Challenges of Climate Change Adaptation in Sundarbans Mangrove Forest of Bangladesh

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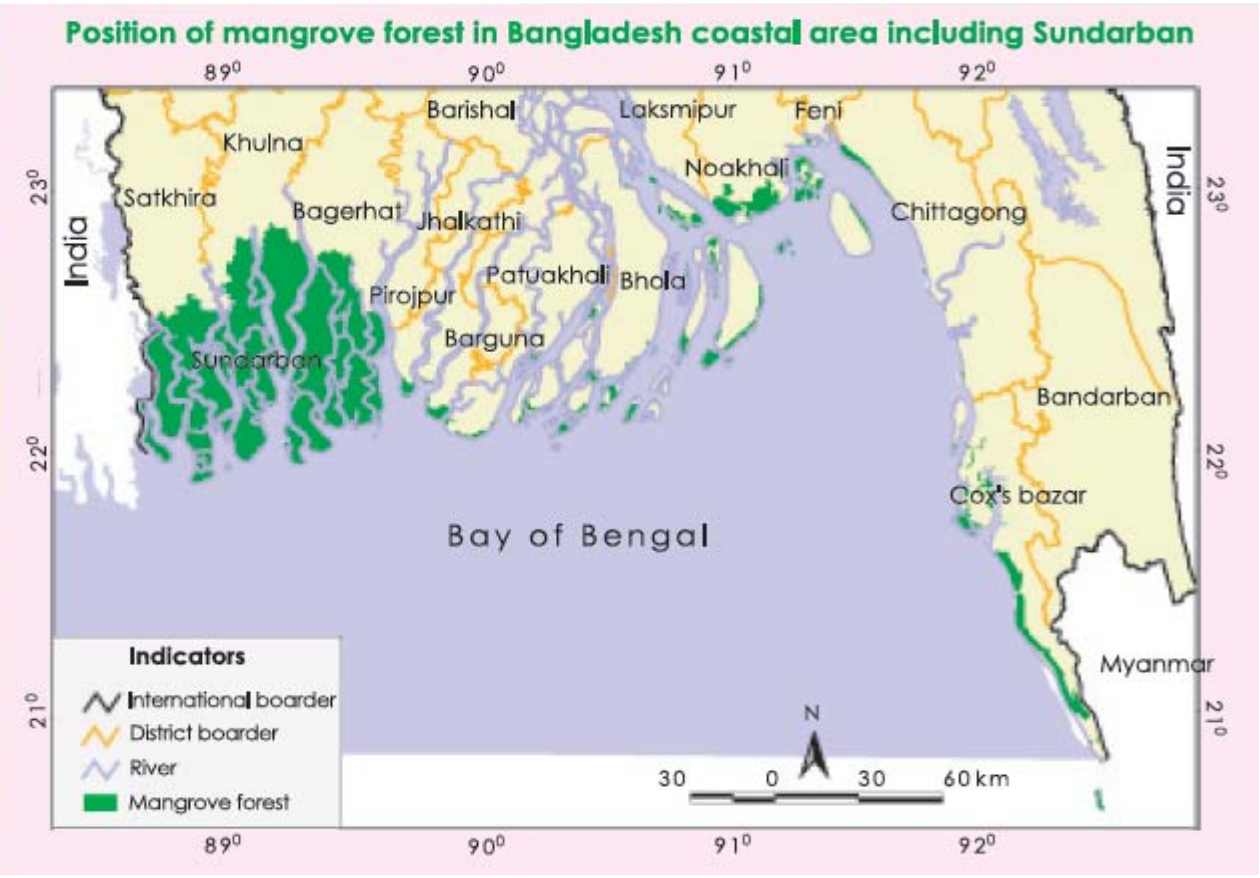
Sundarbans- An Overview

- The south-west region of Bangladesh comprises the world's largest single track of mangrove forest- the Sundarbans



(Source: Climate Change Cell Publication, 2009)

Sundarbans- An Overwiew

(Contd…)

- The Sundarbans covers 577,100 ha (6010 sq. km); 407,100 ha forest and 170,000 ha rivers, canals and creeks.
- Located in the southern extremity of the Ganges river delta bordering the Bay of Bengal.
- The forest extends 80 km inland from the coast
- The forest alone constitute 24% of the total forest area of Bangladesh.

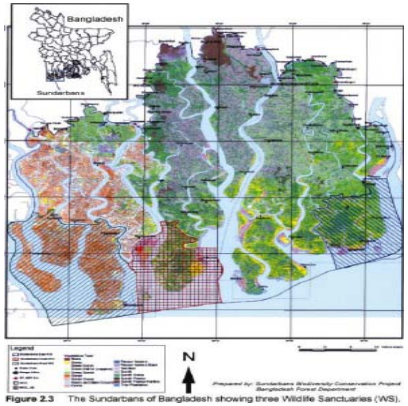
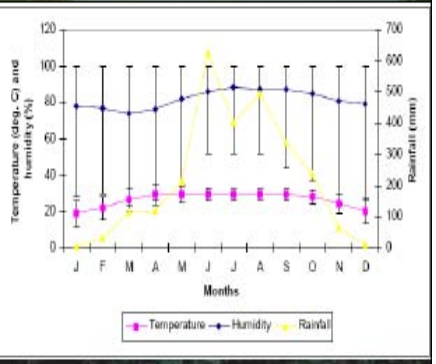


Figure 2.3 The Sundarbans of Bangladesh showing three Wildlife Sanctuaries (WS).

Satellite Image of the Geographical Location of the Sundarbans

This satellite image shows the forest in the protected area. The Sundarbans appears deep green, surrounded to the north by a landscape of agricultural lands, which appear lighter green, towns, which appear tan, and streams, which are blue

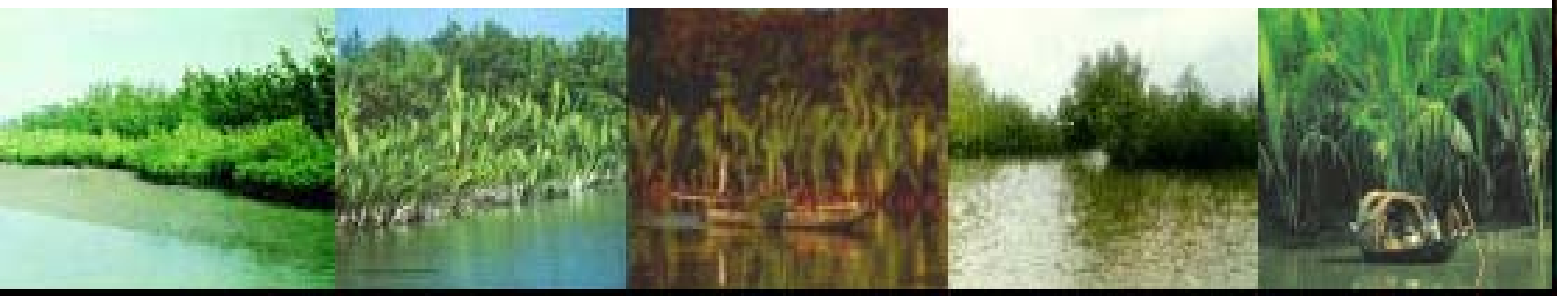


SUNDARBAN: GEO-ECOLOGICAL PROFILE

- The forest floor is 0.91m to 2.11m above mean sea level.
- The interconnected Riverine System provides freshwater supply to the Sundarbans, part of which also influxes with saline water twice in a day during tidal excursion .
- Such an unique characteristics made the Sunderban home of wide variety of fauna and flora

Sundarban: How rich the ecosystem is ?

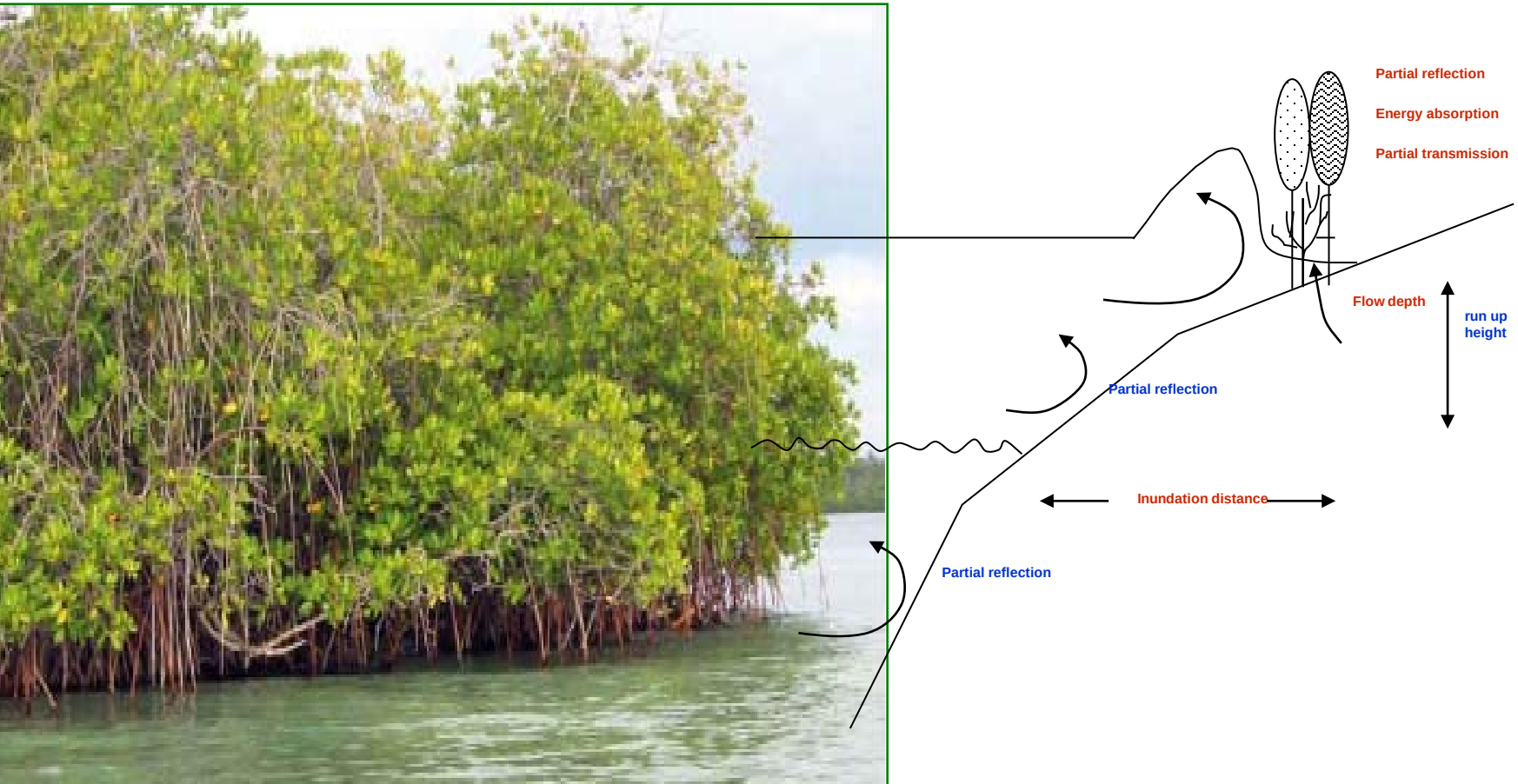
- 334 species of plants,
- 11 amphibian species
- 400 species of fish
- 53 species of reptiles
- 320 species of birds
- 49 species of mammals



Mangroves as Bio-Shield against Tropical Cyclone

- Research has shown that sea-wave of 1m (more than 3 feet) crossing over 1.5 km of mangrove forest is reduced to a height of only 0.05m- significantly decreasing its potential to cause damage

Mangroves as Bio-Shield against Tropical Cyclone



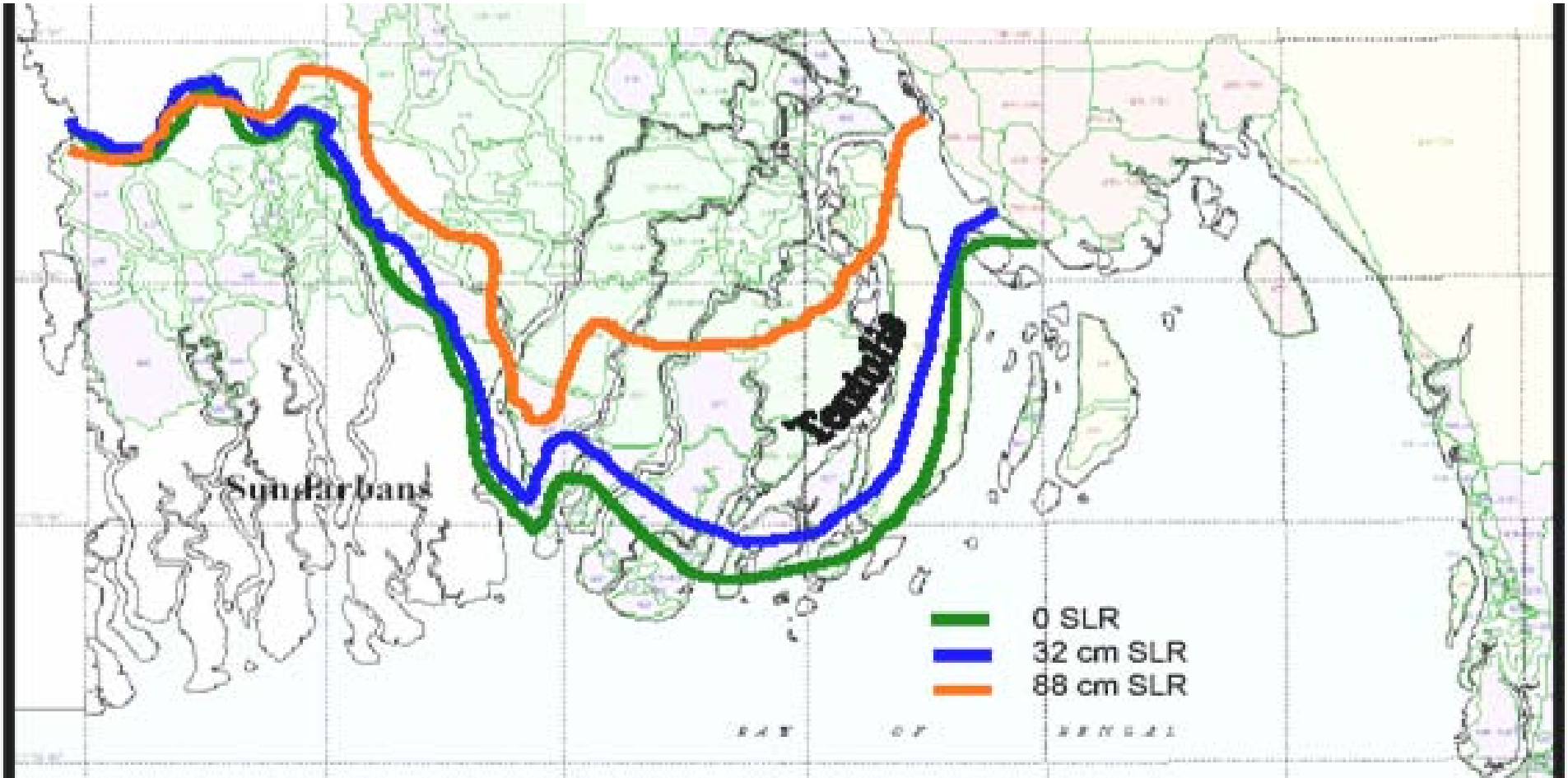
Climate Change Threat to the Sunderbans: Sea level rise

Year	2020	2050	2100
Sea level rise	10 cm	25 cm	1 m (high end estimate)
Land below SLR	2 % of land (2,500 km2)	4 % of land (6,300 km2)	17.5% of land (25,000 km2)
Ecosystem	Inundates 15% of the Sundarbans.	Inundates 40% of the Sundarbans.	The Sundarbans wouldbe lost.
Salinity	Increase	Increase	Increase

Salinity Intrusion

Sea level rise will cause salinity intrusion through rivers and estuaries

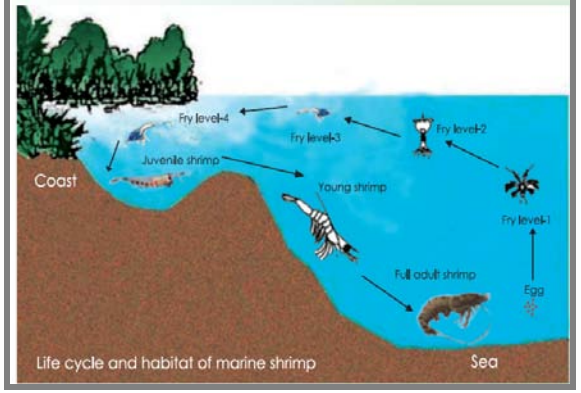
In the rainy season saline water ingress to 10 % of country's area, in the dry season it reaches to 40 %area even



Climate Change Threat to the Sunderbans: Sea level rise

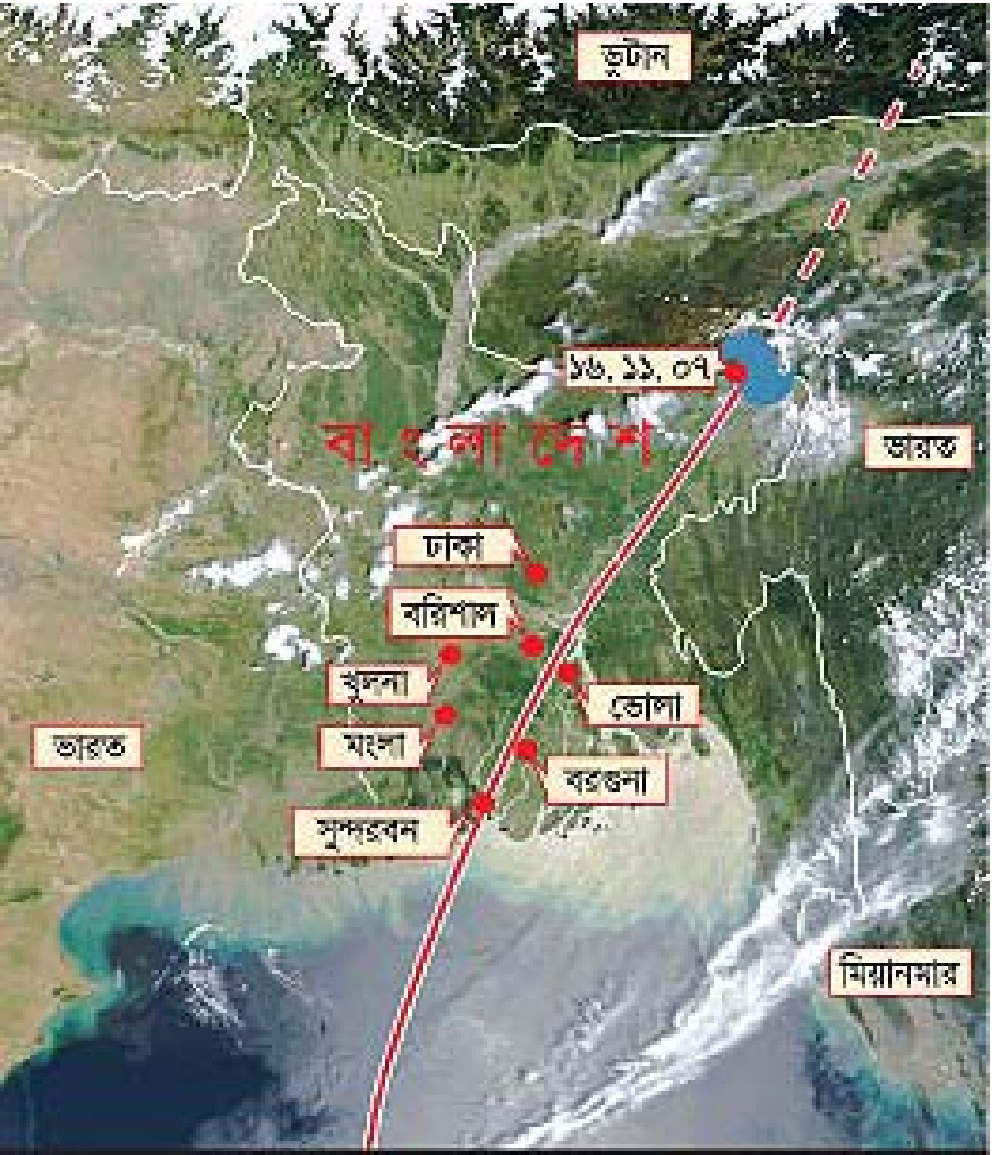
Sea level rise	Potential impacts
10 cm	□ will inundate 15% of the Sundarbans
25 cm	□ will inundate 40% of the Sundarbans
45 cm	□ will inundate 75% of the Sundarbans
60 cm	□ will inundate the whole Sundarbans
1 metre	□will destroy the whole Sundarbans

Adverse Impacts



- **The main impact of sea level rise on water resources is the reduction of fresh water availability due to salinity intrusion. Sundari, the dominent tree species in the Sundarbans suffer rom *top dyeing disease* because of increased salinity**
- **Increased salinity will change the habitat pattern of the forest and adjacent coastal eco-system**
- **Aquatic organisms will migrate inward, because of increased salinity too**

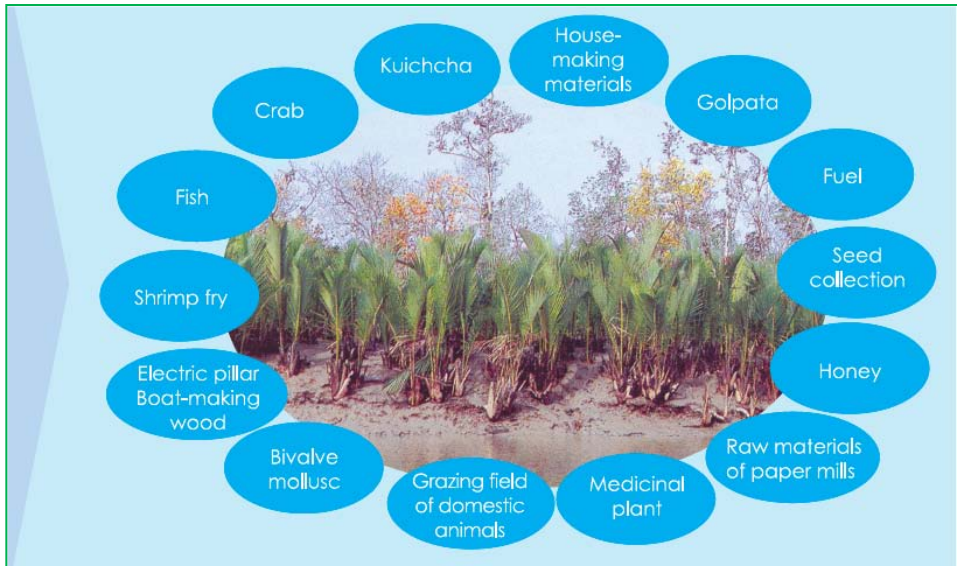
Recent Experience: Cyclone SIDR



- **The Category 4 Cyclone 'SIDR' struck the South West Coast in Nov 2007 caused death of 4000 people, leaving 55000 people physicslly injured and USD 1.2 b economic loss.**
- **The presence of Sunderbans protected the coastal habitat a lot but it faced huge impact itself**

ADAPTATION CHALLENGES

- Eco-system Performance
- Social Safety Services



ADAPTATION CHALLENGES

- Facilitating natural regeneration and natural succession of native tree species
- Ensure supply of fresh water from the upstream to keep the ecosystem live and productive
- Reduce pressure on the forest through development of alternative livelihoods for the forest dependent people

Thank You All