

Adaptation to Environmental Changes: Experiences of Farming Practices in Sagar Island of Indian Sundarbans

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Abstract

The study evaluates farmers' perception of environmental changes and their adopted farming practices in Sagar Island of Indian Sundarbans. Based on the Landsat 4/5 TM and 8/9 OLI for the years 1990 and 2024 and yearly rainfall data since 1970, variations in land use patterns, land surface temperature, yearly average rainfall, normalised differential vegetation index, and salinity index are computed to examine the environmental changes. In addition, information related to farmers' perceptions and changing farming practices have been collected through focus group discussions and personal interviews in two selected villages of the Island, namely Gangasagar and Beguakhali. Results show an increasing trend in average surface temperature, rainfall, and soil salinity and a decreasing trend in the vegetation index, along with notable changes in land use patterns. While these observed trends are consistent with farmers' perceptions, the study also finds cyclones and associated storm surges as extreme climatic events causing salinity intrusion, coastal flooding, waterlogging, and soil degradation and crop failures in the area. As an adaptation strategy, the landless and marginal farmers apply chemical fertilizers, pesticides, medicines, and effective irrigation systems for cultivating salt-tolerant vegetables and paddies. Further, crop selection is determined by environmental conditions, family needs, market demand, surface water availability (during off-monsoon periods), and natural calamities. Nevertheless, rotation of crops and lands, changes in cropping pattern, crop calendar, crop variety, and diversification of crops have emerged as strategies to sustain farming practices, especially by the land-constrained farmers. Policies and interventions should, therefore, aim at addressing these critical aspects.

Keywords: Climate change, Farmer's perception, Adaptation strategies, Farming behaviour, Sagar Island.