



Problem of Management of Storm Surges and Human Plight: A Case Study of Sunderbans Region, India

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Sunderbans Islands situated at the mouth of Bay of Bengal between India and Bangladesh, is an example per excellence of geographically challenged region of the world, where loss of lands and habitats are the two major issues due to sea level rise in recent years. The islands are situated just few meters above sea level and are at particular risk from storm surge inundation. The occurrence of cyclones within a span of three years - Sidr, Nargis, Bijli in 2006 and Aila in 2009, has displaced more than 50,000 thousand people and engulfed its two big islands- Bedford and Lohachara which led to land scarcity. Formation of new islands is constantly going on, what land waters shallow from one end, they spit out as sandbanks and new islands at another. This has created a wide range of ecological and socio-economic problems in the region, leading to crisis in the livelihoods of the poor and marginalized people. The region lacks in disaster management techniques and effective government policies to cope up with the frequent occurrence of storm surges.

Objectives: This paper analyses the contemporary risks of sea level rise in Sunderbans, and its future consequences. It talks about the problem of management of storm surges and the plight of the people where there is absolute failure of decentralized planning. It highlights the latest climatic variations that are taking place over the years. It critically studies the plans and policies of both the central and state government, how effective they are for implementing climate adaptive strategies for this particular region. How this densely populated region of 4.1 million in Sunderban alone, can battle this increasing loss of land and habitat due to storm surges? What are the alternatives that fishermen and farmers can look for to offset their declining economy?

Methodology: Several books and articles have been consulted. Interviews are taken from government officials and residents of Sunderban region.

Major Findings: In Sunderban, the situation is only going to worsen as the sea level rose by 3.18 mm in the past decade because the Pacific Ocean is in La Nina Phase. The surface air temperature over the area shows a rise of 0.019°C per year and cyclones exhibit increasing intensity with increase in frequency of occurrence. It is expected that after 2011, the rate of sea level rise will accelerate resulting into increase in storm surges and higher rate of erosion. Vanishing of two big islands – Bedford and Lohachara has displaced thousand of climate refugees and their inward migration is responsible for mangrove deforestation. The people of the area are poor, illiterate largely (female literacy is just 20 percent) and have poor standard of living. There exist no rehabilitation programme for them; there is extremely poor participation of the majority of the people in decisions that affect their lives. There is an increase in water level during high tide. Intrusion of saline water into the agricultural land results in loss of yield and creates risk to the farmers- loss of agricultural land and making them migrate in search of new lands. Farmers have shifted their cultivation period in anticipation of shifting of monsoon season, they are growing different weather resistant crops, but due to lack of fund and proper market linkage it remained a distant dream for them to cope up with the problem of food scarcity. Embankments are the basis of human habitation in Sunderbans as they are crucial for the existence of human settlements on the deltaic islands, but they have been worn out and the river beds have been raised by siltation causing repeated breaches and total wash out during cyclones and storm surges. There occurred change in local weather, rainfall has considerably increased and become more erratic within a span of ten years. The span of monsoon season has shifted; it is now delayed by 15 to 20 days. The islands at present does not have any access to grid connectivity and solely depend on solar, biomass and renewable energy sources.

Conclusions: India has only one national climate policy for all regions. There is a need to curve out a region

specific climate policy and fund allocation programme by the government to take disaster preventive measures like storm surges and sea level rise. Despite climate change threats to this ecologically fragile niche, population growth is unchecked. Increased displacement of people due to loss of habitation and land will increase India's count of climate refugee and add to the burden of poverty under which it is already reeling. Sunderban reveals the extreme consequences of climate change and global warming. It is one of the most productive and bio-diverse wetlands on earth and may disappear more quickly than other tropical forests.