# Comparative analysis of forest canopy mapping methods for the Sundarban biosphere reserve, West Bengal, India

Ismail Mondal[1] · Sandeep Thakur[1] · Mukhiddin Juliev[2,3] · Tarun Kumar De[1]

## Abstract

The canopy density of forests is highly influenced by population pressure which cause forest fragmentations, deforestations, forest degradation and also land reclamation for infrastructure and agriculture. This study was envisaged with the objective of mapping the forest canopy density with two different methods by using Landsat 8 OLI dataset of the year 2016 after mapping the vegetation indices. One of the two methods is the semi-expert FCD mapper model, while the other model is newly developed by us and consists of eight vegetation indices. After running the models, the results of both the models were compared. It was found that for the semi-expert FCD model, the three classes viz. high canopy density, moderate canopy and low canopy covered an area of 81,615.51 ha (40%), 84,474.72 ha (41%) and 38,844.18 ha (19%), respectively. And for the modified FCD model, the same classes covered 69,134.670 ha (37%), 84,062.250 ha (45%) and 32,529.150 ha (18%), respectively. It was observed that the difference between semi-expert FCD model and the modified FCD model's accuracy is about 1.75% and difference in Kappa statistics is 0.0362. Thus, the modified model is more accurate than the semi-expert FCD model and gives us more detailed canopy density map than the semi-expert FCD map.

**Keywords** Mangrove forest · Vegetation indices · Landsat · Remote sensing · Semi-expert model · Modified model

✉ Ismail Mondal
  ismailmondal58@gmail.com

  Sandeep Thakur
  sandeept.pu@gmail.com

  Mukhiddin Juliev
  mukhiddinjuliev@gmail.com

  Tarun Kumar De
  tarunde@yahoo.co.in

[1]  Department of Marine Science, University of Calcutta, Kolkata 700019, India

[2]  Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, Uzbekistan

[3]  Turin Polytechnic University, Tashkent, Uzbekistan

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