

Session 4.C. Integration of Nbs for climate change adaptation in river basins

Integration of Nbs for climate change adaptation in WRM in Bangladesh



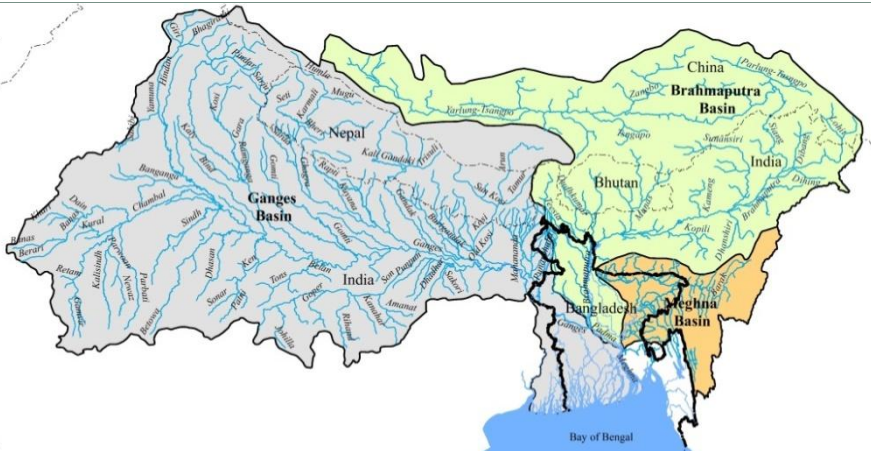
Bangladesh Water Development Board

*The Major Actor in Water Sector of Bangladesh
(65 years in Water Resources Development,
1959-2024)*

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Background



- *Lowermost riparian country of the GBM basins*
- *Exceptionally vulnerable to Climate Change*

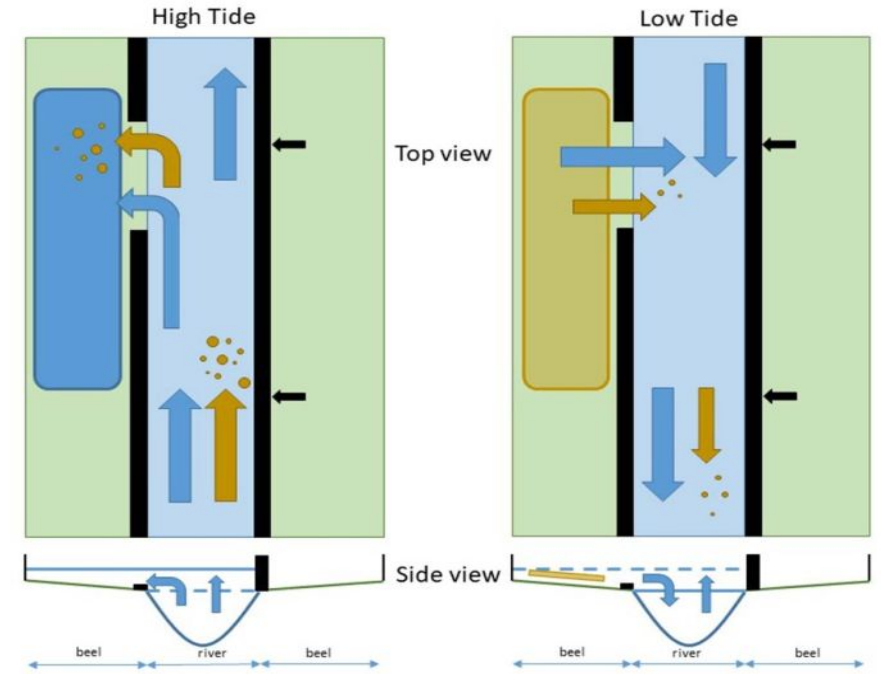
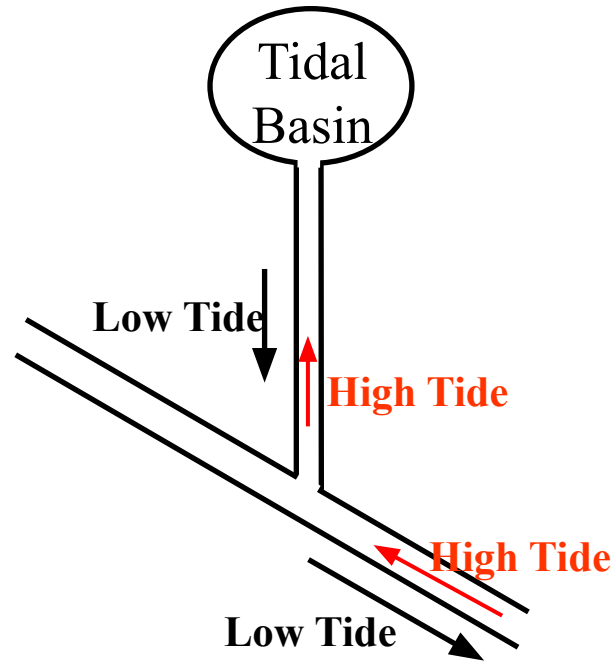
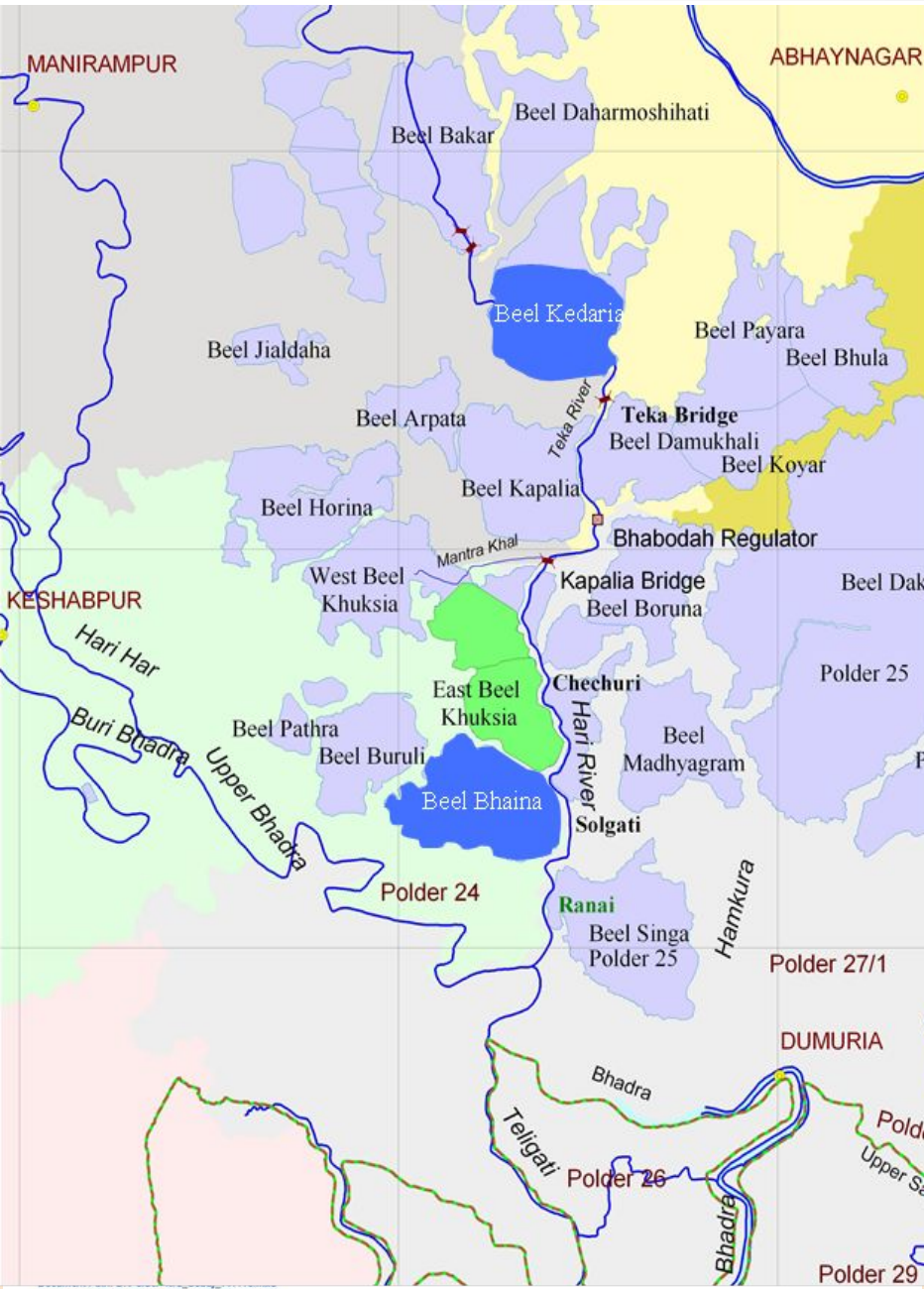
Facing challenges:

- *high temperature,*
- *sea-level rise,*
- *cyclones and storm surges,*
- *salinity intrusion,*
- *monsoon downpours,*
- *recurrent flooding,*
- *large scale river bank erosion,*
- *river dying/siltation,*
- *drought etc.*

The study investigated the present status and prospect of implementation of Nbs, key challenges and way forward

- **Total Catchment: 1.72 million km² only 7% lies within Bangladesh**
- **About 1.2 trillion m³ of water annually**
- **More than 1 billion tons of sediment annually**
- **Too much and too little water in wet and dry season**
- ***Sandwiched by the Himalayas and the Bay of Bengal***
- ***Faces hydro-meteorological consequences originated in the Bay and the Himalayas***

Nbs for Water Logging Problems: Tidal River Management (TRM)



- Severe water logging (drainage congestion) and sedimentation problems in Southwest region (coastal areas) due to polderization
- TRM allows natural movement of tide into a tidal basin from a river.
- Tidal Basin Store Water During High Tide and Release During Low Tide.
- Siltation Takes Place into the Basin During High Tide
- During low tide clear water erode the river bed and increase the drainage capacity

Tidal River Management (TRM): Lesson Learned



Before implementation of TRM

Drainage Improvement and sediment management can be sustained through TRM

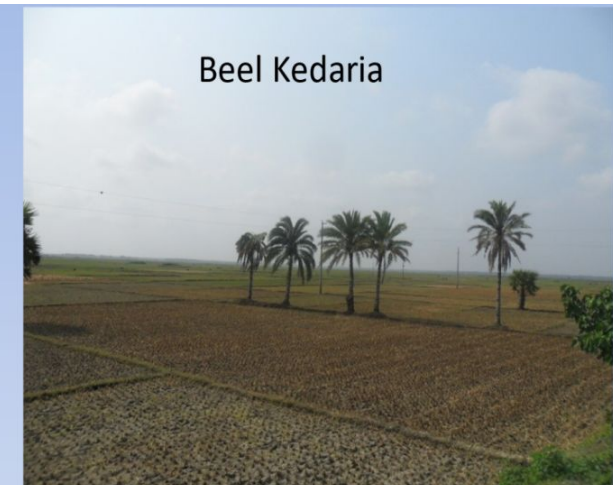
Land Level of Low-lying Beel area can be raised

Land owners are unwilling to provide their land for operation of TRM because of delay in paying compensation

Easy Payment to land owners for crop and fish compensation is crucial for successful sequential TRM operation

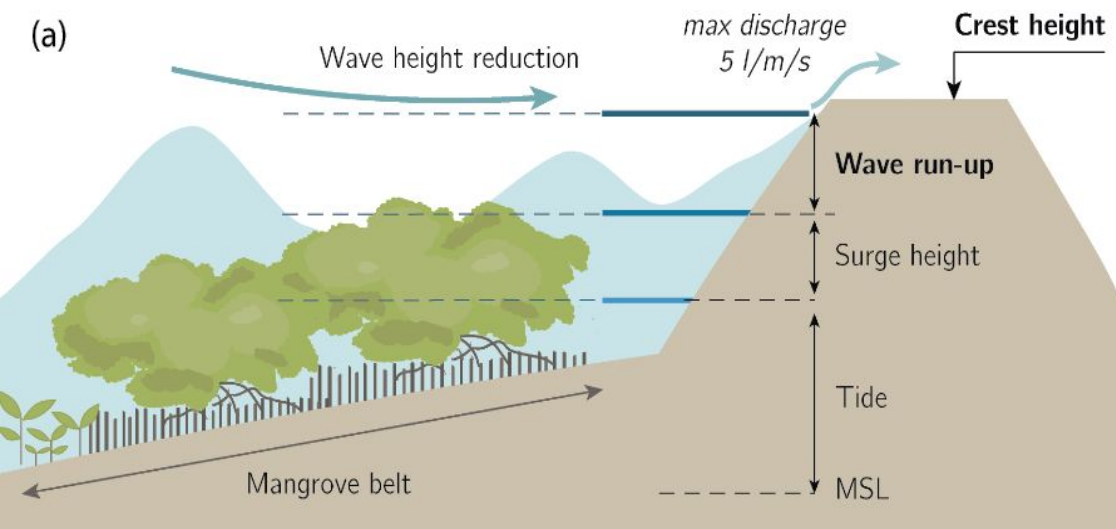
Institutional barriers such as the inability to resolve conflicts between local communities and implementing agencies,

Involvement of local administration in the Planning, Implementation of TRM is vital and it can solve most of the social problems



After implementation of TRM

Mangrove Afforestation: Nbs in the coastal area of Bangladesh



Attenuation, Cost reduction /savings, Risk reduction, Site-specific



In Bangladesh, mangrove afforestation is a vital environmental initiative due to the country's vulnerability to cyclones, tidal surges, and coastal erosion. Bangladesh initiated coastal afforestation since 1966.

200,000 hectares of mangroves planted, world's largest coastal afforestation program in Bangladesh

NBS in combination with hard structures can lead to significant optimization of materials and need for O&M

Water conservation

Biodiversity protection

Carbon sequestration

Soil retention and productivity

Land rehabilitation

Socio-economic benefits



Unavailability of land, difficulties in co-management and maintenance, and lack of monitoring are major challenges that limit the efficacy of coastal afforestation programs.

Vetiver Grass: Nbs for Controlling Water Borne Erosion



*An eco-friendly Vetiver grass (*Vetiveria zizanioides*) has been used successfully over 120 countries for more than a century as traditional technology to hold and bind the soil.*

It has been used for embankment slope protection, gully erosion control etc. Sometimes it may be used as an individual identity or along with geo-jute as an alternative to rigid or hard structures.

It has challenges like limited local knowledge, land-use conflict, waterlogging issues, salinity sensitivity, monitoring and maintenance, animal grazing, lack of government initiatives, fragmented coordination, cyclones and storm surges, heavy rainfall and flooding, absence of financial incentives etc.

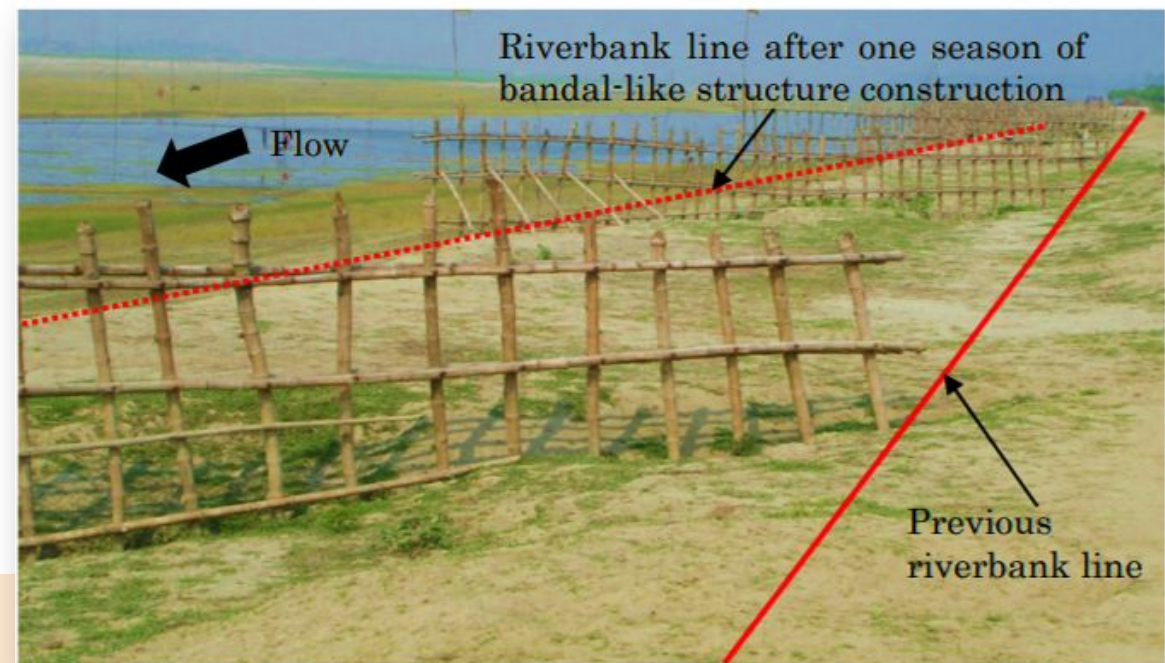
A combination of community engagement, government support, localized research and sustainable practices could overcome those challenges and has a scope to use an alternative approach to river bank or gully erosion, erosion due to wave action etc.

Bamboo Bandalling: Nbs for River Bank Protection and Flood Management



Bamboo Bandalling which is an innovative, eco-friendly, and cost-effective technique used for riverbank protection and flood control, particularly in regions like Bangladesh, where riverbank erosion and seasonal flooding are significant challenges.

The bandals divert the river's flow away from the most vulnerable parts of the riverbank, reducing the direct impact of strong currents and waves on the soil.



It offers a valuable option for communities that need immediate and affordable riverbank protection and ensures minimal harm to aquatic life

These structures require replacement after a single monsoon season, making them suitable for short-term river training in low-discharge, unsubmerged conditions

Challenges and Way forward of application of Nbs

Challenges

- Limited participatory project designing and implementation
- lack of robust design, long-term finance flows, monitoring and evaluation of measures
- Gap among different stakeholders
- Absence of a strong legislative framework supporting NbS
- Lack of confidence of policy makers and professionals on Nbs
- Lack of financing

Way forward

- Ensuring local communities' participation
- Installing long-term Monitoring, Evaluation & Learning system for NbS
- Strengthening institutional structure and integration of NbS in policies & planning;
- Multi-Institutional collaboration might be instrumental for sharing knowledge, technology and best practices among the knowledge institutions and implementing organizations;
- Capacity building , Up-scaling of best practice NbS;
- Fund raising plan is essential for applications of NbS.

THANK YOU

Comments and suggestions please!

