

# **NATIONAL PERSPECTIVE PLAN FOR GANGA- BRAHMAPUTRA LINK -1 FOR BENEFIT OF BOTH INDIA AND BANGLADESH**

**S.K.Mazumder**

Former AICTE Emeritus Professor of Civil Engineering  
Delhi College of Engineering (Now Delhi Technology University)  
E-mail:somendrak64@gmail.com

## **Abstract**

*National perspective plan has been drawn to address the water shortage in the deficit basins lying in south and west by transferring excess water in the east and north-east regions of India. Out of 30 link canals, link -1 connecting Brahmaputra river with Teesta and Ganga rivers will be of great benefit for both India and Bangladesh by way of irrigation, flood control, navigation, drinking and industrial water supply, employment and development of rural areas. A Joint Rivers Commission (JRC) has been formed to discuss and sort out different issues arising out of implementation of the scheme.*

**Key Words:***NPP, Ganga, Teesta, Brahmaputra, Link Canals, India, Bangladesh*

## **1.0 INTRODUCTION**

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 (Fig.1) involving 12,500 km canal length and 32 dams (TFIR, 2005). The approximate cost of NPP Scheme at 2003 prices was 5.6 lac crores which is likely to increase manifold now due to cost and time over run.

As a part of NPP, 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 34 km long feeder canal. Hoogly river was drying up owing to siltation of its off-take point near Jangipur due to tendency of main Ganga shifting towards east. River Hoogly 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 basin to Ganga basin since the minimum 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 Ganga- Brahmaputra link through a feeder canal across Bangladesh (Fig.2) 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, NWDA changed the earlier plan and proposed Ganga- Brahmaputra link -1 (Manas-Sankosh-Tista-Ganga) as shown in Fig.1. The proposed link canal passes entirely through India and it transfers excess water of Brahmaputra basin to Ganga basin via Teesta river so

that dry weather flow at Farakka can be augmented. Link-1 is connected to links 11, 13 and 22 to deficit basins (Pennar and Cauvery basins) in the south (Fig.1) through successive exchange of water from other surplus basins in the way.

The paper is intended to discuss about the benefits and problems related to implementation of Ganga- Brahmaputra link proposed for transfer of surplus water from Brahmaputra to Ganga basins (IWRS,2007).

## **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, 2007). 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 and east to deficit basins in the south and west of India. 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,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 of the opinion that long distance river links may be taken up later and suggested to execute short links like Ganga-Brahmaputra (Link-1) initially on priority basis. 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.

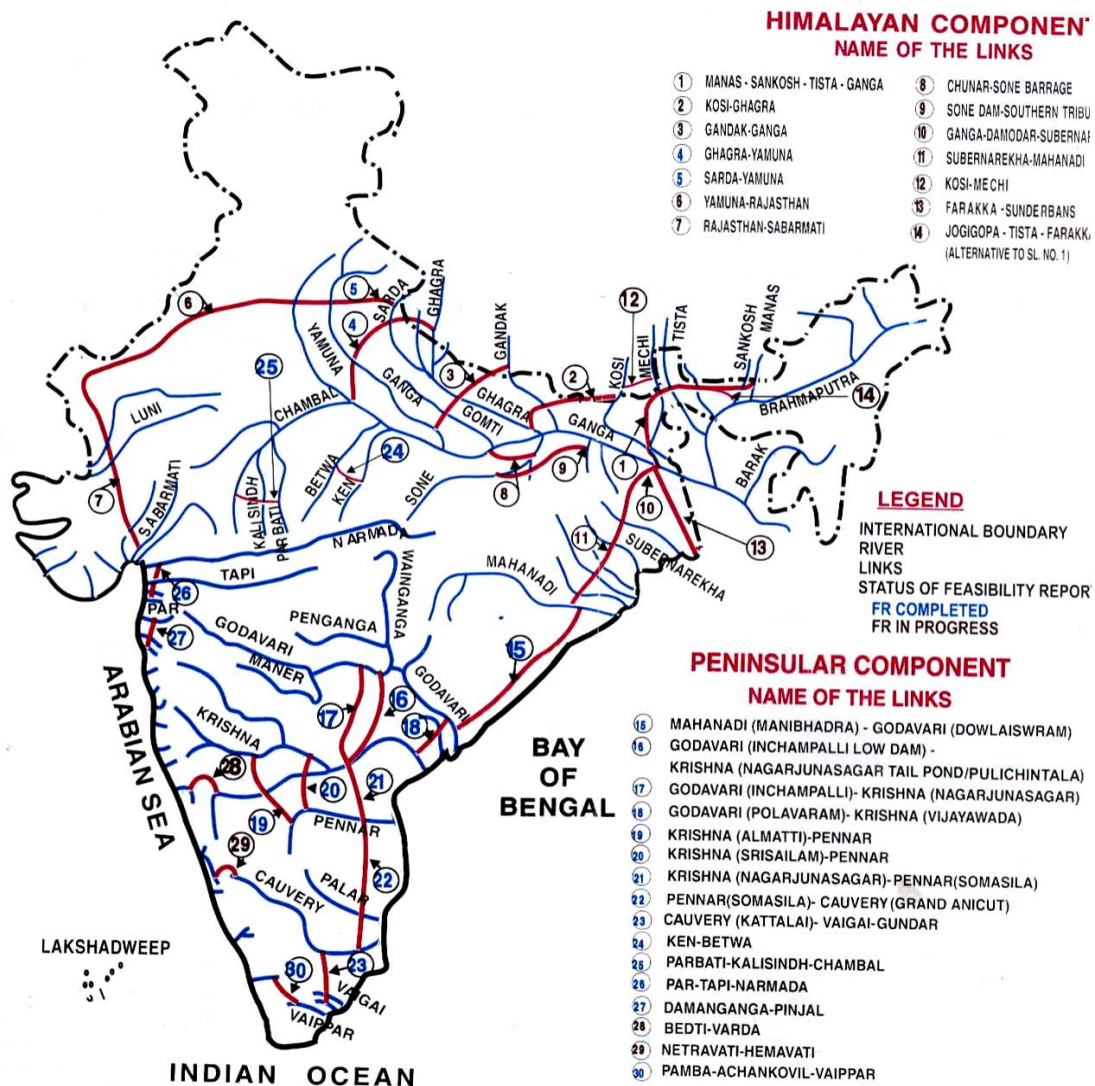
Iyer (2003) remarked that NPP scheme should be undertaken with full recognition of the serious ecological damages that may be caused by interlinking rivers and that the benefits should outweigh the costs. Goyal (2003) was highly critical about viability of NPP.

## **3.0 MERITS AND DEMERITS OF NPP**

### **3.1 Merits of Interlinking**

Proponents of NPP favoring river linking claim several benefits (IWRS,1996; 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



**Fig.1 Interlinking of Rivers (in Blue Color) by Link Canals (in Red color) Showing Manas –Sankosh –Tista-Ganga (Link-1) for Water Transfer from Brahmaputra to Ganga Basin**

### 3.2 Demerits of Interlinking

Opponents of NPP resisting implementation of NPP ((Khitolya et al,2005, Desai et.al,2005 in Reservoirs). are as follows:

- (i) Environmental Damage
- (ii) Massive Investment in Water sector Depriving Other Sectors
- (iii) Falacy of Flood control-only 3% of flood volume will be stored in Reservoirs
- (iv) Interstate Water Dispute for Long Distance links
- (v) Resistance of People in the East and North-East possessing surplus water
- (vi) Poor Performance of Existing Canal Projects-Link Canals may have same fate
- (vii) Poor Economic Return & Faulty Pricing Policy resulting in lack of Maintenance

#### **4.0 WATER TRNSFER FOM BRAHMAPUTRA TO GANGA 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 (Rahman Mizanur,2009).

In its revised proposal, Govt. of India decided to connect Jogigopa barrage with Tista and Ganga bypassing Manas and Sankosh rivers (Fig.2-Full green line). The proposal envisaged the construction of two storage reservoirs (Subansiri and Dihang) 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).

Final plan of Jogigopa -Tista- Ganga link canal involves construction of several hih dams on the tributaries of Brahmaputra river, namely, Sankosh , Manash, Subansiri, Dihang and Lohit rivers 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, Bangladesh and China.

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).

#### **5.0 Benefits of Ganga-Brahmaputra Link**

##### **5.1 Benefits of India**

As mentioned earlier, the proposed link will help in augmenting dry weather flow of Teesta river for irrigation, water supply, navigation, flood moderation and hydro power generation. Teesta barrage project has an irrigation potential of 9.22 lakh ha in six northern districts of West Bengal, namely, Coochbihar, Darjeeling, Jalpaiguri, Uttar Dinajpur, Dakshin Dinajpur and Malda. Water is stored in three storage dams on Teesta river in Sikkim and diverted from barrages on Teesta, Mahananda and Douk rivers. The dams and the barrages are already completed and the construction of distribution canals are in progress. First part of the prosed link i.e. Brahmaputra (Jogigopa) –Teesta link will be of immense benefit for India ensuring



**Fig.2 Ganga - Brahmaputra Link Through Bangladesh(Green dotted-- ) and Jogigopa-Tista – Ganga Through India (Green Full Line - ) with Storage Dams on Brahmaputra Tributories: Sankosh, Manash, Subansiri, Dihang, Lohit, and a Barrage at Jogigopa**

firm water supply, especially during lean season. Although the project started in 1975, it is yet to be completed partly due to land acquisition problem and also due to inadequate lean season flow to meet demand of a huge command of 9.22 lakh ha on firm basis.

Second part of the link canal connecting Teesta with Ganga (Upstream of Farakka) will bring excess water of Brahmaputra basin to Ganga basin to augment dry weather flow at Farakka for transmission to Bhagirathi/Hoogly for survival of Kolkata port, Navigation (National Waterway-1 and 2), industrial use and water supply to Kolkata Metropolitan city and other innumerable towns on either side of Hoogly river. As already mentioned, this link (no.1) is to be connected with other links (No.11,13, 16) for transfer of water from surplus basins of Brahmaputra and other eastern rivers to the water deficit basins through links 21 and 22 as proposed under NPP (Fig.1) to address the severe water crisis in Cauvery and Pennar Basins in the south.

## 5.2 Benefits of Bangladesh

All the three rivers i.e. Ganga, Teesta and Brahmaputra flow through Bangladesh which is a riparian country downstream. In fact 50 more rivers of India (Upper riparian country) pass through Bangladesh. Bangladesh wants the water resources of Ganga and Brahmaputra basins managed in such a way as to minimize flooding during monsoon months and address water shortage during lean months in Bangladesh. Sharing of dry weather Ganga flow downstream of Farakka barrage has been resolved by a joint rivers commission (JRC) for benefit of irrigation in Kushtia and Khulna districts in Bangladesh and recharging ground water for supplemental irrigation. Bangladesh wants similar agreement for sharing of Brahmaputra and Teesta water too. Construction of storage reservoirs behind Sankosh, Manash, Subansiri, Dihang, Lohit dams and a dam at Tipaimukh and flow diversion from Barrage at Jogigopa

will definitely help in reduction of flood damages in Bangladesh during the Monsoon and water supply for drinking, irrigation and other benefits during lean season

At the 36th JRC meeting, India assured Bangladesh that it would implement the Ganga-Brahmaputra link after consultation with Bangladesh (Daily Star, 2005). India, however, has rejected the Bangladesh proposal to have a trilateral agreement between India, Bangladesh and China (Uppermost Riparian Country of river Brahmaputra) who has constructed large numbers of high dams on river Brahmaputra called Yarlung Zangbo in Tibet (Fig.2) without any agreement with either India or Bangladesh.

## **6.0 Conclusion**

National Perspective Plan (NPP) has been evolved after a great deal of investigations with the primary objective of transferring water from surplus basins in the north and north-east to the deficit basins in south and west through 30 link canals. Due to fund shortage, Govt. of India has decided to complete short links at first as suggested by NCIWRD and recommended by a Parliamentary committee set up by the Govt. of India during UPA Govt.. Link -1 i.e. Jogigopa-Tista-Ganga is a short link connecting Ganga, Teesta and Brahmaputra rivers will be very useful to meet the requirements of both India and Bangladesh and bring prosperity to both the countries.

## **REFERENCES**

1. Biswas, A. K. (2004). "Water and Regional Development in Water as a Focus for Regional Development". Unver, O. & Tortajada, C. (eds). Oxford University Press, New Delhi, pp. 1–13.
2. Crow, B., Lindquist, A. & Wilson, D. (1995) "Sharing the Ganges: The Politics and Technology of River Development", Dhaka University Press Limited, Dhaka, Bangladesh
3. Daily Star (2005) "JRC Meet Ends on Good Note", The Daily Star, 5(471), 22 September Available at: <http://www.the-dailystar.net/2005/09/22/d5092201011.htmxx>
4. Desai V.R., Ghosh S.N and Patro J. (2005), "National Water Grid- its Objectives and Challenges", ISH Journal of Hyd. Engineering., Vol. 11, No.1, March
5. Goyal, J. (2003) "Is interlinking of rivers viable?" Chandigarh: The Tribune (March 13). <http://tribuneindia.com/2003/20030313/science.htm#1>
6. IWRS (2007) "Role of Water Resources Development & Management in Bharat Nirman", Theme paper presented on Water Resources Day observed by Indian Water Resources Society (IWRS) at ICID, New Delhi, May 9th
7. IWRS (1996) "Inter-basin Transfer of Water for National Development- Problems and Prospects" Theme paper pub. on Water Resources Day by IWRS, New Delhi
8. Iyer, R.R. (2003), "River Link To disaster" Pub. in The Statesman, April, 5th
9. Khitolya A.K, Goyal A.K and Kumar D. (2005) "Environmental and other Aspects of Interlinking Rivers", Proceedings of Recent Advances in Water Resources Development and Management, organised by Deptt. Of Water Resources Development and Management (WRDM) earlier known as WRDTC), IIT, Roorkee, 23-25 Nov

10. Mazumder, S. K. (2011) "Interlinking Indian Rivers – Merits, Demerits and Difficulties in Implementation" published in the Journal of Bharati Vidyapeeth , Pune
11. NCIWRD (1999), "Annual Report of National Commission for Integrated Water Resources Development", Min. of Water Resources, Govt. of India
12. NWDA (2005), "Water for life", 11th National Water Convention, org. by National Water Development Agency, Govt. of India Delhi, May 11th
13. Rahaman Muhammad Mizanur (2009) "Integrated Ganges Basin Management: Conflict and Hope for Regional Development", Water Policy, January, [www.researchgate.net/publication](http://www.researchgate.net/publication)
14. Sinha, I. N. (1995) "Opportunity, Delay and Policy Planning Vision in the Synergic Development of Eastern Himalayan Rivers: a conspectus". Water Resources Development, 11(3), 303–313
15. Task Force (2003), "Inter-Linking of Rivers "-Agenda for the meeting of IITs and IISC under the chairmanship of Suresh Prabhu, task force, August
16. TFIR (Task Force on Interlinking of Rivers) (2005). Official Website of the Task Force on Interlinking of Rivers, <http://nwda.gov.in/>(accessed 12 May 2005)
17. Verghese, B. G. (1999). "Waters of Hope: From Vision to Reality in Himalaya-Ganga Development Cooperation", Dhaka University Press Limited, Dhaka, Bangladesh