

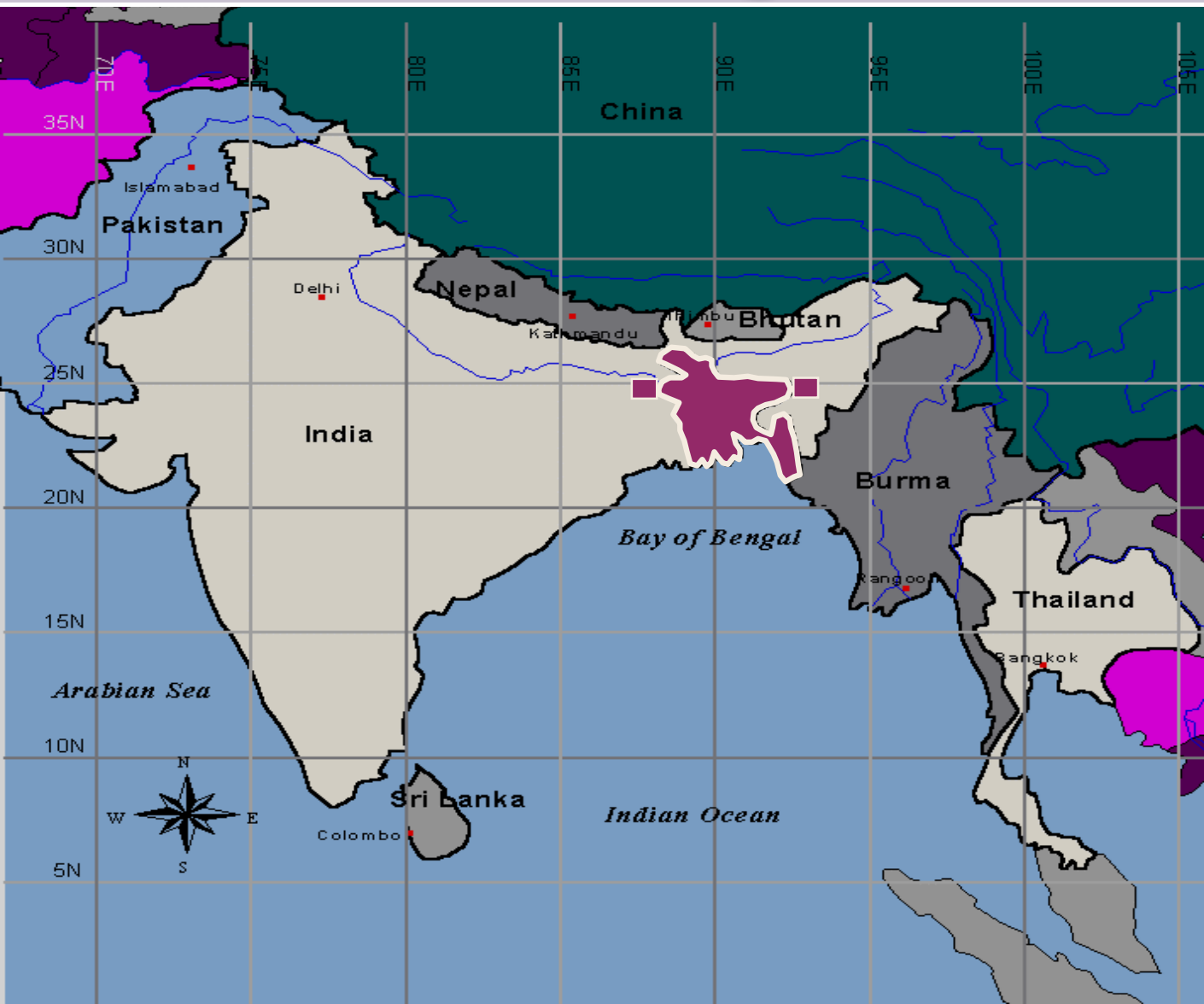
Ministry of Water Resources Of Bangladesh

Flood Control, Drought Relief and Disaster Mitigation

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Geo-Physical Setting Bangladesh

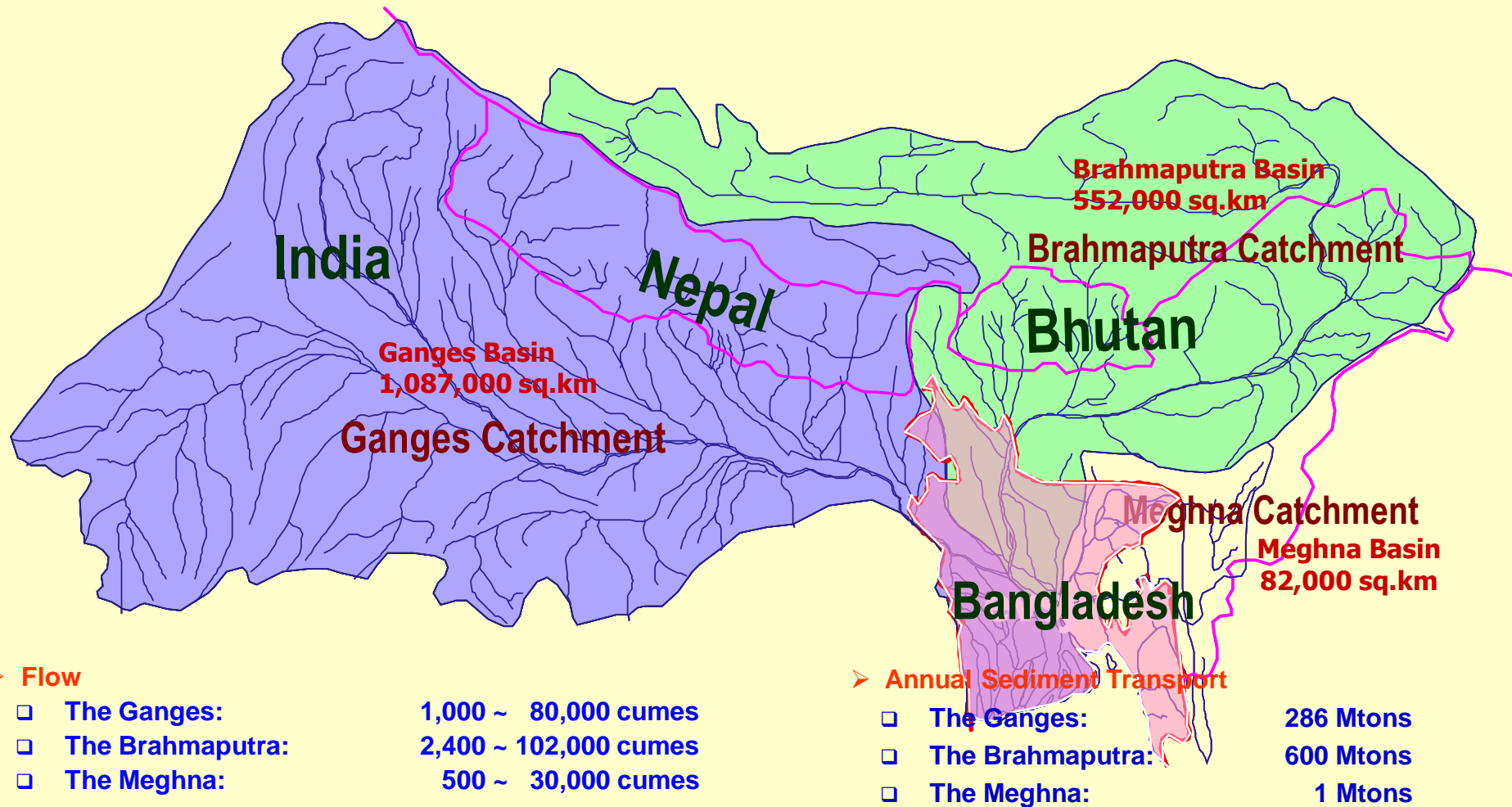


Bangladesh
surrounded on
the east, north
and west by
India,

by Myanmar on
south-east

and by Bay of
Bengal on
south.

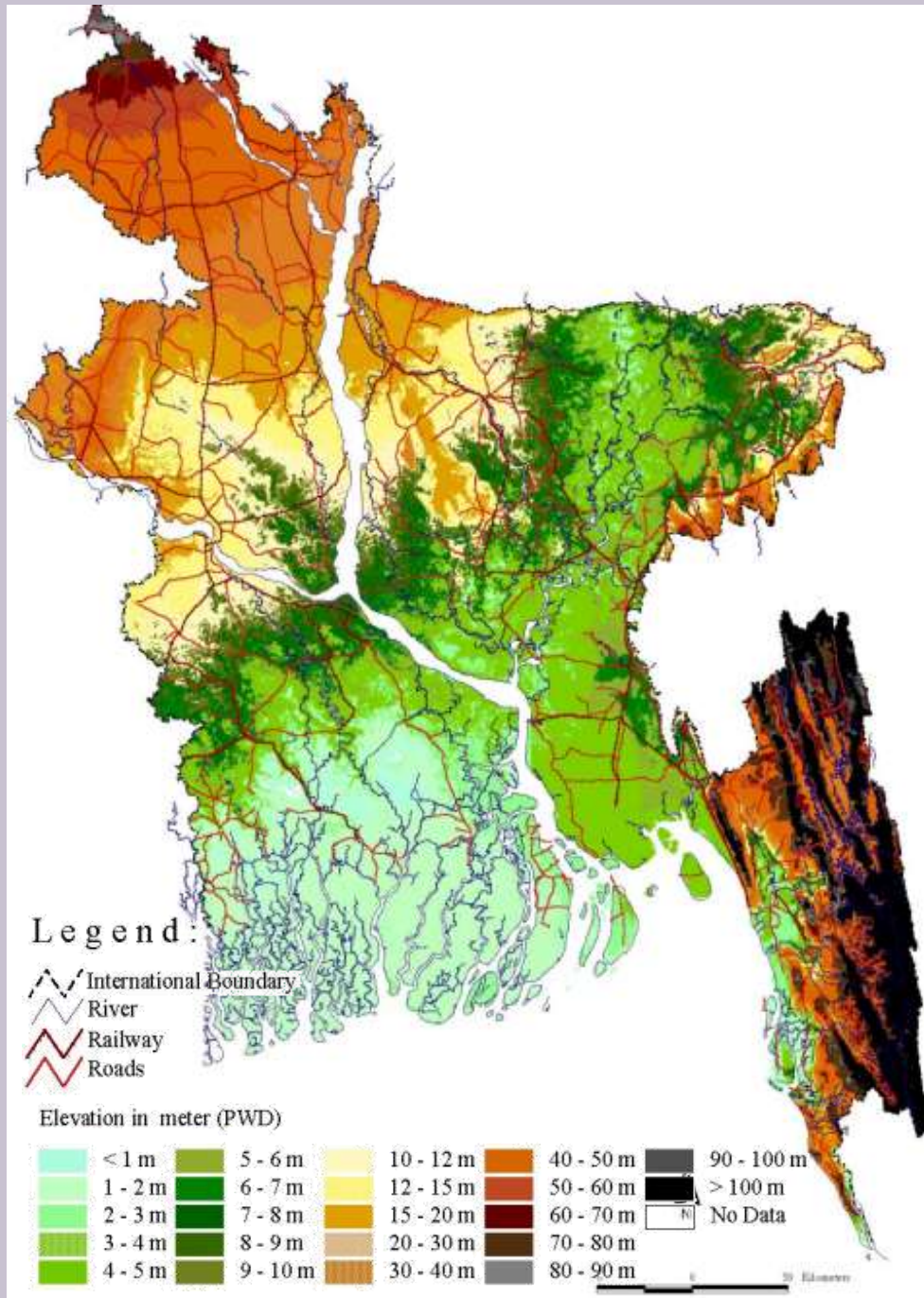
Ganges, Brahmaputra & Meghna River Basin Area



Total estimated sediment load ~ 1.1 BMT

Catchment of main three rivers is 1.72 million sq. km, of which only 7% lies within Bangladesh

Topography of Bangladesh



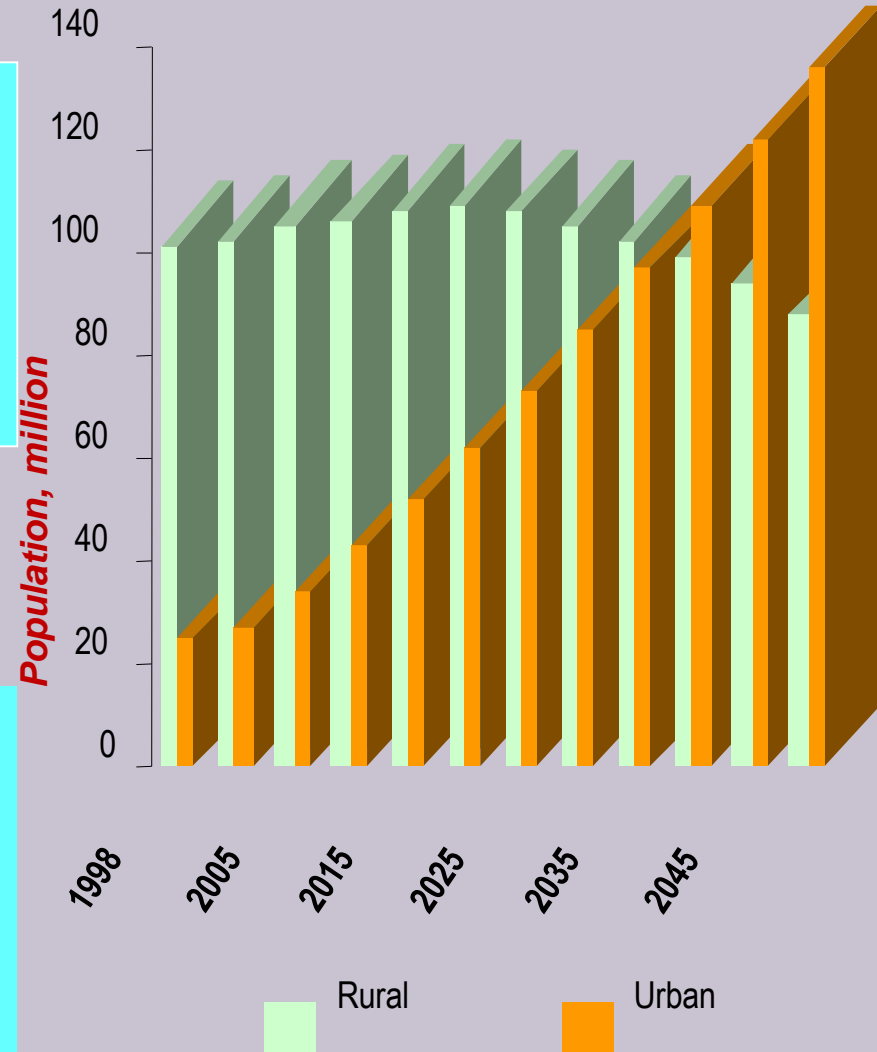
- About 50% of the country is within 6-7 m of MSL
- About 68% of the country is vulnerable to flood
- 25-30% of the area is inundated during normal flood

Population

- ❖ Present is 160.00 million.
- ❖ Expected to about 218 million by 2030.
- ❖ Expected to about 224 million by 2050.
- ❖ Expected to about 250 million by 2100.

- ❖ Rapid urbanization is 40% expected by 2025

- ❖ More Homestead,
- ❖ Increased forestry,
- ❖ Industrialization,
- ❖ Erosion & Global Warming etc. would reduce arable land and create poverty.



Population growth

Bangladesh at a glance

[Water Sector]

- ▣ Biggest delta of the world formed by sedimentation of the three great river systems.
- ▣ Lower riparian of 57 trans-boundary rivers.
- ▣ Tropical climate:
 - Annual average rainfall – 2200mm
 - 1200mm in NW & 5500mm in NE
- ▣ Availability of water:
 - Abundance in monsoon
 - Scarcity in dry season
 - Salinity is a crucial problem
- ▣ Total area : 1,47,570 sq.km.

Bangladesh at a glance

[Water Sector (cont'd)]

- ▣ Arable land: 82,400 sq.km.(8.24 Million ha)
- ▣ Population: 160.00 Million
- ▣ Population density: 1000 persons/ sq. km.
- ▣ Poverty level: 40.8% (as per HIES of BBS/WB).
- ▣ Total food production: 46.17 Million MT.
- ▣ River erosion
 - Annual land loss: 8,700 ha.
 - Annual displacement of population: 64,000.

☐ **Water is central to the way of life in Bangladesh.**

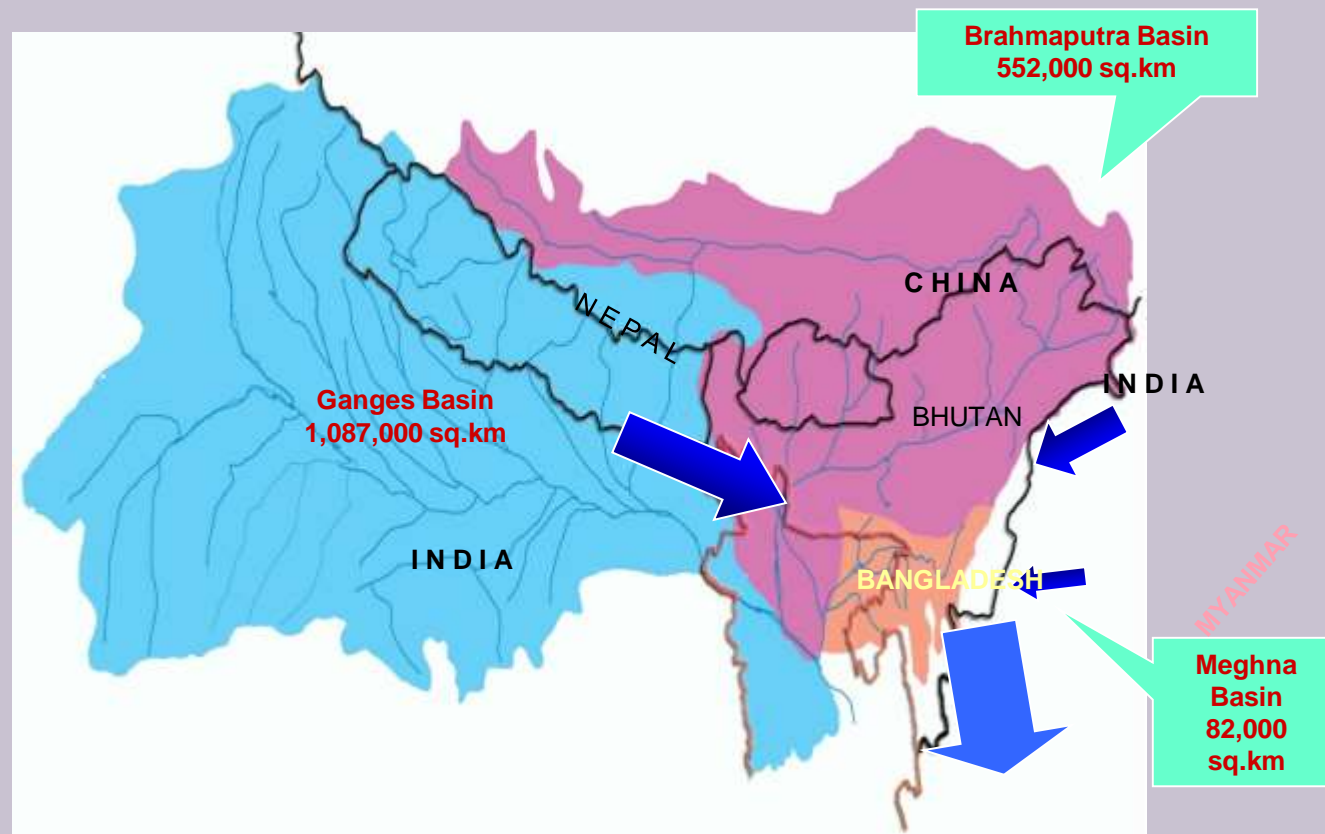
☐ **In monsoon plenty of water, sometimes create flooding**

☐ **In dry season, there is scarcity of water.**



Sources of Water

- ❖ The principal source of water in Bangladesh is the surface water from rivers. Other sources are runoff generated from precipitation and ground water.
- ❖ Local rainfall 250 BCM annually (80% occurs between July-Oct.)
- ❖ Trans-boundary annual inflow 1350 BCM (80% occurs between July-Oct.)



Natural Hazards/Vulnerabilities

Flood

- Flood occurs in Bangladesh regularly.
- 1954, '55, '74, '87, '88, '98, '04 & '07 floods were catastrophic.

Drought

- About 25% of the country suffer water stress in dry season.

River erosion

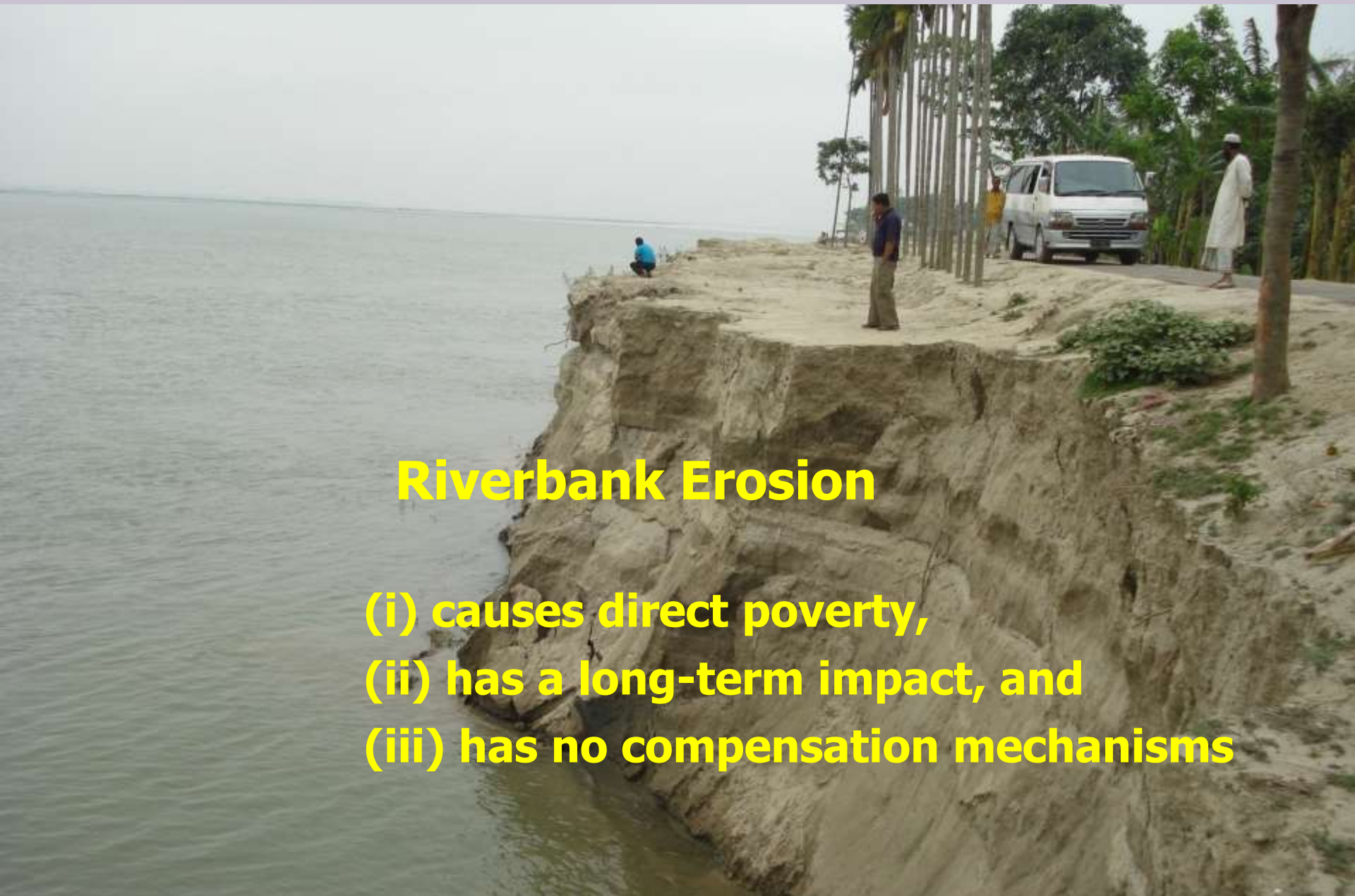
- About 8700 ha agricultural land erodes every year.
- Bank erosion ranges from 250-800 m every year.

Sedimentation

- Loss of navigability.



There are two types of disaster along rivers



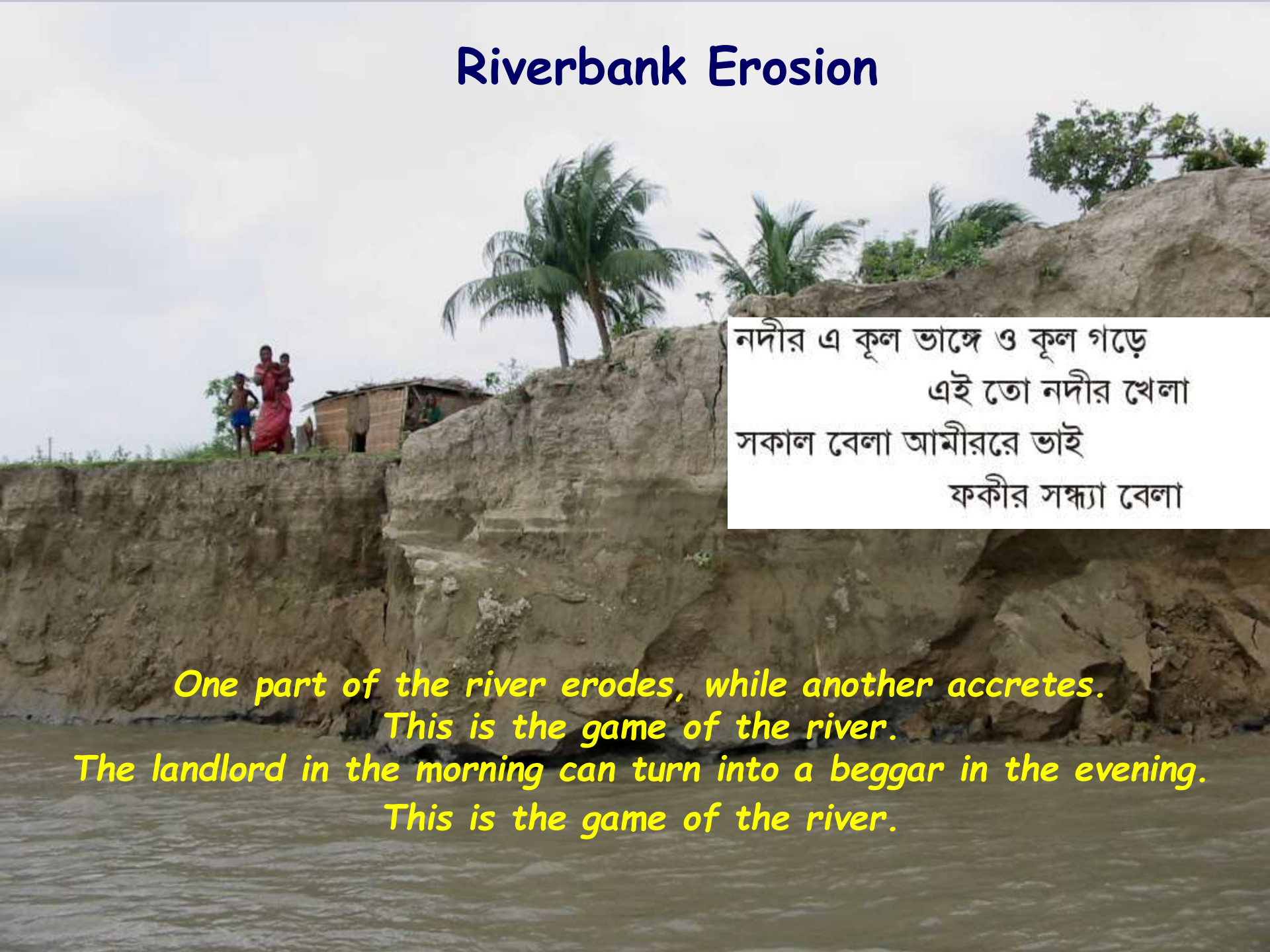
Riverbank Erosion

- (i) causes direct poverty,**
- (ii) has a long-term impact, and**
- (iii) has no compensation mechanisms**

River Bank Erosion



Riverbank Erosion



নদীর এ কূল ভাঙ্গে ও কূল গড়ে
এই তো নদীর খেলা
সকাল বেলা আমীররে ভাই
ফকীর সন্ধ্যা বেলা

*One part of the river erodes, while another accretes.
This is the game of the river.
The landlord in the morning can turn into a beggar in the evening.
This is the game of the river.*

(2) Flood Disaster

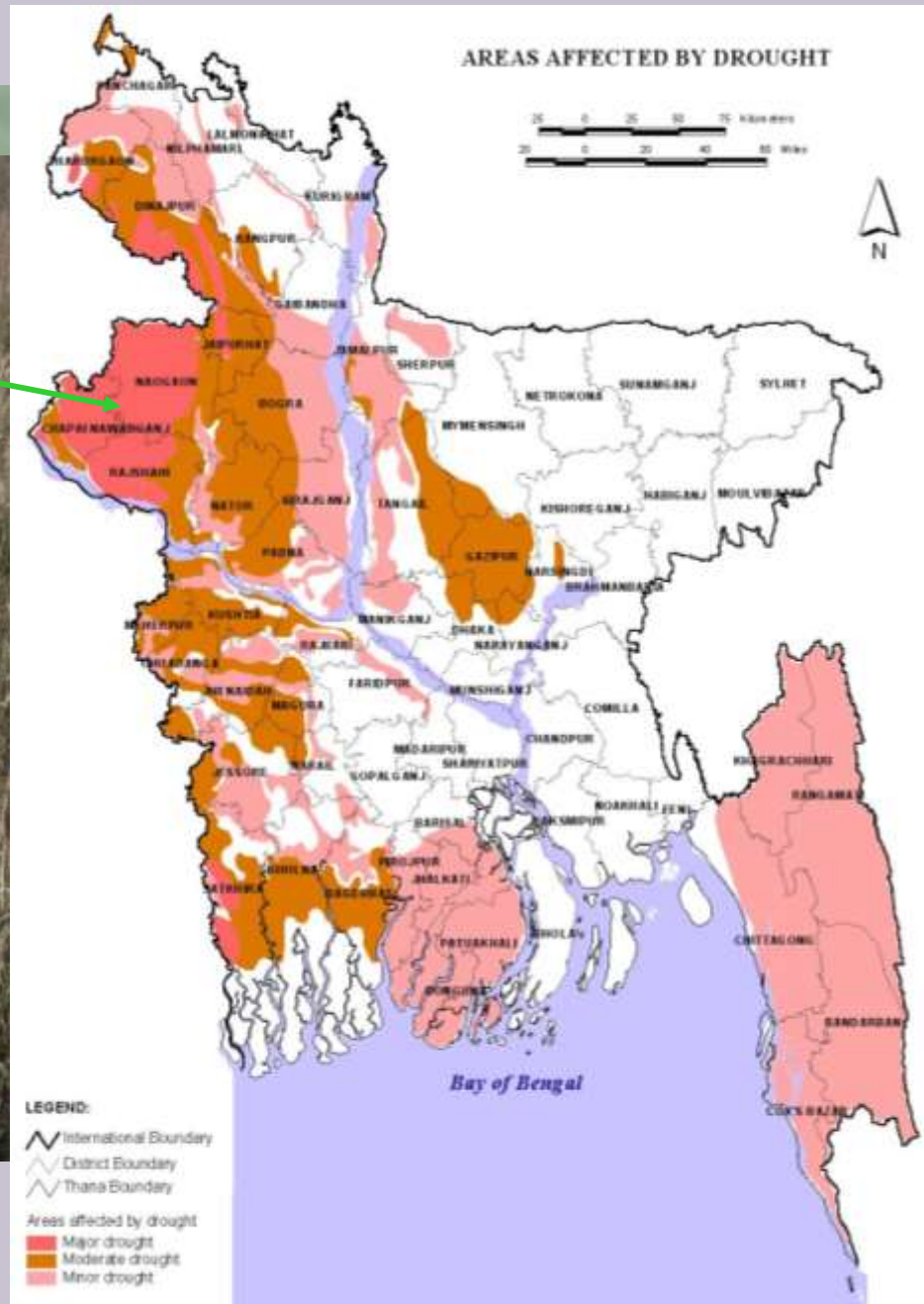
can occur when embankments erode during the monsoon season.



Flood



Drought

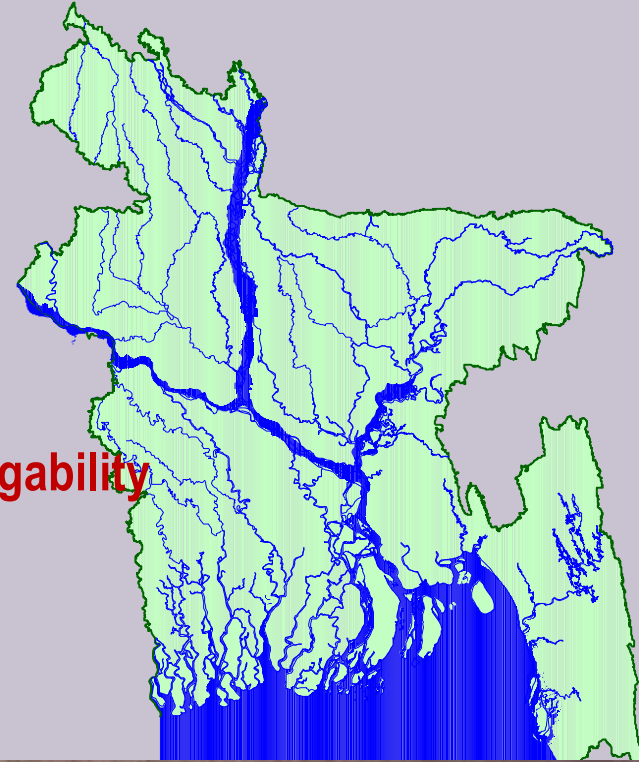


About 25% of the country suffer water stress in dry season

Sedimentation



Loss of Navigability



Natural Hazards/Vulnerabilities (cont'd..)

▣ Salinity intrusion

- Severe environmental degradation in SW areas.

▣ Arsenic contamination

- 59 district out of 64 are affected.

▣ Desertification

- Reduction of dry season flow induces creeping desertification in the Ganges dependent area.

▣ Cyclonic surge

- Annual phenomenon, however cyclone 1970 & 1991 were catastrophic. Recently Cyclone like Sidr (2007) and Aila (2009).

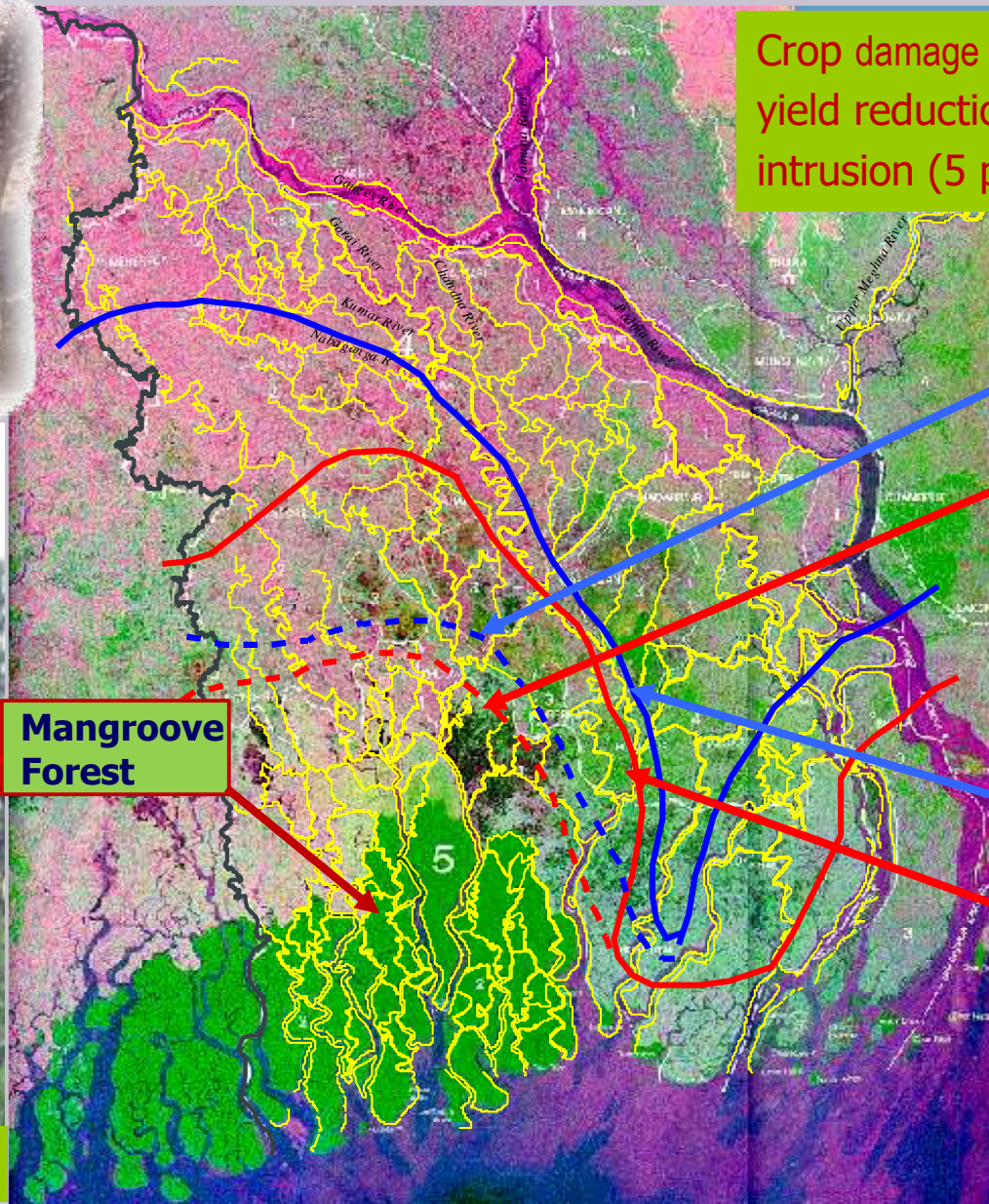
▣ Climate change

- 1.5 m sea level rise would affect 15% of the total population & 16% of the land area.

Sustainability of the Eco-System: **Salinity** Intrusion



Top-dying of Sundari trees



Crop damage and yield reduction due to saline intrusion (5 ppt)

1.0 ppt

5.0 ppt

1973

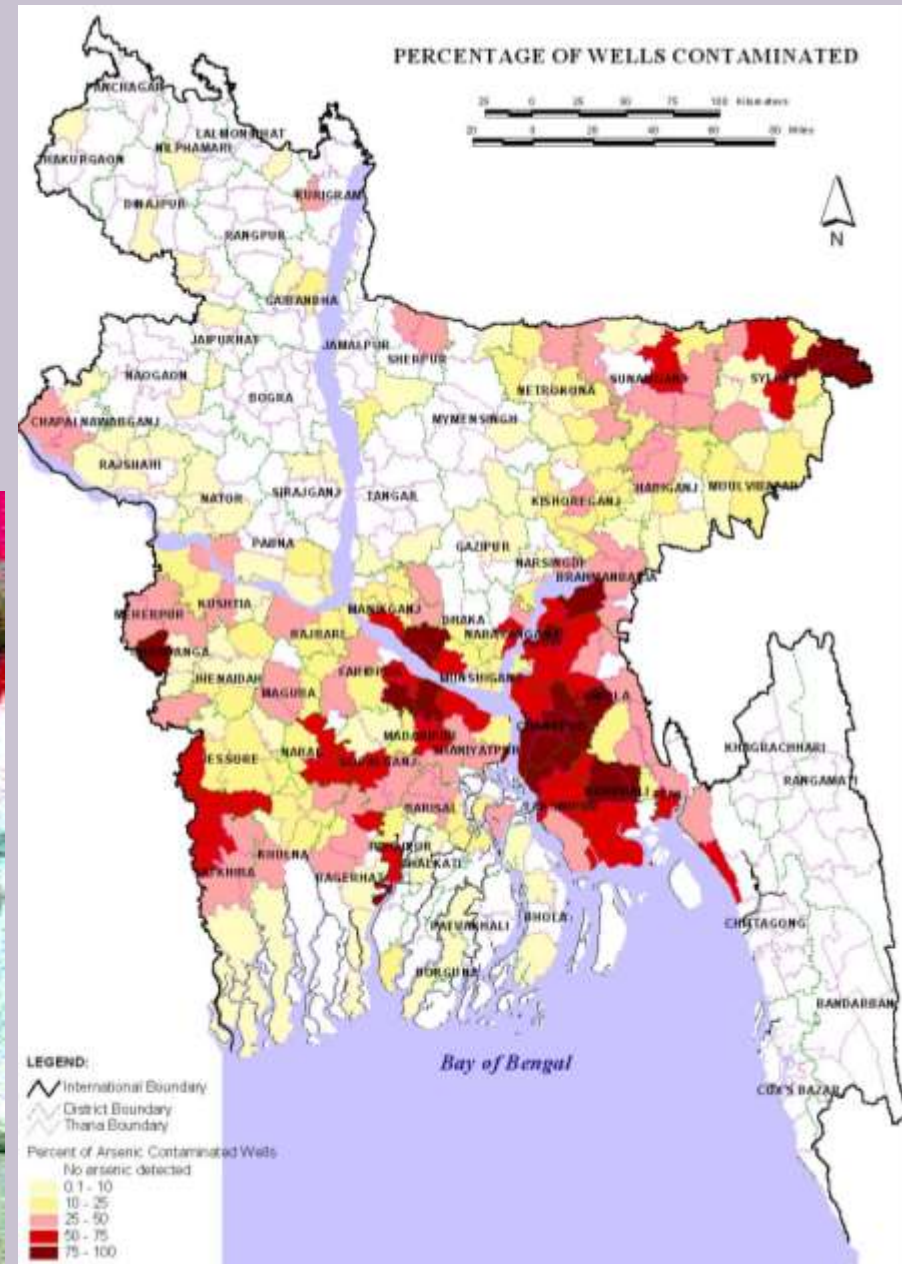
1.0 ppt

5.0 ppt

2006

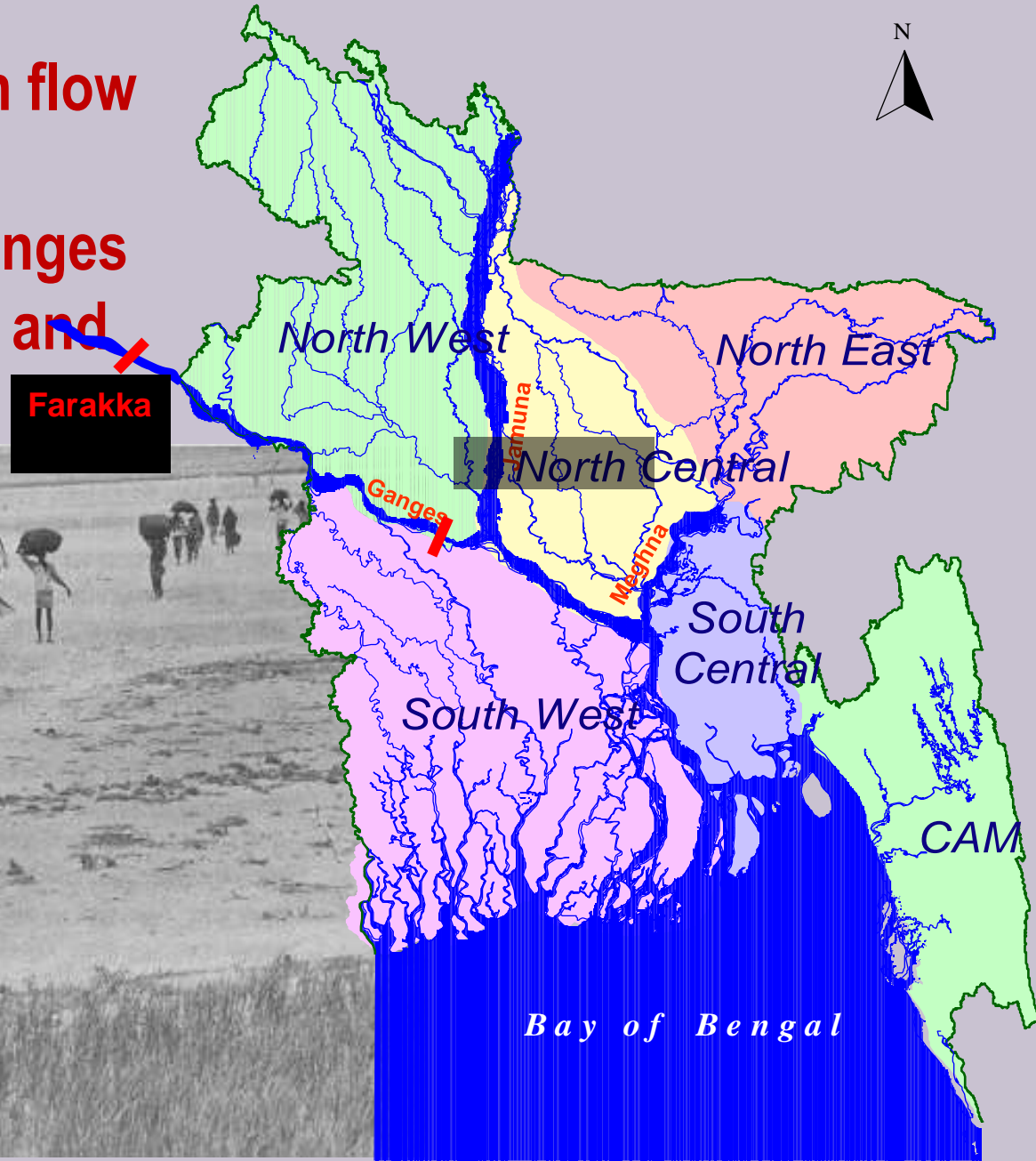
Arsenic Contamination of Groundwater

59 districts out of 64 are affected



Desertification

Reduction of dry season flow of the Ganges causing desertification of the Ganges Dependant Areas (GDA) and part of NW region.

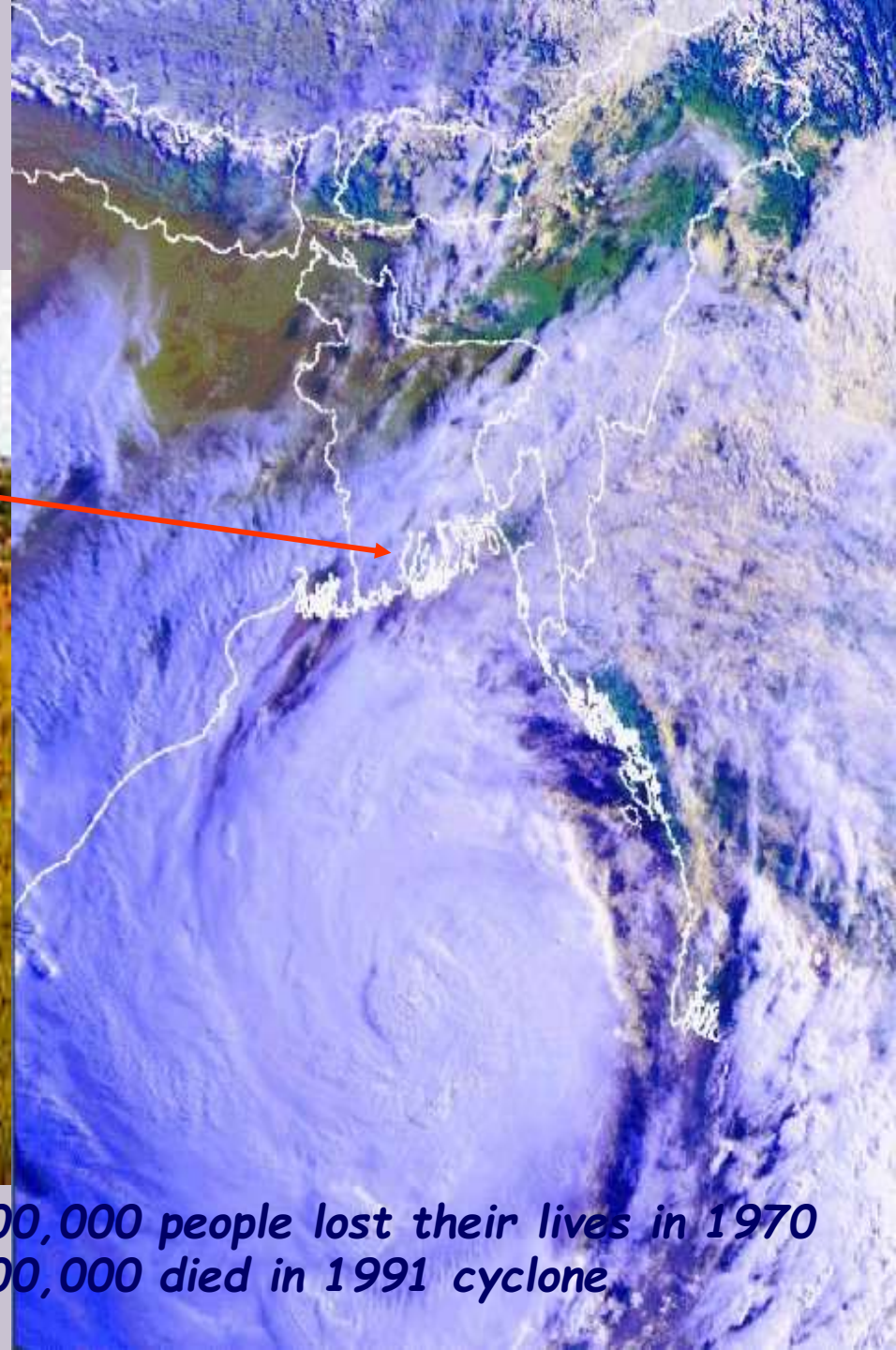


Natural Vulnerabilities

Cyclone induced flooding



*About 1/4th of the country
susceptible to tidal surges*



*300,000 people lost their lives in 1970
200,000 died in 1991 cyclone*



Cyclones Tracks in the recent years (SIDR, BIJLI & AILA)

Flood Control, Drought Relief
and Disaster Mitigation
projects taken by Ministry
of Water Resources
Of Bangladesh.

Flood Control, Drought Relief and Disaster Mitigation projects

- ❖ Total Budget for 2016-17 are 42 billion US dollar.
- ❖ Development Budget for 2016-17 are 14.5 billion US dollar.
- ❖ Dependency for Foreign loan/budget support 4.5 billion US dollar.
- ❖ Allocation for Water sector projects for 2016-17 are 0.50 billion US dollar (Project Aid- 0.15 billion US dollar.
- ❖ Asian Development Bank aided project 3 (allocation: 0.20 billion US dollar.
- ❖ Total Number of Water sector projects are 70.

Flood Control and Drainage (As a measure of Flood)

- ◆ Completed Projects: **709 nos.**
- ◆ Flood Control and Drainage facility area: **5.9 million ha.**
- ◆ Embankment length: **10,000 km**
- ◆ Hydraulic Structure: **14,110 nos.**
- ◆ Pump House: **19 (100 pumps)**
- ◆ Barrages: **4 nos.**
- ◆ Closure: **1,302 nos.**
- ◆ Bridges/Culverts: **5,599 nos.**
- ◆ Road: **1,031 km**



Irrigation (As a measure of Drought)

- ◆ Irrigation canal length: **5,153 km**
- ◆ Irrigation facility area: **1.4 million ha.**
- ◆ Crop production in FCDI project area: **26.6 million ton** (**59%** of total crop production in Bangladesh).



Bangladesh Water Development Board

- ▣ **Flood Control & Drainage Project**
- ▣ **Flood Control, Drainage & Irrigation Project**
- ▣ **River Bank Erosion Mitigation Project**
- ▣ **Land Reclamation Project**
- ▣ **Char Development & Settlement Project**
- ▣ **IPSAM project**

Bangladesh Water Development Board

- BWDB is working to mitigate the flooding, drought, salinity, sedimentation and Cyclonic Storm driven Tidal (Surge) floods.
- BWDB takes pre-disaster actions through FCD/FCDI/REM Projects
- BWDB takes actions at the time of disasters (floods) to sustain infrastructures, and provide warnings to the people through Flood Warning and Forecasting center
- BWDB takes actions after disasters (monsoon floods/tidal surges) to rehabilitate damaged infrastructures

Project Features of Teesta Barrage Project

Canal Head Regulator



Canal Head Regulator

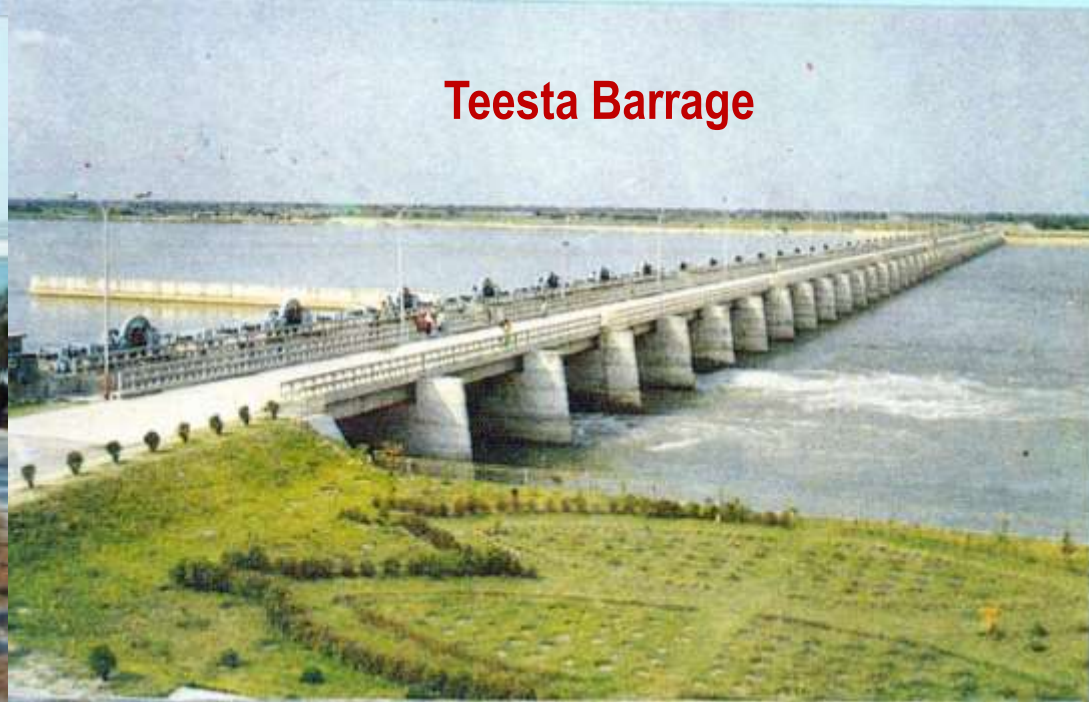
Length: 110 m

No of Vent: 8

Width of vent: 12.19 m

Flow capacity : 283 m³/sec

Teesta Barrage



Tessta Barrage

Location: Doani, Lalmonirhat

Length: 615m

No of Vent: 44

Width of Vent: 12.19 m

Flow capacity: 12752 m³/sec

CROSS REGULATOR

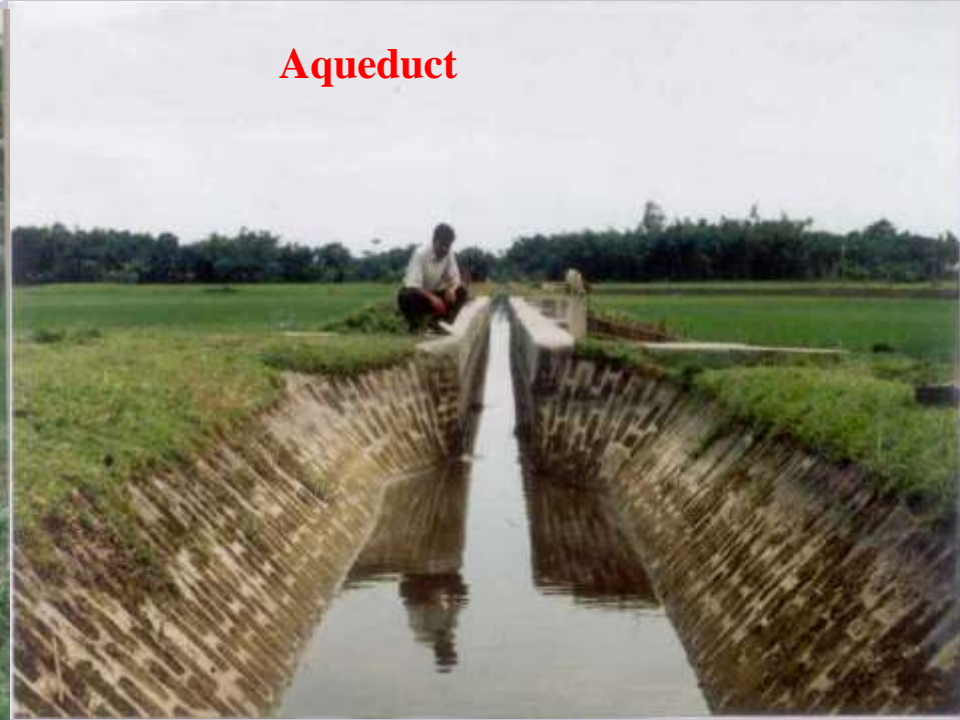


Tertiary canal



Syphone

Aqueduct



River Erosion Mitigation Project



Integrated Planning for Sustainable Water Management IPSWAM

working hard to improve our polder



Activities and Achievements of CDSP-III

Jarirdona khal re-excavation, BWDB



Boyer Char WMG by BWDB



Regulator by BWDB



Deep Tube-well by DPHE



Agricultural Production by DAE



Cyclone Shelter by LGED



Social Forestry by FD



Distributing khas Land by MoL 9500



Database Connectivity by BWDB and WARPO



Future Program

- ▣ Gorai River Restoration Project (Phase-II)
- ▣ Pilot/Capital Dredging of River System in Bangladesh (Phase-I)
- ▣ Procurement of Dredgers and Ancillary Equipment for River Dredging of Bangladesh
- ▣ Buriganga River Restoration Project (New Dhaleswai-Pungli-Bangshi-Turag-Buriganga River System)
- ▣ Dhaka Integrated Flood Control Embankment cum Eastern Bypass Road Multipurpose Project
- ▣ Rehabilitation of Ganges Kobadak Irrigation Project (GKIP)
- ▣ Kurigram Irrigation Project (North & South Unit)
- ▣ Up-gradation and Modernization of National Hydrological services in Bangladesh for Integrated Water Resources Management in the context of Climate Change
- ▣ Study for Impacts of sea level rise on the morphology of the coastal region of Bangladesh and Adaptation measures
- ▣ Early Warning of Storm Surge Inundation in the Coastal Area of Bangladesh.

THANK YOU

