

# Nature Based Solutions – Introduction to Bangladesh and its delta

Catharien Terwisscha van Scheltinga



WAGENINGEN  
UNIVERSITY & RESEARCH



EcoShape  
*building with nature*

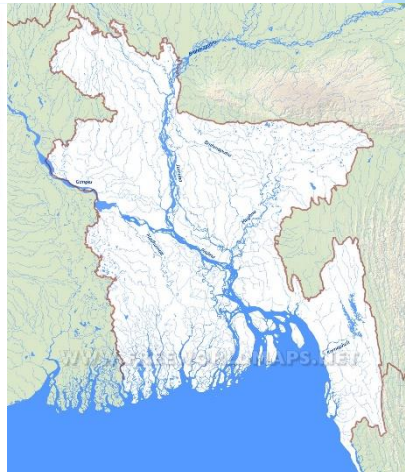


ICCCAD  
International Centre for  
Climate Change and  
Development

Bangladesh: Leader in  
Nature-based Solutions  
9:00 AM CET September 23rd 2021



# Bangladesh



- Population around 163 million (2019), area: 147 570 km<sup>2</sup>
- Average GDP growth 2004 – 2019: between 5 - 8 % per year (2020: 2.4%) (WB data).
- *GDP: Agriculture: 15.1%, Industry: 26.5%, Services: 58.3% (2014 est.)*
- Ambition: to become a (lower) middle income country by 2021 and developed country by 2041

# Definition of delta

- an area of low, flat land, sometimes shaped like a triangle, where a river divides into several smaller rivers before flowing into the sea (<https://dictionary.cambridge.org/dictionary/english/delta>)
- A delta is the fan-shaped area at the mouth, or lower end, of a river, formed by eroded material that has been carried downstream and dropped in quantities that can not be carried off by tides or currents. (U.S. Geological Survey)
- GBM delta: not always clear definition: two third of Bangladesh (e.g. Becker et al, 2020, <https://www.pnas.org/content/117/4/1867>)
- BDP2100: Bangladesh delta = the whole country

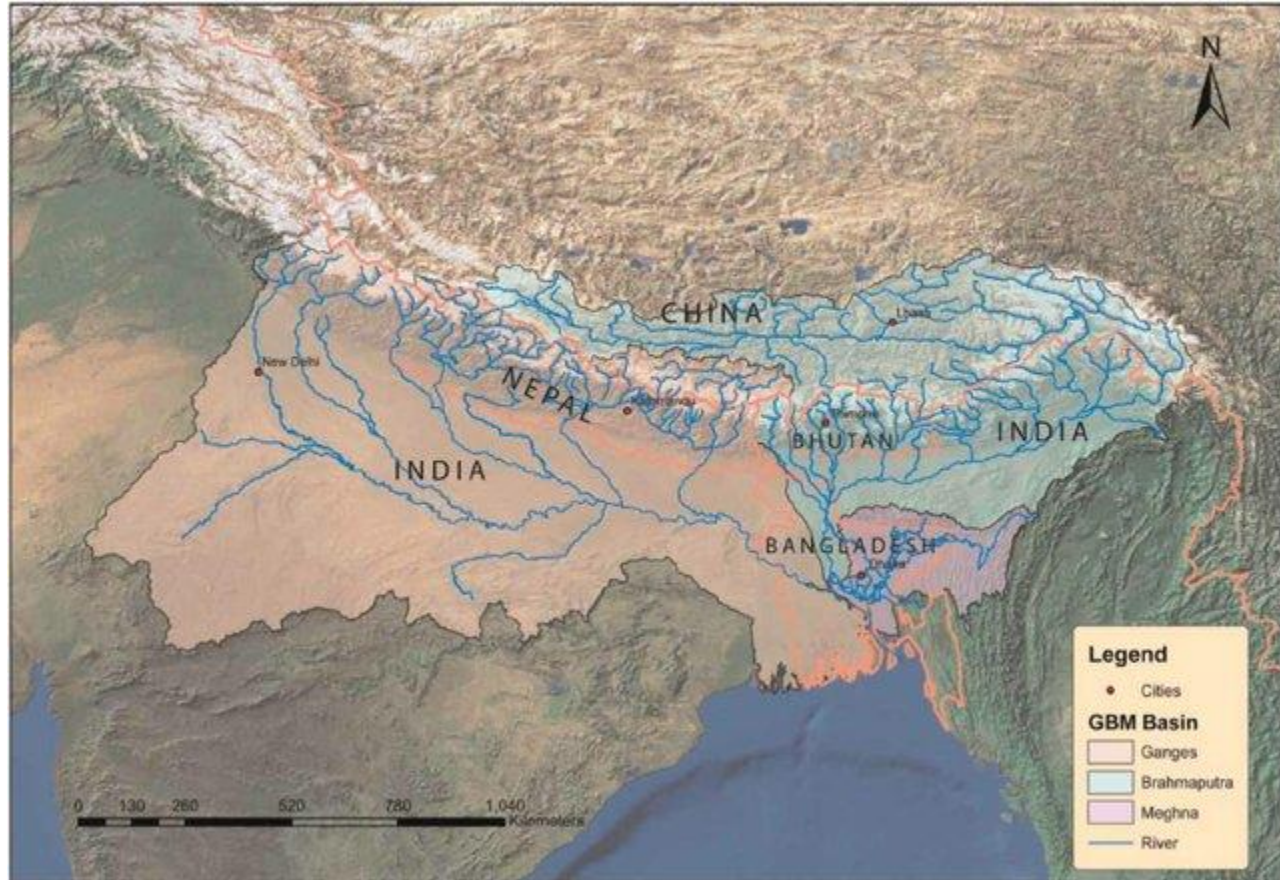
# GBM basin

GBM: 1,7 million sq km, of which 7% in Bangladesh

Discharge: average about 40.000m<sup>3</sup>/s (Rhine 2300 m<sup>3</sup>/s)

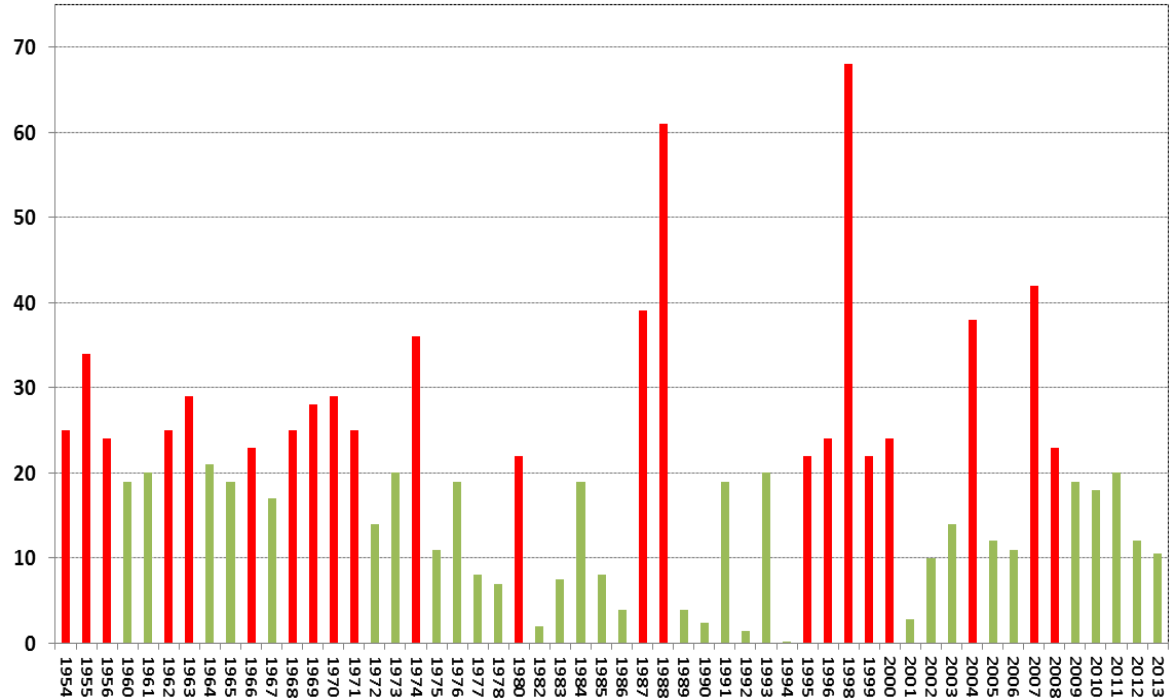
BD - Delta country:  
30% <5 m, 45% from 5-30m  
and 25% >30m

Main Delta Water Issues:  
Flooding, Drought, Erosion &  
Sedimentation, Water  
Quality, Environment and  
Sustainable Governance



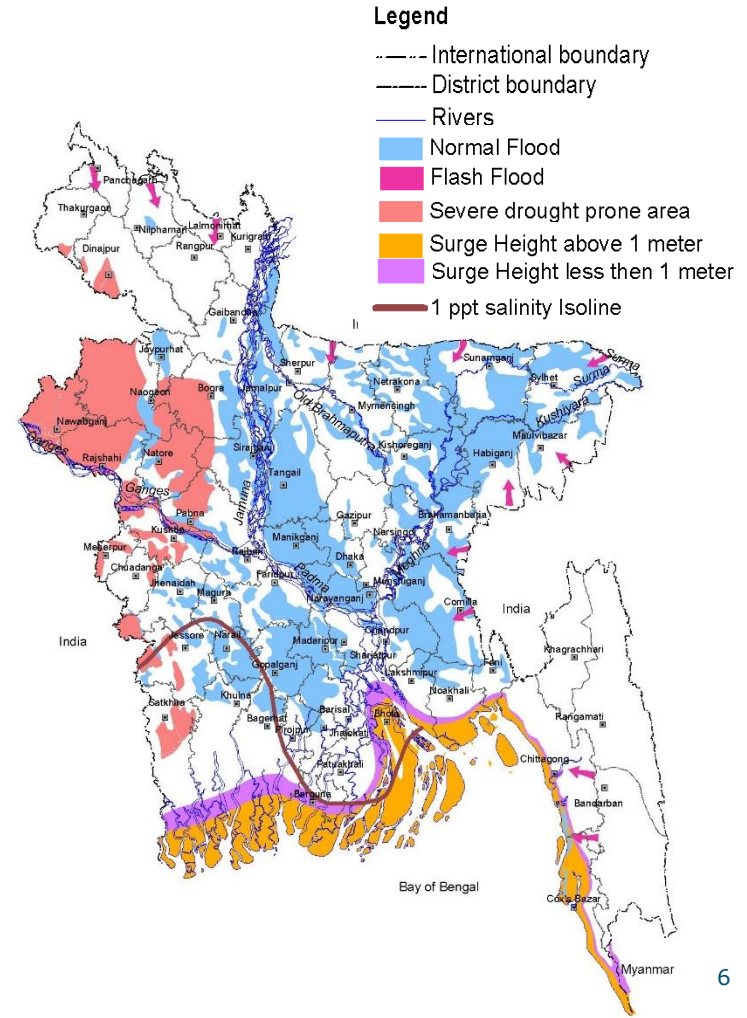


# Floods in Bangladesh: positive and negative



# Water management

- Flood & droughts
- Water logging or drainage congestion
- River erosion and Coastal erosion
- Cyclones/storm surge induced flood
- Salinity intrusion
- Groundwater degradation
- Land subsidence
- Climate change
  - Sea Level Rise (SLR)
  - Temperature rise
- Transboundary issues



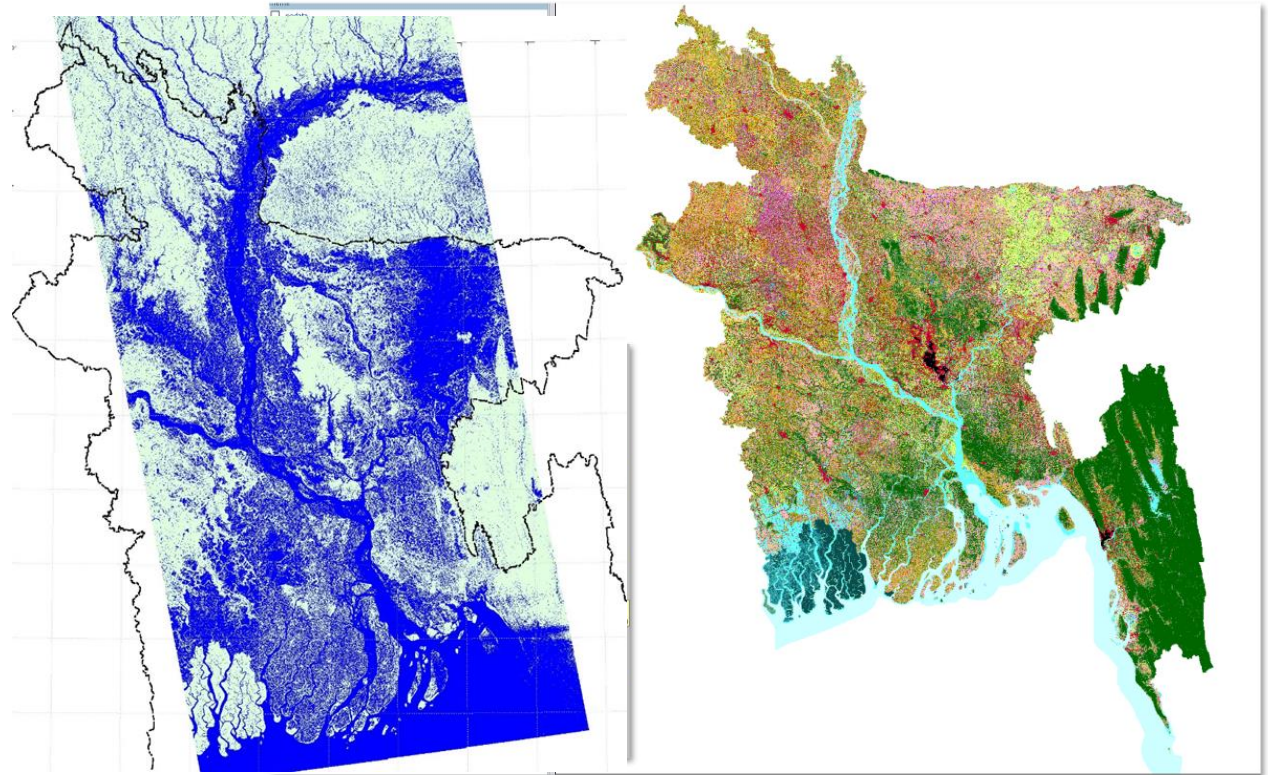
# Trends in urbanization – agriculture – nature

Land use change

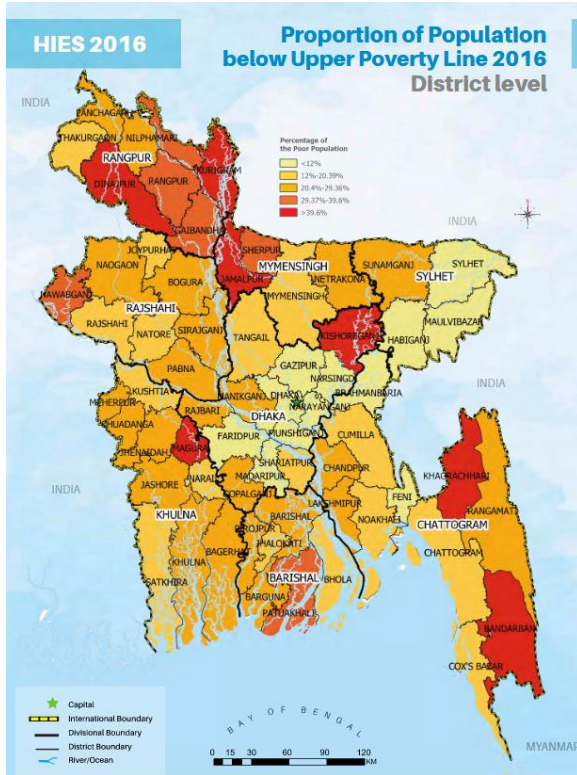
- Agriculture
- Cities
- Forests
- Wetlands

Development

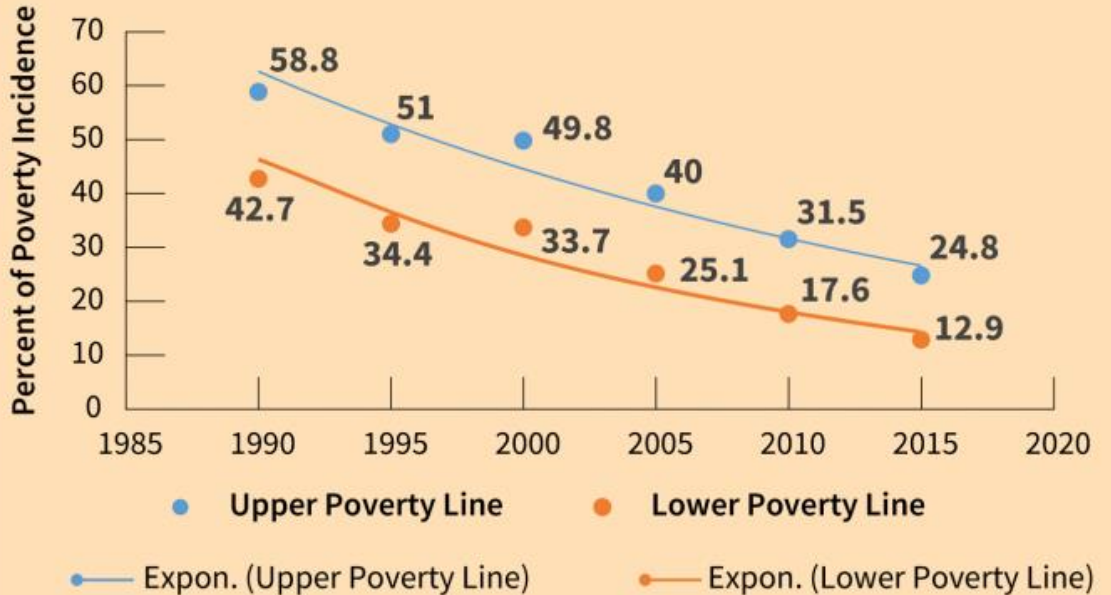
Climate change



# Poverty



## TRENDS IN POVERTY IN BANGLADESH: 1991-92 TO 2015

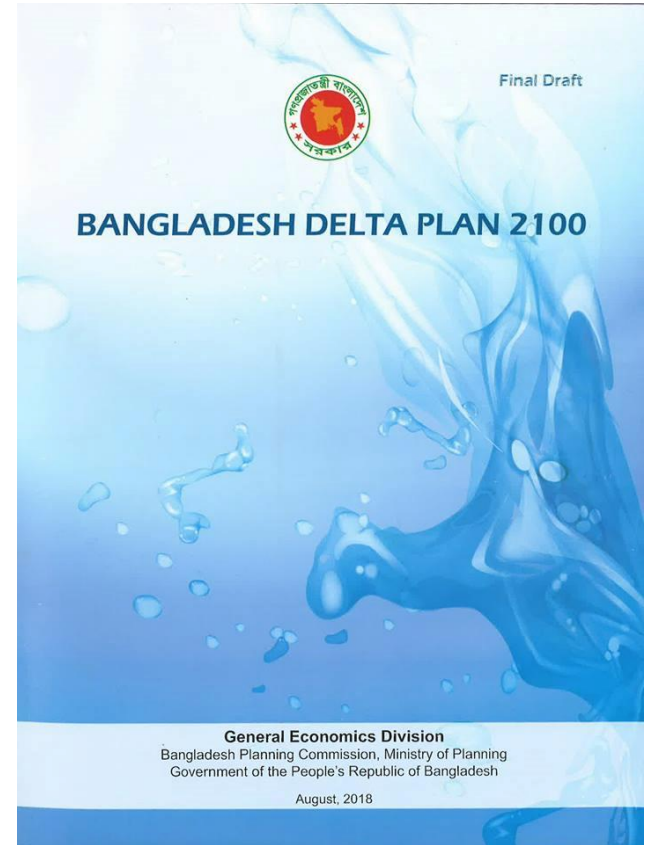




# Bangladesh Delta Plan 2100

<http://www.plancomm.gov.bd/>

- Longer term plan
- Water centric – dealing with uncertainties
- Water & food & environment & cc
- Vision: Prosperous Bangladesh



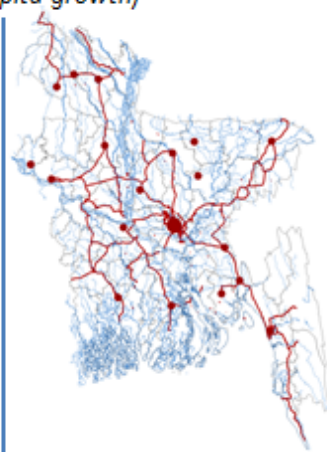


## Productive



High global growth,  
Moderate climate change,  
Strong regional  
collaboration, growing  
population (197m -2050)  
High GDP growth,  
Diversification economy,  
Modernization agriculture,  
decentralization,  
Increased connectivity,  
rapid urbanization (70% -  
2050)

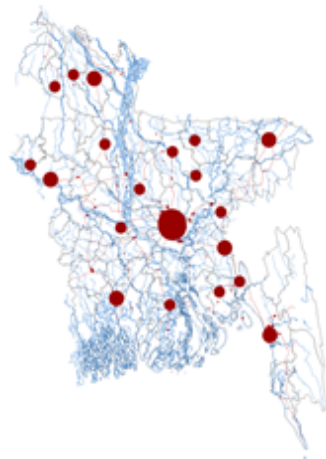
## Diversified economy (high per capita growth)



High global growth,  
High climate change, large  
upstream developments,  
Stabilizing population  
(170m -2050) - high out-  
migration, moderate/high  
GDP growth, agro-  
technology advancement,  
decentralization,  
connectivity & urban  
growth (67% -2050)

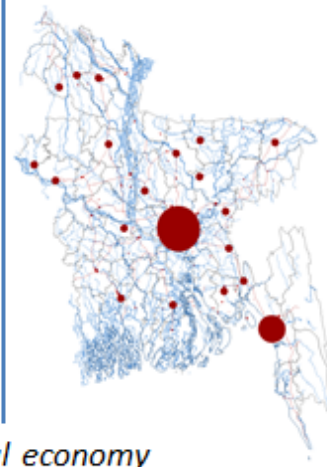
## Resilient

## Moderate water conditions



Low global growth,  
Moderate climate change,  
Limited upstream  
developments, fast growing  
population (210m -2050),  
low GDP growth,  
Traditional economy,  
increase inequality,  
centralized urban growth  
(52% urbanization 2050),  
Poor connections and  
urban facilities

## Extreme water conditions



Low global growth, high  
climate change, large  
upstream developments,  
fast growing population  
(230 -2050), decreasing  
GDP growth, centralized  
urban growth, poor  
housing (45%  
urbanization -2050)  
high rural poverty,  
urban-rural isolation

## Congestion

## Traditional economy (low per capita growth)

## Stagnation





Spatial Layers

Search Layer

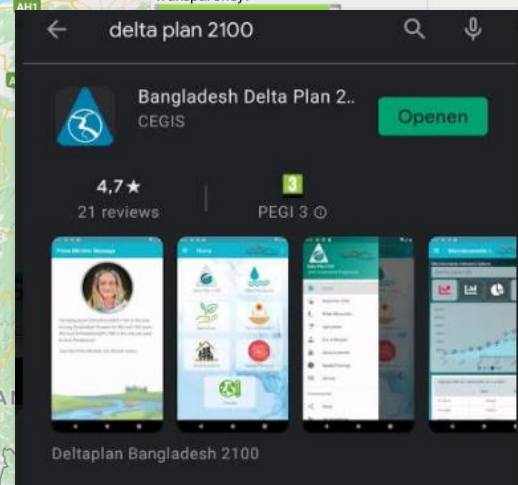
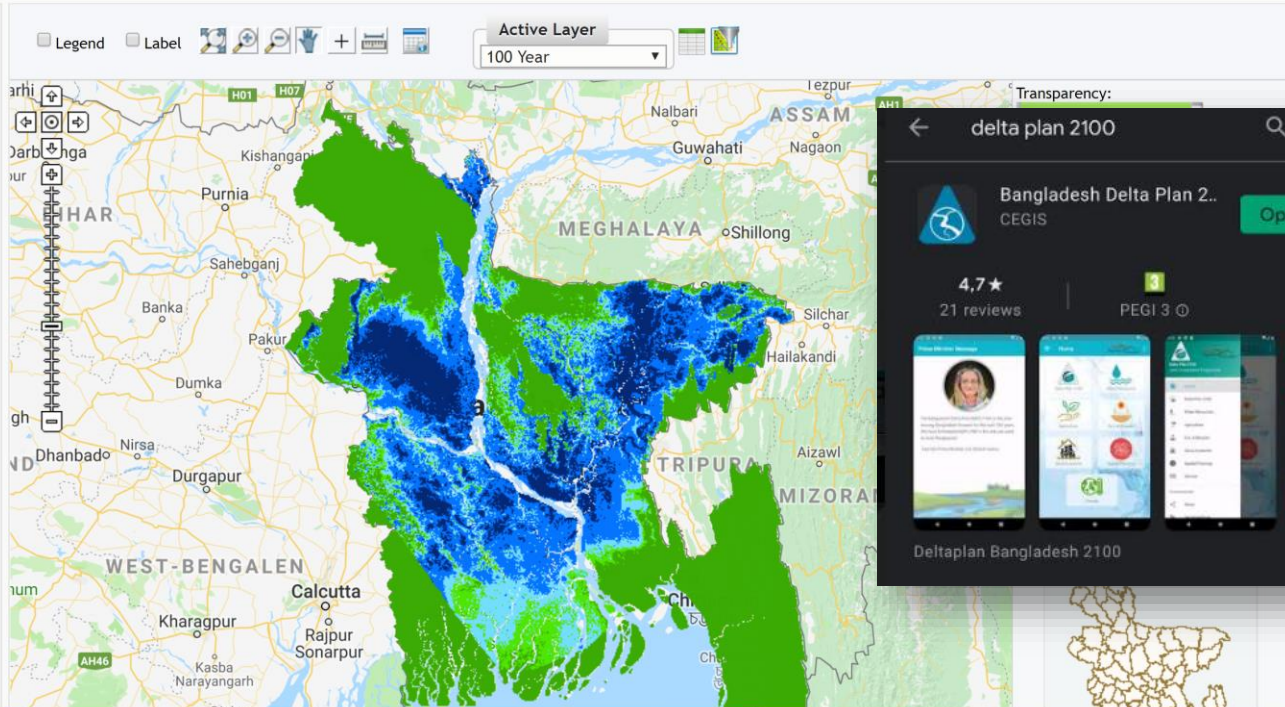
Water Resources

- Detail River
- Transboundary River
- Waterbodies 2010
- Soil Salinity 2009
- Arsenic
- Bankline 2014
- BWDB Project
- Catchment
- Transboundary Catchment
- Channel Jamuna
- Char Land
- Drainage Map
- Coastline 1973-2010
- Coastline 2010
- Haor Boundary Type
- River Flood Return Period
- Proposed Structure
- Embankment
- Rennels River System

Others

Search Document

Baseline Studies



# Strategies in BDP2100 at 3 scales

## □ National Strategies:

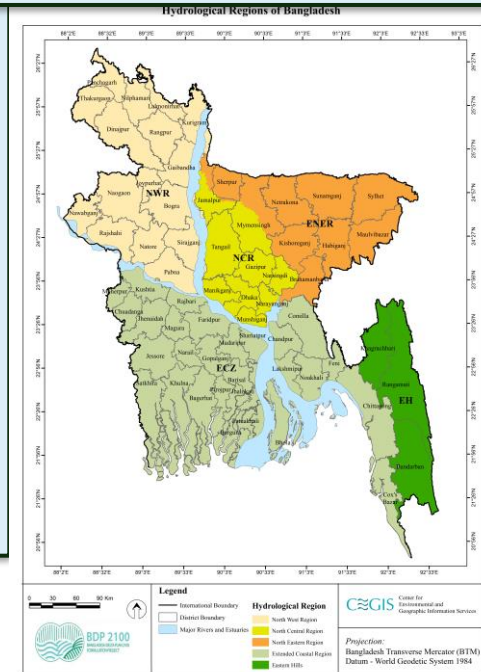
- Flood Risk Management
- Freshwater Supply

## □ Thematic Strategies

- Agriculture, Food Security, Nutrition and Livelihoods
- Transboundary Water Management
- Water Supply, Sanitation & Waste Management
- Environment, Ecology & Biodiversity
- Dynamizing Inland Water Transport System
- Sustainable Land Use and Spatial Planning
- Advancing the Blue Economy
- Renewable Energy
- Earthquakes

## □ 6 Hotspot Strategies

- Coastal Zone
- Barind and Drought Prone Areas
- Haor and Flash Flood Areas
- Chattogram Hill Tracts
- River Systems and Estuaries
- Urban Areas





# Thank you

Contact:

[Catharien.Terwisscha@wur.nl](mailto:Catharien.Terwisscha@wur.nl)

