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WATER - III

Cooperation in the Development and Management of
South Asian River Basins

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Issues and Policies Related to Water Resource
Management of South Asia

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The Everyday Forms of State
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Proposed Union Water Laws:
Need to Rethink the Premises

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Introductory Note

It is evident from all available indices that South Asia faces growing water scarcity. The region also experiences varying rainfall across borders as well as from year to year. This causes natural disasters in terms of drought and flood. It also faces environmental problems with regard to its water resources for lack of proper or adequate sewerage and drainage, the mining of groundwater, and pollution. The recent flood disaster in Uttarakhand has been viewed by some as an outcome of serious environmental degradation in the Himalaya from where several rivers emanate.

Bangladesh and Pakistan are lower riparian countries while India is an upper, middle and lower riparian. Many rivers are shared between Bangladesh, Bhutan, India, Nepal and Pakistan. Partition resulted in the emergence of cross-border conflicts over river waters. However, India signed the Indus Water Treaty with Pakistan in 1960 and the Farakka Agreement on the Ganga with Bangladesh in 1995. In addition, India has agreements with Nepal in relation to the Sharda/Mahakali, Kosi, Gandak and other rivers. Yet, owing to increasing water stress with mounting development needs and the pressure of growing populations, inter-state conflicts have emerged as an important reason for and an obstacle to bilateral and multilateral cooperation.

It is against this background that this Journal prioritises regional cooperation on water related issues. The contribution by R. Rangachari explains the need for cooperation among governments in the region with the objective of achieving optimal, integrated and sustainable development of water resources in the region. P. K. Ray highlights the issues and concerns of water resource management in South Asia and makes the case for sustainable water use in each river basin. He emphasizes the need for controlling and minimizing wastage of water in all sectors through conservation, adoption of better technologies and by preventing pollution.

Alok Bansal brings out the strategic dimensions of the Indus Water Treaty over which Pakistan has raised new issues. Sagar Parsai, in turn, critically examines South Asian trans-boundary water cooperation and argues the case for changes in institutional practices with both internal and external accountability in respect of shared rivers. Finally, Philippe Cullet reviews Union water laws in India, and particularly the Draft National Water Framework Bill, 2013 and the Draft River Basin Management Bill, 2012. He pleads for modern water legislation and regulatory frameworks to achieve given objectives.

I hope this issue of the Journal will be instrumental in generating realistic answers to issues of water resource management in South Asia. I also acknowledge my gratitude to the authors for their insightful contributions to the discourse.

B. G. Verghese
Guest Editor

Cooperation in the Development and Management of South Asian River Basins

R. Rangachari*

INTRODUCTION

Water is one of the most important natural resources of the South Asian Nations. This resource needs to be developed rationally for the benefit of all the people. Therefore, the common objective of all the governments should be the optimal, integrated, sustainable and cooperative development of their region through the development of their water resources. Optimal development and management of river basins is indeed a very challenging task. This becomes even more complicated in regard to large river basins that straddle the territory of more than one state. Rivers often cross several administrative/jurisdictional borders and there could be different objectives, priorities and interests of its units even when they are under one single country. The problems become complex when more nations are involved. Around forty percent of the world's population is estimated to live in such shared basins. Therefore, it is important to understand the challenges of managing, often politically sensitive, trans-boundary waters and to develop strategies and principles applicable to such systems to achieve the desired objectives.

IMPORTANCE OF THE HIMALAYAN RIVERS

The Southern Himalayan Rivers that feed much of south Asia nurture one of the largest supplies of freshwater in the world. There are some ten major watersheds formed by the Himalaya and the Tibetan highlands which spread their waters far and wide. The sources of the Asian rivers Mekong, Chang Jiang, Huang He, Salween, Brahmaputra, Indus, Sutlej, Karnali, Gandak, Kosi, etc., lie there. The Himalayan Rivers are thus very important for sustaining the lives of millions of people. It is no surprise that a recent policy brief of UNESCO/UNEP termed the high mountain region centred on and around the Tibetan Plateau as the "Third Pole".

Two-thirds of India's water resources potential comes from only two of the river basins namely, the Indus and the Ganga-Brahmaputra-Meghna (GBM). Bangladesh, Bhutan, Tibet Region of China, India & Nepal lie in the Ganga-Brahmaputra-Meghna basin. Similarly, the Indus Basin covers parts of Tibet Region of China, Pakistan, India and Afghanistan. Not all their flows can be beneficially utilized. Utilizable flows are

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estimated (and updated from time to time) on the basis of the realistic possibilities of storage/diversion structures, state of technology, hydrology, geology, seismicity, physiography of the land, socio-economic and environmental considerations, etc. also taking into consideration constitutional and legal limitations. If flows in these shared river systems are to be optimally and harmoniously developed and used for the benefit of the people, the good relations and cooperation of the countries sharing them is not only very important but also inescapable.

The influence of the monsoon over the Indian subcontinent is such that there are abundant natural flows, including high floods during the monsoon- from June to September- but the flows become scarce in relation to the needs during the remaining part of the year. Optimally harnessing the bounty of nature, therefore, requires that the monsoon flows be controlled and part of the surpluses stored and redistributed as required, under an agreed framework for sustained development.

LOGIC OF NATURE

There are many logical factors that underline the importance of cooperation between the neighbours for the optimal development of the water resources shared by them. It has been already noted that two out of every five people in the world live in shared river basins. International watercourses have experienced water disputes between riparian states but have also the potential to bind together people separated by international borders by their mutual inter-dependence. Water being a flowing resource rather than a static entity, trans-boundary waters extend the hydrological interdependence across frontiers, linking users in different countries within a shared system.

Political frontiers often do not coincide with the logic of physical geography and natural ecology. There are very few countries, which have all their rivers originating within their territories and emptying into the ocean along their own coastlines. In respect of the Indian subcontinent, in particular, the partition of the subcontinent in 1947 caused an upheaval with new frontiers cutting across its major watersheds. The present political borders of India with the neighbours defy the logic of nature in many ways but water continues to flow, across and underneath the boundaries between the States, or the political lines drawn across maps.

In the past, river flows were often looked upon as merely property to be appropriated by whoever had access to them, disregarding the rights and claims of others to the same. National sovereignty was frequently seen as an ideological barrier to international or regional cooperation in shared water resources. It is a misconception to view national sovereignty as incompatible with interstate cooperation. Management of shared water resources of the international watercourses is an area where cooperation

between nations will lead to shared prosperity and peace. Unfortunately, South Asia seems to have overlooked the advantages of cooperative approaches between riparian neighbours. The nationalistic sentiments by the newly independent nations had become the enemy of rational solutions for securing and enhancing national futures. There are yet others who hold and propagate the view that inter-country cooperation in shared water resources should not be identified merely with a clutch of big projects or cooperation at the level of government. Many others think that local rainwater-harvesting, demand management and such other activities within the territories of each nation should provide the solution. But even they agree that there are many possibilities and compulsions of cooperation, for example, protection of water sources, improving water quality, managing floods and minimizing damages and watershed conservation.

As any discussion on the development and management of all the Himalayan Rivers or the South Asian river basins involves a very large canvas, it is proposed, as an example, to limit the consideration in this paper to the possibilities and benefits of cooperation in respect of the Ganga-Brahmaputra-Meghna basin, which accounts for a large part of the Eastern Himalaya.

THE GBM BASIN

The GBM basin is the second largest in the world, next only to the Amazon and extends over the Tibet Region of China, Nepal, Bhutan, India and Bangladesh. The average annual runoff of the rivers of this system is over 1350 Billion Cubic Metres (BCM). The basin covers a geographical area of 1.75 million sq.km., out of which the arable area is 79 million ha. It is estimated that some 660 million people live in it. The broad country-wide details are given in Table 1

Table 1: GBM Region: Salient Details

Parameter	Nepal	India	Bangladesh	Bhutan	Tibet-China	GBM total
Drainage area in 1000 sq.km	140	1,105	129	45	326	1745
Arable land in million ha	2.6	67.2	9.1	0.2	Neg.	79.1
Estimated population (2010) in million	28	482	145	2	3	660

Source: GBM Region-A framework for sustainable development(Ed) by Q.K.Ahmed and others, Paper by R.Rangachari and B.G.Vergheese, pp 82-83 with estimated population figures for 2010.

Until the late 1980s, while some bilateral agreements between India and some of her neighbours in the GBM region were arrived at, no breakthrough could be achieved by

the various governmental initiatives to secure an agreed approach on water resource development in the GBM region. Such discussions were also conducted bilaterally between India and each of its neighbours. In view of this position it was felt that some appropriate non-official or Track-II efforts might assist the governments in moving forward. A three-country academic-cum-professional group came into being in 1990. Three institutions, one each from India, Nepal and Bangladesh, launched a collaborative study on the integrated development of the Eastern Himalayan Rivers¹.

These studies resulted in a number of publications on the potentials for the development of the GBM region. In 1993 the first of the series titled "Harnessing the Eastern Himalayan Rivers: Regional cooperation in South Asia" was published by the Indian NGO Centre for Policy Research². There were two similar publications from Nepal and Bangladesh NGOs respectively giving their perspectives about the GBM Region. This was followed by another publication in 1994 titled "Converting Water into Wealth: Regional cooperation in harnessing the Eastern Himalayan Rivers" which was the result of consensus of all the three NGO groups. The last publication in this series was brought out in 2000, titled "Cooperation on Eastern Himalayan Rivers: Opportunities and Challenges"³. The same three institutions were later invited by the Third World Centre for Water Management to prepare a Framework for Sustainable Development of the GBM Region. This was also documented in another publication in 2001 titled "Ganges-Brahmaputra- Meghna Basin: A framework for Sustainable Development."

An assessment of the demands on water is required to formulate a developmental policy. It is usual to broadly categorize demand for water under major categories, like water for municipal and rural habitats, agriculture, industry, and infrastructure. Besides the human demands adequate water has to be ensured for preserving the environment and/or restoring to the levels that are considered essential for mankind's wellbeing and survival. The three country study had attempted to examine this matter under the above framework with available information.

In the course of these decade-long (1990-2001) studies undertaken by three prominent NGO think -tanks from Nepal, India and Bangladesh, referred to above, that assessed the role of water resource development in the specific context of each of these countries, followed by a consensus presentation, some very interesting points had emerged and relevant conclusions drawn. These are briefly recapitulated in the later part of this presentation. The concluding main consensus pointed out that "regional cooperation in the harnessing of the Eastern Himalayan rivers, home to the largest concentration of the world's poorest, offers to all countries gains far beyond anything that can be achieved by isolated national efforts"

DISASTER MITIGATION

The GBM region has been facing natural disasters like floods since ancient times. Most of Bangladesh is located within the lower floodplains of the GBM river system. These Rivers drain an area of 1.75 million sq.km., including tracts receiving the highest precipitation in the world, of which only 8% lies in Bangladesh. The country acts as the funnel for the enormous runoff of the GBM system, much of which is generated outside its frontiers. Bangladesh gets flooded each year and this covers about one-fourth of the area of the country. A flood of 20 year return period affects 43 percent of the country. Bangladesh has no storage possibilities in the GBM region and has depended largely on embankments and nonstructural measures for flood management.

GBM region covers only a third of India's area but two-thirds of the flood-prone area in India lies in the GBM region. The recurring flood and erosion problems of the Brahmaputra and Barak valleys and the distress in the Kosi, Gandak, Goghra sub-basins are well documented. The efforts on flood mitigation made by India so far include a few reservoirs in the Ganga subsystem, where they were possible, and flood embankments coupled with nonstructural measures. A Task Force set up by the Govt. of India recommended in its Report of 2004 that for flood management in the GBM basin cooperation of the neighbouring countries was essential. As flood management has to be an integral part of the overall water resource development, regional cooperation in this regard will be essential. Bangladesh looks forward to storage reservoirs upstream in India and Nepal for mitigation of floods in addition to other benefits. Similarly, India also looks forward to storage reservoirs on the upstream region of the major tributaries of the Ganga, the Brahmaputra and the Meghna for flood control and sharing of other multipurpose benefits and costs.

The coastal zones of Bangladesh and India are subject to periodical, often destructive tropical cyclones and associated tidal surges. These cyclones usually originate in the southern Bay of Bengal and Andaman Sea and move up, ultimately striking the coast in India, Bangladesh or Myanmar and weakening. To save lives and property, effective early warning system for cyclones detailing their intensity and movement are of great importance to India and Bangladesh. This calls for cooperation of these countries.

Effective cooperation for disaster management will be most beneficial to all the countries of the GBM region as they share the same river systems which are integrated units and face similar disasters. Also, any natural disaster occurring in the upper catchments can have profound repercussions in the lower reaches.

ENERGY COOPERATION

Energy consumption is a fair index of a nation's development and standard of living. Economic growth and greater energy use have been found to have a direct and positive link. The GBM region is one of the least developed parts of the world as is also reflected in its very low per capita energy consumption. Non commercial and traditional forms of energy dominate the energy scene in the countries of the GBM region. Nepal is landlocked and it imports petroleum products and coal through India. India is also importing a significant part of its crude oil needs which adds a significant burden to its foreign exchange earnings. Bhutan, too, depends on imported petroleum products. In this context, hydropower can play a leading role. Hydro electric power is a renewable source of relatively clean energy, without recurring and uncertain fuel costs. It can be fully integrated with multipurpose development.

There is considerable hydropower potential in the Himalayan region of the GBM basin. India has assessed its potential in the GBM region as well over 45,600 MW. Hydropower is Nepal's major resource endowment. The power potential in Nepal, identified through possible specific projects, is also over 42,000 MW. Bhutan has the hydropower potential of another 30,000 MW. There is a significantly much larger hydropotential in the Tibet region of China, but in the absence of reliable information it cannot be quantified in this study. However, some reports indicate that there could be a possibility of generating 50-70,000 MW of power by a single project to tap the potential at the Bend in the Brahmaputra river through a tunnel linking Tibet and Assam in order to utilize the 3000 m drop in the river.

It seems a paradox that notwithstanding the vast hydropower potential of the Himalayan part of the GBM, the extent of development so far and its pace are both highly disappointing. This position is not due to any lack of serious attempts at increasing hydro generation through specific projects but due to various other reasons. It has been the experience of the world that there is also a significant and positive correlation between the power consumption and the GNP of a nation. The per capita electricity consumption of Bangladesh, Bhutan, Nepal and India is much lower than that of the developing nations of the world. A recent position of the relative electricity consumption is shown in Table 2.

Nepal is planning in the short/medium term reduction in power deficits and minimization of load shedding by small schemes. In the long run, the goals are construction of large power projects for domestic consumption, export of electric power and attainment of better balance between supply and demand. The hydroelectric projects under construction are mainly "Run-of the river" plants. Large projects can be justified in Nepal only if these are based on export market. Fortunately, this possibility exists for

India as a potential export market. The study by IIDS, Nepal indicated that given the vast hydroelectric potential of the country, the long term solution to energy problems and economic development lies in its exploitation. In Nepal "if major hydroelectric or multipurpose water resource projects could be developed based on export market, these will in addition to generating export earnings contribute significantly to meeting if energy needs at comparatively cheaper price as also open up opportunities for nationwide development of transmission and distribution networks"⁵. IIDS study has identified the entire northern and eastern region of India as potential markets for Nepal's power exports. Nepal's hydropower exports to India could also have a significant impact by improving the trade deficit of Nepal vis-à-vis India.

Table 2 Electricity consumption in selected countries

Country	Population in million-2003	Per capita energy consumption in kwh		Per capita GNP in \$ US	
		1980	2003	2003	2004
India	1,071	173	594	540	640
Bangladesh	137	30	145	400	406
Nepal	26	17	91	240	252
Bhutan	2	17	218	630	751
China	1,308	307	1,440	-	1,490
South Asia	1,528*	171	598		697
LDC s	741*	83	114		355
Developing nations	5,094*	388	1,157		1,685
World	6,389*	1,573	2,490		6,588

Figures Relate to 2004

Source: Human Development Report 2006, UNDP from Ambassador Santosh Kumar (2011, page 129)⁴ from "In the National Interest: A companion volume" edited by Ambassador Santosh Kumar for ICRIER and published by Business Standard books, New Delhi, 2011, page 129.

Bhutan, a smaller and until recently, even more hermetically sealed and landlocked Himalayan kingdom exhibits another model. Though it started later, it has already pulled well past Nepal. The Chuka, Tala and other projects have enabled it to increase its per capita consumption (see table 2 above) as also earn significant revenues by sale of surplus power to India. In this process, it has increased its per capita income past those of its neighbours and, the same presently stands next only to that of Sri Lanka in the SAARC region.

The demand for electricity in India has been growing at an average compound growth rate of 8-10 percent. India is presently power hungry and needs to increase its generating capacity. Another matter of concern to India is that the share of hydropower

in India's power mix has declined steadily from 44 percent to 25 percent. Because of the growing imbalance in the hydro-thermal mix the eastern and western regions are required to back down during off-peak hours. There is also a growing pressure by environmental concerns to avoid burning "dirty" coal with its high green house gas emissions. Thus, there is a great need presently to exploit the vast but still largely untapped hydropower potential of GBM through a regional/national grid.

The "Green" Himalayan hydropower, especially in Bhutan and Nepal, should ideally qualify for emission trading under the "clean development mechanism".

INLAND WATER TRANSPORT

For many centuries, the Ganga, the Brahmaputra, the Meghna and their principal tributaries/distributaries served as the major arteries of commerce. The decline of Inland Waterways Traffic (IWT) commenced after British India started developing Railways under state patronage. Improvements of roads and further development of road network accelerated the decline. The partition of India in 1947 dealt a severe blow to IWT. Notwithstanding these developments, even today the lower part of the GBM system is mainly dependent on waterways, particularly in Bangladesh. Transportation by waterways is also the cheapest mode of transport. It reduces the POL import needs and leads to conservation of foreign exchange.

After the realization of the importance of water transport by independent India, efforts were initiated for its revival and strengthening. The Inland Waterways Authority of India (IWAI) was set up in 1986 to develop, maintain and administer "National Waterways." The Ganga River from Haldia to Allahabad was first notified as National Waterway No 1, followed by designation of the Brahmaputra between Dhubri and Sadiya as the National Waterway no. 2. These and other extensions are being developed to provide a minimum navigable depth of two metres and a minimum width of 45 metres. Navigational aids and terminals are also being developed. Kolkata had always been the premier port for this region. The construction of the Farakka barrage with its upstream pond, navigation lock and the feeder canal further helped linking the Kolkata port with its vast hinterland through the extensive IWT network.

Nepal, being a mountainous, landlocked country is in desperate need of a sustainable transport system to serve its domestic needs and for the external transit to the sea. The development of roads throughout Nepal will be expensive in the construction, maintenance and operation stages. Moreover, it will entail large deforestation and impact adversely on the ecology through hill cutting, landslides and cross-country drainage network. Hence, it considers it appropriate to go for a balanced development of roads and inland waterways navigation complementing each other.

Bangladesh being the land of rivers, a dense network of rivers, canals and creeks has served large parts of the country and provided cheap means of transport. Due to the riverine, low-lying and highly flood-prone nature of the country, the construction and maintenance of roads and railways will be very costly compared to that of the waterways. The waterways also link the network with the principal ports of Chittagong and Mongla as also the inland ports at Khulna, Chandpur, Dhaka, Narayanganj and Barisal.

The GBM river system and its connections with the other rivers in the eastern region offer great prospects for interlinking the waterways and ports with coastal shipping. The GBM waterways could establish link with both Kolkota/Haldia of India and Mongla/Chittagong of Bangladesh.

With the rapid implementation of schemes to improve inland waterways and development of efficient cargo river coasters, landlocked countries Bhutan and Nepal can be directly connected with the ports across the open sea. Nepal has for long desired access to the sea through the Ganga (and utilizing the inland waterways in India) in order to overcome the barriers of geography and for facilitation of trade and commerce with the rest of the world. A comprehensive plan to develop and utilize the water resources of the Kosi River to benefit Nepal and India, with navigation as its essential component, is currently on the anvil. A joint study and preparation of the Definite Project Report of the Saptakosi and Sunkosi proposals has been agreed upon by the governments of Nepal and India. They have the potential to extend the benefits even to Bangladesh. Possibilities for extending similar water routes linking landlocked Bhutan to India, Bangladesh and the sea either through India or Bangladesh are considered realistic, subject to detailed studies

For the GBM basin nations, navigation and transit facilities from the upper to the lower regions (Nepal to India, India to Bangladesh, Bhutan to India and Bhutan to Bangladesh) could signify the need to consider regional cooperation in sustainable water resource development with multi-purpose benefits.

AGRICULTURE AND FOOD

The gap between what is possible and what exists in the agricultural scene shows a great paradox. A major problem for the GBM nations (except for Bhutan and the Tibet region of China) is the rapid growth of their population. India expects that its population will continue to increase and by the year 2050 it will be 1.6 billion. This could mean a foodgrain requirement of 350 to 450 million tonnes, according to different estimates. This will be double the current level of production. Similarly, Nepal's growth rate of population is one of the world's highest, which poses a challenge to development. In Bangladesh, projections by different agencies of future population are available. The

projection by the Water Resources Planning Organization WARPO puts the likely population by the year 2050 as around 227 million⁶. The corresponding rice and wheat requirements for 2050 are unavailable but they are indicated as 29.9 million tonnes of rice and 5.4 million tonnes of wheat by 2025, an increase of 30% between 2000 and 2025. These estimations stress on the need for increased productivity in agriculture as expansion of cultivable land is not considered feasible.

In the GBM rivers there is enough water resource potential and large extent of cultivable land exists in the basin. The main problem faced by all the nations is that while there are abundant flows during monsoon they experience dwindling low flows during the rest of the year. This calls for flood mitigation and drainage in the monsoon season as well as augmented flows enabling controlled irrigation during the rest of the year. Though India presently has the largest irrigation system in the world, the quality of water management leaves much to be desired. Water is usually underpriced, if not given free, leading to growing subsidies and inadequate operation and maintenance.

Conflicts among the countries in Asian region over the development and management of water resources are already manifest. Even more are likely in the future that is underscored by possible climate changes and environmental degradation. The Ganges Water Treaty (1996) stipulates flows that are required to be released by India below Farakka for use in Bangladesh. Bangladesh considers that there is a need for the augmentation of the natural flows to meet various needs. There are presently no overall water sharing agreements with the other nations in GBM region, except for stipulations of some releases at a few specific projects. It is apparent that all downstream nations are looking forward to possible storage schemes by upstream countries to meet their increasing water needs.

DOMESTIC AND INDUSTRIAL NEEDS

Drinking water supply and sanitation is a basic necessity of life and is a crucial input to the goal of "good health for all". Nepal considers the provision of adequate water supply and sanitation to be a high priority social objective. In Bangladesh, too, domestic, commercial and industrial needs are given the highest priority under the National Water Plan. An assessment in India indicated that irrigation used the largest part (83%) of all water extracted from various sources while the remaining 17 % related to municipal, energy, industries and miscellaneous uses. The Indian national policy also accords the highest priority to drinking water supply. Various differing water standards in respect of quantity and quality exist in the different GBM nations. Similar is the position in regard to industrial water supply and effluent standards.

WATER QUALITY AND POLLUTION

Industrialization has posed some threat to water quality through untreated or partially treated effluents discharged from various industries. Municipal wastes, industrial effluents and excess use of chemicals and pesticides have polluted surface and ground water quality. Over many decades, most rivers and water bodies have been polluted. Finding the optimum strategies for conservation of water quality has indeed become a challenge to all the GBM nations. Coordination and cooperation among them in this area is another desired activity.

ENVIRONMENT

The GBM region, one of the poorest parts of the world, faces accelerating environmental degradation with the increasing number of people being compelled to live off its natural resources base for their survival. Breaking out of the poverty trap through rapid development activities is going to cast a burden on the environment unless suitable care is simultaneously taken. There is a vast scope and need for regional cooperation by countries sharing a river basin in collectively tackling environmental concerns such as catchment area treatment, sediment control, reforestation, curbing pollution, salinity control, and protection/ improvement of water quality. Adverse impacts in the GBM region due to possible climate changes and the remedial steps to be taken in this regard will be another matter for cooperation by GBM countries.

WHERE DO WE GO FROM HERE?

Water is the key to Asian prosperity. The optimal development of this vital resource in a harmonious manner cannot be left to the mere whims of passing politics. It has been recognized by all that there is an abundance of wealth locked in this shared water resources system of the GBM basin and that it must be creatively developed. The chasm between this region's potential and its present state of realization must be quickly bridged. All the countries involved are too poor to afford further loss of time in this effort.

More than six decades ago, while addressing the silver jubilee session of the Central Board of Irrigation and Power in 1952, Jawaharlal Nehru while referring to "national conflicts which affect the whole human race" deplored our inability to overcome "narrow boundaries, not only of geography but, what is much worse, of the mind". This message is still very relevant.

Many technical alternatives and possibilities for joint actions have been under consideration for decades without really making any progress. Part of the reason for the present slow pace or impasse is that the governments have not so far taken a truly holistic

view. Most past discussions were restricted to some specific projects or sectors, piecemeal. If they have not moved forward collectively, this is also largely due to the legacy of political distrust based on many considerations and past experiences. There is also the unstated fear of smaller countries about a regional ‘hegemony’ overwhelming their interests. Added to these factors are the lack of openness and mindless classification of data in regard to the GBM basin. Also, governments often take a short term political view coinciding with their term in office, while the issues relating to the optimal development of the shared water resources of the GBM basin call for a long-term perspective and a statesmanship approach. The real challenge to diplomacy in our region is to convince the decision-makers that national interests on shared river systems can often be secured through international cooperation.

If the nations in the GBM basin are to roll back poverty and ensure to a large extent better quality of life for the humankind living here, they only have to harmoniously reach out to grasp the various available opportunities. In this process, no country has to be a loser and all can benefit. South Asia will then emerge as a peaceful, stronger, better and happier region for its people.

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Issues and Policies Related to Water Resource Management of South Asia

Pranab Kumar Ray*

As a species of the genus of water scientists, we are concerned both with explaining our water environments and principles of understanding how communities can interact with the resource sector for sustainable uses of water as a component of varied character. We may review our concerns about the water environment of a rather well-endowed geographical space—often defined at various times and occasions as South Asia, promoting many sets of questions, calling for explanations of a vast unused resource base, understanding the links between the physical and human aspects of planning for a resource system in an integrated manner for each planning region, being free from present-day situations of gaps and obstacles which can be mutually discussed and solutions developed with pragmatism and openness about our basic concerns regarding development of humanities.

Water generally is a simple element but not when its demand is generated without giving some consideration to its quantum, nature and more so when politics gets attached to its management. All these aspects are grossly abundant in under-developed countries with colonial legacy of partial planning and moderate implementation about water resources. South Asia is remarkably a reflective space where the canvas of integrated water resource planning for sustainable uses is rather bleak and blank.

South Asia : Indian Council of Social Science Research presented a text by Arthur Geddes, titled *Man and Land of South Asia* in 1981.¹ In this text South Asia is considered as the Indian Sub-continent comprising of India, Pakistan and Bangladesh. Regional geographical texts^{2, 3} have treated South Asia per se Indian Sub-continent comprising of India, Pakistan, Nepal, Bhutan and Bangladesh. The island of Sri Lanka may be considered by its proximity and structural similarities. When hydrological aspects are considered, such a configuration does hold good. Water resources are best defined by watersheds of individual rivers. Indian Sub-continent is drained by a number of mighty rivers, many of which have originated beyond the boundaries of these five sovereign states. Therefore, for the purpose of rational water resources planning and management of South Asian region, any discourse should include the Xizang Zizhiqu Province (Tibet) of China and Afghanistan for two reasons. In the first place, the Indus-Ganga-Brahmaputra-Barak drainage system is well spread over the plateau section of Tibet and

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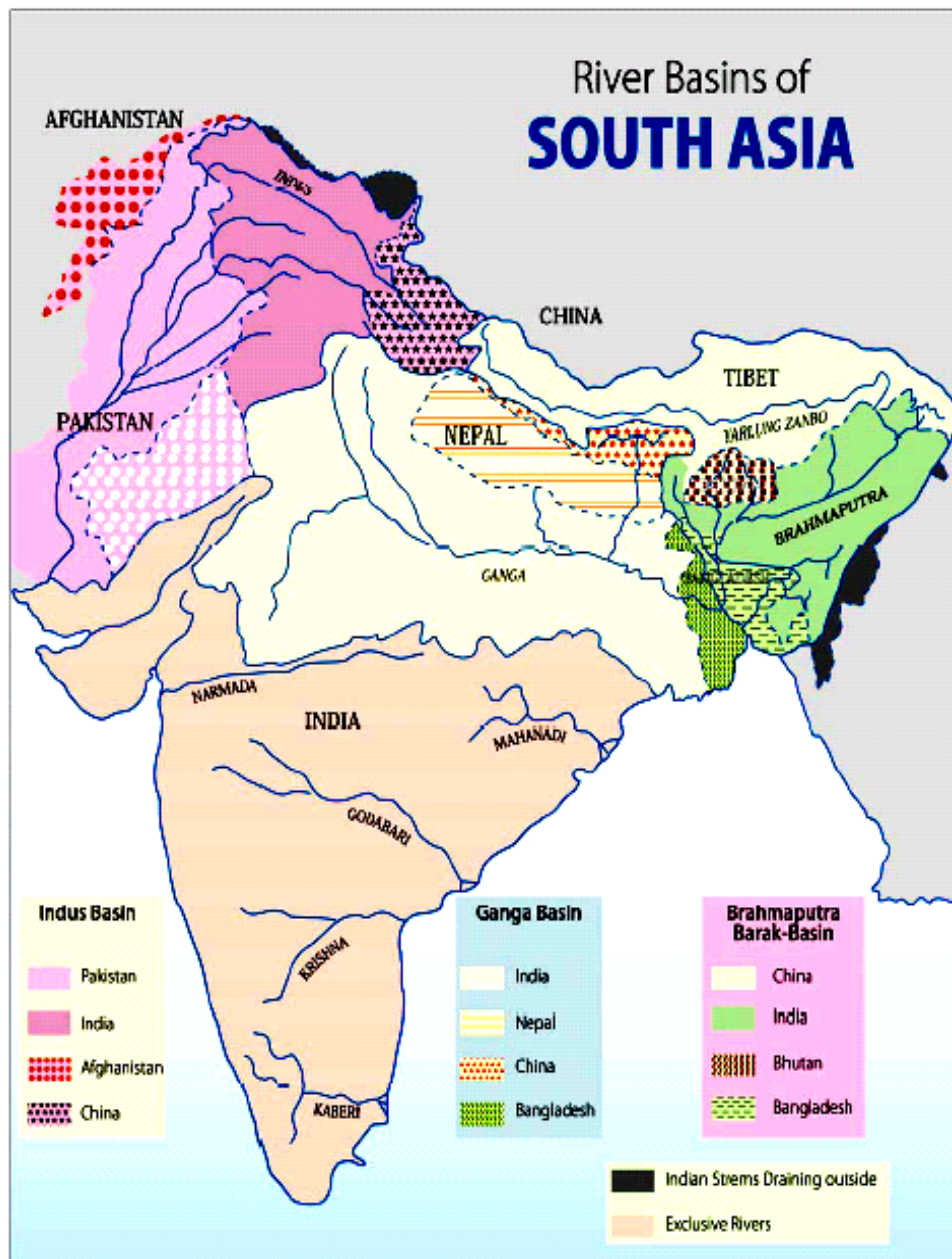
eastern plateaus of Afghanistan beyond the five states of Indian Sub-continent. The second reason is that integrated water resource policy is a multi-lateral issue and all sovereign parties should be treated with equal parity irrespective of their sizes, their contribution to the generated water wealth and their riparian status.

Sri Lanka and Myanmar are excluded in this treatise because an islandic state like Sri Lanka can't be linked with physically detached other sub-continental states. Myanmar, once considered as 'Cinderella Province' of British India was separated from India in 1937. Water resources of Myanmar are partially linked to Yunan Province (China), Manipur-Mizoram (India) and Laos and North Western Thailand region and should be identified within South-East Asian context.

South Asia as a Hydrological Domain: Hydrological domain of South Asia encompasses the entire continental territorial area of India, Pakistan, Nepal, Bhutan and Bangladesh along with southern part of Xizang Zizhiqu province (Tibet) of China and parts of north-eastern areas of Afghanistan. The portion under China is large compared to the small section of Afghanistan draining into the Indus System.

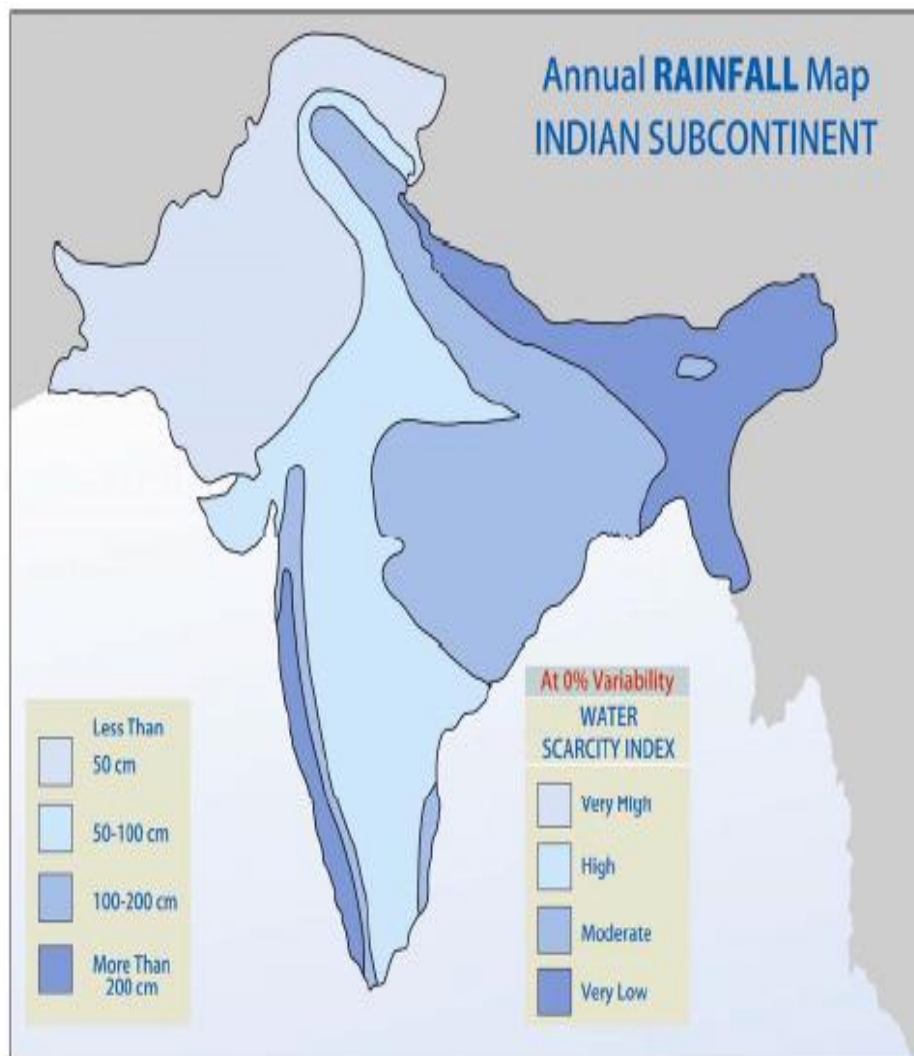
This hydrological domain is drained by three main river systems which are inter-state rivers. They are the Indus, Ganga and Brahmaputra. The other river systems are exclusive for India draining its southern peninsular region. Exclusive river basins are insignificant for other states. Pakistan, Bangladesh, Nepal have small exclusive basins with limited potentials. Against this backdrop of exclusive and tri-lateral structures of these river basins, policies and principles for water resource management for sustainable development should be developed. All such plans should be basin specific at the policy level and state specific at implementation stages for exclusive river basins and multi-lateral inter-state rivers.

Water resource planning for South Asia can consider the policies, issues and implementation aspects for six primary stakeholder countries viz. India, Pakistan, China, Nepal, Bhutan and Bangladesh. The spatial issues of upper Yarlung-Zangbo (Tsangpo) of China and Kabul-Kunar basin of Afghanistan will also be reflected in the common policy formulation section.



The Resource Scenario : Indian Sub-continental parts of South Asia display wide climatic variability. Only a small section of western coastal plain, west of Sahyadris and equally small region of North-East India receives rainfall above 3000 mm. Vast parts of central and north-western India receive less than 1100 mm of rainfall. For Marusthali

(Rajasthan, India) and larger parts of Pakistan average annual precipitation is less than 500 mm. The plateau of Zizang Zizhique from where Yarlung Zangbo generates its discharge is in the rain shadow zone with an average annual rainfall varying between 450-500 mm.



Among the three major river systems of South Asia—the entire Ganga system and the lower Brahmaputra basin receive their major share of water from precipitation falling within Indian Subcontinent. Considering 1250 mm of average annual precipitation fall over 328 ml ha geographical area of India generates 400 ml ha m of water. This amount of water was earlier considered as abundant in the sixties but with increasing population

and greater per capita demand for water, this may not be even sufficient today. In fact, per capita availability of water is getting reduced with time. In 1955 per capita availability of water for Indians was 5,000 cu m which stands at 1829 cu m in 2003 and would be only 1,140 cu m by 2050. The projections for Pakistan as well as Bangladesh are displaying equally alarming pictures of scarcity. Pakistan is served by Indus System. Indus river system originates in dry plateau of Xizang Zizhiqu and navigates equally drier parts of Himadri and Karakoram ranges before entering into desert and semi-desert lands of Pakistan. Nepal is considerably better endowed in these aspects. Nepal, south of Mahabharat Lekh (Middle Himalayas) receives more than 2000 mm of rainfall, while the northern slopes of Middle Himalayas as well as Himadri Range receive rain and snowfall to the tune of 1200 mm. Snowmelt waters provide much for summer time fall of discharge of these rivers. The Arun, Kosi, Karnali, Barun bring water to southern plains of Nepal from the northern slopes of Himadri and from the mostly frozen plateaus of southern Tibet. More than inadequacy, the nature of water utilization is the cause of sensitivity for the water policy in Nepal. Like Nepal, Bangladesh is equally a 'wet' country with pronounced summer scarcity for water. Minimum annual precipitation in Bangladesh is 1500 mm in Western Rajshahi with an annual average 2000 mm and a maximum of 3000 mm in Shylet and Chittagong. The country is rather a paradox. Being the lower riparian state of the mighty Ganga-Brahmaputra-Barak system Bangladesh is enormously endowed with very high water supply yet its summertime scarcity of water is very acute. The country is embroiled in a situation of critical shortage of water during the late winter to the pre-monsoon phase (November to May). Lack of adequate environmental flow⁵ during lean season also increases salinity in river water in deltaic parts of Bangladesh.

Bhutan is a landlocked state with great outflowing rivers like the Manas, Sankosh, Torsa. Being a land of abundant rainfall of over 3000 mm annual average the need of proper planning is more significant. The average water flow draining Bhutan is estimated at 73,000 million m³ per annum. Per capita water availability is estimated at 100,000 m³ which is one of the highest in the world. Department of Energy, Government of Bhutan has prepared Water Resource Management Plan estimating 516 million m³ gross consumptive demand in 2022.

Catchment area of upper Brahmaputra, called Yarlung Zangbo (Tsanpo) forms a significant part of the Ganga-Brahmaputra-Barak (G-B-B) river system and the southern plateau of Xizang Zizhiqu (Tibet, China) automatically becomes crucial for effective water resource management plans of South Asia. Apart from the upper Yarlung Zangbo basin, the upper catchments of the Saptakosi, Karnali, Arun and Barun rivers are spread over southern parts of Tibetan Autonomous Council. All these rivers are important trans-boundary streams for Nepal, India and Bangladesh.⁴

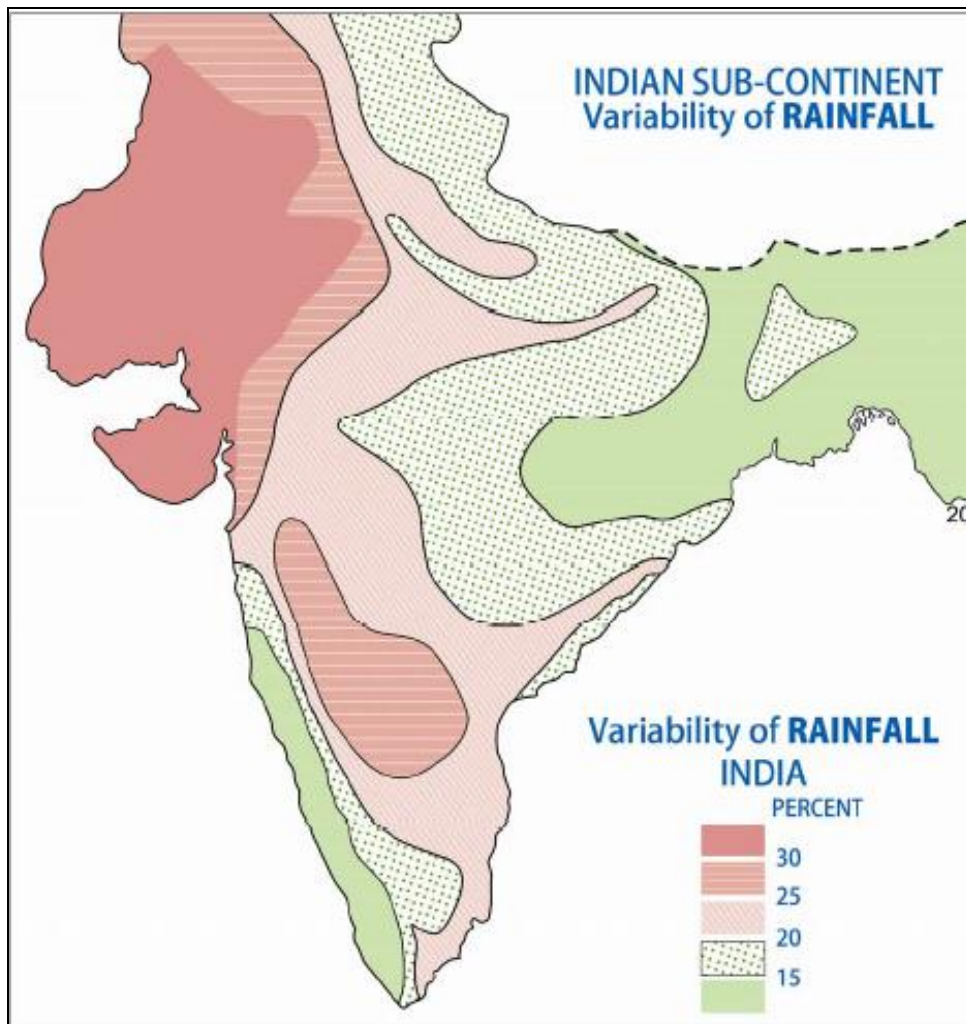
Afghanistan is part of this evaluation because the valleys of the Kabul and Kunar rivers provide some inflow toward Indus system. The amount is not significant but geopolitical norms about trans-boundary river water utilization would require inclusion of Afghanistan and China in this South Asian debate.

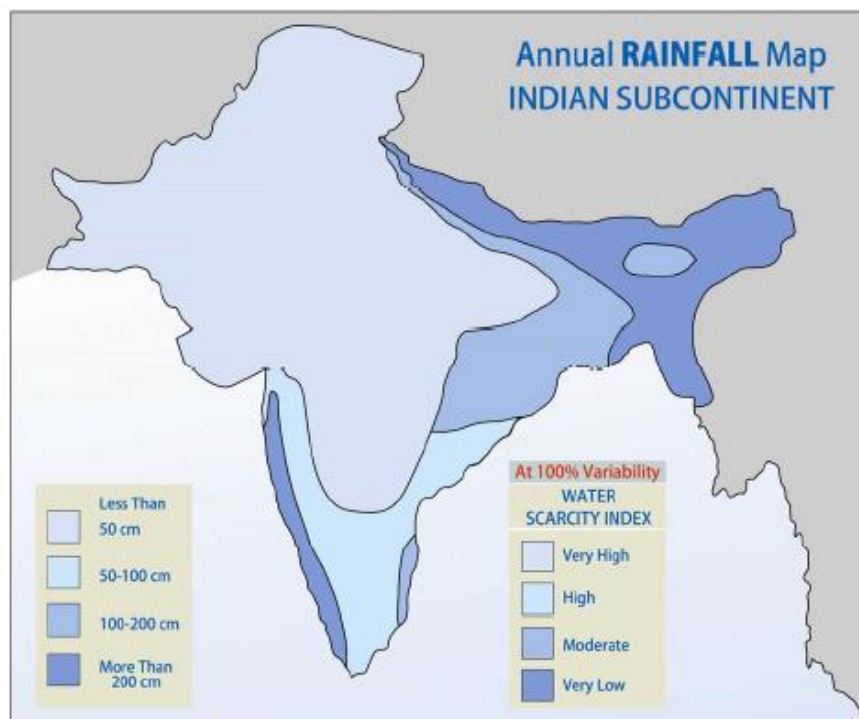
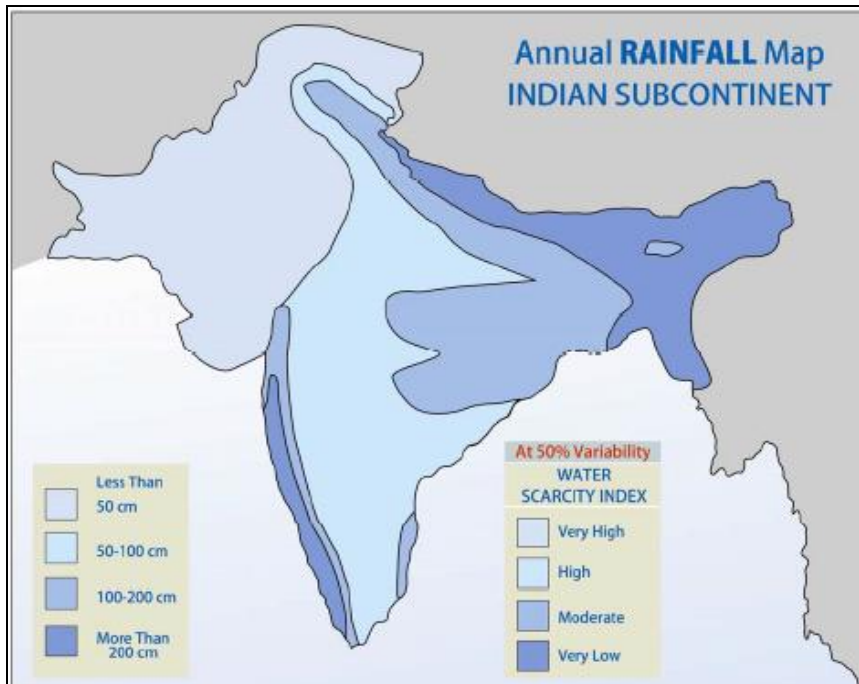
The Issues : Millions of people of South Asia depend on fresh water of high quality⁵ and sufficient quantity for food production, animal raising, industrial production, navigation, hydropower generation and many other uses. All these rivers and their tributaries are capable of causing hazards and endanger human life, houses and other infrastructures due to devastating floods and droughts, bank failure, changes in their courses. With increasing changes in climate⁶, the risks and vulnerability towards river-induced natural hazards will increase in the future. All these will require Integrated Sustainable Water Resource Management (iswrm) expertise, approaches, policies and tools for developing and raising adaptive skills of the concerned communities. The issues for all the three large inter-state basins as well as exclusive basins are similar in character⁷ but planning as well as implementations for these two different types of resource domains⁸ will differ in many aspects and patterns.

Most important among the issues of water resource management is to cater for increasing demands for water from every sector in all the mainframe as well as peripheral countries of South Asia. Rainfall distribution is extremely uneven spatially. Areal extensions of the tentatively surplus zones is many times overshadowed by critically scarce areas. Vast tracts of basin areas receiving less than 1200 mm or even less of annual rain are facing severe crisis.

Scarcity : Scarcity of rainfall is uneven in space and often but not always in time. For the purpose of analysis of this unevenness, all the basins of South Asia are jointly considered⁹. 1200 mm and less isohyet is taken as critical boundary for normal monsoon years. With some percentage of negative variability the critical isohyet is calculated adding absolute value of deficit from normal rainfall and for positive variability the variance value is added. Transformation of variability percentage of rainfall has placed the extent and intensity of scarcity in proper perspective as required for planning positive as well as negative thresholds. For example, the state of Gujarat having expected normal rainfall of 1000 mm will be highly vulnerable even at 15 percent negative variability. But Gujarat have probability of 30 percent or more negative variability. Any Integrated and Sustainable Water Resource Management (ISWRM) system should plan after taking consideration of such 'normal' variability. Scarcity is an effect of several physical processes. With present climate change impacts, such scarcity is likely to vary in space and also in intensity. Present climate is of a wide range from wet Monsoon (Am) to dry Savanah (Aw), hot steppe (Bsh) to hot desert (BWh) types. Warm and cold temperate types of climates are also found in elevated plateaus and high montane ranges. With

retreating glaciers and permafrost zones¹⁰, forthcoming years will be complicated of hydrological environments and by consequent other processes not clear at present. Freak cloud bursts and more frequent tropical depressions and western disturbances would influence hydrological regimes, evidently shifting the peak rainfall season to a new time zone causing instability in crop calendar.





Outflow Wastage : Huge amount of outflow wastage is another issue. As little as 17.25 percent of (in case of India 6.90 billion cu m out of 4000 billion cu m) total precipitation may be available for utilization from surface and ground water sources. A greater percentage of non-available water is lost into oceans as surface outflow¹¹ discharge as well as deep groundwater outflow from underground storage. Surface peak outflow occurs during flood times coinciding with monsoon rains due to failure of the National Water Management Institutes to retain peak flood discharges in reservoirs, barrages and other kinds of storages. Base outflow should be considered as about more than 20 percent of discharge of a channel which is drained into saline hydrosphere making the sweet water runoff practically as a waste. In other words, this is less a issue of outflow wastage than a reflection on the sustainable capacity of National Organizations to maximize the use of available resource. As regard, this aspect, Ganga-Brahmaputra-Barak system is really inefficient. Absence of organizational capacity to use peak monsoon flood discharge of G-B-B system is a serious issue for successful implementation of iswrm.

All India data for utilizable surface water is 690 bcm of which in 2012 only 208 bcm is maintainable in some kind of live storage and the rest 482 bcm—an astounding 71 percentage—is not stored for the purpose of planned and managed utilization. Indian exclusive rivers are those lying south of the Ganga-Narmada-Subarnarekha watershed. Exclusive rivers are not trans-boundary rivers and it can only be expected that capacity utilization would be much higher than 29 percent of these utilizable waters. Yet due to lack in the intra-state policy of sustainable water sharing in principle as a uniform policy, the Peninsular Exclusive rivers are utilized of their 23 percent potential only. From present availability of 432 BCM groundwater only 154 BCM i.e. only 35.6 percent is used, letting 64.4 percent to join southern seas as a wastage. Of the G-B-B system, the Brahmaputra illustrates this issue of utilizable surface runoff with many paradoxes. The Brahmaputra system with the highest mean annual surface flow of 585 km³/year ranks first among all Indian rivers. By the account of mean annual surface runoff per capita water availability would be enormously high over 16,000 m³. But average surface runoff that can be utilized is only 24 km³/year. Three aspects are cited for such an unusually low utilizable surface runoff of the Brahmaputra. Steep slope of the valley within Assam is referred to as the main reason for quick transport of water into lower riparian state of Bangladesh. Variability of rainfall in rainy season is high. Higher temporal variability is known for this basin; so there would be highly variable surface runoff within rainy season. A close consideration of all these aspects would only point towards our inability to manage a mighty channel with rather steepness in gradient and micro-climatic characteristics of temporal variability of rainfall per se surface runoff. Outflow wastage is much less in case of the Indus system which is more intensively used than the G-B-B system.

Resource Planning Status : Another important issue about iswrm is status and nature of present-day water resource planning in India, Pakistan, Bangladesh, Nepal and Bhutan. As for practices in China, the mechanism is rather different. India, Pakistan and Bangladesh inherited legacy of British management for primarily reservoir–canal based irrigation oriented, partial themes of water management. Development of river basins and integration of modalities were not practiced before independence, neither it was implanted in the design fabric of the post independence days. Tarabela, Bhakra spoke same designs like Sukkar or Durgapur barrage of West Bengal. The philosophy never was questioned nor the concepts of integration or sustainability were incorporated in the subcontinent mosaic. Gazoldoba or Dalia barrages are constructed in the same tradition of wasteful conservation and partial planning. In reality, totally integrated sustainable use would be the only way of water utilization.

Nepal and Bhutan have developed their water resource planning under direct intervention if not supervision of the Indian think-tank. Without any observation on the geopolitical linkages for such arrangements, it is needless to point out that the system design for these practices does not reflect integrated sustainable approach either.

China and particularly Tibetan Autonomous Region practices water resource management guided by four water laws on water use, flood control, prevention and control of pollution and water and resource management. None of these laws permits wastage or overuse of water. Seven River Basin Commissions provide basin administration, flow allocations, functional zoning of water and management of pollutant discharge. The rivers Yangtze, Yellow, Huaihe, Haihe, Pearl, Songliao and Taihu have their river commissions but Yarlang Zangbo (Tsangpo) does have any such controlling authority yet. In general, China has implemented regimented dealing with water resources on basin-based strategy.

Afghanistan is linked to South Asian planning by its connections with Indus system. A small portion of basin of Indus is drained with Kabul and Kunar systems. Afghanistan being a semi-desert country with small inland drainage system has not evolved any water policy of significance similar to the other Middle East countries like Jordan or Israel.

The last but most important issue for iswrm in South Asia is absence of comprehensive water sharing policies of uniform mandate and universal applicability. Water sharing policies are required for inter-state as well as intra-state stakeholders. Sharing between two or three sovereign states is as important as sharing issues of intra-state provinces. There are no accepted uniform water sharing policies among the South Asian countries jointly for iswrm of the Indus, Ganga-Brahmaputra-Barak System. At

intra-state levels, the scenario is equally blank with bi-partisan dispute solving tribunals ultimately resorting to temporary solutions at last, through judicial interventions.

Of the seven stakeholders, total absence of any kind of iswrm plans, partial water sharing treaties on specific river basins exist between India, Pakistan, Nepal and Bangladesh. Bhutan, China and Afghanistan are not having any kind of water policy treaty with other stakeholders. Between India and China, the sharing of monsoon time discharge records for flood forecasting is the only platform of exchange of few basic data. The most overriding task would be to develop an effective mechanism to fill up this gap. A review of the reality would show that even the neighbours with closer political affinity never tried to develop frameworks of integrated management of their inter-state rivers. For the intra-state issues of basin-wise development, total, integrated solutions are not pursued for required structural developments.

China as the upper riparian state for Yarlung Zangbo and India as major upper riparian discharge generating state (because Nepal is upper riparian for many resourceful tributaries of Ganga System) are main players in the Indus and G-B-B systems, respectively. Pakistan and Bangladesh being two lower riparian and Nepal-Bhutan as low population density with high per capita availability of water have other distinct interests and orientation in the South Asian perspective¹².

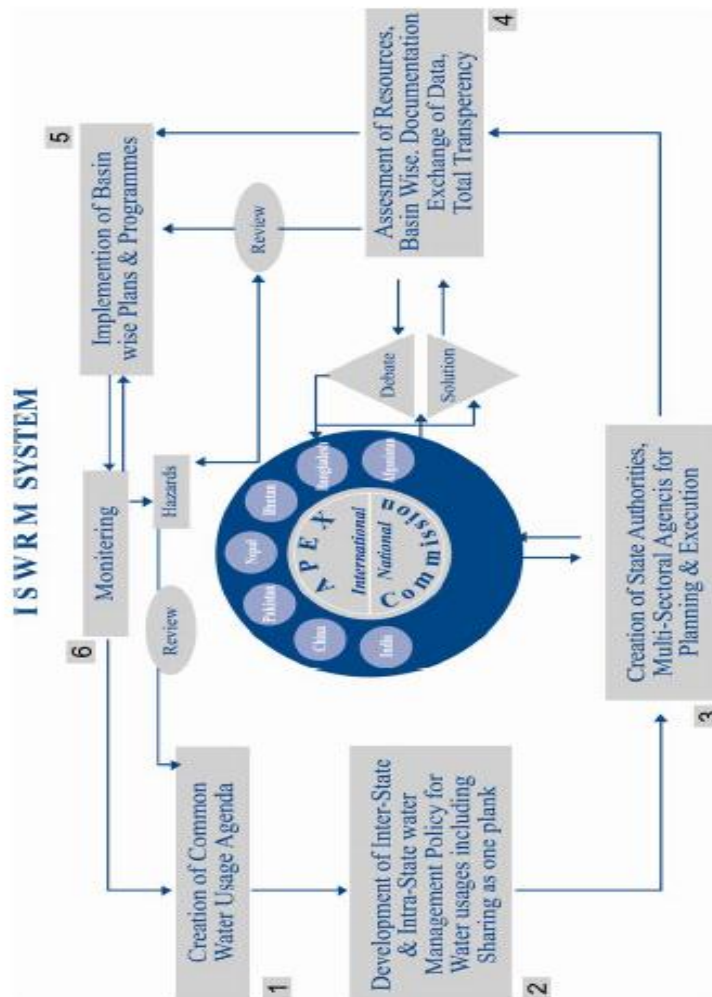
Development of management policies for inter-state as well as intra-state rivers of this region has a legacy of adhocism. Neither for the exclusive state rivers nor for inter-state rivers the policy of water management has gone beyond the scope of deciding the quantum of water to be divided between two countries. Issues are restricted to bi-lateralism even though the rivers may cross three or four states. Integrated water resource management is not even in plan for exclusive rivers. DVC never considered the upper basin areas of the Damodar system in Jharkhand for any water planning.

Topics of water policy, water sharing and related geopolitical issues are widely discussed by concerned sectors of the society including occasional foray by politicians but formation of regional policy of iswrm is yet to be finalised. Bi-lateral and multi-lateral issues are yet to be merged and discussed. It is true that principles of water sharing are much discussed and debated topics but none of the principles is acceptable. No unanimity is reached, no ISWRM is planned. With this backdrop, iswrm for South Asia may be taken up.

The Plan : Integrated and sustainable water resource management system is an urgent necessity. The earlier our South Asian society takes serious consideration of scarcity of quality water at required quantity by 2030 the better it would be. If the real crisis starts at 2050 in the first world, then such a chaos would be generated two decades

earlier in South Asian states. To avoid such a disaster, integrated water management schemes for all basins from the highest to the lowest order need to be planned and implemented by a core agency with linkages for all aspects as noted here.

Two Apex Commission are proposed for national and international levels. At the national level, the commission will deal with issues of water uses, conservation, regulation, sharing and environmental aspects of exclusive river basins of sovereign states like the Narmada basin of India or the Ghaghat, Bansi, Garai basins of Bangladesh. The National Commission will have under it various boards for exclusive basins like the Narmada Control Authority, autonomous bodies like Institute of Hydrology, public sector undertakings and subordinate offices of Central and State Government.



The other Apex Commission is proposed for dealing with water uses, conservation, water sharing and other aspects of inter-state basins under its jurisdiction. This body will formulate policies, plans and strategies for the entire inter-state basin. All sovereign stakeholders with equal power and veto rights will form this International Commission. Both the commissions will work towards planning integrated water resources for development of regions within basins. Policies on water uses, conservation, sharing and maintaining of environmental quality will be similar for exclusive intra-state as well as inter-state rivers. For intra-state rivers provinces, regions will be sharing stakeholders, while for inter-state rivers sovereign states will act as primary stakeholders. Both Apex bodies would develop common use and conservation sharing principles.

WHY ISRWM?

Water sharing mechanism is rather chaotic in South Asia. Discussions and negotiations over water sharing issues are not cultivated without geopolitical implications. One plan failure is not solved by another plan of success. For example, loss of water due to diversion at Farakka to Ganga in Bangladesh can be solved by augmenting the flow by harvesting water from Torsa-Sankosh and linking these two rivers to Ganga through Punarbhaba channel. Exploration of practicable alternative is often blurred by mistrust which is created by political considerations of water issues. Any proposal of a small, viable basin link may generate positive response if the scheme is properly planned with absolute openness in case of two inter-state rivers. For intra-state rivers, this problem is equally manifested with great frequency among stakeholders of exclusive river systems of India. The Narmada, Krishna, Cauveri water sharing issues are equally important in this respect. Sharing 'Equity' is not a simple issue since the amount of equity is so less defined. Even after various propositions about 'equity' for any inter-state river like the Indus or Brahmaputra India-Pakistan or India-Bangladesh can't solve the issue because equity for either state can't be so easily agreed upon.

With frankness and co-operative attitude the principle of 'Need' may be a better guide. The 'Need' can be defined better since the demands for irrigation, industries, domestic needs—for both rural and urban populations, need of increased water to maintain navigation and providing adequate environmental flow—all can be computed for two or more sovereign states or many provinces of a sovereign state. 'Needs' may often be too high to be met by a basin runoff or groundwater. The actual 'Needs' may contain many wasteful practices of water use. Improvement of water use technology are being improved and a lower 'need quota' may appear adequate for negotiation.

After looking into the principles of equity, reasonable utilization, amicable information exchange, peaceful settlement of disputes for the past century, we need some down-to-system evaluation of proposal of co-operative—competition by creating the bi-

nodal Apex body for preparation of iswrm. Considering the infrastructural background, China and India can develop a joint Tech-Tank for water resource management and share such techno-power with other states of South Asia. iswrm is not a simple task, neither it is impossible to attain. It requires a move of rationality in the fields of geopolitics, regional co-operation and straight thinking. Without iswrm all South Asian countries are going to lose at all economic fronts. Agricultural production is not going to match with demand for food. Food security for BPL people can't be provided. The prospects of livestock farming in classic manner need to be modernized. That would demand greater amount of water. Industrial and domestic demands will also rise. Multi-parametric changes in climate will only aggravate the whole scenario. Sustainable integrated planning for mega-basins will thus be the best option. Basin-wise implementations would be a priority and such mega-scale execution will demand enormous amount in logistics, capital and manpower. But more than that would be the essential requirement of political will and co-operation of all kind, not found easily in the political canvas of South Asia. Current practice of fragmented management of water resources in South Asia should leap for iswrm. Reasonable sharing for consumptive need between provinces and states should follow the principle of decreasing the wastage of water by one state on the need of the other. Climate change with higher frequency of extreme events in the coming decades would have various impacts over stream-flow regimes and changing characteristics. Such vulnerability would be a serious problem for Pakistan, North Western and Central India as well as for Northern Bangladesh. iswrm can develop balance between water availability and water uses for livelihood. Water resources of South Asia are utilized in limited ways without integration and evaluation of sustainable techniques for enhancing the amount of limited water resource. Supply of quality, sweet water is more or less finite. With proper recharging of peak flood-time outflow, the virtual amount could be significantly increased.

Water use, its principles and practicable implementation need to be discussed with all users, from village communities to urban corporate and women-men with an eye to increase social equity by involving all users in decision-making. In the agenda of iswrm assessment of basin-wise resources, their documentation and sharing with total openness is proposed. Lack of documentation and least openness about sharing available data is main blockade in the way of proper evaluation of the issues by all concerned organizations—government as well as non-government. Hydrological data input system is not satisfactory in South Asian countries—either spatially or temporally. The coverage of data matrix is traditional with many gaps. For example, detailed field studies on infiltration and transpiration is hardly given their due importance although the trend is to gather discharge data. Without such data on infiltration and evaporation¹³ one can hardly justify the micro-level water management. Official secrecy for hydrological data can reach an unimaginable height in India, Pakistan and Bangladesh. China is equally

regimented about all these. Nepal and Bhutan are rather more open but their infrastructural coverage and density are low.

Sustainable water uses should be the main theme of the basin-wise water use planning. Lowering wastage at various sectors of use would provide better conservation. Wasteful uses if curbed could reduce investment in basin-wise development¹⁴.

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Indus Water Treaty: Problems of Perception

Alok Bansal*

Indus Water Treaty that governs the distribution of waters of River Indus and its tributaries between India and Pakistan has stood the test of time. It has not been abrogated or violated by the two countries, despite two wars, Kargil conflict and numerous moments of heightened tensions. Although it has survived the test of time, there are voices of discontent from both sides of the divide, which keep alleging that the treaty is not fair to them and their region or that the other party is violating the treaty. South Asia is a water deficit region and considering the state of bilateral relations between India and Pakistan, there has always been a trust deficit and this allows many to hype sentiments against the other party and inflame passions. So much so that often well-meaning and knowledgeable institutions and individuals get carried away and accuse the other side of depriving them of their legitimate share of resources.

On 06 September 2012, Lahore High court issued a notice to the Pakistani Federal Government to approach the International Court of Arbitration against illegal construction of dams by Indian authorities on Indus Rivers on a petition filed by Kisan Board Pakistan. The petitioners accused India of attempting to turn Pakistan into a barren land.¹ Even the decisions given by the neutral Court of Arbitration are interpreted as victory by both sides. Even minor restrictions imposed by the arbitrators on any project being built by India on the Western Rivers, are perceived as victory by Pakistan and vice versa. Most people in Pakistan perceive that India is depriving them of their legitimate entitlement of water by constructing dams on the Western Rivers.

Similarly, many in India feel that the Indus Water Treaty has been unjust as it gave Pakistan 80 per cent of the water of the Indus and its tributaries, and accordingly want it to be abrogated. More significantly, the residents of Jammu and Kashmir believe that their interests have been sacrificed as the waters of all the three western rivers, namely, Indus, Jhelum and Chenab have been given to Pakistan, thereby denying them their legitimate share of water for agriculture and domestic consumption, as none of the three Eastern Rivers namely, Sutluj, Beas and Ravi pass through the state. This is often used by the separatists in the Kashmir Valley to whip up anti-India sentiments. However, a careful perusal of the treaty reveals that the apprehensions and perceptions of the people on both sides are far from true.

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This paper attempts to analyse the treaty and its clauses vis-a-vis the popular perceptions to show, how most of the alleged transgressions or the perceived sense of injustice stem from ignorance.

BACKGROUND

Indus Basin begins in the Tibetan Autonomous Region of the Peoples Republic of China, covers the states of Jammu and Kashmir, Himachal Pradesh, Punjab and parts of Haryana in India and encompasses most of Pakistan. The partition of India divided the state of Punjab and accordingly the well developed irrigation infrastructure of Indus River and its tributaries. While the existing headworks on most of the rivers were in the Indian Punjab, bulk of the canal network, which was the largest in the world on a single river system; was in West Punjab and Sindh. As the two states came into being a 'standstill' arrangement was signed on 18 December 1947, whereby the two Punjabs agreed to allow the existing flow of waters in the rivers and canals till 31 March 1948.² However, subsequent efforts by the leadership of East Punjab to get their counterparts from West Punjab to negotiate the distribution came to a nought. Probably, the leaders from West Punjab felt that they could claim almost the entire water of Indus Basin based on the principle of 'historic use'.³ Consequently, India on April 1, 1948 shut off water supplies from the Ferozepur Headworks to the Dipalpur Canal, which fed the main branches of the Upper Bari Doab Canal (UBDC).⁴

Thereafter, Pakistan sent a ministerial delegation to New Delhi to negotiate and the Inter-Dominion Agreement was signed in New Delhi on May 4, 1948, under which India was required to release adequate water for the Pakistani regions of the basin in return for an annual payment from the government of Pakistan. The accord was meant to meet immediate requirements and was followed by negotiations for a more permanent solution. However, negotiations reached a stalemate, as neither India nor Pakistan was willing to budge from their respective positions.⁵

Meanwhile, both sides started building canals and barrages to strengthen their positions. In 1948, India commenced work on Harike Barrage at the confluence of the Beas and Sutlej, while Pakistan started work on the Bambanwala-Ravi-Bedian Link Canal (BRBL), which carried water from the Upper Chenab Canal, passing under the Ravi river in a siphon and feeding the Lahore UBDC near Batapur on the Lahore-Wagah road. The BRBL was completed in 1958 and subsequently, proved to be a significant water obstacle against an Indian invasion during the 1965 War.⁶

It took eight years of painstaking efforts through the good offices of the World Bank to negotiate the Indus Water Treaty that was signed in Karachi on 19 September 1960. The treaty came into retrospective effect from 01 April 1960 and was signed by the

Indian Prime Minister Pandit Jawahar Lal Nehru and Pakistani President Field Marshal Mohammad Ayub Khan. The treaty was accepted by the two sides as fair and equitable and gave 80 per cent of the share of water of the Indus system to Pakistan. The treaty gave the use of Western Rivers namely, Indus, Jhelum and Chenab, with a mean flow of 136 Million Acre Feet to Pakistan, while giving the use of Eastern Rivers namely, Sutlej, Beas and Ravi, with a mean flow of 33 MAF to India. India in addition agreed to pay a sum of 62 million Pounds Sterling to Pakistan to build canals to bring water from Western Rivers to Eastern Rivers to compensate for the eventual reduction of water in these rivers.⁷

Subsequently, Pakistan built Tarbela and Mangla Dams to harness the waters of Western Rivers and to divert them to the Eastern Rivers, which virtually dried up as India built its canal infrastructure. Under the Treaty, India and Pakistan agreed to set up a commission to adjudicate any future disputes over allocation of water. Each of them has accordingly created a permanent post of Commissioner for Indus Waters. Both of these commissioners constitute the Permanent Indus Commission, which is entrusted with the implementation of the Treaty. The Commission is required to hold meetings, tour the river basins and submit its report to the two Governments every year. Both sides are required to exchange information related to river flows as observed by them, not later than three months of their observation and to exchange annual information on agricultural use. In addition, India as a gesture of goodwill, communicates flood data to Pakistan from 1st July to 10th October every year, to enable Pakistan to undertake advance flood relief measures. The arrangement is reviewed every year. By the middle of 2013, the Indus Water Commission has had 111 tours and 106 meetings so far.⁸

PERCEPTIONS IN PAKISTAN

Despite the apparent success of Indus Water Treaty and the Dispute Resolution Mechanism, the popular perception in Pakistan is that India is not complying with it. The federal governments in Islamabad have often tried to cover the inter-provincial differences by blaming most of the inequity in the distribution of waters to various provinces by blaming India for it. The ignorant masses are often led to believe that India is stealing their share of water. Many political parties and agencies with vested interests have provoked the peasantry against India by invoking such accusation.

The reasons for water scarcity in Pakistan are many and amongst them the most significant is its burgeoning population. As the population growth rates in Pakistan have been amongst the highest in the world outside the Middle East and Sub-Saharan Africa, this has reduced the per capita availability of water in Pakistan. This coupled with high seepage in canals, low hydraulic performance⁹ and water intensive agricultural practices have created a water crisis. Consequently, the fresh water resources in Pakistan have

depleted and the per capita availability of water has reduced from 5600 m³ in 1947 to less than 1,000 m³. Pakistan ranks 127th out of 142 countries in water availability and 24th out of 140 in severe water stress countries. Water tables have been falling consistently in Pakistan from over-pumping of groundwater. Pakistan has the highest per capita water consumption in the region because of inefficient use. It ranks 8th among 209 countries in groundwater withdrawals. Major rivers now run dry for portions of the year. The impact of rising water consumption is increasingly visible. Pakistan has the 14th highest per capita consumption of water in the world. Of the total 565,000 tubewells in Pakistan, nearly 70 percent are now pumping hard water or saline water, because sweet water has been exhausted.¹⁰

To compound the problem, rain water is wasted due to absence of adequate catchment and storage reservoirs. The existing reservoirs are ageing and their storage capacity has reduced drastically due to silting. Pakistan currently has a storage capacity of only 30 days and the capacity of its three major reservoirs has reduced by a third. Pakistan's forest cover has also been reducing drastically and this has aggravated the problems of climate change. Thus, Pakistan is often afflicted by flash floods or severe draught. In addition, Pakistan uses 90 per cent of its fresh water consumption for agriculture against a global norm of approximately 75 per cent. This results in acute water shortage for industrial and domestic consumption, which accounts for one-third of its population going without access to safe drinking water.¹¹

The water scarcity leads to mutual bickering between the federating units and provinces indulge in frequent blame games. Considering the eminence Punjab enjoys in the body politic of Pakistan, minor provinces perceive that Punjab steals their share of water. Although, the water sharing between India and Pakistan was negotiated in 1960, it took almost four and a half decade for Pakistan's provinces to agree on a water sharing accord. The Water Apportionment Accord signed in 1991, still remains highly contentious.¹² In fact, there are serious differences regarding the amount of surplus water available in Indus to make any future dam viable. Sindh especially feels that any dam will not only deprive it of its due share of Indus water but will also push the sea water up thereby destroying the fragile Indus Delta ecosystem and turning the fertile districts of Mardan and Swabi into waterlogged marshlands.¹³ The problem of water distribution between Sindh and Punjab have persisted for decades and six commissions including two appointed before independence tried to resolve the issue, but failed. The reason being that agriculture in these two provinces is dependent on fair and just distribution of water from dams and barrages.¹⁴

The agreement on Apportionment of the Waters of the Indus River System between the Provinces of Pakistan was eventually signed on 21 March 1991. The agreement came about after a meeting of the Chief Ministers at Lahore on March 3, 1991,

which was followed by meetings of the representatives of the provinces at Lahore on 04 March and in Karachi on 16 March. The agreement apportioned water between different provinces for Kharif (April-September) and Rabi (October –March) as follows:

Province	Kharif	Rabi	Total
Punjab	37.07	18.87	55.94
Sindh*	33.94	14.82	48.76
N.W.F.P. (a)	3.48	2.30	5.78
(b) Civil Canals**	1.80	1.20	3.00
Balochistan	2.85	1.02	3.87
Total	77.34 + 1.80	37.01 +1.20	114.35 +3.00
* Including already sanctioned Urban and Industrial uses for Metropolitan Karachi.			
** Ungauged Civil Canals above the rim stations.			

The agreement also agreed to apportion any additional river supplies (including flood supplies and future storages) that may become available in the ration 37:37:14:12 to Punjab, Sindh, NWFP (now Khyber Pakhtoonkhwa) and Balochistan respectively. The agreement established an Indus River System Authority to monitor and apportion water as per the agreement. It recognised the need for certain minimum escape of Indus Waters to sea, below Kotri Barrage, to prevent intrusion of sea water and consequent rise of salinity. The agreement could not decide on the amount of this water and it continues to be a matter of debate.¹⁵ Despite the agreement, accusations and counteraccusations continued between provinces about the actual drawal of the waters. Consequently, Pakistan had to install telemetry system in December 2004 to monitor 23 barrages, dams and headworks, with the hope that the provinces will get their share of water in a transparent manner and various complains and speculations will come to an end. The system installed at a cost of Rs 320 million monitors the water discharge through satellites and the data about inflows, outflows and distribution of water at the dams, barrages and headworks is available on the internet.¹⁶ However, the mutual suspicion did not end and in May 2005, the Indus River System Authority (Irsa) was informed that the telemetry system had serious design faults and continued to be non-functional at a number of stations. A report by the technical consultants appointed by Irsa felt that the environmental aspects and power requirements of the system were not taken care of at the time of designing the telemetry system.¹⁷ Consequentially, the accusations and allegations about stealing of water continue between various provinces of Pakistan.

In fact, so acute are the interprovincial differences that a dam at Kalabagh, which is perceived to be the best venue for storage of Indus Waters has not fructified because of differences in perceptions amongst provinces. Though Punjab and the federal government in Islamabad are in favour of building the dam, the other three provincial

assemblies have passed resolutions opposing it. The smaller provinces feel that their interests are being sacrificed to irrigate the fields in Punjab and have threatened civil war if the dam is constructed.¹⁸ As the inter-provincial differences reach a crescendo on account of perceived shortfall in the allocation of water to different provinces, the federal government or some sections of the Pakistani society put the blame on India for violating the Indus Water Treaty. It is widely perceived there that India has no rights over the three Western Rivers and, consequently, any attempt to harness the waters of these rivers for consumptive or non-consumptive uses by India is perceived as infringement of the treaty.

The truth as far as the treaty is concerned, is quite different, the treaty not only allows India adequate water from Indus, Jhelum and Chenab for agricultural usage in the state of Jammu and Kashmir, it virtually allows India almost unlimited non-consumptive use of these waters. According to Annexure D of the Treaty, which governs the generation of hydro-electric power by India on Western Rivers, it allows India construction of fresh 'Run of the River Plants' on these rivers subject to certain technical stipulations. The treaty defines a 'Run of the River Plant' as a hydro-electric plant that develops power without live storage as an integral part of the plant, except for Pondage and Surcharge. The primary criteria being that the volume of water received in the river upstream of the Plant, for seven consecutive days commencing 8 AM (IST) on Saturday, shall be delivered into the river below the Plant during the same period". However, on a daily basis (period of 24 hrs commencing 8 AM (IST)) the water delivered downstream can vary between 30 to 130 per cent of the water received. The flexibility available for daily variation in case of Chenab upwards of Ramban and tributaries of Jhelum were more limited. The stipulation on discharge is not applicable while filling the dead storage of the plant.¹⁹

According to the treaty, India is required to give to Pakistan the design details of every new project, however, every Run of the River project planned on these rivers by India was objected to by Pakistan. The first major setback was, when Pakistan objected to the Wullar barrage in 1991, which was intended to increase the depth of water in the Jhelum and facilitate navigation for transportation. Consequently, India stopped the construction of the barrage pending bilateral settlement of the dispute but till date has failed to convince Pakistan. This has reinforced the belief in India that Pakistan's intent in raising objections is to prevent harnessing of Jammu and Kashmir's immense water resources and consequent development of the province. Subsequently, when India started work in 2000 on 430 MW Baglihar power project on Chenab River, which was conceived in 1992, Pakistan again objected, even though the project envisaged only non-consumptive use of water. Pakistan objected to pondage on the ground that it could flood Pakistan. The fact that India had not violated the Treaty earlier despite grave

provocations and has planned many downstream projects; failed to convince Pakistan. It suggested that a smaller weir would be adequate and objected to the fact that the dam was planned 4.5 m above the highest water level, and could be used to store extra water. Pakistan also objected to the outlets as being too low in the wall of the dam, which could be used to flood areas downstream, whereas India felt that they were necessary for clearing silt.²⁰

Within Pakistan, serious apprehensions were created about the project. It was stated that the project will have huge storage capacity and would inundate the entire Doda District.²² Despite numerous Indian explanations, the public sentiment was so inflamed on account of flawed perceptions that the Pakistan Government was forced to approach the World Bank in November 2004 for resolution of the dispute.²² The World Bank eventually appointed Prof Raymond Lafitte, a Swiss national, civil engineer and professor at the Swiss Federal Institute of Technology in Lausanne, as the neutral expert in May 2005.²³ The neutral expert in his report submitted in February 2007 rejected Pakistan's objections to the project, while asking India to make some modifications to the project. The changes entailed reducing pondage by 13.5 per cent, reduction in freeboard from 4.5 metres to 3 metres and increasing the power intake tunnels by 3 metres, thereby limiting India's ability to control the flow to some extent. However, in a significant decision he rejected Pakistan's objections on height and gated control of spillway as they conformed to the prevailing engineering norms. India had earlier offered similar minor adjustments to Pakistan, but were rejected, as popular perception in Pakistan would have seen it as a sell-out. However, similar decision coming from a neutral expert is considered just and implementable. As a result, the media in both the countries, considered the decision to be favourable to their viewpoint.²⁴

The controversy over Baglihar was followed by Kishanganga, which envisages building a hydroelectric project on the Kishanganga River, a tributary of the Jhelum. The Project releases its discharge through a 22-km tunnel into the Wullar Lake on the Jhelum. All water flows into Jhelum and goes to Pakistan; therefore there is no consumptive use of water. Pakistan objected to the diversion of water from one tributary to another as it is also planning Neelam-Jhelum hydropower project in Pakistani occupied Kashmir (PoK) on river Neelam (as Kishanganga is called in POK). It claims the project would deny water to the Neelam Valley and scuttle the hydropower project. However, according to India, the project would reduce the flow of water by only 27 per cent and would more than meet the irrigation requirements of Neelam Valley, though it could reduce the power generating potential of the proposed 969 MW Neelam-Jhelum hydropower project.²⁵ As the two sides could not resolve the differences and media campaign in the two countries had vitiated the atmosphere, Pakistan went to the International Court of Arbitration at Hague, which restrained India in September 2011 from erecting any

permanent structure on the project.²⁶ However, the Court in its interim order in February 2013 allowed India to go ahead with the project. In fact the Indus Water Treaty clearly had a provision for cases like Kishenganga and states “where a Plant is located on a tributary of the Jhelum on which Pakistan has any agricultural use or hydroelectric use, the water released below the plant may be delivered, if necessary, into another tributary but only to the extent that the then existing agricultural use or hydroelectric use by Pakistan on the former tributary would not be adversely affected.” As Pakistan did not have any “existing use”, Indian position on Kishenganga was unassailable.²⁷ Like in the case of Baglihar, both countries claimed that the order was favourable to them.

Of late, the media in Pakistan has been claiming that India has planned 60 back-to-back water-cum-power projects in the Chenab basin of Jammu and Kashmir and Himachal Pradesh. It has claimed that India has chalked out plans to store 20 MAF water on the Western Rivers with the purpose of power generation and to harness the capacity of regulating release of water to Pakistan.²⁸ Callous media and ignorant analysts have whipped up such frenzy amongst hapless citizens that even import of electricity from India for power starved Pakistan is being perceived as something that would strengthen India’s case on the usage of Indus Waters.²⁹

One thing that both Baglihar and Kishenganga decisions have shown is that the two countries have accepted the decisions given by third parties and have hailed them as a reinforcement of their positions. The fact is that the same results could have been achieved by mutual discussions and without spending enormous sums in costly arbitration.

PERCEPTIONS IN INDIA

Many people in India perceive that the Indus Water Treaty is unfair to them as it gives bulk of the water of the basin to Pakistan, without realising that Pakistan’s dependence on these waters is far greater than India. They also often do not appreciate that a healthy discharge into the sea needs to be maintained to prevent ingress of salinity in the fertile plains of Sindh. A perception has evolved that any project being planned by India on the Western Rivers will be objected to by Pakistan irrespective of the merit of the case. Often example of Tulbul Navigation Project is cited, which has remained stalled due to Pakistani objections. Despite numerous meetings since 1988, the project, which is intended to facilitate navigation between Baramullah and Wullar and could considerably reduce the cost of transportation, has remained suspended due to Pakistan’s intransigence. Pakistan asserts that in view of several improved communication links, serving as better alternatives to river navigation, that have come up in the area, there is no justification for building the barrage, which it feels can interfere with the flow of Jhelum river water into Pakistan and adversely affect its agro-based economy. However,

India has insisted that the barrage would not hinder water flows into Pakistan, but will only prevent Mangla Dam from getting silted.³⁰

Similarly, Kishenganga was delayed due to Pakistani objections as the work had to be suspended from 2011 to 2013, as per the directives of the International Court of Arbitration, even though provision for such a project clearly existed in the treaty. This led to enormous cost over runs in the project. It is believed that Pakistan has a political agenda behind such objections as it feels that these projects could trigger economic development in Jammu and Kashmir and resultant prosperity could derail Pakistan inspired insurgency in the troubled state. This possibly explains why every significant project on these rivers is objected to. This has led to a tendency in India, whereby information on forthcoming projects is shared as late as possible, which violates the Treaty in letter in spirit. There is also a perception in Jammu and Kashmir and to some extent in parts of Himachal Pradesh that their interests have been sacrificed in this treaty.

In fact the former Chief Minister of Jammu and Kashmir Mufti Mohammad Sayeed, categorically stated whilst in office that the interests of Jammu and Kashmir were ignored while signing the Indus-Water Treaty. He stated that state was facing water scarcity despite having three big water resources. He asserted that this huge loss to the state occurred due to wrong policies of the Centre while signing the Indus Water Treaty and therefore it becomes the responsibility of the Centre to fulfill this colossal loss and compensate the state for it.³¹ This perception has percolated down to the masses: they believe that Pakistan has been taking unilateral decisions with regard to water without consulting Srinagar or even Muzaffarabad. They believe that both India and Pakistan have failed to incorporate the rights of the people of Kashmir in the management of water uses and water-related activities under the Indus Water Treaty. They feel that India under the Treaty changed its stance on Mangla Dam, which submerges and exploits the territory of Jammu and Kashmir to the disadvantage of its people for the benefit of the Pakistan's citizens. They feel that the treaty has not been aligned on a principled, fair and just basis, and does not recognise the interests of the affected people and has failed to evolve a mechanism to include their stakes in water allocation decisions.³²

This perception is premised on the belief that water rights of Jammu and Kashmir have been sacrificed to win rights of the other states to Indus Waters. As the water of all the three rivers flowing through J&K have been allocated to Pakistan, the common masses believe that irrigation potential of the state has been sacrificed and this has adversely affected its agricultural growth. They believe that the Treaty stunts their agricultural and industrial growth and overtime could lead to even shortages of drinking water. However, nothing can be farther from truth. Despite allocating the three Western Rivers to Pakistan, the treaty made more than adequate provision for both consumptive and non-consumptive usage of water for the local population. Although, Pakistan has

often derailed or delayed various projects in J&K, it is not because of any flaw in the treaty, but on account of Pakistan's political compulsions.

The entire Annexure C of the Treaty deals with the agricultural use of water by India from the Western Rivers. It authorises India to draw from Chenab Main waters for agricultural usage both in Ranbir and Pratap Canals in the Jammu Region. It authorises withdrawal of 1000 cusecs from 15 April to 14 October and 350 cusecs from 15 October to 14 April in Ranbir Canal and 400 cusecs from 15 April to 14 October and 100 cusecs from 15 October to 14 April in Pratap Canal. It makes additional provision for silt extraction on both the canals and for hydro-electric generation in Ranbir Canal. In addition, India is permitted to continue to irrigate from the Western Rivers those areas which were being irrigated by them on the date when Treaty became effective.³³

In addition India is permitted to make further withdrawals from the Western Rives to meet the irrigation needs of the additional cropped areas as specified below:-

	Water Source	Maximum Irrigated Area (over and above what has been indicated earlier) in acres
(a)	From The Indus, in its drainage basin	70,000
(b)	From The Jhelum, in its drainage basin	400,000
(c)	From The Chenab, (i) in its drainage basin	225,000 of which not more than 100,000 acres will be in the Jammu Dist.
	(ii) outside its drainage basin in the area west of the Deg Nadi	6,000

In addition India may irrigate roadside trees and can redistribute the area to be irrigated in consultation with Pakistan. Besides, there is no restriction on areas to be irrigated from General Storage.³⁴ The fact that India has not been able to bring these additional areas under crop clearly indicates that there is no shortage of water for agricultural usage in the state, especially in Kashmir Valley. In addition, the entire Annexure D of the Treaty deals with the Generation of Hydro-electric power from the Western Rivers. Besides, India is permitted to build general purpose reservoirs on all the three Western rivers for, domestic, flood control and other purposes.

In addition to the storages existing on the date the Treaty came into effect, India is authorised following storage capacities:

	River System	General Storage	Power Storage	Flood Storage
(a)	The Indus	0.25 MAF	0.15 MAF	Nil
(b)	The Jhelum (excluding the Jhelum Main)	0.50 MAF	0.25 MAF	0.75 MAF
(c)	The Jhelum Main	Nil	Nil	Only off channel
(d)	The Chenab (excluding the Chenab Main)	0.50 MAF	0.60 MAF	Nil
(e)	The Chenab Main	Nil	0.60 MAF	Nil

These storage capacities are exclusive of small tanks (tanks with less than 700 acre feet), natural storages in connecting lakes, Dead Storage, Pondage and storage in Regulating Basin for Hydro-electric Plants, Surcharge Storage and Storage on Chenab Main or Jhelum Main not exceeding 10,000 Acre feet.³⁵ The fact that India has not been able to use these storage capacities till date clearly indicates that the Indus Water Treaty has not prevented any genuine requirements of the people living in the Indus Basin in India from being met. The treaty also specifies the period when these storages can be filled. It is therefore quite clear that the perception that the Treaty is unfair to India especially Jammu and Kashmir is deeply flawed.

CONCLUSION

It would therefore be correct to state that the Indus Water Treaty has stood the test of time and most of the complaints against the Treaty in both the countries stem from ignorance about the provisions of the Treaty. Many in Pakistan believe that by undertaking projects on the Western Rivers in Jammu and Kashmir, India is not only stealing their rightful share of water, but is also trying to pit the population of J&K against the Pakistan government. Similarly, many Kashmiris feel that the interests of the state were ignored while signing the Indus Water Treaty and it has prevented the state from attaining the right trajectory of economic growth. The treaty allows India virtually unlimited avenues of exploitation of the Western Rivers provided there is no consumptive use of the river waters. Even the limited storage allowed for consumptive usage has not been fully exploited by India as there is hardly any shortage of water for agriculture in Kashmir. However, the problem is the 'trust deficit' between the two countries that makes them view every step initiated by the other with suspicion.

Pakistan approached the World Bank for appointing a neutral expert in the case of Baglihar, and subsequently, went to the International Court of Arbitration for Kishenganga, spending large sums of foreign exchange and creating acrimony. Both the decisions have by and large conformed to Indian positions. Most of the issues involved

and the differences are technical in nature. Politicising them unnecessarily derails the entire peace process. Silting may make many of the storages unusable in future, it is therefore essential to work out a silt management strategy by setting up low level gates. Pakistan's fears of intentional or unintentional flooding could be assuaged, by specifying the period when these gates can be opened. Setting up a permanent Indo-Pak commission to monitor the discharge from various projects could allay Pakistani fears about flooding.

Of late, certain well-meaning academics have advocated renegotiating the Treaty. It would, however, be an extremely unwise step as the perceptions on both sides are that the treaty is unfair and if the treaty is renegotiated, it would be virtually impossible to close the negotiations. Neither India has a leader of the stature of Jawahar Lal Nehru, nor is Pakistan under a military dictator. It is therefore essential that the genie must not be taken out of the bottle as it would be well-nigh impossible to put it back, howsoever noble the intentions may be. It is more significant to educate the masses about the provisions of the Treaty so that false perceptions are not created that vitiate the relations between the two countries.

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Beyond South Asian Geopolitics: The Everyday Forms of State Ineffectiveness in Water Cooperation

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A fair bit of research and deliberation has gone into figuring out whether South Asia is actually capable of cooperating for better outcomes on its shared rivers (Verghese 2007; Chellaney 2011; Wirsing 2013; Shah and Giordano 2013). Even as no conclusive answer has yet emerged, the acute asymmetry in geopolitical power between co-riparian countries in South Asia most often occupies a central position in received analyses of challenges. As I shall argue in this paper, that alone cannot explain the current state of non-cooperation or ineffective cooperation on water in South Asia. Analytical frameworks of similar nature such as securitization (Buzan, Weaver and de Wilde 1998; Mirumachi 2013) or advocacy against pervasive contagion of nationalism (Ahmed, Dixit and Nandy 1997; Mohsin 2006) as well assign too much credence to the power of the state without adequate examination of the ability of South Asian states to push unilateral outcomes on water.

Things become even more problematic when due attention is not given to the domestic discord between the statist view of national interest and the underlying diversity of interests that contest the "national interest" on shared rivers (Prasai and D. Surie 2012). Inadequate recognition of the effects of that discord leads analysts to assume that the resources and authority of powerful states when employed in pursuit of national interest can produce hegemonic outcomes for the weaker state on shared rivers (Zeitoun and Warner 2006). I am not contending with the plausibility or the essence of this theory, but I am appealing for a more nuanced view of the power of the state vis-à-vis its ability to produce real world, unilateral outcomes on water. It is my hope that "seeing the state" more correctly will allow us to reexamine the failures of cooperation more accurately.

Even as India's South Asian neighbors watch India's economic rise in awe and admiration, in a recent book, Gurcharan Das advances a curious and somewhat counter-intuitive claim on India's economic success that the rise of India happened despite the state, not because of the state (Das 2012). Since the book was published 2012, rising inflation and falling value of the Rupee have kept Indian economic planners busy and helpless at the same time. State ineffectiveness in South Asia is pervasive and such an idea, when someone articulates it well enough, acquires empirical resonance across very many contexts in the region.

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In Nepal, when a sudden leap of performance in Millennium Development Goal (MDG) indicators in the 2000s came to light (NPC 2010), analysts were scrambling to find out "what went right" with the Nepali state in the middle of a raging civil conflict. The underlying curiosity was fueled by the fact that during the decade of 2000s, under the pressure of Maoist insurgency, the Nepali state was effectively confined to district headquarters failing to maintain flow of essential services in the rural areas. In this precise period, the MDG indicators were showing a glowing progress suggesting that the state is not quite as material to progress in social development as earlier thought. The real cause of the improvements indeed came from equally sudden growth in remittance receiving households as the intensifying conflict began to drive hundreds of thousands of young Nepalis to Malaysia and the Gulf states in search of employment (Prasai 2009). With hundreds of thousands of households gaining access to new incomes, household investments in nutrition, health and education became larger and MDG indicators started to improve. We can turn to Pakistan and begin to see a "perpetual state of transition" where an elected government lasted its full term only after six decades of independence yet the country continues to muddle through in spite of crippling energy crisis and rising threat of widespread insurgency.

This "despite the state" theory is not meant to suggest that cooperation for better outcomes on shared rivers can be achieved despite the state. Instead, it is meant to question the current framework of cooperation which accords unfettered monopoly to state actors to design and drive the process of collaboration even as their capacity to do so can be abundantly questioned. On shared rivers, for instance, through six decades of negotiations and countless joint commissions, technical committees, working groups and task forces all we have managed to come up with are a handful of treaties and agreements—Kosi (1954), Gandak (1959), Indus (1960), Mahakali (1996) and Ganga (1996)—all of which have implementation problems of various kind (Siwakoti 2011).

The South Asian failure to cooperate on water is not unique to water; it replicates itself in many areas of regional cooperation. For the purposes of this paper, the moribund state of South Asian Association of Regional Cooperation (SAARC) is worth a mention but does not merit a lengthy diagnosis. What's perhaps pertinent is the state of intra-regional trade in South Asia. Unlike other perfunctory rituals performed in the name of SAARC, cooperation on trade can actually have material benefits to the countries and people of South Asia. In spite of its potential, intra-regional trade in South Asia remains the lowest among all regional trading blocs in the world at 4.8 percent (Chatterjee and George 2012). On broader issues of regional connectivity, South Asia falls far behind every other comparable region. Governments of India and Pakistan do not trust their own banks, border agencies and consulates to discern which traveler or transaction is legitimate and impose a blanket restriction on movement of people and finances; across

South Asia integration-promoting policies and practices are exceptions rather than the rule.

It is safe to assert that regional cooperation on water cannot be remarkably different from regional cooperation on energy or trade. In the end, the agenda on cooperation on water will have to navigate the interests of the same political class, the same bureaucracy and in the backdrop of the same geopolitical reality as the agenda on trade, connectivity and energy. The mere fact that cooperation on water cannot draw capacity or resources from a different set of institutions suggests that a different outcome on water is perhaps not possible. Yet South Asia's need to cooperate on water is remarkably different. By all accounts, water stressed and disaster prone locations and populations in South Asia will keep growing. From this point of paradox, one can ask what needs to change in order for a different outcome on water to materialize, even as the rest of agenda on regional cooperation remains stagnant. Before getting to that question, however, I will elaborate specific deficiencies of South Asian states vis-à-vis their ability to produce better outcomes on shared rivers.

Deborah Stone in her analysis of the public policy challenges in Nepal identified three crucial areas of policy problem: representation, implementation and accountability (Niti Foundation 2012; See also Stone 2002). This diagnostic framework appears to fit well in several South Asian contexts, largely because of shared history, culture and comparable (but not similar) stages of growth of the region. With particular references to Gandak and Kosi agreements in Nepal and on-going negotiations between India and Bangladesh on Teesta, I will illustrate representation, implementation and accountability processes within trans-boundary water policies and negotiations to point to a) pervasive water governance capacity deficits in South Asian states; and, b) how the unfortunate combination of low state-capacity and complete state-monopoly continues to impede trans-boundary cooperation on shared rivers.

REPRESENTATION

In policy processes whose knowledge counts and whose voice is heard have perennially mattered (Stone 2002). The politics of public policy is such, particularly in democratic states, that the framers of the policy cannot be seen to be partial to any particular interest other than what is widely perceived as common interest. The moment a public policy fails this test; its legitimacy can be questioned. The problem indeed is that a river is a complex ecological system as well as a highly valued resource. It is tied to the broader ecology of the basin affecting life and livelihood way beyond the confines of the basin drainage systems. It is concurrently a nutrient carrier and an effluent carrier, a resource for irrigation and source of floods. It can generate electricity when made to pass through tunnels and turbines but can remain a thriving fishery otherwise. Without dams

and barrages it can be used for navigation and with dams and barrages it can supply electricity to urban economies. With development a river brings jobs and infrastructure and without development it supports the ecological and cultural continuity. It is genuinely difficult to find a "common" interest in the use, abuse or conservation of rivers.

On a resource which is so complex, the regulatory arrangements set up by South Asian governments are remarkably simple. With some exceptions, there usually is a ministry of water resources with near-monopolistic control over three functional areas of water management and allocation: irrigation, urban-industrial consumption and energy. In Nepal's case, there are separate ministries for irrigation and energy; in India, Bangladesh and Pakistan, the ministries have a consolidated mandate. For the last 2-3 decades, depending on which country we pick, either an environmental agency or a ministry of environment with some regulatory voice over proposed developments has been set up.

A dominant policy voice in all South Asian water resources ministries comes from engineers, who are by training, practice and professional aspirations predisposed to think of extractive infrastructure in the language of diversions, dams, barrages, tunnels and turbines. At the political level, these hydro-engineering imaginations become alluring symbols of modernization and development. The combination of engineering enthusiasm and political sloganeering allows South Asian hydrocracies to think of water in its most simplified form of utility and ignore counter-narratives of all other types with ease. While this has generated inherent representational deficiency in water policies across South Asia, the hydrocracies are structurally and politically predisposed not to notice it.

Meaningful representation in a policy process requires access to information. Although varying in degrees, South Asian governments have traditionally considered fairly innocuous hydro-meteorological data and details of hydro-engineering projects "state secrets". In the age of remote sensing and telemetry, the Water Resources Information System of India, for instance, still denies public access to data on its trans-boundary rivers. That affects the Indus, Ganga and Brahmaputra basins in entirety and with three of the largest river systems in India excluded, the material value and meaningfulness of such a water resources information system can be judged for its own worth. Countries with functional right to information acts (RTI)—India, Bangladesh and Nepal—have of late witnessed increasing use of RTI filings by Civil Society Organizations (CSOs) with an intention of bringing water-related information to the public domain (See Dutta and Shreedhar 2010, for instance) . With supply-side commitment on RTI being stronger in India than in other South Asian countries obtaining notes and minutes related to bilateral negotiations on shared rivers has become easier from India. CSOs in Nepal, for instance, have begun to partner with their Indian

counterparts to extract notes from bilateral meetings when Nepali government denies access to such information. While these developments are encouraging, RTI activism can only go so far as to compel governments to share information that they intend to share. Unfortunately, the information that they do not intend to share is the information required to develop informed positions on policies.

When it comes to trans-boundary rivers, the aura of exclusivity in deliberations is further accentuated with protocol-laden, time-consuming, and extremely formal negotiations conducted away from the public eye. South Asian governments rarely call public consultations to determine what constitutes "national interest" on a particular bilateral negotiation before agreeing on the agenda. Providing a seat in the negotiating table to governmental consultative bodies such as the water and energy commission (or its equivalent) is about how far governments are willing to go in the name of widening representation. In bilateral negotiations, agenda-setting itself takes quite a bit of negotiation; once the agenda is set, understanding each other's claims takes a long time; once each other's positions are understood, articulating each other's bottom-line position takes even longer time; eventually, taking the conversation to conclusion and signing an agreement takes a decade or more. Water sharing agreement on Teesta has been four decades in the making and is still not signed. The more efficiently concluded treaties on Ganga and Mahakali also took a decade or more to finalize. The formal, single-track and state-managed negotiation process is inherently slow in nature and undeterred by any sense of urgency.

Negotiating parties are meant to "represent" their respective group (or national) interests at the negotiating table. When that interest is not robustly articulated and broadly accepted within the group, the ability of the negotiators to make dynamic adjustment to their positions and enter into reasonable compromises begin to weaken (Coleman et al 2008). When that happens, the negotiators either resort to iterative consultations within their group or refrain from making even reasonable compromises on their originally articulated position. Both actions delay the negotiation process. The sluggishness of South Asian negotiations on shared rivers is attributable, in part, to the inadequate representation of broadly-held interests at the negotiating table. The ways in which this plays out can be described in the following two ways (see also Prasai and M. D. Surie 2012):

Effects of excluding powerful actors from the negotiating table. In South Asian foreign policy practice, bi-lateral negotiations on shared rivers involve negotiators from the ministry of water resources and ministry of foreign affairs (or their equivalents). On the Teesta agreement, this arrangement proved too narrow to drive the eventual agreement even as negotiators on both sides had agreed to all details of the accord. After preparing the ground work at the 37th meeting of India-Bangladesh Joint Rivers

Commission in March 2010, an agreement on Teesta was almost reached in September 2011. In a rather dramatic last minute breakdown, the prime ministers of India and Bangladesh were unable to preside over the signing ceremony of the accord, which was to be touted as a "historic agreement" that would open the way to share benefits on six more trans-boundary rivers that India and Bangladesh were co-riparians of.

The person behind the sudden reversal of fate was not even party to the negotiations. As in all such instances, her interests at the negotiating table were assumed to be represented by hydrocrats from New Delhi. In this instance, however, what was determined to be in India's national interest was not in the interest of Mamata Banerjee. Mamata had registered a resounding victory in the state assembly elections of West Bengal overcoming decades of communist domination of politics in that state. She was the chief minister of the state and, at that time, a key ally in the prime minister's ruling coalition. Mamata needed to consolidate her political base in North Bengal, a traditional stronghold of the communists and to project her image as the new patron of North Bengal.

The Teesta river flows into Bangladeshi territory from North Bengal where an ambitious Teesta Barrage Project (TBP) is planned (and partially constructed at Galjaldoba) to irrigate 922,000 hectares of land and generate 67.5 MW of electricity. For the political elite in North Bengal the TBP symbolizes a promise of development that was never delivered to the region. North Bengal is also home to a sizable population of Hindu refugees from partition of India in 1947 who do not view Bangladesh favorably. Portraying a "no compromise" position on Teesta would grant Mamata much needed political currency in North Bengal and as a powerful ally in Manmohan Singh's shaky political alliance Mamata was able to put enough pressure on the government to withdraw from the negotiations at the eleventh hour. Swiftly unfolding contestation between local and national political actors, in the end, thwarted the Teesta agreement.

But the broader lesson to draw from this episode is that the highly reductionist constructs of benefits of water—measured only in cusecs and megawatts—that South Asian hydrocracies are habituated to couple with the unreliable state-managed, single-track negotiations is barely able to meet the representational challenges of complex interests around allocation and management of water. If we continue to rely on this practice, a different outcome on cooperation is perhaps not possible.

Effects of excluding legitimate interests from the negotiating table. I have already discussed how South Asian hydrocracies harbor a paradigmatic bias towards extractive usage of water. Even as water policies in South Asia have begun to admit that a holistic approach is desirable and participation matters, the mainstreaming of this approach is yet to be implemented. In the meantime, the culture of limiting design

parameters to the technical aspect and refusing to acknowledge the politics around hydro-engineering structures continues. While simplifying constraint parameters is an essential engineering propensity and it helps to optimize cost-benefit ratios, the approach fails miserably when a reliable and broadly-acceptable articulation of public interest is difficult. Unfortunately, everything around water is mostly of this nature. Cost of what and benefit to whom become important political questions and once you privilege one interest over the other arbitrarily the project becomes immediately controversial.

An interesting account of the contested field of public interests is provided by The Asia Foundation report on political economy analysis of the Teesta Basin (Prasai and M. D. Surie 2012):

There is no jurisdictionally-integrated, basin-wide approach to conservation and management of the Teesta River Basin. In Sikkim, the state government plans to put the river as well as its significant tributaries through tunnels and turbines to produce 5,000 megawatts of electricity through a series of power plants. As the river enters the plains of West Bengal, there are barrages and canals planned to irrigate agricultural lands. Once the river crosses the border with Bangladesh, there are other irrigation and flood control structures in various stages of planning and construction. The basin as a unit of analysis rarely surfaces in bilateral negotiations. Sustainability of the river ecology is nominally recognized in the form of minimum flow or environmental flow. However, the content of negotiations is largely centered on technical discussions around the volume of water shared between both countries. This highly reductionist approach to negotiations has excluded a range of economic, cultural, and ecological interests from the discussion. The study team's survey asked respondents within the basin to assign values to their concerns regarding the river. When the team isolated locations where 50 percent or more of respondents assigned "high" ratings to a particular value or concern, it found that 61 percent of respondents in Gangtok and Kalimpong assigned "high" ratings for the cultural value of the river; in Rangpur (Bangladesh) and Jalpaiguri (India), 59 and 54 percent valued the river for fulfilling their household needs; in the same locations, 52 and 51 percent expressed "high" ecological concerns for the river; and, in Gangtok and Kalimpong (India) and Chilmari (Bangladesh), 58 percent rated disaster as a "high" concern.

It is clear that the governments of India and Bangladesh and within India the state governments of Sikkim and West Bengal are pursuing different sets of interests on Teesta. When it comes to the people whose lives are intrinsically linked to the river, the interests pursued by their respective governments tend to diverge from their core concerns. One can well imagine that in a situation such as this, a single-track, state-

managed and non-inclusive negotiation process has minimal chance of bringing diverse interests into a convergence.

IMPLEMENTATION

A direct reflection of incomplete convergence of interests during an agreement process can be found in the implementation process. As mentioned earlier in this paper, the handful agreements on shared rivers that South Asia has so far produced have varying degrees of implementation problems. They range from no implementation (Mahakali) to limited implementation (Ganga) and troubled implementation (Indus, Kosi and Gandak). In this section, I will illustrate the nature of the implementation problems with reference to Kosi, Gandak and Mahakali agreements. The implementation of Kosi and Gandak agreements shows a general capacity deficit in the governments to implement the agreement, whereas the case of Mahakali underscores how weak convergence of interest (political will) affects agreement implementation.

The Kosi agreement was signed in 1954 and some revisions in the agreement were formalized in 1966 (Siwakoti 2011). The Gandak agreement was signed in 1959. The agreements govern over Kosi and Gandak barrages and both have had lingering problems of inundation claims and land compensation unresolved till date. On a routine basis, both barrages generate claims and counter-claims on dry season allocations, flow control, river training, siltation and maintenance, and security breaches. Since 2001 a bilateral Joint Committee on Kosi and Gandak Projects (JCKGP) has been formulated to resolve these issues. The minutes of the JCKK are publicly accessible at the "Water beyond Borders" website hosted by Legal Initiative for Forest and Environment (LIFE).

The Mahakali Treaty was signed in February 1996. The Nepali government at that time had come under heavy criticism for ceding its strategic and economic interests to India. Enough analysis has been done on that question (Gyawali 2009; Pun 2009; Mirumuchi 2013). Successive governments in Nepal have chosen to move slowly on Mahakali, whereas the Indian side raises the implementation status from time to time. Some of the conversation around Mahakali Treaty implementation can be captured through the minutes of the Nepal-India Joint Committee on Water Resources (JCWR) posted at the Water beyond Borders website. Content analysis of the JCKGP and JCWR minutes reveal the following:

Ineffective state. During the first meeting of JCKGP held in December 2001 the Indian side had raised three specific security concerns at the Kosi Project: continuing unauthorized fishing at the barrage area, theft of construction material and cables from the project site and vandalism at the canal facilities. When the committee met three years later, the same complaint was repeated and again in 2006 meeting the first agenda item

remained the same. In each of the meetings, Nepal side renewed its assurances with no material changes on the ground. It was in the fourth meeting held in 2009 that the committee finally put in the minutes: "The Indian side appreciated the enhanced cooperation from the Government of Nepal on security issues." It appears to have taken some 8 years for Nepal to meet basic law and order standard at the project site.

Also, in the first meeting in 2001, Nepal side had raised the issue of accrual of unpaid land taxes since 1987 that the Indian government owed to the Nepali government. Eight years later in 2009, the JCKGP noted during its fourth meeting: "the Nepalese side stated that the land tax for Kosi and Gandak projects was still due. The committee decided that the records of land tax of the Kosi project will be verified by the concerned offices..." Ten years later, in the sixth meeting the agenda was still not resolved: "the matter was discussed in detail. It was noted that preparation of the accounts of Kosi project is under process." At this level of efficiency and with this kind of response to problems, it is difficult to imagine South Asia getting very far on water cooperation or India—as portrayed by some—being able to push unilateral outcomes on shared rivers with ease.

Entangled bureaucracy. In February, when the dry season begins to peak, it was noted that barrage gates in Gandak Barrage were not operating properly. It was apparently established that the problem was with the quality of power supply from Surajpura Power House. At a point when demands on barrage are perhaps at the highest, here's how the JCKGP meeting in February 2011 proposes to solve the problem:

The Indian side conveyed the difficulties in operation of the barrage gate due to low voltage at Gandak Barrage site. They requested to shift the switch of the gate operation from Gate No. 36 to Gate No. 1. It was decided that the Executive Engineer, Mechanical, Valmikinagar will discuss the matter with the concerned officer of Nepal Electricity Authority, which will be arranged by the Department of Irrigation, Nepal and coordinated by Liason Officer, Water Resources Department, Government of Bihar, Kathmandu. The Department of Irrigation, Government of Nepal will facilitate an early resolution of these problems.

With two agencies in India and two agencies in Nepal involved in finding an appropriate solution to the voltage stabilization problem at Gandak Barrage and the Department of Irrigation in Nepal, which does not have a direct jurisdiction over Nepal Electricity Authority, entrusted with the responsibility of finding an "early resolution" of the problem, the likelihood of the problem being solved in time to maintain lean season flows in 2011 is slim. Since Water Beyond Borders website does not have minutes of the 7th JCKGP meeting, and the minutes are not available on proactive disclosure basis, I could not get to the final outcome of this story. Nonetheless, as mentioned in this paper

earlier, the bilateral arrangements on negotiations and implementation of agreements are unwieldy and bureaucratically entangled mechanisms rarely able to produce results on time.

Weak political will. Article 10 of the Mahakali Treaty calls for the creation of a bilateral agency called Pancheshwar Development Authority (PDA) for development, execution and operation of Pancheshwar Multipurpose Project, an integrated hydrological infrastructure system that is expected to deliver and regulate the shares of water and energy to both India and Nepal as stipulated in the treaty. Between the signing of the treaty in February 1996 and the second JCWR meeting in October 2004 no significant progress on the creation of PDA occurred even as some work on Detailed Project Report (DPR) was being carried out. Four years later, or 12 years after signing the treaty, the third JCWR meeting in September 2008 decided to set up PDA "at the earliest". It took the two countries some six months to get to the next stage where, as per the minutes of the fourth meeting of JCWR, the Indian side presented a draft Terms of Reference (ToR) to the Nepali side and Nepali side reverted the ToR with some modifications and the two sides agreed to finalize the text in the next meeting of the JCWR. After another seven months, the fifth meeting in November 2009 noted in cryptic terms: "During the fourth meeting of the JCWR, it was agreed to finalize the terms of reference for Pancheshwar Development Authority at the fifth meeting of JCWR. The Committee discussed the issue." No concluding comments or next steps were provided beyond that statement. In the sixth meeting, two years later in November 2011, it was noted that Government of Nepal has approved the ToR and that Government of India was reviewing the amendments and it would be approved within three months. Thirteen months later, in January 2013 when the seventh JCWR meeting was held in Kathmandu, the Indian government was still reviewing the ToR.

One needs to ask what is holding India and Nepal from making progress on some basic elements of the Mahakali Treaty 17 years after signing the treaty? Neither the ToR on Pancheshwar Development Authority nor the DPR on Pancheshwar Multipurpose Project ought to take 17 years to draft. Agreed that in Nepali politics, the Mahakali Treaty is not a celebrated piece of achievement and that may be a reason for Nepali politicians to drag their feet on Mahakali. More interestingly, if India indeed emerged the net winner in Mahakali Treaty negotiations as analyses suggest (Pun 2009; Gyawali 2009; Mirumachi 2013) why is India, with all its economic and geopolitical advantages, is not able to push the implementation faster? There appears to be a large gap between intentions and delivery capacities in South Asian states. While capacity deficits are fairly evident, the less evident cause must be political will.

ACCOUNTABILITY

In South Asian bilateral agreements two interesting patterns of behavior emerge: more often than not, what is promised is not delivered and what is agreed is not followed up. The meeting minutes of both JCKGP and JCWR show this pattern and so does 17 years of inaction on the Mahakali Treaty. Before I get into the two patterns that I claim to be true, let me illustrate how erratic the frequency of bilateral conversations themselves is. The second meeting of JCWR met in 2004; for four year there were no meetings and between September 2008 and November 2009 there were three JCWR meetings. Then there was a lull. It then took another two years before the sixth meeting was held in Delhi in November 2011 and after 14 months the seventh meeting was held in Kathmandu in January 2013. In none of the minutes, there is an explanation given as to why and when JCWR meetings are to be called and why they were not held regularly.

Promised but not delivered. While I have already discussed how in the JCKGP the issue of tax payments and security were repeatedly raised and assurances of action were repeatedly iterated but no actions were taken, I would like to mention another issue, which is material to the intent of the agreement, that is, what was promised was not delivered:

- First Meeting of JCKGP (December 2001): Nepal brings to notice to the Indian side that it is not receiving its rightful share of 850 cusecs of water through Nepal Eastern Canal (NEC). The committee decides to deploy joint observation teams and rectify the matter.
- Second Meeting of JCKGP (December 2004): The Indian side claims that Nepal is receiving 850 cusecs as promised and the Nepali side claims that the discharge measure is calibrated wrong. The committee decides that the joint observation should include discharge measurement.
- Third Meeting of JCKGP (June 2006): The Nepali side reiterates that it is not getting its rightful share of the water and the Indian side repeats that it is releasing to the NEC 850 cusecs as per the agreement. It is reported that the joint observation was not deployed in the two years since the last meeting and this time the teams would be deployed.
- Fourth Meeting of JCKGP (May 2009): The joint observation team is deployed in February 2007 and it was observed that only 633 cusecs of water was being discharged to the NEC. The committee decides to rectify the problem.

- Fifth Meeting of JCKGP (June 2010): The Indian side informs the Nepali side that NEC will receive its rightful share of water once the Gandak Canal Restoration Scheme is implemented, meaning NEC continues to get reduced discharge.
- Sixth Meeting of JCKGP (February 2011): Nepal claims that it is still not getting its rightful share of water and the Indian side promises to recalibrate the gauge and release the water by June 2011.

It is not known (in the absence of the minutes of the 7th JCKGP meeting) if the problem has now been rectified. What is clear, however, is that for at least a decade Nepal did not receive its share of water as stipulated in the agreement and no one has been held accountable for the failure.

Agreed but not followed up. The third meeting of JCWR in September 2008 opens with an interesting observation: "some committees and sub-committees met more frequently and made significant progress, whereas the performance of the other committees and sub-committees needed improvement." There are no follow up statements, no assignment of responsibility for follow-ups. It almost appears that this high-level meeting, where secretaries of the two governments are heading the delegations, has no control over non-performance of "some committees" constituted by their own governments. This story repeats itself in several instances. In the case above, between the second (December 2004) and the third (June 2006) meetings of the JCKGP where the decision to deploy joint observation teams to ascertain the discharge rate at NEC was to be reviewed two years after the decision was made the words chosen to describe the lack of follow-up were: "[the joint observation]...could not be carried out," with no explanation from or assumption of responsibility on any side. One can almost observe this lack of mutual accountability as a prevailing culture of bilateral dealings.

SUMMING UP

A key argument of this paper has been that too much extrapolation has gone into predicting the effects of South Asian geopolitics on water. While the theoretical scope of this thesis is difficult to contend, I have argued that the state capacities, irrespective of the geopolitical pecking order, matter a lot. States operate broadly within their capacities, institutional norms, cultures and values. Their ability to pursue particular results on water will remain on par with their ability to produce results on economic performance or access to justice or education. The limitations imposed by the intrinsic capacities of the states cannot be transgressed by riparian endowments alone, for instance, in the case of Nepal or by economic and geopolitical power, for instance, in the case of India.

A key determinant in the ability of the state to produce broadly desired and faster outcomes on water is how democratically, openly and inclusively it is able to articulate its interest on water. A statist (as in the state knows best) and highly reductionist (as in only utility counts) approach to locating national interests on water runs into problems of domestic impasse. This is exactly what is happening to India's river linking project and this is the reason for Nepal to remain stuck at 700MWs when it can profitably produce more than 40,000MWs of electricity. If states cannot get past their own domestic impasse, they cannot expect to benefit from shared rivers.

To get to a different level of preparedness and to deliver broadly desired outcomes on shared rivers, some key institutions and practices within the South Asian states need to change: first, the irrational fear over sharing basic hydrological data needs to be overcome; second, the hydrocracies created in the 1950s with the sole purpose of designing and building hydro-engineering structures have to become truly interdisciplinary; third, internal and external accountability of bilateral and multilateral bodies on shared rivers needs to be improved; and, fourth, below the single-track, formal negotiation process, informal, multi-track dialogue processes should be initiated.

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Proposed Union Water Laws: Need to Rethink the Premises

Philippe Cullet*

The Union Government has circulated two proposed new water laws, the Draft National Water Framework Bill, 2013 and the Draft River Basin Management Bill, 2012.¹ These two bills reflect in some way new thinking about water regulation which includes, for instance, the need for having a set of principles governing all water uses and all water bodies. In this sense, the two bills are premised on ideas that would take water laws forward, something that is seriously needed given that many water laws are now outdated. Yet, as this article discusses, while both bills start from the premises with which most people may agree, the way in which they are conceived make them inappropriate starting points for new legislation in 2013.²

NEED FOR A WATER LAW FRAMEWORK

There have been increasing calls over the past decade for the adoption of a framework water law.³ Indeed, no water legislation since at least the 19th century has ever set down a set of basic principles which apply to the entire the water sector. There are various substantive reasons why a framework is needed. Firstly, the water sector is governed by two different sets of principles depending on whether the issue at stake is surface water or groundwater. Legal principles governing the use of these two bodies of water have not been updated for about a century and a half.⁴ As a result, they are still based on the idea that surface water and groundwater are different while we now clearly know that this is not the case.⁵ A framework legislation that provides a central point guiding all water uses would ensure, for instance, that panchayat, district or state administration have clear guidance in situations where a given source of water needs to be allocated to domestic use, irrigation, livelihoods and industrial uses. For the time being, this is largely left to administrative and political considerations, giving the state machinery ample flexibility, often at the cost of social and environmental considerations. This has the potential to give rise to conflicts that are unnecessarily adjudicated by the courts, as in the case of a dispute over the use of the Rajsamand Lake in south-west Rajasthan where the dispute between the farmers and town dwellers went all the way to the Supreme Court.⁶ Secondly, a framework is also needed to reflect the recognition of the fundamental right to water by the courts since the early 1990s.⁷ Indeed, there is no legislation that puts this right into a framework that is directly applicable and thus

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contributes to the realisation of this right for every individual. Thirdly, a framework is needed to reflect the fact that water law is part of a broader corpus of laws that are concerned with water. This includes, in particular, the environmental law. The need for making the link between the two is particularly crucial in a context where environmental law includes key water-related legislation, such as the Water (Prevention and Control of Pollution) Act, 1974.

The debate over a framework for water law has been dominated by a debate between those arguing in favour of a framework legislation and those arguing that there should be no such framework because it will unnecessarily contribute to unwanted centralisation in the water sector.⁸ The debate should, however, take a different direction, as the opposition is not between having and not having a framework legislation. It should rather be about whether the framework should be at the state of union level. In terms of the constitutional scheme, water is primarily a state prerogative. It is thus primarily at the state level that a framework should be introduced. In the absence of state legislation, it has not been uncommon for the Centre to take the initiative. Such initiatives can take the form of legislation adopted on the basis of Article 252 of the Constitution or can be framed in terms of a model legislation to be adopted in a state-specific format by state legislative assemblies.

In the present context, another distinction can be made. The Draft National Water Framework Bill, 2013 proposes legislation based on Article 252 of the Constitution. This is not actually a novel proposition since the Planning Commission had earlier set up in 2011 a committee that had drafted the National Water Framework Bill, 2011.⁹ What matters more is the intent and content of the proposed framework. While the Planning Commission bill focused on a coordination framework, the 2013 draft goes in a completely different direction that is clearly tilted towards strengthening the power of the Central Government in the water sector at the expense of the States.

Beyond the issue of whether a framework should be adopted, there is the more important question of the framework that needs to be given to water in the context of the pervasive nature of water and its links with so many other sectors. This is, for instance, the case in respect of the link between water and the environment. Environmental law has been overwhelmingly developed at the union level and has included a framework legislation since 1986 whose definition of the environment includes water.¹⁰ The real issue is thus not just one of coordination of water within the water sector but of coordination of the different sectors within which water is a key dimension. The Draft National Water Framework Bill, 2013 recognises indirectly that environmental law is a key dimension of modern water law,¹¹ but fails to actually make the link between the two. In more practical terms, this is probably not unexpected, since the committee that drafted the bill did not include anyone from the Ministry of Environment and Forests.

PUSH TOWARDS CENTRALISATION

A joint reading of the two drafts bills under consideration brings out a number of important issues concerning water law in general. Firstly, both are conceived as central acts, but the proposed justification is different since the Draft National Water Framework Bill, 2013 is seen as encroaching on the prerogatives of states and hence requiring the use of Article 252 of the Constitution whereas the Draft River Basin Management Bill, 2012 conceived as a set of amendment to the River Boards Act, 1956 is justified by its focus on inter-state issues that fall directly into the mandate of the Central Government.

The different justification notwithstanding, the understanding has been until now (and since the Government of India Act, 1935) that states are the primary actors in water regulation. This implies that the competence of the union is residual and concerns only issues, which cannot be effectively addressed at the state level. This constitutes a limited application of the principle of subsidiarity between the federal units and the centre in recognition of the variety of issues arising in the water sectors of the various states of the country covering a multiplicity of hydrological and climatic situations.

The two new bills seem to be informed by a completely different perspective that is premised on strengthening the role and powers of the Central Government at the expense of the states and a fortiori districts, blocks, municipalities, panchayats, ward sabhas and gram sabhas. In the case of the Draft National Water Framework Bill, 2013, an interesting statement is made to the effect that water is a 'common pool resource of the community',¹² something that seems to indicate decentralisation to the most local level. Yet, the next paragraph indicates that 'the state holds water in public trust'.¹³ In principle, the idea that the state is a 'trustee' is a step forward compared to the previous situation where the state exercised its power of eminent domain over water.¹⁴ Yet, in a context where community level is not prioritised and where the powers of the trustee are not defined, it is more than likely that in practice the 'trustee' will be able to carry on acting in more or less the same way as the 'sovereign' state today. In fact, while the principle of 'subsidiarity' is mentioned,¹⁵ it is strictly limited to groundwater and does not apply generally in the Framework Bill.

Other provisions of the Framework Bill confirm this reading. In general terms, there is little to confirm a decentralisation focus. Indeed, the only other mention of decentralisation is found in a provision dealing with 'local rainwater-harvesting and micro-watershed development'.¹⁶ There is also a section entitled 'Participatory Water Management'. This seems to provide a framework for decentralisation but does not actually fulfil its stated aim. The Bill starts by suggesting the setting up of 'water user associations' that are not defined but are specifically conceived as being set up outside of the panchayat and municipalities, thus necessarily restricting the powers of

democratically elected bodies of local governance over water.¹⁷ Further, the only paragraph that gives some further hints as to the powers given to water user associations focuses on their powers to collect water charges. These associations are thus conceived within the narrow confines of the push for the commercialisation of water supply services. On the whole, the Framework Bill seems to be most concerned about a twin agenda of centralisation and commercialisation. This is confirmed by the proposal for the introduction of a Water Regulatory Authority whose sole mandate is the 'fixation of water pricing'.¹⁸ This new governance structure with a focused mandate would also impact the work of the proposed water user associations since they cannot function independently but would work under the guidance of the Authority.¹⁹

The Draft River Basin Management Bill, 2012 goes even further than the Framework Bill in proposing a strengthening of the powers of the Central Government. It starts by asserting that the 'regulation and development' of inter-state rivers and river valleys should be taken under the control of the Central Government.²⁰ This concerns twelve of the main river basins of the country including the Cauvery, Ganga, Indus, Krishna and Narmada basins.²¹ The strong assertion that there is a public interest in taking over inter-state rivers and river valleys is a direct reproduction of the same provision found in the original River Boards Act, 1956.²²

The novel assertion of power at the union level is found in the operative parts of the Bill. Under the 1956 legislation, a board is to be established 'on a request received in this behalf from a State Government'.²³ The Draft River Basin Management Bill, 2012 completely overturns this and simply declares that the Central Government shall establish river basin authorities.²⁴ The shift from an act that intended to a large extent to foster coordination between states to an instrument that seeks to give the Centre strong over-riding powers is highlighted in the operative parts of the Act and Bill. In the River Boards Act, 1956, the first function of a board is to 'advise' governments.²⁵ In the Draft River Basin Management Bill, 2012, the functions of the Governing Council of a river basin authority include the power to approve a river basin master plan, to allocate the costs of executing schemes among governments and to accord clearance to water resources projects.²⁶ The river basin authorities envisaged under the Bill are thus much more powerful than in their earlier avatar.

This new stronger and more centralised avatar of river boards needs to be seen in historical perspective since the Draft River Basin Management Bill, 2012 advertises itself as bringing a set of amendments to the River Boards Act, 1956. It is generally understood that the latter legislation has on the whole been a failure to the extent that boards have not been set up.²⁷

It is difficult to provide a detailed analysis of the shortcomings of the 1956 legislation since it has not been the subject of much interest in scholarly debates. However, what is certain is that the lack of response by states to this legislation cannot become the basis for moving to a framework that drastically centralises decision-making power in this area without a full policy debate that does not appear to have taken place. Indeed, while there may be river basins like the Ganga basin that can possibly not be appropriately regulated without union coordination given the number of states involved, the case of the Narmada basin that lies essentially within MP is a case where a number of basin issues will be local issues that may not be best addressed by the Union. The need for circumspection is also linked to the fact that the constitutional scheme provides in effect for the Union to have a secondary role in water regulation and only intervene where states cannot address certain issues alone. In such a situation, the lack of implementation of the River Boards Act, 1956 is not sufficient to justify in itself a complete change of perspective on the matter.

A top-down centralising perspective also generally informs the Draft River Basin Management Bill, 2012. Here again, there is a statement that water is a common pool resource. However, the relevant section is a contradiction in terms. It states that water is a 'common pool community resource held, by the state'.²⁸ While this section qualifies 'held' by stating that it is held under the public trust doctrine, the problem is the same as highlighted in the case of the Draft National Water Framework Bill, 2013. Simply stating that water is held under public trust does not necessarily restrict the state's power of control in practice. Similarly, such a statement does not imply that the state is conceived as starting at the panchayat/municipality level and in fact there does not appear to be any decentralisation focus in this provision. This absence of a perspective that conceives of governance starting at the most local level is confirmed by section 4 of the Bill that specifically provides that cooperation among basin states is 'for the mutual benefit of the basin States and the Indian Union'. Nowhere is there any hint of other actors or beneficiaries besides the Union and the basin states.

LACK OF CONTRIBUTION TO MODERNISING WATER LAW

At this juncture, there are strong substantive reasons for introducing new water laws or reforming existing water laws. This is due to the fact that many laws are completely outdated, such as in the case of irrigation acts drafted decades ago when groundwater was not a significant source of irrigation.²⁹ Similarly, the allocation framework that distinguishes surface water and groundwater is based on a dated and incorrect understanding of the links between the two.³⁰ Further, water laws do not include an environmental or protection dimension and what exists in the legal framework is mostly found in environmental laws.

From the point of view of modernising water law, the Draft River Basin Management Bill, 2012 is, for instance, informed by the need to move towards river basin planning. This is something that water practitioners have been requesting for a long time and that has been widely shared among countries for some time.³¹ In this sense, the Bill moves beyond the 1956 act that only considered rivers and river valleys to move towards basin management, including not only water but also related resources.³² Similarly, the Draft National Water Framework Bill, 2013 is informed by the need for setting out certain basic principles in legislation to ensure that the legal framework is not guided only by judicial statements or administrative directions.

While there is a need for modern water laws, the two draft bills fail in their present form to harness this potential. This is visible, for instance, in the fact that neither bill is built in a clear and unequivocal manner on the principle that all water needs to be governed by a single set of principles. The Draft River Basin Management Bill, 2012 recognises the issue and devotes a separate section to 'conjunctive management' but this is a very limited framework since the provision only enjoins states 'make their best efforts' to manage water in a unified manner.³³ The Draft National Water Framework Bill, 2013 does not fare better. Interestingly, its first principle for water management focuses on integrated management with other resources.³⁴ At the same time, when it comes to water, it does not have a set of principles applying to all water. This is, for instance, the case of the precautionary principle that appears to apply only to groundwater.³⁵

The limited application of the precautionary principle in the Framework Bill is an important marker of the partial environmental perspective introduced here. The Draft River Basin Management Bill, 2012 has a similar vision of the relevance of environmental principles. For instance, it includes a section 5 entitled 'equitable and sustainable' use of water that seems to include the environmental perspective completely missing from the previous section that simply talks about cooperation between basin states being for their mutual benefits, without any qualification.³⁶ Yet, the paragraph of section 5 that specifies the meaning of equitable and sustainable starts by telling states to attain 'optimal and sustainable' use, only qualified later by the need for it to be 'consistent with adequate protection of quality of water'.³⁷ The rather convoluted treatment of environmental matters is further visible in the list of functions of river basin authorities. The general functions of the Governing Council focus on development, management and regulation of river basins.³⁸ Conservation is mentioned as part of these functions but it is clearly a subsidiary concern since the Governing Council is to make recommendations for conservation 'in accordance with the River Basin Master Plan'.³⁹ River basin master plans are not devoid of environmental considerations. Yet, they are clearly defined as being plans for 'development, management and regulation' and do not include conservation or

protection as part of their core aims.⁴⁰ This is all the more surprising when it is compared with the River Boards Act, 1956 where the first power of the boards is to advise the states on 'conservation, control and optimum utilisation',⁴¹ conservation being the first of the three.

WAY FORWARD

There is an urgent need to revisit ageing water laws and old water law principles. This is made all the more urgent by increasing concerns over water quality, access to water and water availability in the context of global environmental change that may further threaten water supplies.

The reforms that are necessary must start by recognising that water is firstly a local issue and that water is not only a fundamental right in itself but also the source of the realisation of various other fundamental rights, such as the rights to health, sanitation and the environment. Beyond this, reforms must be built on the basis that water is also a primary input for livelihoods, agriculture in general and for industrial uses. The legal framework that is needed is one that puts fundamental rights squarely at the centre of the regime and provides the basis for ensuring that all the links between different water uses can be addressed in a principled manner.

At this juncture, the lack of a set of general set of principles concerning water in general, the lack of binding quality standards and the lack of an effective environmental dimension to water law ensure that powerful actors make use of the inherent flexibility that this non-system affords. This is neither equitable nor sustainable nor effective. This lack of framework has not provided appropriate results until now. In the future, with increasing water scarcity on the one hand and increasing over-abundance of water on the other hand, there will be an even stronger need for conserving, using and regulating water in a comprehensive, decentralised, equitable and environmentally sustainable manner.

This calls for a different kind of new water laws. Such laws must, for instance, avoid making references to a right to water and then limit the quantity associated with its minimum realisation to an unacceptably low 25 litres per capita per day (lpcd).⁴² This happens to go entirely against the policy goals at the national level that put the minimum level of sufficient access to drinking water at 40 lpcd already in the 1970s in the context of the Accelerated Rural Water Supply Programme (ARWSP). This has now been increased in the Strategic Plan of the Ministry of Drinking Water and Sanitation whose target for 2022 is 70 lpcd.⁴³ The problem goes beyond the specific issue of the content given to the right to water. Indeed, more generally, the Bill does not place itself within the context of

the fundamental right to water being a guiding framework for a framework legislation on water.

The two proposed bills confirm that while water law needs to be modernised, there is a danger in doing so without having a broad view of what needs to be achieved. The kinds of instruments proposed seem more concerned about concentrating power at the centre than providing broad frameworks for a resource, which is primarily a local concern and must thus be managed on the basis of the principle of subsidiarity and of its ecological functions without which no human or economic development will take place.

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