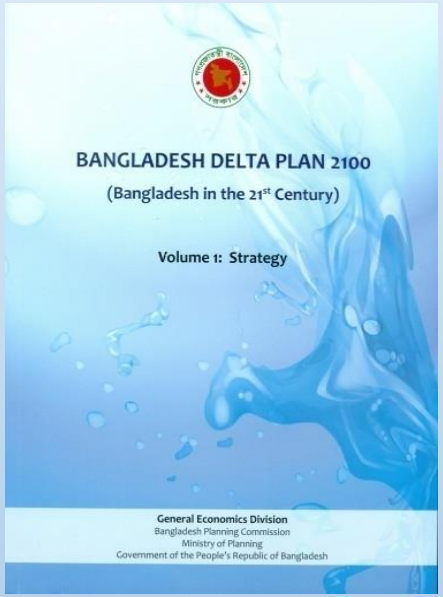
Training on
BDP 2100 Strategies/Measures:
National and Trans-boundary Water Management and Inland Water Transport



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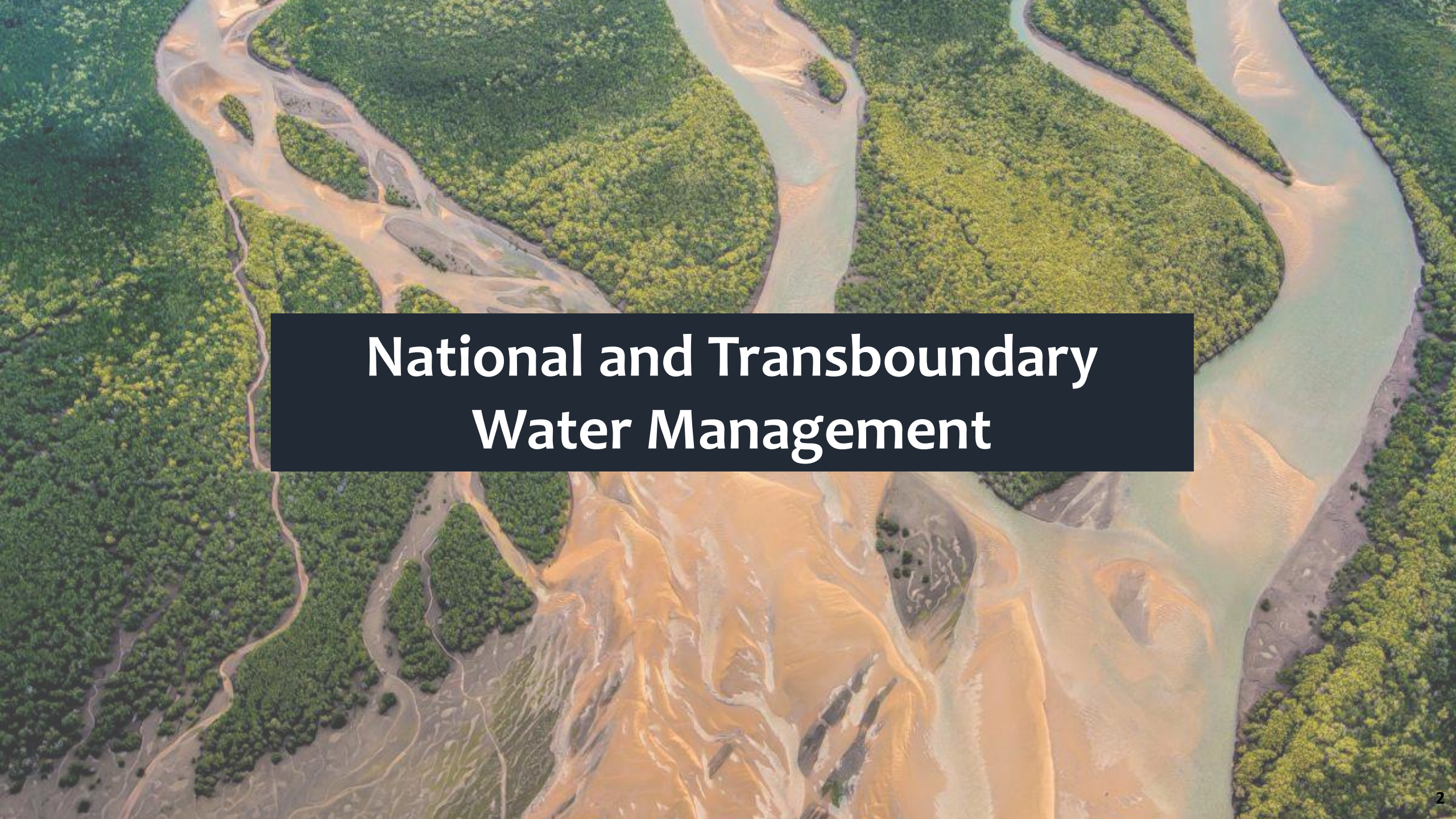
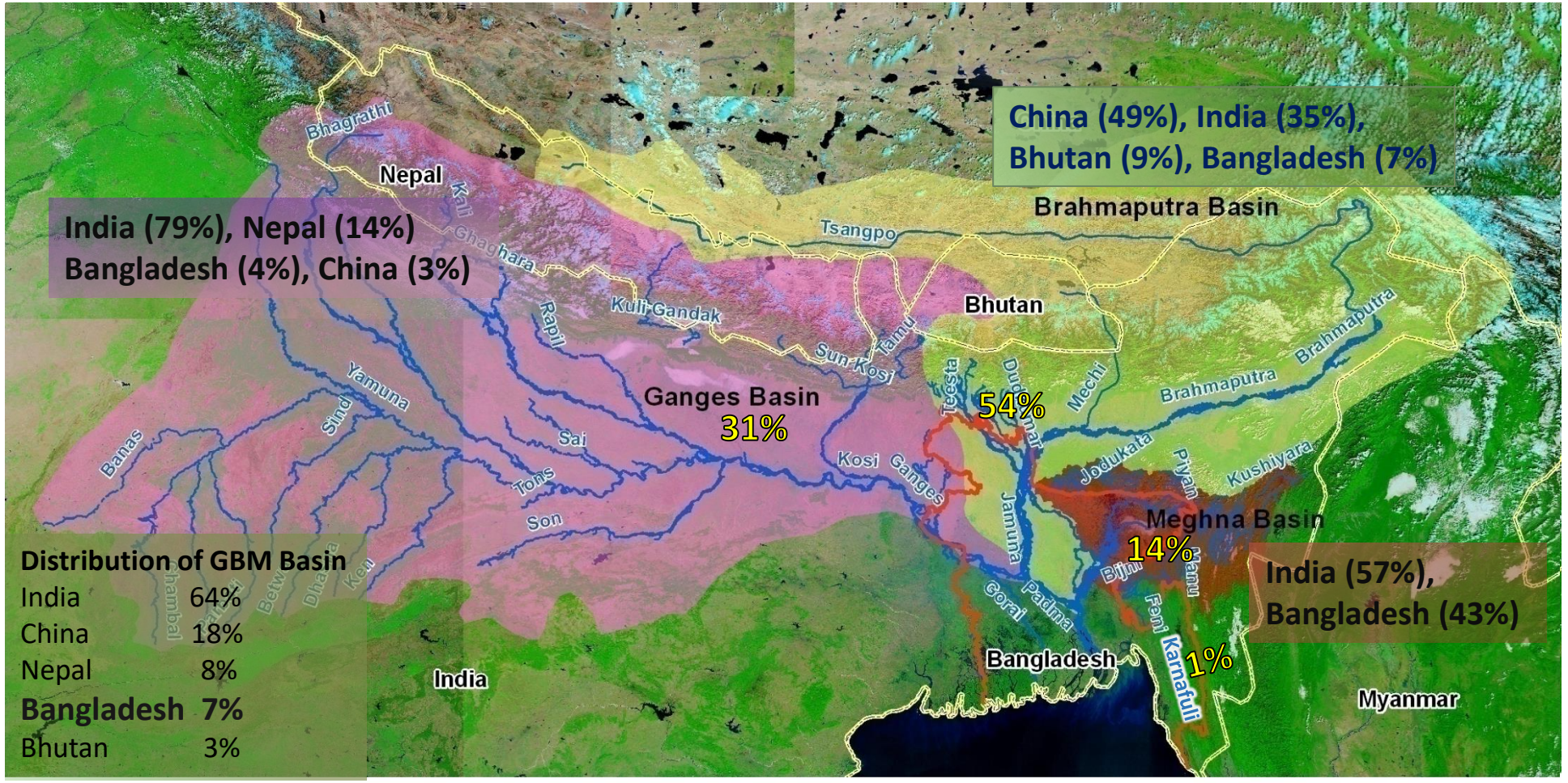


National and Transboundary Water Management

Geographical Challenges

Bangladesh ecosystems depend on regional river systems: (Ganges-Brahmaputra/ Jamuna-Meghna)



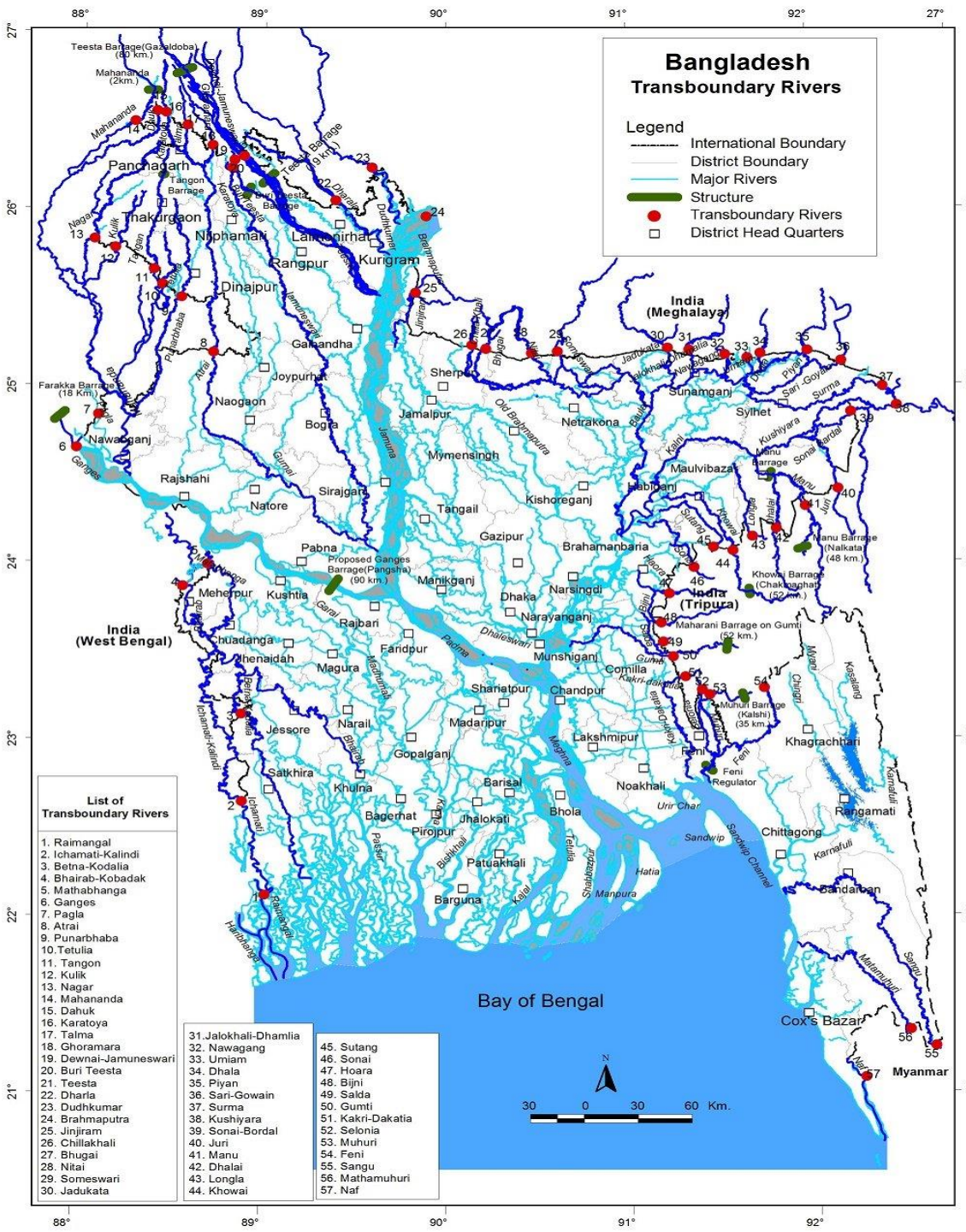
Ganges Basin	
Catchment area (sq km)	10,00,000
Av. Annual rainfall (mm)	1,200
Av. Annual discharges (cumec)	11,000
Max. Discharge (cumec)	78,000
Sediment transport (m ton/yr)	550

Brahmaputra/Jamuna Basin	
Catchment area (sq km)	5,73,000
Av. Annual rainfall (mm)	1,900
Av. Annual discharges (cumec)	20,000
Max. Discharge (cumec)	1,00,000
Sediment transport (m ton/yr)	590

Meghna Basin	
Catchment area (sq km)	77,000
Av. Annual rainfall (mm)	4,900
Av. Annual discharges (cumec)	4,600
Max. Discharge (cumec)	20,000
Sediment transport (m ton/yr)	13

Transboundary River of Bangladesh

Hydrological Region	No of Rivers	(%) of total Trans flow
North West	17	7
North East	20	6
South West	5	0.1
South East	9	1
Eastern Hill	3	0.5
River and Estuary	2	86
North Central	1	
South Central	-	
Total	**57**	**100%**



Monthly Water Balance in Major Rivers of Bangladesh

Table: Monthly Water Balance in Major Rivers of Bangladesh

Months	Ganges & Brhamaputra Discharges (bcm)	Other Trans boundary Rivers Discharge (bcm)	IRWR (bcm)	Monthly RW (bcm)R	EWR (bcm)	Available RWR (bcm)	Water Demand (bcm)	Excess(+) or Shortage (-)
January	22.5	2.32	0.33	25.15	20.42	4.73	6.96	-2.24
February	16.58	1.71	0.83	19.12	18.45	0.67	10.32	-9.65
March	18.61	1.92	1.97	22.5	20.42	2.08	12.44	-10.36
April	26.18	2.7	4.99	33.87	19.77	14.1	4.25	9.85
May	48.75	5.04	11.68	65.47	20.42	45	0.9	44.15
June	95.39	9.85	20.13	125.37	19.77	105.6	0.43	105.18
July	181.6	18.76	22.81	223.17	20.42	202.75	1.5	20.25
August	222.44	22.98	18.16	263.58	20.42	243.16	0.83	242.34
September	197.9	20.44	14.05	232.39	19.77	212.62	0.69	211.92
October	111.55	11.52	8.05	131.12	20.42	110.7	0.94	109.76
November	46.39	4.79	1.61	52.79	19.77	33.02	1.39	31.64
December	29.06	3	0.39	32.45	20.42	12.03	4.61	7.41

Source: Chittagong University of Engineering & Technology, 2016

Strategy for Better Regional Cooperation

Peak Discharges	Scenario	2015 (*reference*, m^3/s)	2030	2050	2100
Ganges					
Peak discharge *% change of mean annual maximum at Hardinge Bridge*	Productive Resilient Moderate Active	51,130 51,130 51,130 51,130	15 30 15 30	20 40 20 40	30 70 30 70
Brahmaputra					
Peak discharge *% change of mean annual maximum at Bahadurabad*	Productive Resilient Moderate Active	67,490 67,490 67,490 67,490	5 15 5 15	10 20 10 20	15 30 15 30
Meghna					
Peak discharge *% change of mean annual maximum at Bhairab bazar*	Productive Resilient Moderate Active	13,370 13,370 13,370 13,370	5 15 5 15	10 20 10 20	15 30 15 30

Strategy for Better Regional Cooperation

Ganges					
Upstream Abstractions	**Scenario**	**2015 (*reference, m³/s*)**	**2030**	**2050**	**2100**
Ganges					
Change Average dry season flow *% change (minus) at Hardinge Bridge*	Productive	750	*controlled by Ganges Water Treaty*		
	Resilient	750			
	Moderate	750			
	Active	750			
Average dry season flow *m³/s at Hardinge Bridge*	Productive	750	*controlled by Ganges Water Treaty*		
	Resilient	750			
	Moderate	750			
	Active	750			
Brahmaputra					
Change Average dry season flow *% change (minus) at Bahadurabad*	Productive	3,000	-5%	-15%	-30%
	Resilient	3,000	-15%	-30%	-50%
	Moderate	3,000	-10%	-25%	-40%
	Active	3,000	-20%	-40%	-60%
Average dry season flow Brahmaputra *m³/s at Bahadurabad*	Productive	3,000	2,850	2,550	2,100
	Resilient	3,000	2,550	2,100	1,500
	Moderate	3,000	2,700	2,250	1,800
	Active	3,000	2,400	1,800	1,200

Transboundary Water Related Issues and Challenges

Based on the investigation of the problems and issues of the BDP 2100 hotspots, the following seven crucial water related issues have been identified to be addressed at national level due to cross-cutting nature of the problems, challenges and possible measures.

- Flood Risk Management
- **Dry Season Water Availability and Irrigation Management**: Only 15% of total flow available in in dry season..

  According to IUCN, environmental flow is 30%. Target has been set to make it 30% by 2030.
- **River Management including pollution control:** Coastal Zone Protection and Management
- Fresh Water Supply
- Wetland Protection

Regional Co-operation Framework and River Basin Organization

Govt. of Bangladesh and India signed a ‘ Framework Agreement on Cooperation for Dev. In September 2011. This historical document encompasses number of areas of mutual interest, the highlights of which are as follows.

- To promote trade investment and economic cooperation;
- To enhance **cooperation in sharing of waters of common rivers and exploring** the; possibilities of common basin management of common rivers for mutual benefit;
- **To cooperate in flood forecasting and control;**
- To cooperate and provide necessary assistance to each other to enhance navigability and accessibility of river routes and ports;
- To develop mechanisms for technical cooperation and exchange of advance information with respect to natural disasters;
- To establish arrangements for cooperation in generation, transmission and distribution of electricity, including electricity from renewable or other sources;
- To promote scientific, educational, cultural and people to people exchanges and cooperation between the two countries, which will be implemented through programmes and joint initiatives in the areas of agriculture, education and culture, health, tourism, sports, science and technology;

Regional Co-operation Framework and River Basin Organization

- **To develop and implement programmes for environmental protection and responding to the challenges of climate change through adaptation;**
- To harness the advantage of sub-regional cooperation in the power sector, water resources management, physical connectivity, environment and sustainable development for mutual advantage, including jointly developing and financing projects;
- To cooperate closely on issues relating to their national interests; and
- To cooperate on security issues of concern to each other while fully respecting each other's sovereignty.

For sharing of transboundary water, some basin wide organizations are the **Mekong River Commission**, **Nile Basin Initiative**, and **International Commission for the Protection of the Rhine, Lake Chad River Commission** etc. Although presently, there are no such organizations in existence for the South Asia region, the following can be established in light of the above framework:

- Ganges River Basin Organization - comprising Bangladesh, India and Nepal;
- Brahmaputra River Basin Organization - comprising Bangladesh, India, Bhutan and China; and
- Meghna/ Barak River Basin Organization - between Bangladesh and India.

Review of Progress with Regional Water Cooperation

- **Cooperation between India and Bangladesh**

➢ ***Sharing of the Ganges Waters at Farakka***

- ❑ The Government of Bangladesh and India signed a Treaty for sharing the Ganges waters at Farakka on 12 December, 1996 for a period of 30 years
- ❑ Bangladesh has been receiving its guaranteed share of 35000 cusec of the Ganges water at Farakka in three alternate 10-day periods during the critical period (11 March to 10 May).
- ❑ The issue of augmentation of the Ganges flow at Farakka by constructing reservoir in Nepal was also discussed in the 37thmeeting of JRC in March, 2010.

➢ ***Sharing of the Teesta Waters***

The Joint Rivers Commission (JRC) at its 32nd meeting held in Dhaka in July, 1997 set up a Joint Committee of Experts (JCE) headed by Water Resources Secretaries of both the countries for working out a formula for long term/permanent water sharing agreement of the common rivers with priority to the Teesta.

➢ ***Sharing of Water of all other Transboundary Rivers including Dharla, Dudhkumar, Manu, Khowai, Gumti and Muhuri***

Bangladesh and India exchanged available data of the Manu, the Muhuri, the Khowai and the Gumti in 1999 and that of the Dharla and the Dudhkumar in 2000 and also relevant technical parameters in the subsequent technical level meetings.

➢ ***Flood Forecasting and Warning***

Bangladesh has been receiving flood related data and information of various transboundary rivers from India during 15 May to 15 October since 1972.

Review of Progress with Regional Water Cooperation

- **Cooperation between Nepal and Bangladesh**

  ❑After the two consecutive devastating floods in 1987 and 1988 a summit level meeting was held between Bangladesh and Nepal.

  ❑The 5th meeting of JEC was held in Dhaka in February, 2008. The Committee finalized the work plan of the Joint Technical Study Team (JTST).

  ❑The Committee noted that there exists huge potential in Nepal for harnessing of water resources by constructing reservoirs at suitable locations in Nepal. These would achieve flood peak attenuation at lower reaches, augment dry season flows and also generate huge hydro-power.

- **Cooperation between Bhutan and Bangladesh**

  During the visit of the Prime Minister of Bhutan to Bangladesh in December, 2014, the two Prime Ministers agreed inter-alia to enhance collaboration in Water Resources Management and Power/Hydro-power and Connectivity in the sub-regional context. Both sides also agreed to enhance cooperation in tourism sector, agriculture, education, health and human resources development.

- **Cooperation between Myanmar and Bangladesh**

  No specific institutional mechanism

Review of Progress with Regional Water Cooperation

- **Cooperation between China and Bangladesh**

❑After the two flood catastrophes of 1987 and 1988 in Bangladesh, a summit level meeting was held between China and Bangladesh in November 1988.

❑A China-Bangladesh Joint Expert Team was set up. This team prepared a study report on "Flood Control and River Training Project on the Brahmaputra River in Bangladesh" in March 1991which has been endorsed by the two Governments.

❑In August2005,a MoU was signed. As per the MoU the two sides agreed to cooperate in water resources management including relevant policies and regulations, research and development, trade and commerce, institutional capacity building and personnel training, etc. Concrete cooperation would involve the following main aspects:

- Cooperation and coordination in international water forum;
- Cooperation in areas of flood control, water induced disaster reduction, river training, water resources utilization and development;
- Enhancing the flood forecasting capability through exchange of flood related data and information of the Yaluzangbu/Brahmaputra river; and
- Utilize and protect the water resources of transnational rivers in the region keeping in mind the principles of equality and fairness.

Strategy for Better Regional Cooperation

The following options can be considered to ensure proper management of river basin and utilization of available resources

•Incorporation of multi-layered dialogues that will enable participating **countries to initiate negotiations from new entry points and also link water related negotiations with other river interests** and regional cooperation issues.

•It is **imperative that environmental flow is maintained in the rivers** and as such, necessary initiatives have to be taken both on a bi- and multi-lateral basis and enacted accordingly.

•**Simultaneous negotiation of multiple treaties** has to be done **to ensure that the benefits given up on one treaty could be used as leverage for another more significant treaty**. By applying the negotiation of multiple treaties approach, both countries have more options to come to mutually agreeable and beneficial terms.

•Prioritization of rivers has to be done in implementing devised schemes regarding water sharing. Framework of agreement for sharing of the Teesta, the Dharla, the Dudhkumar, the Manu, the Khowai, the Gumti, and the Muhuri need to be implemented at technical level.

•Demand based common river basin management schemes has to be initiated

Strategy for Better Regional Cooperation (Cont'd)

•**International approach** can be implemented **that will involve active participation of a third party**, either an international organization or a country.

•Strategies have to be devised **to combat the implications of the adverse effects of climate change upon** the river basins. Should there be a shortage on the availability of upstream flow, initiatives such as implementation of reservoir system to retain water to fulfill dry seasonal water demands has to be done.

•Furthermore, knowledge building on **hydro-diplomacy would** be useful for the trans-boundary water negotiations.

Inland Water Transport System

Table : Rate of Fare and Freight of Different Modes of Public Transport

Name of Transport Corporation	FY 2006	FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014
Fare in BDT per passenger per kilometre									
Bangladesh Railway	0.38	0.38	0.38	0.38	0.38	0.39	0.39	0.58	0.75
Bangladesh Road Transport Corporation	0.78	0.87	1.05	1.05	1.13	1.48	1.48	1.48	1.48
Bangladesh Inland Water Transport Corporation	**0.42**	**0.42**	**0.51**	**0.51**	**0.51**	**0.71**	**0.96**	**0.96**	**1.00**
Bangladesh Biman	3.98	4.55	4.65	4.79	4.80	5.22	5.46	4.53	4.22
Freight per tonne per Kilometer in BDT									
Bangladesh Railway	1.49	1.55	1.56	1.58	1.58	1.59	1.59	2.00	5.65
Bangladesh Road Transport Corporation	2.47	2.58	3.04	3.64	3.90	4.57	4.57	4.57	6.53
Bangladesh Inland Water Transport Corporation	**1.25**	**1.25**	**1.16**	**1.16**	**1.16**	**1.17**	**1.47**	**2.19**	**2.19**
Bangladesh Inland Water Transport Authority								1.40 to 1.70	1.40 to 1.70
Bangladesh Biman	1.67	1.71	1.75	1.78	1.80	1.00	1.10	2.06	2.10

** For air cargo, the fare is quoted in Kg/lb. /kilometer.*

Source: BIWTA and BBS, 2015

Table : Comparison of Cargo Tariff by Modes (BDT/ tonne-km)

Mode	Dhaka-Chattogram (264 Km)	Dhaka-Sylhet (346 km)
Road	4.50	4.34
Rail	2.74	3.78
IWT	**0.99**	**0.63**

Source: World Bank, 2007

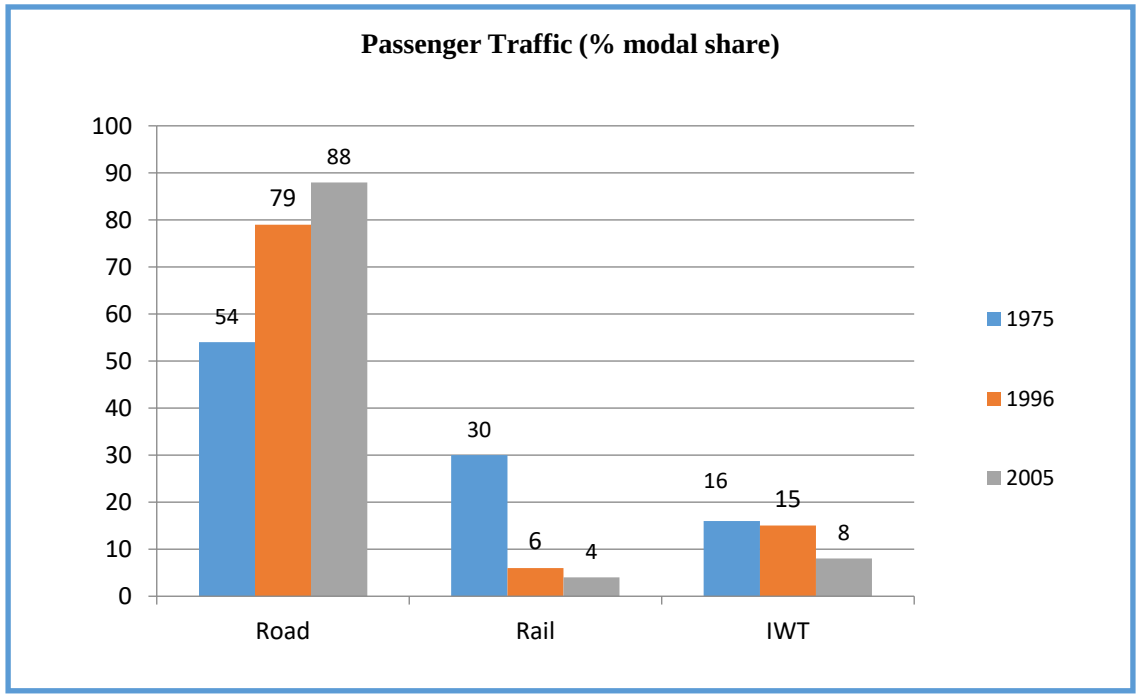
Table: Productivity of Different Modes

Comparison	Road	Rail	IWT
Network (km)	274,000	2,800	24,000
Productivity Passenger-km	359,000	1,500,000	369,000
Productivity Tonne-km	57,000	293,000	127,000

Source: The World Bank, 2007.

Inland Water Transport Development Context

Despite being the cheapest mode of transport, the popularity of IWT as a mode of passenger and cargo transportation has been on declining. A World Bank Report published in 2007 showed that the modal share of IWT registered a gradually declining trend during last few decades. Thus, the modal share of IWT fell from 16% passenger and 37% cargo in 1975 to 8% passenger and 16% cargo in 2005



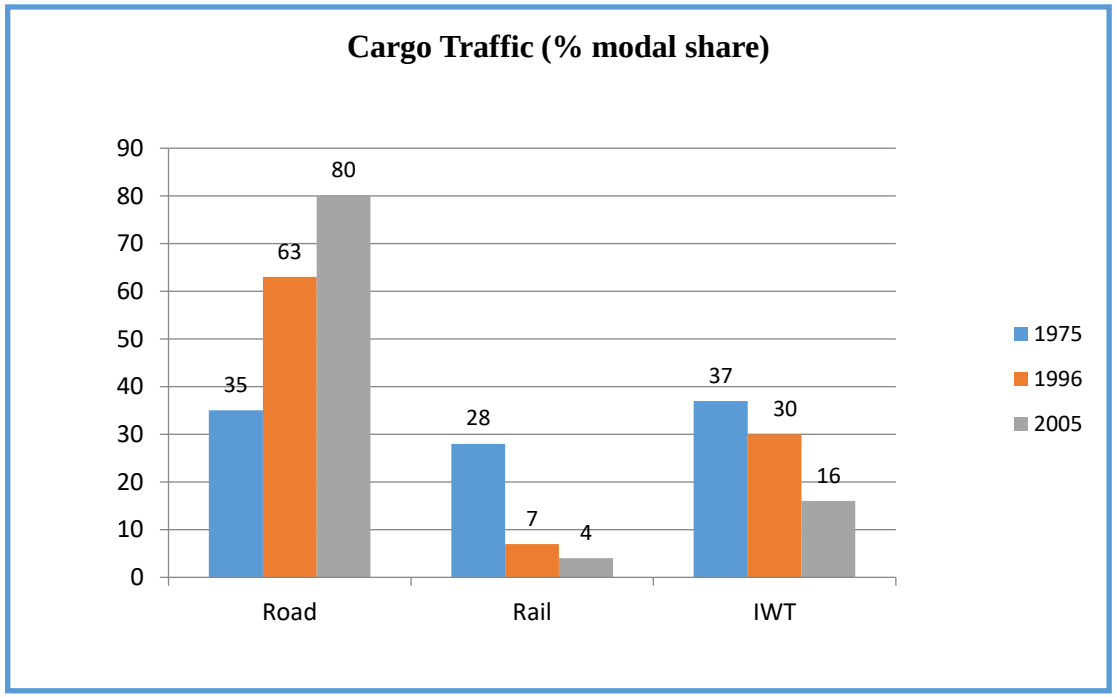


Figure : Modal Share of Passenger and Cargo Traffic

Source: World Bank,2007

Present Status of Inland Water Transport (IWT)

According to the Report of IWT Master plan prepared by DHV Consultants in 1989 BIWTA categorized the inland waterways of Bangladesh into four hierarchical classes as follows. In terms of network length, the classified perennial routes (Class-I, II and III) amount to almost 3,600 km and seasonal routes (Class-IV) to almost 2,400km, totalling about 6,000 km.

Name of Route	Minimum Depth	Length of Route and Percentage	Minimum Vertical Clearance	Minimum Horizontal Clearance
Class- I	3.66 m	683 km (11.4%)	18.30 m	76.22 m
Class- II	2.13 m	1,027 km (17.1%)	12.20 m	76.22 m
Class- III	1.52 m	1,885 km (31.5%)	7.62 m	30.48 m
Class- IV	Less than 1.52 m	2,400 km (40.0%)	5.00 m	20.00 m
Total		***5,995 km (100%)***		

Inland Waterway Route Classification

Table : Classified IWT Routes (I & II)

Class		Route	Description (river/town)	Distance (km)
I	1	Dhaka-Chattogram	Buriganga, Dhaleswari, (Lower) Meghna, Shah- bazpur, Hatia Channel, Karnafuli river	306
	2	Shambhupura-Demra	Lakhya river-Narayanganj	22
	3	Shambhupura- Bhairab Bazar	Upper Meghna-Ashuganj	85
	4	Chowkighata- Maheswarpasha	Lower Meghna, Arial Khan, Kirtankhola, Gab Khan, Baleshwar, Mongla-Ghsiakhali Canal, Pussur, Khulna, Kazibacha, Bhairab	270
	Class I Total:			***683 km***
II	1	Bhairab Bazar-Chattak	Upper Meghna, Kalni, Surma river	228
	2	Mohanpur- Daikhawa	Meghna-Chandpur, Padma, Jamuna (Barhmaputra)	385
	3	Deara-Barishal Via Nandibazar	Meghna, Jayanti, Arial Khan	84
	4	Pussur-Chalna-Raimangal	Sutarkhali, Sibsa, Bajboza, Sekbaria, Arpangasi, Malanchi-Border	143
	5	Hizla-Shaistabad	Meghna-Azimpur/Dharmaganj, Arialkhan	30
	6	Sattal-Daudkandi	Meghna	24
	7	Chandpur-Ichuli	Dakatia Nullah	7
	8	Chattogram-Cox's Bazar	Karnafuli, Kutubdia & Maiskhal Channels, Bagkhali	99
	Class II Total:			***1,000 km***

Source: BDP 2100 Baseline Study Report: River Systems Management Including Morphological Dynamics of Bangladesh Delta, 2015.

Table : Core Waterways Network Recommended in the Master Plan, 2009

IWT Route	Length (km)
1. Dhaka-Narayanganj-Chattogram	306
2. Dhaka-Barishal-Mongla	418
3.Chandpur-Bhairab Bazar/Ashuganj	102
4. Mohonpur-Daikhawa	385
5. Bhairab-Chatak	228
6. Jamuna/Hurasagar-Baghabari	15
7. Dilalpur-Fenchuganj	191
8. Chatak-Sylhet	53
9. Mongla-Khulna-Noapara	80
10. Dhaka-Tongi	40
11. Barishal-Patuakhali	85
12. Barishal-Barguna	97
13. Narayanganj –Narsingdi	77
14. Narayanganj –Meghnaghat	42
Total	***1,822***

Source: IWT Master Plan, Final Report, 2009

Key Routes of India-Bangladesh IWT

Table : Key Routes of India-Bangladesh Inland Water Transit and Trade

1	Kolkata- Haldi - Raimongal- Chalna- Khulna- Mongla- Kawkhali- Barishal- Hizla- Chandpur- Narayanganj- Aricha- Siraganj- Bahadurabad- Chilmari- Shubri- Pandu- Shilghat
2	Shilghat- Pandu- Dhubri- Chimari- Bahadurabad- Sirajganj- Aricha- Narayanganj- Chandpur- Hizla- Barishal- Kawkhali- Mongla- Khulna- Chalna- Raimongol- Haldia- Kolkata
3	Kolkata- Haldi - Raimongal- Mongla- Kawkhali- Barishal- Hizla- Chandpur- Narayanganj- Bhairab Bazar- Ashuganj- Ajmiriganj- Markuli- Sherpur- Fenchuganj- Zakiganj- Karimganj
4	Karimganj- Zakiganj- Fenchuganj- Sherpur- Markuli- Ajmiriganj- Ashuganj- Bhariab Bazr- Narayanganj- Chandpur- Hizla- Barishal- Kawkhali- Mongla- Raimongal- Haldia- Kolkata
5	Rajshahi- Godagari- Dhulian
6	Dhulian- Godagari- Rajshahi
7	Karimganj- Zakiganj- Fenchuganj- Sherpur- Markuli- Ajmiriganj- Ashuganj- Bhariab Bazr- Narayanganj- Chandpur- Aricha- Sirajganj- Bahadurabad- Chilmari- Dhubri- Pandu- Shilghat
8	Shilghat- Pandu- Dhubri- Chimari- Bahadurabad- Sirajganj- Aricha- Chandpur- Narayanganj- Bhairab Bazar- Ashuganj- Ajmiriganj- Markuli- Sherpur- Fenchuganj- Zakiganj- Karimganj

Source: BIWTA, 2015

Challenges: River Morphology and Climate Change Issues

The following main causes were considered by the Daily Hourly Volume (DHV) for deterioration of waterways:

- Abstraction of water or stream flow reduction
- Reduction in cross-boundary flow
- Silting up of off takes
- Reduction in tidal volume
- On-going sedimentation

Currently, some challenges identified in the IWT sector are as follows:

- Incremental dredging demand to maintain navigability;
- lack of infrastructure, non-compliance of guidelines for construction of bridge over the rivers, encroachment in the rivers;
- lack of safe vessels and skilled workforce;
- lack of policy guidelines, poor governance;
- Inadequate budget allocation;
- lack of intermodal coordination;
- Inadequate progress with regional cooperation.

Challenges: Navigability in Waterways Management Issues

1. The Principle of Uninterrupted Navigability of Waterways
2. Incremental Dredging Demand for Maintenance of Navigability
3. Weak Port and Integrated Transport Capacities
4. Inadequate Intermodal Connectivity
5. River Safety and Other Key Issues
6. Non-Compliance of Guidelines for Construction of Bridge/Culvert and Cables/Wires over the River
7. Encroachment of Rivers bank, channel
8. Lack of Safe Vessels and Skilled Work Force
9. Institutional Constraints and Inadequate Enforcement of Regulating Agencies
10. Regular Hydrographical and morphological Survey

Challenges: Navigability in Waterways Management Issues (Cont'd)

11. Higher Turnaround Time for India-Bangladesh IWT Routes:

Sl	Route	Mode of trade	Time taken (Days)
1.	Narayanganj-Kolkata	Inter-country	40
2.	Kolkata-Karimganj	Transit	45
3.	Kolkata-Khulna	Inter-country	25
4.	Kolkata-Pandu	Transit	50

Source: BDP 2100 Baseline Study Report:- Sustainable Transportation and Infrastructure, 2015.

Causes for such high time for turnaround are as follows:

- Poor navigational quality due to siltation and inadequate maintenance service,
- High time for loading and unloading due to lack of appropriate handling facilities,
- Absence of night navigation facilities,
- Present procedures of customs and immigration,
- Low efficiency of the vessel and crew.

Developing a Dynamic Inland Water Transport System

There are at least **four sets of issues that policymakers should consider** in developing an efficient IWT:

First, addressing river morphological and climate change issues. In this regard, policymakers need to address twin challenges emanating from both domestic as well as from cross border water management issues;

Second sets of issues relate to river transport infrastructure development. In this regard, the policy should be prioritising routing based on economic viability and those priority routes should be modernised and integral part of multimodal connectivity, among others.

Third sets of issues involve governance and investment issues, the former is critical to governing the sector for better functioning of the IWT system and the latter is critical to maintain navigability and develop modern facilities and human resources.

Final sets of issues should focus on economics and governance of cross-border rivers, aimed at making the river transport viable. In this regard, the corresponding parties should have a clear roadmap on user fees, tariff rates, and joint efforts to develop infrastructure, among others.

Developing a Dynamic Inland Water Transport System (Cont'd)

1. **Addressing river morphological issues**
2. **Climate Change Adaptation**

   - **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.
   - For sustainable navigability **river training works** should also be carried out.
   - **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.**
   - For **adapting** with the **changing condition of navigation** of the river, design and dimension of vessels 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.

3. **River Transport: Priority Routing and Infrastructure Development**
4. **Integrated Transport Logistics**
5. **Increasing Investment in IWT**

(to be continued..)

Developing a Dynamic Inland Water Transport System (Cont'd)

6. **River System management and Making Cross-boundary IWT Viable**

7. **Integration of IWT with Multimodal Transport System**

Policies within the National Integrated Multimodal Transport Policy (NIMTP) to improve safety in Inland waterway sector are:

- Connect railways and road communication in major port/landing stations.
- Provide automated loading-unloading facilities in all inland water port and landing stations.
- Ensure that vessels are provided with sufficient life saving devices;
- Ensure adequate vertical clearance in inland waterways for safe passage of vessels and providing Low Tension Lines and High Tension Lines to safe heights;
- Ensure addition of necessary equipment including Differential Global Positioning System (GPS) to use electronic hydrographic chart; and
- Ensure use of Digital Mobile Radio and wireless technology to ensure uninterrupted communication from bank to bank, vessel to bank and vessel to vessel.

IWT Strategy Aligned with BDP 2100 Goals

Strategies for inland waterway sector mainly include:

- Develop reliable water system conditions for long term **sustainable IWT through the capital and maintenance dredging** of the rivers Padma, Meghna, Jamuna, Brahmaputra, Dharla, Arial khan, Kushiyara, Gorai, and Manu.
- **Regular dredging** should also be considered for **Ghashiakhali** and other channels in the **Sundarbans.**
- Ensure efficient and equitable use of sand through the **regular shifting of the 'Balu-mahal'** (sand quarry). The local administration should take necessary steps accordingly. Specific guidelines should be developed for the management of soil/sediment resultant from dredging.
- Contribute to dealing with trans-boundary water aspects by developing mutual understanding and cooperation

(To be Continued…)

Goal-wise Elaboration of IWT Strategies & Sub-strategies

Strategy 1.1: Develop reliable water system conditions for long term sustainable IWT and economic development

Short term measures: Provide a flood and climate change resilient operational environment for shipping, ports and related facilities;

Medium term measures: Ensure the performance of key societal and economic functions of IWT.

Strategy 2.1: Cooperate and coordinate with BWDB to provide optimal levels of surface water for navigation

Short term measures:

-- Coordination on water levels and necessary measures to be taken

Medium term measures:

-- Renew river classification and standards

-- Coordinating maintenance of water levels.

Long term measures:

-- Ongoing maintenance dredging.

Goal-wise Elaboration of IWT Strategies & Sub-strategies (Cont'd)

Strategy 2.2: Increase water use efficiency across whole IWT sector and ensure sustainable water use

Short term measures:

-- Promote recycling and safe reuse of water with latest technology

-- Small-scale water harvesting techniques at large ports including recycling / safe reuse of water

Medium term measures:

-- Full coverage small-scale water harvesting in all ports and landing places

Long term measures:

-- Advanced water supply and sanitation system and wastewater treatment in all ports and ships

Strategy 2.3: Control pollution, ensuring water quality and provide sustainable and safe water supply and sanitation systems

Short term measures:

-- Improve water quality by reducing pollution

-- Installation of appropriate water supply mechanism in ports to ensure safe drinking water (including gravity flow systems, water harvesting and tubewells where applicable)

-- Application of sustainable water supply for boats

-- Motivational work for proper sanitation practices on boats

Goal-wise Elaboration of IWT Strategies & Sub-strategies (Cont'd)

Medium term measures:

-- Water supply and sanitation, including solid waste management in ports, landing places and ships

-- Improve water quality by reducing pollution

Long term measures:

-- Advanced water supply and sanitation system and wastewater treatment in all ports and ships

Strategy 3.1: Develop the navigation network according to the societal and economic demands

Short and Medium term measures:

-- Conduct traffic surveys to establish passenger and cargo requirements on the main rivers, feeders and creek routes

-- Reclassify the inland waterways network according to sustainable navigability and traffic importance. **Classify network into two categories: National and Rural. Rural waterways should include local and rural routes**

-- The core waterways should include fairways between maritime ports and central regions, economic zones and intra-regional routes

-- Class I and part of Class II and Class IV (especially for retention) will be completed in the short term

Implementation of remaining **Class II together with Class III and IV routes will be completed in the medium term**

-- Carry out river conservancy works including river training works for navigational purposes and for provision of aids to navigation including marks, buoys, lights and semaphore signal

Goal-wise Elaboration of IWT Strategies & Sub-strategies (Cont'd)

Strategy 3.2: Contribute to integrated management of rivers

Short term measures:

- **River** and **khal restoration**
- Integrated **sediment and erosion management;** local erosion control by using hard materials
- Reduce silt, silt traps, remove debris
- Carry out **river conservancy works by river training works for navigational purposes** and providing aids to navigation: **install marks, buoys, lights and semaphore** signals

Medium term measures:

- Prepare a **dredging strategy and dredging program for the medium term to accommodate and stimulate economic growth,** to support implementation of the BDP 2100 targets.
- Management **sediment supply** to the rivers
- Manage **river beds to levels** required for navigation
- **River erosion** control by **creating green belt** along banks

Strategy 3.3: Develop, maintain and operate inland river ports, landing / ferry ghats and terminal facilities in ports or ghats

Short term measures:

-- Carry out r**emoval** of **wrecks and obstruction in** inland **navigable waterways**

-- Coordinate and integrate programs of BIWTA with BWDB and LGED in relation to navigability, dredging and port development

-- Provide and further improve pilotage and hydrographical survey services

Strategy 4.1: Safeguard and maintain the wetlands including its ecosystems and also to ensure quality of water in relation to pollution by water crafts and ports.

Some of the components to be safeguarded under the goal are mangrove forests, water and riverine ecosystems, coastal greenbelt, seasonal and perennial wetlands, tidal freshwater frontier, etc.

Strategy 5.1: Mainstream IWT

Short term measures:

-- Minimizing the gaps between planning and implementation

Strategy 5.2: Prepare and implement capacity building and institutional strengthening to professionalize IWT-performance and sector in relation to stakeholders

Short term measures:

-- Develop need based Capacity Building and Strengthening Program at National level, including possible proposals for reforms and restructuring

-- Strengthen local and regional institutions for navigation and port management

-- BIWTA and BWDB should work closely together when drawing up programs for effective coordination

-- Coordinate, set and enforce standards for bridges: increase coordination of different public authorities to ensure sufficient clearance under bridges

Strategy 5.3: Enhance private sector participation in the IWT sector

--- BIWTA should concentrate more **in preparing dredging strategies and programs** on the basis of **comparative traffic importance against available resources.** Actual dredging could also be performed by **the private sector**. BIWTA should restrict itself in procurement of dredgers, it should rather lease out the existing fleet to private sector;

Strategy 5.4: Contribute to dealing with transboundary water aspects by developing mutual understanding and cooperation to attract more regional and intra-regional traffic in the waterways of Bangladesh.

Short term measures:

-Under the existing **Protocol on Inland Water Transit and Trade between Bangladesh and India,** the following joint initiatives and assurances should be committed by both Governments:

--**Improve navigability of existing routes and identify new routes.** Upstream cooperation and commitment to maintain navigability in the downstream routes.

--Identify most economic and efficient transport chain and establish connectivity with other modes.

Strategy 5.6: Early warning, storm surge and flood risk preparedness

Short term measures:

-- **Revision** of **cyclone / storm-surge warning s**ystems
-- Harmonize flood patrolling / fighting procedures
-- Development of community based early warning and forecasting systems
-- Flood hazard zoning and building conditions (incl. flood proofing): mapping and enforcement
-- Plans for shelter and evacuation optimization, establish disaster management social groups

Strategy 6.1: Prepare and implement a sustainable IWT-vision and strategy

Strategy 6.2: Promote renewal and innovation of IWT sector and fleet

Strategy 6.3: Promote development of riverine and maritime ports

To conclude, Dynamizing Bangladesh's river transport system for the 21st century will require the confluence of four critical strategies:

a) **Managing the nation's hydrological resources and the river system,**

b) **Adapting to climate change impacts on river morphology and channel configurations,**

c) **Developing institutions and establishing legal framework for cross-boundary navigation for seamless movement of goods and people, and**

d) **Adopting sound investment and financial management policies.**

Thank You

Open Discussion
&
Question-Answer