

Mangrove cover change detection in Vankalai bird sanctuary in Mannar District of Sri Lanka using Landsat satellite imageries

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Vankalai sanctuary, partly a wetland which was declared as one of the bird sanctuary by the Department of Wildlife Conservation (DWC) of Sri Lanka in 2008. The sanctuary is located adjacent to Mannar town covering 4839 ha. This sanctuary consists of several ecosystems such as arid-zone thorn scrubland, mangrove, salt marshes, lagoons and coastal grasslands. The objectives of this study are to identify the temporal changes of the mangrove covers and to understand the anthropogenic factors that have been influencing in the changes of mangroves from 1999 to 2017. Mangrove cover mapping have been carried out to the year of 1999, 2006, 2010 and 2017 using freely available Landsat satellite imageries. Mangrove area has been detected through the indices of normalized difference vegetation index (NDVI) in the remote sensing (RS) and geographical information system (GIS). After geometrically corrected, the images have been used to derive NDVI with the visible red and near infra red (NIR) bands in the remote sensing software of ERDAS Imagine 2014. Based on the NDVI values of each year the mangrove cover was estimated. Result of the analysis showed that, the mangrove cover has decreased in the Northwest and the middle part of the sanctuary. Significant amount of mangrove areas has been destroyed due to the illegal fishing and the mismanagement of mangrove between 2007 to 2009 periods. The total extent of mangrove cover was 6.5 km² in 1999 but this extent has decreased in 2006 and 2010 as 5 and 4.5 km² respectively. Results in 2017, indicated that the total extent of mangrove cover was 4.7 km². Therefore, proper monitoring and conservation programmes are needed to conserve the bird sanctuary in future.

Keywords: Landsat satellite, mangrove, NDVI, NIR

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