# Eighth Major General Samir Sinha Memorial Lecture Water Conflict: The Looming Threat\*

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Let me join in paying tribute to Major General Samir Sinha, a former Director of the USI in whose memory this auditorium has been named. I did not know him but I did study in the same school as he did in Ranchi for a few weeks, before being withdrawn on account of illness. To that extent, we shared something in common. We remember him through these Lectures in his name.

#### **Some Basic Facts**

Water is life. Mounting stress is evident on account of population growth, seasonal and spatial variation, development, upstream diversion and pollution. Now we must factor in climate change. India was peopled by 330 m in 1947. We are 1200 m today and will be 1700 m by 2050 when our population stabilises. All these Indians need more water per capita.

Only 2 per cent of available water is freshwater, the balance consisting of ocean and polar ice. Of this water stock, only half is utilisable. Water is sourced from atmospheric precipitation as rain or snow, river flows, lakes and groundwater aquifers. Surface and ground water are not independent entities but are hydrologically interconnected. There are many saline aquifers and both surface and ground water can get polluted or mineralised. Ground water must be harvested, not mined; and drainage is most important.

Many major rivers, certainly India's Himalayan rivers, are international watercourses with the Country being an upper, lower and middle riparian in different situations. International water law is still evolving, other than in relation to navigation and, possible pollution, and there is no overall binding statute regarding consumptive uses though the International Lawyers Association (the Helsinki Rules) and, more recently the UN, have sought to frame regulations. The former is not binding; the latter has not been ratified by the number required for enforcement. Yet, domestic law, court rulings, arbitration awards, treaties, conventions and donor conditionalities provide a framework of guiding principles and best practices.

Round the world, pressures to access and control water are mounting. Conflict threatens and water has become a major security concern, domestically and internationally. There are numerous examples.

# The Domestic Scene in India

Inter-state, inter-regional and inter-sectoral strife is commonplace. Disputes over the Cauvery, Ravi-Beas and other rivers have raised tensions; as also rural-urban, municipal and pollution issues. Who own the water beneath an individual's property? Current concerns are partly directed towards mediating this issue so as to ensure equity.

The Indian constitution delegates resolution of inter-state water disputes to an Inter-State Water Tribunal (Article 262). But though empowered to do so, Parliament has not legislated to bar the jurisdiction of the courts from such disputes or complaints, with the result that the Supreme Court has in effect reopened the Award of the Narmada Water Dispute Tribunal. The Ravi-Beas Tribunal's final Award has yet to be pronounced on account of serious differences between Punjab and Haryana, while the Cauvery Tribunal's Award has been by-passed. In all cases politics has intervened.

Stay orders and protests have also delayed or prevented the construction or completion of various water resource projects on a variety of displacement, compensation, human rights, environmental and equity considerations. All these are products of or generate conflict situations. They constitute complex, sensitive and emotional issues, sometimes of an inter-generational character, that call for delicate handling. Yet, delay constitutes denial and denial can unleash a stream of other wrongs to other actors and interests.

# **India's International Waters**

The Indus and Ganges, Brahmaputra and Barak/Meghna (GBM) are international rivers that India variously shares with China, Pakistan, Nepal, Bhutan and Bangladesh. The Manipur and Kaladan rivers are shared with Myanmar.

Indo-Nepalese water relations go back to British India when the Raj negotiated the Sharda Barrage in 1927 that entailed a small territorial exchange as well. With Independence and menacing floods in Bihar and UP, Government of India negotiated the Kosi and Gandak projects with Nepal though both were soon modified to accommodate Nepalese concerns. Nevertheless, Nepal felt that the Sharda, Kosi and Gandak agreements were one-sided and gave the Kingdom unequal benefits. This was not really so, as there were several balancing factors; but perceptions are the realties that shape national attitudes and dictate policy. Big neighbour arrogance and mismanagement by UP and Bihar in shared projects also queered the pitch.

This is the backdrop to Nepal's tendency thereafter to drag its feet on cross-border water projects, seeking prior guarantees of benefits even before project parameters were frozen. Internal politics intruded and the sheer magnitude of many Himalayan projects was certainly daunting. Thus were Kosi, Mahakali and many other projects delayed, despite a landmark Mahakali Treaty (1996) that set out an agreed basis for cost-benefit sharing. In seeking to get too much, Nepal got nothing. As against a techno-economically feasible hydro potential of 45,000 MW, Nepal has actually developed less than 1500 MW, though with its Himalayan gradient and abundant water resources, it could match Gulf petro-dollars with aqua-dollars.

# Bhutan

Bhutan, a smaller state with a later development start has, with full Indian cooperation, developed 2000 MW and will soon attain 5000 MW installed capacity while planning to generate up to 10,000 MW. From being the poor cousin, Bhutan will soon boast the highest per capita income in the SAARC region, leveraging its hydro potential to develop sustainably.

# Bangladesh

The GBM empty into the Bay of Bengal through Bangladesh which is a low lying funnel, highly susceptible to floods and storm surges. Partition virtually landlocked India's northeast and disrupted its arterial waterways. Bangladesh in turn found 95 per cent of its headwaters emanated in or through India. It naturally sought a share of GBM waters for consumptive uses and to prevent saline intrusion from the sea. India's decision to build the Farakka Barrage to save Kolkata port became the flashpoint.

The 40,000 cusec diversion of water from Farraka to the Bhagirathi-Hoogly set alarm bells ringing and East Bengal/Bangladesh demanded a fair share of lean season flows. Tortuous negotiations yielded a just outcome in the Ganges Water Treaty, 1995, guaranteeing Bangladesh a minimum of 35,000 cusecs or 50 per cent of available flows during the most critical six weeks of the January to May lean season. Though Bangladesh gets this water, none of it goes into the Gorai distributary that feeds the Khulna region on account of a natural silt blockage or hump at its off take caused by secular geo-morphological changes in the regime of the river which has been shifting eastwards. Uninformed Bangla opinion has raged against Indian mala fides with internal political compulsions precluding any clarification by Dhaka. Fortunately, that situation is now changing. Avoidable controversy over the sharing of Teesta waters and Indian plans to build the Tipaimukh hydro-cum-flood moderation/navigation project on the Barak is also now moving towards resolution.

# **Indus Waters Treaty**

Partition severed an integrated Indus irrigation system across united Punjab and Sind. Initial controversy over canal water flows resulted in negotiations leading to the Indus Waters Treaty brokered by the World Bank. This gave the three eastern rivers (Sutlej, Beas, Ravi) to India and the three western rivers (Chenab, Jhelum, Indus) to Pakistan. It however permitted India stipulated consumptive uses to irrigate up to 1.34 m acres of land and store 3.60 MAF of water for flood moderation and power generation in that part of J&K controlled by India. An Indus Commission was set up to monitor and manage the Treaty and an elaborate dispute settlement mechanism put in place.

India was required to inform Pakistan of any scheme it proposed on the three Western rivers, leading to Pakistani objections, delays, even modification (Sallal-I), delay (Baglihar) or denial (the Tulbul flood detention barrage) of these projects. The latest clutch of "disputes" relate to the Kishenganga (a Jhelum tributary), Sawalkote (Chenab), Nimoo Bazgo (Indus) and other projects. Pakistani objections have risen to a crescendo of hysteria and rabid jihadi rhetoric alleging water theft, willful Treaty violations and plans to flood and desertify Pakistan in turn, and wage water terrorism that could lead to nuclear war.

Although Pakistan is admittedly facing water stress, there is no warrant for its wild charges against India which

threaten to undermine the Indus Treaty. India is using less than its irrigation entitlement in J&K and has no storage on the three western rivers, relying exclusively on run of river pondages which are permissible under the Indus Treaty. Indeed, part of its unused entitlement is still flowing into Pakistan as a bonus. The problem is that Pakistan has not managed its water resources efficiently and has not built sufficient storages (partly on account of inter-provincial disputes). As a result, 35 MAF of its share of 137 MAF of Indus waters flows to the sea unutilised during the flush season. It would appear the Indus issue is being politicised and linked to a renewed thrust based on the argument that the Indus is Pakistan's "lifeline" and it must therefore control its headwaters that flow through the Indian part of J&K. The reasoning is specious. The Indus Treaty laid that ghost to rest.

The real answer, especially with the onset of climate change, lies in further cooperation under the Indus Waters Treaty as envisaged in Article VII to optimise available benefits though joint investigations and engineering works to build or augment storages on the three western rivers on either side of the LOC.

# **China/Tibet**

Over the past many years there have been persistent reports of grandiose Chinese plans to divert the great Tibetan rivers, including the Tsang-po, northwards to the Gobi and the northern plains beyond Beijing. The fear has been that this will "dry" up the "Brahmaputra". Apart from the fact that the "Brahmaputra" is only formed after the confluence of the Tsang-po, (which becomes the Dihang/Siang in Arunachal), Dibang, Luhit and Noa Dihing near Sadiya in Assam, more than 70 per cent of its discharge is generated south of the Himalaya. Topography, ecology, hydrology, economics and technology do not suggest that such a massive northward diversion of Tibetan rivers is feasible. Proposals have certainly been mooted but have been strongly discounted and ridiculed by Chinese experts.

Smaller diversions are possible and even legitimate if feasible and there can be no objection to reasonable consumptive uses in Tibet. But crying wolf because of reports of small projects in Tibet and problems caused by debris dams in the Himalaya-Karakoram in China is best avoided.

#### The Mekong and Salween

Reports that China plans to divert the Salween and Mekong or dry them up by massive hydro projects within its own territory are equally misplaced. Hydro projects are non-consumptive as the water returns to the river. Large hydro project have indeed been built on the upper Mekong or Lacang in China. But the river here flows through very rugged terrain and there is little scope for irrigation uses. Therefore, the diversion charge is baseless or greatly exaggerated. A recent meeting of the Mekong Commission disabused those who feared an imminent danger of crippling diversions by China.

#### Afghanistan

Afghanistan is landlocked. It has four river basins – the Kabul, Amu Darya, Helmand and Hari Rud - originating within its territory but flowing into Pakistan, Central Asia and Iran. Being a late developer and racked by conflict, it faces prior appropriation by its neighbours and is handicapped by a poor data base and the lack of water agreements except for a limited one with Iran (1973).

In the 1950s and 1960s, the then Soviet Union greatly over-extended irrigated cotton cultivation in Uzbekistan, Turkmenistan and Tadjikistan. This virtually dried up the Amu Darya which soon failed to reach the Aral Sea, causing widespread desertification and an ecological catastrophe. The damage is now being slowly repaired but Afghanistan's largest river may be hostage to the resuscitation of a ravaged Central Asian ecology.

#### **Turkey and the Tigris Euphrates**

The Tigris and Euphrates rise in Turkey's Antolian Plateau. They have been harnessed to generate power and irrigate parts of southern Turkey but there is "surplus" water that Turkey proposed to divert southwards to Syria, Iraq, Saudi Arabia and beyond through "Peace Pipelines" that it would control. The Arabs protested and demand their due share of river flows.

#### **Israel-Palestine**

Underlying the territorial conflict between Israel and Palestine for control of land, heritage sites and settlements, is a

struggle for water, centring on the Jordan and Yarmuk rivers and a shared aquifer. The land is desert but water transforms it. Here is a conflict waiting to explode unless resolved sooner.

#### The Nile and Africa

Egypt, it has been said, is a gift of the Nile. The upper riparians are now demanding to share that gift. Sudan first, then several central African states watered by the White Nile, and now Ethiopia, the source of the Blue Nile. A series of hydro dams built and planned in the Ethiopian highlands – the Gibe I, II, III, and IV cascade for example, will also provide water for irrigation lower down. But there are concerns and a Nile consortium has been put in place to reconcile differences on the further development and sharing of the waters of the Nile basin.

Similar efforts are being made to seek trans-boundary cooperation on the Congo, Niger, and Zambezi and other African rivers.

# **Climate Change**

Enter climate change and we have something of a game-changer. The tropical regions will be particularly affected and the Indian sub-continent acutely, though in descending order from West to East.

Aberrant rainfall, glacial melt, enhanced flooding and sedimentation, debris, dams and sea level rise - all threaten established hydrological patterns. There may not be diminished rainfall but its occurrence could be wayward and episodic. Wind and snow patterns are changing. Glaciers are melting, though the rates of retreat and ablation vary, with some glaciers even advancing. The science is still tentative but there is no doubt about the trend, including polar warming. Initial glacial melt is augmenting summer flows but once these storehouses are diminished or exhausted discharges will fall. One study suggests that the Indus at Skardu may carry 30 per cent less water 30 years from now. How do we cope, nationally and worldwide?

Climate change does not respect boundaries or treaties and activities far away can affect local water regimes.

The Himalayan-Karakoram shield and Tibetan Plateau are among the most important global weather makers. In Tibet, glacial melt has been aggravated by melting permafrost in the vast northern rangelands. This has been reportedly caused by faulty livestock management patterns introduced over the past 30 years by the Chinese to support a growing immigrant population. Initially large herds of sheep, goats, yaks and horses were encouraged, resulting in overgrazing the pastures and destroying biodiversity and altering the heat balance thus affecting humidity, temperatures and precipitation. Subsequently grazing has been sought to be limited by enclosures, resulting in another cycle of unintended effects.

# **The Way Ahead**

These practices and trends call for global scientific studies, and India and China should cooperate with others to develop the knowledge required to devise appropriate coping strategies. Therefore, to cry at China on non-issues is most unwise.

India and Pakistan should move to Indus-II to harness the optimal potential of the Indus system to store water and generate power. Aberrant weather calls for more storages as insurance to trap the water and prevent storm surges, floods and sediment slides. Automated weather platforms in remote regions should be jointly set up and interrogated by satellites to provide real time data about potential debris dams and looming disasters.

India, Nepal, Bhutan and Bangladesh should also revisit their postures and plans to forge new cooperative and coping strategies to mutual benefit. Water conservation, demand management, appropriate pricing policies and cropping patterns call for review so as to avoid or mitigate crises and conflict.

The challenge is enormous, but can be met – cooperatively. In so doing we may be able to move on to another and better and more sustainable growth path that caters to everybody's need but discourages greed. Gandhiji said that a hundred years ago.

\*Text of the talk delivered at USI on 21 April 2010, with Air Marshal AK Singh, PVSM, AVSM, VM, VSM (Retd), former AOC-in-C, Western Air Command, in Chair.

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