in Pakistan and tend to easily become polarized. For example, the 3,500 MW Kalabagh dam, though an engineering marvel, has created a deep social rift. Punjab, seen as a preferred state, advocates large dams and is a prime beneficiary of projects like Kalabagh, but for provinces like Khyber-Pakhtoonkhwa (earlier North West Frontier Province) it is a bane since large pieces of the land would be submerged. Sindh equally fears being deprived of its share of water. This goes to prove that the Inter-Provincial Agreement of 1991 on water sharing has completely failed. It is ironic that the concerns raised by Pakistan on the Baglihar and Kishanganga projects with India are quite identical to those raised by Sind on the Kalabagh dam. Pakistan needs multipurpose reservoirs for hydroelectric power generation, as it ensures the availability of energy on a sustainable basis and at affordable prices.

India has a much higher ratio of storage to water flow as compared to Pakistan on the Indus

basin. Estimates suggest that while Pakistan has only achieved 11% storage capacity, India on its allocated eastern rivers has accomplished 52% and is utilizing almost 80% of hydroelectricity pote ntial. In comparison Pakistan has only managed to harness 5,200 MW against a potential of 38,000 MW on the rivers. The planning commission and implementing bodies for some strange reasons have delayed the development of hydropower. This has only given India the 'priority' advantage, as the IWT stipulates that the country which first completes its project on a river will get complete rights of that river.

Jammu-Kashmir is a key factor in the water debate. The population at the time of the treaty was 3.5 million, which now has grown three-fold. The demand for irrigation and electricity is critical to the agricultural sector. In spite of its vast hydroelectric power potential, which varies from a high estimate of 15,000 MW to a low of 7,487 MW, the state of Jammu-Kashmir remains industrially backward. The people and leadership in Jammu-Kashmir are largely critical of the IWT. They feel that the restrictions placed on the use of water resources by the Treaty have become a hamper to economic development. The IWT gives a virtual veto to Pakistan to scuttle proposals for harnessing the hydroelectric power potential of the western rivers. The restrictive provisions under the Treaty allow for only 10% of hydroelectric potential in Jammu-Kashmir and 40% of cultivable land.

Remarkably, the means to overcome some of the predicted water woes and the energy crisis between India and Pakistan are farsightedly laid out in the IWT itself. Article VII is about 'Future Cooperation' and opens up a range of possibilities through "optimum development of the rivers" by "mutual agreement to the fullest possible extent." It relates to "installing hydrological observation stations" and "carrying out such new drainage works as may be required…." It also states "…the two parties may, by mutual agreement, co-operate in undertaking engineering works on the rivers." However, if such engineering work "affects the other party materially, it shall notify the other party of its plans and shall supply such data relating to the work as may be available…." Keeping in mind the 'optimum development,' new dams should be selected in ways that take into account the 'health of the rivers,' which includes ecological considerations, sediment loads, and flow regimes. Often the social and ecological costs are not fully considered. A completely new orientation to dams needs to be developed involving greater public participation.

In order to energize riparian relations, continued dialogue is crucial. The public discourse on water issues between India and Pakistan, and by association the development of energy and power, is far too narrow and is largely based on misconception. In spite of the detailed permissive and restrictive provisions of the treaty, water figures and facts have tended to be shrouded in secrecy. Transparency will help in clearing the air and will allow for shared benefits on the waters, building ideas of 'water peace' rather than 'water wars.' The negotiators to the

treaty were visionary and had initially approached the dispute through joint development. 50 years of the IWT have not seen such synchronization, but the next 50 years should. The thrust should be the sharing of data and joint research on climate change mitigation, and joint development of the vast hydroelectric and irrigation potential of the western rivers for mutual benefit. There is much sense and sensibility in the IWT that cannot be easily dismissed. Three cheers to it!

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