

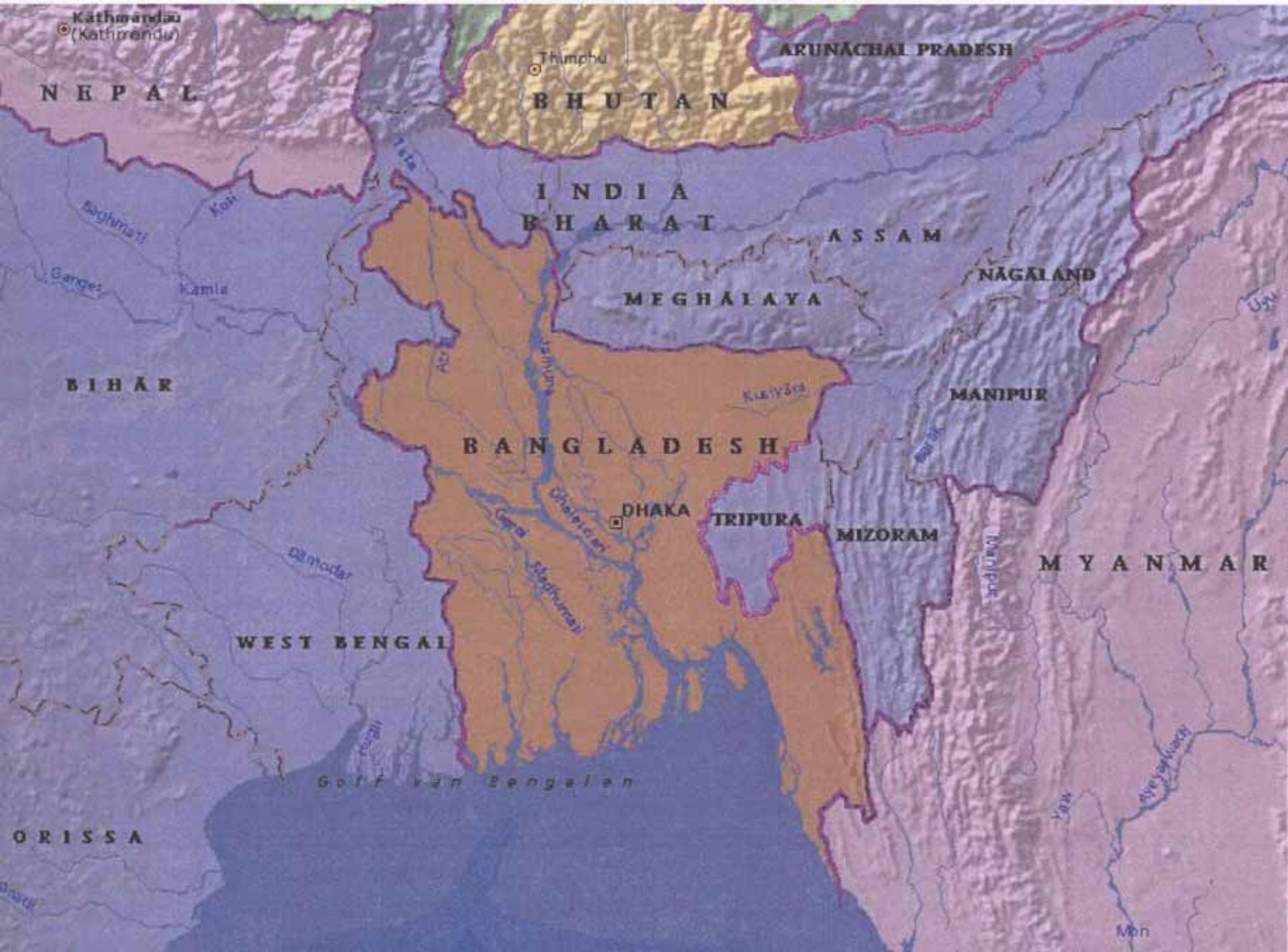
**WELCOME TO PRESENTATION
ON**

**Water Management challenges in
Bangladesh**

By

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BWDB, BANGLADESH



Bangladesh at a Glance:

- Located in South Asia between $20^{\circ}34'$ and $26^{\circ}38'$ North Latitude and between $88^{\circ}01'$ and $92^{\circ}41'$ East Longitude
- Has an area of 147,570 sq.km
- India on the west, the north and the north-east, Myanmar on the south-east and Bay of Bengal on the south
- Bangladesh enjoys a sub-tropical monsoon climate
- Lowest temperature comes down to 4°c during winter and rises up to 43°c during summer

- ❑ Most of Bangladesh has been built up by the alluvial deposit of the Ganges, the Brahmaputra and the Meghna.**
- ❑ It has nearly flat topography**
- ❑ Most of the land lies within 20 meters above the Mean Sea Level(MSL)**

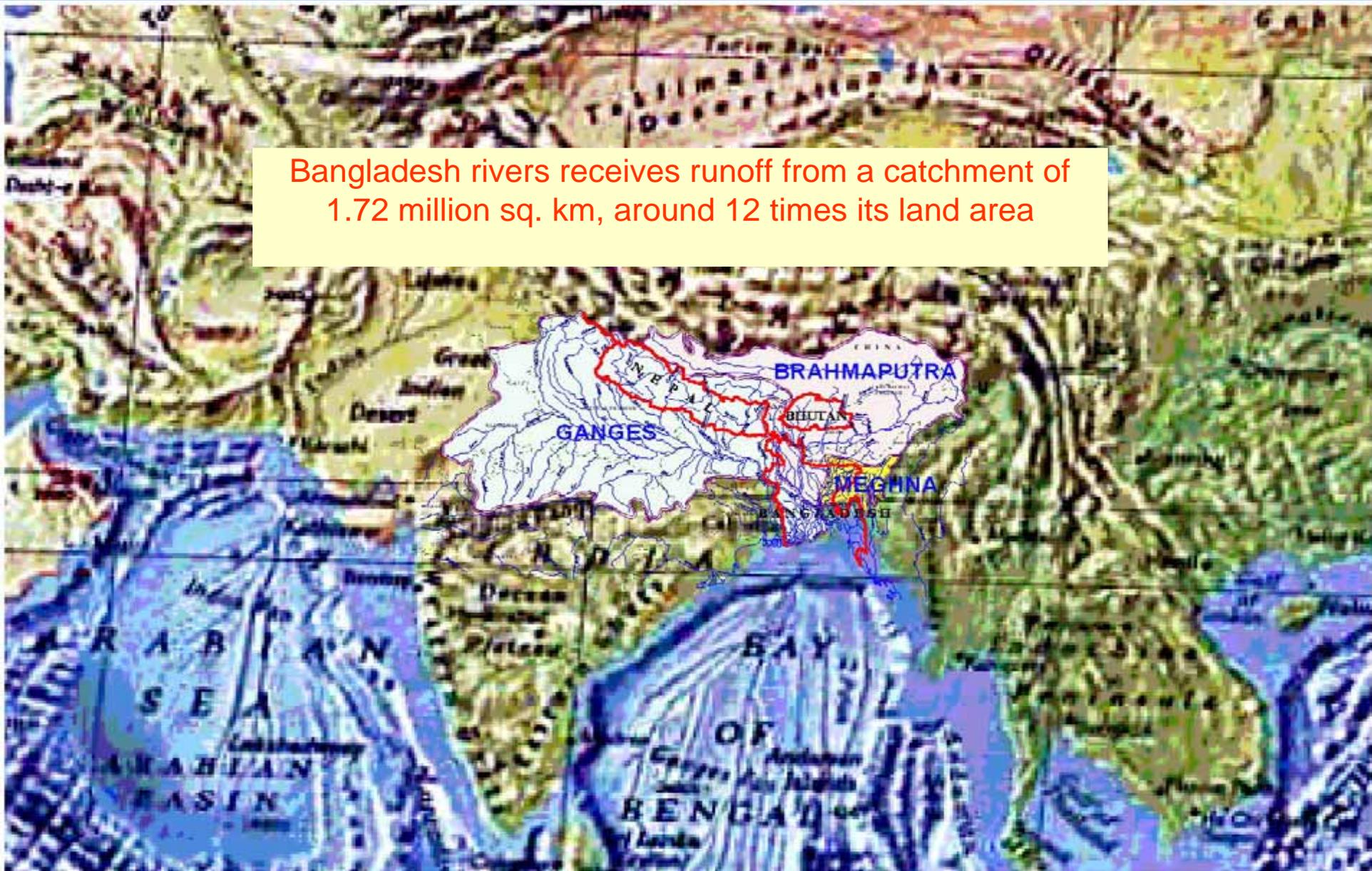
Annual rainfall:

- **1250 mm in the extreme west to about 5000 mm to the north-east**
- **Average annual rainfall is about 2300 mm**

Population:

- **The country is densely populated and the present population exceeds 129 million**
- **Present growth rate is 1.47%**

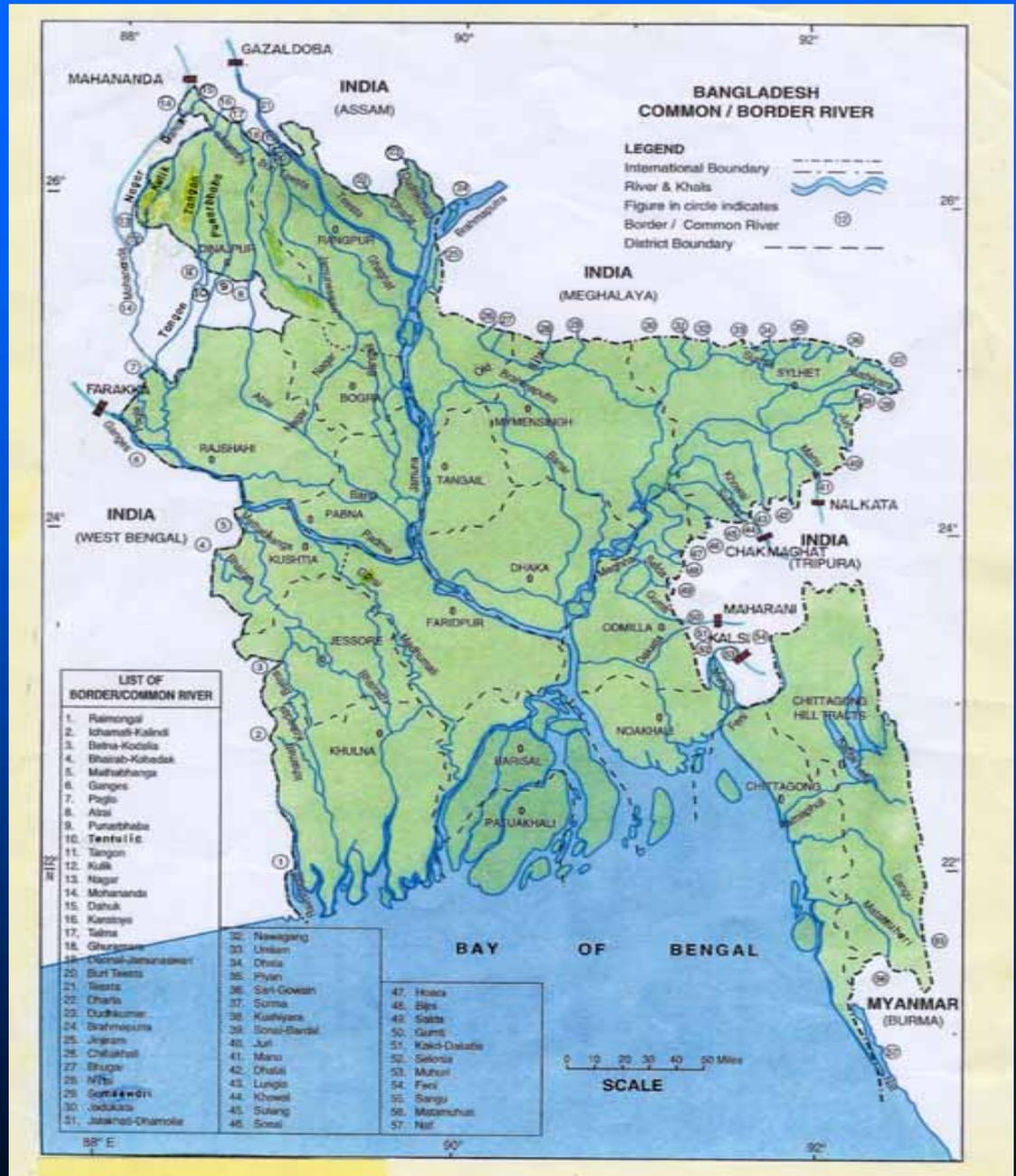
Bangladesh rivers receives runoff from a catchment of 1.72 million sq. km, around 12 times its land area



- ❑ **Out of 1.72 million sq.km of total catchment area only 7% lies within Bangladesh**

- **The very geographical location of Bangladesh makes it the lowest riparian country of 57 Trans-boundary rivers of which 54 comes from India and 3 from Myanmar**

BANGLADESH COMMON/BORDER RIVERS



Main Features of Major Rivers of Bangladesh

| | Brahmaputra | Ganges | Meghna |
|---|----------------------------------|--------------------------------------|-----------------------------------|
| Length of river (km) | 2,900 | 2,550 | 900 |
| Length within Bangladesh (km) | 270 | 260 | 400 |
| Total Basin area (km ²) | 552,000 | 1,087,001 | 82,000 |
| Basin area within Bangladesh (km ²) | 39,100 | 46,300 | 35,000 |
| Highest recorded discharge | 98,300 (cumec) at Bahadurabad | 76,000 (cumec) at Hardinge Bridge | 19,800(cumec) at Bhairab Bazar |
| Lowest recorded discharge | 2,860 (cumec) at Bahadurabad | 261 (cumec) at Hardinge Bridge | Tidal |

- ❖ **Being the lowest riparian, the country has no control over the huge cross-boundary flows of about 140,000 cumec (4,944,058 cusec) carried into Bangladesh by these rivers during monsoon.**

MAJOR ISSUES

- Flood Disaster Management
- Erosion Control
- Irrigation & Drainage

Flood



- Flood occurs in Bangladesh regularly
- Being low-lying country, at least 22% is flooded every year
- In case of severe flood, 66% area inundated
- 1954, '55, '74, '87, '88, '98, & '04 floods were catastrophic

Water Resources Management Vulnerabilities: Flood



Major Causes of Flood

- Unique Geographical location
- Relatively low Topography
- Three major river systems, Ganges, Brahmaputra & Meghna carry huge flow from the combined catchments of 1.72 million sq km lying in India, Nepal, Bhutan & China
- 7% of the catchments lie in Bangladesh

Flood Management in Bangladesh

- Structural Measures
- Non-structural Measures

Structural Measures

- Flood Embankment
 - Channel Improvement
 - River Training
 - Coastal Embankment
- Among these Structural measures, construction of embankment is most popular and very old practice in Bangladesh.

Non-structural

- **Flood Forecasting & Warning System**
- **Erosion Prediction System**
- **Environmental Monitoring Network**
- **Watershed Management**
- **Planning & Development Policy**

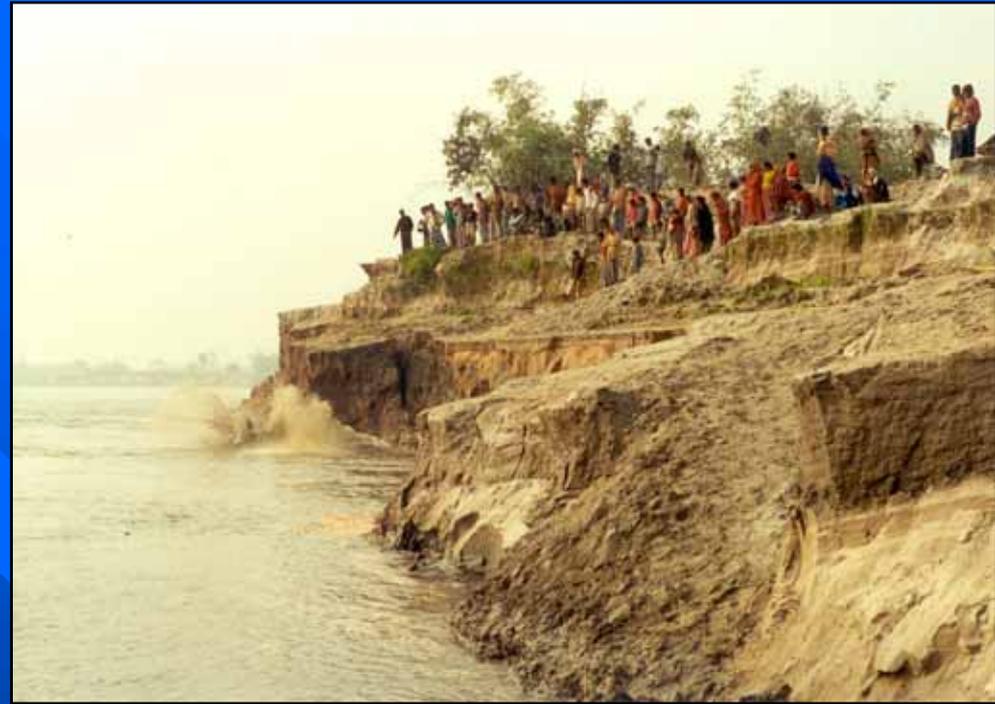
Rive erosion: Common scenario

- River erosion is an inevitable natural phenomenon in Bangladesh .
- The GBM river system drains about **1350** billion cubic meters of water of which **80%** flows during the monsoon season.
- Due to a fine sedimentary environment of the river course the substantial bank erosion rate is high as 1.0km/yr.
- Satellite images from 1982-1992 shows a loss of 106,300 ha land in GBM river system of which 70,000 ha lost in Jamuna only

Rive erosion: Common scenario (Contd.)

- **1200 km river bank is actively eroding and 500 km face severe problems related to erosion.**
- **Border river erosion is causing loss of land to the neighboring countries.**
- **Special care for the border river erosion control is required.**

River Bank Erosion



Water Resources Management

by

Bangladesh Water Development Board

The bottom half of the slide features several overlapping, semi-transparent blue geometric shapes, including triangles and parallelograms, arranged in a dynamic, abstract pattern.

Bangladesh Water Development Board (BWDB)

- Established in 1959 as water wing of erstwhile EPWAPDA on recommendation of 'Krug Mission Report'
- A prime organization in water sector mandated to manage, develop and harness the water resources of the country through combating floods, drought, river erosion, tidal inundation etc.

The Activities of BWDB

- Construction of dams, barrages, reservoirs, embankments, regulators etc for flood control, drainage, surface irrigation and drought prevention;
- Re-excavation of rivers/khals for irrigation, drainage improvement, fisheries, navigation, forestry, and environmental restoration including salinity control;

Major Physical Components

| | |
|------------------------|-----------|
| ■ Embankment | 9,943 km |
| – Coastal | 4,530 km |
| – Others | 5,413 km |
| ■ Irrigation canals | 5,111 km |
| ■ Drainage Channels | 3,783 km |
| ■ Hydraulic Structures | 13,949 no |
| ■ Pump house | 19 no |
| ■ Barrages | 4 no |
| ■ Rubber Dam | 2 no |
| ■ River Closures | 1300 no |
| ■ Bridges & Culverts | 5,593 no |

Protective Structures in Bangladesh



Protective Structures in Bangladesh

Mathurapara Hard Point



Protective Structures in Bangladesh



Photo 7.9-5: Groyne G-2, Bed Protection, dumped CC-Blocks (without filter layer)

Protective Structures in Bangladesh



Photo 8.2-7: Remnants of the groyne at Hasnapara (situation in December 1999)

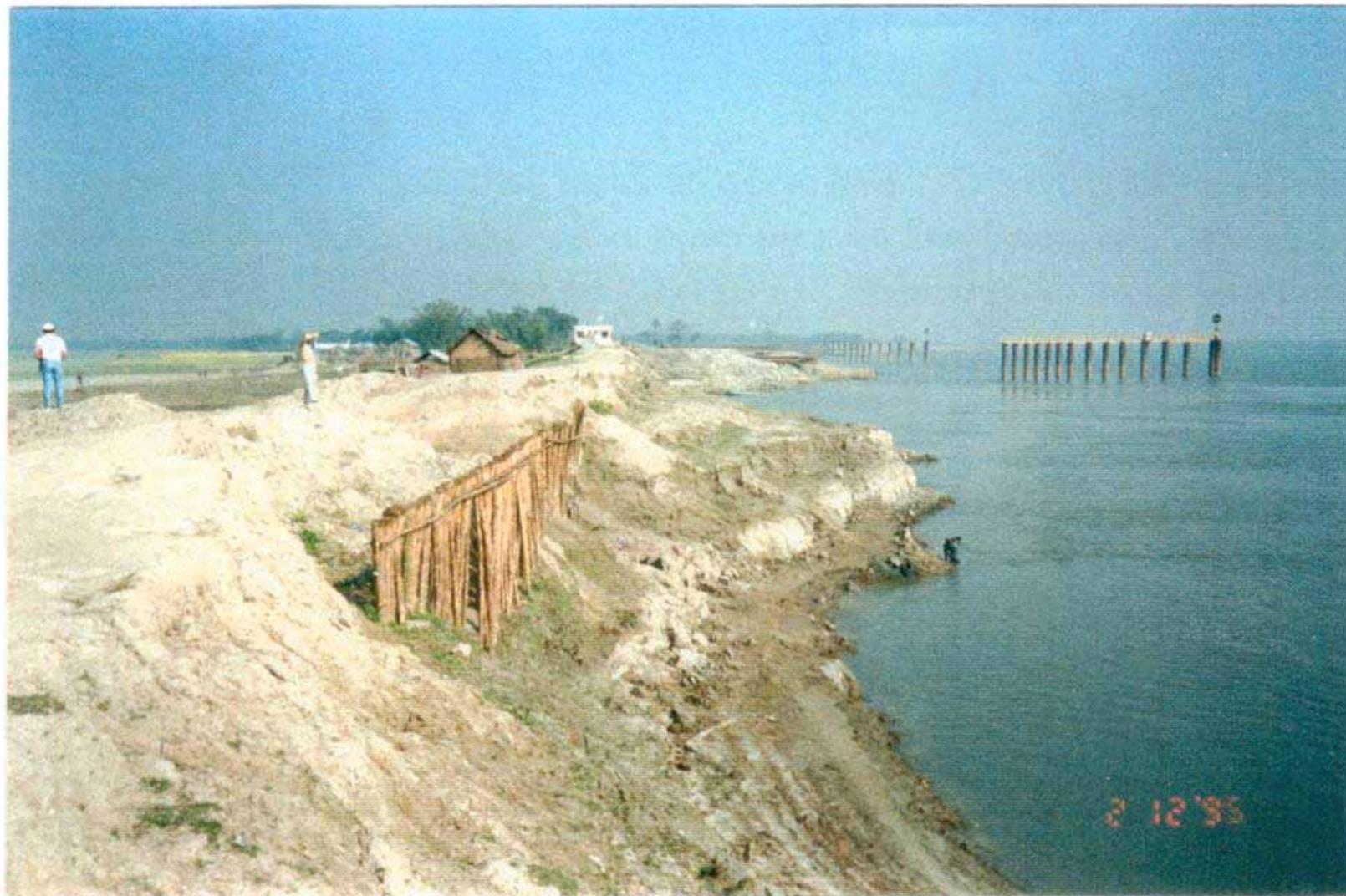


Photo 3.7-1: Remnants of groyne G-2 (view from downstream) and erosion of main embankment d/s of groyne G-2

Achievement of BWDB-Infrastructure

Projects Completed: 684 Nos.

a) Pre-Independence : 144 Nos

b) Post Independence
(1972-2005): 540 Nos

CONCLUSION :

- ✚ The GoB has already emphasized the need of a more integrated approach to water resources management.
- ✚ The present institutional framework in Bangladesh is already evolving towards a shape conducive for implementing IWRM.
- ✚ Yet, Bangladesh alone can not be successful in implementing IWRM concept.

Regional Cooperation:

Co-operation among the co-riparian countries of the GBM basins is an important factor in the field of IWRM to cope the water crisis and to boost socio-economic upliftment of the millions of people living in the GBM basins.

International agencies and Institution like the Asian Development Bank (ADB) and NARBO may have the potential of playing the role of an effective facilitator to forge cooperation amongst the co-basin countries of the Ganges, the Brahmaputra and the Meghna rivers.

Thank You