Geoenvironmental significance of Barak river system in the Barak- Ganga-Brahmaputra Linkage

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Abstract

The northeastern regions of India, especially southern Assam, Manipur and Mizoram, have always been difficult to access due to its rugged and hilly terrain. Inland waterway transport is the need of the time. In this context, the role of Barak River becomes very important for the connectivity amongst Mizoram, Manipur, southern Assam and Tripura. The present work covers the total journey of Barak River from its origin in Manipur to the merger into the Bay of Bengal. Barak river not only forms the lifeline of southern Assam valley but also of the Sylhet Plains of Bangladesh. Barak reaches the Bay of Bengal after receiving a lot of rivers from Mizoram, Meghalaya and Tripura. Enroute its journey, it gets several names as Kushiara, Kalni and finally Meghna.

The geoenvironmental significance is amazing in the light of the fact that the well-known mighty rivers Ganga and Brahmaputra ultimately merge into Barak known as Meghna in Bangladesh and the final delta made by the combined flow of Ganga, Brahmaputra and Barak is actually the Meghna delta. Significantly, Barak River's stretch of 121 kms. between Lakhipur and Bhanga has been declared as the National Waterway-6 (NW-6) by the Act of Parliament in 2016.

Keywords: Barak, Surma, Ganga, Brahmaputra, Surma, Meghna, NW-6.

Introduction

The current geopolitical situation between India and Bangladesh is demanding a serious trade route obviating Bangladesh. Apart from strengthening the protection of the Chicken-Neck corridor of Siliguri, there is an urgent need of boosting up the potential of northeastern rivers. Barak river, originating in Manipur and flowing through Manipur, Assam and Tripura, can be a vital resource for the region. The Barak valley is the lifeline of the people of southern Assam. They totally rely on it for their essential needs like drinking water, agriculture, irrigation and industry. Considering the rough terrain in the major parts of the region, it can be significantly developed as an economic and ecofriendly mode of transport.

On top of that its geoenvironmental location can play a key role in the regional growth. Barak river is the lifeline of the southern Assam Valley and it covers the western part of Manipur, south Assam districts of Karim Ganj Hailakandi and Cachar, Southern part of Meghalaya and the northern parts of Tripura. The drainage area of the Barak basin in India is 41,157 sq. It covers only 1.38% of the total geographical area of the country. It lies between east latitudes 21º58' to 26º24' north and 90º10' to 95º7' longitudes.

With a total catchment area of about 39390 sq. kms, Barak river system is the second largest drainage network in northeast India spreading over 30155 sq. kms of India, 7780 sq. kms of Bangladesh and 840 sw. kms area of Myanmar[4]. Barak River valley is bordered by Barail Hills on the north, Naga and Lushai hills on the east by the plains of Bangladesh to south and west. The bed gradient of the Barak River is very gentle, it varies from 1:10,000 in the upper reach to 1:20,000 in the lower reach. This basin covers only 0.893 M-ha that sums up to 0.5% of the culturable area of the country[3].

The popularly known term 'Barak Valley' comprises of three districts: Hailakandi, Karimganj and Cachar covering a total geographical area of 6950 sq. kms [Hailakandi 1327 sq. kms, Karimganj 1870 sq. kms and Cachar 3720 sq. kms][5]. Many wetlands have developed in the alluvial reach of the river in Barak valley by the fluvial processes[3,6]. Some are formed by tectonic processes. These wetlands play a major socioeconomic role in the Barak valley.

National Waterway 6 (NW-6) in India was declared by the Act of Parliament in 2016[7]. This waterway is in the Barak River, connecting Lakhipur to Bhanga, covering a stretch of approximately 121 km. The waterway is designed to connect to other waterways like NW-1, NW-2 and NW-5, potentially forming a larger waterway grid in the Eastern region (Fig.1).

Material and Methods

The current study is mainly based on the study of the relevant literature and case studies. Utmost care has been taken to record the exact coordinates of the origin of these rivers, their confluences and diversion etc.

Origin of the Barak River: Barak River originates from Japvo Mountain of Manipur hills at an altitude of 3,015 m. at Lali Village in Senapati district (Manipur), near Manipur Nagaland border at Mao Samsang, 130 km north of Imphal, the capital of Manipur. It bears the coordinates 25°30'19"N and 94°23'21"E. (Fig. 2). Near its source, the river receives a lot of little hill streams such as Kagni, Senai Buri, Howrah, Hari Mangal, Durduria Kakrai, Kurulia, Shonaichhari and Balujhuri[8].

Barak flows westward through Manipur State, turning southwest reaching Mizoram State's border in the mountainous terrain up to Tipaimukh the tri-junction (at 24°14'N and 93°1.3'E approximately) of the junction of three States Manipur, Assam and Mizoram.

After meeting "Tuiwal river", the river takes a hairpin bend and veers abruptly and flows northwards (Fig. 3). At Tipaimukh, Barak meets northerly flowing "Tuiwal" River After meeting "Tuiwal river", the river takes a hairpin bend.

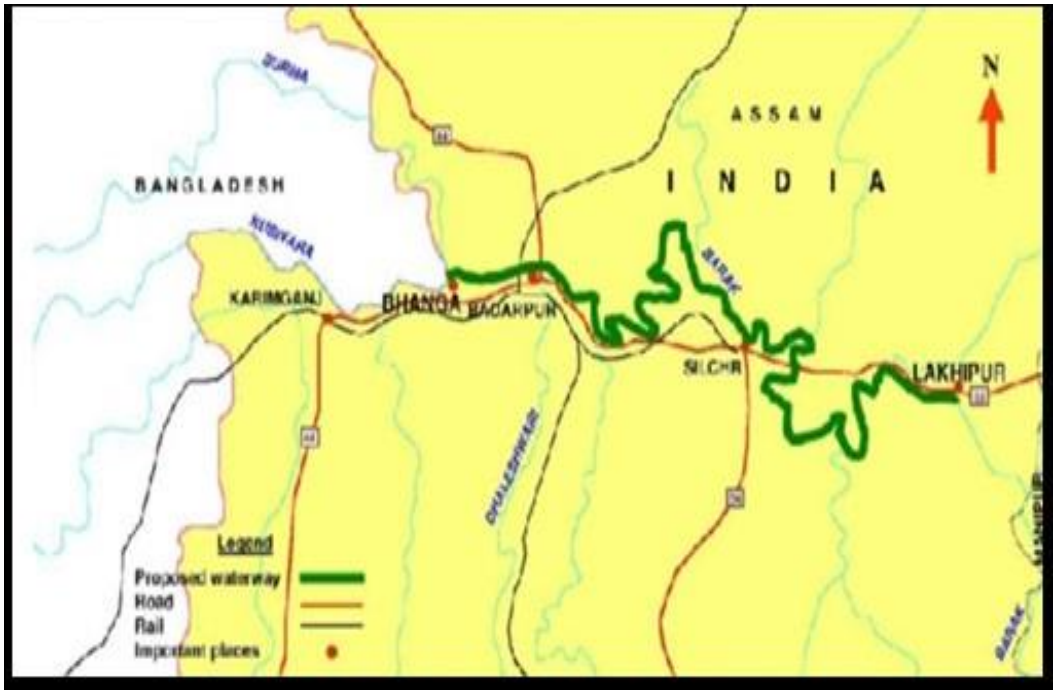

Fig. 1: National Waterway 6 (NW-6)

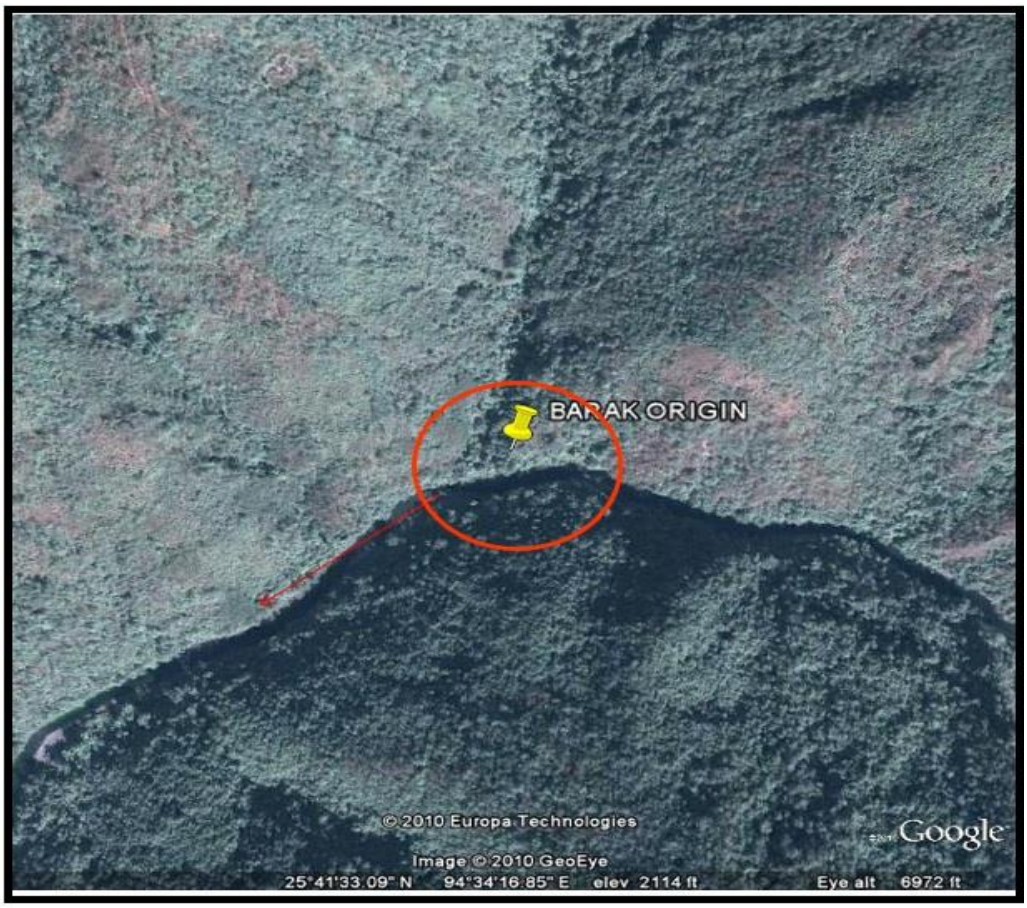

Fig. 2: Origin of Barak River

Fig. 3: Barak Tuiwal Junction at Tipaimukh

Fig. 4: Barak – SerluiJunction

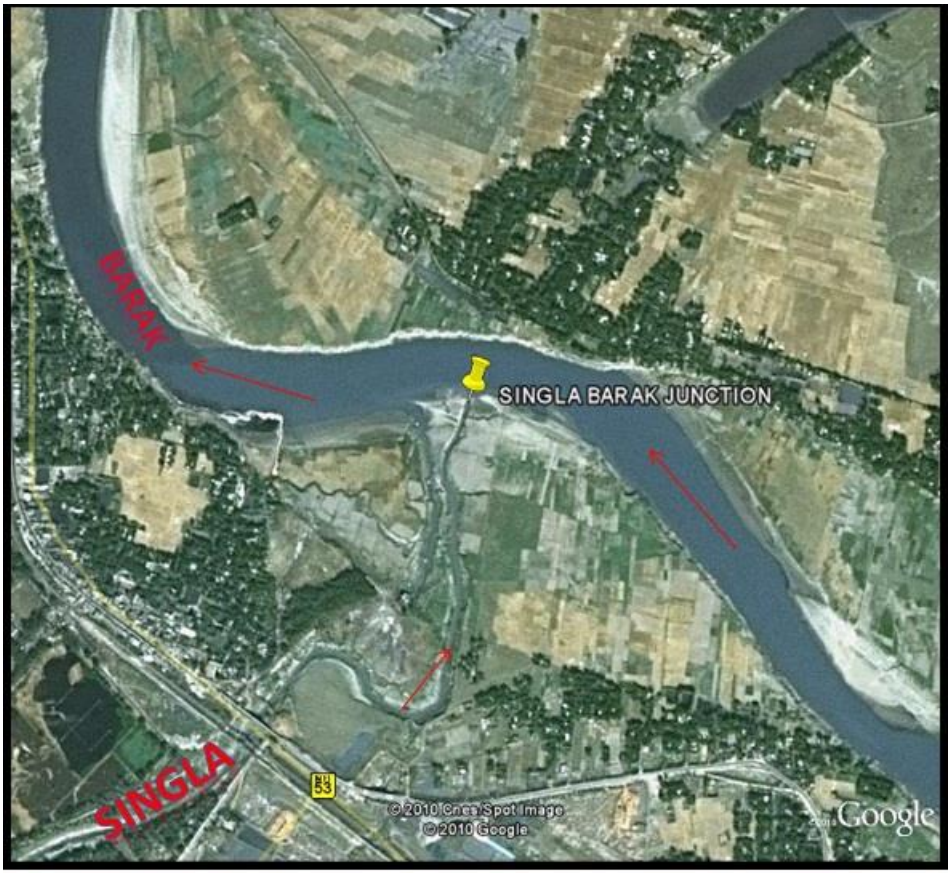

Fig. 5: Barak-Singla Union

Fig. 6: Barak -Madhura Union

https://doi.org/10.25303/189da1110122

Fig. 7: Barak-Tlawng Union

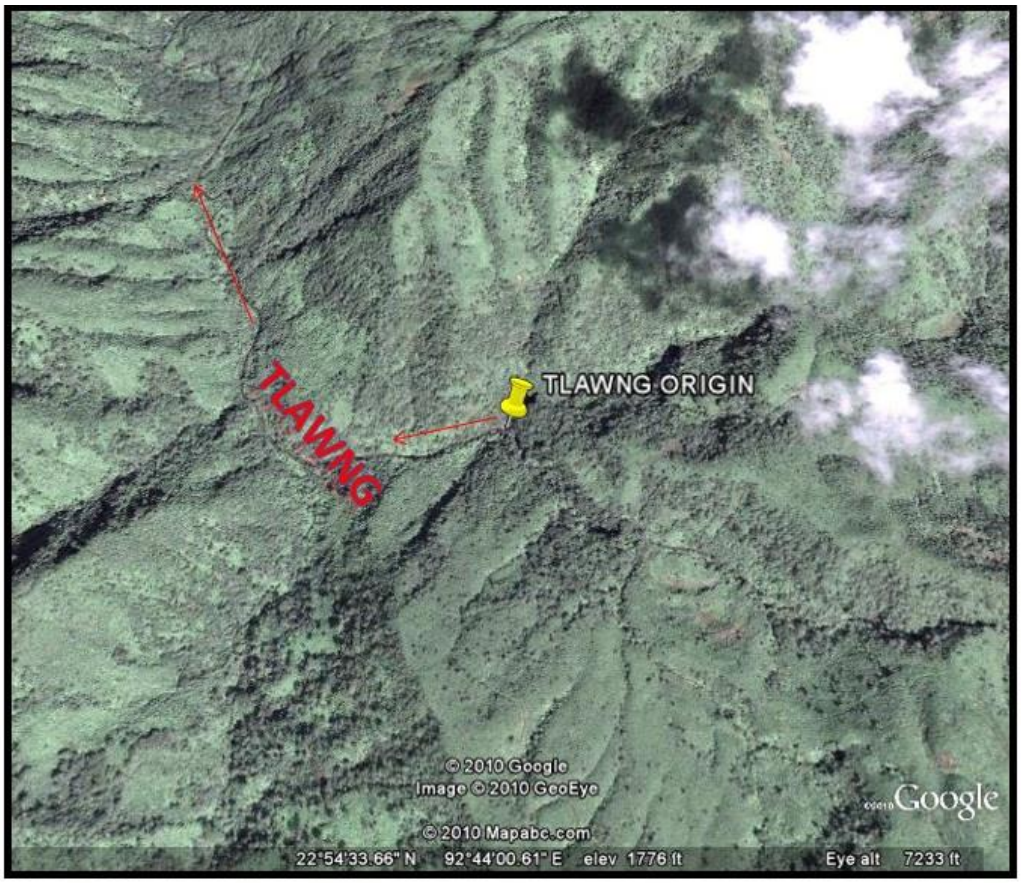

Fig. 8: Tlawng Origin

Fig. 9: Surma-Kushiara Divide

Fig. 10: Surma-Someshwari Union

Fig. 11: Langkain-Kushiara Union

Fig. 12: Kushiara- Manu Union

Fig. 13: Kushiara-Surma offshoot Union

Fig. 14: Surma-Kushiara Réunion

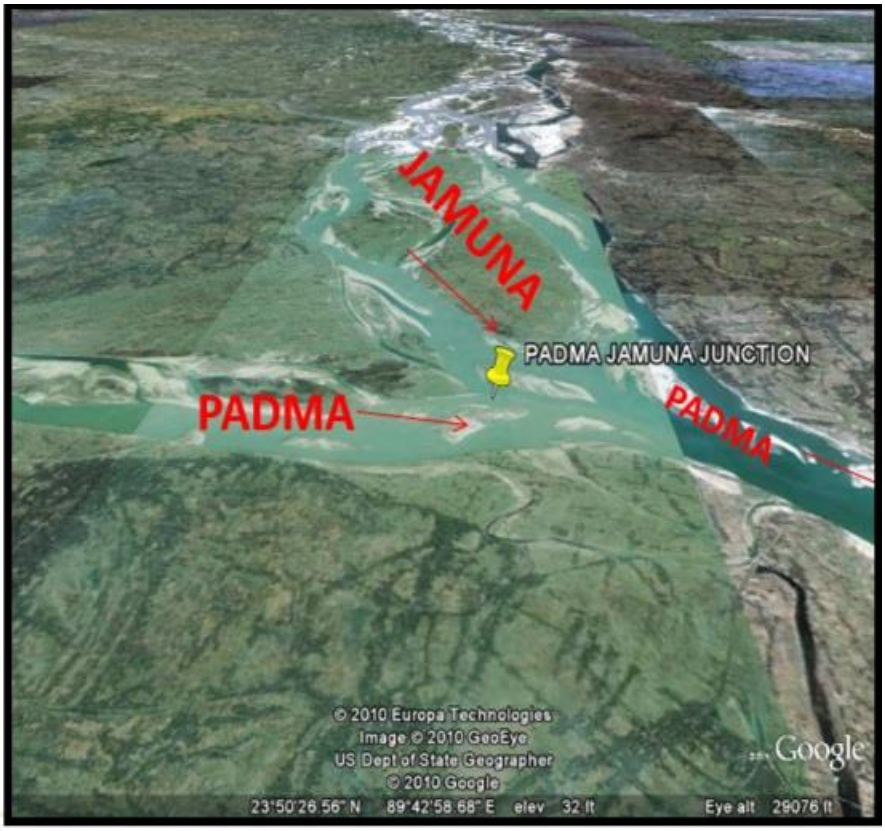

Fig. 15: Padma-Jamuna Union

Fig. 16: Padma-Meghna Union

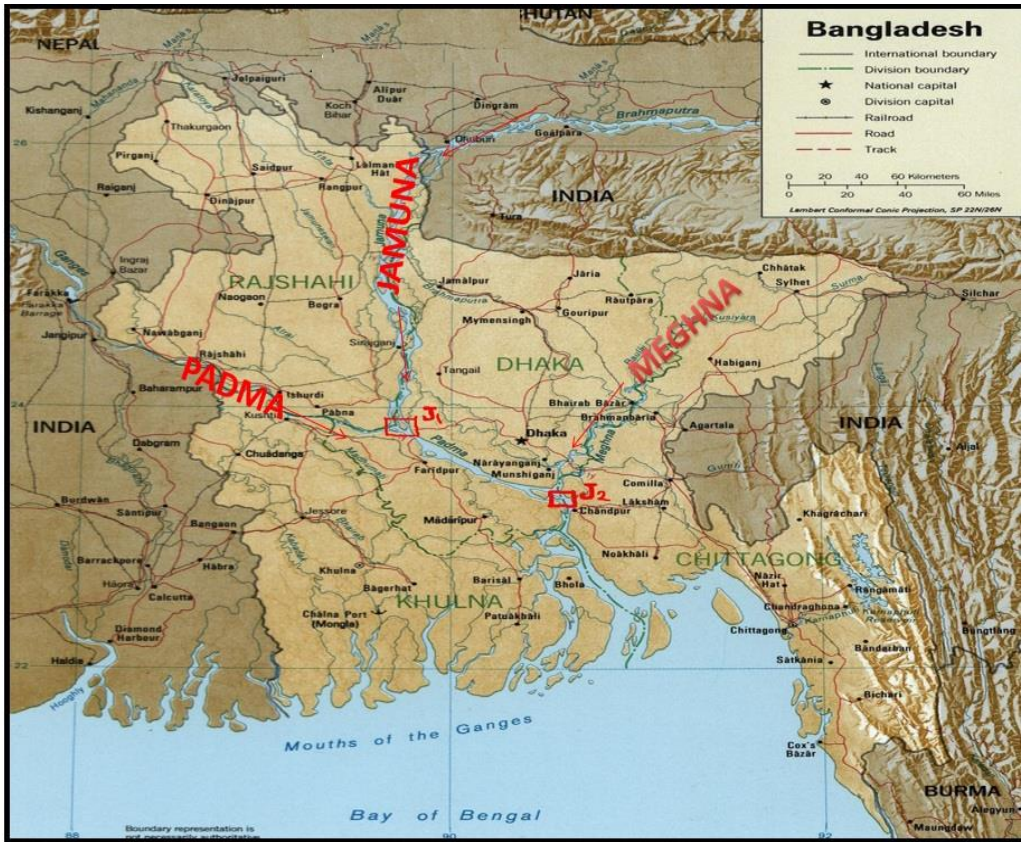

Fig. 17: Padma-Meghna-Jamuna Composite

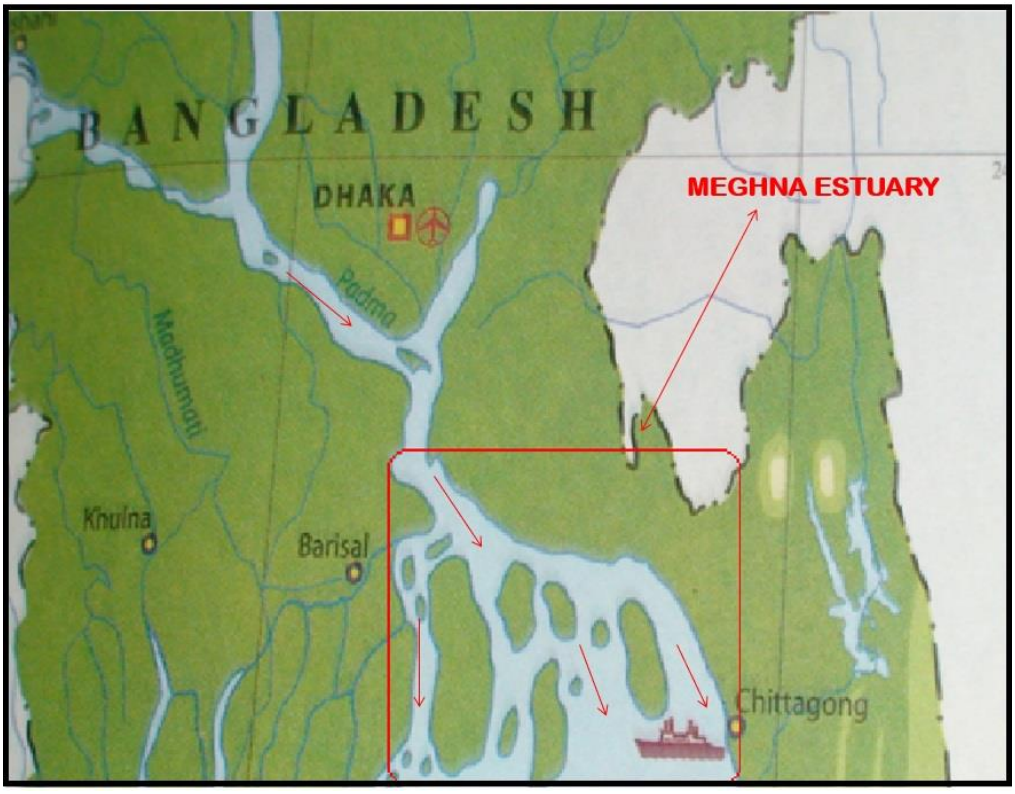

Fig. 18: Meghna Eustary

Results and Discussion

Moving into the plains of Cacher district of Assam it forms the border of Assam and Manipur States up to Jirimat. Another northerly flowing river from Mizoram, "Serlui" joins it as the left bank tributary, at approximately 24°45'06"N and 92°54'36"'E (Fig. 4). Singla river joins Barak as the left bank tributary off Hailakandi at the coordinates 24°51'50.88"N and 92°36'38.15"E (Fig. 5). At

coordinates 24°53'8.87"N and 92°44'14.03"E, west of the Silchar town, the southerly flowing Madhura River joins Barak as the right bank tributary (Fig. 6)[8].

Tlawng river joins Barak as its left bank tributary, in Cachar district nearly 15 km west of Silchar town and 8 km east of Badarpur town, at 24º4'06" N and 92º54'38" E.(Fig.7). Tlawng is the biggest northerly flowing river from Mizoram, which originates at Zobuk in Zopuii Hills, 8 kms off the Lunglei town, at the height of 1395 at a coordinate 22º53'13"N and 92º44'30" E (Fig.8). Tlawng contributes a huge volume to Barak, through contributions from Tut and Terei rivers, which are the left bank tributaries of Tlawng[8].

Bifurcation on a water divide: At the coordinates 24°52'35.37"N and 92°29'18.67"E, the westerly flowing Barak River bifurcates into northerly flowing Surma (Right) and southerly flowing Kushiara (Left), due to a topographical divide (Fig. 9). The Surma river is also born of Barak which forms the lifeline of the Sylhet plains of Bangladesh. At this point, the river enters the Sylhet depression (or trough) of Bangladesh and forms the Surma Basin. Surma is also fed by some right bank tributaries from Meghalaya. The major right bank tributary Someshwari joins it at coordinates 25°1'50.24"N and 92°17'45.95"E. (Fig. 10). From this point, the Surma is called "Baulai River".

Journey of Kushiara: Kushiara river keeps flowing west and southwest and enters Bangladesh. The principal tributaries of the Barak in India are the Jiri, the Dhaleshwari (Tlawng) the Singla, the Longai, the Madhura, the Sonai (Tuirial), the Rukni and the Katakhal. From the source to the Indo-Bangladesh border, the Barak river flows for 564 km. Langkain river flows northwards from Mizoram western border and continues to flow in Tripura. It finally meets Kushiara at 24°42'19.37"N 91°57'11.29"E., approximately 2.5 kms NNE. of Fenchuganj, Bangladesh (Fig. 11). The Kushiaraalso receives tributaries from the Sylhet Hills and Tripura Hills to the south, the main being the Manu River. It joins Kushiara as its left bank tributary, near Ballabhgarh at the coordinates 24°35'47.62"N and 91°43'40.54"E (Fig. 12). From this junction onward Kushiara gets a new name and is also known as "Kalni" (Fig. 13).

Reunion of Kushiara and Surma and Birth of Meghna: Surma and the Kushiara finally rejoin in Kishoreganj district above Bhairab Bazar, Bangladesh, at coordinates 24° 9'12.65"N and 90°59'20.83"E. After this reunion the original Barak, which bifurcated into Surma and Kushiara, is finally known as Meghna River (Fig. 14). Meghna is joined by the many right bank tributaries the main being the great Gumti River, created by the combination of many streams. These rivers reinforces Meghna a lot and increases the water flow considerably.

The complete journey of Barak river from its origin to its transformation into mighty Meghna Riverhas given birth to the Ganga-Brahmaputra-Meghna System, that finally culminated into the Meghna Eustary. The holy river Ganga is known as ''Padma River'' in Bangladesh. At approximately 23°48'16.88"N 89°43'38.00"E, nearly 35 km west of Dhaka,the Capital of Bangladesh, "Padma River (Ganga)" is joined by "Jamuna River" (Brahmaputra) at Goalandaghat as its left bank tributary. The combined flow is called Lower Padma (Fig. 15).[9,10].

Padma river joins with the Meghna in Chandpur District, nearly 55 kilometers SE of Dhaka at coordinates 23°15'14.55"N and 90°38'9.73"E. After getting Padma as its right bank tributary, Meghna becomes mightier and their onwards is known as Lower Meghna (Fig. 16)[9,10]. Figure 17 shows a composite of Gaga-Meghna – Brahmaputra with an aim to project the clearer picture of this system. "The merger of Padma and Jamuna is shown as J-1 and the merger of Meghna and Padma is shown as J-2[10].

After Chandpur, with the combined flow of the Padma and Jamuna, the Lower Meghna moves down to the Bay of Bengal in an almost straight line. In the course from Chandpur to the Bay of Bengal, the Meghna splits into a number of little rivers, but the main flow is through the Meghna Estuary that ends up into the Bay of Bengal (Fig. 18).

Conclusion

Barak river has strong geoenvironmental signature in the social, cultural, economic and geopolitical aspects of the two participating countries India and Bangladesh. Barak river not only provides food and water to Manipur, Assam and Tripura but also to a major portion of Bangladesh through its northern division Surma River, which caters to the need of Sylhet plans of Bangladesh. Identifying the strategic importance of the Barak River, Government of India has declared a 121 km section of Barak from Lakhipur to Bhanga as National Waterway-6 (NW-6).

Improving connectivity between the northerly flowing rivers of Mizoram and Barak, may develop an effective waterway transport system. On top of that, this development will bring a negative carbon print in the pristine northeastern region of India. The Barak River system can play a key role in alternative connectivity between the mainland India and northeastern States of India.

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References

1. Astapati A.D., A Study on the Socioeconomics of Imperata Grassland Managers at Dargakona Village, Barak Valley, Assam, Northeast India, *Ecological Questions*, **3**, 1-12 **(2023)**

2. Bhattacharjee P.R. and Nayak P., Socio Economic Rationale of A regional Development Council for the Barak Valley of Assam, *Journal of NEICSSR*, **27(1)**, 13-26 **(2023)**

3. Dutta N. and Sarma J.N., Drainage Analysis in a Part of The Barak Valley, North-Eastern India, *Journal of Earth Science*, **Special Volume**, 187-197 **(2013)**

4. Nath A. and Ghosh S., The influence of urbanization on the morphology of the Barak River floodplain in Cachar District, Assam, *Water Policy*, **24(12)**, 1876–1894 **(2022)**

5. Nath M. and Chaudhari C.P., Geology of Barak Valley, A Review, A Comprehensive Study of Southern Assam Region, Lakshi Publication, Guwahati, 142-161 **(2018)**

6. Sharma N., Sustainable development of water resources in the Brahmaputra and Barak River system of northeast India, *WIT Transactions on Ecology and The Environment*, **193**, 835-845 **(2015)**

7. The National Waterways Act, Act No. 17 of 2016, 1-17 **(2016)**

8. Verma Rahul, The Major Drainage Systems in the Northeastern Region of India in The Indian Rivers, Hydrology, 429-464 **(2018)**

9. Verma Rahul, River Systems of Mizoram: Potential Avenue in the Multi Modal Transport System in the Region, Pre-Conference Jour., Community Based Water Resource Management in Northeast India, Lessons from Global Context, Eds., Jain C.K., Bahrul Islam K.M. and Sharma S.K., Allied Publisher, New Delhi, 27-35 **(2011)**

10. Verma Rahul, The Drainage System of Tlawng River, Mizoram: Linkage with Barak-Meghna-Brahmaputra System, Proc. Vol. of Case Studies on Real Time Hydrological Modelling for Ganga-Brahmaputra Basins, Ed. Jha R., NIT Rourkela, India, 121-131 **(2010)**.

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