

ASSESSMENT OF ECOLOGICAL DISTURBANCE ON INDIAN SUNDARBANS WITH SPECIAL REFERENCE TO AMPHAN CYCLONE BY USING GEOSPATIAL TECHNOLOGY

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Abstract

The mangrove ecosystem of Sundarbans region plays a significant ecological and socio-economic role in both India and Bangladesh. An increase in coastal human settlements makes the area more vulnerable to natural disasters such as tsunamis and cyclones. Mangroves as an exclusive group of plants provide many ecological services such as reducing the impacts of cyclonic storms and gales and minimizing the sea level rise due to global warming. Sundarbans were facing immense destruction due to super cyclones during past years. The present study investigates the ecological disturbance caused by cyclone Amphan in Indian Sundarbans using remote sensing multispectral imagery. The pre and post-cyclonic Landsat data were analyzed to quantify the damaged area in Sundarbans due to the effect of the cyclone, Amphan. Normalized Vegetation Index (NDVI) and Enhanced Vegetation Index (EVI) were used to estimate the vegetative changes or loss that occurred due to the cyclone. Normalized Difference Water Index (NDWI), Normalized Difference Bareness Index (NDBal) and Normalized Difference Salinity Index (NDSI) are the other indices used to study the effects of cyclone. The study found that from pre to post-cyclonic period mangroves reduced from 1851.88 km² to 1643.74 km² and about 50.18 km² of vegetation becomes sparse. High salinity values were observed during the post-cyclonic period which indicates that the super cyclone results in the saltwater intrusion. From pre to post cyclone, NDBal results shows an increase in barren land from 908.13 km² to 1365.57 km².

Keywords: *Sundarbans, Cyclone, NDVI, EVI, Salinity, LST*