Adaptation for Sundarban (Mangrove Forest) Delta

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Outline of Presentation

A. Settings of the Sundarban Delta

B. Challenges

C. Impact of Climate Change

D. Landmark initiatives

E. Joint initiatives and Way Forward
The Sundarban Delta

- Largest contiguous blocks of fresh water mangrove forest in the world with very high species and unique biodiversity
- A part of the GBM delta, spanning about 350 km width in Bangladesh and India
- Assembled through deposition of silt transported by the Ganges and Brahmaputra rivers about 7000 yrs ago
- It is about 8,500 sq km across India and Bangladesh, of which 60% lies in Bangladesh and 40% in India
- Ecologically fragile and climatically vulnerable region that is home to over 6.8 million people (2.3 million in Bangladesh and 4.5 million in India)
## Settings of Sundarban Delta

### Ganges Basin
- **Catchment Area (Sq. Km)**: 1087000
- **Av. Annual rainfall (mm)**: 1200
- **Av. Annual Discharge (m²/s)**: 11000
- **Max. Discharge (m²/s)**: 78000
- **Sediment transport (m ton/yr)**: 550

### Brahmaputra Basin
- **Catchment Area (Sq. Km)**: 552000
- **Av. Annual rainfall (mm)**: 1900
- **Av. Annual Discharge (m²/s)**: 20000
- **Max. Discharge (m²/s)**: 100000
- **Sediment transport (m ton/yr)**: 590

### Meghna Basin
- **Catchment Area (Sq. Km)**: 82000
- **Av. Annual rainfall (mm)**: 4900
- **Av. Annual Discharge (m²/s)**: 4600
- **Max. Discharge (m²/s)**: 20000
- **Sediment transport (m ton/yr)**: 13
Ecosystem Shouldn’t have any Boundary!!

“Ecosystems can not be divided by the International Boundaries”
SRF = 5,467 km²

24 ranges

SRF = 5,467 km²

8 blocks

SRF = 5,467 km²

58 compartments

SIZ = 3,533 km²

With SRF = 9,000 km²

ECR = 1,761 km²

With SRF = 7,228 km²

Core zone = 1,914 km²

Buffer zone = 1,180 km²

Block zone = 4,400 km²

Total = 7,494 km²
Significance of the Sundarban

- **Natural World Heritage Site** from 1997 (UNESCO) and **Ramsar Site** of International Importance since 1992

- **Three wildlife sanctuaries**; Home of many **globally significant but endangered species** like the Royal Bengal Tiger, River Terrapin, Olive Ridley Turtle etc

- **Rich of biodiversity** in both the terrestrial and marine environment

- **Wide range of flora** with more than **512 species** including 334 plant, 165 algae

- **Rich in fauna** with **693 species** and The varied bird-life including **315 species** of waterfowl, raptors and forest birds

- **Dependency of millions of people for resource based livelihoods**

- **Barrier** against **cyclones and storm surges** saving lives and properties worth **between 273-714 million US$**

- **Efficient carbon sink**
Major Issues and Challenges of Sundarban

- Increased intensity and frequency of **cyclones and storm surges**

- Increased **salinity intrusion** due to **reduction of freshwater flow** and **altered changes in flow** due to interventions & **siltation** of river

- Loss of connectivity of river system which are the contributor of freshwater flow to Sundarban

- **Over exploitation** of resources due to dependency on Sundarban

- **Conflict** over agricultural and shrimp culture

- **In migration of population** particularly in India

- **Lack of basic facilities and livelihood opportunities** around Sundarban

- **Changes in the habitat** condition
Impact of SLR on Sundari

Source: CEGIS, 2006

Dominant of Plant Scenario (Base)

Health Index (Base)
- Sundri Dominant: Very Good, Good, Poor
- Gewa Dominant: Very Good, Good, Poor
- Goran Dominant: Very Good, Good, Poor

Dominant of Plant Scenario (SLR-32cm)

Health Index (SLR-32cm)
- Sundri Dominant: Very Good, Good, Poor
- Gewa Dominant: Very Good, Good, Poor
- Goran Dominant: Very Good, Good, Poor

Dominant of Plant Scenario (SLR-88cm)

Health Index (SLR-88cm)
- Sundri Dominant: Very Good, Good, Poor
- Gewa Dominant: Very Good, Good, Poor
- Goran Dominant: Very Good, Good, Poor

Sundari Dominant

Bar chart showing percentages for Very Good, Good, and Poor categories for SLR-Base, SLR-32cm, and SLR-88cm.
Landmark joint initiatives for Sundarban Delta

- A framework agreement was signed between two Prime Ministers for initiation of basin level cooperation
- Protocol on ‘Conservation of the Royal Bengal Tiger of the Sundarban’
- MoU was signed for Conservation of Sundarban and emphasize for common understanding of impacts of climate change along with adaptation strategies
- Sustainable Development through improvement of the resilience of the ecosystem against CC
- Sundarban Delta Vision 2050 to improve governance structure, increase fresh water availability, adaptation to CC
- Consensus methodology and piloting for environmental flow assessment for Sundarban
Both India and Bangladesh have explicitly stressed and made commitment in COP21 for joint action to protect the Sundarban and Bengal Tigers.

Evidence based advocacy with Track-I level stakeholders for development of Bangladesh-India institutional platform for conservation and development of the Sundarban.

Landscape narrative for assessment of changing dynamics and delineation of planning boundaries of Sundarban landscape to facilitate and support effective bilateral cooperation.

Identification of risk and opportunities in landscape from climate change induced challenges.
Way Forward

- Strategic Environmental Assessment should be undertaken before taking any adaptation measure due to complexity.
- Joint comprehensive adaptation measures should be taken considering alternative livelihood and basic facilities to avoid the dependency on Sundarban.
- Conservation of the forests for enhanced carbon sink (2.8 million ton/year) and provide protection to the embankments against storm surges and tidal erosion.
- In climate change scenario quantity and quality of water is important but timing of availability is more crucial.
- Equitable sharing of transboundary water should be allocated for basin countries and also for river ecosystem.
Let there bring peace for them......

Thank You