8th NARBO IWRM Training,
27 November – 4 December 2013, Sri Lanka.

Welcome to
Group Presentation

IWRM of Ganges-Brahmaputra-Meghna Basin

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Country : Bangladesh

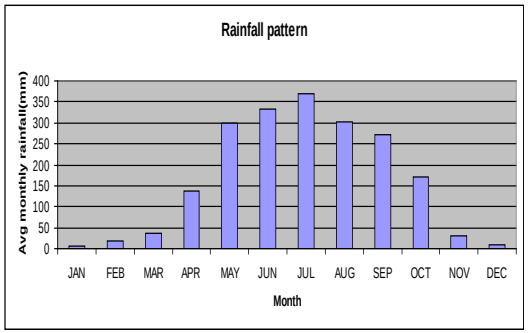
4 December, 2013

Contents of Presentation

- Overview of present Condition
- Future possibilities
- Conclusion
- IWRM Spiral

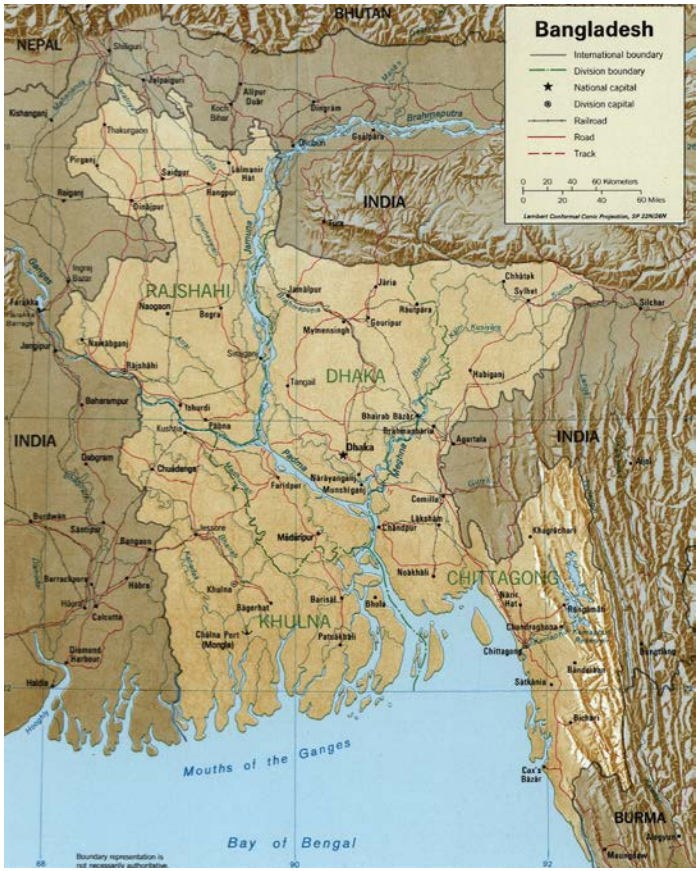
Natural conditions:

A tropical and a riverine country in Southern Asia.

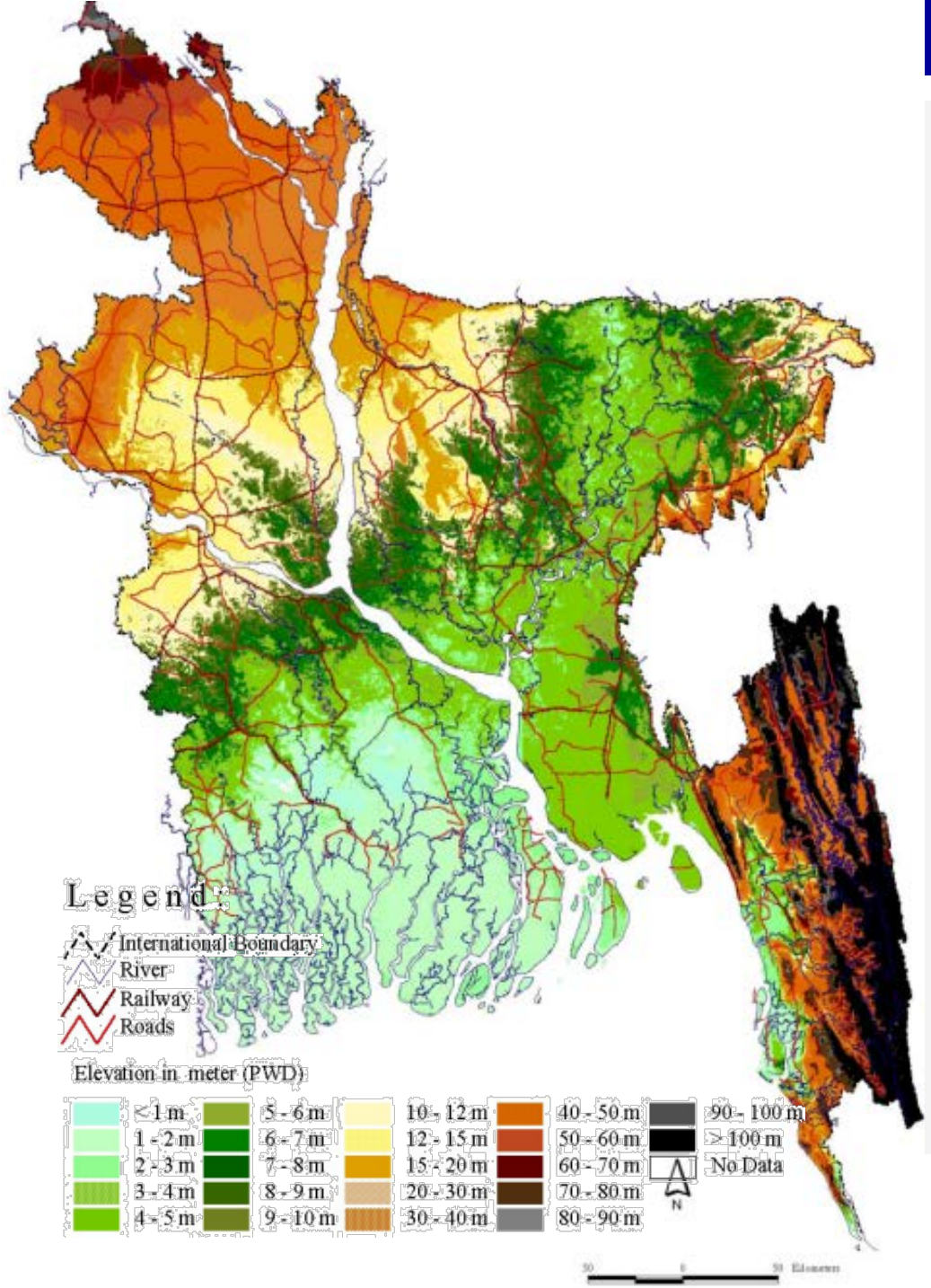


- Total area=147,570 km2 (Sri Lanka=65,610 sq km)
- Population density=1,015 persons/km2 (Sri Lanka= 330 persons/km2).
- Rainy season (June to Sept=4 month) accounts for **70 to 85**% of annual rainfall,
- average annual rainfall over country= **2,000 - 2,300** mm,

  (varies from **1,500 mm**. in west to **5,000 mm**. in north-east.)
- World highest annual rainfall of **10,820** mm(avg) Cherapunji in India, 16 km from BD border,



Topography of Bangladesh



- ❖ About 50% of country is below 7.0 m of MSL.
- ❖ About 68% of country is vulnerable to flood.
- ❖ 25 to 30% of area is inundated during normal flood

- Geomorphology of Bangladesh has 3 distinctive features:

(i) a broad alluvial plain subject to frequent flooding(80%): Elevations less than **10m**

(ii) a slightly elevated relatively older plain(8.4%):Elevations 20-25 m. Barind Tract &Madhupur Tract

(iii) a small hill region drained by flashy rivers(12.6%). elevation ranges between **600-900 m** .

- **Highest point is** Keokradong(**1,230 m**)

All Major rivers of South and South-East Asia are coming from Himalayan region

Name of Major Rivers=Ganges-Brahmaputra-Meghna

Origin of Major 3 Rivers=Nepal,China,India

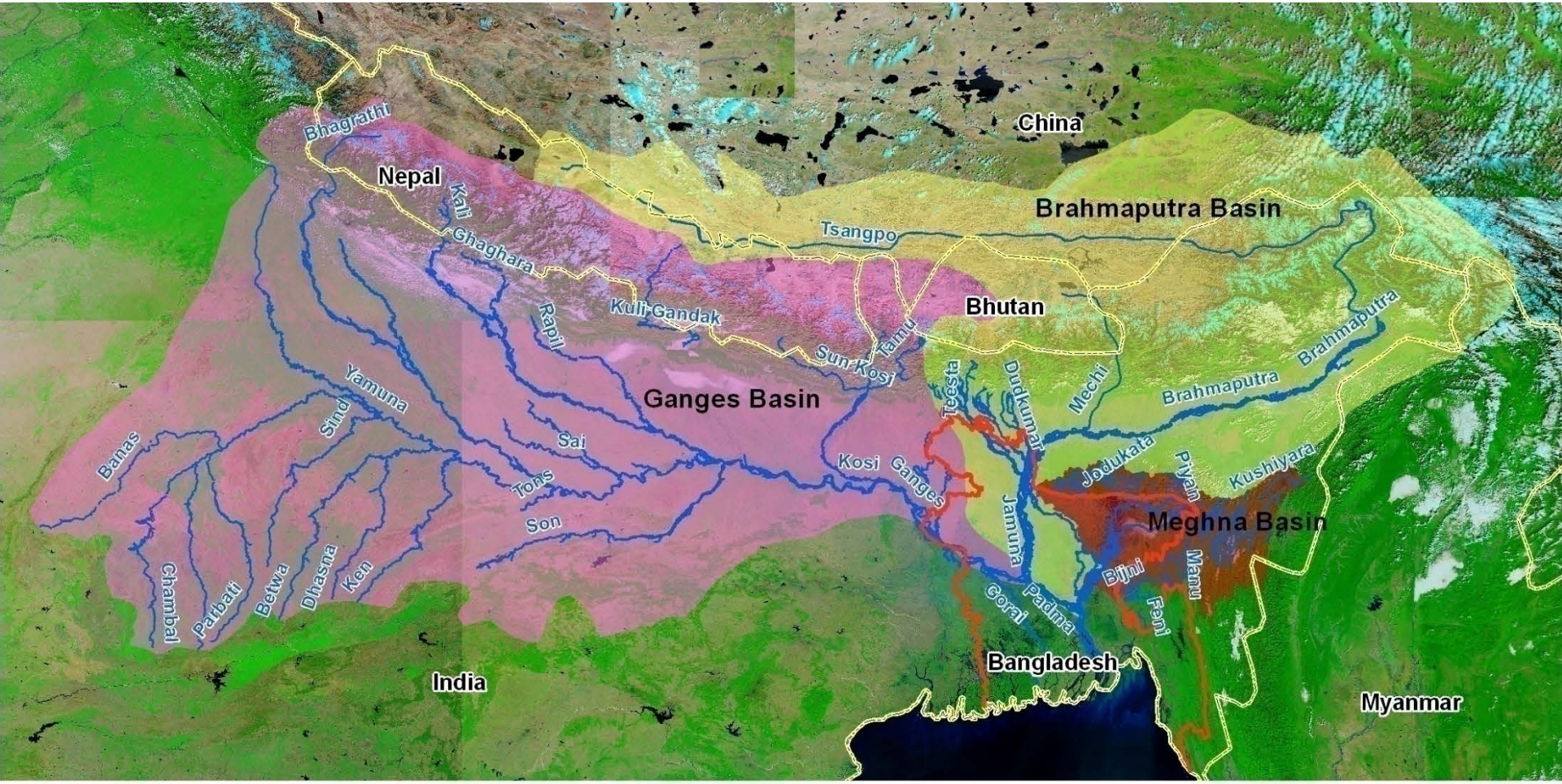
Total Length of 3 Rivers= 55,000 km

Basin Area of major 3 Rivers=1,761,300 Sq.km

Maxm. Discharge=250,000m3/s

Annual Sediment transport=1,765MTon

Bangladesh Setting

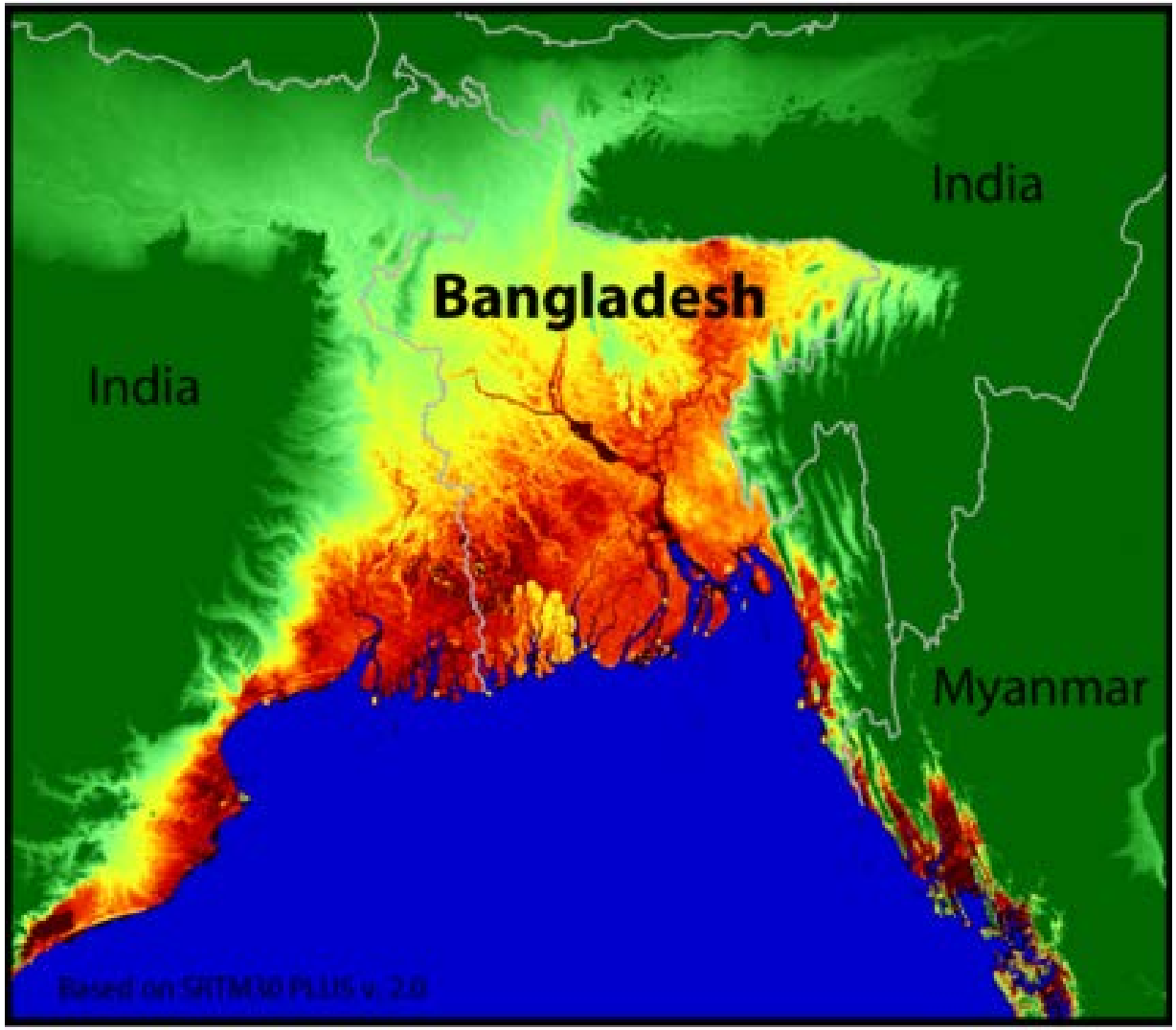


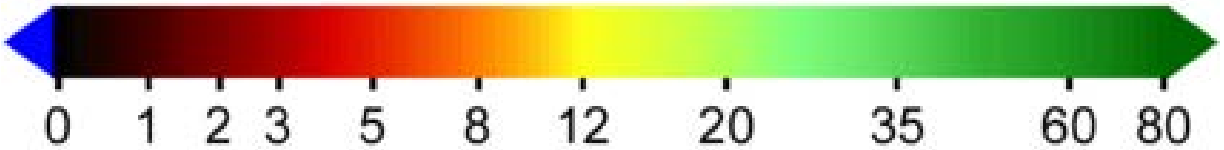
Ganges Basin	
Catchment Area (Sq. Km)	1087000
Av. Annual rainfall (mm)	1200
Av. Annual Discharge (m^3/s)	11000
Max. Discharge (m^3/s)	78000
Sediment transport (m ton/yr)	550

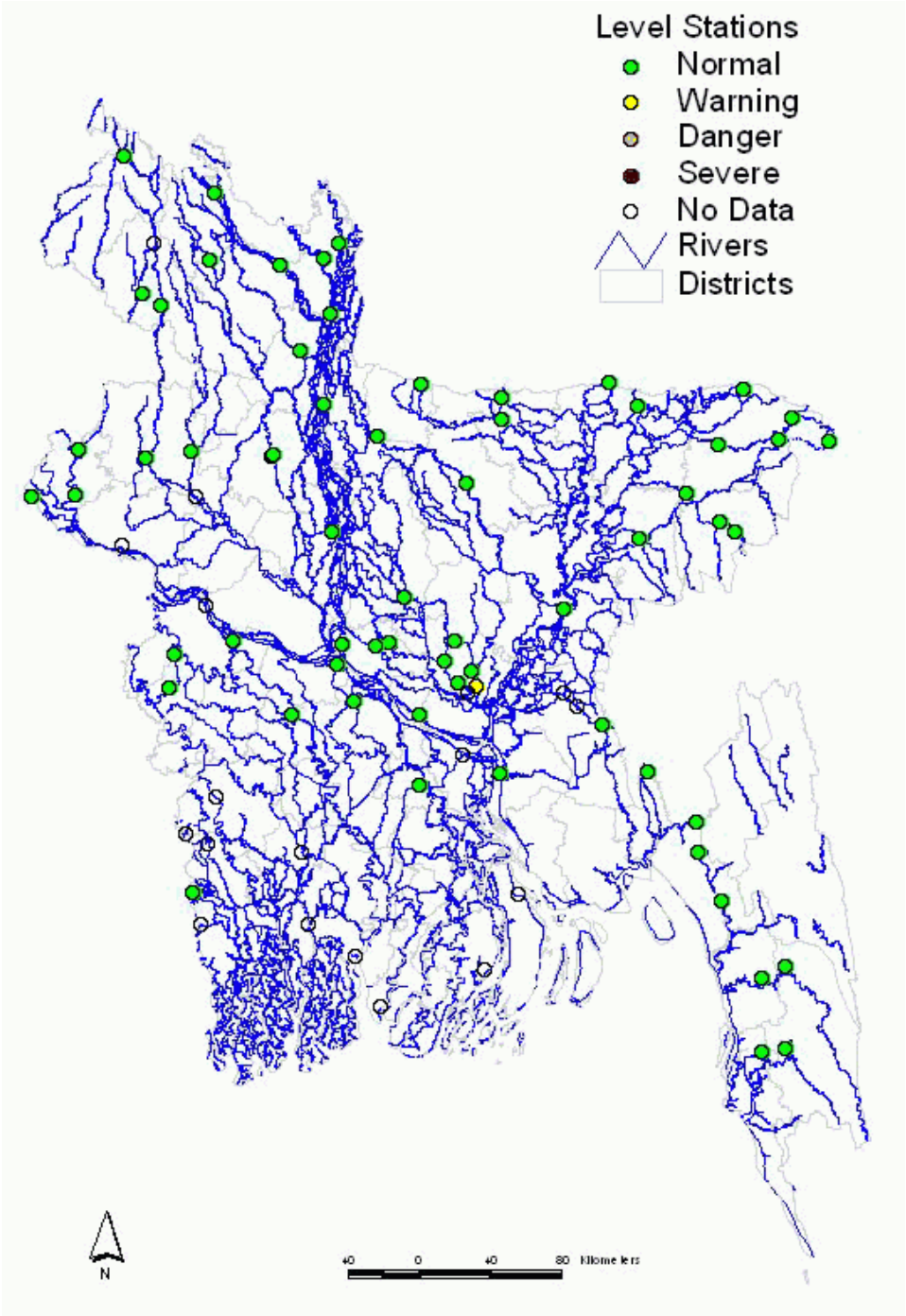
Brahmaputra Basin	
Catchment Area (Sq. Km)	552000
Av. Annual rainfall (mm)	1900
Av. Annual Discharge (m^3/s)	20000
Max. Discharge (m^3/s)	100000
Sediment transport (m ton/yr)	590

Meghna Basin	
Catchment Area (Sq. Km)	82000
Av. Annual rainfall (mm)	4900
Av. Annual Discharge (m^3/s)	4600
Max. Discharge (m^3/s)	20000
Sediment transport (m ton/yr)	13

Sea Level Risks - Bangladesh






Level Stations
Normal
Warning
Danger
Severe
No Data
Rivers
Districts
N
40 0 40 80 Kilometers

Salient Feature

- # About **93%** of the GBM Basin area outside BD.
  (only **7%** area inside Bangladesh).

- # An average annuall flow of **1,009,000 Million m3** ,
  80% occurs **from June to September.**
  Stored over BD Plain, about **9.0 m** of standing water depth

- # Transports each year into BOB =**1.8 billion tons.**
  Stored over BD, about **1.6 cm thick** sedimentation

- # Low topography, about **22%** area of country is flooded.
  FCD devices(embankments,regulators , sluices..) are constructed to reduce depth of flooding for crop production.

Name of River	Total Basin Area (Km2)	% of Basin Area contained by different Countries					
		Bangladesh	India	Nepal	Bhutan	China	Myanmar
Ganges	1,087,000	4%	79%	13%	-	3%	-
Brahmaputra	532,000	4%	36%	-	9%	51%	-
Meghna	102,000	48%	50%	-	-	-	2%
Total=	1,761,300	7%					

The 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

Too much water - flooding

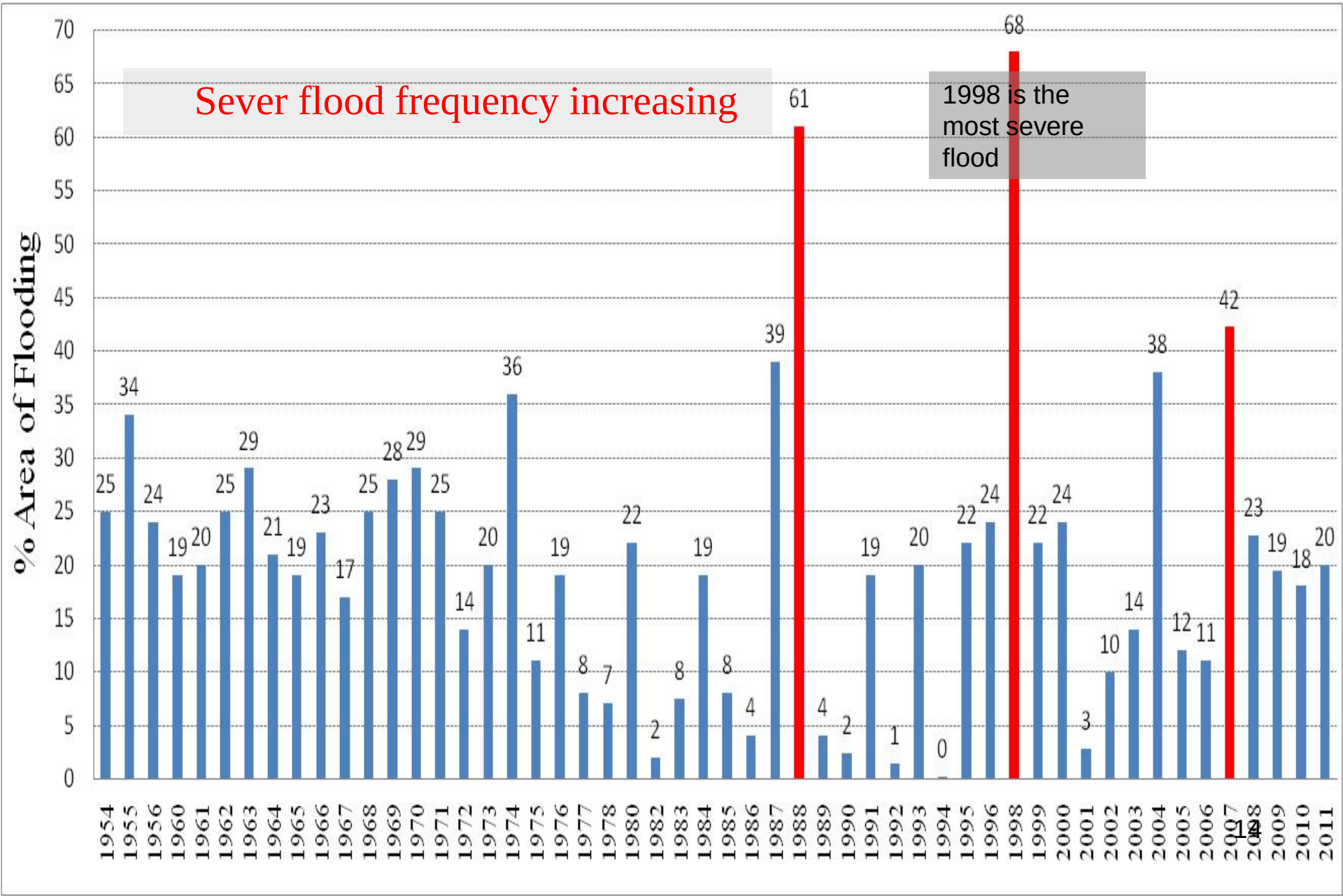
Too little water-drought

Erosion – source of many social prob

Climate Change

- Sea Level Rise
- More salinity intrusion
- Sever Flood
- Sever cyclone
- Sever drought
- Erratic rain

Flooded Area from 1954 to 2011

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Water a threat to living condition and development

WATER
is great
opportunity
for
Bangladesh

MAJOR PHYSICAL COMPONENTS CONSTRUCTED BY BWDB so far (As of June 2013)

- Embankment= 10,405 km.
- Hydraulic Structures=14,287 nos
- Irrigation Canal= 5,175 km.
- Pump House=19 nos.
- Barrage = 4 nos.
- River Closures= 1,330 nos.
- Area reclaimed from sea= 0.1 million ha
- Area benefited(FCDI)= 6.00 million ha
- Irrigaion Area benefited(FCDI)= 1.00 million ha
- Increased Food production per year=182.95 billion Tk

Teesta Barrage

Sluices at Bhola

Drainage canal at Noakhali


6 10'98

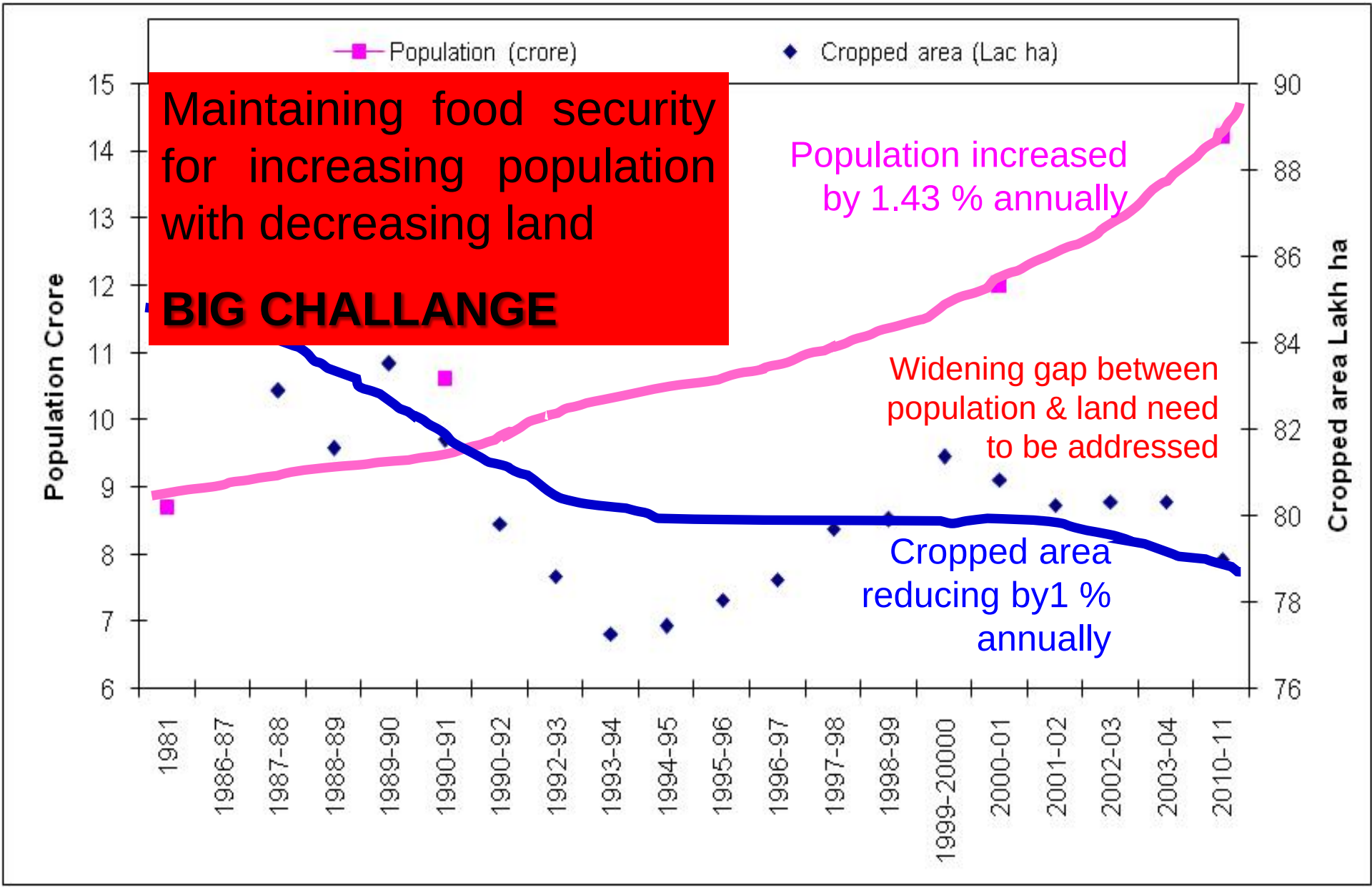
Water Sector Development 1954-2013

- Devastating flood in 1954 and 1955, 'Crug Mission' formed in **1957** under UN.
- As per mission's recommendations, EPWAPDA started operation in **1959.**
- In 1964, a 20-year Water Master Plan(IECO Master Plan), prepared by EPWAPDA with USAID assistance.
- The water wing of the the authority was restructured in **1972** into Bangladesh Water Development Board(BWDB).

Water Sector Development 1954-2013(Contd)

- Flood in 1987 &1988.
- Flood Action Plan(FAP) formulated.
- **National Water Policy (NWPo)-1999.**
- The enactment of the **BWDB Act, 2000.**
- **National water Management Plan (NWMP)-2004.**
- **National Water Act,2013**

Population vs Cropped area of Bangladesh



Future Possibilities

Bangladesh and IWRM:

- **Water, the fundamental need of all living beings, is the single-most important resource for the wellbeing of the people of Bangladesh .**

- **Floods during monsoon and scarcity of water during the dry seasons are the two extreme characteristics of water availability in Bangladesh.**

- **Both these events cause extreme miseries and hardship to the millions of people.**

•Over the decades Bangladesh has been trying to overcome this twin problem by adopting various measures and projects under different water management endeavors.

• These measures have brought in significant gains.

• Thousands of hectares of lands with agriculture, homesteads and other infrastructures have been protected from the fury of floods in varying degrees.

Basin wise - management of international river waters

- **managing risks; valuing water; governing water wisely;**

- **Integrated Water Resources Management (IWRM)would be the only tool to face these challenges.**

Transboundary River Waters and Bangladesh

- **Bangladesh is the lowest riparian of more than 50 transboundary rivers.**
- **It has no control over the flows of these rivers.**

- **There are problems of sharing the waters of these rivers with the upper riparian.**

- **If these problems are not resolved betweenthe riparians through mutual understanding in a spirit of good neighborliness then the IWRM in Bangladesh would remain only a dream.**

- **In addition, generation of huge hydropower to meet up energy crisis in the region create more job opportunities through Industrialization.**

- **To that end, Bangladesh, India and Nepal can form the Ganges River Basin Organization**

- **A portion of the monsoon floods of the Ganges which cause widespread damages in the cobasin countries could be conserved in the upstream storage sites (particularly in Nepal) to mitigate flood intensities downstream.**

- **This in turn would enable significant augmentation of the dry season flows of the Ganges satisfying the reasonable water needs of all the co-basin countries.**

International River Basin Organizations for the Brahmaputra and the Meghna Rivers

- The water availability in the Brahmaputra and the Meghna river basins are also highly seasonal like the Ganges.

- Storage of some parts of the monsoon flows of these rivers can easily meet the dry season water demands in the co-basin countries.

- China, India, Bhutan and Bangladesh can form the Brahmaputra River Basin Organization.

- Similarly India and Bangladesh can consider constituting the Meghna River Basin Organization.

CONCLUSION :

- Water in the Ganges, the Brahmaputra and the Meghna rivers are too precious resource.

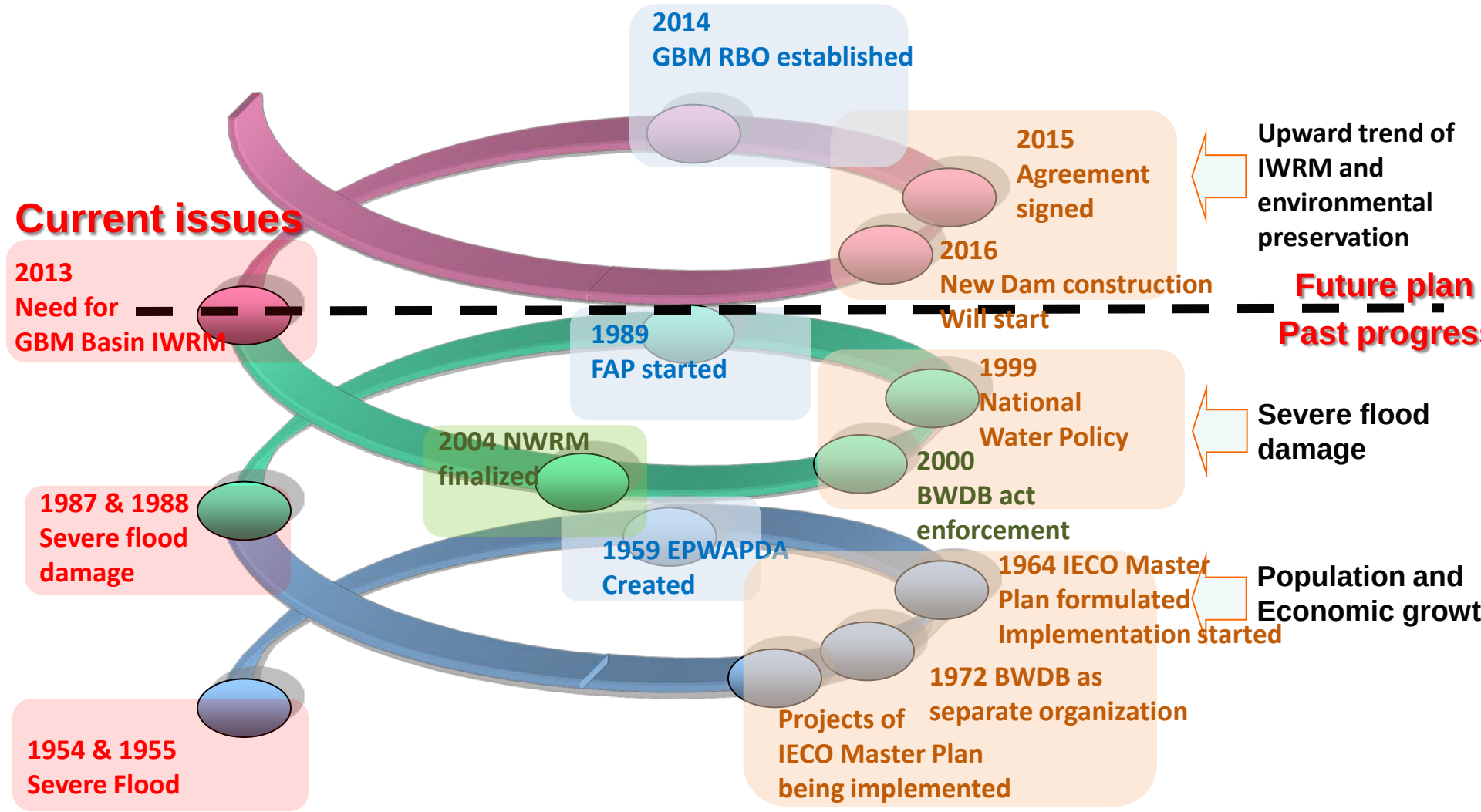
- It is a tragedy that the people living in these basin areas are still one of the poorest in the world despite the basins' rich endowments.

- The co- basin countries of these rivers can move forward to form the River Basin Organizations of the Ganges, the Brahmaputra and the Meghna towards transforming this region from one of the poorest to one of the most prosperous.

International agencies and Institution like the Asian Development Bank (ADB) and NARBO(Network for Asian River Basin Organization) 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.

IWRM of GBM Basin



Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and United Nations Educational, Scientific and Cultural Organisation (UNESCO, Paris), 1999.

Thank You

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