

Contribution of Ganges-Brahmaputra Delta for Developing the Sustainable Blue Economy in Bangladesh

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Abstract— Ganges-Brahmaputra delta is one of the biggest deltas in the world. This delta is one of the most productive and beneficial areas in Bangladesh. Deltaic regions play an important role in biodiversity, economy, society, and sustainable development. The Ganges Brahmaputra delta is considered one of those deltaic areas, which can sustain a strong economy for a significantly large number of the population. Currently, Bangladesh, being an uprising maritime country planning to make the blue economy more sustainable. The aspects of the blue economy of Bangladesh are related to the Ganges-Brahmaputra delta in many ways. This paper describes the contribution of the Ganges-Brahmaputra delta for the development of maritime Bangladesh in means of economic and social factors, legal controls, possibilities, challenges, and government actions. The paper also illustrates the possibilities of the Ganges-Brahmaputra delta for ensuring economical sustainability in Bangladesh.

Keywords— Blue economy, Ganges-Brahmaputra delta, Sustainable development, Economy, Opportunities

I. INTRODUCTION

Ganges-Brahmaputra delta, also known as Ganges delta, the Sundarbans delta, or Bengal delta is playing a significant role in the human lives of Bangladesh for ages. A delta is a unique type of land formed by the sediment deposition carried by the rivers. Deltas always offer themselves as a suitable place to survive. The Ganges-Brahmaputra delta flows into the Bay of Bengal, encompassing an area of 100,000 km². Figure 1 shows the illustration of the Ganges-Brahmaputra delta in Bangladesh.

Geologically, most portions of the Ganges-Brahmaputra delta flowing in Bangladesh are originated in China and India. The deltaic areas provide fresh water, fish, and other marine resources, as well as highly productive agricultural land. These qualities make this delta an imperative land for South Asian countries. The Ganges-Brahmaputra delta is providing shelter for millions of people for ages [2]. This delta has a huge impact on the economy and social structure of Bangladesh.

The economy of Bangladesh is booming day by day. Since 2009 Bangladesh's economy has grown almost 188% with a current GDP of 8.15%. Bangladesh has already passed over Pakistan. But due to the COVID-19 pandemic currently, this progress is not getting its mark. It can be mentioned that Bangladesh got this boost of economy without using its marine resources properly.

Unfortunately, marine resources have not been explored entirely till now. Bengal delta can push Bangladesh's economy one step ahead and can create many scopes for work. But surely this is not going to be an easy task. Because the deltaic area has the most vulnerable weather, and sometimes it is a very challenging job to work under this kind of adverse weather.

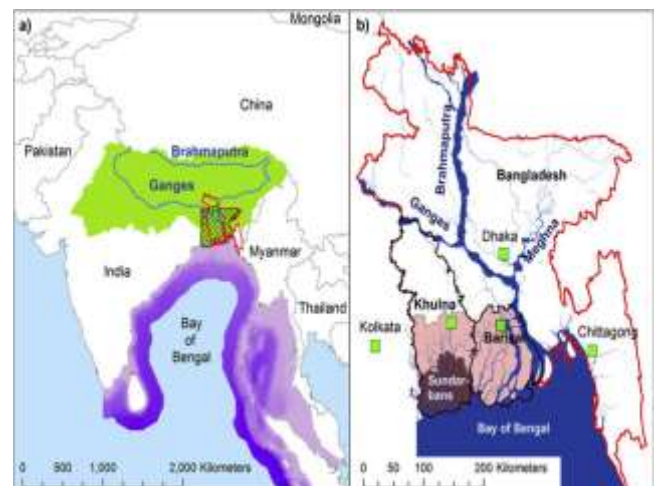


Figure 1: Illustration of Ganges-Brahmaputra delta in Bangladesh [1]

This study will provide a comprehensive overview of the Ganges-Brahmaputra delta, its effect on biodiversity, the social impact of the delta, the economic impact, the delta's

role in achieving sustainable growth, the legal aspects of the delta, and all the challenges of achieving sustainable goals. So, this study would assist the government, respected authorities, policymakers, investors, businesspeople to recognize the importance of the delta and its vast aspects. This study would also identify the challenges of achieving sustainable blue economy in Bangladesh and would provide some ideas to resolve those challenges as well.

II. RELATED WORK

The Ganges Brahmaputra Delta is situated in the biggest part of Bangladesh and about one-third in India. So, this delta is an integral part of life for the people of these countries. Several studies have been performed on the economic importance of the Ganges-Brahmaputra delta and the geological formation of the delta till now. Kuehl et al. studied the Ganges-Brahmaputra delta and described the geological formation of this delta from the Himalayan Mountains. The study also illustrated the Holocene evolution of the Bengal delta [3]. Rashid et al. found that the sediments of the Ganges-Brahmaputra delta are at least 12320 years old and there is presence of thick clay and silty clay deposits in the sediments [4].

Haque et al. developed a 3d model named "Delft 3D" to record the hydrodynamics and morphological changes of the delta [5]. So that the salinity and level rising of the coastal areas can be measured. Masud et al. studied the necessity of tidal river management (TRM) of the Ganges-Brahmaputra delta and found that the financial benefit of TRM is nearly 90 million US dollars per year and by implementing TRM in the agriculture sector sustainability in the economy can be achieved [6]. Integrated assessments of the Ganges-Brahmaputra delta were done by Nicholls et al. and in that study, the factors influencing natural and human drivers of the Ganges-Brahmaputra delta were described broadly [7].

Nicholls et al. performed an assessment of social and environmental sustainability of the Ganges-Brahmaputra delta and demonstrated different models to achieve sustainability in a proper way [1, 8]. Hale et al. studied the sustainability of the Ganges-Brahmaputra delta and found the relative importance of fluvial and tidal processes of deltaic management to ensure sustainability. The study also measured tidal and seasonal variations of water discharge to predict the flood conditions [9] and recommended that proper management of flood-prone areas must be done to ensure the sustainability of this delta.

Islam studied the ecosystem of the delta and found that the ecosystem is being degraded day by day. He showed that deltaic floodplains are being affected by saline water intrusion in the coastal areas. The study also described that the highest salinity occurs in the western part of the delta near the mangrove areas and thus it is a great threat to the largest mangrove ecosystem of the world [10]. Szabo et al. studied the scenarios of population change in the Ganges-Brahmaputra delta and found that population growth will

be continuous in this area and policy initiatives will have to address the challenges related to population aging [11] in the upcoming days to achieve sustainable development goals.

Though Bangladesh has great maritime history from the ancient time, but the concept of the blue economy is newly introduced in this country. Hussain et al. studied the major opportunities of the blue economy for Bangladesh. Several aspects of the blue economy such as maritime biodiversity, marine tourism, marine biotechnology, marine renewable energy, marine resources, oil, and gas exploration, etc. were discussed in that study. The study suggested a detailed framework for ensuring sustainability in the blue economy sectors of Bangladesh. The study also showed the necessity of implementing government policies to ensure the development of the sectors [12]. Rahman studied the role of Bangladesh in developing the blue economy and showed the importance of imposing laws to ensure maritime safety, protect the marine environment and marine biodiversity [13].

The current study aims to show the importance of the blue economy to ensure sustainability in the Ganges-Brahmaputra delta. The study will also describe the contribution of the Ganges-Brahmaputra delta in ensuring economical sustainability in a detailed way.

III. METHODOLOGY

This paper is an individual desk study. The research work provides a very strong idea about the Ganges-Brahmaputra delta and its significance. The paper also describes probable possibilities and challenges which can put a difference in the big picture. This is a theoretical paper and a sound combination of existing thoughts and new ideas. Research conducted by other experts on the deltaic region helped the authors to look for the key points about the Ganges-Brahmaputra delta that matters for Bangladesh. The data collection included secondary sources; such as academic literature, individual reports, graphs, pictures, and some other publicly available online and offline data. All the sources were examined before considering, and every point is elaborated with logical facts. This article is based on sources that the researchers consider reliable, and the findings are referenced through citations.

IV. DISCUSSION

The Sustainable Blue Economy of Bangladesh

Bangladesh is a growing maritime country. Despite having a history of maritime business, Bangladesh could not express herself as a developed maritime nation which is very unfortunate. But the good thing is the country is thriving. Blue economy refers to the extraction of resources from the oceanic area, which contributes to the growth of the country's economy. 'Sustainable' word adds some extra quality to this economic growth. Sustainable economy is referred to the economic development of a country without having any negative impact on the social, environmental, and cultural life of a country.

After the boundary resettlement of the Bay of Bengal with Myanmar in 2012 and with India in 2014, Bangladesh achieved 1,18,813 square kilometers of sea area. There are many expensive natural resources, livings, and non-livings in the Bangladesh territory. There are almost 500 varieties of fishes, crabs, octopuses, and others. Fish and other kinds of seafood are huge money earners for Bangladesh. Blue Economy always produces healthy growth for the national economy. So, it is important to work on the blue economy constantly. For example, the effect of the blue economy on China's GDP (Gross Domestic Production) rose by nearly 7% during 2000-2011 which is noteworthy indeed [14].

Keeping these in mind, the government of Bangladesh is taking all the required measures to develop its blue economy. If Bangladesh uses its oceanic resources in a scientific and efficient way, it will certainly add a new dimension to the economy of the country. Seafood accounts for approximately 15 % of the world's protein demand. Many oil and gas reserves are also known to exist in the oceanic region of Bangladesh. Successful extraction of those resources can be a trump card for Bangladesh. Shipbuilding is another industry in which should be prioritized. More international trade, ports, ships can create a huge impact and much new employment. This sector has been neglected by govt. for a long period. But the good news is now govt. is trying to reshape this industry again. Several sectors are related to the blue economy, but the most important ones are shown in figure 2.



Figure 2: Blue Economy sectors of Bangladesh [12]

Currently, the pillar of the country's economy is the manufacturing industry, and luckily it is growing every year. If the blue economy adds its enormous value with it as the blue economy has great potential, then Bangladesh's economy can achieve a great level with a positive social impact. The following sections describe several impacts of the Ganges-Brahmaputra delta that would be beneficial for achieving sustainable blue economy.

Impacts of Ganges-Brahmaputra Delta on Ecosystem

The Ganges Brahmaputra delta contains various forms of ecosystems. These ecosystems include different floodplains such as rivers, wetlands, coastal areas, etc. Rivers and streams combine to create a wetland ecosystem. Wetlands are important habitat for Bangladesh as approximately one-third (30%) of Bangladesh's land area consists of wetlands and 13% of these wetlands are mangroves. The main ecosystem in the delta area is the agro-ecosystem, which is mainly man-made, and it covers 54% of the total land of Bangladesh [15]. The ecosystem of the delta based on various aspects of wetlands can be easily understood from figure 3.



Figure 3: Ganges-Brahmaputra delta ecosystem sustainability model [16]

The Sundarbans Mangroves ecosystem is the largest mangrove ecosystem in the world. It is named after the mangrove species *Heritiera* types, locally known as Sundri. The Sundarban is 20,500 square kilometers in area. These mangroves turn salt water into fresh water and provide shelter and food for many species of animals [17].

People living in Bangladesh are receiving many kinds of benefits from the Ganges Brahmaputra delta, such as provisioning services. Provisioning services are items extracted from the environment. They include fruit, fiber, fresh water, and so on.

Impacts of Ganges-Brahmaputra Delta on Social Life

The Ganges-Brahmaputra delta is home to a total population of approximately 169 million. As the Ganges-Brahmaputra delta is in a third-world region, it is emerging rapidly from a very low economic base and is affecting society. Since many centuries ago, the delta formed the agrarian boundary, and this region still provides the same services. For quite a long time, the community seems to have a connection with the Ganges-Brahmaputra delta. The delta is an indispensable part of the environment. Ganges-Brahmaputra delta offers a wide range of benefits to society, for example, the water source: drinking water, household water, irrigation, industrial usage, cooling water, food supply, leisure, sewage recipient, navigation path, flood protection, energy source, modern rivers may

have legal status as persons, source of national pride, subject to trans-border disputes, cultural object: myths, legends, arts, religions (river Gods, sacred rivers), and contributing to strategic goals, poverty reduction and so on. Over time, due to urbanization, the waters of this delta have deteriorated and, as a result, the delta has become less linked to the natural ecosystem, and people’s perception of rivers has changed.

Table 1: Social susceptibility of Ganges-Brahmaputra delta [18]

Variables	Reasoning
Density of Population	About 200 persons/sq.km. are living in this area
Illiteracy rate	People are not aware of their right to education as a result illiteracy rate is very high.
Poverty	Most of the people living in this area are poor. They have a lower response to hazard impacts
Agricultural dependency	People are dependent on agriculture.
Drinking water	People have limited access to pure water.
Sanitation facility	People do not have proper sanitation facilities.

People's social and rural life relies on this delta. Ganges-Brahmaputra delta is linked to socio-economic growth, technological advancement, electrical power, agricultural expansion, irrigation, inland navigation, flood protection. On the other hand, the delta has some negative impacts on humans, such as polluted water, water scarcity, waterborne diseases, unsightly ecosystems, impoverishment, and increased floods. Besides, there are adverse effects on river ecosystems, including the degradation of wetlands and floodplains, the pollution of waterways, the substitution of nature by ancient artifacts, the substitution of wetlands by reservoirs, the reduction and extinction of lakes, wetland ecosystems, and the loss of biodiversity.

Prospect of Ganges-Brahmaputra Delta on Economy

The Ganges-Brahmaputra delta has tremendous potential to make the economy expand. As the average annual income of deltaic people is much higher (almost USD 200) than the average income of other people in different regions of Bangladesh [19]. The deltaic area has some significant excellence to help in the economic field of a country. If the Bengal delta is dissected, it is found that it has very fertile land, a huge stack of sediments, huge production of fish and other kinds of seafood, ship transportation, etc. These things are playing a huge role in GDP. Asian deltas have a reputation for growing GDP.

Bengal delta is a low-lying zone and extremely disaster probe. Floods and cyclones are a curse for the constant development of the deltaic areas of Bangladesh. So, the country needs a clear strategy to get rid of these issues. The government has failed to create a dam in the delta region. As a result, people are facing major devastation every year due to the floods. The recent flood of 2020,

July-August, has broken several records of the 1988 and 1998 floods. The damages due to the flood are still going on. If the government successfully resolves these problems, the deltaic zone will be an ace for the country’s GDP. Most importantly, it will provide a sustainable economy for this country.

Prospects of Ganges-Brahmaputra Delta on Sustainable Development

Social and economic sustainability depends on mainly six variables such as health, human development index, employment, skilled labor, net savings, and research [19]. It is to be remembered that the Ganges-Brahmaputra delta or Bengal delta is an area that contains a huge number of resources. Unfortunately, the resources are not being utilized for years. But in this 21st century, sustainability should be achieved to survive on this planet. Bengal delta can help this nation to get that sustainability. This sustainability is multi-dimensional, and the concept is explained briefly in this paper.

Geomorphic Sustainability

Geomorphic sustainability is a linkage between sediment budgets and resulting land elevation. Bengal delta is one of the most disaster-prone populous deltas in the world. Bangladesh is a low tide area, so every year tonnes of sediments are congregated to active this deltaic area morphologically. And it is almost 10⁹ tonnes of sediments needed for the Bengal deltaic area. But the catchment of sediment flux is often significantly reduced by upstream dams. Indian dams are preventing in this case. Moreover, abstracting groundwater for drinking and irrigation purposes is causing subsidence. It is usually 3.6 mm/year on average, but sometimes it becomes too high. It can even reach 22 mm/year as it occurred in Pakistan, Indian delta [20]. It varies from river to river. Hydro morphological characteristics of the main rivers of Bangladesh are shown in figure 4. Four characteristics such as catchment area, annual average rainfall, discharge rate of water and total transportation of sediments have been illustrated in the figure. From the figure it is seen that Ganges River has the highest catchment area while Meghna river faces the maximum rainfall. Again, river has highest percentage of sediments and also discharges maximum water among the rivers.

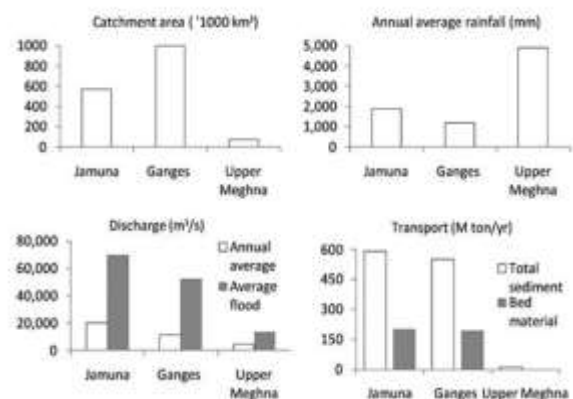


Figure 4: Hydro morphological characteristics of deltaic areas of Bangladesh [21]

This deltaic area is very flood-prone, but the flood has some benefits, also by gathering sediments and making the land fertile [22]. It has been estimated that pondered areas of Bangladesh have lost 1 to 1.5 meters of land elevation, comparing with mangrove forests of Sundarbans since 1960 [8]. Bangladesh is using Tidal River Management (TRM) which is a small-scale control with a long-term goal for geomorphic and ecological sustainability.

Managing sediments in a proper way will help the whole nation a lot. It will create more productive land; the livelihood of rural people will be better, increase ecological diversity as well. Right now, the main goal is to establish plans successfully. It will take us towards sustainable development.

Ecological Sustainability

Except for Sundarbans, the areas of the delta mostly are agriculture and aquaculture area and highly populated. Ecologically sustainable development should be promoted more widely. Often saline intrusion in rivers and groundwater is resulting in soil salinization, and it is a hamper for ecological sustainability. But sometimes, salinization requires altered agriculture practices [24]. These aspects are mostly influenced by the economic transformation of land use, which can be extremely detrimental while also encouraging maladaptive processes. Brackish shrimp cultivation with high intensity is an example of this, and it is broadly popular in Bangladesh.

Soil salinity and acidity are rising, and soil quality is deteriorating because of this farming. It can also cause soil toxicity, which is harmful to the mangrove ecosystem. Shrimp cultivation has some short-term export value but not a healthy option to do so as it is destroying traditional cultivation and creating unwanted social conflicts. Collecting shrimp larvae is an informal job there as it is engaging women, but it is a hamper for aquaculture as well as creating negative consequences in ecology. If ecology is hampered or getting destroyed due to any reason, then it can cause climate change as well.

Thus, ecological sustainability is somewhat dependent on geomorphological processes. But it is also impacted by human activities. To solve these issues, people must settle geomorphic sustainability at first; in the long run, they are completely linked.

Economic Sustainability

Economic sustainability depends on the future sustainability of deltas, production, land usage, and ensuring well-being for the population. The utilization of economic sustainability must be done to achieve sustainable development goals (SDGs) fixed by the United Nations. Deltas always have immense potential to make growth for the economy. In this paper, the adverse effects of shrimp cultivation in Bangladesh were described. Apparently, it seems good and very much profitable as it has export value. But this is short-term; it is a mess in the bigger picture.

Shrimp cultivation is a money-spinning business. It boosts economic growth which is a very important thing for a country. Moreover, it is filling SDG-8. In the year 2016-17, Bangladesh earned 500 million USD from the shrimp business. But this business is constantly damaging the water quality and creating a negative impact on biodiversity conservation, which is resisting achieving SDG-15. The coastal area is a huge asset for any country. It saves you in extreme time. But if this goes like is then it is a threat to geomorphic sustainability [1].

Economic sustainability can be accomplished through implementing national policy, plans, and procedures. But it is never easy because everyone wants to make it again first so it's difficult to make the benefits of industrialization while also safeguarding the environment and biodiversity. This environment dilemma shows the problem through the way and opportunities or potential and also helps to understand the real economic growth. It is to be remembered that deltas are a natural capital to this nation, and people have to turn this into physical and financial capital. To make these possible proper plans are needed, stakeholders have to come in front, massive investment, and, most importantly, perfect execution is needed. A delta has enormous potential. Rural people do not get well-being of life like urban people, govt. has to be made these equal. Then indeed, deltas can be economically sustainable for this country.

Social Sustainability

Social sustainability should be achieved, as it is a key part of a country's growth. Increasing the economy or earning more does not provide social sustainability. There can be a non-linear distribution of inequalities inside a society. Unfortunately, this inequality increases with economic growth. Poor is getting poorer, and the rich is becoming richer. The increase in land price and farming inequalities occur in deltaic areas. It turns society into an unstable situation. And an unstable situation inside the society can make stop economic growth too. Or people will be more convinced of an urban, which is extra pressure for cities. So, it is also essential to care for local rural communities in the deltaic area.

Challenges for Developing the Sustainable Blue Economy of Bangladesh

The concept of the blue economy is very new in Bangladesh. It is high time for Bangladesh to fit its resources for maximum utilization of the Ganges-Brahmaputra delta. The development of the blue economy has started, but there are challenges. Some of those challenges are:

- 1) Policy issues: There is a lack of proper policies regarding the blue economy. So for developing a sustainable blue economy, policies should be introduced. For example, in 1977, the 30-year Ganga Agreement between Bangladesh and India was signed. The Farakka Water Sharing Agreement states that in which season India will close the sluice gate of the

dam and when India will open it. It also states the amount of water that Bangladesh and India will get will depend on the amount of rainfall upstream, water flow, and speed. But the policy is not being confirmed. India usually opens the sluice gates during the monsoon and closes them in the dry season. As a result, Bangladesh is facing flooding in the deltaic areas in the rainy season and drought during the winter.

- 2) Shortage of skilled marine professionals: Trained marine professionals are important to the growth of the blue economy in Bangladesh. Bangladesh has vast maritime resources, but there are no surveys available on these resources. As a result, these assets are not being less fruitfully used to grow the nation. The development of maritime professionals is, therefore, a challenge for the growth of the blue economy in Bangladesh.
- 3) Control over external interference: The government must be constrained to ensure realistic control over the entire coastal region. Besides, the Bangladesh Coast Guard must be aware of the need to prevent conflicts in the coastal region.
- 4) Lack of technology: Bangladesh has very limited access to the latest maritime technologies. However, without appropriate technology, maritime targets can not be accomplished. Moreover, without technological inventions, the growth of the blue economy is unthinkable. So, it is very much important to bring the latest technologies in Bangladesh for developing the blue economy.
- 5) Safeguarding mangroves: Bangladesh has the largest mangrove forest in the world called Sundarbans. It has a large ecological system, and it protects the country from many natural disasters. But the mangrove sector in this country is very neglected.
- 6) Maritime security: Maritime security has become a matter of concern and conventional threats in the Ganges-Brahmaputra delta, which is now a national phenomenon in Bangladesh. Many criminal activities are occurring in this region, such as illegal fishing, weapons, and drug smuggling, extortion, maritime terrorism, and maritime pollution. It is, therefore, very necessary and difficult to ensure maritime safety.
- 7) Marine pollution: The sea and delta regions are contaminated in many ways every day. Marine pollution is a major threat to the climate as well. So pollution should be prevented.
- 8) Establishing marine tourism: Marine tourism is a new idea in Bangladesh. Marine tourism is one of the world's rising tourism segments that draw visitors to marine activities. Marine tourism will contribute to the social, environmental, and economic benefits of local communities. The growth of this sector is, therefore, both demanding and very forward-looking.

V. RECOMMENDATIONS

To overcome the addressed challenges, some recommendations to utilize the potential of the delta are suggested as follows:

- a) Flood management- Proper flood management should be done over the Bengal delta. As every year, people are facing massive amounts of damage due to floods. Individual eco-friendly dams and proper management can be a solution to this problem.
- b) Improving strategy – Bangladesh should have a better and more specific agreement with India on the water distribution of rivers. The Tista-dam agreement with India is a mess. Here, the foreign policy needs to be strict.
- c) Dredging the river – The depth of some rivers is decreasing every year. As a result, this has become an obstacle to the daily movement of inland vessels, and it also hinders the economy. So, the dragging should be appropriately handled.
- d) Agriculture, food security, and livelihood – Millions of people living in deltaic areas remain below the poverty line due to the lack of a healthy living climate and the unfair distribution of resources. The local authority should check up on this issue.
- e) Sustainable land use – Land preservation is also a big accomplishment in the delta regions. Investments should be made in this sector agro-scientists should try to come up with new ideas for sustainable land use.
- f) Shipping and port facilities- In Bangladesh, there is no smart inland port in Ganges–Brahmaputra delta areas. Moreover, the inland vessels are not modernized as well. So, it is recommended that respective authorities should come forward and make decisions to improve shipping and inland port facilities in deltaic areas.
- g) The availability of freshwater-Freshwater has always been a concern of deltaic people. They have severe health issues due to the lack of this. Proper steps should be taken to provide these people with clean drinking water.
- h) Conservation of marine ecosystems-There should also be a clear strategy for marine ecosystems. The cultivation of shrimp is destroying this ecosystem. A specific plan for preserving sea species is a vital necessity.
- i) Use of renewable energy- It can be noted that climate change has a serious impact on the delta. Renewable energies like wave energy, solar thermal energy, hydropower can be used. Thus, the government should move towards green or clean energy to make this delta more sustainable.
- j) International Cooperation: It is necessary to have discussions with neighboring countries about water resources sharing, flow control activities, and exchange the data of flood forecasting in the Brahmaputra Basin. Besides, joint flow monitoring is needed in the Farakka dam during the period of 1st January to 31st May every year under the Ganges River Water Sharing Agreement.

VI. CONCLUSION

The rivers of Bangladesh are playing an important role in many aspects, including floodplains and economic issues of Bengal. The Ganges-Brahmaputra delta is one of the

largest deltas in Asia. The delta region is also developing rapidly but from a very low economic base. This development is an ongoing issue of the 21st century. Ganges–Brahmaputra delta is contributing to agricultural production, socio-economic and industrial development, simultaneously for the protection of floodplain and wetland ecosystems. This delta is full of natural resources. But due to some challenges, such an amazing resource is remaining yet still underrated and in some means: undiscovered. Ganges–Brahmaputra delta has the prospect to be a central hub for establishing the blue economy of our country. Due to lack of awareness the country is not using its one of the best assets. The devolvement needs to be sustainable for sure, otherwise, in the 21st century; an unplanned development will just invite destruction. This paper offers a complete review of the Ganges–Brahmaputra delta. The paper shows the current situation of the delta, its prospects in different sectors of the blue economy, legal issues, challenges, and possible solutions to overcome the obstacles. The paper may become a cooperative tool for the respective government and non-government authorities, stakeholders, and businesspersons to invest or understand the whole circumstances of the Ganges–Brahmaputra delta. So, hopefully, it will provide a better understanding for the readers about the Bengal delta, and the respective authority will be able to take the right step towards sustainable development.

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