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P25.08**Role of Indian Sunderban mangroves in mitigating climate impacts: an appraisal**Sahana Bose*Jawaharlal Nehru University, Centre for International Politics, Organisation and Disarmement, New Delhi, India*

According to Intergovernmental Panel on Climate Change, India is amongst 27 countries that are most vulnerable to sea level rise caused by global warming. Sunderban represents the largest contiguous mangrove ecosystem in the world, consist of hundreds of island crisscrossed by a maze of tidal rivers, estuaries and creeks, shows India's vulnerability. It is located at the eastern coastal region and experiencing sea level rise at an average rate of 3.14mm per year along with the submergence of its islands and mangrove forest. Research based on satellite imaginary has revealed that a rise of upto 1 meter is expected to inundate about 1000 square kilometers of the delta. 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. Mangrove forest which is considered to be the lifeline of this region is declining at an alarming rate due to ever changing salinity of water, soil texture, tidal actions as well as ecological factors arising out of increasing biotic pressure.

Objectives: This paper deals with the factors responsible for mangrove deforestation in Sunderban, what are the present and future consequences for such deforestation related to climate change and global warming. It provides an insight for a layman to understand what role the mangrove forest can plays in safeguarding with the problem of environmental refugees, problem of poverty, unemployment and agriculture. It deals with the socio-economic rationale behind mangrove rehabilitation in such a challenging region. It also studies the remedies to check sea level rise, the policies of climate change to afforest Sunderban. Overall this paper attempts to highlight the impacts, issues and dimensions of mangrove restoration in Sunderban region and to what extent they imply for sustainability and climate change issues in Indian context.

Methodology: Both primary and secondary data are used for qualitative and quantitative analysis. Interviews were taken from government officials and local people to know the problem of the region.

Major Findings: Large forest areas of Sunderban have turned into forest villages with heavy with carbon dioxide in the environment. Local people destroy mangrove forest of the region unknowingly; they do not know the concept of climate change and global warming. India is experiencing some of the very real effects of climate change. Sunderban is loosing 100 square kilometers every year. Sagar islands- one of the first inhabited islands in the world that has been submerged by the rising seas. Vanishing of other two big islands - Bedford and Lohachara, has displaced thousand of climatic refugees and their inward migration is responsible for mangrove deforestation. There exist no rehabilitation programme for them; there is extremely poor participation of the majority of the people in decisions that affect their lives. This region is one of the world's remotely challenged geographical regions with a population density of more than 1100 person per square kilometers. There occurred change in local weather, the frequency of the cyclone has decreased but their severity has increased, rainfall has become more erratic within a span of ten years. A study conducted by Jadavpur University, Kolkata pointed out that the Sunderbans would lose another 15 percent of its total habitable land, displacing more than 30,000 people by 2020. There exist "char politics" which according to the local villagers is the politics of gaining new lands for settlement. When new lands are formed people with more political up hold get access to it and other sections of the society are sidelined. Poor people are becoming poorer; they are the real victims of climate change. Plagued with poverty and unemployment people try to deforest the existing mangrove vegetation for shrimp farming and agriculture. They fail to understand that the silt roots of rhizophora are modified in a manner so that it can stand firmly in the mud and withstand the soil erosion, surge storms especially during hurricanes and tsunamis. Sunderban mangrove forests provide an average of 6000t/ha mangrove litter which produce huge amount of organic material for the whole ecosystem. Studies shows establishment of fodder and fuel wood plantations in the villages as a livelihoods option is expected to lead to decrease the pressure on mangroves. Other adaptation options include agro-forestry methods, include plantation of mangroves along freshwater canals and ponds are recently done by the village communities. Sunderban Development Board under state and central government, since its inception in 1980s has brought several changes for the development of the region. **Conclusion** –Sunderbans are still at a controllable stage. Continuous monitoring, policy change and management interventions must be triggered for mangrove restoration. Scientist say that the Sunderbans, South Asia's largest carbon sink which mops up carbon dioxide must survive to help prevent global

warming. Out of 60 varieties of mangrove species that are found in India, Sunderban accounts for 50, many of which are rare. It has a seemingly unlimited capacity to absorb pollutants from air and water. Though the economic and social benefit arising from this mangrove rehabilitation would be more meaningful to the local communities of this region but it acts as an eye opener to the whole world to understand the concept of forest conservation in mitigating climate change. All constitute part of this complex ecosystem depending upon each other. Any damage to one part will damage and change the whole constitution of the ecology of this area; Sunderban reveals the extreme consequences of climate change and global warming, therefore mangrove plantation is the ultimate solution to this problem.

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