

Investigating Changes in Nijhum Dwip Mangrove Forest: A Study on NDVI, LAI & Land Use Land Cover

Tahmina Anwar Tonny

Shahjalal University of Science & Technology

Abstract

Nijhum dwip is situated in the Bay of Bengal, off the coast of Bangladesh, in the southwestern part of the country. This island has different types of vegetation including mangrove forests, green grasslands and different shrubs, which contribute a lot to ecological diversity. The mangroves play a crucial role in protecting the coastline and supporting marine life. Utilizing LANDSAT 7,8, and Sentinel-2 data, this study evaluated NDVI (2015-2023), LAI (2018-2023), and LULC (2005, 2010, 2015, 2020, 2023) for forest biomass assessment. The NDVI values fluctuated, reaching a peak (-0.061272472 to 0.389624357) in 2021 and a low (-0.025837515 to 0.2483112370) in 2016. The LAI value was the highest in 2023 ranging from 4. 96058 to - 0.277276 and the lowest LAI value was in 2018 ranging from 2.60431 to 0. LAI and NDVI both exhibited an upward trend. Employing the iterative self-organizing (ISO) cluster method, LULC changes were quantified, revealing the mangroves' peak at 17.001 km² in 2010, with 2015 displaying the highest percentage relative to the total area (37.37%). The study shows the need for continuous monitoring in Nijhum Dwip. The ndvi and lai of the findings produced R2 values of 0.0944. The findings advocate for focused land management development to conserve forest biomass, urging relevant agencies and policymakers to prioritize conservation efforts. This comprehensive study provides insights into the evolving trends of LAI, NDVI, and LULC in the region, offering valuable information for effective mangrove conservation strategies.