

Brahmaputra : Dam and Diversion

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“Traditionally, the Chinese people’s respect for their Emperor increases when the latter undertakes projects that no human mind can conceive of. After all, the Emperor is the Son of Heaven, and only in Heaven can projects such as the Grand Canal or the Great Wall be envisioned. It is also the role of the Emperor to bring Heaven’s vision down on earth. If he fails, his Mandate is terminated by Heaven and a Revolution or a Rebellion occurs.”

South Asia Politics : Water Wars in South Asia (2003)

Introduction

The Communists came into power in China in 1949. On 01 October 1949, from the rostrum of the Tiananmen Square, Mao addressed the masses assembled to listen to the new Emperor. He told them: “The Chinese people have stood up”. A dynasty was born. The First Generation of this dynasty also had to build a new Canal or a new Wall. Mao’s Dream was to catch up with the West and produce as much steel as UK in a few years time. It resulted in the Great Leap Forward and the death of 40 million people. Mao lost his mandate for a few years, but came back with an even greater project: a Great Proletarian Cultural Revolution which also took the lives of a few millions. Deng Xiaoping continued along the same direction with his new economic Revolution: “To become rich is Glorious”. In many ways, he succeeded and entered the Pantheon of the Great Emperors. In the next generation, the Premier Li Peng, an engineer by profession, undertook the massive Three Gorges Dam which is to produce 18,200 MW of electricity. Four new mega projects were put on the design tables as the Fourth Generation was taking over which are designed to solve the problems being faced due to imbalance in the supply of the nation’s water, energy, mineral and human resources, which are vital to a coordinated development of the national economy. They are the diversion of southern water to the north, a west-east natural gas pipeline, transmission of electricity from west to east and a railway linking Tibet with the rest of the country (already commissioned). In this article I intend to throw light on the South-North Water Diversion Scheme and study the implications of the same on India and South Asia.

South-North Water Diversion

According to the 10th Five-year Plan, water will be diverted from the south via three channels in the eastern, central and western regions, respectively. The western route will draw water from Jinsha, Yalong and the Dadu tributaries of the Yangtze River in southwest China, to the upper reaches of the Yellow River to solve water shortage in the northwestern regions. The central route is to fetch water from the Danjiangkou Reservoir on the border between Hubei and Henan provinces to Beijing and Tianjin. The eastern route will draw water at Yangzhou on the lower reaches of the Yangtze, flowing through a section of the ancient Grand Canal¹ and lakes northward to reach Hebei and Tianjin. Upon completion, the project will link up the Yangtze, Huai, the Yellow River and Hai (3-H Basins) valleys, forming a network of four horizontal and three vertical² waterways that allow a rational allocation of the country’s water resources nationwide. The project is designed to divert 40 billion cubic meters of river water a year, which equal the annual flow of the Yellow River, the second longest in China. It is expected to quench the thirst in the north and break the bottleneck hampering economic and social development in China so as to promote a sustainable social and economic development and benefit future generations, according to the Ministry of Water Resources. With the relocation of water resources, not only some 20 large and medium sized cities like Beijing, Tianjin and Shijiazhuang will be relieved of the constraints of water shortage, new economic growth points will rise up along the new waterways, especially in the western regions in a short time.

One can have an opinion on most of these projects and particularly on the gigantism of some of its components, but they are internal problems of China. However, one is not: the Brahmaputra diversion!

The Problem of Water

Hydrologically, there are two Chinas — the humid south, which includes the Yangtze River basin and everything south of it, and the north, which includes all the country north of the Yangtze basin. The south, with 700 million people, has one third of the nation’s cropland and four fifths of its water. The north, with 550 million people, has two thirds of the cropland and one fifth of the water. The water per hectare of cropland in the north is one eighth that of the south. The northern part of the country is drying out as the demand for water outstrips the supply. Water tables are falling.³ Wells are going dry. Streams are drying up, and rivers and lakes are disappearing. Under the North China Plain, a region that stretches from just north of Shanghai to well north of Beijing and produces 40 percent of China’s grain, the water table is dropping by an average of 1.5 metres per year.

Farmers in the north are faced with losses of irrigation water both from aquifer depletion and from the diversion to cities and industry. Between now and 2010, when China’s population is projected to grow by 126 million, the World Bank projects that the nation’s urban water demand will increase from 50 billion cubic meters to 80 billion, a growth of 60 percent. Industrial water demand, meanwhile, is projected to increase from 127 bcm to 206 bcm, an expansion of 62 percent. In much of northern China, this growing demand for water can be satisfied only by taking irrigation water from agriculture.⁴ What happens to irrigation water supplies directly affects China’s agricultural prospect. Whereas less than 15 percent of the US grain harvest comes from irrigated land, in China it is close to 70 percent.

In the competition for water between cities, industry, and agriculture, the economics of water use do not favour agriculture. In China, a thousand tons of water produces one ton of wheat, worth perhaps \$ 200. The same water used in industry will expand output by \$14,000-70 times as much. In a country that is desperately seeking economic growth and, even more, the jobs it generates, the gain in diverting water from agriculture to industry is obvious.

Asia's Water Tower

This led the Chinese experts in Beijing to look around for water. Where did most of Asia's waters flow from? The obvious answer was not far: the Tibetan plateau, the principal watershed in Asia and the source of its ten major rivers. Tibet's waters flow down to eleven countries and are said to bring fresh water to over 85 per cent of Asia's population, approximately 50 percent of the world's population. Three of the world's ten major rivers, the Brahmaputra (or Yarlung Tsangpo in Tibet), the Yangtze and Mekong have their headwaters on the Tibetan Plateau. The other major rivers which originate in Tibet are the Huang Ho (or Yellow river), the Salween, the Arun, the Karnali, the Sutlej and the Indus. About 90 per cent of their run off flows downstream to China, India, Bangladesh, Nepal, Pakistan, Thailand, Myanmar, Laos, Cambodia and Vietnam. For us in India, the main concern is the Brahmaputra, the Indus, and the Sutlej, whose waters give life to more than 500 million people living downstream.

Himalyan Glaciers

It is roughly estimated that 10-20 per cent of the Himalayan region is covered by glacial ice while an additional area ranging from 30-40 per cent has seasonal snow cover. Himalayan glaciers cover around 100,000 square kilometers and store about 12,000 cubic km of fresh water: the most incredible water tank one can imagine. The perennial run of the rivers originating from these glaciers also result in a stable flow of water to regions which are dominated by monsoon rainfall (with rain pouring for only a few months of the year). Consequently, the Tibetan rivers, independent of seasonal precipitation patterns, are an important factor in sustaining hydrological regimes of South Asia.

The Yarlung Tsangpo

The Yarlung Tsangpo or Brahmaputra as it is known in India, has an immense bearing on the life of hundreds of millions in the sub-continent. It is the largest river on the Tibetan plateau, originating from a glacier near Mt Kailash. It is considered to be the highest river on earth with an average altitude of 4,000 metres. It runs 2,057 kms in Tibet before flowing into India, where it becomes the Brahmaputra. One of its interesting characteristics is the sharp U turn it takes at the proximity of Mt. Namcha Barwa (7,782 metres) near the Indian border. The two larger tributaries of the Tsangpo are the Kyichu (or Lhasa River) and the Nyangchu. Near Shigatse region, the Yarlung valley is 20-30 kms wide. This area with its sand dunes and lakes is the cradle of a two thousand year-old civilization. China's Tibet, a Chinese magazine describes the scenery: "The complex and unique geographic and climatic conditions created by this great river provide Tibet with a wide array of wildlife. Black-necked cranes, Tibetan antelopes, wild Tibetan donkeys, sheep and Tibetan gazelles are among the larger animals found in the river valley.5" In Tibet, the river is often navigable, local people use coracles (made of yak hide and bamboo) to cross it. The Yarlung Tsangpo enters India in Siang district of Arunachal Pradesh. When it penetrates Assam, it is joined by two other rivers (the Dihang and Lohit).

Significance of the Brahmaputra Basin

The Brahmaputra has always been considered as the very soul of the State by Assamese poets and ordinary people alike. Its valley has fertile farmland, with large areas covered with Sal forests, a valuable tree that yields resins. Crops of tea, rice and jute bring wealth to the region. River floods over much of the valley in the rainy season providing natural irrigation to rice growers. The rare one-horned rhinoceros, extinct in other parts of the world, is still found in Assam, along with tigers, elephants and a large variety of fish. Around the settlements in the Brahmaputra Valley many fruit-bearing trees like mango, jackfruit and papaya are easily grown. Entering Bangladesh, the river unites with the Ganga and is known as the Padma, before becoming the Meghna-Brahmaputra after merging with the river Meghna. Finally it divides into hundreds of channels to form a vast delta which flows into the Bay of Bengal.

The Grand Canyon

But let us come back to the Tibetan plateau. When the Tsangpo reaches its easternmost point in Tibet, it takes a sharp U turn known as the Great Bend. Only recently it has been found that the Yarlung Tsangpo gorge forms the longest and deepest canyon in the world.

For the first time in May 1994, Xinhua News Agency mentioned about the length and depth of the canyon: "Chinese geologists claim that a remote Tibetan canyon is the world's largest, bigger and deeper than the Grand Canyon. The Yarlung Zangbo Canyon, in the vast Himalayan range that encircles China, averages 3.1 miles (5 kms) in depth and extends 198 miles (317 kms) in length. The Grand Canyon in the southwestern US state of Arizona is, by comparison, a mere 1 mile (1.6 kms) deep but 217 miles (347kms) long, with a width of between 4 and 12 miles. Scientists found that the canyon located in the Himalayan range, averages 5,000 metres in depth, with the deepest section reaching 5,382 metres.6"

A few years later, it was found that near Mt. Namcha Barwa (7,756 metres), the Tsangpo Gorge is eight times as steep and three times as large as the Colorado in the Grand Canyon. It is in the Great Bend that China is planning

one of the most important components of the ‘western route’ diversion scheme.

The Project

The Tsangpo project will have two components: one will be the construction of the world’s largest hydroelectric plant that would generate twice the electricity produced by Three Gorges Dam. Today, the biggest power station in the world is located in Itaipu in Brazil: it has a total installed capacity of 12,600 MW. The Three Gorges Dam on the Yangtze River (PDC is 2009) will have a 18,200 MW capacity. The hydroelectric plant on the Great Bend of Yarlung Tsangpo will dwarf all these projects with a planned capacity of 40,000 MW. The second component of the project will be the diversion of the waters of the Tsangpo which will be pumped northward across hundreds of kilometres of mountainous regions to China’s northwestern provinces of Xinjiang and Gansu. For the Chinese leaders, it is enough to know that the Tsangpo river tumbles down over 3,000 metres in less than 200 kms. This gives the gorge one of the greatest hydropower potentials available in the world. It makes emperors dream.

For the Tibetans, it is one of the most pristine regions of their country. They consider the area around the Bend as the home of the Goddess Dorjee Pagmo, Tibet’s protecting Deity. Many believe that this place, locally known as Pemakö is the sacred realm often referred to in their scriptures: The Last Hidden Shangrila. For South Asia and more particularly for India, the enormity of the scheme and its closeness to the Indian border cannot be ignored. It is not only the sheer enormity of the project which has to be considered, but the fact that if it is accomplished, it will have ominous consequences for millions of people downstream. Their basic need for water and their survival would be endangered. Once Ismail Serageldin, a former Senior Vice President of World Bank said: “The next World War will be over water.” China’s green light for the project could be considered by South Asia as a declaration of war.

Media Reports

The first (and almost only time) that the matter was reported in the Indian Press was in June 1997 when Outlook magazine wrote a piece entitled: “China proposes to divert the Brahmaputra at source to green the arid Gobi desert.” The magazine wrote: “The initial report — that the Chinese were planning to raise their food output in the decades ahead — was hardly stop-press material. But as details leaked out, policymakers in India and Bangladesh felt a shiver of apprehension: the Chinese proposed to divert the Brahmaputra river at source; in Tibet, even set off a peaceful nuclear explosion, to serve their purpose.”

At that time, the only thing that a former director, Asian Development Bank said was that under international law, no one could stop China and that “The Chinese government has equal rights to the use of the river.” However, Outlook revealed that “the concern in Assam and Bangladesh is understandable. The Luit - as the river [Brahmaputra] is locally called - figures prominently in the folklore and culture of Assam and the Northeast; has been the theme of countless Bhupen Hazarika songs. The river is crucial to the economy of the entire region, where the concept of irrigation through ground water sources has not really taken off.”

In the coming months, more publicity was given to the dam as well as the diversion proposals. In September 1997, Agence France Press in Beijing reported: “Three experts propose construction of giant dam in Tibet”. It stated: “After a long experience of exploration on the site, we believe that the project could begin to be included in the agenda of the concerned department”. The project was also mentioned in news briefs in the China Daily Business Weekly (21 September 1997) and the International Water Power and Dam Construction Monthly (November 1997). In January 1998, the German TV channel ZDF presented a feature on the Yarlung Tsangpo project, in a programme entitled “Die Welt” [The World]. The Chief Planner, Professor Chen Chuanyu was interviewed. He described the plan to drill a 15 km (9.3 miles) tunnel through the Himalayas to divert the water before the U turn and direct it to the other end of the bend. This would shorten the distance of the approximately 3,000 metres altitude drop from 200 kms to just 15 kms. He explained that the hydropower potential of 40,000 MW could be used to pump water to northwest China over 800 kms away.

National Geographic Expedition

An interesting aspect briefly mentioned is that this area known to the Tibetans as Pemakö was considered to be a sacred area, rarely visited by outsiders. The difficulty of access to this unexplored region must have created one of the greatest obstacles for the engineers in Beijing. At the end of the 90’s, the Chinese government decided to permit foreigners to explore the Grand Canyon. The well-known National Geographic expedition, with ultra sophisticated materials and highly professional rafters made the first discoveries. Though it resulted in the death of an American kayaker, Doug Gordou in October 1998, it permitted a far greater knowledge in several previously unexplored parts of the gorges. Books and video footage of this expedition (as well as subsequent ones) certainly helped the Chinese planners to get a more accurate picture of the difficulty of the terrain (as well as the potentialities).

The opening of the area to adventure tourism was certainly a step of the preparatory work to find an approach way for dam site. In the recent years, the Chinese have been more discreet on the project, although a few reports have continued to come in. The correspondent of The Telegraph in Beijing wrote in October 2000: “Chinese leaders are drawing up plans to use nuclear explosions, in breach of the international test-ban treaty,⁸ to blast a tunnel through the Himalayas for the world’s biggest hydroelectric plant. China will have to overcome fierce opposition from neighbouring countries who fear that the scheme could endanger the lives and livelihoods of millions of their people. Critics say that those living downstream would be at the mercy of Chinese dam officials who would be able to flood them or withhold their water supply.”

The Implications

The construction of this multi-billion dollar project is tentatively scheduled to begin in 2009, the year the Three Gorges Dam is supposed to be completed. Based on mean annual flow, the Yarlung Tsangpo, constitutes 33 percent of the total flow of the Brahmaputra when it enters India. In other words, for the sub-continent it is the largest proportion of stable flow from glacial sources. The implications of a huge storage dam on the Yarlung Tsangpo and the diversion of the waters to northwestern China are multiple and far reaching for Tibet, India and Bangladesh. But most importantly, this project represents a direct threat to the people living downstream in India and Bangladesh.

For Tibet and the surrounding areas. A reservoir for a 40,000 MW capacity dam would create a huge artificial lake inundating vast areas of virgin forest within the canyon and beyond. The reservoir would stretch hundreds of kilometres upstream the Yarlung Tsangpo into the Kongpo region. Rare species of flora and fauna within the canyon (though not yet well documented) will be lost for scientific study. The Chinese authorities themselves admit that the canyon is the home for more than 60 per cent of the biological resources on the Tibetan Plateau. Although the population in the canyon is rather small, the indigenous people would suffer great hardship and be forced to leave their ancestral lands. It may not be a problem for Beijing who has 'resettled' more than one million Chinese Hans since the beginning of the construction of the Three Gorges Dam, but for the Tibetans, it would mean the loss of a last sacred place and the home of their Protecting Deity. Furthermore, Tibetans would not benefit in any way from the power produced by the hydel plant, as it would be sold to China's southern neighbours or used to send the water upstream to northwestern China. Additionally, the water diversion scheme is likely to be a highly inefficient and wasteful exercise with billions of cubic metres of water being lost to evaporation, leakage, percolation, etc... through the 800 kms-long canals and aqueducts.

If the project comes to fruition, Tibet and the world would have lost this virgin region and its canyon, a great treasure heritage. But, when the stakes are so high and the ego of the emperors so big, one can have no doubt that the scheme will be implemented. The potential use of nuclear devices to create tunnels for the project raises further serious concerns about the environmental impacts of such a project for the region and those living downstream. There will also be a great danger of sending contaminated waters to northwestern China. This is perhaps one of the most important side-effects, not yet addressed by the Chinese scientists.

For South Asia. India and Bangladesh would be at the mercy of China for adequate release of water during the dry season, and for protection from floods during the rainy season. India knows from its own internal problems how difficult it is to solve a water dispute. When it comes to a transboundary question (when the boundary is not even agreed upon), it seems practically impossible to find a workable understanding. Precipitation in North India (particularly Assam) and Bangladesh is very high (80 per cent) during the four monsoon months (between June to September), and low (20 per cent) during the remaining eight months. China, seeing her own interests, could withhold water for power generation and irrigation during the dry season and release water during the flood season with the catastrophic consequences for eastern South Asia. It has to be noted that if the Tsangpo project is implemented, large parts of the scheme of linking the Indian rivers would become redundant. Last and perhaps most serious: the Great Bend is located in a highly seismic prone area. A huge reservoir and a few Peaceful Nuclear Explosions (PNE's) could provoke disastrous consequences by upsetting the geological balance. Will men be wise enough to learn from the past and study nature's limits and reactions before wanting to alter her?

Liquid Bombs

An event which occurred in June 2000 could be an illustration at a very reduced scale of what could happen if the Tsangpo project is one day completed. At that time, the breach of a natural dam in Tibet led to severe floods and left over a hundred people dead or missing in Arunachal Pradesh. It is not difficult to understand that areas downstream in Arunachal or Assam are extremely vulnerable to what takes place upstream in Tibet. A few weeks later, a similar mishap took place on the other end of the Himalaya. The Tribune in Chandigarh reported this strange event "Even three days after the disaster, the mystery of the flash floods in the Sutlej, which wrecked havoc along its 200-km length in the state, remains unresolved. Experts are at a loss to understand where the huge mass of water came from."

Imagine a 50-ft high wall of water descending into the gorges of Kinnaur in Himachal Pradesh! In a few hours, more than 100 persons died, 120 kms of a strategic highway (Chini sector) was washed away and 98 bridges destroyed. The details of this incident were similar to the Arunachal Pradesh's one. A detailed study carried out a few months later by ISRO scientists confirmed that the release of excess water accumulated in the Sutlej and the Siang river [the Tsangpo] basins in Tibet had led to the flooding. Nearly a year later, the weekly India Today commented "While the satellite images remain classified, officials of the Ministry of Water Resources indicate that these pictures show the presence of huge water bodies or lakes upstream in Sutlej and Siang river basins before the flash floods took place. However, these lakes disappeared soon after the disaster struck Indian territory. This probably means that the Chinese had breached these water bodies as a result of which lakhs of cusecs of water were released into the Sutlej and Siang river basins."

Conclusion

Nobody can deny that China has a very serious problem with food and water. Even the rivers are drying up. An unexpectedly abrupt decline in the supply of water for China's farmers poses a rising threat to world food security. China depends on irrigated land to produce 70 percent of the grain for its huge population of 1.2 billion people, but it is drawing more and more of that water to supply the needs of its fast-growing cities and industries.

The problem is now so clearly linked to global security that the US National Intelligence Council (NIC), the

umbrella over all US intelligence agencies, has begun to monitor the situation with the kind of attention it once focussed on Soviet military manoeuvres. Indeed, it is clear today that these questions do not pertain to environment only, but also to international security. If Beijing was to go ahead with the Tsangpo project, it would practically mean a declaration of war against South Asia.

The only solution seems to lie in bringing the matter to the negotiating table. If a river-water treaty could be signed between India and Pakistan in the early sixties, why cannot a similar agreement be made between China, India and Bangladesh, in order to assure a decent life for all in the region?

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Journal of the United Service Institution of India, Vol. CXXXVIII, No. 571, January-March 2008.