NUS National University of Singapore | ISAS Institute of South Asian Studies

ISAS Brief
No. 801 – 6 August 2020

China's Hydropower Projects on River Brahmaputra

Amit Ranjan

Summary

A number of hydropower projects on the Chinese side of River Brahmaputra are a cause of concern for India. While some of these worries may be genuine, scholars argue that others stemming from the fear of a decline in water flow are unfounded.

On 23 January 2013, three hydropower projects – Dagu, Jiacha and Jixu – on Yarlung Tsnagpo, known as the Brahmaputra in India, were listed in the State Council of China's energy plan for the 12th Five-Year Plan (2011-15). These three hydro projects were in addition to the 510 megawatt (MW) Zangmu, located in the Gyaca in Tibet. Its construction began in 2010 and, in October 2015, the Zangmu dam became fully operationalised. Zangmu is considered to be the world's highest-altitude hydropower station. It has a capacity of producing 2.5 billion kilowatt hours of electricity per year.

Among the three new dams planned in 2013, Dagu (640 MW) is bigger than Zangmu. It lies 18 kilometres upstream of Zangmu. Jiacha is a 320-MW dam located in the middle reaches of River Brahmaputra, downstream of Zangmu. The third is the 560-MW Jiexu dam. It is 11 kilometres upstream of Zangmu.

Addressing the concerns expressed by India over the three planned dams on River Brahmaputra, in a press conference on 4 February 2013, China's foreign ministry spokesperson, Hua Chunying, said:

> "China has always been responsible on the development and utilisation of cross-border rivers. We carry out the policy of placing equal importance on development and protection and take account of the influence on the downstream countries. The planned dams will not affect flood control, disaster mitigation and ecological environment in the downstream areas. China and India have maintained communication and cooperation on the issue of cross-border rivers."

Seven years after it was planned, in July 2020, according to the China Society for Hydropower Engineering, Jiacha hydropower station was successfully gated to store water. In August 2020, the first of the three units will be put into operation. Jiacha is expected to generate about 1.704 billion kilowatt hours of electricity. Jiacha hydropower station is located in the Gyatsa county of the Tibet Autonomous Region. Its construction started in December 2015 by Huaneng Tibet Power Generation Company Ltd, a subsidiary of the state-owned China Huaneng Group. Once the operation of Jiacha dam begins, the project will transmit power jointly with Zangmu hydropower station which, as claimed, will solve electricity shortage in Tibet.

India has some concerns over the dams on the transboundary River Brahmaputra.

First, according to media reports, Zangmu and the other hydropower projects in the upper riparian are "weapons" used by China against India. This is perhaps an over-exaggeration of the situation. However, Ken Conca, in his article, *Decoupling Water and Violent Conflict*, observes that water can, in fact, "create complex and difficult hydro-political relations" between the riparian states.

Second, the fear expressed in India is that through such hydro projects, China will able to divert waters of River Brahmaputra to its parched northern parts through the South-to-North Water Transfer Project. The Great Western Line plan, envisaged in 1990s and then by Lin Ling, author of *Tibet Water will Save China* in 2006, called for the construction of canals to transfer water from Rivers Yarlung Zangbo, Nu, Lancang, Jinsha, Yalong and Dadu. This plan was later abandoned due to its high cost and relatively low benefits.

Third, all the Chinese hydro projects on River Brahmaputra are run-of-the-river projects. However, they will need to store huge volumes of water to run the turbine to generate electricity throughout the year.

Fourth, to address their water-related concerns over River Brahmaputra, in 2002, India and China signed a memorandum of understanding, under which China agreed to provide hydrological data on River Brahmaputra's water flowing in the Chinese territory. India pays around ₹1 crore (S$183,532) every year to get data from Nugesha, Yangcun and Nuxia hydrological stations for the Brahmaputra and from a station at Tsada for the River Sutlej. However, the military stand-off between India and China at Doklam in 2017 affected this arrangement. At that time, China stopped sharing water-related information to India. The reason given was a technical snag at the water-measuring stations. However, for the same period, China provided hydrological data on River Brahmaputra to Bangladesh.

Contrary to the popular arguments in India about Chinese diversion and regulation of Brahmaputra's waters, citing data published by the Chinese researcher L Jiang and team, Nilanjan Ghosh shows that the total annual outflow of River Brahmaputra from China is estimated to be about 31 billion cubic metres (BCM) while by the time it reaches Bhadurabad, the gauging station near the end of the rivers' sub-basin in Bangladesh, its outflow is about 606 BCM. Then, citing the work of scholars B Datta and Vijay Singh, Ghosh writes that River Brahmaputra's peak flow during the monsoon at Nuxia and Tsela Dzong, water measuring stations in Tibet, is about 5,000 and 10, 000 cubic metres per second respectively while this is around 40,000 cubic metres per second in Guwahati and 50,000 cubic metres per second at Bhadurabad. During the lean season, the flow at Nuxia is about 300-500 cubic metres per second while it is about 4,000 cubic metres per second at Guwahati and 5,000 cubic metres per second at Bhadurabad. Ghosh concludes that as the Brahmaputra becomes fatter after reaching India, the "popular hypothesis" about reduced water flows in River Brahmaputra due to such constructions is scientifically incorrect.

. . . . .

Dr Amit Ranjan is Research Fellow at the Institute of South Asian Studies (ISAS), an autonomous research institute at the National University of Singapore (NUS). He can be contacted at isasar@nus.edu.sg. The author bears full responsibility for the facts cited and opinions expressed in this paper.