

Adverse Impacts of Climate Change
Perception and Responses of Local Community

Sunderban Delta

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Introduction

Sunderban is located in the eastern Indian state of West Bengal in vast delta of the Ganges, south of Calcutta and bordering Bangladesh in the east

- Location 21° 30' to 21° 15'N; 88° 10' to 89° 10' E
- Total area 9630 Sq. Km / 963,000 hectares
- Core area 1690 Sq. Km / 169,000 hectares
- Buffer zone 2233 Sq. Km / 223,300 hectares

It is the largest contiguous mangrove ecosystem (along with Bangladesh) in the world

Maps of Sunderban



Introduction.....continued

- It has the largest mangrove diversity in the world including several threatened floral and faunal species
- The core area (Sunderban National Park) has been designated as World Heritage Site
- Approximately 4 million people live in Sunderban
- The community is fully dependent on the forest resources
- Agriculture is not properly developed due to many reasons
- Sunderban is under severe stress and the community is quite vulnerable



Human Community in Sunderban

- The Sunderban consists of 102 islands, among them 48 are inhabited
- The population of the region is mainly migrant settlers from different parts of Bangladesh and southern West Bengal for last 60 - 120 years
- At present four major types of livelihood activities are practiced:
 - **Agriculture**
 - **Fishery**
 - **Wood Collection**
 - **Honey Collection**

Agriculture

- Approximately 65% of the total population are dependent on agriculture based economy
- Generally a there is a single crop economy, in some places double crop are in practice with rain water harvesting
- Paddy, Potato, Green Chili, Pumpkins etc, are the major crops
- The yield is good and farmers are in some cases successful in diversifying into various cash crops
- Lack of proper market linkages acts as a barrier for their economic realization - which in turn leads to poverty



Fishery

Fishing activities are prevalent at various scales in the Sunderban catering to livelihoods amongst 15% of the population

- Organized large scale fishing activity occurs in sea and deepwater
- Small scale fishing activity in the delta region (half of them are illegal)
- Micro scale fishing activity in the shallow river bed - mainly to collect the baby prawns / shrimps
 - high short term income - risk factor high in terms of biodiversity presence e.g. Crocodiles, Sharks
- This also leads to rapid siltation in riverbed



Honey Collection

- Approximately 3% of the total population involved in this trade
- Government has legalized and regulated the activity
- Due to low government rates compared to open market people are indulging in illegal trade of honey
- Risk factor high since honey collection is done within habitat of Tiger leading to possible man-animal conflicts

Wood Collection

- Approximately 5% of the population is involved in the trade
- Most of them are illegal
- A major environmental concern due to depletion in mangrove stocks
- Economic returns good compared to other livelihood options
- Risk factor high since collection is done from Tiger habitat

Summarized Local Community Perception About Changing Climate

Temperature:

- No major changes in recent past
- The span of summer season has increased
- Span of winter has decreased

Rainfall & Humidity :

- Rainfall has considerably increased (known to be one and half times more than what it was 15 years ago)
- The span of monsoon season has shifted (approximately it is now delayed by 15 - 20 days)
- The number of cloudy & humid summer days has increased

Summarized Community Perception About Changing Climate

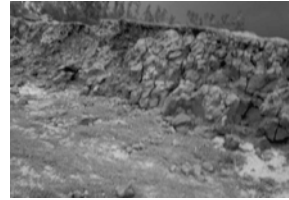
Sea Level Rise

- Villagers see definite changes in terms of sea level rise
- They have seen sufficient increase in the level of water during high tide (*Bhara Kotal*)
- Community also talked about settlement of the local habitat and river siltation as major causes for flooding of rivers



Adverse Effects of Climate Change as Perceived by The Community

- Intrusion of saline water into the agricultural land - results in loss of yields and greater risk to the farmer
- Permanent intrusion causes loss of agricultural land and making people migrate (environmental refugees)
- Change in monsoon pattern causes severe stress on agriculture which is fully dependent on weather
- Increase in span of summer increases insect attack on crops
- The delayed winter hampers the cultivation of "Ravi Crop" (winter crops)
- The intrusion of saline water causes severe stress on availability of drinking water
- Increasing humidity leads to incremental phenomenon of vector borne diseases



Responses of The Community

- Shifting of farming time in anticipation of shifting of monsoon season - *currently an issue as this will lead to lower market demand & price*
- Diversification into different weather resistant crops - *not a secure mechanism since realization of money against the crops due lack of market linkages still needs to be addressed*
- Construction and renovation of ponds and canals for rain water harvesting and use in winter cultivation
- Constructing of mud-barrages around the island to protect it from incursion of saline water - *lack of finance and absence of a proper institutional mechanism are major deterrents*



Responses of The Community (contd)

- Reforestation activity (mangroves) on the mud barrage to make it durable
- Searching for alternative livelihood options for proper substitution of certain livelihood activities like baby prawn/ shrimp catches, timber smuggling etc.
- Looking for effective capacity building activity through scientific and organizational intervention in support of their indigenous adaptation efforts.

The three things they need the most:

- Alternative Livelihoods Option & Proper Market Linkages
- Education
- Primary Health Services



Our Observations

- Various initiatives at different stakeholder' levels already in operation
- These initiatives are lacking in co-ordination and integration amongst themselves
- WWF India has already initiated dialogue with most of these stakeholders at NGO, Government, Academia levels, active in various forms of intervention in Sunderban, to form a consortium
- The consortium will propose to develop a Integrated Programme to address the various interventions required to enhance the coping capacity of the community in Sunderban region against adverse impacts of climate change and thus decrease the vulnerability

