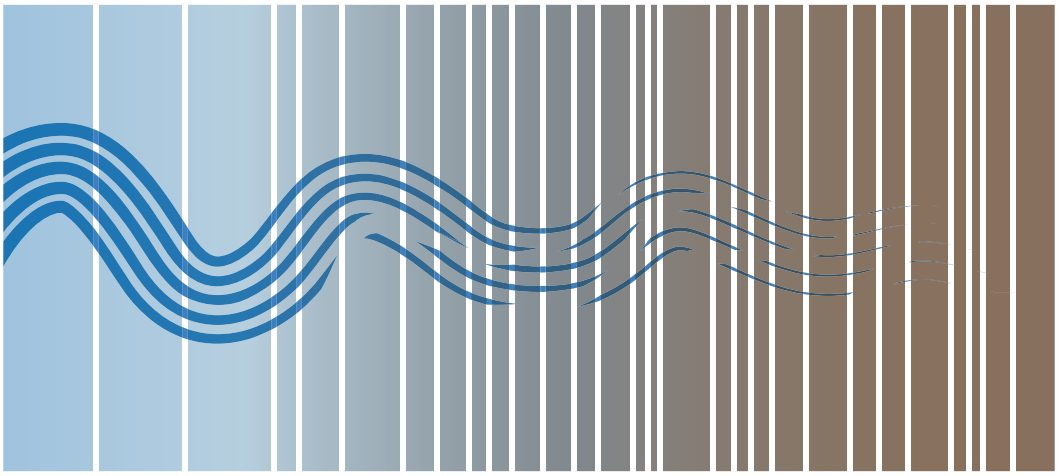
The Himalayan Challenge

Water Security in Emerging Asia



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CONTENTS

EXECUTIVE SUMMARY

- The Himalayan River Basins in China, Nepal, India and Bangladesh are home to about 1.3 billion people - i.e. almost 20% of the world's population and almost 50% of the total population of these countries.

- Water availability on per capita cubic metre basis is estimated to decline from 2150 at present to 1860 in 2030 in case of China, from 1730 to 1240 in case of India, from 7320 to 5700 in case of Bangladesh, from 8500 to 5500 in case of Nepal.

- About 10% to 20% of the Himalayan Rivers are fed by glaciers – an important source of water in low season. According to some studies, the glaciers will be seriously affected by global warming by 2350 while other estimates suggest that it will take 600-700 years for Himalayan glaciers to deplete. Reliable estimates are not available due to the absence of meteorological stations in crucial geographical areas, lack of scientific data and collaborative studies. However, for the glaciers that have fed rivers for thousands of years, a few centuries is a short period of time. Also, some impact will be already visible by the middle of the 21st century. The Yellow River in China and the Ganges (with its tributaries) in India will be the most affected and turn into seasonal rivers by the second half of the century. They are expected to lose between 15% to 30% water due to glacier depletion. The Yangtze and Brahmaputra will also lose about 7% to 14% of the annual flow due to depletion of glaciers. Bangladesh will face the cumulative impact of these developments.

- While glacial melting will eventually reduce river flow in the low season, an increase in temperature in some areas will cause heavy precipitation concentrated for a few days during July-September. This will increase the risk of flooding. The overall pattern will be intense rain over a few days and long dry periods. Some areas like north-east China and northern parts of India will see decline in precipitation.

- In the next 20 years, the four countries in the Himalayan sub-region will face the depletion of almost 275 billion cubic meters (BCM) of annual renewable water. For comparison, this is more than the total amount of water available in one of the countries – Nepal – at present. At the same time, demand will increase due to growth of population and economic development. As a result, China will experience an annual water deficit of 50-100 BCM in 2030 at a relatively low utilisation rate of 28% in 2030 and India's water surplus will become half to 200-260 BCM despite an unsustainable utilisation rate of 61% at that time. Nepal and Bangladesh will also see their water balance shrink.

- The agricultural sector will continue to be the major consumer of water in China, Nepal, India and Bangladesh, although the industrial and domestic sectors will also need more water in the future. In China, agriculture consumes about 65% of water. This proportion will decline to 55% by 2030 before rising again slightly around 2050. In India, agriculture accounts for almost 90% of the water usage but this will decline to 70-75% by 2050. Nepal and Bangladesh presently use more than 95% of their water for agriculture and will continue to do so until 2030.

- In addition to depletion of water resources due to natural reasons, it will not be possible to use the available water resources because of pollution and losses caused by inefficient management. Yellow River Conservancy Committee estimates 34% of the river unfit for drinking, aquaculture, and agriculture. The tributaries of Yangtze River are extremely polluted to the extent of 30%. In India, Yamuna River, the main tributary of the Ganges is extremely polluted to the extent of 50%. Most of the rivers in Bangladesh are considered extremely polluted, though precise degree of damage is not available. Only the rivers in Nepal and Brahmaputra in India and its tributaries are relatively clean.

In addition to shrinking rivers, all countries face the problem of loss of permafrost, deforestation and the disappearance of lakes. Thousands of lakes in the source region of Yellow and Yangtze have disappeared. These developments have resulted in desertification, which can further result in an increase in temperature and create a vicious cycle.

The cumulative effect of water scarcity, glacial melting, disruptive precipitation patterns, flooding, desertification, pollution, and soil erosion will be a massive reduction in the production of rice, wheat, maize and fish. Both India and China will face drop in the yield of wheat and rice anywhere between 30-50% by 2050. At the same time demand for food grains will go up by at least 20%. As a net result, China and India alone will need to import more than 200-300 million tonnes of wheat and rice, driving up the international prices of these commodities in the world market. This will have adverse impact on the poor all over the world.

The dire need for water, electricity and flood control has led to construction of dams. Some of the dams do not last as long as intended. Moreover, they result in displacement of local populations and have adverse impact on water flows of lower riparian countries in the case of the trans-boundary rivers. The speculation about China's plans to build a dam at the Great Bend on Yarlung Tsangpo (Brahmaputra) and India's River-Linking project are matters of concern, as they can reduce river flows in low season. Since the Himalayan region has high seismic activity, an earthquake can damage a dam and flood an entire region, causing devastation.

Water scarcity, decline in food availability, reduction in livelihood opportunities in rural areas, desertification, soil erosion, sea-level rise and construction of dams will lead to displacement and migration of 50 to 70 million people in the four countries by 2050. Scientific estimates of potential migration figures are not available but based on past trends the risk of more than 100 million people migrating internally or to neighbouring countries will result in social conflict on communal or secular basis. Water scarcity and environmentally-induced migration will exhibit reverse pattern as compared to the conventional economic migration. For instance, people will be displaced from Nepal's Terai region, China's northern provinces and river estuaries in the south-east, coastal districts of China and Bangladesh, northern provinces of India which have hitherto been the destination for migrant population due to industrial growth in these regions. In China, the number of economic conflicts will increase as a result of all this activity. In the other three countries social conflict may find ethnic, communal or religious expression.

Relations between India and China may become strained due to competition over expanding influence in Nepal and especially, if China decides to build a dam or diversion project at Great Bend over Yarlung Tsangpo. Relations between India and Bangladesh may become strained due to a decrease in flow of rivers from India to Bangladesh and increase in refugee flow from Bangladesh to India. Relations between India and Nepal may become strained due to plans of either party to build dams on their side of the border. Though this deterioration of relations is unlikely to result in inter-state military confrontation, it can lead to new external alliances, producing fresh alignments and polarisation in Asia and 'beggar thy neighbour' politics, which can compromise the internal options of each country. Though the problems arising from water security are essentially internal, the solutions will need to be in the form of trans-boundary and sub-regional cooperation, especially if emerging Asia wants to convert adversity into an opportunity.

China shares flood forecasting data in the monsoon months with India and Bangladesh. This is supplied by email twice a day. It is necessary to increase its frequency since sometimes 12 hours can prove to be too long to avert a catastrophe. It is also necessary to extend this data-sharing cooperation to the full year, particularly including the low flow periods.

China and India have institutional arrangements for cooperation on data-sharing to address climate change and related problems in the Himalayan and Tibetan regions. It is necessary to actualise these arrangements

through concrete projects of high intensity, quality and magnitude. More importantly, such arrangements need to be extended to sub-regional level by including Nepal and Bangladesh since many of the issues are interlinked across the four countries. A Regional Information Sharing Network is recommended.

- The Dhaka Declaration on Water Security (Annexure 2) has proposed an expert committee to prepare a roadmap for data-sharing and scientific exchange and to prepare guidelines for introducing transparency regarding relevant data.

- Since quantitative issues are controversial, a beginning can be made with data sharing on water quality monitoring. Already a network of experts for such a purpose has been established for the South Asian countries. It can be expanded to include China.

- Nepal, Southwest China and Northeast India are landlocked areas. Water transport can provide new connectivity, opportunities for trade and tourism and employment. While India can link to its north-eastern states through Bangladesh, Nepal can connect to India through waterways. Water-based transport also tends to be more environment-friendly than other modes of transport.

- The Brahmaputra can also be utilized for navigation, though combined with multi-modal transport in some sectors where the river flow does not permit water-based transportation.

- The Himalayan sub-regional water transport can comprise of two corridors, with India and Bangladesh as transit nations. The first segment includes Nepal-India-Bangladesh connecting Karnali, Narayani and Saptakoshi Rivers in Nepal to the National Waterways-1 in India. The second segment includes China-India-Bangladesh connecting south-west of China to ports in Bangladesh through waterways in India. In exchange for navigational benefits, India and Bangladesh can secure concessions and cooperation from other countries in the region in other spheres as well. In addition, waterways in the Sunderbans can be developed further for promotion of the mangrove forests as a destination for eco-tourism and for use by smaller vessels. This will maximize the potential economic benefits of the waterways in the region.

- Nepal has a hydro-electricity generation capacity of 600 MW. Its potential capacity is 40 GW while the potential demand for current population is about 2 GW. The demand is much higher if population and economic growth over the next 2-3 decades is taken into account. Thus, Nepal has the potential to export surplus power to India and China and to a lesser extent Bangladesh. India and China are currently investing in Nepal's hydro-electricity creating scope for either cooperation or competition, depending on how they manage their relationship.

- In preparation for the Copenhagen Summit on Climate Change in 2009, India and China established a working group for cooperation. This can be complemented by a sub-regional mechanism for climate change cooperation to undertake studies on impact of climate change on the region by learning useful practices from each other and by mutually formulating policies for adaptation and mitigation.

- Once trust and confidence are established through practical cooperation, data sharing, scientific exchanges, hydro-electricity, irrigation, trade, transit, and tourism, the four countries can consider Integrated River Basin Management. The Integrated River Basin Management would require agreement on certain principles which are in conformity with the UN Watercourses Convention, Biodiversity Convention and the Ramsar Convention. If such an agreement on principles is possible, the next logical step would be to establish a river basin organisation.

- Collaboration on the management of the Ganges and Brahmaputra Rivers, under the umbrella of a Himalayan

Rivers Commission (HRC), will enable all four countries to tap expertise that might not have been available under a nationally-driven framework. The establishment of consultative bodies working on different aspects of river management will also facilitate basin-wide water development. The ability to seek scientific and engineering advice at the highest level, for the collection of hydrological and climatic data, flood forecasting, environmental management, water quality monitoring and design and implementation of water projects are essential for a better understanding of the river basins. The idea of learning from the experiences of other countries and gaining an insight into how they are adapting to climate change and growing water insecurity could also be mutually beneficial. The onset of more erratic monsoons for instance, is a problem which will affect all the countries. This will necessitate research and development of hybrid crops as well as that of more sustainable water utilization practices – the former of which is currently being researched and implemented in India and China, and could be shared with Bangladesh and Nepal under the provisions of Himalayan River Commission.

Cooperation on the water issue should be looked upon as a means to a peaceful co-existence. Joint water management offers the scope for people-to-people and/or expert-to-expert connections, thus creating a channel for peaceful dialogue irrespective of political and military developments.