South Asia's Water Woes: Are Rivers the Next Frontier?

Ravi Tuteja

River Water and Conflict

For centuries, war and conflict has been tied to the protection of water resources. With the risk of water shortages around the world becoming more and more of an issue, water has become the fuel of certain conflicts in many regions around the world. "Water Wars" are becoming inevitable in the world's future as the misuse of water resources continues among countries that share the same water source. International law has proved inadequate in defending the equal use of shared water supplies in some parts of the world. The rapid population increase has greatly affected the amount of water readily available to many people. The Himalayas constitute the largest reservoir of snow and ice in the world outside the Polar regions, with about 15,000 glaciers draining into the Himalayan-Karakoram river system. It has been estimated that about 33,000 sq km of the Himalayas is under glacier ice and the volume of Himalayan ice cover is of the order of 1,400 billion cubic metres (bcm). Snow and glacier melt constitutes the most important part of the Tibetan runoff and makes significant contributions to the southern Himalayan river flows during summer. The glacial lakes that dot Tibet feed numerous streams.

The South Asian countries deal with conflict over the sharing of river water supplies in both downstream and upstream regions. The distribution of water resources throughout Southeast and Central Asia is increasingly becoming a political issue, with tensions mounting over the control of water supplies. The idea of shared water supply has not been easily understood by the nations of this region. The growing populations come with the increase in demand for potable

Colonel **Ravi Tuteja** is Deputy Director, Centre for Land Warfare Studies, New Delhi.
(N.B. Views expressed and suggestions made in the article are made by the author in his personal capacity and do not have any official endorsement.)

water and could be a catalyst for conflict arising from ethnic and political disputes. The looming struggle over water resources in Asia has been underscored by the spread of irrigated farming, water-intensive industries and a growing middle class that wants high water-consuming comforts like washing machines and dishwashers. Household water consumption in Asia is rising rapidly, and in several major economies, there are acutely water-stressed communities.

The spectre of water wars in Asia is being heightened by climate change and environmental degradation in the form of shrinking forests and swamps that foster a cycle of chronic flooding and droughts. The Himalayan snow melt that feeds Asia's great rivers could be accelerated by global warming. While intra-state water-sharing disputes have become rife in several Asian countries — from India and Pakistan to Southeast Asia and China — it is the potential inter-state conflict over river water resources that should be of greater concern. This concern arises from Chinese attempts to dam or redirect the southward flow of river waters from the Tibetan plateau, starting point of the Indus, Mekong, Yangtze, Yellow, Salween, Brahmaputra, Karnali and Sutlej rivers. Among Asia's mighty rivers, only the Ganges starts from the Indian side of the Himalayas.

It has been stated that the next world war will be over water. Tibet is a source of many rivers which are the lifeline to almost 50 percent of the world's population residing in South and Southeast Asia. Also, the Himalayas constitute the largest reservoir of snow and ice in the world outside the Polar regions, with about 15,000 glaciers that drain water into the Himalayan-Karakoram river system. China today faces acute water scarcity due to its burgeoning population, increased industrial development and water intensive agriculture practices. It does not want its aspirations to attain superpower status being thwarted by a major water crisis. On the other hand, since independence, India had held the view that there would not be any problem of reduced flows or contamination of rivers emanating from Tibet because of the terrain conditions, limited cultivable land and the low population of Tibet. This view will need to be change, considering the recent Chinese activities aimed at exploiting the potential of the Tibetan rivers. If this be the case, then there is strong reason to believe that it could be a flashpoint of future conflict with China.

International Laws on River Water Sharing

The issue of sharing of waters of an international river is a most contentious one between countries which requre increasing amounts of waters for various purposes. To date, the sharing of waters of a river between countries is directly linked to the kind of 'use' the river is being put to by different stakeholders. With

the complexity involved in defining the term 'use', countries preferred to resolve this issue bilaterally by making water sharing arrangements that defined a water sharing formula based on the extent of 'use' of the "river water basins". However, history has shown that states have time and again disregarded the "river basin approach" and have attempted to look at water sharing of international rivers from the perspective of where they are located. Consequently, the country located upstream or the "upper riparian", on account of its location, would have priority rights of access to river waters compared to a state located downstream, termed as the "lower riparian".

The spectre of water wars in Asia is being heightened by climate change and environmental degradation in the form of shrinking forests and swamps that foster a cycle of chronic flooding and droughts.

While a number of doctrines and laws on international water sharing were in vogue in various continents, the UN adopted the "Convention on the Non-Navigational Uses of International Water Courses" in 1997. In this convention, the UN moved away from the "river basin approach" concept to a "water course system". A water course is defined as a system of surface waters and ground waters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus. It also adopted "equitable and reasonable utilisation" with a view to attaining optional and sustainable utilisation. It also provides for regular exchange of data and information on the condition of the water course, to include hydrological, meteorological, hydro-geological and ecological data as well data related to water quality and related forests. However, when the UN convention was adopted by a vote, 103 countries voted for it, three states opposed it, and 27 states, including India, abstained. China, Turkey and Burundi were the three states that opposed the convention. Thus, both India and China would have problems or hurdles in the event that the two countries have to negotiate a water sharing agreement with regard to rivers emanating from Tibet as neither recognises the UN convention.

India's Water Sharing Treaties with its Neighbours

India has not adopted a holistic approach when entering into water sharing treaties with neighbouring countries. A glaring case in point was the signing of the Indus Water Treaty between India and Pakistan, with China being excluded from the treaty altogether. The fact that India has given more water to Pakistan

and got less water by signing the Indus Water Treaty shows the ineptitude with which the treaty was negotiated. A similar non-holistic approach while entering into a water sharing treaty with Bangladesh has also resulted in avoidable acrimony with Bangladesh. With the exponential increase in population amongst the upper and lower riparian states, the requirement of water too has gone up exponentially. Thus, this may be yet another cause for a future conflict situation. A counter to the above point of view is that China has little or no population at all in the areas where the Indus, Sutlej and Brahmaputra rivers flow in that country. Thus, China's use of these rivers would be restricted to hydel power generation, which would not result in any reduction of water flow to India from these rivers. However, given China's penchant for mega projects, it should come as no surprise if China were to announce a grand plan to re-route the rivers emanating from Tibet into its hinterland some time in the future.

Implications of China's Plans to Re-route/Block River Waters: Options for India

Brahmaputra River

The Brahmaputra river, variously known as the Jamuna in Bangladesh, Ya-lu-tsang-pu Chiang, or Yarlung Zangbo Jiang by the Chinese and Tsang-po by the Tibetans is one of the largest river systems emanating from Tibet. It is also one of the largest of the 260 plus international river basins which cover 45 percent of the earth's land surface, shared by more than one nation. The length of the river is 2,900 km from Manasrovar Lake due east, making a prominent U turn into India and thereafter draining into the Bay of Bengal in Bangladesh.

The Brahmaputra basin covers a drainage area of 580,000 sq km; 50.5 percent of this area is in China, 33.6 per cent in India, 8.1 per cent in Bangladesh and 7.8 per cent in Bhutan. In India, the basin is shared by six states, primarily Arunachal Pradesh (41.88 per cent), Assam (36.33 per cent), Nagaland (5.57 per cent), Meghalaya (6.10 per cent), Sikkim (3.75 per cent) and West Bengal (6.47 per cent). The Brahmaputra basin is India's most precious water resource, accounting for 30 per cent of the total water sources and 40 per cent of total hydropower but as of now, only 5 per cent of the hydropower, 10 per cent of the irrigation and 4 per cent of ground water potential has been utilised.

Another significant hydrographic facet of the Brahmaputra is its susceptibility to flooding. In India and Bangladesh, there is an approximate discharge of 500,000 cubic feet (14,200 cubic metres) per second. There have been major floods in the Brahmaputra valley in 1954, 1962, 1966, 1972, 1974, 1978, 1983, 1986, 1988, 1996,

1998 and 2000. The maximum flooding in India occurs in the Brahmaputra valley which is 9.6 percent of the total; this affects 32 lakh hectares and covers 40 percent of the land mass in the northeast. The flooding is a result of a combination of factors such as intense monsoons, poor geological formations, high level of seismic activity, high rates of erosion, heavy deforestation, land use pressure and high population growth. The measures employed for control of floods in the Brahamaputra valley are adhoc, thereby, in some ways adding to the pressure by shifting the pattern rather than arresting it. However, there is a paradox in the water supply in the Brahmaputra. During the monsoon season, there is perennial flow of water from June to December which is almost 80 percent of the entire downpour each year. On the other hand, in the dry season, there is very low precipitation. This makes the region extremely vulnerable to water stress of both paucity and excess.

With the exponential increase in population amongst the upper and lower riparian states, the requirement of water too has gone up exponentially. Thus, this may be yet another cause for a future conflict situation.

The Brahmaputra is a major river basin for both India and Bangladesh. Since it flows through harsh mountainous terrain, its direct use for mainland China may be limited. However, China's plan of creating a grand South-North linkage of rivers has invited attention to the river. A report in the *People's Daily* in July 2003 revealed that China was conducting a feasibility study for a major hydropower project on the Yarlung Zaugho, as the Brahmaputra is called in China. As a lower riparian state, India has been bringing this issue to the notice of China, as such a project would have economic, social, environmental and political impact on communities which are dependent on the river system. However, so far what China has accepted is to share only hydrological information of the river system during the monsoon/flood season. This is so because China's water crisis is becoming more and more acute by the year. Thus, at this stage, it would not like to share or come to any further agreement with India, as the obvious answer to China's water stress lies in the Tibetan plateau.

The Chinese are aware that as the upper riparian state, they have a distinct advantage over India. India will need to keep China engaged on the issue but since both countries are opposed to the UN convention, there cannot be any recourse to international law on this issue. The options for India could be to take recourse to the following:

- Convince China to get into a meaningful dialogue on sharing the river's water. Include Bangladesh in the negotiations as well.
- Accept the terms of the UN convention and engage China. In the event of China not accepting to negotiate, both India and Bangladesh could take recourse to the intervention of the UN.
- With its poor record on climate change and environment, China is increasingly becoming more sensitive to international criticism. Hence, pressure from global environment bodies on China could be another option.

Sutlej River

The Sutlej river has its source near the Mansarover Lake in the Rakas Tal. It is known as the Langquen Zangbo or the Xiangquan river in Chinese and the Langquen Kanbob in Tibetan. Its Vedic name is Satadru and it is known as Shatadru in Sanskrit. From the source, the river flows northwest, parallel to the Himalayas. After a run of 320 km, it finds a gap at Shipkila to enter India. As it emerges from the Zanskar range, it is joined by the Spiti river. While flowing through Tibet, it runs through deep gorges and is fed by the waters of melting glaciers and numerous mountain streams. There are approximately 30-40 big glaciers that feed its water during the warm season. The famous Pareechu river is one of them. The Sutlej flows above 4,000 metres while in Tibet and is within the frozen zone. There is hardly any rain in this area. Out of 51,000 sq km of catchment area upstream of Rampur, only 14,000 sq km is in India. The Sutlej receives 59 per cent of water from glaciers and snow and only 41 per cent from rain. It is estimated that of the 59 per cent water from glaciers and snow, about half is in Tibet. The entire water from rainfall is within India.

The ancient kingdom of Guge in Tibet flourished on the banks of the Sutlej from the 10th to 16th centuries. Now it is a historic ruin. The Chinese have constructed a barrage near this site in the Zhada County on this river to meet the electricity demands of the local population. There are unconfirmed reports that China may divert the water of this river for domestic purposes. On entering India, the Sutlej river is reinforced by the Spiti and other big and small glacial streams which almost double its size and volume of water. The Sutlej makes a diagonal thrust through the Greater Himalayas and after a run of 60 km through the gorge, it is joined by another big and important tributary, the Bapsa, near Karcham. For the next 25 km, the Sutlej is most ferocious and turbulent; and it is in this stretch that it has the maximum hydel power potential, which is assessed to be to the tune of 10,000 mega watts (MW). The famous Nathpa-Jhakri hydel project is located along this stretch. The Hindustan-Tibet road runs along the banks of the river and

is the only means of surface communications from Rampur to Spiti.

After this, the Sutlej makes a 200 km dash till finally it loses its momentum and mingles with the backwaters of the Bhakra Dam. Downstream of the Bhakra Dam , there are three more barrages at Ropar, Harike and Husainiwala in India and one more at Suleimanki in Pakistan, that harness the water of this mighty river. Thus, the entire network of canals in Punjab, Haryana and north Rajasthan is dependent on the waters of the Sutlej. The electricity produced by Nathpa-Jhakri and Bhakra Dam supports almost the entire Northern Grid. Thus, the Sutlej is actually the "life line" of the states of Himachal, Punjab, Haryana, Rajasthan and Delhi.

With its poor record on climate change and environment, China is increasingly becoming more sensitive to international criticism.

In 2004, China informed India that approximately 35 km from the Himachal Pradesh border, an artificial lake measuring about 230 hectares had been formed on the Pareechu river – a tributary of the Sutlej. The lake had been formed due to landslides in the area. However, this information caused panic as flash floods in the Sutlej had caused massive damage in India in 2000. Also, the incident led to a debate on whether the formation of the lake was due to natural or man-made causes. It was stated that formation of such a lake was a "liquid bomb" in the hands of the Chinese that could devastate the lower reaches in India at will. It was also envisaged that China may have resorted to directional blasting to cause a landslide that made a dam across the river. China did not permit a fact finding team from India to visit the spot of the lake formation, further giving rise to speculation that the lake had not been formed due to natural causes. Moreover, it also emerged during a seminar that no maps or satellite imagery of the area were available to the Ministry of Water Resources to make a correct assessment, despite repeated requests for the same.

China does not appear to have taken India into confidence about any of its activities on the Sutlej river. The barrage at Zhandu has the potential of controlling Sutlej flows into India. At present, except for the memorandum of understanding (MoU) for sharing hydrological information of the Tibetan rivers during the flood season, there is no subsisting agreement between India and China on water related issues, even though Indian rivers such as Brahamputra, Indus and Sutlej originate in Tibet. The Indian authorities need to be concerned about the upstream use of water in Tibet that will cause reduction in Himalayan river flows. There is a presumption that such utilisation will be insignificant due

to the terrain conditions and sparse population. However, the scenario will be totally different in the next 30-50 years, with the rapid development of Tibet and its growing population. The water of the Sutlej will become important. Especially, if the Chinese decide to divert the water during lean periods in winter and release large flows during the glacier melting period in summer.

Therefore, it is important that India enters into a water sharing treaty with China at the earliest to safeguard its strategic and economic interests. The treaty should have all safeguards that have a bearing on the well-being of our nation and its people. Since Tibet is the reservoir of more than 50 per cent of the water needs of China and South Asia, there is a need to have a treaty for better management of water resources in an integrated manner. Transparency and the will to cooperate with each other will be the key to arrive at an acceptable solution to all the parties. India needs to have an understanding with China to pass on regular information with regard to the Sutlej river. Moreover, regular satellite coverage of the area would form an important part of negotiations if activities to either block or re-route any river flowing into India are detected.

Indus River

India's major concern lies in the fact that China was not made a party to the Indus Water Treaty between India and Pakistan. The vast arid and population free area through which the Indus flows in Tibet lends itself to large-scale dams and large hydro-projects. Given China's penchant for mega-projects and large requirement of water, it could be a long-term plan for China to divert the water of the Indus through tunnels and canals to the thirsty north. Although India is not using the water of the Indus except for some minor local irrigation in Ladakh, any future diversion of the water Indus of the by China will have a major impact on the sharing of these waters between India and Pakistan.

The following recommendations are made:

- The aspect of sharing of river waters has not been addressed at the strategic level, and requires greater in-depth study to arrive at a more holistic formulation of strategies while dealing with our immediate neighbours. Not only should the Ministry of Water Resources be the one engaging China on this important issue, but also the Ministry of External Affairs and the Ministry of Defence should be involved.
- Inadequate knowledge of the rivers can lead to wrong assessments. Hence, there is a need for creation of an accurate database, updating of maps and full use of satellite imagery. Tasking of technical agencies to do this work

must be done accurately.

- There is need to review the Indus Water Treaty and bring China on board while doing so.
- The data on the requirement of water by China already exists. It can only make up its massive shortfall of requirement by tapping the Tibetan rivers. If India does not address this aspect now, there will be problems in the future.
- More discussion on China's actions relating to the Mekong river and the experience of Southeast Asian countries needs to be analysed in detail.
- While there is no cause for India to over-react at the present, India also cannot ignore the issue and wait for a crisis to happen before some action is taken.

Given China's penchant for mega-projects and large requirement of water, it could be a long-term plan for China to divert the water of the Indus through tunnels and canals to the thirsty north.

Conclusion

India has held a view that there would not be any problem of reduced flows or water quality in rivers emanating from Tibet, considering the terrain conditions, limited cultivable area and population in Tibet. But recent Chinese activities to exploit the potential of the Tibetan rivers such as the Sutlej and Upper Brahmaputra (Yarlung Tsangpo) within its territory to augment its water and power needs have fuelled many misgivings in India. China's mastery over the art of understatement has added to its inscrutability since till recently it had been vehemently denying any such move for exploiting the Tibetan rivers

South Asia, with more than 50 per cent of the world's population, is facing a looming water crisis. There is a need for better understanding of the impact that water shortages in the region can have on the region and on India in particular. With China being an upper riparian state and also in view of the fact that India has no water sharing treaty with China, there is a requirement to study whether this could or would actually be the trigger for full-fledged conflict between the two countries. The problem of dealing with China also is whether to adopt a bilateral approach or involve international institutions for arbitration. While most water treaties, including the Indus Water Treaty, have been successful as these have been arbitrated with the assistance of international agencies like the World Bank, China is more amenable to a bilateral dialogue. Thus, a suitable

approach may have to be decided. Hence, there is a need for handling water sharing issues with all neighbouring countries in a more holistic manner so that a future conflict situation does not arise.