

CLIMATE CHANGE AND INLAND NAVIGATION IN BANGLADESH

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KEY POINTS

- s 2IVERS ARE AN IMPORTANT DEPOSITON WILL CHANGE THE TRANSPORTATION IN "ANGLADESH PATHS OF WATER WAYS IN "AN
- s)T IS PREDICTED THAT CLIMATE-CHANGES RESEARCH IS ESSENTI THROUGH INCREASED SEA LEVELS LIKE SCENARIOS AND IMPAC FLOODING AND INCREASED SEDIMENT



Table 3: Employment in IWT Mode (Figures in number)

Sector	Employment
Public Sector	4000
Private Sector	5000
Total	9000



Table 4: Productivity among Road, Railway and IWT

Intermodal Comparison	Road	Railway	IWT
(-)	2,74,000	2,800	24,000
(-)	3,5,000	15,00,000	3,6,000
(-)	57,000	2,3,000	27,000

IMPACTS OF CLIMATE CHANGE ON INLAND NAVIGATION AND ECONOMIC LOSSES

(200)⁶

increasingly frequent and severe tropical cyclones,

heavier and more erratic rainfall,

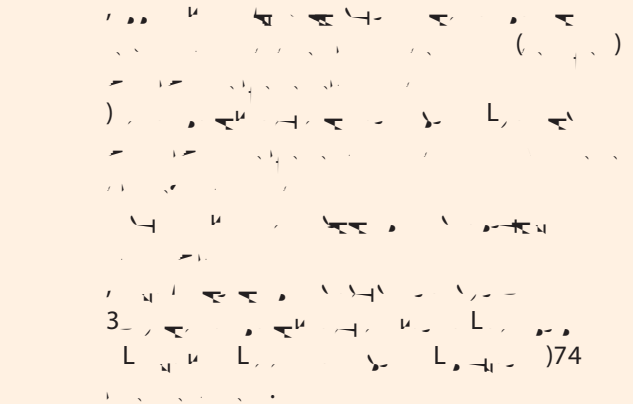
river bank erosion,

increased sedimentation in riverbeds

melting of the Himalayan glaciers,

lower and more erratic rainfall,

sea level rise



Challenges Faced by BIWTA

Impact on Navigability:

Impact on Navigability: 46%

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2.25 7

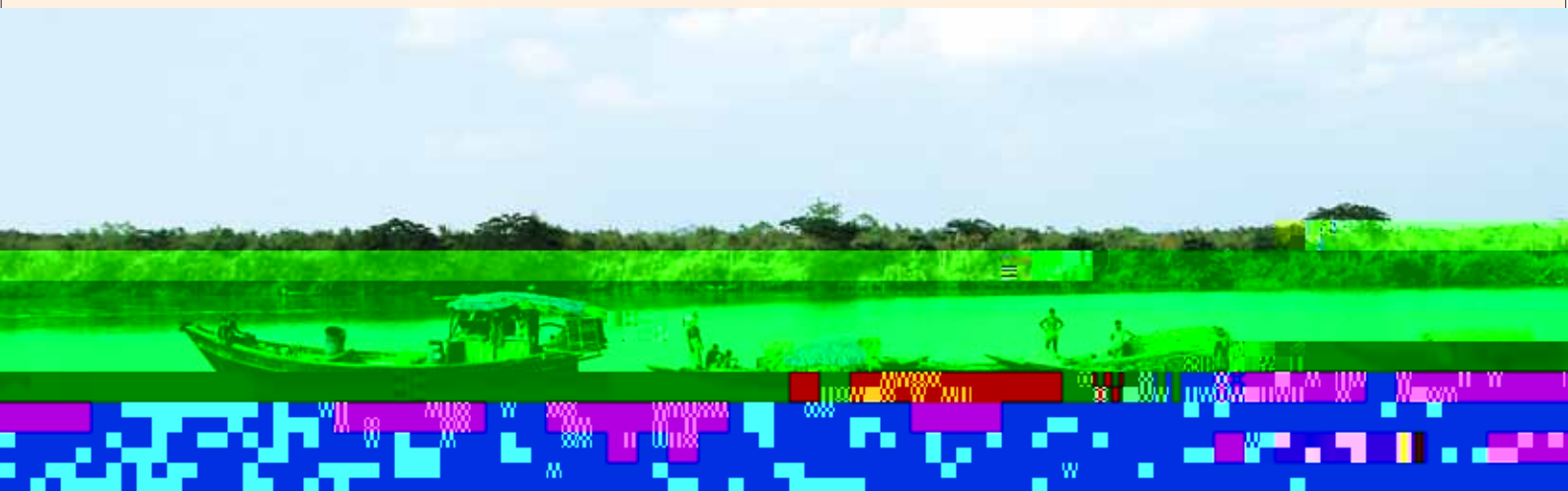
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⁶ (200). Bangladesh Climate Change Strategy and Action Plan, 2009. L (L)

According to reports gathered from BIWTA it was revealed that in most cases sustainable navigability could not be achieved by dredging. Deposition of silts hindered the navigability in certain stretches immediately after the dredging. As such BIWTA has to struggle for maintaining the navigability.

The IWT corridor between Dhaka-Narayanganj and



The equipments (e.g., aid to navigation) are vulnerable to flood, storm surge and cyclone. Aid to navigation equipments are being washed away regularly by onrush of flood water. SIDR in 2007 destroyed, damaged or washed away about 80% of the navigational aid equipments installed in the waterways in Barisal and Khulna divisions.

BIWTA so far developed 21 inland ports and 380 landing stations. The list of BIWTA installations can be seen in Table 5. About 43% of the landing stations were developed in the rural areas of Barisal Division. About 35 landing stations are located in the rural areas of the districts of Khulna, Bagerhat and Satkhira. About 30% of these landing stations were damaged, pontoons were displaced, damaged or capsized during SIDR as well. Landing stations located in the coastal area exposed to saline intrusion. Floating pontoons, jetties or shore connection cannot last long due to salinity of the water

Table: 5. List of BIWTA Installations

Obsolete Inland port and landing Stations: The river ports and landing stations developed at the banks of the rivers need to be developed considering impacts of climate change. The design of these installations is dictated by the difference in water level between dry season and the wet season, which varies locally and may be in the magnitude of 6 meters. In coastal area the difference in water level is further amplified by tidal action. The banks of the river slope gently towards the centre line of the river, necessitating long jetties to serve river craft in water with sufficient depth. A further significant factor in shaping the structure of the jetty is the method of cargo handling which is done almost exclusively by head-load. Following the benchmark of Public Works Department (PWD) BIWTA developed ports and landing stations facilities calculating the high water and low water variation.

As climate change factors were not considered, already in some places, it can be seen that the facilities which were developed in the past are now on the shore quite away from the river or in the mid-stream of the river without any shore connection. Floating pontoons are

often shifted to another place due to change of course of river or due to erosion leaving behind the piles or spuds.

Hazardous locations: When BIWTA struggle to maintain the navigability, at the same time at some places vessels struggle to negotiate against strong current. In the late monsoon or due to flash flood discharges of water and roughness of water increase in some stretches to such extent that navigation becomes very dangerous. One of such example is the confluence of Meghna and Dakatia near Chandpur port. A dangerous whirlpool develops there caused at least half a dozen of marine accidents in the recent years and claimed thousands of lives.

RESULTANT IMPACTS AND ECONOMIC LOSSES

The people of Bangladesh learnt to depend upon waterways not only for drinking water, agriculture, foods, shelter but also for passage of goods and passengers from one place to other. In fact transportation in this part of the world started with the rivers. Inland waterways have become a very important mode for not only maintaining transport link between the various remote parts of the country but also as a means for transporting import and export cargo. IWT has proved more accessible and cheaper than roads and railways and the poor people use the mode more. A World Bank study conducted in 2007 revealed that 12.3% of rural population or 50% of all rural households have access to water transport. Due to its natural advantage over the other two surface modes (roads and railway); IWT is in a position to contribute significantly to the Government effort for the growth and reduction of poverty. Impacts of climate change on navigation therefore has detrimental effects on transportation of goods and materials.

MANAGING CLIMATIC HAZARDS

Mitigation

Generation of greenhouse gases (GHG) in Bangladesh is low. In the transport sector of Bangladesh emission of CO_2 by inland vessel is the lowest. It means more use of waterways for the purpose of transport will result in increased saving in fuel and less emission of CO_2 . In 2005 IWT sector achieved a savings of 155,000 tons of CO_2 than there exist opportunities in reducing emissions.

In Bangladesh, like other developing countries, IWT performance is achieved with old engine technology which means efficiency of fuel consumption can be

achieved. This improvement would make IWT more competitive and would increase the transfer from road sector to IWT, further reducing the impact on carbon footprint of the sector.

Technological developments with regard to i) vessel operation, ii) vessel design, iii) engine efficiency and propulsion system, and iv) alternative fuel options must be reviewed. Energy efficiency gain can be realized through each of these categories against increased investment costs.

Adaptation

The navigators of Bangladesh have adopted through experience to navigate in the deteriorating conditions of the river. Such conditions increase the cost of the maintenance of vessels and of infrastructure and allied services. Due to increased cost for maintenance of the vessels, owners have decreased the cost for safety. As a result marine accidents have become regular incidents in inland navigation. BIWTA the public authority responsible for development, maintenance and operation of inland water transport cannot meet the increased demand for maintenance of waterways and of ports and landing facilities due to paucity of fund.

In the mean time, maintenance of navigability of the waterways must be carried out carefully. Dredging technique and dredging method should be determined in a manner that can adapt to the erratic conditions of the rivers due to climate change. Through morphological and social studies dredge spoil may be discharged to raise the river banks. For sustainable navigability river training work should also be carried out as well.

Through practical experience it was evident that bandalling in some stretches of rivers may develop navigability to some extent. As such bandalling programs should be carried out where feasible.

Facilities in the river ports and landing station should be made flexible in a way to adjust the changing conditions of the rivers due to climate change.

Due to climate change river will be more meandering and bed will be raised to such extent that will restrict smooth navigation. For adapting the changing condition of the river, design and dimension of the vessel must be changed. The breadth of a vessel may remain unchanged but the draft and the Length Overall (LOA) must be changed. Deeper draft long vessels must be replaced by flat bottom with shorter LOA vessels.

FINANCING ADAPTATION IN INLAND NAVIGATION

Public expenditure in IWT is too low compared to its modal share or contributions to the national economy. In the surface transport sector development allocation for IWT was 5% annually on an average. After the completion of the IWT-III projects financed by the World Bank in 2000, BIWTA did not implement any project financed by any development partners. Moreover, for adapting to the climate change in the IWT there exists neither action plan nor any fund. Although recently BIWTA received an allocation of BDT 210 million from the Climate Change Trust Fund to remove the garbage deposited on the beds of the rivers around Dhaka city.

The finance for adaptation and mitigation in the IWT sector has to come from the global source on a purely grant basis. To this end the Ministry of Environment and Forest responsible for working out the cost of implementing the climate change Action Plan must include the IWT sector in consultation with the Ministry

of the impact of climate change does not exist. No GOB agencies have so far undertaken any study or any effort to this end. Due to the unavailability of data modelling, scenario limitation and lack of coordination it is very hard to highlight the impact of climate change on IWT.

Public and Private Bodies Related to IWT

There are many factors that influence water qualities of the inland water system. Department of Shipping (DOS) is the principal entity responsible for:

- ENSURING ENVIRONMENTALLY WATER QUALITY AND MAINTENANCE PRACTICE IN THE IWT SECTOR;

- IDENTIFYING AND REGULATING POLLUTE AND DEGRADE THE ENVIRONMENT;
- ENSURING LONG TIME USE OF RESOURCES WITHOUT ADVERSELY AFFECTING THE ECO-SYSTEM.

It is essential that DOS ensures is maintains these responsibilities through further research into how climate change will affect these water ways in the future. Public and private bodies related to development, maintenance and operation of inland

Table 6: Public and Private Sector Organisations related to IWT

Public Bodies	Responsibilities
Bangladesh Inland Water Transport Authority (BIWTA)	Development, maintenance and control of inland water transport and of inland waterways
Bangladesh Inland Water Transport Corporation (BIWTC)	Carriage of passenger and goods as a public corporation. Presently only engaged in ferry operative between road, heads and in passenger service in Dhaka-Barisal-Khulna route. Cargo vessels, oil tankers and sea-tracks owned by BIWTC have been leased out to private operators
Department of Shipping (DOS)	As a public regulatory body regulates construction of ships, inland navigation and safety
Private Bodies	
Bangladesh Cargo Vessels Owners' Association (BCVOA)	Carriage of cargo by vessels registered under Inland Shipping Ordinance (ISO), 1976
Bangladesh Coastal Ship Owners' Association (BCSOA)	Carriage of goods mainly from maritime ports to inland destination by vessels registered under merchant Shipping Ordinance (MSO), 1976
Bangladesh oil tanker Owners' Association (BOTOA)	Carriage of Pol and liquid bulk by vessels registered under ISO and MSO
Bangladesh Inland Water (Passenger carrier) Association (BIWPCA)	Carriage of passengers by vessels under ISO
Launch Owner' Association Bangladesh (LOA)	Carriage of passengers by vessels under ISO
ENGINE AND "ULKHEAD COAST OWNERS' Association	Carriage of goods, passengers and extraction of sand from the river mostly by informal boats.
Country Boat Owners Association	Carriage of passenger and good by informal boats.

CONCLUSION AND RECOMENDATIONS

Inland water transport provides transportation access to about 25% of rural households in Bangladesh. Considering the economic viability, inland navigation facility is comparatively cheaper than the other available transport system. The external cost is low and IWT is environmental friendly, requires minimum maintenance and is a safe transport option. Considering the developmental issues, inland navigation transport facility has been under developed due to the overwhelming development of the road transportation system. Road network is responsible for deteriorating of many previous navigable routes due to the blockage of water transport.

It is thought that climate change, through increased sea levels, increased flooding and increased sediment deposition, will change the paths of water ways in Bangladesh. Exactly what will happen is still unknown. It is essential more research is done to ascertain likely scenarios.

To ensure adaptation to reduce the vulnerability to climate change on inland navigation and shipping this paper recommends the following:

- s # ONDUCT A STUDY TO ASCERTAIN THE IMPACT OF climate change on inland water transport (navigability, port, landing stations) and to draw up an action plan for adapting to climate change and mitigation.

- s # ONSTITUTE A CORE COMMITTEE the climate change ensuring representation from Ministry of Shipping, Ministry of Environment, Ministry of Forestry, Ministry of Water Resources, Bangladesh Inland Water Transport Authority and Trade Bodies.
- s 4 HERE SHOULD BE CLIMATE CH Ministry of Shipping and in the agencies to