

# NATIONAL PERSPECTIVE PLAN (NPP) FOR WATER TRANSFER WITH PARTICULAR REFERENCE TO BRAHMAPUTRA-GANGA LINK

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## 1.0 INTRODUCTION

Mangala Rai, former Director General, ICAR and Ex-Secretary, Deptt. of Agricultural Research & Education in an article (The Statesman, 2017) stated: “India is heading for an agrarian crisis. With 17.78% of total world population, India possess only 2.3% of world’s land resources and 4.2% of world’s water resources. Although, country’s food grain target has reached 273mt to feed its 1250 million population, farmers are committing suicide as agriculture has become a loss-making business and the young generation in the villages are no more opting for agriculture as a profession. It is a failure of our political, bureaucratic and administrative system. Although there is a lot of talk about increasing water reservoirs and accelerated irrigation by building link canals to transfer water from water surplus to water deficit basins, there seems to be nothing on the ground”.

Concept of national water grid for effective management of flood and drought situations in India was introduced by a number of eminent persons in the past. But the proposals were rejected as they were found to be techno-economically not viable. National Water Development Agency (NWDA) was set up in 1982 to study the possibility of water transfer from surplus basins to deficit basins. NWDA proposed the National Perspective Plan (NPP) consisting of 14 river links under the Himalayan component and 16 river links under the peninsular component as shown in Fig.1 involving 12,500 km of canal length and 32 dams (TFIR , 2005)

India is having water-related conflicts among several states. North east states say that their water surplus is due to lack of storage as there is hardly any investment there. The most important point to be considered is the estimated cost of the NPP project in comparison to other alternative methods to conserve water for food scarcity and its impact on our economy and the environment. The approximate cost of the NPP Scheme as estimated by the Task Force was about 5.6 lac crores at 2003 prices which is likely to increase manifold now due to cost and time over run.

India advocates inter-basin water transfer from the Brahmaputra basin to the Ganga basin through a link canal to address the dry season flow scarcity in the Ganga basin. Farakka barrage on Ganga and Jangipur barrage on Bhagirathi (a tributary of Ganga) were constructed in 1971 to forcibly divert 1130 cumec Ganga flow to Bhagirathi/Hoogly river system through a feeder canal 40 km long. Hoogly river was drying up due to siltation of its offtake point near Jangipur. River Hoohly is the lifeline of West Bengal as it feeds Kolkata port. It is used for navigation (National Waterway- 1) and water supply to Kolkata and other innumerable towns located on both sides of Bhagirathi/Hoogly river.

Under NPP, it was first proposed to transfer surplus water of Brahmaputra river basin to Ganga basin since the minnum dry weather flow in Brahmaputra is estimated as 5,500 cumec which can be further augmented by release of water from storage reservoirs proposed to be built in

India and Bhootan. India's 1978 proposal for Brahmaputra-Ganga link through a feeder canal across Bangladesh which was the shortest link without any lift component was, however, rejected by Bangladesh Govt. Apart from its claim for more water downstream of Farakka barrage, Bangladesh also claims water share of Tista river. Keeping in view the Bangladesh demand for more water from both Ganga and Tista basins, Govt of India has now changed the earlier plan and the new Brahmaputra-Ganga link-1 (Manas-Sankosh-Tista-Ganga) is shown in Fig.1. The proposed new link passes entirely through India and it transfers excess water to Farakka for onward transmission to links 11, 13 and 22 to deficit basins in the south.

The paper is intended to discuss the various problems related to implementation of NPP in general for water transfer of surplus water from north to south and Brahmaputra-Ganga Link for addressing the water scarcity in Bangladesh downstream of Farakka barrage in particular.

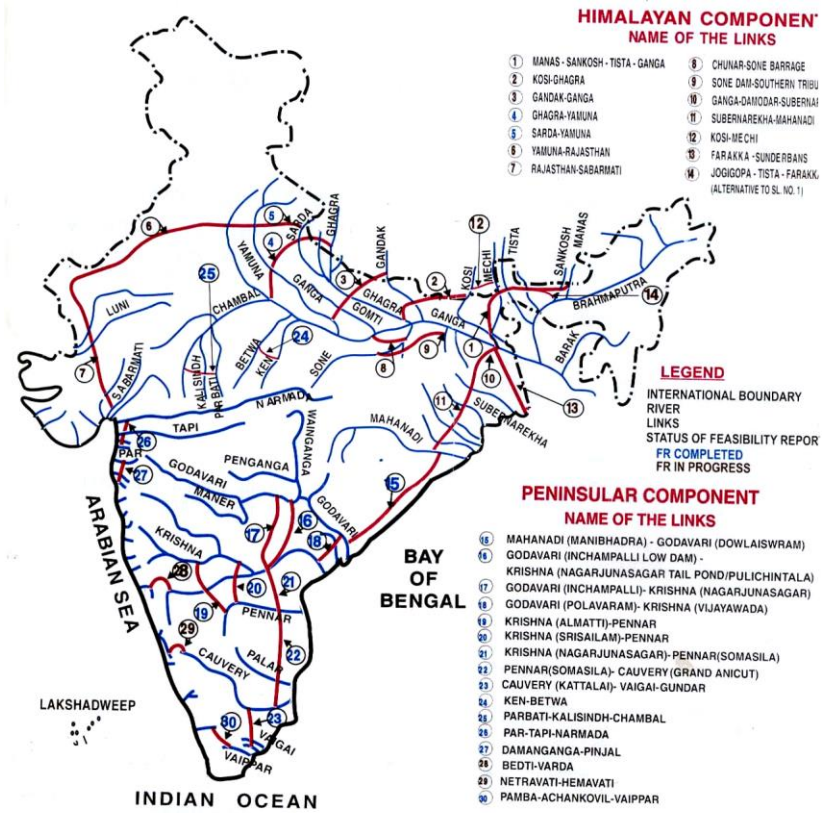
## **2.0 Historical Development**

Concept of national water grid for effective management of flood and drought situations in India was introduced by a number of eminent engineers in the past, like Sir Arthur Cotton, Dr. K.L. Rao, Captain M. N. Dastur and many others (IWRS-1996). But all the proposals were rejected as they were found to be techno-economically not viable. It was Indira Gandhi who set up the National Water Development Agency (NWDA) in 1982 to study the possibility of water transfer from surplus basins in the north to deficit areas in the south and north-west. NWDA - under the Ministry of Water Resources, River Development and Ganga Rejuvenation (now Ministry of Jalshakti), Govt. of India- proposed the National Perspective Plan (NPP) consisting of 14 river links under the Himalayan component and 16 river links (Mazumder-2003,2006,2011) under the peninsular component as shown in Fig.1 (NWDA,2005). After the Supreme Court order to implement the project in a period of 15 years by 2012, a Task Force (2003) was appointed by the late Vajpayi led NDA Govt. under the chairmanship of Sri Suresh Prabhu, former union minister of commerce under the Modi led NDA Govt. National Commission of Integrated Water Resources Development (NCIWRD, 1999) was not in favor of long distance river links and suggested to execute short links (like Brahmaputra-Ganga link) initially. The past UPA Govt. wanted to hear the views of all the stakeholders and experts before taking a final decision. A standing committee under the chairmanship of Sh. Sambashiva Rao, M.P., was formed and the committee invited suggestions /opinions of public and experts in the subject. The committee examined the representations and finally gave its recommendation to the Govt. of India regarding implementation of the proposed NPP scheme. Iyer (2003) remarked that NPP scheme should be undertaken with full recognition of the serious ecological damages that may be caused by interlinking rivers and that the benefits should outweigh the costs. Goyal (2003) was highly critical about viability of NPP.

## **2.0 NEED FOR WATER TRANSFER**

Areas with water availability less than 1000m<sup>3</sup> per capita per year are designated as scarcity areas. Although, the average figure 1545m<sup>3</sup> /capita/year for India (Iyer, 1989), if taken as a whole, indicates that India may not be water deficit right now, but looked from the spatial distribution of available water from basin to basin, there is a great deal of non-uniformity due primarily to extreme non-uniform rainfall over the country. Table-1 gives the list of surplus and scarce basins in India (IWRS, 2007). Whereas per capita water availability in Brahmaputra basin is 18,417 m<sup>3</sup>/year, it is 667 m<sup>3</sup>/yr in Cauvery basin and 383 m<sup>3</sup>/yr in Pennar basin. Rapid rise in

population in India and ever increasing water pollution will soon render many of the surplus basins in India to be water scarce basins. Water transfer from surplus to scarce basins for sustainable development of water resources in India has been found necessary to fight recurring floods and droughts in many parts of the country. Only way we can address the recurring problems of water shortage in scarce basins is by transfer of flood water from surplus to drought prone areas in scarce basins (Table-1). It is estimated (IWRS, 2007) that an additional area of 35 mha of land can be brought under irrigation by river linking. Few short distance river links (Fig.1) like Ken-Betwa(Link-24), Par-Tapi-Narmada (Link 26) , Daman Ganga-Pinjaj (link27) are in the process of implementation. Besides the above problems, water transfer from Manas, Sankosh, and Kamali rivers need concurrence from Govt. of Bhutan .



**Fig.1 Principal Indian Rivers (in Blue) and Proposed Interlinks (in Red) Under NPP**  
**Table1: Surplus and Scarce Basins in India**

Surplus Basins		Scarce Basins	
Basins	Per Capita Water Availability in M <sup>3</sup> Per Year	Basins	Per Capita Water Availability in
Brahmaputra Basin	18,417	East flowing Rivers	010
Barak Basin	7,646	Cauvery	666

Estflowing Riversbetween Tadri and Kanyakumari	3,538	Pennar	648
Estflowing Riversbetween Tapiand Tadri	3,194	West flowing River Basin of Kutch and Saurashtra including Luni	631
Narmada	2,855		
Brahmani-Baitarni	2,696		
Mahanadi	2,546	East flowing River Basins between Pennar and Kanyakumari between Pennar and Kanyakurnari	383
Godavari	2,026		
Indus	1,757		
Ganga	1,473		

### 3.0 MERITS OF NPP

Proponent of NPP favoring river linking claim several benefits (Mazumder, 2011) e.g.

- (i) Food security through irrigation of an additional area of 35mha
- (ii) Increase in land productivity in drought prone areas in the south and west
- (iii) Additional hydro-power generation of the order of 50,000 MW, especially in the North –East
- (iv) Water supply for drinking and Industry
- (v) Navigation for inland water transport
- (vi) Employment opportunities in rural areas
- (vii) Ecological benefits due to dry weather flow augmentation by releasing stored water

### 4.0 OPPOSITION VIEWS IN EXECUTION OF NPP

Views of opponents resisting execution of NPP are briefly summarized underneath:

(i) **Environmental Damage**

A group of people, especially the NGOs, the Socio-Economic and the environmental group (Reddy et al, 2002) are strongly against the inter-link. They apprehend that such a massive inter- basin transfer of water will result in environmental degradation (Khitolya et al,2005), loss of aquatic eco-system, loss of land and forests, fisheries and the livelihood of the poor people who thrive on river, massive displacement of people, evaporation losses, water logging and salinity and possible change in the climate (Desai et.al,2005) due to submergence of vast areas of land in reservoirs and the huge network of unlined open canals of large size.

(ii) **Massive Investment**

Rs.5.6 lakh crores ( at 2003 price index) required for the implementation of the project, which is likely to further increase manifold due to cost and time overrun, is going to deprive other important projects for our socio-economic development due to diversion of fund for NPP. The loans from world bank (2006) etc. may subject the country to a

permanent vicious debt trap where the country is likely to lose its economic sovereignty and dictated by foreign powers granting the loans. They also complain about inadequate information and transparency about the scheme, lack of data regarding cost of other alternatives to inter-link e.g. what will be the cost of transporting surplus foods (by increasing productivity of irrigated land from the current figure of 2 T/ha to 4 T/ha or more) from water surplus areas to drought prone areas as an alternative to long distance water transfer for irrigation and water supply.

(iii) **Falacy of Flood control**

Since only a small part of flood water (approximately 3 %) will be stored and transferred, there will be hardly any flood relief. Droughts may not occur concurrently with floods and it may not be feasible to remove drought in all the distant areas, especially those lying in higher altitude due to excessive cost of pumping.

(iv) **Interstate Water Dispute for Long Distance links**

India is having water-related conflicts among several states, e.g. Haryana and Punjab - Karnataka, Kerala and Tamil Nadu- Bihar, Assam, West Bengal and Orissa - Maharashtra, Gujrat and Kerala- Punjab, Madhya Pradesh and Rajasthan. The proposed NPP scheme envisages transfer of water from surplus basins to drought prone basins (irrespective of whether they are riparian/co-basin or not) will lead to serious disputes amongst states. Recently, the country witnessed bitter quarrel and animosity amongst the states of Kerala, Karnataka and Tamilnadu over the sharing of water from rivers Cauveri and Krishna, even though all these states are riparian. One can well imagine the degree of complexity and the dispute that will arise over sharing of water for the proposed NPP scheme-especially the long distance ones- where a large numbers of states will be involved resulting in tension and rivalry amongst the people of different states. It took nearly 15 years to resolve the dispute over Narmada river water sharing amongst the states of Gujrat, Maharastra, M.P. and Rajasthan.

(v) **Resistance of People in the East and North-East**

Most of the surplus water lies in the East and North-East states where people are economically backward mainly due to lack of investment. People may resist inter- basin transfer of their water resources free of cost to the beneficiary states unless the Govt. of India bring their economic condition at par with other developed states of the country. Equity in economic development is no less important than equity in water distribution for a healthy and prosperous nation. There is a massive unemployment and unrest amongst the unemployed youths in these states. Unless the Govt. addresses these problems first by taking up those components of the projects e.g. in-basin development of hydro-power, irrigation, flood control, inland waterways, communication and development of other infra-structures for these states, it may be almost impossible for the project authorities to implement the proposed river linking scheme, however well planned it may be.

(vi) **Poor Performance of Many Existing Projects**

It is extremely important to evaluate and improve the performance of the existing river valley projects and address the genuine problems being faced by the people especially those who are affected and who oppose river valley projects for fear not unfounded. Performances of many of the projects are not satisfactory (Mazumder, 2002, 1984). About 70% of irrigation water is currently being wasted (CWC,2010) due to improper

maintenance, lack of proper co-ordination between users and controlling authorities, mismanagement of water at farm level, wrong and unrevised pricing policy (INAE,2008). Almost one third of the irrigated land is subjected to water logging and salt problems. Farmers of Punjab state are not allowing completion of Sutlej-Yamuna Link (SYL) while half of the project is already completed by the Haryana Govt. long back and the entire investment is lying idle. Punjab farmers are resisting mainly due to their fear of water logging and salinity experienced earlier by them from Bhakra-Nangal scheme. Tista barrage irrigation project in the northern part of West Bengal is half completed even after 40 years from its start due to lack of funds and problem of land acquisition. One of the DVC main canals which was designed for inland navigation has not carried a single vessel so far in spite of large investments and wastage of prime agricultural lands which had to be occupied for the construction of the wide navigation canal. The state of Kosi canals and the problems being faced in river training are well known (Chitale, 1990). These are only a few examples to illustrate the utter mismanagements in water sector. The maintenance cost and physical position of the dams, canals, tunnels, and captive electric power generation created as capital assets under the plan will involve huge financial burdens. Many such projects which were earlier considered to be national assets are fast becoming national liabilities. Should we build such schemes which cannot be maintained? Unless and until the situation is corrected and performance improved, it will be very difficult to earn people's confidence and convince them for implementing a massive program like NPP Scheme however justified it may be.

#### **(vii) Poor Economic Return & Faulty Pricing Policy**

Unlike other commodities, water for irrigation and power is currently distributed almost free of cost. The present irrigation water rates are extremely poor and the realization of even those low rates is still poorer. Whereas during the British days, 87% of the maintenance and overhead costs used to be realized from users, today the revenue receipt has come down to 15% only (Mohile, 2000). As a result, there is hardly any maintenance of the irrigation projects after their completion. There is tremendous wastage of surface water due to losses in conveyance and operation as well as in the farms since farmers get it free of cost. Presently, the overall irrigation efficiency of most of the surface irrigation schemes for agriculture, which consume about 70% of India's available water supply, is about 35% only, compared to 55% in China and 75% in Japan. The savings of water due to even a marginal improvement in irrigation efficiency and use of return flow through scientific management of irrigation water may be sufficient to irrigate the additional areas for increased food production. It will be wise to charge the beneficiary states for the water they will receive and pay a part of the revenue to the donor states as a price of the water they legally possess. The present practice of distributing irrigation water almost free of cost should be abandoned and the water rates so fixed that the revenue realized could pay for at least the annual maintenance and overhead costs, if not the annual depreciation, interest on borrowed capital and the amount to be paid to the donor states.

### **5.0 WATER TRANSFER FROM GANGA TO BRAHMAPUTRA RIVER**

India advocates inter-basin water transfer from the Brahmaputra basin to the Ganges basin through a link canal to augment the dry season flow in the Ganga basin downstream of Farakka barrage in order to address the grievances of Bangladesh. India's 1978 proposal consisted of a



barrage 2460 m long across the Brahmaputra river at Jogigopa (Fig.2) in Assam with a link canal 324 km long, 274 metre wide and 9 metre deep (passing mostly through Bangladesh) up to a point upstream of Farakka barrage in West Bengal as shown in Fig.2 (dotted green Line). This proposal was the shortest link between Brahmaputra and Ganga. It had no lift component and the flow was entirely through gravity. However, the proposal was rejected by the Bangladesh Government due to political reasons.

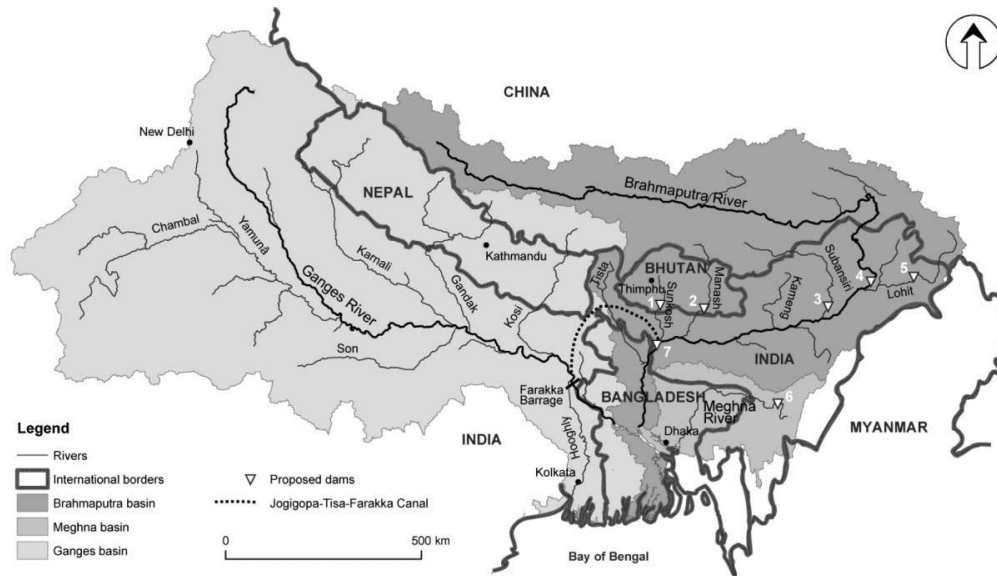
In its revised proposal, Govt. of India decided to connect Jogigopa barrage with Tista and Ganga bypassing Manas and Sankosh rivers (Fig.2-Full line). The proposal envisaged the construction of three storage reservoirs (Subansiri, Dihang and Tipaimukh) in the eastern foothills of the Himalayas to supplement the dry season flow of the Brahmaputra at Jogigopa. The idea is to divert water from February to April to the Ganges when (according to India's estimate) water is abundant in the Brahmaputra and scarce in the Ganges due to late arrival of Monsoon in Ganga basin as compared to Brahmaputra basin. The Dihang and Subansiri reservoirs were estimated to lower the flood peak in Bangladesh by 1.3m while the Tipaimukh dam would reduce the flood in the Meghna basin in Bangladesh, especially in Dhaka (Crow et al., 1995; Verghese, 1999: 363).

Final plan of Jogigopa -Tista- Ganga link canal (Fig.3) involves construction of several large dams on the tributaries of Brahmaputra river, namely, Sankosh, Manash, Subansiri, Dihang, Lohit rivers as indicated in Fig.3 with a view to augment dry weather flow in the Brahmaputra at Jogigopa barrage. Owing to topographic factors, this link would involve a lift of 60 meter and require 7,500 MW of power (Verghese, 1999). However, it is exclusively within Indian Territory and passes through the 32 km narrow belt (Known as Chicken Neck) separating India from Nepal and Bangladesh.



Fig.2 Brahmaputra-Ganga Link Through Bangladesh (Green--) and India ( Full line--)

This link-1 is further connected to links 10,13 and 15 (Fig.1) for transfer of excess water of Brahmaputra, Ganga, Mahanadi and Godavari basins to the scarce basins of rivers Cauvery and Pennar in the south by successive exchange of water . The link will have a capacity of 2,832 m<sup>3</sup>/sec at its head (Sinha, 1995) and used as part of National Waterway -1 (Sadia to Haldia). However, construction of the dams/reservoirs to store water of Manas and Sankosh rivers need concurrence of Bhootan Govt which is friendly to India. In 1993, India and Bhutan signed an agreement for a feasibility study for storage dams with a power generation capacity of 1,525MW on the Sankosh river (Sinha, 1995; Biswas, 2004).



**Fig.3 Showing Jogigopa-Tista-Ganga Link Canal (Dotted Line) with Dams at 1: Sankosh, 2: Manash, 3: Subansiri, 4: Dihang, 5: Lohit, 6: Tipaimukh and 7: Jogigopa**

## 6.0 VIEWS OF BANGLADESH OVER BRAHMAPUTRA-GANGA LINK

Bangladesh opposes Brahmaputra flow diversion on the ground that similar problems may arise in Bangladesh due to Brahmaputra flow diversion as presently experienced due to Ganga flow diversion from Farakka barrage. Bangladesh is in favor of Ganga flow augmentation to the extent 3,300 to 5,300 m<sup>3</sup>/sec (Rahaman, 2009) during the lean season by building several storage reservoirs in Nepal. These incremental flows alone are over four times the present lean season flows in the Ganges at Farakka. At the 2005 Joint Rivers Commission (JRC) meeting, Bangladesh proposed holding tripartite talks between Nepal, India and Bangladesh to discuss the construction of several water reservoirs in Nepal. Bangladesh seeks water-sharing agreements also for 53 other common rivers flowing from the Himalayas through the Indian states of Bihar, Assam and West Bengal to Bangladesh basins located downstream of all these rivers (Daily Star, 2005). Bangladesh argues that the augmentation of the Ganges water should be solved through construction of multiple storage reservoirs in Nepal as there is enough water in the Ganga basin. It wants the water managed in such a way as to minimize flooding during monsoon months and water shortage during lean months in Bangladesh. Such a scheme presents less of a threat to Bangladesh sovereignty and also avoids India's claim to the Brahmaputra waters (Crow et al., 1995). It advocates a tri-partite agreement between China, India and Bangladesh for any flow diversion from Brahmaputra river. China has agreed to invest huge amount money for



construction of two long barrages inside Bangladesh - one across river Brahmaputra (at Bahadurabad, Jamalpur) and the other across the Ganga (at Pangsha on Tista) in Bangladesh without consulting India. India has already constructed a barrage on Tista river at Gajoldoba (near Shiliguri) in west Bengal for diversion of flow of Tista into two major irrigation canal systems for agriculture in the states of Jharkhand and West Bengal.

## **7.0 INDIA'S STAND OVER BRAHMAPUTRA-GANGA LINK**

India wants to divert water from the north-eastern Brahmaputra basin for augmenting the dry season flow of the Ganga and Tista basins through the proposed Manas-Sankosh -Tista-Ganga link for addressing the immediate problems being faced by Bangladesh during lean season downstream of Farakka and Tista barrages. It will help in transfer of excess of combined flow of Ganga and Brahmaputra basins from north to south of India in the long run by interlinking Farakka (Link-1) with other links (Links 24, 26 and 27 of NPP). The proposed link will help generating about 50,000 MW of hydropower using God given terrain head of north-eastern states south of Himalayas. It will be highly beneficial for water transport for navigational use (National Waterways-1 &2).The proposed link is exclusively through Indian Territory and will divert flow generated in Indian catchments south of Tibet.

Large numbers of dams and reservoirs have been already built by China in Brahmaputra basin (called Tsangpo river basin in Tibet) for storage of water of Tsangpo river and its tributaries and diverting flow to dry areas in the north of China without entering into any agreement with either India and Bangladesh. Although 90% of Ganga and Brahmaputra catchments south of Himalayas belong to India, it has agreed for bilateral agreement with Bangladesh for water sharing of Ganga and Brahmaputra rivers through joint rivers commission (JRC). Put simply, Bangladesh wants to share water of Brahmaputra and Ganga multilaterally by involving China, Nepal, India and Bangladesh. But India wants to share water bilaterally with Bangladesh since the proposed Brahmaputra-Ganga link has nothing to do with either Nepal or China who has violated international norm of consulting riparian states while constructing multiple reservoirs on Tsangpo river and its tributaries in Tibet. In short, there is an unresolved dilemma between the proposals of Bangladesh and India over Brahmaputra –Ganga link for water sharing over time or space (Rao, et al, 2012). At the 36th JRC meeting, India assured Bangladesh that it would implement the Ganga- Brahmaputra link after consultation with Bangladesh ([Daily Star, 2005](#)).

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