

The Climate Change Refugees

Mousuni, Digha and Shankarpur

STORY SULAGNA CHATTOPADHYAY PHOTO PRASAD



Young Jalaluddin clambered on to the falling roof, balanced himself on the still firm bamboo pole, first of many that plunged through the clayey soil, braced against the swirling winds, and stretched out his hands to grab the last gourd. Without warning, the soggy walls came crashing down, yielding itself to the relentless surge of the angry oceans. Jalaluddin swung his lithe body to escape unhurt, but the gourd was gone, bobbing in the churning seas. Food had never been a problem in this bountiful little island of Mousuni, deep in Sunderban, yet Jalaluddin fell upon the wet ground and moaned the loss of his gourd - the insignificance of their existence hit him like a bolt. As the salt of his tears fell upon the salty waters, Jalaluddin rose, a black shadow against the grey skies, determined to build again - a home beyond the reach of the dark eddying seas.

Jalaluddin is no longer young - a retired school teacher, he lives at the centre of Mousuni, a pretty mud house, a little flower patch, a caked portico at the back, an outhouse toilet and kitchen, plenty of room, it is a appealing **gram Bangla** picture - only the underlying grim truth is far from happy. Mousuni is an island under siege – just like millions of other islands and coastlines along the Bay of Bengal that are experiencing enhanced erosive action.

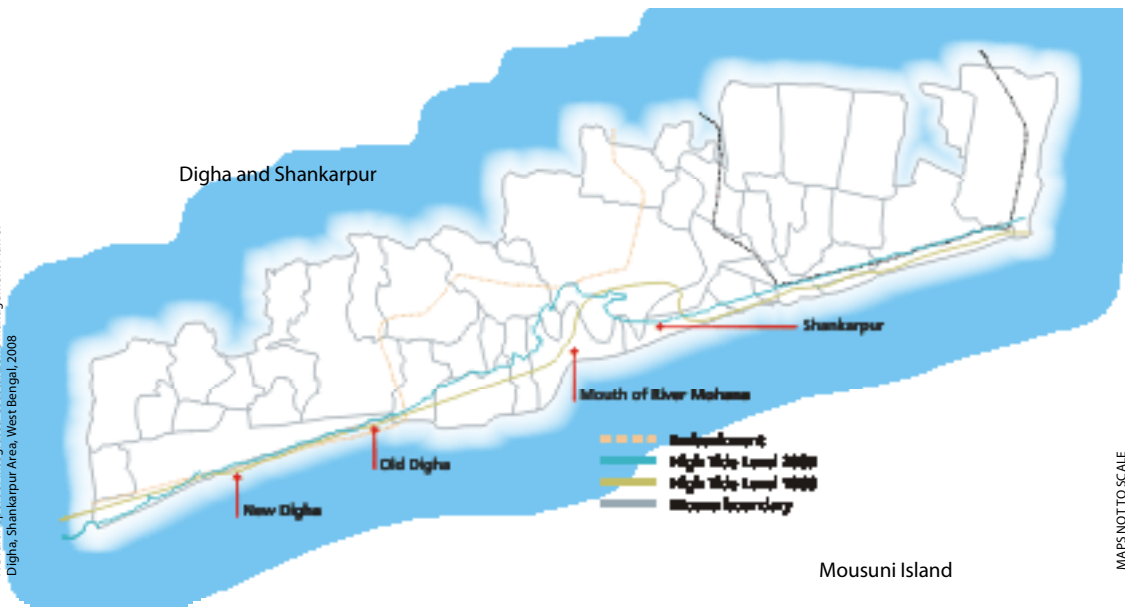






CAPTIONS:

1. Groin destruction at New Digha
2. Geotube/Geojute embankment, under progress on the Shankarpur coast
3. Work in progress on a devastated stretch of embankment on south western side of Mousuni.
4. Remains of earthen embankment completely washed away at Mousuni
5. *Jhau Balla* embankment under construction at the Shankarpur Coast
6. Significant beach lowering was observed over the erosional domains of the coastal tract. Note the wave cut dunes and dark bands of exposed clay, indicative of sand load being carried away, exposing the underlying strata.



MAPS NOT TO SCALE

The water levels are rising. Eminent scientists from various fields confirm the sea level rise, but records of the number of humans affected and habitats destroyed remain unconfirmed. Two conjoined areas of Mousuni in Sunderban and Digha with its adjoining offshoot, Shankarpur, the only sea resort of West Bengal, were briefly under our scanner, for a period of three months, to ascertain the extent of damage to its people and its coast. The unstructured, open ended interviews were conducted by our team, primarily in Bengali. Arjun Manna, presently working as Field Assistant with the WWF (India), facilitated interviews in Mousuni, being fluent with the local dialect. About eighty respondents were accessed and the gloomy reports filled us with a sense of panic. How will a densely populated region - 4.1 million in Sunderban alone, battle this increasing loss of land and habitat? What are the alternatives that fishermen and farmers can look for to offset their declining economy? How will the poor regain their lost homes and where can they go as climate change is slowly but surely beginning to affect them.

Sunderban deltaic island system along with the coast of Digha and Shankarpur is facing degradation with frequent embankment failures, submergence and flooding, beach erosion and siltation in navigational channels, cyclone and storm surges. The area and its people are now increasingly vulnerable, more so for the island system as they have no mainland to merge into and will acquire refugee status once



Source: Anamitra Anurag Danda, Surviving in the Sunderbans: Threats and Responses, September 2007

their homes are washed out. Despite climate change threats to this ecologically fragile niche, population growth is unchecked. Also wide scale reclamation, deforestation and unsustainable resource exploitation have produced changes in the physical and biological dynamics of the coastal system.

The women and children, the vulnerable group of this assessment, are finding themselves increasingly stressed with the changing coastlines and salt water intrusions into the croplands. As men out migrate in search of viable avenues, farm work is increasingly being assigned to women. Young boys and even younger girls fetch freshwater from community tubewells, now a norm rather than an exception, gather litter for ducks and poultry, dehusk rice and collect

Dr. Sugata Hazra Director
School of Oceanographic Studies,
Jadavpur University, Kolkata

Surface air temperature over the area shows a rise of 0.019°C per year and cyclones exhibit increasing intensity with decreasing frequency of occurrence. This has a significant bearing on the extent of coastal flooding, erosion and saline water intrusion due to storm surges. The increase also implies an increase in precipitation over the area. The Sunderban deltaic region follows the natural dynamic process of erosion and accretion. At present however there is overall reduction of land area despite feeble delta outbuilding phases. The possibility of a relative rise in sea level thus stands confirmed. This contention is also supported by similar observations from the Digha and Shankarpur coastal stretch which shows a parallel retreat of shore line with time over last decade.

Areas like Shankarpur or Dadanpatra Bar, two potential tourism development zones, which were previously stable have been witnessing severe coastal erosion since 1994. This can be confirmed from the damaged sea wall, destruction of the concrete wave breakers and the wave cut dunes. Near Digha, Mohana, a river



estuary, has widened its mouth through bank erosion. A comparative study of the shoreline changes from the year 1969 to 2005 reveals that the entire coastal stretch from Digha to Shankarpur is under erosive action. Man made interventions have hastened the process as aquaculture farms within the intertidal zone have come up at the expense of saltpans and intertidal mangroves. Despite the plantation programme a significant reduction of forest areas along Digha to Shankarpur may be seen. The island Sagar itself has registered a net loss of 30 km² area over the past 30 years. The entire population of Khasimara, Baisnabpara, Khasimara Char and Baghpara villages on Ghoramara Island has had to leave its original habitat and seek refuge in the nearby island.

Dr. Anurag Danda Senior Project Coordinator,
Sunderban Programme, WWF (India), Kolkata

Embankments are the basis of human habitation in Sundarban, as they are crucial for the existence of human settlements on the deltaic islands. Breaches in embankments force change in livelihood pattern from land based to water based, which has a significant bearing on the health of the ecosystem. An earthen embankment running across 3520 km was erected in the early twentieth century to protect agricultural land from saline water flooding cropland. However with time the embankments have been worn out and the river beds have been raised by siltation



causing repeated breaches and total wash out during cyclone and storm surges. The extent and intensity of coastal flooding is bound to increase in future in pan Sunderban area.

firewood. Women, carry produce to local markets in small cycle carts, refurbish their mud houses, grow the rice saplings, replant flooded fields during the monsoon, lead cattle to graze and gather them in the evening, dry fish in the sun and tend vegetable gardens among other household duties. They also meticulously tend the betel leaf plants and collect their leaves for sale. The women respondents were reticent about providing details about their health status, more so as the area surveyed was Muslim

dominated. Working without menfolk was never an issue for the zesty smiling women of Mousuni and Shankarpur, as men were eternally out either fishing or looking for jobs elsewhere. Men in their lives, they asserted, had a limited role to play in day to day chores. When quizzed about climate change, they retorted, especially in Mousuni, about how not only the salt water intrusions but the varying rainfall patterns too have affected crop loss. So localised is their plight that they find it extremely difficult to



address the West Bengal authorities for redressal.

According to Dr Hazra the rate of relative sea level rise is presently approaching 3.14 mm per year near Sagar Island and this could increase to 3.5 mm per year over the next few decades due to global warming. World over the sea level rise is churning out 'environmental refugees' displaced from their original habitats. Reducing land area in islands such as Lohachara (now completely destroyed), Bedford or Ghoramara is creating a new defenseless community. The area, threatened by post partition refugee influx, proliferation of aquaculture farms, large scale reclamation, today experiences exacerbated environmental stress. The resource depletion thus can trigger large scale migration especially from the fragile Sundarban Island system in near future.

The Shankarpur beach, as reported by many respondents, were once resplendent with wildlife. It was the abode of the endangered Olive Ridley turtles and Horseshoe crabs. But today the biodiversity register shows no entries. Hannan, a trawler employee commented that though the fish catch has reportedly grown with better techniques and mechanisation, the number and size of fish species is on the decline as is the catch per unit. This obviously indicates significant stress on coastal biodiversity.

Also intense wild prawn seed collection, a destructive procedure with bycatches of other juveniles destroyed, affects biodiversity and can endanger the livelihood of the fishermen community in the future. The mangrove forest, nursery grounds for many species, is predicted to diminish further with some fresh water species like *Heritiera*, *Nypa* or *Zylocarpus* swiftly turning extinct.

In Mousuni, Digha and Shankarpur area about ninety percent of the population is agriculture dependent. Mousuni is further unique, in the sense that it bears a single crop of paddy - *aman*, a monsoon dependent paddy, in a year. This monocrop dependency is intimately linked to salinity and water logging. In the dry season, huge portions of land remain fallow for want of irrigation. Additionally, withdrawal of subterranean water is not only cost prohibitive, but hazardous in a salt ingressive regime. Most of the population here resides below the poverty line, and the number is rapidly increasing. Following agriculture, fisheries provide a sizeable source of employment but lack of infrastructure for industries has largely disabled the inhabitants and made them

dependant on the rapidly disappearing shores.

Safia, a demure young mother of three, spoke of how rainfall patterns have changed. "The monsoons arrived on time. My crops grew fast, a healthy bright green. Then came a violent storm one dark, damp morning, the embankment breached and I lost half of what I had sown. The plants drooped as they stood amidst salt water, turned yellow and then black. Yet, I was happy, the rest of the crop, beyond the lily lake, was doing fine. The ears of rice were filling up, pumped full, its ripe round seeds almost touched the ground. But the rains just wouldn't stop. It was September, yet it rained. My yellow, full ears were ready for harvest, but the rains still came. I lost another a quarter of what was left - washed away before my eyes. I usually sell two quintals of rice in the market, but this time I had to purchase to survive."

EVOLVING A PROGRAMME

To evolve any effective management system for the climate change refugees, the status of the coastal community, their livelihood and nature of participation in the local governance needs to be analysed and ensured. To prevent salt water intrusions, coast stabilisers, with mangrove restoration, embankments - geotube/geojute bunding, palisade fencing with *jhau balla*, groin enforcement and urgent repair of earthen embankments as a short term measure may stretch adjustment time. While the embankments are working, socio economic vulnerability of the people residing here may be reduced. Nine mouzas/talukas and several islands in the Sunderban are depopulated (Dr Hazra) due to the natural stress and coastal erosion. Poverty alleviation programmes may be launched, and upliftment of backward communities undertaken. Electricity, must be provided to increase working hours, directly beneficial where home based self help projects have been initiated. A livelihood option, it can offset the fall in income. Diversified cropping pattern can help avoid climate change vulnerability and cashew, coconut, etc, as plantations turn viable. A salinity tolerant paddy using water from the brackish aquifers, blended with rainwater harvested during monsoons can provide a *boro* or winter crop, along with the *aman*. Also small scale industries, such as betel leaf, cashew oil, coconut oil, fiber etc, can be planned to balance falling opportunities in these rapidly eroding coastal tracts. 