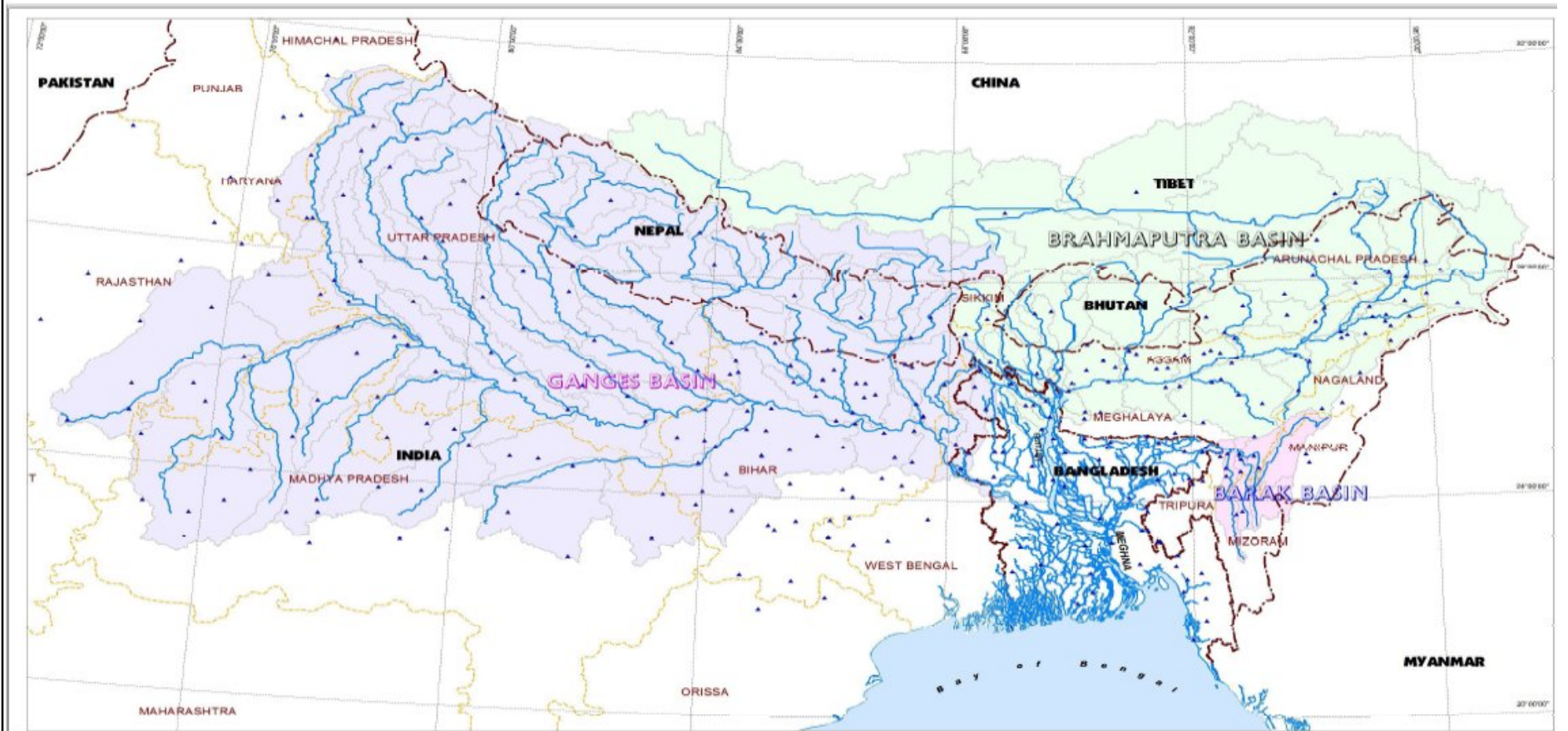


# Learning from development of polder system in lower GBM delta

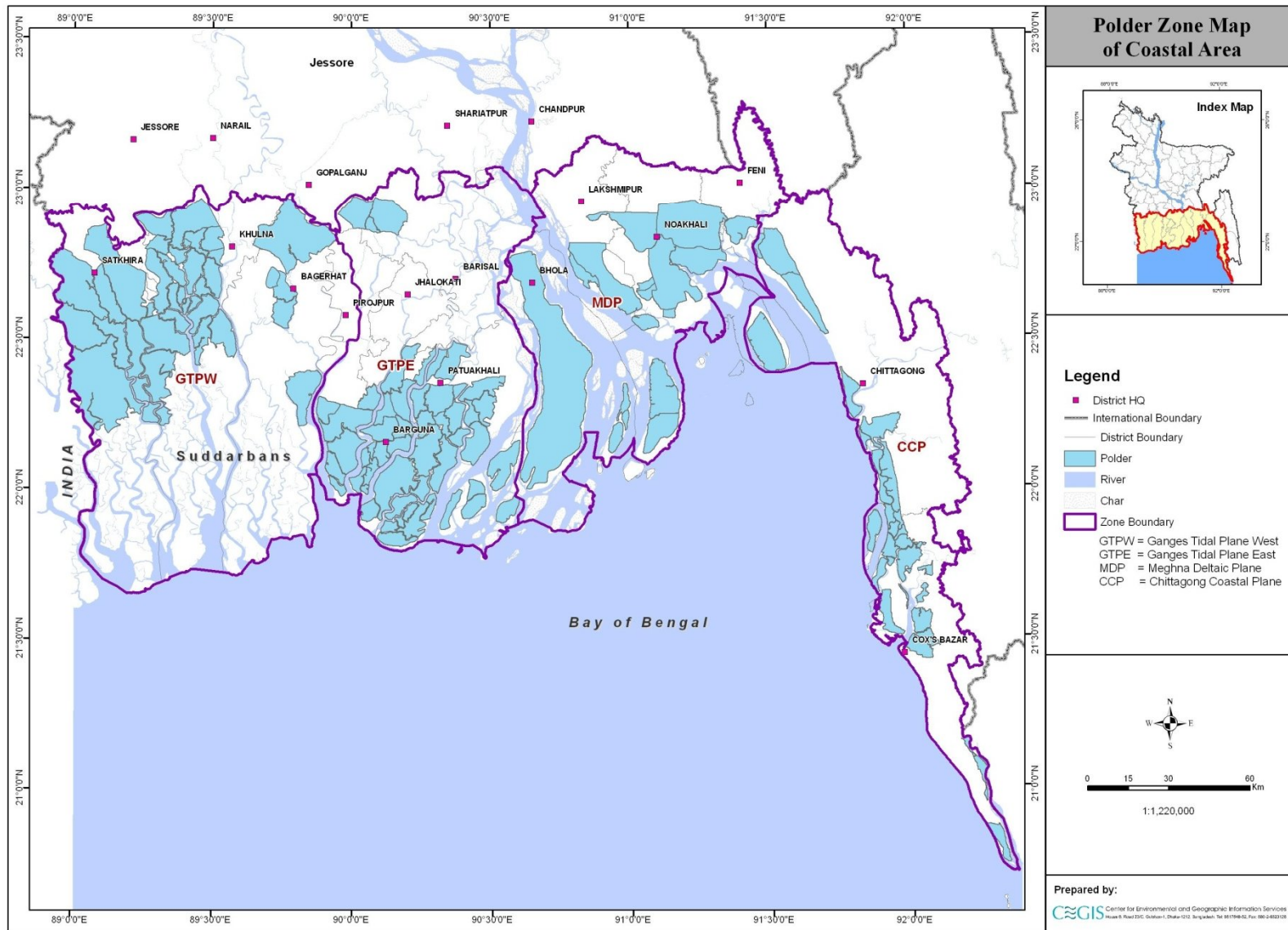
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# Ganges-Brahmaputra-Meghna (GBM) basin



# Polder System in Bangladesh



# Historical developments of polders

Timeline	Drivers	Policy focus	Major purpose
Early 1960s	Major flood in 1950s, population increase	Food security	Rice production through protection against tidal flood and salinity
Mid 1980s	Export earning	Economic development	Shrimp cultivation through intake of saline water
Late 2000s	Frequent cyclones	Climate change resilience	Improvement of living condition through protection against regular inundation

# Impact of polders on crop production

## ***Intervention***

- Embankments encircling tidal floodplains in order to secure crop against regular tidal flood and salinity
- Delinking of floodplain from rivers and loss of floodplain sedimentation

## ***Gain***

- Agricultural production increases
- Positive social impacts

## ***Loss***

- Floodplain fisheries production decreases
- Economic return???
- Siltation of rivers leads to severe drainage congestion
- The impact propagates to Sundarbans mangrove forest

# Impact of polders on crop production (Contd.)

## ***Lesson learnt***

- Open water fisheries loss was not accounted
- Absence of beneficiary participation
- Inadequate O&M
- Inadequate monitoring

## ***Policy recommendations***

- Accounting for loss of ecosystem services
- O&M funding should be ensured
- Participatory planning and monitoring

# Use of polders for shrimp farming

## ***Intervention***

- Retrofitting embankments with saline water intake structures creating permanent saline environment within the polders

## ***Gains***

- Shrimp becomes 2nd largest export earner

## ***Loss***

- Saline land and water
- Complete degradation of homestead ecosystems (loss of vegetable, fruits etc.)
- Severe social conflict between crop and shrimp farmers.

## ***Policy recommendations***

- Prohibiting shrimp cultivation within polders
- Land use zoning

# Damages to polders due to cyclone

## ***Observations***

- Increase in cyclonic activities
- Many polders affected in 2007 and 2009
- Polders are unable to provide protection against storm surge
- Shrimp polders were more damaged than others

## ***After effects***

- Living condition severely degraded
- Migration



# Damages to polders due to cyclone (Contd.)

## ***Rehabilitation***

- Rehabilitation has been very difficult
  - fund
  - Procedures and logistics
  - Vested interest

## ***Policy recommendations***

- Raising and strengthening polders against climate change threats (sea level rise, cyclone)
- Who will pay?? Climate change financing
- Emergency management fund
- Proper maintenance of embankment

# Broad Lessons

- Shifting goal posts
- Tidal floodplain ecosystem is sensitive
- Adaptive planning

# Thank you for your attention

